

*THE IMPACT OF BASEL III ON THE PROVISION OF LONG - TERM
HOUSING FINANCE IN SOUTH AFRICA*



Department of Construction Economics and Management

Dissertation Submitted in Partial Fulfilment of the Requirements for the
Degree of Master of Science in Property Studies

By: Peter Graham MacKenzie

Student Number: MCKPET005

Supervisor: Robert McGaffin

The copyright of this thesis vests in the author. No quotation from it or information derived from it is to be published without full acknowledgement of the source. The thesis is to be used for private study or non-commercial research purposes only.

Published by the University of Cape Town (UCT) in terms of the non-exclusive license granted to UCT by the author.

Declaration

I am presenting this dissertation in PARTIAL fulfilment of the requirements for my degree.

I know the meaning of plagiarism and declare that all of the work in the dissertation, save for that which is properly acknowledged, is my own.

This thesis has been submitted to the Turnitin module and I confirm that my supervisor has seen my report and any concerns revealed by such have been resolved with my supervisor.

I hereby grant the University of Cape Town free licence to reproduce for the purpose of research either the whole or any portion of the contents in any manner whatsoever of the above dissertation.

Signed by candidate

PG MacKenzie

22/12/2017

Acknowledgements

I would like to start by thanking God for giving me the motivation and the determination to complete this this Masters programme. Without HIS guidance and support, none of this would have been possible.

Thank you to my supervisor Mr. Robert McGaffin for his invaluable advice whilst writing this thesis. The insight and direction that he has given me has been instrumental to its completion.

A huge thank you to my family for their continual thoughts, prayers, and encouragement throughout this journey. Their unwavering support never goes un-noticed and is immensely appreciated.

I would like to reserve a special thank you for my wonderful wife Nicci. She has unselfishly and tirelessly supported me throughout. I would like to thank her for the continuous love, encouragement, support and loyalty. If it weren't for her, none of this could have been done.

Abstract

South Africa suffers from an acute housing shortage with the lack of access to credit partly to blame. The implementation of Basel III, an international regulatory framework touted to impact the banking sector, has been suggested as a potential catalyst to credit deterioration in South Africa. The purpose of this study is to assess the impact of the Basel III regulatory Accord on the provision of long - term housing finance in South Africa. A combination of interviews with bank personnel, as well as a time – series statistical analysis utilising aggregate bank balance sheet data is employed to gauge how changes in banks' balance sheet compositions may affect long - term housing finance.

South African banks are historically well capitalised. However, the introduction of newly developed parameters in accordance with the Basel III Accord appear to threaten bank profitability. Findings from the study indicate that the provision of long - term housing finance will be compromised in certain ways with some sectors of the housing market more impacted than others.

Table of Contents

Chapter 1 - Introduction	1
1.1 Background	1
1.2 The Basel Accords	5
1.2.1 History of the Basel Accords	6
1.3 Return on Equity	8
1.4.1 Research Problem	9
1.4.2 Research Questions	9
1.4.3 Research Aim	9
1.4.4 Research Proposition	10
1.4.5 Research Objectives	10
1.5 Research Methodology	10
1.6 Research Contributions	11
Chapter 2 - Literature Review	13
2.1 The Basel Accords	14
2.1.1 Basel I	15
2.1.2 Basel II	20
2.1.3 Basel III	29
2.2 How the Impact of Basel III on the Macro Economy and Banks (ROE, balance sheets etc.) will Impact on the Provision of Housing Finance	37
2.2.1 Macro – Economic Impact of Basel III	38
2.2.2 Basel III and its effect on bank balance sheets and ROE	40
2.2.3 Impact of Basel III on Bank Lending Rates	44
Chapter 3 - Research Methodology	51
3.1 Research Philosophy	51
3.1.1 Research Approach and Research Methods	52
3.1.2 Research Design	53
3.1.3 Data Collection	55
<i>i. In – Depth Interviews</i>	55
<i>ii. Time - Series Analysis</i>	56
3.2 Reliability and Validity	57
3.2.1 Qualitative Reliability and Validity	57

3.2.2	Quantitative Reliability and Validity	59
	Chapter 4 – Findings, Results, and Discussion	61
4.1	Field Research (In-depth Interviews)	61
i.)	<i>Respondent Profiles</i>	62
ii.)	<i>Interview Questions</i>	63
4.1.1	Thematic Analysis through Coding	67
4.1.2	Theme Analysis	70
4.2	Quantitative Data Analysis Results	82
4.3	Discussion and Analysis.....	94
	Chapter 5 – Conclusion	100
5.1	The Research Question	100
5.2	Achieving the Research Objectives	100
5.3	Research Findings	103
5.4	Research Proposition	104
5.5	Limitations.....	105
5.6	Future Research	106
	References	107
	Appendix	116

Chapter 1 - Introduction

The main conduit to home ownership for the vast majority of the South African population is by way of mortgage bond finance, a funding covenant usually acquired through the traditional retail banking sector. However, affordability constraints for the majority of consumers has been suggested as a hurdle to obtaining housing finance, and therefore one of the primary contributors to the lack of adequate housing provision in the country. Thus, a systematic understanding of how Basel III, a directive that has been touted to influence the banking sector and the provision of long - term finance, is crucial to understand. Accordingly, the aim of this paper is to gauge what impact the new Basel III banking regulation will have on the provision of long - term housing finance in South Africa.

The first section of this chapter aims to briefly summarize the importance of long - term housing finance to households and the economy. The second section provides a concise overview of the business drivers of banking and how the Basel regulations are likely to impact on them. Section three outlines the research method that was used in this report and details the research problem, questions, aims, proposition and methodology to be used.

1.1 Background

For many South Africans, purchasing a home for the first time will not only be the largest investment they will ever make, but also the source of the largest financial encumbrance that they will ever undertake. Regrettably, whilst South Africa boasts a world - class banking system that consistently places in the top ten positions globally for banking soundness, and with over thirty banking institutions on offer, access to long - term credit for the majority of the population is a major concern (Centre for Affordable Housing Finance in Africa, 2016). According to The World Economic Forum's Global Competitiveness Report for 2015 – 2016 (Browne et al., 2015), South Africa was ranked 21st out of 140 countries globally for the affordability of financial services and 32nd for the ease of access to loans. Interpreting these statistics suggests that credit accessibility in South Africa is not a pressing issue. In reality however, a conflicting scenario prevails. Although South Africa has an exceedingly active

credit market, long-term mortgages only accounted for roughly 31% of all loans granted in 2015 according to the Africa Housing Finance Yearbook, to be referred to as AHFY (2016). In fact, the majority of all finance granted during 2015 was of the un-secured variety; a less than ideal scenario. Nevertheless, there are several reasons that contribute to these statistics.

To start, income inequality in South Africa is endemic, with a high unemployment rate and low education levels contributing to a housing market that is vastly diversified in value terms. As an illustration, Cape Town's Atlantic Seaboard is home to the continent's most expensive residential real estate with a record recent sale of R290m; yet 90% of the residents living in the Alfred Nzo Municipality, in the Eastern Cape, earn less than R1, 600 per month. Evidently, there are consumers' representative of all income levels in South Africa – those who simply need to fill the basic housing need, and others whose primary goal is investment and wealth creation.

Statistics South Africa (2016) reports that South Africa's real estate, business, and finance sectors are the largest contributors to the country's GDP making up 20% of this indicator for the year 2016. Including the construction sector, this figure increases to almost 24% of GDP. Clearly, access to credit is not only immensely important for the survival of the South African economy as a whole, but it is just as important to consumers in the housing market.

It has been suggested that the most important part of an economy is the availability of credit. By way of applying basic economic principles, this statement suggests that the extension of credit leads to a rise in consumer spending, and consequently increasing income levels in the economy. These higher income levels and elevated levels of spending may lead to a higher gross domestic product (GDP), and as a result, potentially faster productivity growth. If credit is used to purchase productive resources, it helps in economic growth and adds to income (Keats, 2015). Based on this statement, as well as the fact that South Africa's residential house construction and rental market is a R152 billion industry sustaining employment to 468,000 people annually demonstrates that the availability of, and access to mortgage finance is critical for the South African economy and individual consumers alike (Centre for Affordable Housing Finance in Africa, 2016).

However, arguably one of the most notable requirements for bank credit stems from the escalating housing costs in South Africa. In 2016 for example, it was estimated that the cheapest entry level home that could be built would cost in the region of R350, 000 - yet only 16.6%% of the South African population earn more than R20, 000 per month. Based on these statistics, it is clear how access to bank finance is a necessity for the majority of the population to acquire even an entry level home (Centre for Affordable Housing Finance in Africa, 2016).

In 2015, residential mortgages accounted for 31 percent of all loans granted down from a previous base of 47 percent in 2008. On the contrary, unsecured loans increased in prevalence from 21 percent in 2008, to 34 percent of all loans granted in 2015 (Centre for Affordable Housing Finance in Africa, 2016). This adjustment of lending from that of a long - term nature to that of a short term nature can have severe financial implications for borrowers and society alike. Does this somewhat worrying trend, combined with the imminent arrival of full Basel III implementation, suggest a decrease in the availability of long - term housing finance in South Africa? This question remains to be answered.

Erbas and Nothaft (2002, p. 4) in their International Monetary Fund (IMF) working paper argue that the provision of affordable home mortgage loans to a large segment of a country's general population can assist with both growth enhancing and redistributive objectives and further remark that "International experience suggests that widespread availability of home mortgages has a favourable impact on the quality of housing, infrastructure, and urbanization, in short, on improving living standards and alleviating poverty." Erbas and Nothaft (2002, p. 4) continue by adding that the "widespread availability of affordable mortgages may enhance savings, promote financial market development, and stimulate investment in the housing sector." Thus, any regulation that proposes changes to the country's banking legislation, and thus potentially the credit market, runs the risk of adversely affecting the provision of finance to both individual consumers and corporates alike. Nonetheless, to be in a position to understand how households gain access to credit, and what factors determine the availability of credit, one needs to understand the business of banking, and how it is impacted upon by regulation.

Simply, one of the many ways in which banks make money is to 'borrow' money at a certain cost from a variety of sources that include retail depositors (by way of offering savings and

cheque accounts to individuals and companies), wholesale funders (borrowed funds from institutional investors), and via funding on the wholesale market (borrowing from other banks), and then lending out these 'borrowed' funds at a higher interest rate to individuals or companies whom require long - term funding for investment purposes. In the words of Bezoen (2015, p. 1), "Banks function as the main provider of credit intermediation between investors and suppliers and provide critical services to consumers and businesses." Naturally, any regulation that tampers with the flow of credit between banks and consumers has the potential to disrupt economic growth.

The third Basel Accord, known simply as Basel III, is being implemented globally between 2013 and 2019. This revised banking protocol has been suggested as a potential catalyst for reduced levels of lending as a result of the revised minimum capital requirements, and the newly introduced liquidity conditions. Yadav et al. (2014) report that the recapitalization efforts of banks' will affect banks' supply of funds, thereby driving them to look for ways to reduce lending to ensure regulatory minimums are upheld.

The Availability and the Affordability of Bank Credit

The relationship between bank lending and the broad topic of residential housing is an interesting debate. Additionally, what an impact on bank lending essentially means, and how it can affect the housing market is important to understand. Housing markets in South Africa are largely dependent on the ability of consumers to not only access bank finance, but be in a position to afford bank finance as well. Pearson and Greeff (2006), as cited by Rust (2006), note that the Financial Sector Charter of 2004 has given low income earners accessibility to multiple forms of credit; which has ultimately resulted in negative strain on their debt profiles, and compromised their affordability of housing.

Demand and supply tells us that when the supply of bank credit deteriorates, the amount of available housing should inevitably diminish as well - a less than ideal scenario for a developing country such as South Africa. There are two key measures that impact an individual's ability to obtain finance: i.) the affordability of finance and ii.) the availability of finance. Understandably, any directive that is set to decrease the affordability of finance (such as an increase in interest rates or a reduction in the term of the loan), as well as the availability of finance (i.e. a reduction in credit supply), will have undesired consequences on

housing markets and the ability of consumers to access housing markets. Basel III is a regulation that can influence both of these measures, and thus has the ability to directly implicate the housing sector as well as the ability of consumers to access the housing market. Evidently, bank finance is arguably the most important link in the housing chain, and is vital to its efficient operation. Therefore, how the new Basel III regulation is likely to impact the availability of long - term finance, and the affordability of finance, is crucial to understand. Equally important to understand is how the various sectors of the housing market are likely to be impacted by the Basel III Accord.

1.2 The Basel Accords

The global banking environment has largely been governed by the Basel Accords as set by the Basel Committee on Banking Supervision. This set of banking regulations, initially introduced in 1998 with the implementation of Basel I, aims to improve the supervision, regulation, and practices of banks worldwide with the objective of boosting financial stability (BFIS, 2016). However, as respectable as these measures are, there are both economic and institutional implications that need consideration. Proponents of the Accords argue that the large majority of noteworthy international banks, as evidenced by the 2007 – 2008 financial crisis, are over leveraged and undercapitalised (Kasakende et al., 2012) and thus need an auditory body to ensure that reckless lending and perilous speculation initiatives come to an end. Opponents of the Accords argue that the availability of credit, as well as a degree of regulatory leniency on the banking environment, is essential to sustained economic growth.

Fundamentally, the Basel Accords are largely centred on the premise of strengthening the financial soundness of banks by means of boosting their minimum capital requirements; or simply, the amount of regulatory capital held as a percentage of risk weighted assets (RWA) i.e. loans (bank assets) that are weighed according to their inherent risk. To remain compliant with these minimum regulatory capital requirements, banks can do one of three things. Either, i.) increase their capital levels by retaining earnings or issuing new capital, ii.) decrease their overall level of assets or alternatively, iii.) maintain the quantity of their asset base whilst shifting towards less risky assets (Cumming and Nel, 2005).

Capital on a bank's balance sheet comes in various forms and is categorised by its ability to absorb losses (Norton Rose Fulbright, 2010) and includes i.) Debt (i.e. subordinated debt), ii.) Equity (i.e. shareholders' funds and retained earnings), as well as iii.) Preference shares. The best quality capital is dubbed 'Tier 1 capital' and includes securities such as common shares and other innovative instruments that have equity like characteristics. The next category of capital is referred to as Tier 2 capital and is composed of instruments such as Preference shares; whilst Tier 3 capital, the lowest class of capital, includes subordinated debt (Norton Rose Fulbright, 2010). Since inception, the Basel Accords have evolved with the ever changing financial landscape, and have been revised to address any pitfalls in their makeup.

1.2.1 History of the Basel Accords

Basel I

The International Basel Committee on Bank Supervision (BCBS) introduced the first Basel Accord, Basel I, in July 1988 with the intention of creating a series of regulatory guidelines that sought to reduce institutional credit risk within the banking sector (AdvisoryHQ, 2016). Basel I was predominantly aimed at addressing the credit risk facing banking institutions and overlooked the supplementary risks that banks frequently encounter. Balin (2008) mentions that Basel I was simply drafted to ensure that banks' held adequate capital to mitigate against risk in the creditworthiness of its loan book. However, it had no capital directive to guard against additional risks such as interest rate variations, currency fluctuations, and general macroeconomic slumps. The omission of a framework to guard against these additional threats is one of a number of criticisms aimed at Basel I. As a result, Basel II was introduced in 2004 to adapt to the shifting financial environment, and to address some of the shortcomings of the first Basel Accord.

Basel II

Basel II, as described by Heid (2007), sought to better align regulatory capital with economic risk and strongly emphasised the *quality* of assets, as opposed to the *type* of assets. The second Basel Accord adopted the framework of the first Accord and expanded its parameters to include the three pillars as described below (Bank for International Settlements, 2016):

- i. Pillar 1: Minimum Capital Requirements
- ii. Pillar 2: Supervisory Review Process
- iii. Pillar 3: Market Discipline

In summary, as the name suggests, the first pillar determines the calculation of the amount of capital to be held by banks' depending on the transaction type. The revised Accord included two different approaches to calculating capital requirements – the 'Standardized Approach', and the 'Internal Ratings Based Approaches'. The second pillar, as Balin (2008) mentions, is intended to address bank-regulator collaboration, and strengthen the rights of the regulator in bank supervision and dissolution. Essentially, regulators are given greater authority to oversee and implement new risk protocols within the banks' if needed. The final pillar sets to improve market discipline within a country's banking sector and encourages banks to disclose capital and risk-taking positions to the general public (Balin, 2008).

Subsequent to the financial collapse of 2007 – 2008, the prevailing Basel II Accord at the time was heavily criticized, with accusations of ineffectiveness, and indictments pertaining to the inadequate assessment of risk (AdvisoryHQ, 2016). In response, the Basel Committee decided that the international banking community lacked both transparency and accountability, and to avoid another banking crisis additional supervision was needed as to how banks' reported 'Tier 1' capital (AdvisoryHQ, 2016). Resultantly, Basel III was introduced in December 2010 to resolve some of the criticisms aimed at the Basel II Accord.

Basel III

The Basel Committee set itself three main objectives as a pre-requisite to the formation of Basel III that include (AdvisoryHQ, 2016):

1. Ensuring that participating banks are robust enough to survive future financial shocks without causing contagion to other economies or sectors.
2. Imposing better risk mitigation strategies on all facets of the financial industry.
3. Solidifying the financial sectors' governance, disclosure practices, and overall transparency.

As well as a modification to what is deemed as an acceptable form of regulatory capital for banks to hold, three new principal components have been included as part of the revised

Basel III framework. Namely, the Liquidity Coverage Ratio (to address short term liquidity), Net Stable Funding Ratio (to address long - term liquidity) and the Leverage Ratio (to limit the amount of borrowing/gearing the banks undertake). These three metrics control a banks liquidity position and financial gearing, and will be assessed in greater detail to uncover their effects on bank profitability.

1.3 Return on Equity

The continuing implementation of the Basel frameworks into the global banking environment through the three Basel Accords will have, and have had, a direct effect on banks' return on equity (ROE) ratios, or put differently, the return that is generated on shareholders' funds. The worldwide banking sector peaked in 2006 with record profits among America's six largest banks hovering around \$82.6 Billion whilst ROE's among these banks averaged 23.5%. However, in 2012 post the 2007 – 2008 financial crisis, ROE's were reduced to approximately 3.9% - less than twenty percent of the 2006 highs, even though banking profits have ascended back to over \$61 Billion. In light of this statistic, banks have recognised the importance of increasing ROE, and so have implemented a renewed business focus around attempting to increase this measure as opposed to purely seeking higher profits.

The introduction of Basel III will likely have a significant impact on the South African banking sector's profitability through a combination of increased capital adequacy ratios and augmented liquidity requirements; ultimately resulting in a *negative* impact on the provision of long - term housing finance. These constraints are expected to adversely affect banks' ROE and Internal Rate of Return (IRR) - two of the most analysed indicators of a bank's profitability. However, there is a contrarian school of thought on the matter which suggests that Basel III will force banks to cut back on lending against risky assets, and so will increase their exposure to retail housing sectors (Yadav et al., 2014).

We find that the implementation of Basel III is expected to negatively impact the provision of long - term housing finance in South Africa. However, the nature and extent of this impact is unknown. This paper seeks to identify to what extent the proposed Basel III regulations will have on the availability of, and the cost of, long-term housing finance. Further to this, how each housing sector is likely to be impacted in its individual capacity should the availability of

long - term funding be compromised, will also be explored. To begin, each of the Basel regulations and their principle components will be studied with the purpose of understanding exactly what these Accords encompass and how they currently have, and may affect the provision of housing finance. Subsequent to this, the degree to which the South African economy relies on the provision of, and the structure of long-term housing finance will then be uncovered. Marrying the results of these two studies will provide a better explanation as to how Basel III will affect both the housing market, as well as the individual consumer.

1.4.1 Research Problem

There are three stratum to this problem that this research recognizes and aims to bring together. In short, i.) society needs housing; ii.) the general population needs long-term housing finance in order to acquire housing; and iii.) the proposed regulatory changes via the implementation of Basel III will potentially discourage the provision of long - term housing finance by banks.

1.4.2 Research Questions

Main Question:

1. When compared to Basel I and Basel II, what effect will the implementation of Basel III have on the provision of long - term housing finance in South Africa?

Sub-Questions:

- 1.1 How does Basel III affect bank profitability, and will Basel III have an impact on the viability of the provision of long - term housing finance by lending institutions?
- 1.2 Based on the above, how will this impact on the extent and nature of housing finance provision?

1.4.3 Research Aim

To determine the impact of Basel III on the availability, and the cost, of long - term housing finance that is required to address the housing problem in South Africa.

1.4.4 Research Proposition

The implementation of Basel III is expected to have a direct negative effect on the profitability of the banking sector, which will reduce the availability and increase the cost of housing finance, and therefore will impact negatively on the provision of housing in South Africa.

1.4.5 Research Objectives

- To understand the fundamentals of the Basel III Accord, including the calculation of Risk Weighted Assets (RWA), Probability of Default (PD), Exposure at Default (EAD), and Loss Given Default (LGD).
- To assess whether the introduction of Basel III will have an impact on overall bank profitability.
- To determine how the impact of Basel III on bank profitability will influence long - term housing finance provision.
- With particular reference to mortgage loans, in what ways will South African banks react to regulatory changes in capital requirements.
- To establish whether banks respond to changes in capital requirements by changing risk-weighted assets, or by varying qualifying capital, or by employing both of these strategies.
- Determining the final impact on the provision of housing finance and hence housing provision.

1.5 Research Methodology

Due to the fact that Basel III is yet to be introduced, and its implications still unidentified - the research framework will largely be exploratory in nature. However, as Basel III has evolved from the premise of Basel II, there will also be a degree of research that is explanatory in nature.

The research will utilize a mixed method approach consisting of both qualitative and quantitative research designs. The qualitative aspect of the research will employ a 'field

survey' research design whereby leading banking officials will be interviewed regarding the potential impact of Basel III on long-term housing finance in South Africa.

The qualitative findings will be corroborated through a quantitative descriptive statistical analysis of lending activity, and the structure of banks' balance sheets between 2005 (Pre - Basel II) and 2016 (Build up to Basel III implementation). This analysis will be modelled around a time-series research technique developed by Cummings and Nel (2005).

1.6 Research Contributions

The housing problem in South Africa is a major concern, with the lack of access to adequate housing due in part to the limited supply of credit to consumers. Consequently, how the impending Basel III bank regulations are likely to effect the supply of credit to the end-user is important to understand.

As alluded to beforehand, the housing segment in South Africa is particularly extensive, with consumers of all income levels potentially impacted in disparate ways by changes in bank regulation. At the base of the income scale, consumers are simply trying to realise the basic housing need whilst also having a tangible investment. At the higher end of the income spectrum, individuals are acquiring residential property for both their primary use, as well as using residential property as a conduit for investment. Either way, what is evident is that the housing sector is a major contributor to South Africa's employment, infrastructure development, and economic growth. Evidence to this is the fact that South Africa's construction sector contributes nearly 1,500,000 jobs to the country's workforce (Statistics South Africa, 2016). However, according to Jordan and Wilse - Samson (2015) , this figure should be considerably more with a further 1,000,000 jobs on offer as a result of housing construction and its allied spin-offs.

In general, the construction industry creates jobs that are particularly suited to less skilled workers - the predominant labour force segment in South Africa, and the primary contributors to the unemployment crisis that the country faces. Interestingly, in China, a country that is largely known for its strength in manufacturing and its accompanying workforce, has had roughly the same amount of direct jobs created in the construction sector than what was

created in the manufacturing sector over the past 10 years. Furthermore, China's recent contraction in housing is revealing the extent to which its manufacturing sector depended not only on exports, but on construction as well (Jordan and Wilse - Samson, 2015).

Resultantly, for a number of reasons, this paper will offer additional value to the economic based literature of the residential housing sector, as well as offer further insight into how changes in banking regulation may have an impact on the demand and supply of housing, as well as the ability to access the housing market.

Insight into the complex nature of Basel III, its mechanics, as well as what this Accord is trying to achieve is paramount in understanding how and why changes in these banking regulations are likely to result in externalities on the housing market, and the availability of long - term finance. Additionally, establishing how banks are likely to respond to a decrease in profitability, and what influence these responses may have on the housing sector can be a valuable resource when estimating the impact of any similar subsequent legislature.

Chapter 2 - Literature Review

This chapter provides a review of the existing literature relating to the anticipated effects of the Basel III Accord on the provision of long - term housing finance in both a South African and international context. The provision of finance by the commercial banking sector, the main supplier of credit in South Africa, is heavily dependent on the regulations that govern the banking sector. Correspondingly, the delivery of housing to the South African market is largely dependent on the availability of credit. As a consequence, any regulation that impacts the banking sector, will naturally have an impact on the accessibility to credit. Therefore, an overview of the three sets of banking regulations collectively known as the Basel Accords, and how they have influenced the banking sector is paramount when gauging the effects of the Basel III regulation.

It is well acknowledged that South Africa suffers from an acute housing shortage with over 2 million households still living in informal dwellings – estimated at roughly 7 million people (Centre for Affordable Housing Finance in Africa, 2016). However, as well as having its challenges, the South African property market is also an important contributor to the South African economy. Owing to the fact that Basel III is still in the implementation stage, the current literature is sparse in terms of the expected effects that the Basel III Accord will have on the provision of long - term housing finance in South Africa. As a result, this study aims to enrich the current contribution of literature on offer by determining whether the provision of long - term housing finance will be impacted by the Basel III regulatory Accord in South Africa.

The first section of this chapter provides a brief history of the Basel Accords along with a description of their core mechanics and their associated objectives. The concepts that are relevant to all of the Accords will be explicated in further detail as the understanding of these concepts at the onset is imperative in order to gain a proper understanding of *how* the Basel regulations can affect long - term housing finance and the provision thereof. Additionally, to fully appreciate what the current literature articulates, and *why* this material is pertinent, a solid grasp of the Basel fundamentals is necessary. Accordingly, a description of the central framework underpinning the Basel Accords will be carried out, with Basel III a primary focus. Thereafter, what the literature suggests as to how each specific element of the Basel III

regulation is projected to effect long - term housing finance will be explained. This section will then give a brief synopsis as to how the consumer may be impacted by each of these individual components. The chapter will then be concluded by outlining what the current literature conveys as to what implications the Basel III Accord is anticipated to have on bank profitability, the macro economy, and lending rates.

2.1 The Basel Accords

The topic of bank regulation has been an ongoing debate over the years with opposing views on the subject. Exponents of bank regulation commonly put forward two justifications for its necessity: the risk of a systemic crisis, as well as the inability of depositors to monitor banks (Goodhart et al (2008) as referenced by Santos, 2001). A systemic banking crisis refers to a situation in which numerous banks within a country experience serious solvency problems or liquidity constraints simultaneously - either because the failure of one bank (or a group of banks) spreads to other banks in the system, or because all banks are effected by a particular outside shock (World Bank, 2015). The most recent example of such a crisis was the sub-prime mortgage crisis of 2007 – 2008 that led to the bankruptcy of Lehman Brothers, as well as the bailout of numerous other systemically important banks (banks that are regarded as ‘too big to fail’). The inability of depositors to monitor banks, the second justification for bank regulation as suggested by Goodhart et al (2008), advocates the need for a body that is representative of depositors to limit adverse selection and moral hazard within the banking industry. Both of these justifications present valid arguments for the regulation of banking systems as evidenced by the excessive risk – taking that led up to the 2007 - 2008 financial crisis that brought the world’s financial markets to their worst levels since the Great Depression of the 1930s.

Conversely, adversaries of bank regulation argue that too much bank regulation impedes economic growth, and that less regulation is required to increase profitability (Cafariello, 2014). Nonetheless, concerns about bank regulation were ultimately addressed with the implementation of the first Basel Accord in 1988.

The Basel Accords, originally assembled by the Basel Committee on Banking Supervision (BCBS) are known as:

“the primary global standard setter for the prudential regulation of banks and provides a forum for cooperation on banking supervisory matters. Its mandate is to strengthen the regulation, supervision and practices of banks worldwide with the purpose of enhancing financial stability (Bank for International Settlements, 2016, para 1).”

The Basel Accords are extremely complex in their composition and to fully grasp the constitution of the Accords would require a review that is beyond the confines of this thesis. However, there are a number of concepts that are central to all of the Accords that require a rudimentary understanding in order to gain an appreciation of not only how the Basel Accords function, but also what the Accords are aiming to achieve. This thesis aims to address how long - term housing finance will be impacted by the implementation of Basel III. To answer this question, it is essential to understand *why* Basel III and the provision of finance are related, and in what context. Understanding this relationship will assist in showing *how* the implementation of Basel III may impact the provision of long - term housing finance. Accordingly, a summary of the Basel Accords including a description of their components is a necessity. To begin, the first two Basel Accords will be summarised with the aspects that are most likely to have an impact on the provision of housing finance outlined. Thereafter, the third Basel Accord will be reviewed with the aspects that are most pertinent to long - term housing finance emphasised.

2.1.1 Basel I

The International Convergence of Capital Measurement and Capital Standards, commonly known as Basel I (to be referred to as Basel I), was originated in 1988 with two fundamental objectives. The first objective was to strengthen the stability and soundness of the international banking system, while the second objective was uniformity in its application to different international banks with a vision to reduce a source of competitive disparity among banks in separate countries (Bank for International Settlements, 1988).

The first Basel Accord was largely directed at credit risk (the risk of counterparty default), while other risks such as interest rate risk and investment risk were essentially left to be dealt with by supervisors in the respective countries (Bank for International Settlements, 1988). Essentially, the Basel I Accord was divided into four pillars: Namely, the Constituents of Capital, the Risk Weighting of Assets, a Target Standard Ratio, as well as the Transitional and Implementing Agreements (Balin, 2008).

Basel I addressed credit risk through the introduction of a 'minimum capital requirement' rule, as well as through a concept termed the risk-weighting of assets (RWA) - a process that classifies bank loans according to their perceived credit risk. Credit risk, as defined by the Bank for International Settlements (2000), is the potential that a bank borrower will fail to meet their obligations in accordance with the agreed terms. Therefore, to mitigate against credit risk, banks are required to hold a percentage of capital against their risk weighted assets. Assets that are deemed 'risky' in nature inherit a high 'risk-weighting' while assets that are 'less risky' in nature are assigned a lower 'risk – weighting'. The risk weightings as prescribed by the Basel I Accord are shown below in Table 1:

Table 1: Basel I Standardized Approach Risk – Weightings

Risk Weight	Asset Class
0%	Cash and gold held in the bank. Obligation on OECD governments and U.S. treasuries.
20%	Claims on OECD banks. Securities issued by US government agencies. Claims on municipalities.
50%	Residential mortgages.
100%	All other claims such as corporate bonds, less-developed countries' debt, claims on non - OECD banks, equities, real estate, plant and equipment.

Source: BIS (1988)

Perhaps the simplest way to demonstrate this calculation is by way of a simple example. Suppose that a conventional home loan of R1, 000,000 carried a 'risk - weighting' of 50% (as

prescribed by the Basel I regulation). The RWA of this home loan would then be calculated as $R1,000,000 * 50\% = R500,000$. As the Basel I regulation stipulated that a minimum of 8% capital was to be held against a bank's risk weighted assets, the total capital holding for this loan would then be calculated as $R500,000 * 8\% = R40,000$. Therefore, against a R1,000,000 loan, a total of R40,000 would need to be held. As demonstrated, for every loan that a bank advances, a proportion of the value of the asset is held with the end goal of creating a capital buffer (Dagher et al. (2016).

To understand the impact of these regulations on the business of banking, one needs to understand the basics of a bank's balance sheet.

In brief, a bank's balance sheet is broken into two parts. An asset side, as well as a liability side (and equity). Assets are items that the bank owns and includes items such as bank reserves, loans to customers, as well as securities and other investments (which are divided into the banking book and the trading book). Banking book assets are securities that are not intended to be sold (i.e. low-risk securities that earn a return on idle cash if there are no profitable lending opportunities), whereas the trading book included assets that must be valued daily at their market price (i.e. derivatives and other securities held by banks in their capacity as market makers). Liabilities are what the bank owes to other parties. Liabilities in the context of this description are used to fund the assets of the banking institution. Items include deposits, as well as short and long - term debt. The difference between the assets and liabilities is known as the equity portion – or the portion which shareholders have a claim to. Shareholder equity is mainly comprised of retained profits (i.e. earnings not paid to shareholders as dividends) as well as the proceeds the bank has received from selling its shares to investors (Oppenheimer and Hollingsworth, 2014). In the context of Basel, capital is the equity that is held on banks' balance sheets, and the capital requirement is the amount of equity (amongst other securities) than needs to be held by the bank in relation to its assets. For a number of reasons, and specifically relative to the understanding of Basel III, equity is important for a variety of reasons: 1.) equity is loss absorbing 2.) equity funds assets similar to how debt and deposits fund assets and 3.) equity is not a debt contract (Oppenheimer and Hollingsworth, 2014).

Effectively, bank capital acts as a cushion to absorb potential losses that may be incurred by a bank during periods of financial distress. In the event of a loss situation, the regulatory capital as specified by the Basel I Accord is drawn on before investor deposits are compromised. Norton Rose Fulbright (2010) remarks that the Basel framework imposes capital adequacy requirements that restrict the amount of assets that a bank may have as a multiple of its capital which helps insure that losses can be absorbed without compromising the rights of depositors and creditors. Thus, the requirement to hold capital is a form of protection to both depositors of money, as well as the economy at large. Essentially, the goal of employing a minimum capital requirement as per the Basel frameworks is to transfer risk from depositors of funds, back to the bank and its shareholders.

How Basel I Defines Capital

Basel I introduced a two tier system for the definition of capital: Tier 1 capital (known as core capital) and Tier 2 capital (known as supplementary capital). The Bank for International Settlements (1988) defines Tier 1 capital as permanent shareholders' equity (i.e. issued and fully paid ordinary shares and perpetual non – cumulative preference shares) and disclosed reserves (i.e. retained earnings). Whereas Tier 2 capital as defined by Nayak (2013) includes all other capital such as hidden reserves, long – term debt with maturity greater than five years, and gains on investment assets. As expected, Tier 1 capital is considered higher quality capital than Tier 2 capital as evidenced by its composition and its ability to absorb losses.

Simply, banks make money by obtaining funding from one source at a particular interest rate, and then on-lending these funds at a higher interest rate than what the funds were borrowed for. The difference between the interest rate of the borrowed funds, and the interest rate charged to the end user is known as the 'margin.' The margin earned on a transaction is essentially the banks profit on the contract. However, banks need to procure these funds from various sources in order to be in a position to extend these funds in the form of bank loans. Oppenheimer and Hollingsworth (2014), outline three primary sources which banks can draw on to fund their lending activities:

- i. Deposits: includes savings accounts, cheque accounts, and certificates of deposits.
- ii. Debt: includes both short term loans as well as long - term borrowings.

- iii. Equity: proceeds that a bank has received from selling shares on the open market to investors as well as retained earnings.

Bank capital that is held to comply with the Basel regulations cannot comprise of depositors' funds, but primarily of shareholder equity; ultimately shifting the risk from depositors of funds to equity shareholders. As a result, depositors are offered a layer of protection on their investment as their funds cannot be used to absorb bank losses. As shareholder funds can be used in times of financial distress as a capital buffer to draw upon, they require a higher return on their investment in exchange for the additional risk borne. Consequently, shareholders have a direct claim on a bank's profit in the form of dividends. For this reason, equity is considered an expensive form of funding when compared to other capital sources (Investec, 2016).

Nevertheless, banks hold capital from a variety of sources to fund their business initiatives that generally comprises of shareholder equity (and retained earnings), subordinated debt, and preference shares - all in varying degrees. The degrees to which these capital holdings are limited are explicitly stated by the Basel Accords. The first Basel regulation prescribed a minimum capital requirement of 8% of RWA to be held by banks. However, of the 8% capital requirement, a minimum of 50% of the banks' capital base has to consist of Tier 1 capital, and Tier 2 capital is permitted up to an amount equal to (but no more than) the Tier 1 capital portion i.e. 4% Tier 1 and 4% Tier 2 for a total capital holding of 8%. It is important to note that the national regulators in a specific jurisdiction have the right to enforce higher capital holding requirements over and above the minimums as prescribed by the Basel Accords. The South African Reserve Bank (SARB) for instance has traditionally imposed capital holding requirements beyond what has been set by the BCBS.

Advantages and Disadvantages

The Basel I Accord introduced a uniform definition of capital adequacy globally, and brought an awareness to judicious capital management across the financial industry (AdvisoryHQ, 2016). However, although the regulation had its merits, there was still room to improve the directive in a number of capacities.

Roy et al. (2013) identified a number of benefits that the first Basel Accord introduced to the banking sector that included:

- i. A fairly simple framework.
- ii. Internationally active banks demonstrated a considerable increase in capital adequacy ratios.
- iii. Increased competitive equality among internationally active banks.
- iv. Global adoption of Basel.

However, along with the advantages that the Basel I Accord offered, a number of disadvantages ultimately become evident including the fact that (Roy et al., 2013):

- i. Capital adequacy solely depended on credit risk, and other risks such as operational and market risk were overlooked.
- ii. The assessment of credit risk did not take into account the difference in credit quality among debtors.
- iii. No emphasis on market values but rather on book values.

Supplementary to the shortcomings identified above, a number of drawbacks pertaining to the Basel I Accord are noteworthy to this research. Balin (2008) mentions that the Accord gave misaligned incentives to banks, and as a result of the 'absoluteness' of Basel I's risk-weightings, banks identified ways to bypass Basel I's standards and add more risk to their asset books than what was originally intended by the Accord. Balin (2008) includes a further criticism of the Accord relating to its application to emerging markets by mentioning that although the Basel I Accord was not intended to be adopted by emerging market economies, it generated foreseen and unforeseen distortions within the banking sectors of industrialized economies as a result of its application to emerging economies under the pressure of international policy and business communities.

Ultimately, critics of the Accord felt that additional measures beyond capital ratios were needed to assess the true risk potential of a bank (AdvisoryHQ, 2016). Consequently, a revised regulatory framework commonly known as Basel II was introduced.

2.1.2 Basel II

In June 2004, The Basel Committee on Banking Supervision released the 'International Convergence of Capital Measurement and Capital Standards: A Revised Framework', also

known as Basel II. The revised Accord set to address the criticisms directed at the first Basel Accord, and so implemented measures to ensure that other risk types were also addressed.

To accomplish the renewed focus of a more comprehensive risk mitigation policy, the Basel II Accord was established upon three pillars all of which aimed to achieve different initiatives:

- i. Pillar 1 – Minimum Regulatory Capital
- ii. Pillar 2 - Supervisory Review
- iii. Pillar 3 – Market Discipline

Pillar 1 – Minimum Regulatory Capital (Credit Risk, Market Risk, and Operational Risk)

Credit Risk

This first pillar, also known as Minimum Regulatory Capital, saw the largest amount of development since the implementation of the first Basel Accord (Balin, 2008) and sought to address credit risk, market risk, and operational risk – all of which are assessed in different ways. A noteworthy modification to the first pillar of the Basel I Accord when measuring credit risk is the methodology that could be used by banks to calculate RWA. As described earlier, calculation of RWA as per the first Accord was completely inflexible in nature with all risk-weightings pre-determined as per the standardized approach table included in the preceding section. The logic used for the assessment of credit risk was arguably inadequate as demonstrated by the following example:

According to the first Basel Accord, a residential home loan necessitates a 50% risk weighting. Therefore a home loan to, for example, a forty year old professionally qualified salaried employee earning R1,500,000 and buying a house in Camps Bay would require the same amount of capital to be held as a twenty two year old non-degreed self – employed individual earning R240,000 that is purchasing an apartment in Johannesburg CBD. Clearly, the bank loan to the forty year old professional is less risky than the bank loan to the twenty two year old buying an apartment in Johannesburg CBD, and yet the same amount of capital was held against these two transactions. As demonstrated, it's clear how banks can be disadvantaged by using a 'blanket' approach when determining the risk – weighting of their assets. This approach, known as the 'standardized approach', is not exceedingly risk sensitive and its

application not sophisticated in nature. Therefore, to address complications like the example mentioned above, the revised Basel II framework introduced the Internal Ratings Based approaches. Namely the 'Foundation Internal Rating Based Approach' and the 'Advanced Internal Rating Based Approach' (to be referred collectively to as IRBA).

Internal Ratings Based Approaches

Generally speaking, banks earn a significant part of their income through their ability to loan money at a higher interest rate than what the funds are borrowed for. Therefore, in theory, the more banks are able to lend money, the higher their income should be. So, if capital cannot be loaned out, but needs to be held for regulatory purposes, the bank is subject to decreased profitability. Therefore, any opportunity for banks to hold less capital would in all likelihood be eagerly perused, as this offers an opportunity to increase profitability. The Internal Ratings Based Approaches afford banks this opportunity.

Roy et al. (2013) mention that internal rating based approaches allow banks to measure credit risk by assigning an internal rating decided by themselves, as opposed to adopting an external rating provided by external credit rating agencies. This method effectively allows banks to rate their own loans according to the borrower type, as well as the nature of transaction; and so banks can legitimately hold less capital against 'less-risky' loans resulting in higher profitability on that specific transaction. Balin (2008) solidifies this statement by ascertaining that if banks adopt the internal ratings based approaches, the Basel Committee is offering them the opportunity to hold less capital reserves and thus benefit from higher profitability.

Foundation Internal Ratings Based Approach

The internal ratings based approaches employ an intricate set of formulae in the assessment of RWA and a comprehensive review of their mechanics is not necessary for this research. However, there are a few concepts that are worth understanding as they form the basis of the Internal Ratings Based Approaches, and demonstrate how bank lending can be influenced as a result of their use.

Credit risk is categorized into two types of losses: expected loss (EL) and unexpected loss (UL). Expected losses are the average losses that would be expected from an exposure or a portfolio of assets (loans) over a given period of time. Therefore, banks usually create impairment

provisions for these losses to offset expected losses as part of the accounting process (Investec, 2016). According to Schuermann (2004), the expected loss on a lending transaction utilizes four key parameters to assess credit risk:

- Probability of Default (PD) – the probability over a one year time horizon, expressed as a percentage that a borrower will default.
- Loss Given Default (LGD) – in the event of a borrower defaulting, this is the loss that the bank would incur expressed as a percentage of the exposure at default.
- Exposure at Default (EAD) – the amount of exposure (as opposed to the percentage) when a loan is in default.
- M (M) – remaining term of the loan.

Formulary, the expected loss on a transaction is the product of the probability of default, the loss given default, and the exposure at default ($EL = PD * LGD * EAD$).

On the contrary, unexpected losses are those losses that occur over and above the expected losses, and banks are required to hold capital in order to cover these unexpected losses. The amount of capital required (also known as the capital demand) to cover these losses is determined by calculating the RWAs. Banks that have adopted the internal ratings based approaches are permitted to use their own specific internal models when calculating UL. The PD models, a key component of the UL calculation, allow the estimation of risk parameters based upon statistical methods as opposed to simple estimates. PD models are intended to rate credit risk (Investec, 2016) and ultimately assign a ‘score’ to a particular borrower. A number of factors, both quantitative and qualitative, are taken into account when assigning a ‘score’ to a particular borrower. In the case of an individual, the most common purchaser of residential property in South Africa, inputs such as the below are considered:

Quantitative Inputs	Qualitative Inputs
Debt Service to Income Ratio	Age
Disposable Income Ration	Qualification
Financial Leverage	Employment Status and Household Income
Fixed Income	Residency Status
Net Asset Value	Region

Very simply, once the data from these inputs are collated, an overall 'score' is then assigned to a specific individual. The score that has been calculated has a corresponding PD and risk grade that is assigned to it. Depending on the score that is calculated, the IRB model effectively assists the bank in calculating how much capital it needs to protect itself against unexpected losses that may arise from the loan that it originates. Evidently, riskier transactions with higher PD's command a higher capital requirement for the banks and vice-versa; perhaps an indication that engaging in this type of lending is unfavourable. The foundation internal ratings based approach allows banks to estimate the PD whereas the LGD, EAD, and Maturity are estimated by the regulators.

As an example, how a 32 year old BCOM graduate with low debt levels earning R450, 000 and living in Durban has behaved historically (financially) contributes towards the estimation process of the bank when determining the PD. Hence, the quality of the historical data input is vital to an accurate risk reflection using the IRBA's. Bakiciol et al. (2008) say that a large data requirement of more than 5 years is required for use of the IRBA's, and that a large investment on the banks part is required to put these approaches in place and maintain them.

Limitations of the PD Models

Although comprehensively more advanced than the standardized approach, there are a few noteworthy limitations to the PD Models (Investec, 2016):

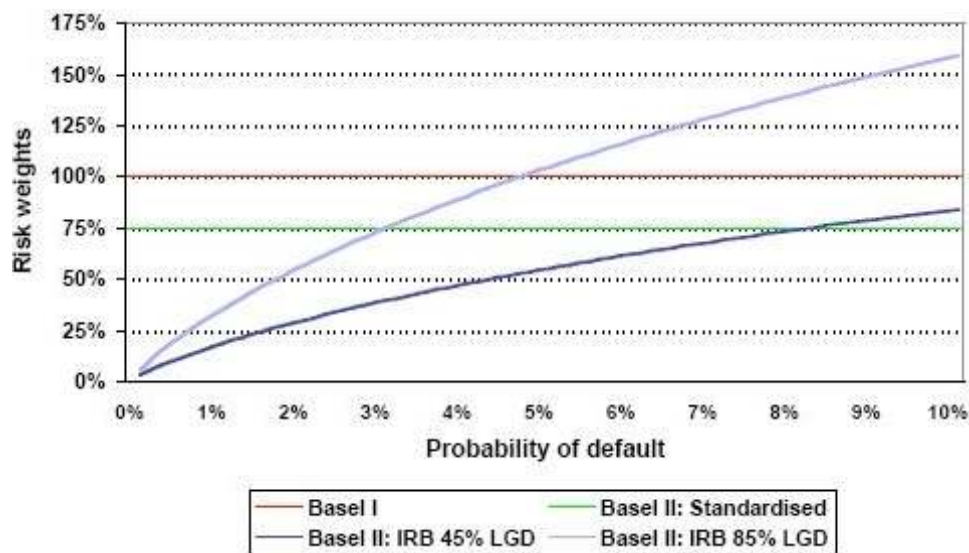
- Large amounts of data are required to develop the PD models, and if data quality is poor, the model will yield incorrect estimates
- Not all factors that indicate a borrower is at risk of defaulting are taken into account. Resultantly, expert credit risk knowledge is still a crucial part of a banks overall credit risk management process
- Assumptions are made in the PD Models that may result in estimates that are not 100% accurate

Balin (2008) remarks that the IRB approaches allow banks to engage in self – surveillance, and that unnecessary risk-taking will result in banks having to hold more capital (which results in less profitability). Further, self – surveillance avoids potential legal battles between regulators and banks and so decreases the costs of regulation. Balin (2008, p. 9) continues by saying that

“the ‘tailoring’ of risk weights allows additional capital to be channelled to the private sector—because public debt is no longer ‘more trusted’ by assumption, banks will be more apt to lend to private sources. This, in turn, increases the depth of the banking sector in a country’s economy, and in sum, encourages economic growth. ‘Poor’ risks can no longer hide under a rather arbitrary risk ‘category,’ preventing the tendency of banks to ‘wobble’ risks around category-based weights.”

Advanced Internal Rating Based Approach

The advanced internal rating based approach is similar to the foundation IRB however the LGD, EAD and Maturity are also estimated by the bank (as opposed to regulators) based on historical data.



Source: <https://upload.wikimedia.org/wikipedia/en/7/7a/Cardrisk.jpg>

As demonstrated in the above graph, one can note the benefit to a bank whom uses the IRB approach to calculate the RWA for an individual whom has a credit card product with the banking institution when compared to Basel I and the Basel II Standardized Approach.

What is important to note is that all banks utilising the IRBA’s have internally ‘built’ their own specific risk weighting models, and so may encounter different results for the same consumer profile when compared to another bank. For this reason, the South African Reserve Bank

conducts periodic inspections of individual banks IRB models to ensure that there is some consistency between them.

Market Risk

The second element of risk addressed by the first pillar of the Accord is that of market risk, or the risk of losses of on – and off – balance sheet positions that arise from movements in market prices including equity positions, foreign exchange rates and interest rates (Bakiciol et al., 2008). As market risk traditionally involves mitigating the risk aspects on a bank's trading book, the approaches implemented by the Accord to address this type of risk are expected to have little impact on a bank's long - term residential lending practices, and so will not be described further for the context of thesis.

Operational Risk

The Bank for International Settlements (2011) defines operational risk as the risk of loss that results from inadequate or failed internal processes, systems, and people or from external events. Similar to market risk, the approach implemented by the Accord to address operational risk is expected to have little impact on a bank's long - term residential lending practices, and so will not be further described for the context of this thesis.

Capital Requirement as defined by Basel II

The objective of the capital ratio is to calculate the minimum capital requirements that are required to address the risk components of credit, market, and operational risk. According to the Bank for International Settlements (2004), total capital as a percentage of RWA must not be lower than 8% with Tier 2 capital limited to 100% of Tier 1 capital. Tier 3 capital is similarly limited to 100% of Tier 1 capital. What constitutes these capital tiers is summarised below (Basel ii Compliance Professionals Association, n.d.):

- i. Tier 1 Capital: Also known as 'core capital' this tier of capital includes ordinary shares/common stock, disclosed reserves, and non-cumulative perpetual preferred stock.
- ii. Tier 2 Capital: Also known as 'supplementary capital' and includes undisclosed reserves, revaluation reserves, general loan-loss reserves, hybrid debt capital instruments, and subordinated term debt.

- iii. Tier 3 Capital: this third tier of capital is employed at the discretion of national authorities for the purpose of meeting a proportion of market risks (subject to conditions) and includes short-term subordinated debt subject to certain conditions.

Pillar 2 - Supervisory Review

Pillar II of the Accord formed principles for a bank's Internal Capital Adequacy Assessment Process which is intended to identify risks that are not easily recognizable to the bank (such as strategic, liquidity, and reputational risks), but that are material to the bank. Additionally, requirements were established to support banks' capital adequacy by estimating economic capital to account for unforeseen losses (Agarwal and Ravitz, 2014).

The second pillar of the Basel II Accord grants supervisory powers to regulators to inspect banks' capital assessment policies and risk management systems. Additionally, regulators are given the authority to implement additional capital buffers if required (Roy et al., 2013). Essentially, the main objective of the second pillar is the emphasis that is placed on supervising the quality of a bank's new systems for risk assessment (Griffith - Jones, 2007).

Pillar 3 – Market Discipline

The objective of Pillar 3 is to compliment the first two pillars of the Accord by forming a set of disclosure requirements that allow market participants to assess key pieces of information on capital, risk assessment processes, risk exposures, the scope of application, and hence the capital adequacy of the institution (Bank for International Settlements, 2004). Cadiou and Mars (2008) have a similar view and mention that the motive of Basel III is to improve market discipline through effective public disclosure, and that the pillar has increased the amount of information made publically available by banks.

Advantages and Disadvantages of Basel II

The Basel II Accord had a number of advantages over the Basel I Accord according to Nayak (2013):

- i. The updated Basel II Accord is more risk sensitive.

- ii. There is wider recognition of credit risk mitigation.
- iii. The discrepancy between regulatory capital and economic capital is reduced significantly due to the fact that the regulatory requirements will rely only on a bank's own risk methods.

Hassan Al-Tamimi (2008) found that the number one benefit of the Basel II Accord according to UAE bank employees with adequate Basel II knowledge was that of *productive portfolio risk management*. In other words, banks have an opportunity to become more profitable as less risk in the banking environment means greater profitability.

Subsequent to the 2007 - 2008 global financial crisis, the Basel II Accord was on the receiving end of a wave of criticism. Some of the principle reproaches included the following:

- i. Pro-cyclicality: During periods of economic retraction, bank assets (loans in particular) are assigned higher risk-weightings leading to an increase in capital requirements. Simultaneous to this, capital provisions of the bank will begin to decline as loan losses start to accelerate. As a result of these factors, banks may be induced into decreasing lending advances whilst increase lending margins, thereby intensifying the pro-cyclicality of banking behaviour. Conversely, during periods of economic expansion, lower risk weighting and excessive capital holdings by banks may lead to the expansion of credit volumes and the risk of a credit-led boom (Andersen, 2011).
- ii. Securitisation: According to Heffernan (2005), as quoted by (Neethling, 2014), the Basel II capital requirements provide an incentive for banks to shift credit risk off balance sheet through the securitisation (or pooling) of loans which are packaged and on-sold to institutional investors. These bundled loans are analysed by credit risk agencies who estimate the underlying risk of these loans and then assign an investment rating based on the riskiness of the underlying assets. Although the ratings agencies developed models to certify individual companies, a concern was that their models had not been tested for rating pooled assets where the specific intention of the originating bank was off balance sheet credit risk transfer (Neethling, 2014).
- iii. Developing Economies: the main criticism of Basel II with respect to emerging markets was that that the Basel Committee stated that its recommendations are for its G-10 member states and not for developing economies. Although a set of standards called

Core Principles for Effective Banking Supervision were created for developing economies, their extensiveness and relative anonymity in the policy making community have limited their impact upon international banking. As ratings agencies and large banks see the Basel Accords as the proper standard for banking regulation globally, critics allege that the joining of developing market bank policy into a less precise and publicised standard effectively causes the needs of emerging market financial sectors to be ignored (Balin, 2008).

2.1.3 Basel III

The sub-prime mortgage crisis of 2007 – 2008, one of the largest financial collapses in recent memory, was the consequence of three prevailing issues. Firstly, banking sectors in many of the world's economies had excessive leverage. Secondly, there was an erosion of the quality and level of the capital base amongst banks. And thirdly, banks held insufficient liquidity buffers (Bank for International Settlements, 2010b). Recognizing this, the BCBS introduced 'Basel III: A Global Regulatory Framework for More Resilient Banks and Banking Systems' and 'Basel III: International Framework for Liquidity Risk Management, Standards, and Monitoring' (to be referred to collectively as Basel III) in December 2010. The revised Accord sought to improve the banking sector's ability to absorb shocks that arise from economic and financial stress, and thus aimed to decrease the spill over from the financial sector into the real economy (Bank for International Settlements, 2010b).

Chun et al. (2012) explain that Basel III primarily consists of two parts; a macro – prudential regulatory framework (oversight of the financial system as a whole) as well as a micro – prudential regulatory framework (oversight at firm level). The macro-prudential regulatory framework includes introducing a leverage ratio regulation, strengthening the regulation of systemically important banks, and establishing countercyclical buffers. According to Ilkova (2016), the macro-prudential framework is intended to enhance the ability of banking systems to absorb shocks that result from economic and financial stress. In contrast, the micro-prudential regulatory framework includes measures such as raising the quality and quantity of regulatory capital, supplementing the risk coverage of regulatory capital, introducing global liquidity standards, introducing a leverage ratio regulation, as well as

strengthening risk management, supervision, and disclosure (Chun et al., 2012). Van Dyk (2011) is of the opinion that the aim of micro prudential regulation is to increase the resilience of individual banking institutions during times of stress.

Chun et al. (2012) state that the BCBS anticipates Basel III will boost the stability of the global banking system in the medium to long - term by providing incentives for banks to build up a liquidity and capital base. Further, the new regulation would restrain banks from taking excessive risks by incentivising them to move away from a business model of high risk high return to that of low risk and low return. As an added measure, the liquidity regulation would ensure that banks change their business model of borrowing low cost short term funds to invest in assets that are long - term and risky in nature; whilst the leverage ratio and countercyclical buffer would harness the excessive expansion of banks (and hence asset size) and thus temper fluctuations in credit supply (Chun et al., 2012).

Basel III and its effect on banks' Balance Sheets

The Basel III framework impacts all components of a bank's balance sheet. As a result, the structural changes which banks will need to pursue in order to abide by the Basel III Accord will have potential implications on long - term housing finance. Therefore, for the purpose of this thesis, understanding how these structural changes are going to impact long - term housing finance is imperative. In the words of Warnock and Warnock (2008, p. 239), "Housing is a major purchase requiring long-term financing, and the factors that are associated with well-functioning housing finance systems are those that enable the provision of long-term finance." Taking note of this, a factor that is associated with a well-functioning housing system and that enables the provision of long-term housing finance is the credit system. Consequently, the banking sector, which is the main provider of credit in South Africa and the chief role player in ensuring that housing finance is provided, must be understood when attempting to grasp how Basel III will impact its operation and therefore the provision of housing finance. In light of this, the below chart provides an illustration of where the specific components of the Basel III framework will affect a banks' balance sheets.

KEY CHANGES TO THE ASSET SIDE

Counterparty Credit Risk

- Introduction of additional charges for counterparty credit exposures arising from banks' derivatives, repo and securities financing activities

New Market risk and Securitisation Framework

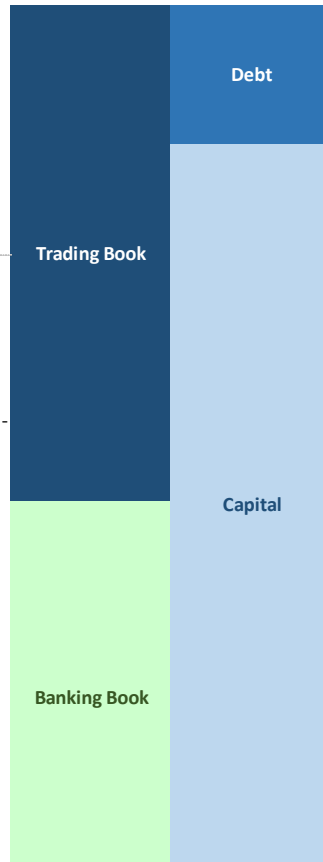
- Introduction of a stressed value-at-Risk (VaR) and Risk capital requirement
- Increase of capital requirements for re-securitizations in both the banking and trading book

Liquidity Coverage Ratio

- Introduction of a global minimum short term liquidity standard, requiring banks to hold sufficient levels of high quality liquid assets

Selective Origination on New Lending

Higher Pricing for New Credit Extension



KEY CHANGES ON THE LIABILITY/CAPITAL SIDE

Net Stable Funding Ratio (NSFR)

- Introduction of a long-term structural ratio to address liquidity mismatches

Capital Adequacy Requirements

- Increase of the minimum Common Equity Tier 1, Tier 1 and Total Capital Adequacy requirements

Conservation/Countercyclical buffer

- Introduction of additional capital conservation (2.5%) and counter-cyclical (0-2.5%) buffers to withstand future stress periods

Leverage Ratio

- Introduction of a non-risk based measure of capital structure (Minimum Tier 1 ratio of 3%/SARB 4%)

Capital Quality

- Requirement to form core capital predominately through common shares and retained earnings

Capital Deductions

- International harmonization of capital deductions and prudential filter (e.g. limited recognition of investments in FIs)

Source: Nedbank Basel III & IFRS 9 Investor Presentation November 2015

The sub-prime mortgage crisis of 2007 – 2008 highlighted the fact that the global banking system suffered from a lack of high *quality* regulatory capital, and that the definition of capital varied across jurisdictions. Moreover, excessive on-and off-balance sheet leverage was built up among the banking sectors of many countries, which was accompanied by a gradual erosion of the quality and quantity of the capital base (Lee, 2014). As a response, the Basel III Accord incorporates an explicit focus on what constitutes capital; and thus ensures that common equity and retained earnings, regarded as the highest quality component of a bank's capital base, must be the predominant form of Tier 1 capital.

Resultantly, the Basel III Accord designates capital as follows (Bank for International Settlements, 2010b) :

Basel III Capital Requirements

Tier 1 Capital ('Going – Concern' Capital)

- Common Equity Tier 1: Common Equity, Retained Earnings
- Additional Tier 1: Perpetual bonds with call option of +5 years

Tier 2 Capital ('Gone – Concern' Capital)

- Long - term sub-ordinated loan with an original maturity of at least five years

The limits and minimums for the above defined capital are subject to the following restrictions:

1. Common Equity Tier 1 must be at least 4, 5% of RWA
2. Tier 1 capital must be at least 6% of RWA
3. Total capital (Tier 1 and Tier 2) must be at least 8% of RWA

Tier 1 capital is capital that is able to absorb losses on a going concern basis i.e. capital that can be depleted without placing the bank into insolvency. Whereas Tier II capital can absorb losses on a gone – concern basis i.e. capital that can absorb losses in insolvency before depositors losing their money (Jinks et al., 2011).

At face value, these amendments do not appear too radical a change when compared to Basel II. However, the composition and cost of the capital tiers has changed significantly which is particularly important to emphasis. Annexure A1 and A2 provide an illustration of the Basel III phase – in timelines, as well as an outline of the difference in capital holding requirements between the Basel II and Basel III Accords respectively.

Capital Conservation Buffer

In addition to the capital requirements as outlined above, a capital conservation buffer has been added as part of the Basel III Accord. This measure is intended to ensure that adequate capital buffers are build up by banks outside periods of economic stress so that these buffers can be drawn upon should losses be incurred (Bank for International Settlements, 2010b).

The capital conservation buffer has been set at 2.5%, and must be held in tangible common equity capital. This requirement is over and above the regulatory minimum of 8% (raising the total capital requirement to 10.5%), but is not included as part of the regulatory minimum.

This buffer has been set so that if a bank's capital holding falls into the 'buffer' zone (between 8% and 10.5%) of capital during periods of economic stress, there are restrictions that are imposed on dividend distributions until the buffer is adequately restored. To further offset the contraction of the buffer, banks have the ability to restrict discretionary payments to employees and other capital providers (Hannoun, 2010). The objective of this buffer is to make sure that banks are capable of absorbing losses without breaching the minimum capital requirement of 8%, and can continue with business in a downturn without the need to deleverage (Roy et al., 2013).

Countercyclical Buffer

The Bank for International Settlements (2010b) maintain that there can be particularly large losses in the banking sector when a period of excessive credit growth is followed by an economic downturn. These losses can undermine the banking sector and trigger a situation where problems in the banking sector can contribute towards a downturn in the real economy, which then feeds back into the financial system. Accordingly, the countercyclical buffer "aims to ensure that banking sector capital requirements take account of the macro – financial environment in which banks operate (Bank for International Settlements, 2010b, p. 57)." This buffer is deployed at the discretion of national regulators and varies between 0% - 2.5%. Typically, if the availability of credit is expanding faster than Gross Domestic Product (GDP), capital requirements can be increased by regulators to preserve the national economy from excess credit growth (Roy et al., 2013). Drehmann and Gambacorta (2012) comment that Basel III has introduced the countercyclical buffer as a prudential tool with the principle objective of protecting the banking system from the escalation in system wide risk and quote the BCBS by mentioning that the buffer may have the side-benefit of restraining the build-up of excess capital in the first place.

Leverage Ratio

According to the Bank for International Settlements (2014) publication titled “Basel III Leverage Ratio Framework and Disclosure Requirements”, another contribution to the 2007-2008 financial crisis was the build-up of excessive on and off balance sheet leverage in the banking system. Simply, the Bank for International Settlements (2014) defines the leverage ratio as a bank’s Tier 1 capital divided by the banks total exposures. Currently, the Basel committee has agreed to a minimum leverage ratio requirement of 3% which is intended to restrict the excessive build-up of leverage in the banking sector in order to avoid a deleveraging process that can threaten the economy and the broader financial system (Bank for International Settlements, 2014). The South African Reserve Bank has applied a more stringent ratio which has been set at 4%.

Liquidity Measures

Liquidity is defined simply as the ability to convert non – cash assets (i.e. listed securities, gold, etc.) into cash with relative ease. The Bank for International Settlements (2010b, p. 8) says that “strong capital requirements are a necessary condition for banking sector stability but by themselves are not sufficient. A strong liquidity base reinforced through robust supervisory standards is of equal importance.” The preceding Accords failed to incorporate a global liquidity standard amongst their content and the financial crisis revealed the importance of liquidity for the proper functioning of the global banking sector and financial markets. In order to address this shortfall, two liquidity standards have been included as part of the Basel III framework.

Liquidity Coverage Ratio

The first of these standards, the Liquidity Coverage Ratio (LCR), has been established to support the short-term resilience of a banks liquidity risk profile by ensuring that there are adequate high quality liquid assets to endure an acute stress test scenario lasting for thirty days. An example of such a stress scenario would include a run-off of a proportion of retail deposits, a partial loss of wholesale funding capacity, or a partial loss of secured short term financing (Price Waterhouse Coopers, 2011). Wu et al. (2013) state that the LCR is a measure of asset liquidity, and define the LCR as the stock of HQLA to the net cash outflows over a 30 calendar day period under a severe liquidity stress condition, expressed as a ratio.

The Liquidity Coverage Ratio formula is as follows:

$$\text{Liquidity Coverage Ratio} = \frac{\text{Stock of High Quality Liquid Assets}}{\text{Net Cash Outflows over the next 30 calendar days}} \geq 100\%$$

In this instance, 'High Quality Liquid Assets' include those with a low credit and market risk, certainty of valuation, have a low correlation with risky assets, and are listed on recognized exchanges. Further, these assets would need to be in an active market with committed market makers, have low market concentration, and have flight to quality (Price Waterhouse Coopers, 2011). The tiers of assets are similar to the first pillar of the Basel III Accord in that there are two types of assets that are considered for the liquidity coverage ratio: Level 1 Assets, as well as Level 2A Assets and Level 2B Assets. In brief, Level 1 Assets include instruments such as cash, central bank reserves, sovereign and Supra-national bonds assigned a 0% risk – weight under Basel II Standardized Approach (Price Waterhouse Coopers, 2011). Whereas Level 2A Assets include sovereign and public sector bonds assigned a 20% or lower risk – weight under Basel II Standardized Approach, Corporate securities AA- or higher, and Covered Bonds rated AA- or higher (Davis, 2015). Each level of asset is assigned a 'Weighting Factor' with Level 1 assets receiving a 100% weighting, and Level 2B assets weighted between 25% and 50%. Naturally, a higher weighting factor provides less of a 'dilution' of the asset value, and hence the overall calculated ratio.

The LCR, as observed in the denominator of the above equation, considers the *net* cash outflows over the next 30 calendar days (i.e. cash inflows – cash outflows). Cash inflows include receipts from secured lending, as well as retail, commercial, and financial entity assets. In contrast, outflows include the depletion of cash deposits from sources such as retail and SME (small and medium enterprise) clients. In a similar vein to how HQLA are treated, both cash outflows and cash inflows are allocated a run-off factor based on their 'stickiness' (or propensity to be withdrawn under a stress scenario), and assurance of receipt. When considering cash outflows for example, retail and SME deposits are at the bottom end of the scale with a 10% run-off factor, whilst wholesale deposits are at the opposite end of the spectrum with a 100% run-off factor.

Examining the LCR equation, it is evident that when high quality liquid assets with a higher weighting factor, cash outflows that enjoy a lower run-off factor, and cash inflows that are allocated a higher run-off factor are combined, a higher LCR is the result. To comply with the LCR, banks need to maintain an overall ratio of greater than or equal to 100%. Diagram A3 of the appendix provides a comprehensive overview of bank asset weightings, as well as the various cash inflow and cash outflow run-off factors.

Net Stable Funding Ratio

The second standard, known as the Net Stable Funding Ratio (NSFR), has a one year time horizon and aims to achieve long - term bank resilience by creating further incentives for banks to fund their activities with more consistent sources of funding on a continuing basis (Bank for International Settlements, 2010b). In essence, the NSFR will attempt to align the maturity of client deposits with asset maturities, and will “promote more medium and long – term funding of the assets and activities of banks .” (Price Waterhouse Coopers, 2011, p. 28)

The Net Stable Funding Ratio is calculated as follows:

$$\text{Net Stable Funding Ratio} = \frac{\text{Available Amount of Stable Funding}}{\text{Required Amount of Stable Funding}} \geq 100\%$$

The constituents of stable funding are profuse, and an exhaustive list of these items is unnecessary. However, in brief, an example of available stable funding and required stable funding as defined by Price Waterhouse Coopers (2011) is as follows: available stable funding includes a portion of non-maturity deposits and/or term deposits with a maturity of less than one year that would be expected to stay with the institution for an extended period in a stress event. Whereas required stable funding includes assets such as residential mortgages, and cash with maturity of less than one year. Similarly to the LCR, an available stable funding (ASF) factor varying between 0% and 100% is applied to the various funding sources, while a required stable funding (RSF) factor that also varies between 0% and 100% is applied to the several asset types. As expected, funding sources that attract a higher factor, and asset types that are assigned a lower factor, both result in a higher NSFR. To comply with the NSFR, banks need to maintain an overall ratio of greater than or equal to 100%. Diagram A4 of the

appendix provides a comprehensive overview of both the required and the available stable funding factors.

2.2 How the Impact of Basel III on the Macro Economy and Banks (ROE, balance sheets etc.) will Impact on the Provision of Housing Finance

The 2007 – 2008 financial crisis appears to have changed the global financial landscape perpetually, with international regulations such as the Basel Accords moulding its operation. International regulators have specified a new set of liquidity and capital standards that have tightened the grip on global financial institutions, and ultimately dragged the world economy into an apprehensive state; adding to this unrest was the banking industry fuelling fears that the new stringent reforms may impede economic recovery (Abdel-Baki, 2012). However, Africa as a continent is fortunate to have survived the financial crisis fairly unscathed - largely owing to the resilience of its banking sector.

Historically, more than 33% of African nations have imposed stricter capital requirements amongst their banks than what was stipulated by the Basel II Accord; and minimum liquid asset requirements as well as loan loss provisions exceeded those of advanced economies (Kasakende et al., 2012). Further, these countries have maintained a broader range of limitations on the composition of banks' assets and liabilities and business activities. South Africa, for example, implemented a 9.5% total capital to RWA as opposed to the 8% as specified by the Basel II Accord. In terms of Basel III, South Africa has implemented a minimum total capital requirement of 9% which demonstrates South Africa's stance on prudent banking regulation. As a result of these measures, one can contend that bank regulation is more robust than what prevails in developed economies (Kasakende et al., 2012).

Banking in the current economic environment is an international business that witnesses cross border financial flows on a daily basis. This results in several cross border multinational banks holding a prominent share of the banking market of which Africa is no exception (Kasakende et al., 2012). Global reforms such as the Basel III Accord were developed in response to the financial crisis in advanced economies, with African bank regulators having little influence in modelling them. For that reason, it is important to understand whether the

Basel III Accord is likely to benefit the current economic (and banking) climate in South Africa, or be counterproductive to its progression. To answer this question, an investigation is required into how the financial framework amongst South Africa's major banks will be influenced.

There are a number of components on a bank's balance sheet that are impacted by the Basel III regulation, as evidenced by the preceding review of the Basel Accords, which may influence the availability of credit to the market. The externalities that stem from balance sheet restructuring are likely to influence the banking sector's profitability, business strategy, and hence the provision of credit. Resultantly, it is important to recognize which of the Basel components are likely to affect the availability of credit, in what ways, and why. As expected, certain components are anticipated to have a larger impact than others on bank lending.

A review of the literature suggests a number of potential implications on the provision of finance due to the Basel III banking regulation. Accordingly, an account of these suggestions will be the ensuing aim of this chapter. In summary, matters to be covered include the macro-economic impact of Basel III, the effect on bank ROE, changes in lending rates, as well as the expected externalities resulting from specific Basel III components.

2.2.1 Macro – Economic Impact of Basel III

It is important to quantify whether the mandatory higher capital prerequisites as prescribed by the new Accord are expected to have a positive effect on economic output which in turn has an effect on the availability of credit to the economy. An increase in Real GDP (i.e. output) is usually as a result of either an increase in aggregate demand or a corresponding increase in aggregate supply. So, if the Basel III regulation were to result in the acceleration of growth of economic output, with aggregate demand as the main driver, by deduction one could expect the uptick in demand results from factors such as lower interest rates, higher asset prices, increased consumer confidence, and/or a more bullish banking sector (Pettinger, 2017).

Interestingly, a study undertaken by Caggiano and Calice (2011) assessed the anticipated long-term economic costs and benefits of tighter capital ratios in terms of their effect on output. The analysis commenced by estimating the long-term benefit of higher capital holdings amongst African countries by whether there are any quantifiable gains in African GDP that

result from a reduced probability of future banking crises. Following this, the long-term estimated economic costs as a result of higher capital ratios were taken into consideration. The long - term economic costs were considered to be the equivalent of estimating the impact on the cost of bank credit as a higher cost of credit leads to lower levels of investment and consumption, which in turn has a negative effect on the level of output. In order to estimate these costs, the long-run relationship between lending spreads and capital buffers was analysed. Following this, the long-term relationship between lending spreads and GDP was examined. The study was then concluded by combining the results from both of the exercises to determine whether an increase in capital requirements does have a net long-term benefit on steady-state output.

Resultantly, Caggiano and Calice (2011) concluded that tighter capital ratios do have marginal net benefits on the level of steady state output for a fairly wide range of capital levels. The study found that there are net output benefits for capital levels to increase by up to four percentage points above current level; thereafter, net benefits begin to decrease. Another noteworthy finding was that should capital ratios increase by more than nine percentage points, the marginal net benefits of higher capitalization become negative. On average, the African banking system holds capital buffers in excess of minimum requirements and findings of the paper suggest that African regulators should ensure that current capitalization levels amongst African banks are at least maintained (Caggiano and Calice, 2011). The authors of this paper have advised that due to data limitations, the cross country dimension of the study, the specific models used in the analysis, and other relevant factors, the results of this study are subject to considerable uncertainty. However, the authors do believe that the study does give a comprehensive synopsis of the long-term economic impact of higher capital requirements on African economies.

The Basel Committee on Banking Supervision found similar results to Caggiano and Calice (2011) in their long – term economic impact assessment report of stronger capital and liquidity requirements. The report considers the long - term economic costs and benefits of tighter liquidity and capital regulations by assessing their impact on economic output. According to the report, the benefits of a stronger financial system include a lower probability of banking crises (and the accompanying output losses), as well as a drop in the amplitude of fluctuations in output during non – crisis periods (Bank for International Settlements, 2010a).

While costs come in the form of a downward adjustment in the level of output (whilst leaving the trend rate of growth unaffected) when lending rates are increased. Although the empirical estimates of the benefit and costs are subject to uncertainty, the findings suggest that there is still considerable leeway to further tighten liquidity and capital requirements and still yield positive benefits (Bank for International Settlements, 2010a).

Another study undertaken by Abascal et al. (2011) for the *Banco Bilbao Vizcaya Argentaria* when assessing the direct impact of the new financial regulation on emerging economies found that a 1% increase in both capital and liquidity reserves amongst developing countries generated a decrease in per capita GDP of between 0.04% and 0.15%. The report also found that should the capital/asset ratio increase by 20%, the corresponding effect would be a decrease in per capita GDP by 2.5%, and if the liquid reserves/assets ratio increased by 20% a 0.5% decrease in per capita GDP could also be expected.

In summary, the financial intermediation function in the economy may be hampered by an increase in lending rates and a reduction in lending volumes leading to a slowdown in economic growth (QIS, 2010 as referred by (Chun et al., 2012). However, economic growth over the medium to long - term may be promoted by lowering the costs of funding for capital and liquidity by reducing the risk of another financial crisis, and enhancing the stability of the overall banking industry (Chun et al., 2012). Taking this into consideration, the literature then suggests that getting the regulatory balance right is key for economic prosperity.

2.2.2 Basel III and its effect on bank balance sheets and ROE

Closely related to the capital structure of a bank is the concept of Return on Equity (ROE), or put differently, the return on shareholders' funds. ROE is one of the chief investment ratios that investors consider when analysing bank performance and as a result, banks generally try to maximise this ratio as much as possible. Alexandru and Romanescu (2008) endorse this statement by stating the ROE is the most significant indicator for bank profitability.

ROE Example

The concept of ROE, with respect to banking, is perhaps best understood by providing a practical example. As the main focus of this study deals with the provision of long - term

housing finance, a residential lending transaction is conceivably the most fitting manner in which to demonstrate how ROE is calculated.

Suppose that an individual approaches a banking institution in order to raise finance to assist him/her with the purchase a residential property that has the following particulars (NB: The below example utilizes the 'Standardized Approach'):

Purchase Price: R5, 000,000

Deposit: R1, 500,000

Loan Facility: R3, 500,000

Fee: R5, 250 (lending fees recognised over 3 years – i.e. R1, 750 per annum)

Loan to Value (LTV): 70%

Interest Rate: Prime – 1, 50% (9% - Prime currently at 10.5%)

Assumed Transfer Price (interest rate bank pays on the borrowed funds): Prime – 2, 50%

Nominal Gross Spread (2, 50% - 1, 50%): 1%

First Year Income Generated:

Lending Margin R35, 000 (R3, 500,000 X 1%) + Fee R1, 750 = R36, 750 Total Gross Income

Assume a cost to income ratio of 75%. Therefore effectively 25% of Total Gross Income is seen as NPBT (Net Profit Before Tax) (R36, 750 X 25%) = **R9, 188**

Risk weighting for residential property $60\% \leq LTV < 80\%$ is **40%**. Therefore the Risk Weighted Assets (RWA) for this transaction is R3, 500,000 X 40% = R1, 400,000.

We then multiply the RWA by a capital charge of 8% (assumed). R1, 400, 000 X 8% = R112, 000. This amount is re-invested at a rate of 7. 5% (assumed) providing income of R8, 400 whilst invested.

Therefore to calculate Return on Capital (ROC) we add the two income streams and divide by the capital amount.

$R9,188 + R8,400 = R17,588 / R112,000 = 15.70\%$ Return on Capital.

ROE Generated in the First Year

Effective Capital Charge: R112,000 (Calculated Previously)

Capital is comprised of 75% Equity, 15% Preference Shares, and 10% Subordinated Debt

Therefore, the equity component of the capital held is R84,000 ($R112,000 \times 75\%$). Before ROE is calculated, the cost of debt and preference shares need to be subtracted.

Assuming that the cost of debt (K_D) is 2.21% ($R112,000 \times 2.21\% = R2,475$), the adjusted return after subtracting (K_D) is $R9,188 + R8,400 - R2,475 = R15,113$ and translates into a ROE of 17.99% ($R15,113 / R84,000$).

To increase ROE, banks can prompt this client to take – up additional ‘capital light’ banking products (products that do not require capital to be held) such as a bank account, a foreign exchange account, and an in-house insurance offering (if available) for example.

The Bank Supervision Department (BSD) of the South African Reserve Bank (2014) has observed that across South African banks, ROE levels have decreased somewhat as a result of significant investment in IT systems and processes currently underway outlined as key factors. Statistically, the aggregate ROE levels amongst South Africa’s large banks decreased from 18.7% in December 2012 to 16.34% in December 2013, which corresponds with the Basel III capital requirements that were adopted at the beginning of 2013 (South African Reserve Bank, 2014). However, the ROE has nearly improved to December 2012 levels with Nastas et al. (2017) reporting an aggregate ROE of 18.6% for the second half of 2016 amongst South Africa’s largest banks. This data suggests that the initial ‘shock’ of the new capital requirements has filtered through the system.

Looking forward however, research undertaken by Abascal et al. (2011) estimates that ROE levels amongst emerging market banks is set to decrease by between five and six percent due to higher Core Tier 1 capital requirements as well as changes in capital deductions. Yadav et al. (2014) further this statement by mentioning that a combination of capital buffers,

increased capital requirements, as well as increased liquidity requirements are likely to impact the ROE for banks.

Chun et al. (2012) explain that banks typically attempt to increase their capital adequacy ratios when capital levels fall below the new minimum capital requirements by either reducing RWA in the denominator, or alternatively by increasing regulatory capital in the numerator. Accordingly, RWA can be reduced by either scaling down the size of assets, or more commonly, by swapping high risk weighted assets with low risk weighted assets. Chun et al. (2012), mirroring a research methodology that was originally undertaken by King (2010), used aggregate balance sheet and income statement data from various banks and across several countries (both developing and developed) to track how changes in a bank's capital structure and asset composition will affect each component that contributes to a bank's net income. Thus, by measuring the change in net income and shareholder's equity associated with the regulatory changes, the researchers were able to calculate the increase in lending spreads required to achieve a given ROE. As described beforehand, banks fund their lending activities through the use of deposits, wholesale funding, and shareholders' equity. One of the assumptions of the study was that any change in the composition of a bank's capital structure, a likely scenario with the impending Basel III regulation, will see a reduction in liabilities (i.e. wholesale funding) offset by an equal increase in shareholders' equity (and therefore an increase in the capital cost of the funding). Therefore, the higher ratio of RWA to total assets requires larger amounts of equity to be raised and thus a reduction in the requirement for wholesale funding. A scenario such as this typically results in the augmentation of lending spreads as the increase in the capital costs becomes higher than the increase in net income (Chun et al., 2012). The results of the study found that the ratio of risk weighted assets to total assets, the long - term interest rate on debt, and the relative size of loan to total assets were the major factors affecting lending spreads, all things being equal. Additionally, the estimation results revealed that for every percentage point increase in required regulatory capital, the required lending spreads to maintain ROE vary significantly across different banks and countries. Nonetheless, developing countries such as Brazil, China, and India, whom along with South Africa and Russia make up the BRICS nations, require an increase in lending rates between 13.2 bp and 23.1 bp for every percentage increase in required capital to ensure that ROE remains unchanged (Chun et al., 2012).

Observably, the Basel III Accord is anticipated to have implications on bank ROE as capital levels held by banks' start shifting. As a result of the higher capital requirements, banks' ROE numbers will be under pressure. Davis (2015) mentions that the higher capital requirements as stipulated by the Basel III Accord will offer increased loss absorption but will also be ROE dilutive. Therefore, to ensure that ROE levels are not compromised, a number of options are available including either increasing lending spreads on loan products, reducing retail rates on depositors funds, or decreasing company costs in the form of staff compensation for example (Norton Rose Fulbright, 2010). However, and more importantly for the context of this research, banks' may also explore other ways of increasing ROE including boosting other income streams that are 'capital light' in nature as opposed to solely striving to grow their lending book. Evidently, this scenario would have implications on the provision of long-term lending with a reduction in lending facilities a potential consequence.

2.2.3 Impact of Basel III on Bank Lending Rates

According to a 2012 survey undertaken by the African Union for Housing Finance amongst its member nations, the below reasons were highlighted as key obstacles to obtaining residential mortgage finance (Chimutsa, 2013):

- High interest rates
- Access to long - term funds
- Credit risk (no credit histories, no documented income, etc.)
- Difficulties with proper registration
- Cost and time of foreclosing properties
- Burden of regulation (capital requirements, liquidity, etc.)

The first three reasons on this list - high interest rates, access to long - term funds, and credit risk - are all items expected to be impacted by the Basel III regulation. One of the main contributors to the success of the housing market in South Africa is the availability of, and access to bank credit. Baily and Elliot (2013) explain that credit drives economic activity by enabling households to purchase homes without having to save the entire cost in advance. This account is especially relevant in emerging economies such as South Africa that suffer from poor household savings rates, and have a sizeable low income populace. Taking

cognizance of this, there are a number of variables that can influence the availability of, and access to bank credit; all of these variables can impact the various income segments of the housing market in different ways. One of these variables is a variation in lending rates - or put differently, at what interest rate consumers can borrow funds.

Net – Stable Funding Ratio

How South Africa and its banking system responds to the Basel III Accord and its requirements could be key in determining how bank lending will be affected. Nkosi (2013) in his joint congress address to the International Union for Housing Finance and the European Federation of Building Societies believes that Basel III and its liquidity requirements will have significant implications on home loans in South Africa due to the long - term nature of the product. The closing words of this statement automatically brings ones thoughts to the NSFR.

Stable funding as defined by Marks and Nicolaidis (2014, p. 56) is the “portion of those types and amounts of equity and liability financing expected to be reliable sources of funds over a one-year time horizon under conditions of extended stress.” In essence, as the name suggests, the NSFR is aimed at changing the way banks fund themselves, and urges banks to decrease the duration gap between assets and liabilities (Ilkova, 2016).

The structural specifics of South Africa’s financial system will make the implementation of the NSFR exceedingly challenging for a number of reasons (Ilkova, 2016). Firstly, South Africa suffers from a lack of adequate household savings which make deposits a scarce resource. In fact, at 15.4% of GDP, South Africa has one of the worst savings rates in the world (Erasmus, 2015). And secondly, as a result of inadequate savings, banks rely on professional wholesale funding in order to achieve their funding needs (Ilkova, 2016). This situation is exasperated further by a bias towards contractual savings in the form of pension and provident funds as opposed to bank deposits (Davis, 2015).

A report compiled by the South African Reserve Bank (2012) task team that was led by Dr. Daleen Smal echoed similar sentiments after its analysis of how the NSFR liquidity requirements may impact the South African economy (*subsequent to this assessment the NSFR has been amended to be more aligned with the South African economy*). The task team found that for South African banks to meet the NSFR requirements, the banks will need to make significant adjustments to their balance sheets. To begin, the funding structure of banks

will need to be lengthened in order to encourage a shift from short term funding to long - term funding - this could be achieved by increasing deposit rates on long - term deposits for example. Van Dyk (2011) shared this opinion by commenting that there could be a consequential impact on both pricing and margins as the liquidity ratios will coerce firms away from obtaining short term funding towards funding that is more long - term in nature.

The second opinion of the task team was that the maturity of assets on a bank's balance sheet may need to be shortened which would result in a preference for short loans, and the securitisation of long - term loans. The review was concluded by the task team indicating that if these two measure were not sufficient in achieving the required NSFR, banks may need to shrink their balance sheets and cut back on long - term lending (in the form of home loans for example). As a consequence, these balance sheet adjustments were expected to result in higher lending spreads as well as a reduction in the advancement of credit facilities, which would impact borrowers through rising funding costs and a reduction in the availability of credit in the real economy. This would in turn contribute towards a reduction in GDP as a result of lower consumption and investment expenditure levels amongst other variables.

Due to the physiognomies of the South African financial market, the SARB has modified the treatment of funding that is received from corporate customers with a residual maturity of less than six months by applying an ASF (Available Stable Funding) of 35% in contrast to the global standard of 0% (Ilkova, 2016). As a result, all of South Africa's major banks are compliant with the NSFR as of end December 2016 (Nastas et al., 2017).

Liquidity Coverage Ratio

Allowing long – term assets to be financed while accommodating investors' preferences for shorter term investments is commonly known as maturity transformation, and is one of the core functions of a bank (Segura and Suarez, 2016). This maturity 'mis-match' between short term deposits and long (er) term lending can place banks into a liquidity predicament as evidenced by the sub-prime mortgage crisis of 2007 – 2008. Cabral (2013) in his assessment of what triggered the 2007 – 2008 financial crisis argues that the high profits experienced by the banking sector prior to the financial crisis were achieved through a combination of balance sheet expansion, as well as the mounting term, default, and liquidity risk mismatches between assets and liabilities. The end result was an increase in banks financial leverage as

they became less liquid, ultimately setting the conditions for a systemic banking crisis. In response to a lesson learnt from the financial crisis that capital requirements alone are not sufficient to sustaining a sound banking system, the BCBS introduced a global framework for liquidity management (Allen and Carletti (2008) as cited by Li (2017)). One of these instruments, the liquidity cover ratio, is used to ensure that banks hold enough high quality liquid assets to meet their liquidity needs for a period of 30 days under an acute liquidity stress scenario (Giordana and Schumacher, 2011). This piece of the newly introduced legislature has been described as “the most ‘painful’ piece of legislation to hit the sector, and will cost European Banks nearly 12 per cent of their 2012 earnings on average (JPMorgan as quoted by Bncini and Gauci (2011, p. 1)). Li (2017) reaffirms this statement by indicating that the implementation of the LCR can lead to a reduction in economic activity through the decrease in credit supply from the banking system. Dissection of this statement implies that the asset holding requirements of the LCR in the form of high quality liquid assets necessitates that banks need to hold assets on balance sheet that could otherwise be on-lent to induce further profitability. Davis (2015) in his assessment of the LCR and its optimisation for bank implementation highlights this point by stating that increasing the proportion of level 1 assets against level 2 assets will lead to an increase in the LCR but will come at a higher negative carry cost to the bank. Essentially, the high quality liquid assets that are held for regulatory purposes are not earning the yields that they could achieve elsewhere. Greef (2012) of the *Global Ratings Co.* ascertains that the biggest impact of the LCR will come in the form of increased pressure on bank profitability and ROE, with banks possibly having to increase their holding of liquid assets which will ultimately lead to a reduction in asset yields. As a result, customers may be subjected to increased pricing.

Interpretation of the above literature, as well as dissection of the formula behind the calculation of the LCR, together suggest that there are both advantages and disadvantages to be had with the implementation of the LCR. One of the drawbacks arise from the changing liability and maturity structures of a banks deposit book. Essentially, longer deposit terms, blended with additional deposits from retail, SME, and non – financial corporates, result in a lower net outflow. Naturally, to achieve a scenario such as this, banks will have to ‘pay – up’ for the procurement of longer term deposits from the likes of retail and SME clients. As a result of the amplified cost of a banks funding base, higher interest rates will in all likelihood

be charged on lending advances. Nastas et al. (2017) mention that the introduction of the LCR has amplified competition in the market amongst banks to attract customer deposits that assist with meeting liquidity requirements, with increased rates being paid to customers in order to attract supplementary deposits. Evidently, as 'input' costs are increasing in the form of higher funding costs, banks will likely increase their lending margins in order to maintain profitability. Nastas et al. (2017) found that for the year ending 2016, spreads on long - term funding amongst South Africa's four major banks remain elevated and still appear to be showing a high liquidity premium.

Another drawback of the LCR stems from the fact that banks will be restricted to 'on-lend' their HQLA. Economic principles suggest that a reduction in the supply of a good or service is bound to lead to an increase in price, or in this case, an increase in interest rates. However, there are also advantages to be had. Hartlage (2012) says that maturity transformation benefits long-term borrowers by way of an increased supply of long - term loans, which also enhances the affordability of long-term loans.

In a South African context, the current short-term liquidity position of the banks will be a tell-tale sign as to what impact the full implementation of the LCR will have on the local lending environment. As at 31 December 2016, all of SA's major banks were compliant with the 70% minimum phase in requirement. The phase in arrangement requires the LCR of all banks to increase by 10% annually until full implementation (100%) in 2019. Judging by the previous implementation performance of South African banks meeting these phase-in targets, there shouldn't be any issues with banks being compliant within the required timeline.

In short, the literature suggests that borrowers of funds will have seen an increase in interest rate pricing on mortgage loans, and this may continue somewhat as banks complete the phase – in of full Basel III LCR compliance. On the contrary, depositors of funds will benefit from increased interest rates offered on retail deposits as banks attempt to bolster their book of high quality liquid assets.

The BCBS's Quantitative Impact Study of 2010 as cited by Chun et al. (2012) suggests that the measures proposed by Basel III could result in both positive and negative effects on the banking industry, and in order to fulfil the Basel III requirements banks have to secure a considerable stock pile of capital and liquidity which could threaten the profitability of the

banking industry by increasing the cost of funding in the short term. Yadav et al. (2014) expand this statement by making mention of the fact that higher capital and liquidity requirements have an economic cost and therefore impact the borrowing costs of funds for banks, with loan rates having to factor in the higher cost of capital. Clearly, these statements both suggest that the escalating cost of bank funding will undoubtedly lead to an increase in lending rates with the borrower in the unfortunate position of having to accept more expensive borrowing costs.

The affordability of housing in South Africa is a major challenge with 83, 4% of households earning less than R20, 000 per month (Centre for Affordable Housing Finance in Africa, 2016). This coupled with the fact that building costs are rising faster than inflation means that housing affordability will be an enduring challenge for some time to come. In 2016 as outlined previously, it was estimated that the cheapest newly built house could be built for roughly ZAR350, 000 – leaving only 15% of the entire South African population able to afford the monthly repayments (Centre for Affordable Housing Finance in Africa, 2016). Clearly, any increase in borrowing rates could invoke further distress in terms of affordability.

Effect of Tighter Capital Requirements

The major South African banks have traditionally held capital buffers in excess of the regulatory minimums set by the Basel Accords. According to a report rendered by Nastas et al. (2017), robust capital positions amongst South Africa's major banks have contributed to a combined core Tier 1 capital ratio of 13.1%, and a collective total capital adequacy ratio of 16% at the end of 2016 - well above the South African regulatory minimum capital requirement of 9.75%. The report specifies that a combination of resilient earnings, as well as the proactive management of RWA amongst the banks have been the main contributors to these healthy indicators.

Chapter Conclusion

Having summarizing the literature, it is evident that there will inevitably be implications on bank lending in South Africa through the introduction of Basel III. In brief, the Basel III Accord will implicate all components of a bank's balance sheet including the asset side (in the form of new loans originated), the liability side (in the form of deposits), as well as the capital side (through higher capital holding costs). As a result, it is clear that the Basel III when compared

to the Basel II Accord is a great deal more 'expansive' in terms of risk coverage, and contains a variety of newly introduced measures that banks have not had to contend with previously. When combined with firmer capital requirements, these newly introduced Basel measures have been suggested as an impetus for banks to change the way housing finance is offered in its current guise. However, in exactly what manner housing finance is expected to change is up for debate. There is a gap in the literature pertaining to the anticipated tangible effects of the Basel III Accord on long - term housing finance in South Africa; which necessitates the need for further research on the topic in order to uncover exactly how housing finance in a South African context will be impacted, and what these implications signify for consumers.

In an attempt to uncover some of the anticipated effects of the Basel III Accord on long - term housing finance in South Africa, this study employs a mixed method research technique utilizing a combination of qualitative and quantitative research approaches. The next chapter of this study offers a detailed description of the research methodology, and provides an explanation as to why these research methods were employed to achieve the research objectives and solve the research question.

Chapter 3 - Research Methodology

The objective of this chapter is to describe the research methodology used to attain the research objectives. This includes a discussion of the research philosophy, approach, methods, design, and analytical techniques that were used in the research. The chapter is concluded with an explanation as to why the study is valid and reliable.

3.1 Research Philosophy

There are many ways in which to gain knowledge, and each form of knowledge is valuable. However, as an individual researcher, the process in which to gain knowledge must be chosen (Hudson and Ozanne, 1988). Ontology as defined by Hudson and Ozanne (1988) is the nature of reality, while epistemology can be described as the different forms of knowledge of that reality, and what nature of relationship exists between the inquirer and the inquired (Anderson, 2013).

The research undertaken for this thesis adopts an interpretive approach and supports the notion that people make their own decisions which are not connected to the laws of science or nature (Patel, 2013). This study assumes that in the financial field, reality is mental and is perceived – there is no one real world that exists (Hudson and Ozanne, 1988). The investigation of Basel III and its potential impact on long - term housing finance results in a variety of subjective responses from respondents. Effectively, different theories are constructed among different individuals. Each individual upholds their own personal belief systems that are moulded around social experiences and are subjective in nature. In other words, following an interpretist approach to research seeks to determine meanings, reasons, motives, and other subjective experiences that are time and context bound (Hudson and Ozanne, 1988). Interpretivism holds that the research and the research subjects interact with one another and create a cooperative inquiry (Reason and Rowen 1981; Wallendorf 1987) as referenced by (Hudson and Ozanne, 1988). Furthermore, as social reality is founded upon an individual's perceptions, in order to understand those perceptions, the individuals (the

inquired) must be involved in creating the research process by supplying information as well as guiding the research (Hudson and Ozanne, 1988).

Hudson and Ozanne (1988) state the research design of an interpretivist approach is continually evolving and is described as an emergent process, and researchers following this approach enter the research environment with some prior knowledge of the subject. However, this knowledge is insufficient for selecting a research design due to the shifting paradigms of perceived realities (Hudson and Ozanne, 1988). Considering this description, the research for this study began with a basic understanding of Basel III, and progressed towards a research design most suitable for the research objectives. Accordingly, this research can be assumed to have been an emergent process.

3.1.1 Research Approach and Research Methods

According to Dudovskiy (2016), an inductive research approach collects data with the intention of identifying themes and patterns, exploring a phenomenon, and creating a conceptual framework. While Gabriel (2013) says that an inductive approach will typically use research questions to limit the extent of the study, and is associated with the generation of new theory developed from the data. The research approach undertaken for the purposes of this study was inductive in nature and involved identifying patterns from data observations that resulted in a supposition (or theory) as to how Basel III may impact long - term housing finance in South Africa. This research methodology was strategically aligned to the aims and objectives of the study and ultimately assisted in answering the research questions.

This research utilized a combination of both qualitative and quantitative research methods to assist in obtaining the answers to the research questions. As Basel III is still in the implementation phase, and its implications still unidentified, the research was exploratory in nature. However, due to the fact that Basel III was developed as an 'add-on' to the foundations introduced in the first two Basel Accords, a degree of the research is explanatory by description.

3.1.2 Research Design

i.) Field Research

The goal of field research is to gather information that enhances your understanding of an issue or question and arranges those findings in a convincing and well-ordered document that proposes a new answer, insight, or solution (Colorado State University, n.d.). Using this description as a guideline, the qualitative aspect of this research was undertaken by obtaining opinions from business leaders and analysts that represent some of South Africa's leading banks as to how they anticipate the Basel III Accord to effect the provision of long - term housing finance in South Africa. Due to the complexity of the Basel Accords, as well as the evolution of the regulations over the years, the aim of this section of the research was two-fold. The first aim was to compliment my understanding of the objectives of the Basel Accords, whereas the second aim was to enhance my knowledge of the Basel III fundamentals in order to fully appreciate the feedback obtained from the interview respondents. Understanding the goals and mechanics of Basel then assisted with grasping how these regulations are likely to impact the provision of long - term housing finance in South Africa.

The research was then bolstered by an in-depth revision of the Basel Accords and their defining features. As an added measure, references from government bodies including the Bank for International Settlements and the South African Reserve Bank, as well as works originating from leading industry experts were reviewed to solidifying my understanding of the Basel Accords and assist with obtaining solutions to the research questions.

ii.) Statistical Analysis – Longitudinal (Time – Series)

Cumming and Nel (2005) in their economic paper entitled “Capital Controls and the Lending Behaviour of South Africa Bank: Preliminary Findings on the Expected Impact of Basel II,” employed a research technique that produced a set of valuable results pertaining to the anticipated effects of Basel II on bank lending in South Africa. In this paper, a similar approach was used to make a preliminary assessment of the impact of Basel III on the banking sector and hence long - term housing finance. Cumming and Nel (2005) employed a time series data

analysis identifying trends in the aggregate of South African banks' balance sheets over a defined time. The aims of their assignment were threefold:

- a. To determine in what way South African banks react to regulatory changes in capital requirements.
- b. To establish whether banks respond to capital requirement changes by varying qualifying capital, by changing risk-weighted assets, or by employing both of these strategies.
- c. Measure the changes to banks' risk-weighted asset holdings, and assess whether these assets have become more or less 'risky' in recent years.

Similar to the study undertaken by Cumming and Nel (2005), this research adopted objectives comparable to the above – mentioned with the exception of a few key modifications. The time-series analysis for this study incorporated elements specific to the Basel III Accord and covered between 2005 and 2017. Within this period, three 'phases' are identified:

- Phase 1 (2005 – 2007): Pre Basel II until implementation of Basel II ('Implementation Phase')
- Phase 2 (2008 – 2012): Post implementation of Basel II ('Consistency Phase')
- Phase 3 (2013 – 2017): Build up to full Basel III implementation ('Preparation Phase')

Phase 1 of the time – series is dubbed the 'Implementation Phase' and spans between 2005 and 2007. This is considered a significant period for the purposes of this study as it tracks changes in bank specific data prior to the implementation of Basel II, leading up to the full implementation of Basel II on 1 January 2008. Phase 2 of the study period covers from 2008 to 2012 and is termed the 'Consistency Phase' of Basel II due to the steadiness of the regulatory banking environment until the start of the 'phase – in' period of the Basel III Accord on 1 January 2013. The third phase of the study period, the 'Preparation Phase' falls between 2013 and the beginning of 2017, and is defined by the phasing in of the Basel III Accord from 1 January 2013.

The goal of this section of the research was to monitor variations in particular bank variables that are specifically influenced by the Basel Accords. Based on the historical variations in these variables at significant stages over the three time phases, a prediction as to how Basel III may

affect long-term bank lending could be made. Key bank aggregate variables that were considered include:

1. Capital Adequacy Ratios
2. Risk – Weighted Assets
3. Composition of Loan Extension
4. Return on Equity

3.1.3 Data Collection

i. In – Depth Interviews

The general interview guide approach is meant to ensure that the same consistent areas of information are collected from the interviewees, which provides more of a direct focus than the conversational interview approach and still permits a degree of adaptability and freedom in getting the information from the interviewee (Valenzuela and Shrivastava, 2002). Whereas utilising the standardized, open – ended interview approach, the same open – ended questions are asked to all interviewees which offers the benefit of a faster interview process as well as feedback from respondents that can be more easily compared and analysed (Valenzuela and Shrivastava, 2002).

The data for the qualitative aspect of the research was collected by conducting in – depth interviews with business heads and analysts representing some of South Africa’s largest listed banks. Further, an interview with a senior representative from the Bank Supervision Department of the South African Reserve Bank was undertaken. Accordingly, consensus opinions from the private sector as well as the government sector were gathered. Interviews included discussions focussed on the various components of Basel III, and how banks’ anticipate Basel III to affect finance provision in South Africa (with specific reference to long - term housing finance). Elements including return on equity, capital requirements, liquidity requirements, risk – weighted assets, the housing market, and the provision of housing finance were debated.

Following a combination of the frameworks from these two interview approaches, all interviews conducted utilised a combination of the features offered by the general interview

guide approach, as well as the standard open ended approaches, and were semi – structured in nature. A variety of pre-determined open – ended questions were compiled for the interview process with each interviewee questioned on the same assembly of questions; a characteristic of the standardized open – ended interview approach. A combination of the two interview processes allowed the added advantage of being able to explore specific areas of interest/questions that evolved from the pre-determined questions in more depth in order to gain further insight into the subject matter.

ii. Time - Series Analysis

The quantitative component of the study used a time – series data analysis with data obtained from the Annual Bank Supervision Department Reports of the South African Reserve Bank. This data was further supported by historical ‘BA 900 Returns’ for banking institutions as well as aggregated ‘DI and BA returns for the South African banking sector’. The bank specific variables that were mentioned previously (i.e. RWA, loan composition, capital adequacy ratios and ROE) were used as input values for the three time phases of the time – series analysis.

3.1.4 Thematic Analysis

Thematic analysis was used as a diagnostic tool to evaluate the responses that were gathered throughout the interview process. Braun and Clarke (2006) describe thematic analysis as a method for analysing, identifying, and reporting themes within data. A theme according to Braun and Clarke (2006) captures something important about the data in relation to the research question, and embodies a meaning or patterned response within the data set. Consistent with these descriptions, the research utilised a coding process to identify common themes and echoed opinions amongst respondents. The themes identified in this research capture something important in relation to the overall research questions (Braun and Clarke, 2006). To this end, themes within the data were identified using an inductive coding approach as opposed to a theoretical procedure; coded data was not premised to fit within a pre-existing coding frame (Braun and Clarke, 2006). Effectively, codes were derived from the data using the conventional content analysis approach (Hsiu-Fang and Shannon, 2008) as quoted by Ford (2014), and the coding process was descriptive in nature (Ford, 2014). Coding and

analysis of the data was predominantly at the semantic level with theme development reflecting the explicit content of the data (Braun et al., 2014)

3.2 Reliability and Validity

Reliability is described as the repeatability of findings while validity refers to the credibility of the research findings (Sommer, 2006).

3.2.1 Qualitative Reliability and Validity

The issues of reliability and validity when undertaking qualitative research are can be broadly categorized into four areas of concern from which major sources of error can originate (Brink, 1993):

1. The researcher
2. The subjects participating in the research
3. The situation or social context
4. The methods of data collection and analysis

All four of these risk areas concerning the validity and reliability of research were considered and mitigated. One of the foremost reservations when undertaking a research report is that of researcher bias; several writers advise researchers to spend a period of time in the research situation before the data collection starts (Brink, 1993). Following this recommendation, a significant period of time was spent getting acquainted with the Basel Accords and their effect on long - term lending through review of Basel specific resources. As an added measure, time was spent with industry insiders discussing the concepts of bank lending, the Basel Accords, and credit risk.

The second concern outlined above is focused on the subjects participating in the interview, as respondents fail to always provide truthful information. To bypass this concern I ensured that all interviewees understood the exact nature of the research, and what the intention of the research was. As an added measure, the responses provided by the interviewee's were

compared with the feedback obtained from all of the interviewees to ensure there was an element of consistency amongst responses.

Fortunately, there were no concerns from a situational and social context. All interviews were conducted in a professional manner and on a 'one-on-one' basis. The interviews took place in an environment conducive to dialogue and knowledge sharing. All interviews were recorded to ensure that an accurate account of every interview was logged.

The reliability and validity of a research assignment is contingent on the potential for succeeding researchers to reconstruct original strategies, and so an accurate account of the research design is essential (Brink, 1993). Therefore, to address concerns aimed at the data collection and analysis methods that were utilised, a number of directives were employed. To start, the research design as well as the methods of data collection have been precisely identified and thoroughly described to avoid any ambiguity or related concerns. Moreover, to prevent sampling bias, interviewees from both the private and public sectors were embraced to ensure that a well – rounded information set was realised. Additionally, all respondents were exceedingly well-versed in the context of the Basel Accords, and so could provide an informed account of the effects of Basel on long - term housing finance. Amongst the interviewees were business heads, a top tier analyst, as well as a respondent from the Bank Supervisory Department of the South African Reserve Bank.

This research report has used a mixed – method approach with both quantitative and qualitative methods exercised. This form of triangulation in the context of this report has also assisted in increasing the validity of the results. The primary data that was collected for this research whilst adopting an interpretist approach can feasibly be associated with a high level of validity, as data obtained pursuing this method tends to be trustworthy and honest (Dudovskiy, 2016).

3.2.2 Quantitative Reliability and Validity

According to Heale and Twycross (2015), there are three different forms of validity measures, and a further three types of reliability measures that can be employed to critique quantitative research:

Validity Types

1. Content Validity - the degree to which a research tool (or instrument) accurately measures all aspects of a construct
2. Criterion Validity - the degree to which a research instrument is related to other instruments that measure the same variables
3. Construct Validity - the extent to which a research tool (or instrument) measures the intended construct

Content validity questions whether the research instrument measures the entire domain relating to the research variable (Heale and Twycross, 2015). The research undertaken for this study utilised a time – series statistical analysis covering a period of twelve years measuring changes in key variables ‘unique’ to the Basel Accords such as risk weighted assets, loan, capital adequacy ratios, and loan types for example. With this in mind, it can be affirmed with confidence that an adequate dataset was used for the purposes of this research and covered all data pertaining to the subject matter.

Criterion validity gauges whether a particular test (or study) accurately predicts the outcome of the study. This research employed a similar quantitative research technique that was used by both Neethling (2014), as well as Cumming and Nel (2005). Keeping this in mind, it can be argued that that quantitative aspect of this research was consistent with the techniques that were employed by previous researchers and so offers a strong degree of predictive validity.

According to Shuttleworth (2009), construct validity defines how well an experiment measures up to its claims, and assesses whether the variable that is being tested is addressed by the experiment. Evidence of construct analysis for this study is demonstrated through the use of an analysis that relates directly to Basel III and the accompanying financial variables that bank regulations are most likely to influence.

Heale and Twycross (2015) outline the following attributes that contribute towards the reliability of a study:

Reliability Attributes

1. Homogeneity: The degree to which all the objects on a scale measure a particular construct.
2. Stability: The consistency of results utilising an instrument with recurring testing.
3. Equivalence: The consistency among responses between multiple users of an instrument or study.

The first two attributes of reliability are commonly tested by using 'item – to – total correlation' and 'test-retest' respectively. The quantitative aspect of the research used objects that are characteristic to those influenced by the Basel Accords thereby proving homogeneity. Further, repeated testing of the study yielded identical results as the dataset that was employed for this component of the research was numerical and therefore 'fixed' by description.

Equivalence in a quantitative study is determined by using inter – rater reliability. As previously alluded to, this research employs a research technique that has been used by previous researchers and as a result, the attribute of equivalence is displayed.

Chapter Conclusion

The research for this thesis employs a combination of qualitative and quantitative research techniques utilising in – depth interviews, as well as a time – series statistical analysis to assist with solving the research questions. The study is underpinned by an interpretivist research approach and supports the notion that people make their own decisions and so gathered information is subjectively derived. The qualitative findings, as well as the quantitative results of the research are outlined in the succeeding chapter. The outcomes that have been identified are followed by a discussion around what the research suggests as to how long - term bank finance may be impacted.

Chapter 4 – Findings, Results, and Discussion

In this chapter, the research data collection process, findings, and analysis will be discussed. The chapter is arranged in two parts. The first part describes the data collection methods that were used for the respective research methods. Thereafter, the qualitative and quantitative data that was collected is presented along with an illustration of the analysis process and the ensuing results. The second part of this chapter provides an analysis of the data, and offers some further insight as to what the outcomes of the analysis may mean for the provision of long - term housing finance. Thereafter, to conclude, what the results of the analysis reveal about the research questions are proposed.

4.1 Field Research (In-depth Interviews)

The qualitative component of this research was accomplished by conducting in-depth interviews with business heads and leading analysts employed within the banking sector. Due to the fact that the full effects of the Basel III Accord on the banking industry are still undetermined, the goal of these interviews was to gather opinions from industry experts as to how Basel III might impact banks, and what effect the Basel III Accord is likely to have on the provision of long - term housing finance. On conclusion of the interviews, it was decided that the most effective way to analyse the data was to identify recurring themes and shared opinions amongst the respondents. It is worth highlighting that qualitative research can often reveal information that is hard to discover by using only quantitative forms of research – this research was no different and yielded some valuable results. These will be discussed shortly.

At this point, it is worth repeating that this research is underpinned by an interpretivist philosophical assumption and supports the concept that reality is observed by different individuals in different ways, and is subjective (Mitchell, 2016). Thus, the views expressed by respondents in this research are assumed to be defined by personal work experiences and are subjective in nature. Based on this premise, it is fair to assume that the sentiments obtained from experts and business leaders operating in the banking industry offer the greatest prospect of uncovering answers to the research questions. In line with these

suppositions, Braun and Clarke (2006) mention that thematic analysis can be a method that is used to reflect reality, and as a technique to unravel the surface of reality; effectively bringing a degree of reliability to the research outcome.

Further, assumed realities identified in the data were the focus of the reportage, and so thematic analysis in the context of this study was approached in a realist manner (Braun et al., 2014).

i.) Respondent Profiles

Interviews undertaken for this research followed the ‘general interview guide approach’ (Valenzuela and Shrivastava, 2002) and were semi – structured by definition (Ritchie et al., 2003). A range of pre-determined questions were derived for the interview proceedings. All questions were assembled to assist with reaching the research objectives, and to help answer the research questions. Due to the flexibility of the general interview guide approach, supplementary topics of similar interest could be reconnoitred to gather additional insight where necessary.

A total of six interviewees (to be referred to as ‘respondents’) participated in the interview process. All of the respondents emanate from the banking sector, and are employed in both the public and private sectors respectively. Due to the intricacies of the Basel III Accord, as well as the knowledge required to have a meaningful debate, participating individuals were selected based on their banking credentials and understanding of the Basel III Accord.

Accordingly, the profiles of the six respondents are illustrated below:

Respondent	Profile	Industry
<i>'Respondent A'</i>	Head of Private Bank - South Africa	JSE Listed Bank
<i>'Respondent B'</i>	Group Executive of Balance Sheet Management	JSE Listed Bank
<i>'Respondent C'</i>	Global Chief Economist	JSE Listed Bank
<i>'Respondent D'</i>	Credit Analyst - One of Top 3 Ranked Analysts Nationally	JSE Listed Bank
<i>'Respondent E'</i>	Head of Private Bank - KZN	JSE Listed Bank
<i>'Respondent F'</i>	Banking Supervision Department - Senior Management	South African Reserve Bank

NB: Names of respondents have been withheld for confidentiality reasons

ii.) *Interview Questions*

The respondents were asked a total of fourteen open ended questions that were designed to extract full meaningful answers by leveraging the participants' knowledge of Basel III, as well as the participants' regulatory banking experience. Where necessary, respondents were probed with additional questions in order to obtain a comprehensive understanding of the subject matter, or to spur further debate. The questions that were posed to the respondents, including a brief justification as to *why* these questions were asked follows:

1. Compared to Basel I and Basel II, do you expect the implementation of Basel III to have a more significant impact on the provision of bank finance and in particular long - term housing finance? If so, how?

The Basel regulatory measures have been evolving since the introduction of Basel I in 1988 followed by the implementation of Basel II in 2008. Fortunately, South Africa was able to meet these regulations with aplomb. This question aims to uncover how the impact of the Basel III Accord will differ from that of the Basel I and Basel II Accords.

2. South African banks, in general, have abided by the minimum capital requirements with 'room to spare' for the Basel I and Basel II Accords. Therefore, do you anticipate Basel III to have any dramatic implications on long - term housing finance at your bank as well as on the South Africa economy in general?

The South African banking sector is particularly well-capitalised. So, if Basel III is expected to have an impact on the provision of housing finance, will it be a drastic effect? Is the regulation going to be something truly 'felt' by consumers looking to raise finance? Will the effect on the housing market drip feed into the wider economy at all? Naturally, the housing market is a very important segment of the South African economy, so any dramatic implications are important to know.

3. How will the consumer be most affected by the impending Basel III regulation (i.e. higher deposit requirements, increase in lending rates, etc.)

How will the 'man in the street' be most affected by the Basel III regulation? I.e. are higher deposits on loans expected, are increased interest rates expected, are home loan terms

expected to change? Additionally, will credit supply towards long - term lending in the form of home loans be affected?

4. With particular reference to mortgage loans, in what ways do you expect your bank as well as South African banks to react to regulatory changes in capital requirements as defined by the Basel III Accord?

The intention behind this question was to understand how banks will adapt to the proposed changes. Can we expect a reduction in lending as a result of the 'stiffer' capital requirements leading to an increase in 'capital light' revenue lines for example (i.e. products that have no capital holding requirements such as FOREX revenue, bank fees, life insurance offerings, etc.)?

5. What sector of the housing market (i.e. lower income, middle income, or higher income) do you anticipate to be impacted the most by Basel III?

Broadly speaking, there are three levels in the housing market, each separated by level of earnings. Are one of these broad segments expected to be more effected by the Basel III regulation than the other? Why?

6. Are banks likely to respond to changes in capital requirements by changing Risk Weighted Assets, by varying qualifying capital, or by both of these strategies?

Banks can either increase their capital adequacy ratio by raising more capital relative to Risk – Weighted Assets (via retained earnings for example), or by decreasing Risk – Weighted Assets relative to capital. The latter option potentially signifying a slow – down in lending. If the second alternative is predicted, one could expect a decrease in lending, long - term housing finance included.

7. How do you anticipate the new liquidity ratios introduced by Basel III (Liquidity Coverage Ratio and Net Stable Funding Ratio) as well as the Leverage Ratio affecting the provision of long - term housing finance?

There has been increased emphasis on bank liquidity post the sub – prime mortgage crisis. Consequently, there are now two restraints impacting banks; capital requirements and liquidity requirements. How will these liquidity ratios effect bank finance? Over - leverage isn't

a concern for South African banks however the leverage ratio was included to ensure that opinions regarding all ratios were covered.

8. Banks can either follow the 'Standardized Approach' or alternatively the 'Internal Ratings Based' approach. Does the approach that is followed have any impact on the provision of long - term housing finance? If so, in what way?

The intention of this question was that if Basel III was anticipated to affect long - term housing finance – would the use of the Advanced Internal Ratings Bases Approach by banks increase the propensity to lend money (as a result of potentially lower RWA than when using the standardised approach).

9. Has there been a dramatic shift in bank focus in terms of prioritising increased ROE (mention USA example)?

ROE is arguably the most scrutinized indicator of bank profitability, and the increased capital requirements courtesy of Basel III are expected to be ROE dilutionary. Therefore, how does a bank 'juggle' profitability (i.e. higher ROE) and regulatory requirements? What impact does a decreased/increased ROE have on bank lending? There are ways other than lending to increase a bank's ROE (i.e. improvement in operational efficiency, increase of lending rates, etc.) – will the extension of finance suffer as a result of the 'preference' for other ROE enhancing techniques?

10. If increasing ROE is a priority of the bank, how would the bank go about achieving this? For example, increasing profit margins on products (i.e. increasing lending interest rate spreads or bank fees for example), decreasing interest rates on retail deposits, etc. What do you foresee as the most likely scenario?

Leading on from question nine, how will banks bolster their ROE's and will this ultimately affect the provision of long - term housing finance? So, would a bank prioritize other ROE boosting methods and consequently 'pull – back' on residential asset exposures?

11. There are two schools of thought that have been suggested as to what the implementation of Basel III may mean for long - term housing finance. The first school suggests that the increased capital requirements will negatively affect long - term housing finance, whereas the

second school of thought anticipates a shift in lending behaviour by the banks from 'more – risky' assets to 'less-risky' assets in the form of home loans. Which alternative do you agree with?

The literature reveals the two schools of thought as mentioned in the above question regarding the provision of long - term housing finance. One school says long - term housing loans will be a less attractive asset option for banks, and the other school says housing loans are less risky (and so RWA requirement are lower) and as a result will be a preferred investment option.

12. If the answer to the above questions agrees with the 'second' school of thought – will the Basel III regulations then assist in the provision of long - term housing finance or will it still be as 'difficult' to obtain ?

Further to the justification offered for question eleven, will Basel III benefit the provision of long - term housing finance as this is considered a less risky asset? If so, will long - term housing finance be easier to obtain after the introduction of Basel III?

13. What component of the Basel III Accord do you feel is *most* likely to affect long - term mortgage finance (i.e. capital holding requirements, capital conservation buffers, countercyclical buffer, liquidity ratios, etc.)?

At this point, the interview would have covered all of the fundamentals of what Basel III is comprised of. Out of all of the Basel III components, what is expected to have the most pronounced effect on long - term housing finance? And why? This question is to really gain another layer of understanding around the fundamentals of the Basel III components.

14. Will the measures used to address market risk and operational risk have any bearing on bank lending? In particular long - term housing finance?

This question was for my personal understanding of how the 'other' risk areas of operational and market risk tie into bank lending. If there was a strong link between these areas, how would long - term housing finance then be implicated?

4.1.1 Thematic Analysis through Coding

Based on the responses to the interview questions outlined above, common themes and shared opinions amongst the respondents were identified using thematic analysis. To assist with the identification and the subsequent categorization of themes, a manual coding process aided by *NVivo* (research software) was conducted across the data set using 'topic' coding to separate the data into the various categories based on the feedback received. Accordingly, a 'bottom up' approach consistent with the inductive thematic analysis was employed (Braun and Clarke, 2006).

Approximately twenty six themes emerged from the data, all of which were identified based on their ability to address the research questions, and to assist with the realisation of the research objectives. The themes, once identified, were then combined to form broader categories based on their similarities. Significant overlap between some of the themes was noted which further warranted the development of broader categories. Based on these categories, an analysis of the interconnections between the identified themes, and how the provision of long - term housing finance may be impacted was made possible. In other words, codes were identified capturing the essential elements of the interview responses and were combined to create a theme based on similarities. These themes were then compared amongst one another to form broader categories (of themes) also based on the similarities found between them (Ford, 2014). Once the data was suitably categorized, the dataset was then analysed to address the research questions and to realize the research objectives.

As revealed in Diagram 4.1 below, there were originally twenty six themes that were identified during the interview process which were eventually combined to create six primary themes. All six of these themes along with their core underpinnings are related, and contribute towards the overarching goal of this research - to gauge the impact of the Basel III Accord on the provision of long - term housing finance. Broadly, these themes convey how Basel III may 1.) affect the provision of long - term housing finance 2.) impact the consumer who requires long-term housing finance 3.) change the way that long – term housing finance is offered in its current form and 4.) effect bank profitability.

Diagram 4.1 – Themes Identified from the Interviews

Primary Themes and Sub - Themes	
	i. Financial Uncertainties
1	Economic Concerns
2	2008 Financial Crisis
3	Affordability
4	Household Savings
	ii. Balance Sheet Considerations
5	Impact on Balance Sheet
6	Capital
7	Leverage Ratio
8	Liquidity Ratios
9	Operational and Market Risk
10	Opportunity Costs
11	Bank Deposits
	iii. Internal Objectives
12	Bank Strategy
13	Risk
14	Standardized and IRB Approaches
	iv. Housing Finance Considerations
15	Credit Extension Implications
16	Loan Term
17	Loan to Value
18	Cost of Lending (Lending Rates)
19	Credit Supply
	v. General Suppositions
20	Impact on Households
21	Current effects of Basel III
22	Housing Market Impact
23	Schools of Thought
	vi. Bank Performance
24	ROE/Bank Profitability
25	Other Costs' of Basel
26	Profitability

Theme 1: Financial Uncertainties

There are a number of lessons that banks have learnt following the 2008 global financial crisis that have changed the way bank lending is conducted today. This fact, coupled with consumer specific issues such as affordability constraints and household savings all form part of the economic concerns that will be discussed.

Theme 2: Balance Sheet Considerations

The second theme encapsulates all of the areas that surround what Basel III was designed to do – strengthen the balance sheets of global banks, and increase the risk coverage of the Basel regulation. Hence, there are certain measures that have been outlined by respondents that will impact the different components of a bank's balance sheet which will be discussed. Further, what the overall impact of these measures is anticipated to be on the availability and affordability of finance will also be considered.

Theme 3: Internal Objectives

There are a number of reasons 'other' than bank regulation that may affect the provision of long - term housing finance according to respondents. Some of these reasons include bank strategy, and the risk appetite of individual banks. Also included in this theme is a discussion surrounding how the standardized, or internal rating based approaches that a bank adopts can affect bank lending.

Theme 4: Housing Finance Considerations

The Basel III regulation is suggested to have an impact on the numerous facets of a lending transaction including the term of the loan, the borrowing rate, as well as the propensity of banks to extend a particular type of credit. Included in this theme is a discussion focused on whether the loan to value requirements on long - term lending transactions has shifted as a result of Basel III.

Theme 5: General Suppositions

The fifth theme identified includes opinions from respondents predominantly centred around how households (or more directly the consumer) have already been implicated by the phasing in of the Basel III requirements, and what sectors of the housing market (i.e. lower income,

middle income, or higher income) are most likely to be effected by the implementation of Basel III. Included in this theme are opinions from respondents that address question eleven of the interviews (the 'two schools of thought' surrounding Basel III and its impact on consumers).

Theme 6: Bank Performance

Theme six captures all of the responses that assist in answering one of the research questions initially outlined in chapter one. Aspects including bank profitability, ROE, and the associated spin-offs on long - term housing finance are included as part of this theme. The discussion concludes with a diagram that provides insight into which components of the Basel III Accord are likely to impact ROE, and what this impact on ROE means for the availability and affordability of long - term housing finance.

4.1.2 Theme Analysis

Before embarking on an analysis of the themes, it is important to develop an understanding of how the participating respondents perceive the intentions of the Basel III framework, and how these objectives have evolved from the prevailing Basel I and Basel II Accords. Once understood, the links that connect these themes and their accompanying underpinnings are easily identified.

The subject of Basel III and the matter of risk mitigation appear to go hand in hand when contemplating the feedback received from respondents. One of the respondents explained how the global financial crisis had exposed three major areas of concern amongst global banks. Firstly, banks were incorrectly measuring risk and that the coverage of risk measurement was not wide enough. Secondly, banks had an inadequate 'capital stack' in that there was not enough loss absorbing capital in the event of an organisation having issues. Thirdly, there was a liquidity issue amongst banks, with banks not holding enough High Quality Liquid Assets (HQLA) to support an organisation's cash outflows in the event of distress. To account for these disparities, the revised Basel framework has expanded its risk agenda significantly. As a result, the measurement of operational, market, and credit risk through the use of risk – weighted assets has increased significantly. Seemingly, it is as a result of the strategies employed to address these three areas of concern that long - term housing finance in South Africa may be impacted upon.

Keeping this in mind, it must be remembered that banks are in the business of helping individuals with their funding needs. *Respondent B* sums it up by saying that banks “create a mechanism to bring two parties together through the taking of deposits, and the extension of credit.” “The role of the bank is to transform short dated liquidity into long dated lending.” Simple as they may appear, there is a great deal of depth behind these statements. Effectively, Basel III is expected to impact exactly what banks were created to do; the taking of deposits and the extension of credit. As well as impacting these functionalities, the obligatory capital holdings of the bank are destined for a shake up as well. Based on this feedback, it is clear that all components of the banks’ balance sheet will be influenced.

The impact that Basel III is likely to have on the various components of a bank’s balance sheet, and what these effects mean for the provision of long - term housing finance is important to understand. Nevertheless, two things are ultimately effected – the availability and the affordability of long - term housing finance.

Theme 1: Balance Sheet Considerations

The Basel III Accord has, and will have, a direct impact on all major components of a bank’s balance sheet according to the majority of respondents. Judging by the feedback obtained from respondents, a banks ‘costs of capital’ (the cost or ‘expense’ of the capital that is held in relation to RWA) as well as ‘cost of funding’ (the cost or ‘expense’ of raising funds that are advanced in the form of loans) are destined to rise. Dissecting these statements further, it is apparent that the asset (loans), liabilities (deposits), as well as the capital structures of banks will be impacted.

Capital Implications

The phrase ‘cost of capital’ has been synonymous with the Basel frameworks for years. South African banks have blamed the slow but apparent increases in interest rates, as well as the progressively more conservative lending practices on the Basel Accords and the increasing ‘cost of capital.’

A banks ‘cost of capital’, as the name suggests, relates directly to the cost of the capital that is held against a banks RWA’s. As described in the chapter two literature review, Basel III

denotes that banks are required to hold a minimum of 6% Tier 1 capital (Common Equity Tier 1 capital must comprise 4.5% of this), and a further 2% in Tier 2 capital, for a total capital compliment of 8%.

Global banks have to abide by the newly proposed Basel III capital standards by 1 January 2019. Once compliant with the revised capital requirements, the pressing question that arises is whether a banks 'cost of capital' is going to increase further than when compared to the Basel II Accord. If so, is the additional increase in the cost of capital going to result in higher interest rates on long - term lending transactions for consumers? The answer to these questions was unanimous amongst respondents.

All respondents were of the opinion that Basel III will ultimately result in the escalation of a bank's capital costs. A venerable explanation was offered by *respondent B* to make sense of how a banks cost of capital was due to rise. The respondent described how the revised Basel standard has specified a new composition of capital to be held as part of a bank's capital stack (to be held against Risk Weighted Assets), that includes so called 'new style' Alternative Tier 1 capital as well as 'new style' Tier 2 capital. These revised capital frameworks were created with the intention of remedying two evident flaws that existed within a bank's capital stack prior to the introduction of Basel III. The first of these flaws was the fact that additional Tier 1 capital, as well as Tier 2 capital, could not be triggered to absorb bank losses (even in the event of a government bail-out) unless a bank formally went into liquidation. To address this issue, Basel III has introduced two clauses, of which either can be triggered, if a bank has reached the point of 'non - viability' as determined by SARS. 'Clause A' states that additional Tier 1 capital and Tier 2 capital can be converted into ordinary share capital in order to absorb loses, while 'clause B' affirms that additional Tier 1 capital and Tier 2 capital can be written - off in order to absorb loses.

Respondent B continued by adding that the second limitation of a bank's capital framework pre - Basel III was that there was not enough loss absorbent capital included within a bank's capital stack in order to absorb bank losses. To address this shortcoming, a revised debt structure has been implemented. According to Basel III, additional Tier 1 capital debt instruments need to be perpetual in nature (no maturity date), and have a call option after 5 years plus one day, subject to the consent of the SARB. Furthermore, coupon payments are

done on a discretionary basis and are not compulsory. Tier 2 debt capital on the other hand is callable after 5 years, and is differentiated by a non – discretionary guaranteed coupon payment.

Due to the changes of the underlying rudiments that comprise these new capital tiers, investors are going to demand a higher rate of return for their investments into these securities as a result of the amplified risk. As a consequence, the cost of maintaining the bank's capital stack will be amplified, with the increase in cost having to be borne by either the shareholders (through lower returns on their investments) or by the borrowers of funds (through higher interest rates on lending transactions). This respondent in particular believes this cost will be equally borne between shareholders and borrowers, suggesting that interest rates on lending transactions are bound to increase as a result of the increasing capital costs that banks will need to endure. In a similar vein, another respondent pointed out that a bank's capital holding cost will be implicated as a result of the increase in Common Equity Tier 1 capital requirements – effectively confirming the remarks of *Respondent B*. Common Equity Tier 1 capital is regarded as the best 'quality' capital a bank can hold. However, it also holds the title of the most expensive form of capital, with shareholders having a direct claim on bank earnings.

In summary, as *Respondent B* alluded to, the additional capital cost to banks courtesy of the Basel III Accord will need to be absorbed somewhere, with consumers of bank credit likely to absorb some of these costs in the form of higher interest rates on lending advances. Fortunately, South African banks are particularly well capitalised when compared to other countries, with South Africa's major banks already compliant with the new Basel III capital standards. As a result, there is no immediate 'pressure' on South African banks to conform to the new capital standards of the Basel III Accord. For this reason, evidence from respondents suggests that South African banks will still be lending money due to their strong capital holdings (as opposed to decreasing their RWA's relative to their capital reserves, in order to grow their capital adequacy ratio). However, these borrowed funds will likely come at a premium for the reasons mentioned previously.

Asset and Liability Implications

Chapter two of this thesis described how a large component of a bank's lending activities are funded through the receipt of cash deposits from individual and institutional investors alike - with these deposits comprising a portion of a bank's liabilities. The Basel III Accord has introduced a measure that will directly implicate the liability side (as well as other parts) of a bank's balance sheet. Or more precisely, its funding base. The newly commissioned Net Stable Funding Ratio (NSFR) aims to decrease the mis-match between short dated funding in the form of deposits, and long dated credit extension; impacting both the asset and liability side of the balance sheet. As a result, banks that are aspiring to grow their long - term residential lending book, will need support in the form of longer term stable funding as well.

Poor household savings rates in South Africa were mentioned by two respondents as an obstacle for South African banks aiming to meet the NSFR deadline. As a result, there will be an increase in competition among banks to attract the limited supply of depositors. Five of the respondents remarked that the increase in competition for NSFR 'friendly' funds will induce banks to increase interest rates on cash deposits in order to entice depositors along with their valuable funds. Explicably, the unwanted consequence of this comportment is an increase in the cost of their funding base (and therefore a likely increase in borrowing rates to offset the escalating cost of the funding base). Similarly to the increasing cost of a bank's capital constituents, the cost of a bank's funding base is set to increase as well.

Evaluating the feedback from respondents, it is evident how the NSFR is going to encourage banks to reduce the duration of their loans, whilst increasing interest rates on their lending facilities. In short, the NSFR is expected to lead to an increase in the cost of funding for banks (through higher deposit rates) in order to facilitate their long - term lending activities. Therefore, to balance the mis-match in funding which the NSFR is trying to align, there can only be two alternatives. Either, banks need to procure more long - term deposits that will ultimately lead to an increase in their cost of their funding base. Or alternatively, there needs to be a reduction in the term of their lending facilities. In fact, the majority of respondents were of the opinion that mortgage loan durations may be reduced in length with one respondent commenting "it (the NSFR) encourages the banks to fund themselves long-term and discourages long-term lending at the same time." Another respondent was of the view

that long - term mortgage finance may be compromised in favour of short term lending facilities. *Respondent F* says, “instead of doing further advances on mortgages, banks might rather opt for shorter term personal loans because you would rather do shorter term financing based on the liquidity impacts.” Reviewing the subsequent quantitative aspect of this research suggests that banks do seem to be shifting their lending practices towards assets that are shorter in duration. These findings will be discussed in the following section.

The newly introduced Liquidity Coverage Ratio (LCR) aims to address short – term liquidity concerns and impacts the asset and liability side of a bank’s balance sheet. When questioned whether the LCR was likely to have an effect on long - term housing finance, the overwhelming majority of respondents stated that it was not a cause for concern for long - term lending transactions. *Respondent C* explained that the LCR is a short term liquidity measure and ensures that banks have “enough liquidity to cover a run on the bank, so I cannot see that it really ties into your long - term mortgage loan.” However, one respondent sees the LCR in another light and indicated that the introduction of the LCR will see the cost of capital increase – the opportunity cost of capital. By definition, the liquidity coverage ratio specifies a particular amount of High Quality Liquid Assets (HQLA) to be held as a buffer to mitigate against short term liquidity risks. As a result, “the LCR has the implication in terms of the consumption of liquidity which leaves lower liquidity to deploy into long dated lending” as stated by one of the respondents. Simply, due to the low yields on traditional high quality liquid assets, banks will be subjected to lower returns for every Rand that requires to be invested into these asset types, further increasing their overall cost of capital. A noteworthy point raised.

Theme 2: Financial Uncertainties

Basel III is a regulatory measure that is intended to promote banking soundness, not foster economic growth according to one of the respondents. Considering this, Basel III has a number of potential implications that may result in the increase in the stability of the banking sector, but may also stifle economic growth through the tightening of bank lending.

The decision to extend finance, as observed by the aftermath of the 2008 financial crisis, can be affected by the current economic climate, as opposed to bank regulations, according to half of the interview respondents. These respondents remarked that economic cycles, as

opposed to bank regulation, are capable of influencing residential housing finance. *Respondent C* substantiates this by saying, “sometimes if we are going through a negative cycle for property and regulations kick in, you then feel that the regulations had something to do with it. Property by and large in South Africa has been very effected by the economic growth and the property cycle itself.”

Supporting this statement, a number of respondents remarked that the sub-prime mortgage crisis of 2008 has prompted authorities to include measures in the Basel III framework that are far more intricate, and less flexible when compared to the two prevailing Basel Accords. *Respondent D* remarks that “Basel III is much more detailed and prescriptive with regard to the treatment of various items on the balance sheet. Because it’s so much more detailed, these prescriptions that have been put in place, very little is allowed for interpretation, management judgement, and risk management based on the circumstances of an individual bank or individual country.”

Closely related to the topic of economics is that of consumer affordability, a factor that the majority of respondents outlined could impact long - term housing finance as opposed to Basel III in the strict sense. A number of issues outside of the regulatory environment impact a consumer’s affordability including aspects such as taxes (direct and indirect), interest rate cycles, and inflation levels. Accordingly, fluctuations in these variables can have a prolific impact on the affordability of bank finance for some individuals. Evidently, certain sectors of the market are anticipated to be effected more than others. This aspect will be discussed in a later theme.

Theme 3: Internal Objectives

The majority of respondents mentioned that there are reasons independent of the Basel III Accord that may impact the provision of long - term housing finance in South Africa.

Two of the reasons that were immediately apparent include bank strategy, as well as the risk appetite of banks. Banks often have varying investment objectives and investment goals when compared to one another. As a consequence, this results in individual banks investing more heavily into an asset class that they deem to be more profitable than another. *Respondent E*, when discussing his own bank’s investment objectives, articulates this by saying, “I think we

have actively sought to decrease our commercial property component; well some of that is driven by rating agency views, so it is not just regulatory.” Conversely, *Respondent B’s* bank is very bullish on commercial property lending, and describes how the ‘asset tilt’ of their lending book is weighted more towards commercial property lending. As demonstrated, certain banks may see more value in long –term housing finance than others, and thus will endeavour to invest in these types of assets. Based on this feedback, the decision by a bank to invest in a particular assets class, like residential housing finance for example, is not always the result of regulatory measures such as the Basel framework, but can be the outcome of a strategic business decision.

Closely aligned to the area of bank strategy is the subject of credit risk, and the calculation of Risk – Weighting Assets (RWA). Interestingly, household mortgage loans have often been referred to as a ‘less – risky’ form of investment for banks as suggested by some sources in the literature review. As a result, banks would pursue these investments due to their ‘conservative’ qualities. Beguilingly, according to two of the respondents, home loans are not always considered a less – risky investment, with other asset types seemingly preferred. Naturally, this feedback does not bode well for the provision of long - term housing finance. However, there is past evidence that suggests banks do invest in home loan assets during times of regulatory reform as a result of their lower risk weightings as found by Cumming and Nel (2005).

Based on the discussed feedback of this theme, it is fairly safe to say that developments such as these may impact the availability of long - term funding. However, the affordability of finance is not expected to be impacted in any way.

Theme 4: Housing Finance Considerations

The inquiry in to what sector of the housing market was most likely to be effected by the Basel III Accord received a somewhat mixed response among respondents. Some respondents indicated that the lower sector of the income market was most likely to be affected while others indicated that the middle income market was likely to be affected most. Further discussion on this matter prompted the comment that “it depends what is considered low income and what is considered high income” by one of the respondents. For the purposes of

this research, a low income earner is an individual with transparent monthly earnings actively seeking to purchase an urban residential property that is priced around roughly R300, 000 - R350, 000. Taking this into account, the large majority of respondents then perceived the lower income market to be most affected. The justification offered by respondents was that of affordability constraints. Discernibly, the lower income consumers are particularly sensitive to variations in lending rates, primarily due to low disposable income levels. Therefore, any increase in their debt instalments can be the difference between making payment, and not making payment. Analysing the feedback cited above suggests that Basel III is expected by respondents to result in higher lending rates and consequently higher debt instalments (hence the majority consensus that the lower income earner will be most impacted by the Basel III Accord). An added consideration that *respondent B* alluded to was that access to housing finance could be prohibitive for low income earners should banks necessitate any deposit requirements on long - term housing finance transactions.

Contrary to some of the other responses amongst respondents, one respondent did remark that the higher end consumer will be most affected by the Basel III Accord, as competition among banks to finance properties for these individuals will become more competitive resulting in lower interest rates for these types of clients. Evidently, high income earning low-risk clients earn a lower risk weighting according to the Internal Ratings Based Approach for their borrowing activities; potentially leading to more price competition amongst the banks. This response appears to be more driven by what the impact may be on the respondents banking business as opposed to an impact against the different tiers of income earners. Based on the above, the majority consensus among the respondents leans towards the lower end of the housing market in terms of Basel III impact, with the middle and high income levels potentially feeling the effects of the Accord to a lesser extent.

Another interesting dimension relating to the increased capital requirements of Basel III is whether banks will look to increase their capital adequacy ratios through the organic generation of profits and retained earnings, or whether banks are more likely to alter their RWA's to ensure that their current capital holdings become a bigger ratio of RWA. When the options were presented to the respondents, the majority of respondents indicated that banks would employ both methods to ensure compliance with the new Basel III regulatory ratios.

However, out of these two options, a variation in RWA seemed to be the stronger possibility. *Respondent D* ratifies this by saying, the “ideal sort of circumstances under Basel III is you have as little as possible in risk weighted assets so you don’t have to work with capital.”

Consideration of these responses suggest that the predominant approach to meeting and maintaining capital targets will be through a variation in RWA. The use of this alternative could benefit long - term housing finance for consumers that enjoy IRBA friendly profiles. However, poorly rated consumers as per banks’ IRBA models are likely to suffer as a consequence.

Theme 5: General Suppositions

A noteworthy variable identified amongst respondents that has a significant impact on the extension of credit is the aspect of loan to value (LTV) on housing transactions. Irrefutably, any change in this metric as a result of Basel III will have a direct impact on consumer affordability, and consequently the extension of credit. As previously mentioned by *respondent B*, enforcing lower loan to value requirements on consumer housing loans by banks can lead to the exclusion of a large percentage of potential home buyers who don’t have the means of raising the required deposit. Therefore, understanding whether Basel III will have any further implications on loan to value levels compared to the previous Basel Accords is an aspect that needs to be understood.

There were mixed responses from respondents as to whether the LTV on a lending transaction was likely to be significantly impacted by the full implementation of Basel III. *Respondent F* acknowledged that LTV’s on lending transactions had shifted, but believed the shift was a result of the lessons learnt from the 2008 financial crisis, as opposed to the Basel regulations. In essence, this respondent was alluding to the fact that banks are demanding larger deposits on property lending transactions to de-risk property loans. However, all other respondents outlined the fact that property lending transactions with a lower LTV translate into a lower risk weighting (and so lower capital holding), and therefore increased profitability. This dimension of lower RWA for lower LTV transactions is consistent with both the Basel II and Basel III Accords. As a result, it can be argued that although LTV is considered for RWA reasons, the Basel III regulation is not likely to significantly change the way that banks currently consider the LTV on long - term lending transactions.

Interpreting this, the feedback suggests that Basel III is not going to significantly impact the required LTV on long - term lending transactions. Rather, the appetite for long - term residential lending transactions with a high LTV will be decided upon based on the bank's risk appetite, and the profile of the individual client (or borrower).

Theme 6 – Bank Performance

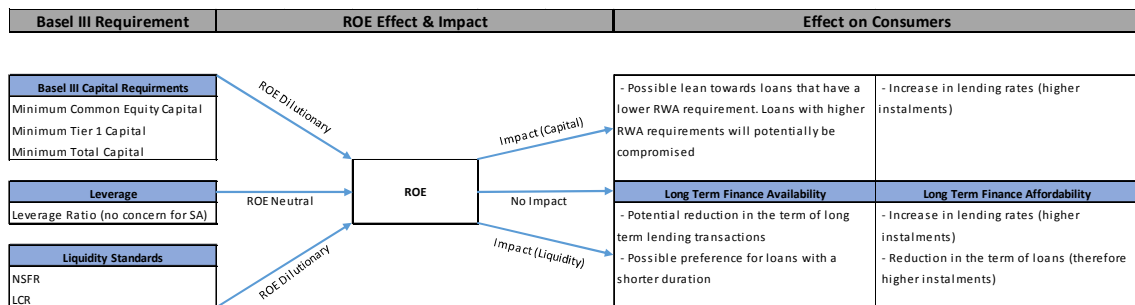
Return on Equity (ROE) is arguable the most scrutinized indicator of bank profitability. For shareholders, it appears to be the most scrutinized indicator of bank profitability. The relationship between Basel III and ROE is an interesting one, with the increased capital requirements of the former destined to put downward pressure on the later. As described previously, Basel III necessitate that banks hold higher levels of *better* quality capital when compared to the prevailing Basel II Accord. Expectedly, the cost of this type of capital comes at a premium, ultimately leading to an escalation in the overall cost of a bank's capital stack. As an illustration, Basel II mandates that common shareholder equity should be at least 2% of a bank's qualifying capital, whereas Basel III stipulates that a minimum of at least 4, 5% of a bank's capital holdings must comprise of common equity Tier 1 capital. To put this into perspective, a practical example with some basic assumptions is perhaps the best form of explanation. Suppose that a bank has R1,000,000 of common equity Tier 1 capital (2%) as part of its capital holdings which needs to be increased to R2,500,000 (4,5%) in order to abide by the Basel III capital requirements. To achieve this, the bank decides to raise the supplementary capital by selling additional shares (or equity) in the market (assuming authorized shares still remained). Once the additional R1, 500,000 of common equity has been raised, the funds would then be ring-fenced and invested in low yielding cash assets, as opposed to being on-lent in the form of residential mortgage assets that generate superior returns. Considering a simple scenario such as this, it is evident how the increased capital requirements have led to decreased bank profitability as well as a compromised return (in the form of profits) on shareholders' equity (due to a combination of a larger equity base and a reduction in profits).

With bank profitability coming under pressure, and capital requirements starting to balloon, how banks are going to handle ROE is an interesting debate. For the context of this research, is the provision of long - term housing finance going to be negatively impacted by the banks'

drive to maintain ROE levels? A prevalent pattern of responses was noted among respondents.

Maintaining (or increasing) ROE seems to be the number one priority for some South African banks. *Respondent E* says that he “would be very surprised if the number one priority of his banks CEO wasn’t to increase their ROE.” There are a number of methods which a bank can employ to influence its ROE. The literature suggested methods such as increasing lending spreads on financial transactions, decreasing retails deposit rates, or limiting employee emoluments. The responses amongst respondents in terms of how banks were going to react to ROE dilutionary pressure was mixed. Some respondents indicated that banks will employ a variety of methods, including some of the methods mentioned above, to maintain ROE levels. However, two of the other respondents had a different view and were of the opinion that the banking market in South Africa was too competitive to simply increase lending rates on their finance transactions or reduce deposit rates on retail cash investments. These respondents suggest methods such as growth in non – interest type products, the development and growth of banking products that are more ‘capital light,’ and becoming increasingly technologically savvy will be how banks respond to ROE challenges. One respondent held the notion that “it’s not so easy to just increase fees anymore” and that “there is a constant focus on what type of lending is done and what type of business models banks use.” Again, this statement relates to the strategy of a particular bank and its investment goals.

Diagram 4.2 – Basel III Effects on ROE



The various components (i.e. capital requirements, leverage, and the liquidity standards) of the Basel III Accord are anticipated to effect bank profitability (and therefore ROE) in different

ways according to respondents. Diagram 4.2 provides a summary of how each of the components of the Basel III regulation are expected to affect ROE, and what these variations in ROE imply for consumers with regards to the availability of long - term finance, as well as the affordability of long - term finance. Expectedly, the components that are ROE dilutionary will negatively affect long - term finance via a reduction in the typical duration of housing loans (NSFR specific), as well as via an increase in lending rates. As illustrated, the capital requirements as well as the liquidity measures introduced as part of Basel III are likely to result in a decrease in ROE; while the newly introduced leverage ratio is not expected to implicate the ROE of South African banks due to their low leverage ratios.

This thesis employs a mixed method research approach utilising a combination of qualitative and quantitative research techniques as stated in the chapter three research methodology. The quantitative analysis for this research was undertaken with the goal of determining whether any of the observations obtained in the interviews could be witnessed through variations in bank specific data leading up to key regulatory events. The next section of the chapter reveals the quantitative results of the study. Thereafter, the results of both the research approaches are discussed with the goal of determining whether the qualitative research findings are supported by the quantitative analysis that was undertaken.

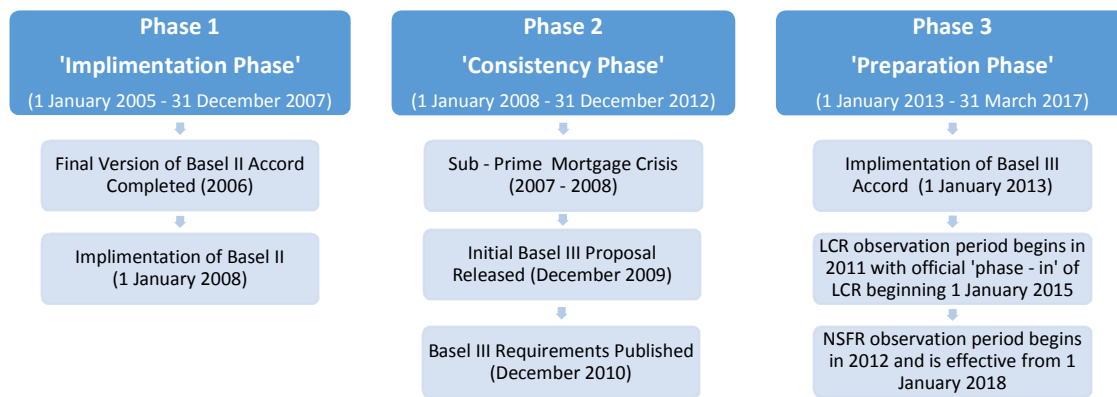
4.2 Quantitative Data Analysis Results

The quantitative aspect of this research employed a three stage time-series data analysis to measure the impact of regulatory capital adequacy requirements on aggregate South African bank balance sheets between January 2005 and March 2017 – a period covering 12 years. The first phase of the study, termed the ‘Implementation Phase,’ spans from the beginning of 2005 until 1 January 2008 and is characterised by the build-up period to, and succeeding implementation of the Basel II Accord on 1 January 2008. Phase two, known as the ‘Consistency Phase,’ is from January 2008 to December 2012 and is considered a ‘consistent’ regulatory period with no new regulatory measures implemented. However, during this period, the initial Basel III proposal was released in 2009, and the Basel III Accord requirements were published in 2010. Equally significant during this time was the origination of the sub-prime mortgage crisis of 2007 - 2008 that wreaked havoc on banking systems and property markets around the world. The final period of the study covers from 1 January 2013,

the official 'phase – in' commencement date of the Basel III Accord, and ends in March 2017. This phase is referred to as the 'Preparation Phase' and witnessed the introduction of the phase – in arrangements for the LCR on 1 January 2015, as well as the observation period for the introduction of the NSFR which began in 2012.

The respective time periods with an outline of the highlighted dates are illustrated in the below timeline:

Research Timeline

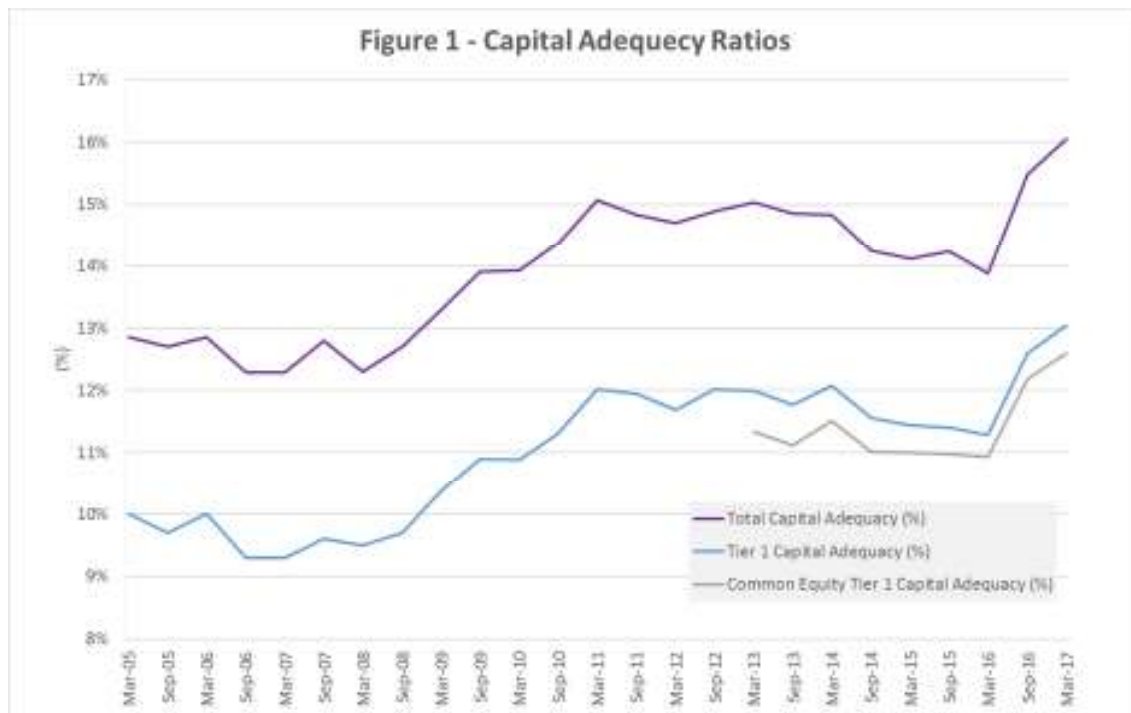


The goals of this part of the research are outlined as follows: (1) To determine in what ways banks typically react to changes in regulatory capital requirements (2) To establish whether banks respond to capital requirements by varying qualifying capital, by changing risk weighted assets, or by employing both of these strategies. (3) To monitor changes in bank asset portfolios with the purpose of determining in what way banks alter investment between different asset classes as a result of a changing regulatory landscape. (4) To determine whether variations in ROE disturb banks' lending patterns.

At this point it needs to be re-iterated that determining the impact of the Basel III Accord on long - term housing finance is no easy task. Basel III is only due for full implementation on 1 January 2019, and its full impact is yet to be known. Furthermore, the data analysis may reveal patterns that can be attributed to causes independent of the regulatory environment. However, by assessing the statistical trends in the build-up to the implementation of the Basel

II Accord, as well as by understanding the components of Basel III and their effects on bank lending, an initial assessment of its impact is achievable.

i. *Total Capital Adequacy v Tier 1 Capital Ratio v Common Equity Tier 1 Ratio*



Source: South African Reserve Bank

The capital adequacy ratios for South African banks spanning from 2005 to 2017 are depicted in Figure 1, and illustrate the trends over all three study phases. The total capital adequacy ratio as demonstrated by the purple line shows the aggregate total qualifying capital amongst South African banks as a percentage of RWA. The Tier 1 capital ratio (blue line) illustrates Tier 1 capital in isolation as a ratio of RWA, and the common equity Tier 1 capital ratio (grey line) represents common equity Tier 1 capital as a ratio of RWA. These capital indicators have specifically been selected for this study as they demonstrate the highest quality forms of capital, and are the most pertinent to the Basel III regulatory requirements. Naturally, all three of these ratios are expected to track one another during any periods of fluctuation across the timeline. To start, the total capital adequacy ratio has shifted from roughly 13% to 16% over the study period increasing by approximately 25%. The Tier 1 capital ratio on the

other hand has increased from 10% to 13% demonstrating a 30% increase. When compared to a near doubling of the capital adequacy ratio between 1991 – 2003 as reported by Cumming and Nel (2005), this increase is moderate in comparison. However, the slight increase in capital, comparatively speaking, demonstrates the fact that South African Banks are, and have historically been, well – capitalised. This is consistent with findings that overcapitalized banks prefer to increase asset holdings or reshuffle their RWA when deviating from their optimal Tier 1 ratio, as opposed to decreasing asset growth in order to magnify their current capital holdings as a ratio of RWA (Schepens and Kok, 2013) - as will be demonstrated in Figure 2.

The first phase of the study period between 2005 and 2008 is relatively stable in terms of capital holdings as South African banks had already accumulated sufficient capital adequacy in anticipation of the Basel II Accord in January 2008. Capital levels at the beginning of 2005 already exceed the South African Reserve Bank Basel II requirement of a 9.5% total capital adequacy ratio, and a 7% Tier I capital adequacy ratio respectively. Conversely, the second phase of the study between February 2008 and January 2011 demonstrates a pronounced increase in capital adequacy ratios which may come as a surprise due to the consistency of the regulatory environment. However, on closer inspection, this outcome is hardly surprising. The sub-prime mortgage crisis that originated between 2007 and 2008 developed into the worst financial downturn the world has experienced since the great depression of the 1930's. Global stock markets crashed, property bubbles burst, and ultimately, the availability of bank finance began to dissolve. The effect of the financial crisis is revealed over this period with growth in total RWA's (an indicator of bank lending), relative to total qualifying capital slowing completely. As a result, capital adequacy ratios escalated as the relative growth in RWA's came to an abrupt halt. This effect is also demonstrated in Figure 2 and will be discussed in the proceeding section.

The final phase spanning between January 2013 and March 2017 is distinguished by the official introduction of the Basel III Accord into the South African regulatory environment. Interestingly, during this period, banks were initially un-responsive to the introduction of Basel III as capital amounts were well in excess of those required by the international Basel III standard, as well as the national Basel III requirements set by the SARB. However, in March 2016, total capital adequacy increased from 13.88% to over 16.05%, a relative increase of

over 15% in a single year; even with minimum capital requirements already being met. This sharp increase in total qualifying capital between March 2016 and March 2017 seems to have been further amplified by a negative growth rate in RWA as well. This demonstrates the point that there are factors outside of the regulatory environment that have an impact on the variation of capital ratios, and that banks hold capital for reasons other than purely banking regulations. Factors that may have influenced this particular period could have been political uncertainty for example, which ultimately lead to the eventual downgrading of South Africa’s credit rating to ‘junk status.’

ii. *Growth of Total Risk Weighted Assets vs Growth of Qualifying Capital*



Source: South African Reserve Bank

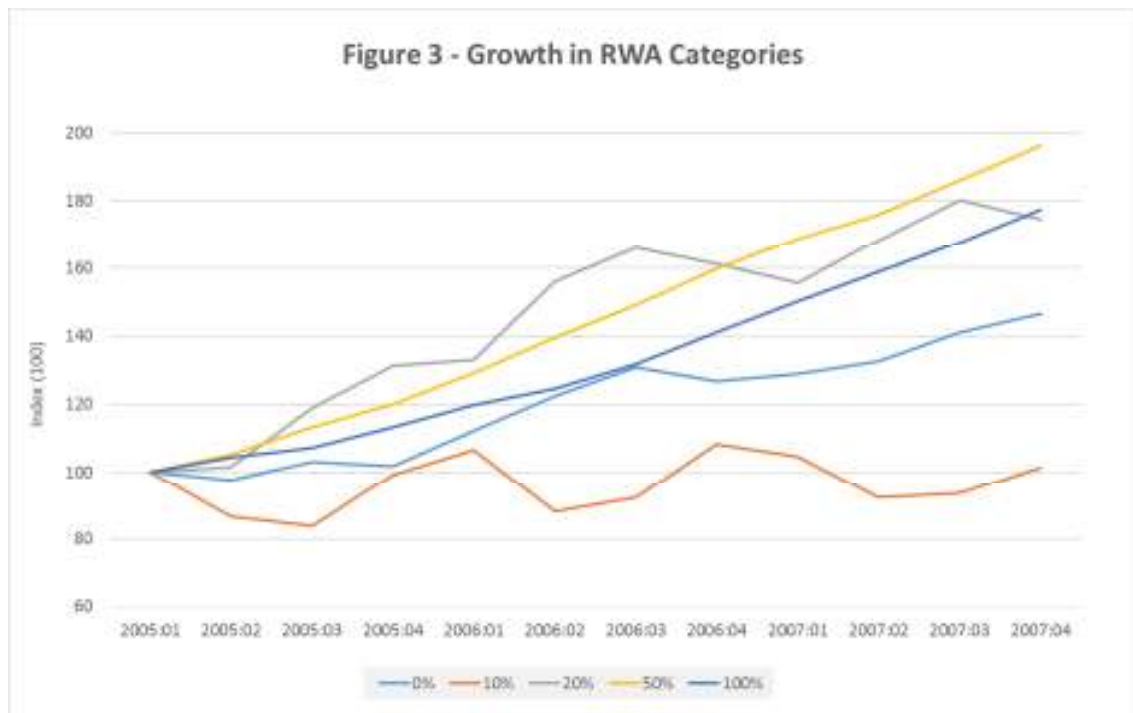
The growth of Risk – Weighted Assets/Off – Balance Sheet items relative to the growth of qualifying capital over the observation period is demonstrated in figure 2. The objective of this comparison is to determine whether the capital adequacy ratio has increased over the study horizon due to the decrease in the growth of RWA relative to total qualifying capital, or whether the increase is attributed to an increase in total qualifying capital relative to RWA.

These trends are significant as they can be used as an indicator of whether there is a slowdown in bank activity preceding or following a particular regulatory event. Over the study horizon, total qualifying capital has increased by 251% whereas RWA has increased by 219%, suggesting that the corresponding increase in the capital adequacy ratio can be attributed to an increase in qualifying capital relative to RWA. However, it is worth noting is that RWA grew by a substantial 219% over the observation period indicating that banks were still active on the lending front. Adding to this, the banking sector enjoyed sufficient profitability to be in a position to augment their capital ratios through the direct increase in qualifying capital as opposed to direct reduction in RWA. Growth of RWA during phase 1 of the study period saw RWA on a higher growth trajectory than total qualifying capital leading up to the implementation of Basel II. The corresponding decrease in the aggregate capital adequacy ratio over the same period as observed in figure 1 again reinforces the capital strength displayed by South African banks who could afford to increase RWA at a faster rate than qualifying capital yet still adhere to the Basel II standards. This trend continued into 2008 before finally slowing towards the later part of the year when the growth rate of qualifying capital exceeded growth in RWA – just before the Johannesburg Securities Exchange plummeted to its lowest levels in years following the sub-prime mortgage crisis. This particular period was defined by a contraction in bank lending relative to total qualifying capital, leading to an increase in the capital adequacy ratio as demonstrated in Figure 1. The remainder of the ‘stability’ phase was largely consistent with both RWA and total qualifying capital increasing at similar rates.

Phase 3 of the timeline began with total capital adequacy and RWA increasing proportionately. However, 2016 was characterised by the highest increase in total capital adequacy relative to RWA experienced over the study period as evidenced in figure 2. As discussed previously, no obvious reason can be identified for this sudden increase as South African banks already have sufficient capital in their coffers to abide by the Basel III capital requirements. Again, this reaction by the banking fraternity is indicative that reasons outside of the regulatory environment have caused the upward spike in capital holdings.

iii. RWA of Loans and Advances

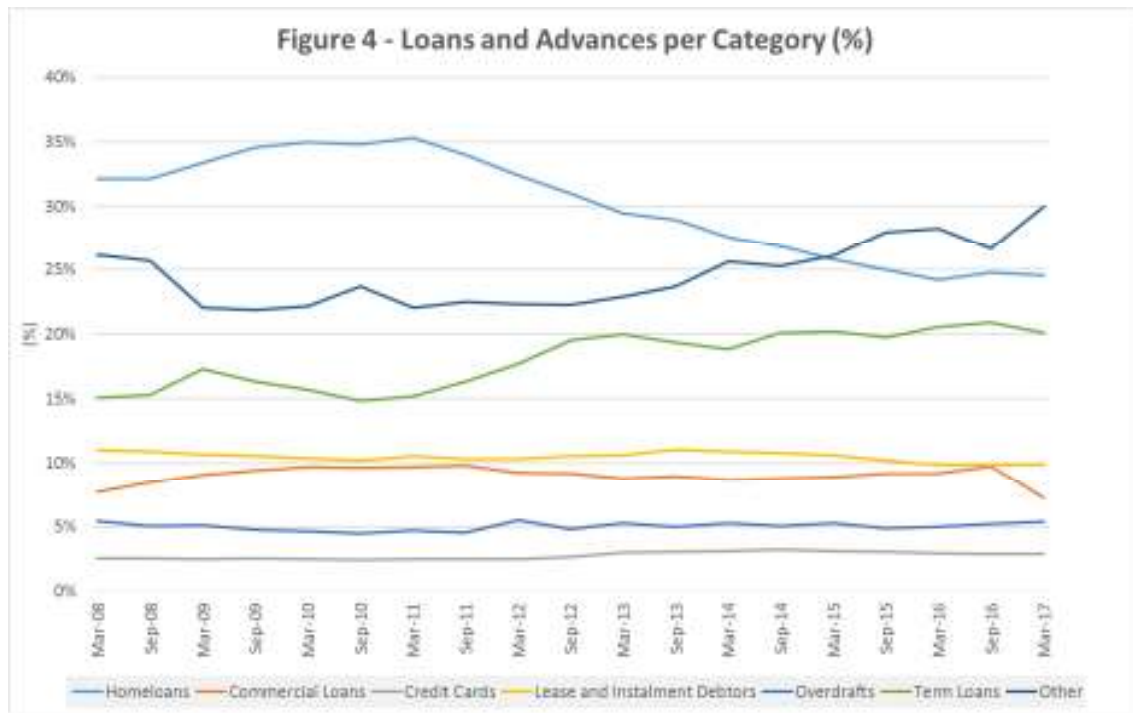
The concept of the risk-weighting of assets, as governed by the Basel Accords, is anticipated to affect bank assets in different ways. Obviously, the lower the amount of capital a bank can hold against a lending transaction the better (i.e. lower risk weighting). Therefore, it is expected that assets with a low risk weightings are preferred over assets with a high risk weighting. However, this statement is mentioned with caution as there are various other factors outside of capital holding costs that influence a bank's decision to extend a particular type of finance. Some of these reasons may include, but are not limited to, the lending facilities raising fee, interest rate, and strategic goals. Nonetheless, a comparison of loan types over the study duration is an indicator of how sensitive particular types of loans are to the regulatory environment. Owing to the fact that Basel II introduced the internal ratings based approach (in January 2008), which is the capital requirement model utilised by all four major banks, the period stretching from 2005 to 2008 will be analysed independently to the remainder of the study period that extends between 2009 and 2017. The change in reporting methods following the introduction of Basel II further solidifies the requirement to analyse these phases separately.



Source: South African Reserve Bank

Figure 3 demonstrates the growth in the various bands of risk – weighted assets leading up to the implementation of Basel II in 2008, from a base level of 100 at the beginning of 2005. This phase was governed by the Basel I Accord regulations, and RWA's were measured by the standardized approach (note that growth in the 150% RWA category has been removed from the dataset as this category contributed less than one percent to total RWA. Further, due to a low starting base, its annual movements appear drastic in nature). Somewhat unexpectedly, the 100%, and 50% risk-weighted categories, which are the two 'riskiest' asset classes in the dataset, gained the most over this period increasing by 77%, and 96% respectively. However, closer inspection reveals that in 2005 banks were already compliant with the capital ratios required by Basel II and so had no direct incentive to decrease the risk weighting of their asset exposures. As a result, banks continued with speculative lending advances, ultimately confirming the theory that undercapitalised banks respond to regulatory changes quicker than adequately capitalised banks. Neethling (2014) affirms this by mentioning that banks do not have to lower RWA, raise additional capital, or contract credit supply when their capital ratios are in excess of the regulatory requirement. The behaviour of these loan patterns suggests that adequately capitalised banks still have scope to engage in more 'risky' loan activities in a changing regulatory environment.

iv. *Loans and Advances per Category*



Source: South African Reserve Bank

Figure 4 displays different loan types, as a percentage of total bank lending, between 2008 and 2017. The second phase of the review period spanning from 2008 to 2012 is characterised by two distinct variations. Firstly, residential loans peak at roughly 35% of total loans, then reversed and continued on a downward trajectory towards the Basel III implementation deadline. Secondly, term loans and ‘other loans’ remain fairly stable initially, before continuing on an upward path in 2010 seemingly to replace what was ‘lost’ in the residential loan category. This behaviour is potentially a result of two factors. Either, the risk – weighting of residential and term loans have shifted significantly under the parasol of the Basel II framework with term loans requiring a lower regulatory capital amount than residential loans. Or alternatively, banks are seeking to decrease the terms of their loans by re-shuffling asset portfolios away from residential loans (typically twenty to twenty five years in duration) towards term loans (typically a 24 – 36 month duration) and other loans (which includes redeemable preference shares, loans granted/deposits placed under resale agreements, and banks intra-group balances to name a few).

Considering the first option, as articulated previously, all four of SA's major banks utilise the advanced internal ratings based approach, with their asset portfolios comprising approximately 85 percent of South Africa's total bank advances (International Monetary Fund, 2010). So, aggregate movements among the major four banks (who use the internal ratings based approaches) is a worthy indicator when attempting to explain the overall fluctuations in bank lending. Testing this proposal, it was found that by employing an Advanced Internal Ratings Based Approach model that is currently being used by one of South Africa's banks, residential home loans require more capital to be held than a three year secured loan (a loan type that is comparable to a term loan that is secured by collateral such as listed equities, for example) when considering the same client profile (please note that banks develop their own individual IRBA models based on past data as to how different profiles of clients have conducted themselves historically, and therefore it cannot be guaranteed that all IRBA models used by South African banks will yield that same result. However, the outcomes should be relatively consistent). Therefore, the deviation from the 2008 asset allocations to residential home loans and term loans may be due to the underlying risk – weightings that accompany these asset classes. This finding is similar to that of Cumming and Nel (2005) who established that residential loans, which were allocated a lower risk weighting, increased at a higher rate than general loans, that were given a higher risk weighting, in anticipation of the Basel I Accord.

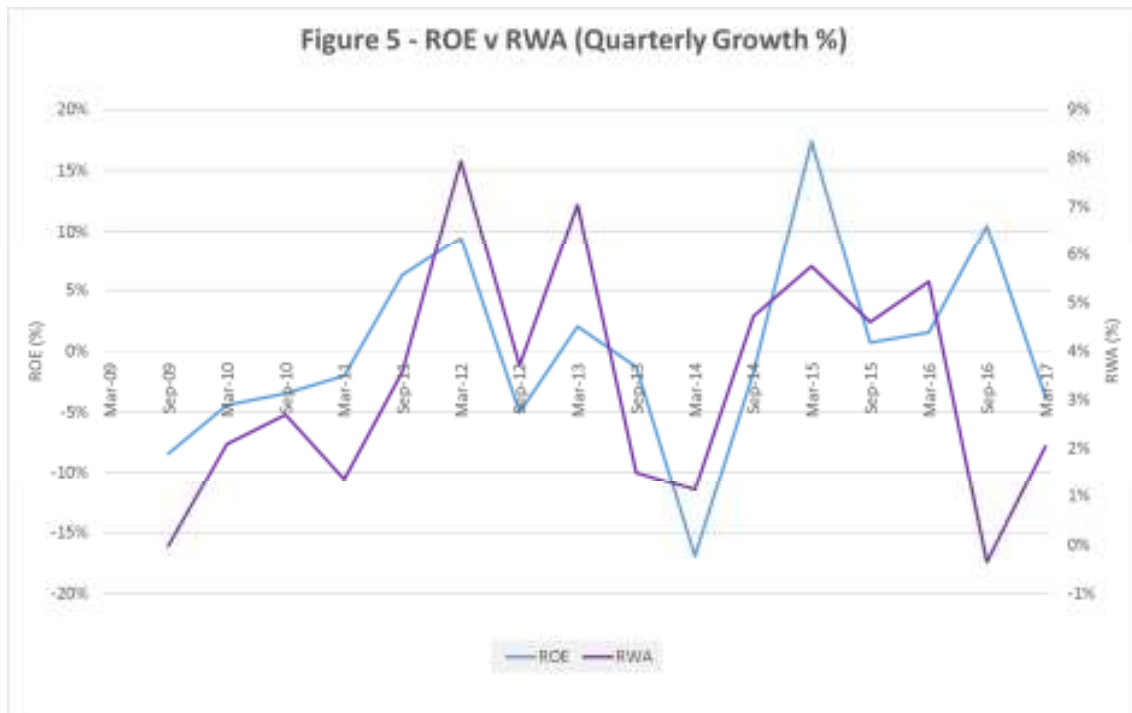
Considering the second potential explanation, which proposes that banks are aiming to decrease the length of their average asset tenors, can be examined by considering the phase – in, and introductory dates of the liquidity ratios. The newly introduced net stable funding ratio and liquidity coverage ratio, both which are included in the Basel III framework, seek to gauge the funding profile strength of banks. With particular reference to this, the NSFR considers the amount of stable long - term funding available as a ratio of the amount of long-term funding required, as banks attempt to better align the mis-match of long - term loans that are currently funded by short term deposits that are less stable in nature. Evidently, the objective of the NSFR is two-fold: *i.*) to decrease the terms (length) of finance agreements and *ii.*) to increase the 'stickiness' and duration of deposits. Considering this, one could argue that the decrease in home loan extensions as well as the relative increase in term loans and 'other

loans' granted are a result of banks attempting to meet the NSFR implementation deadline by 1 January 2018.

The relationship between Return on Equity (ROE) and RWA is an interesting prospect to explore. ROE is considered one of the main indicators of bank profitability with its impact on loan advances worth investigating. As ascertained in the chapter two literature review, the new Basel minimum capital requirements are expected to have a dilutionary effect on bank ROE. This fact, coupled with the additional pressure imposed by shareholders to maintain ROE in the changing regulatory landscape may force banks to respond in certain ways. Expectedly, banks can either respond by aiming to increase non – interest revenues in order to boost profitability (and therefore increase ROE). Or alternatively, banks can strive to grow their lending books to increase profitability, which would be noted by an increase in RWA.

As explained previously, banks can increase capital as a percentage of RWA by either reducing RWA (which also means a potential decrease in ROE as banks cut lending), or alternatively by introducing capital into their balance sheets via retained earnings, etc. However, in Figure 2 it was demonstrated that although capital was increasing, RWA was also increasing (albeit at a slightly slower rate). This indicates that banks have not cut back on RWA growth to effect the new capital requirements but have maintained their financing activities. It should be remembered that ROE can also be increased in a variety of ways including improving operational efficiency, decreasing costs, or increasing a client's product line at the bank for example. However, evidence in Figure 5 suggests that increasing ROE by growing RWA is still a priority for banks. Therefore, it can be argued that when ROE levels are low, banks increase lending activities and RWA to 'boost' ROE in order to meet investor expectations; and when ROE levels are high (and capital adequacy is lower) there is an increased focus by banks to increase capital adequacy levels through the raising of additional capital as opposed to a reduction in lending.

v. ROE vs RWA



Source: South African Reserve Bank

As shown in graph 5, it appears that quarterly growth in ROE and RWA is generally positively related. There tends to be an increase in ROE when a positive growth rate in RWA is noted, and similarly a decrease in ROE when a negative growth rate in RWA is noted. This observation confirms views expressed in the chapter 2 literature review that raising bank capital may be ROE dilutive. When comparing Figure 1 against Figure 5, an upward trend in the total capital adequacy ratio is accompanied by a reducing growth rate in ROE when analysing the same time period. The stable phase of the timeline between 2009 and the 2013 phase -in arrangement of Basel III predominantly follows these discussed patterns. However, the period between September 2015 and September 2016 bucks this trend with ROE increasing while RWA is decreasing. This period corresponds to the sudden increase in the total capital adequacy ratio experienced in 2016 as highlighted in Figure 1. These irregular movements once again reiterate the notion that factors outside of the regulatory environment effect bank lending and profitability. Based on the general relationship observed between RWA and ROE, it can be suggested that should ROE decrease in the lead up to the full implementation of

Basel III in 2019, banks are likely to maintain their financing activities as opposed to decreasing RWA and solely relying on other capital 'light' business initiatives to bolster profitability.

4.3 Discussion and Analysis

Considering the results from the quantitative and qualitative aspects of this research, the exact impact of the Basel III Accord on the availability and affordability of long-term housing finance is particularly difficult to determine. However, gauging by the feedback obtained from respondents during the qualitative component of this thesis, coupled with the results of the quantitative analysis, it appears that the Basel III Accord is anticipated to have an impact on long - term housing finance; albeit perhaps not overwhelming by description.

Qualitative Analysis

All respondents who participated in the interview process acknowledged that there will be implications on long - term housing finance as a result of Basel III – primarily due to its effect on all major components of a bank's balance sheet. Historically, the Basel Accords have to a large extent been regarded as a 'capital' intensive framework impacting the banking sector. Now, due to the additional dimensions of the Basel III framework, the assets and liabilities that encompass a bank's balance sheet require meaningful consideration as well. As a result of this, the Basel III framework is predicted to increase not only the cost of capital, but the cost of funding for banks as well. Some of the effects of the Basel III Accord have already been felt by consumers according to the majority of respondents in the interviews. This circumstance has stemmed from the fact that South African banks have been preparing for the implementation of Basel III for a number of years, with the gradual phase – in of the Basel III requirements ultimately leading to an increase in the cost of capital, as well as an increase in the cost of funding. However, as there are a number of Basel III components still to be introduced, further implications resulting from the Basel III Accord can be anticipated.

Six distinct theme categories were identified during the qualitative aspect of this research after an extensive coding process. Each category contained a set of 'sub-themes' all linking back to the central theme and research questions by virtue of similarities identified between

them. The first theme, 'Balance Sheet Considerations,' focused on the ensuing changes to a bank's balance sheet as a result of Basel III, found respondents in agreement that all components of a bank's balance sheet will be impacted as a result of the Basel III Accord. The revised tiers of capital holding are set to increase the cost of capital, while the NSFR and LCR are set to impact both the asset and liability side of the balance sheet, with the cost of funding set to increase as a result. Owing to these changes, the overriding consensus shared amongst respondents was that pricing (interest rates charged by banks on consumer loans) is bound to increase, while the 'standard' term of long - term lending facilities may be reduced. These effects, resulting from adjustments to banks' balance sheets, were included within the fourth theme that was identified from the interviews – 'Housing Finance Considerations.'

The second theme recognized during the qualitative aspect of this research were 'Financial Uncertainties.' Within this category, affordability was identified as a major factor that affects a large number of South African home buyers. Circumstances such as an increase in interest rates, or higher deposit requirements that result from a regulatory measure such as Basel III could preclude a significant amount of home buyers from obtaining finance. Further to this, and relating to the issue of affordability, are the economic concerns that banks have. Comments from respondents suggest that depending on the current economic climate, banks may have more of a risk appetite for a particular asset type than others. Principally, this feedback demonstrates that a host of factors beyond regulatory amendments can impact a bank's decision whether to extend a particular type of finance.

A number of the respondents alluded to the fact that changes in a bank's lending practice can be as a result of factors other than bank regulation. Individual banks have their own strategies in terms of asset growth, and a cut-back in long - term housing finance for example may result from internal investment strategies that are set as opposed to impending bank regulation measures. These aspects, together with the recognition that all banks have their own risk tolerance levels, point to the fact that each bank follows its own set of internal objectives that guide the decision making process. Accordingly, these aspects were included as part of the third primary theme that was identified from the research – 'Internal Objectives.'

'General Suppositions' was the fifth theme identified from the dataset and included further context around whether Basel III had any current effects on consumers, as well as whether

Basel III would have any direct impact on housing finance due to the perceived 'riskiness' of housing assets. Interesting, it seems that housing assets are not always considered to be low risk investment vehicles, and Basel III would not necessarily inspire further investment into housing assets in the form of long-term housing loans by South African banks. However, due to the phase-in approach of the Basel III Accord, it seems that some of the effects of Basel III have already been felt by consumers, and a supplementary major decline in housing asset finance by the banking sector was not likely (as some of the effects of the Basel III Accord have already been filtered through the system).

The final theme identified during the interview process, 'Bank Performance,' relates directly to a bank's profitability. Directly addressing one of the research questions, how bank profitability (and therefore ROE) was due to influence the lending aspect of bank behaviour was evaluated based on opinions gathered from respondents. As alluded to previously, the impending Basel III regulations are envisaged to result in a dilution of ROE which banks can respond to in a variety of ways. Either, banks can aim to prioritise non-interest revenue lines that are capital 'light' in nature and thereby reduce growth of their asset books. Or alternatively, banks can strive to grow their lending books, increasing their profitability, resulting in an increased ROE. The feedback from some respondents suggests that due to the competitive nature of the South African banking market, simply increasing fees or interest rates may not be a viable option for banks, and that additional profitability will need to come in the form of supplementary revenue streams that don't require capital to be held as a prerequisite (although bank fees are considered a capital light revenue item, market competition would prohibit this as an option).

Quantitative Analysis

Analysing the quantitative results of this study reveal a number of factors worth highlighting. Firstly, it's clear that South African banks are particularly well capitalised and are under no pressure to escalate their capital ratios in order to meet the minimum capital requirements as stipulated by the Basel II and Basel III Accords. Consequently, the upward advances of the capital adequacy ratio that were noted over the observation period resulted from banks' supplementing their capital bases, as opposed to reducing their RWA (with the exception of the timeframe surrounding the global financial crisis). As a result, the impending Basel III

capital requirements that are set to be officially introduced on 1 January 2019 are not expected to result in any significant variances in bank behaviour due to the fact that the South African banking sector comfortably meets the required capital requirements. However, along with the capital requirements of the Basel III Accord come the liquidity requirements, which may result in a more pronounced effect on long - term funding transactions such as housing loans.

Competition in the market amongst banks to attract customer deposits to help meet liquidity requirements are likely to result in higher interest rates being paid to customers (a development confirmed by the qualitative aspect of this research). Additionally, optimising the mix of the deposit book by increasing longer term funding and reducing high cost wholesale funding has been a key initiative for South African banks (Winterboer et al., 2011). As a consequence, there has been an apparent shift in asset portfolios amongst the banks with NSFR 'friendly' shorter term facilities taking preference over longer term lending facilities. To this effect, a gradual decline in home loans was identified in 2010 that eventually levelled off in 2016. The decrease in home loans virtually emulated the increase in term loans/other loans over the same period which suggests that banks were aiming to shorten their asset tenors leading up to the implementation date for the NSFR. As described in chapter two, the SARB proposed a measure in November 2015 that considers the deposits received from financial corporate customers with a residual maturity of less than six months differently to the global standard. Resultantly, all South African Banks are expected to be compliant with the NSFR by the 1 January 2018 implementation date. Interesting to note is that the SARB proposal regarding the treatment of these deposits corresponds almost precisely with the levelling off on the cutbacks that were observed with home loan extensions.

Lastly, based on the discussed results, it is fair to say that capital requirements have historically been met by raising additional capital courtesy of South Africa's well-developed capital markets (Cumming and Nel, 2005) as opposed to an outright reduction in credit extension – a pattern that is expected to continue towards the Basel III capital implementation date on 1 January 2019. Affirming one of the themes identified by the quantitative section of this research is that the increased competition amongst banks to source household deposits is likely to result in an increase in lending rates as customer deposits become more expensive to secure and banks strive to maintain adequate ROE levels.

Chapter Conclusion

In summary, the quantitative and qualitative outcomes of this study largely complement one another with similar results being found. With direct reference to the research questions, what the study reveals about the expected impact of the Basel III regulation on the provision of housing finance, the nature and extent of housing finance, as well as bank profitability is summarized in the table below:

Summary of Results

Research Method	Basel III Impact on the Provision of Long - term Housing Finance	Basel III Impact on Bank Profitability	Basel III impact on the Nature and Extent of Housing Finance
<i>Qualitative Findings</i>	<ul style="list-style-type: none"> ▪ Banks may have a preference for loans of a shorter duration 	<ul style="list-style-type: none"> ▪ Negative impact on bank profitability and a dilution of ROE 	<ul style="list-style-type: none"> ▪ Increase in lending rates on housing loans ▪ Decrease in the term of traditional housing loans
<i>Quantitative Findings</i>	<ul style="list-style-type: none"> ▪ Evidence of a decrease in long - term housing loans offset by an increase in loans of a short term duration 	<ul style="list-style-type: none"> ▪ Dilution of Bank ROE when capital adequacy ratios increase 	<ul style="list-style-type: none"> ▪ Evidence of a decrease in mortgage loans and an increase in term loans (i.e. a general decrease in the term of loans)

The quantitative and qualitative findings of this study each suggest that long - term housing finance as offered in its current form may be subject to change. The reasons for this are two-fold. Firstly, the implementation of the newly unveiled liquidity ratios, as well as the introduction of more arduous capital requirements, may force banks to alter the structure of their housing loans and increase interest rate pricing on loan extensions in order to remain Basel III compliant and profitable. Secondly, the Basel III capital requirements are expected to have a dilutionary impact on ROE, presumably leading to an increase in interest rate pricing in order to maintain or grow ROE, as banks have to contend with a revised 'capital stack.' However, owing to the robust capital structure of the South African banking fraternity (as evidenced in the quantitative component of this study), the revised Basel III capital measures are not anticipated to drastically effect the provision of long - term housing finance. This point is confirmed by a respondent in the qualitative of this research

who was of the opinion that any repercussions stemming from the amended capital requirements have already been felt by consumers.

Chapter 5 – Conclusion

5.1 The Research Question

The Basel III Accord has been touted as a banking regulation that will not only impact the profitability of the banking sector but will also discourage the provision of long - term housing finance in South Africa. The research questions in this study undertook to validate this conjecture by establishing the following: i.) When compared to Basel I and Basel II, what effect will the implementation of Basel III have on the provision of long - term housing finance in South Africa? ii.) How does Basel III affect bank profitability, and will Basel III have an impact on the viability of the provision of long - term housing finance by lending institutions? iii.) Based on the above, how will this impact on the extent and nature of long - term housing finance provision? In order to uncover the answers to these questions, this paper established a set of research objectives that once complete, would contribute towards answering each of the research questions.

5.2 Achieving the Research Objectives

The research objectives were as follows:

- i. To understand the fundamentals of the Basel III Accord, including the calculation of Risk Weighted Assets (RWA), Probability of Default (PD), Exposure at Default (EAD), and Loss Given Default (LGD).

This objective was achieved by reviewing literature specific to the underlying fundamentals of the Basel Accords. All of these components (excluding RWA) are inclusive to the Internal Ratings Based Approach's (IRBA's), which necessitated the need to attain an in-depth understanding of the foundation and advanced internal ratings-based approaches.

- ii. To assess whether the introduction of Basel III will have an impact on overall bank profitability.

One of the key metrics that shareholders scrutinize when determining bank profitability is a bank's Return on Equity (ROE). To realise the above-mentioned objective, changes in aggregate bank ROE statistics leading up to key regulatory events were noted by utilising a statistical time – series analysis. Specifically, how ROE had changed in the lead up to the full implementation of Basel II, as well the preliminary implementation of Basel III provided an indication of how Basel III was destined to effect the profitability of the banking sector.

- iii. To determine how the impact of Basel III on bank profitability will influence long - term housing finance provision.

The findings of the in-depth interviews assisted in achieving this objective. The opinions obtained from respondents provided insight into how the provision of long - term housing finance would be affected should bank profitability be compromised.

- iv. With particular reference to mortgage loans, in what ways will South African banks react to regulatory changes in capital requirements.

This objective was achieved by evaluating the outcomes of the quantitative and qualitative research studies. How the provision of mortgage finance by banks had previously responded to the implementation of Basel II, and what industry experts believed was the most likely outcome (in terms of the provision of long - term finance) as a result of a change in capital requirements, were used as a resource to meet this objective.

- v. To establish whether banks respond to changes in capital requirements by changing risk-weighted assets, or by varying qualifying capital, or by employing both of these strategies.

Similar to objective four mentioned above, this goal was achieved by evaluating the outcomes of the quantitative and qualitative research studies. How banks had previously responded to changes in capital requirements, and what industry experts believed was the most likely outcome (in terms of how banks were anticipated to meet

the new capital requirements of the Basel III Accord) as a result of a change in capital requirements, were used as a resource to meet this objective.

- vi. Determining the final impact on the provision of housing finance and hence housing provision.

Achieving all of the five aforementioned objectives ultimately assisted in realising this objective - numerous questions need to be answered in order to determine the final impact on the provision of long - term housing finance. Attaining this objective would ultimately assist in finding the answers to the research questions.

The research objectives for this study were achieved by employing a mixed method research methodology utilising a combination of both qualitative and quantitative research techniques inductive in nature. The qualitative component of the research was undertaken by conducting in – depth interviews with a number of respondents employed by some of South Africa’s largest banks. The respondents emanated from a variety of divisions within the banking sector which assisted in attaining a well-rounded perspective of how Basel III may impact long - term housing finance. The interviews were further complimented by what the literature revealed as to how the Basel III regulation is anticipated to effect long - term housing finance.

Drawing on a quantitative model originally developed by Cummings and Nel (2005), the quantitative aspect of this research employs a time - series statistical analysis that compares data across three distinct time periods. The first phase of the study spans from the beginning of 2005 until 1 January 2008 and is characterised by the build-up to, and the succeeding implementation of the Basel II Accord on 1 January 2008. Phase two ranges from the beginning of 2008 until the end of 2012 and is considered a ‘consistent’ regulatory period with no new regulatory measures implemented. The final period of the study covers between 1 January 2013, the official ‘phase – in’ commencement date of the Basel III Accord, and ends in March 2017. This model uses a longitudinal time series statistical analysis to chart changes in key statistics that are influenced by the Basel banking regulations. Data that is analysed includes changes in RWA, capital adequacy ratios, ROE, lending volumes, and loan composition between the three time periods.

5.3 Research Findings

This study has had the benefit of considering and comparing information from a theoretical perspective (through a literature review), as well as from a practical standpoint (by way of the research findings).

The current literature relating to the Basel III Accord and its anticipated effects on long - term housing finance suggests that the revised capital requirements along with the new liquidity measures introduced in the Basel III Accord are bound to have a significant impact on the various aspects of long - term housing finance on a *universal* basis. In South Africa however, a slightly different scenario may prevail.

The findings of the research suggest that the implementation of Basel III in South Africa will have a more pronounced impact on the provision of long - term housing finance than when compared to Basel I and Basel II. Evidence of this assertion comes in the form of the recently introduced liquidity framework, as well as through the design of a revised capital structure obligation for banks that is more arduous and expensive to maintain than when compared to the current capital requirements of the Basel II Accord. As expected, these measures are predicted to adversely affect a banks cost of capital, profitability, and consequently, ROE.

The unfavourable effects of Basel III on bank profitability and ROE have also given rise to three principal areas in which long-term finance in its current form may be subject to change. Firstly, the affordability of long - term housing finance may be compromised through an increase in lending rates on long - term finance transactions. Secondly, analysis of the research results suggest that the 'standard' term of long - term lending transactions may be in line for a reduction. Lastly, the availability of long - term housing finance may be 'directly' compromised as banks opt to invest in short term asset portfolios as opposed to long - term lending contracts. Additionally, consumers on the lower end of the earnings scale may be excluded from accessing bank credit as the alleged escalations in lending rates influence bond affordability - essentially an 'indirect' effect on the availability of long - term bank finance.

Before the commencement of this thesis, the goal was set to attain a better understanding of the Basel Accords along with their associated mechanics, and *how* these Basel Accords impact a bank's lending practices - both of these goals have been achieved. After reviewing the

results of the research, it is anticipated that long - term housing finance in South Africa will be impacted to some extent. However, as South African banks as a whole are well capitalized and are already in accordance with the majority of the Basel III measures, the impact of the Basel III Accord on consumers is likely to be limited. In fact, it seems that a large part of the Basel III effects has already been filtered through to consumers and any further effects will be somewhat marginal. However, what is evident, is that certain profiles of consumers will be more effected than others. The internal ratings-based approach currently utilised by the big four banks yields significantly different results depending on the borrower of funds and the associated probability of default. Reading into this suggests that consumers on the lower end of the income scale are more likely to feel the effects of the Basel III Accord as RWA requirements for those specific transactions increase significantly. Further, any increase in lending rates ensuing from the Basel III Accord will add additional affordability pressures as a result of increasing monthly instalments. Logically, the housing shortage in South Africa occurs in the entry level housing segment. Ironically however, this seems to be the sector that will be impacted the most by Basel III.

5.4 Research Proposition

The research proposition for this thesis was as follows:

The implementation of Basel III is expected to have a direct negative effect on the profitability of the banking sector, which will reduce the availability, and increase the cost of housing finance, and will therefore impact negatively on the provision of housing in South Africa.

Considering the limitations associated with this research, I support the initial proposition of this research. The findings of the study suggest that the profitability of the South African banking sector will be compromised as a result of the Basel III Accord and its associated capital requirements. Further, the availability of long - term housing finance in its current guise may be subject to change with banks rather opting for loans with a shorter maturity period. Although the housing market in South Africa is not expected to be greatly impacted by the Basel III Accord, the lower income sector of the market is expected to be impacted the most due to affordability constraints found in this segment of the market.

5.5 Limitations

The Basel III Accord only requires bank compliance by 1 January 2019, and is still in the early stages of implementation with a number of its major components still to be 'phased – in.' As a result, this research does have its limitations given that the tangible effects of the Basel III Accord are still unidentified. Thus, the views obtained from the literature concerning the effects of Basel III, as well as the opinions obtained from respondents regarding how Basel III will impact the banking environment are subjective and have no verifiable grounds. However, by assessing how the banking sector previously reacted to the implementation of the Basel II Accord, a preliminary assessment of the Basel III impact is possible. With regards to the qualitative aspect of this research, the sample size of the study was limited due to the fact that there are relatively few Basel III experts within the banking environment that have the appropriate Basel III knowledge to discuss the topic in any meaningful depth which obviously limits one's ability to generalize the results. However, this shortcoming was mitigated by the fact that the conclusions drawn from this study are derived from the literature, along with the quantitative aspect of the research.

In addition to these limitations is the fact that the revised Accord contains a number of key modifications unique to the Basel III Accord, which are not included in the prevailing Basel I and II regulations. Two of these reforms, the Net Stable Funding Ratio, and the Liquidity Coverage Ratio, are such examples. Consequently, the effects of these ratios have no prior exemplars as a basis of comparison, also adding to the limitations of the research. Nevertheless, an understating of the mechanics that comprise these ratios, as well as what components of a bank's balance sheet are going to be implicated as a result of the introduction of these measures, gives way to an informed account of the likely impact that the Basel III Accord and its newly introduced regulatory measures will have on long - term housing finance in South Africa.

Due to the limitations encountered in the research, the likely impact of a banking regulation such as Basel III on long - term housing finance can only be determined through the analysis of historical data, as well as by the collection of subjective opinions. Therefore, the conclusion

to this research comes with a caveat in that the research outcome of this study is based upon independent interpretation as opposed to tangible facts.

5.6 Future Research

The Basel Accords are a set of extremely complex bank regulations that require an in-depth study to fully understand their intricacies and are beyond the confines of this thesis. However, it is believed that this thesis has contributed to gaining an understanding of the core components of Basel III, and how these components impact bank finance and consequently the housing market. Research that is focused around housing and any element that may impact housing provision is important for a developing country like South Africa that suffers from income inequality as well as an acute housing shortage. As bank regulation becomes tighter, and bank profits become more strained, it will be interesting to see how growth in non-traditional banking systems in South Africa respond. Shadow banking for example, when considering its narrow definition, is a growing \$34 trillion global industry that helps support real economic activity, and provides a valuable alternative to bank funding (Financial Stability Board, 2017). Accordingly, further research pertaining to finance that is available through non – bank credit providers who are not subjected to the same stringent regulations and costs as traditional banks (such as shadow banking), would be a helpful in ascertaining whether these types of financial institutions would have a positive influence on helping South African consumers access housing finance.

References

- ABASCAL, M., CARRANZA, L., LEDO, M. & MARMOLEJO, A. L. 2011. Impact of Financial Regulation on Emerging Countries. *BBVA Research Working Papers Number 11/08*. Madrid, Spain: BBVA.
- ABDEL-BAKI, M. 2012. Forecasting the Costs and Benefits of Implementing Basel III for North African Emerging Economies: An Application to Egypt and Tunisia. *Economic Brief*. Abidjan, Côte d'Ivoire: African Development Bank.
- ADVISORYHQ. 2016. From Basel I to Basel III – Overview of the Journey (Basel 1, 2, 2.5 and 3). Available: <http://www.advisoryhq.com/articles/basel-i-2-2-5-3/> [Accessed 2016/12/28].
- AGARWAL, D. V. & RAVITZ, M. 2014. *The ABCs of Basel I, II, & III* [Online]. Available: https://www.capgemini.com/resource-file-access/resource/pdf/the_abcs_of_basel_i_ii_iii.pdf [Accessed 2017/02/22].
- ALEXANDRU, C. & ROMANESCU, M. L. 2008. The Assessment of Banking Performances - Indicators of Performance in Bank Area. University Library of Munich, Germany.
- ANDERSEN, H. 2011. Procyclical Implications of Basel II: Can the Cyclicity of Capital Requirements be Contained? *Journal of Financial Stability*, 7, 138–154.
- ANDERSON, T. 2013. Research Paradigms: Ontology's, Epistemologies & Methods. Barcelona, Spain: eLearn Center (Universitat Oberta de Catalunya).
- BAILY, M. N. & ELLIOT, D. J. 2013. The Role of Finance in the Economy: Implications for Structural Reform of the Financial Sector. Washington DC: The Brookings Institution.
- BAKICIOR, T., DURAND, N. C., & LU, D. 2008. *Basel II*. Eco467 ed. Princeton, New Jersey: Princeton University.
- BALIN, B. J. 2008. Basel I, Basel II, and Emerging Markets: a Nontechnical Analysis. Washington DC: Johns Hopkins University.

BANK FOR INTERNATIONAL SETTLEMENTS. 1988. *International Convergence of Capital Measurement and Capital Standards*. In: BASEL COMMITTEE ON BANKING SUPERVISION (ed.). Basel, Switzerland: Bank for International Settlements.

BANK FOR INTERNATIONAL SETTLEMENTS 2000. *Principles for the Management of Credit Risk* In: BASEL COMMITTEE ON BANKING SUPERVISION (ed.). Basel, Switzerland: Bank for International Settlements.

BANK FOR INTERNATIONAL SETTLEMENTS 2004. *International Convergence of Capital Measurement and Capital Standards*. In: BASEL COMMITTEE ON BANKING SUPERVISION (ed.). Basel, Switzerland: Bank for International Settlements.

BANK FOR INTERNATIONAL SETTLEMENTS 2010a. *An Assessment of the Long-Term Economic Impact of Stronger Capital and Liquidity Requirements*. In: BASEL COMMITTEE ON BANKING SUPERVISION (ed.). Basel, Switzerland: Bank for International Settlements.

BANK FOR INTERNATIONAL SETTLEMENTS 2010b. *Basel III: A Global Regulatory Framework for More Resilient Banks and Banking Systems*. In: BASEL COMMITTEE ON BANKING SUPERVISION (ed.). Basel, Switzerland: Bank for International Settlements.

BANK FOR INTERNATIONAL SETTLEMENTS 2011. *Principles for the Sound Management of Operational Risk*. In: BASEL COMMITTEE ON BANKING SUPERVISION (ed.). Basel, Switzerland: Bank for International Settlements.

BANK FOR INTERNATIONAL SETTLEMENTS 2014. *Basel III Leverage Ratio Framework and Disclosure Requirements*. In: BASEL COMMITTEE ON BANKING SUPERVISION (ed.). Basel, Switzerland: Bank for International Settlements.

BANK FOR INTERNATIONAL SETTLEMENTS. 2016. *About the Basel Committee* [Online]. Bank for International Settlements. Available: <https://www.bis.org/bcbs/about.htm> [Accessed 2017/02/24].

BASEL II COMPLIANCE PROFESSIONALS ASSOCIATION. n.d. *The Basel ii Accord* [Online]. Washington DC: Basel ii Compliance Professionals Association. Available: [http://www.basel-ii-accord.com/Basel ii The constituents of capital 49.htm](http://www.basel-ii-accord.com/Basel%20ii%20The%20constituents%20of%20capital%2049.htm) [Accessed 2017/07/23].

- BEZOEN, B. 2015. *The Impact of Basel III on European Bank Lending*. Master of Business Administration, University of Twente.
- BNCINI, J. & GAUCI, A. 2011. *ALERT Liquidity* [Online]. Malta: KPMG. Available: <https://home.kpmg.com/za/en/home/insights/2014/08/liquidity-coverage-ratio.html> [Accessed 2017/07/13].
- BRAUN, V. & CLARKE, V. 2006. Using Thematic Analysis in Psychology. *Qualitative Research in Psychology* [Online]. Available: <http://eprints.uwe.ac.uk/11735> [Accessed 2017/08/20].
- BRAUN, V., CLARKE, V. & RANCE, N. 2014. How To Use Thematic Analysis with Interview Data. *The Counselling & Psychotherapy Research Handbook*. London: Sage.
- BRINK, H. I. L. 1993. Validity and Reliability in Qualitative Research. *SA Society of Nurse Researchers' Workshop*. Rand Afrikaans University: University of South Africa.
- BROWNE, C., SALA-I-MARTIN, X., CROTTI, R., DI BATTISTA, A., CORRIGAN, G., DRENIK HANOUIZ, M., GAVLAN, C., MARTI, G., GEIGER, T. & GUTKNECHT, T. 2015. The Global Competitiveness Report 2015 - 2016. Geneva: World Economic Forum.
- CABRAL, R. 2013. A Perspective on the Symptoms and Causes of the Financial Crisis. *Journal of Banking & Finance*, 37, 103 - 117.
- CADIOU, C. & MARS, M. 2008. Basel II Pillar 3: Challenges for Banks. In: PIROLO, T. & HEWER, J. (eds.) *The Journal: Global Perspectives on Challenges and Opportunities*. December 2008 ed.: Price Waterhouse Coopers.
- CAFARIELLO, J. 2014. *The Great Bank Regulation Debate How Much is Too Much?* [Online]. Baltimore, Maryland. Available: <https://www.wealthdaily.com/articles/the-great-bank-regulation-debate/5260> [Accessed 2017/08/01].
- CAGGIANO, G. & CALICE, P. 2011. The Macroeconomic Impact of Higher Capital Ratios on African Economies. *Working Paper Series N° 139*. Tunis, Tunisia: African Development Bank.
- CENTRE FOR AFFORDABLE HOUSING FINANCE IN AFRICA 2016. *Housing Finance in Africa Yearbook 2016*, Johannesburg, Centre for Affordable Housing Finance in Africa.

CHIMUTSA, C. 2013. Stability vs. Access? Basel III in Southern Africa. *Sound Housing Finance around the World - IUHF Joint Congress*. Vienna, Austria.

CHUN, S. E., KIM, H. & KO, W. 2012. The Impact of Strengthened Basel III Banking Regulation on Lending Spreads: Comparisons across Countries and Business Models. *BOK Working Paper No. 2012-15*.

COLORADO STATE UNIVERSITY. n.d. *Conducting Field Research* [Online]. Colorado State University. Available: <https://writing.colostate.edu/guides/guide.cfm?guideid=23> [Accessed 2017/08/07].

CUMMING, S. & NEL, H. 2005. Capital Controls and the Lending Behaviour of South African Banks: Preliminary Finds on the Expected Impact of Basel II. *South African Journal of Economics*, 73, 641-656.

DAGHER, J., DELL'ARICCIA, G., RATNOVSKI, L. & TONG, H. 2016. Capital Buffers. *Finance and Development*. Washington, DC: International Monetary Fund.

DAVIS, M. 2015. Basel III & IFRS Investor Presentation. Nedbank.

DREHMANN, M. & GAMBACORTA, L. 2012. The Effects of Countercyclical Capital Buffers on Bank Lending. *Applied Economics Letters*, 19, 603-608.

DUDOVSKIY, J. 2016. *Ontology* [Online]. Available: <http://research-methodology.net/research-philosophy/ontology/> [Accessed 2017/04/02].

ERASMUS, S. 2015. *South Africans Among the World's Worst Savers* [Online]. Cape Town: Fin24. Available: <http://www.fin24.com/Savings/News/South-Africans-among-the-worlds-worst-savers-20150707> [Accessed 2017/08/05].

ERBAS, N. S. & NOTHAFT, F. E. 2002. The Role of Affordable Mortgages in Improving Living Standards and Stimulating Growth: A Survey of Selected MENA Countries. *IMF Working Paper 02/17*. International Monetary Fund.

FINANCIAL STABILITY BOARD 2017. Global Shadow Banking Monitoring Report 2016. Basel, Switzerland: Financial Stability Board.

FORD, H. 2014. *Advanced Qualitative Analysis* [Online]. Oxford Internet Institute. Available: <https://www.slideshare.net/hfordsa/qualitative-codes-and-coding> [Accessed 2017/09/07].

GABRIEL, D. 2013. *Inductive and Deductive Approaches to Research* [Online]. United Kingdom. Available: <http://deborahgabriel.com/2013/03/17/inductive-and-deductive-approaches-to-research/> [Accessed 2017/08/09].

GIORDANA, G. & SCHUMACHER, I. 2011. The Impact of the Basel III Liquidity Regulations on the Bank Lending Channel: A Luxembourg Case Study. *Working Paper No 61*. Luxembourg: Central Bank of Luxembourg.

GREEF, P. 2012. *Compliance with Liquidity Ratios Biggest Risk for SA Banks in Basel III* [Online]. Johannesburg, South Africa: Global Credit Rating Co. Available: <https://globalratings.net/news/article/compliance-with-liquidity-ratios-biggest-risk-for-south-african-banks-in-ba> [Accessed 2017/08/05].

GRIFFITH - JONES, S. 2007. Implications of Basel II for Stability and Growth in Developing Countries; Proposals for Further Research and Action. *Financial Liberalisation and Global Governance: The Role of International Entities*. Rio de Janeiro, Brazil: University of Sussex.

HANNOUN, H. 2010. The Basel III Capital Framework: a Decisive Breakthrough. *BoJ-BIS High Level Seminar on Financial Regulatory Reform: Implications for Asia and the Pacific*. Hong Kong: Bank for International Settlements.

HARTLAGE, W. A. 2012. The Basel III Liquidity Coverage Ratio and Financial Stability. *Michigan Law Review*, 111, 453-483.

HASSAN AL-TAMIMI, H. A. 2008. Implementing Basel II: An Investigation of the UAE Banks' Basel II Preparations. *Journal of Financial Regulation and Compliance*, 16, 173 - 187.

HEALE, R. & TWYXCROSS, A. 2015. Validity and Reliability in Quantitative Studies. *BMJ Journals*, 18, 66-67.

HEID, F. 2007. The Cyclical Effects of the Basel II Capital Requirements. *Journal of Banking & Finance*, 31, 3885-3900.

HUDSON, L. A. & OZANNE, J. L. 1988. Alternative Ways of Seeking Knowledge in Consumer Research. *The Journal of Consumer Research*, 14, 508-521.

ILKOVA, E. 2016. Regulatory Update: Basel III. Rand Merchant Bank (Unpublished).

INTERNATIONAL MONETARY FUND 2010. South Africa: Detailed Assessment of Compliance on Basel Core Principles for Effective Banking Supervision. Washington, DC: International Monetary Fund.

INVESTEC 2016. Basel: Advanced Internal Ratings Based Approach. Investec (Unpublished).

JINKS, A., MCCOACH, L., CHERNISHEV, A., BONG, E. & KNUCKEY, J. 2011. *Overview of Basel III - Minimum Capital Requirements and Global Liquidity Standards* [Online]. Australia. Available: <https://www.claytonutz.com/knowledge/2011/january/overview-of-basel-iii-minimum-capital-requirements-and-global-liquidity-standards> [Accessed 2017/07/01].

JORDAN, L. & WILSE - SAMSON, L. 2015. *Housing and Jobs go Hand in Hand* [Online]. Mail & Guardian. Available: <https://mg.co.za/article/2015-05-07-housing-and-jobs-go-hand-in-hand> [Accessed 2017/04/21].

KASAKENDE, L., BAGYENDA, J. & BROWNBRIDGE, M. 2012. Basel III and the Global Reform of Financial Regulation: How Should Africa Respond? a Bank Regulator's Perspective. *Bank of Uganda mimeo*.

KEATS, R. 2015. *Understanding the Role of Credit In The Economy* [Online]. Available: <http://marketrealist.com/2015/09/understanding-role-credit-economy/> [Accessed 2017/05/15].

LEE, E. H. 2014. Basel III and Its New Capital Requirements, as Distinguished from Basel II. *Legal Studies Research Paper Series Paper No. 2014/06*. Hong Kong: University of Hong Kong.

LI, B. 2017. The Impact of the Basel III Liquidity Coverage Ratio on Macroeconomic Stability: an Agent-Based Approach. *Economics Discussion Papers*. Kiel Institute for the World Economy.

MARKS, L. E. & NICOLAIDES, M. C. 2014. Understanding Basel III. Delaware, USA: Latham & Watkins.

MITCHELL, K. 2016. CON5037Z : Research Methodology Lecture Notes. *Theoretical Frameworks*. Cape Town: University of Cape Town.

NASTAS, C., VAN VELDEN, L. & ROOPNARAIN, R. 2017. Standing Firm Against Headwinds. South Africa – Major Banks Analysis. South Africa: Pricewaterhouse Coopers.

NAYAK, A. 2013. *An Overview of the Basel Norms - I, II & III* [Online]. Slide Share. Available: <https://www.slideshare.net/arunavnayak75/an-overview-of-the-basel-norms> [Accessed 2017/02/22].

NEETHLING, S. B. 2014. *Empirical Evidence of Aggregate Supply by South African Banks Since the Introduction of International Risk Based Capital Regulation*. Master of Financial Management, University of Cape Town.

NKOSI, N. 2013. Impact of Basel III on Low Income Housing. *International Union for Housing Finance/European Federation of Building Societies*. Vienna: Standard Bank.

NORTON ROSE FULBRIGHT. 2010. *An Introduction to Basel III - its Consequences for Lending* [Online]. Available: <http://www.nortonrosefulbright.com/knowledge/publications/31077/an-introduction-to-basel-iii-its-consequences-for-lending> [Accessed 2017/02/24].

OPPENHEIMER, L. & HOLLINGSWORTH, D. 2014. Capital Requirements and Bank Balance Sheets: Reviewing the Basics. Available: <http://www.thirdway.org/memo/capital-requirements-and-bank-balance-sheets-reviewing-the-basics> [Accessed 2017/07/08].

PATEL, D. 2013. *Interpretivism* [Online]. SlideShare. Available: <https://www.slideshare.net/deepalipatel246/interpretivism-16119473> [Accessed 2017/11/19].

- PETTINGER, T. 2017. Factors Affecting Economic Growth. Available from:
<http://www.economicshelp.org/blog/2671/economics/factors-affecting-economic-growth/>
[Accessed 2017/08/05].
- PRICE WATERHOUSE COOPERS 2011. Risk & Capital Management Under Basel III. Price Waterhouse Coopers.
- RITCHIE, J., LEWIS, J., ARTHUR, S., ELAM, G., FINCH, H., KEEGAN, J., ROBIN, L., NAZROO, J., O'CONNOR, W., SNAPE, D., SPENCER, L., WARD, K., CLARISSA, W. & WOODFIELD, K. 2003. *Qualitative Research Practice A Guide for Social Science Students and Researchers*, Wiltshire, Great Britain, SAGE Publications.
- ROY, D. G., BINDYA, K. & SWATI, K. 2013. Basel I to Basel II to Basel III: A Risk Management Journey of Indian Banks. *AIMA Journal of Management Research*, 7, 0974-497.
- RUST, K. 2006. *Analysis of South Africa's Housing Sector Performance* [Online]. FinMark Trust. Available:
<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.463.4115&rep=rep1&type=pdf>
[Accessed 05/08/2018].
- SCHEPENS, G. & KOK, C. 2013. Bank Reactions after Capital Shortfalls. *Working Paper Series November 2013*. Frankfurt, Germany: European Central Bank.
- SCHUERMANN, T. 2004. What Do We know About Loss Given Default? *Wharton Financial Institutions Center Working Paper No. 04-01*. New York.
- SEGURA, A. & SUAREZ, J. 2016. How Excessive is Banks' Maturity Transformation? *Working Paper Series No 3*. European Systemic Risk Board.
- SHUTTLEWORTH, M. 2009. *Construct Validity* [Online]. Available:
<https://explorable.com/construct-validity> [Accessed 2017/11/19].
- SOMMER, A. B. 2006. *Research Methods*. California, United States: University of California.
- SOUTH AFRICAN RESERVE BANK. 2012. *The Economic Impact of the NSFR in Terms of the Basel III Framework*. Pretoria, South Africa: South African Reserve Bank.

- SOUTH AFRICAN RESERVE BANK. 2014. *Basel 3 Economic Impact Studies*. Pretoria, South Africa: South African Reserve Bank.
- STATISTICS SOUTH AFRICA. 2016. *Quarterly Labour Force Survey Quarter 4: 2016*. Pretoria, South Africa: Statistics South Africa.
- VALENZUELA, D. & SHRIVASTAVA, P. 2002. *Interview as a Method for Qualitative Research* [Online]. Arizona, USA: Arizona State University. Available: <http://www.public.asu.edu/~kroel/www500/> [Accessed 2017/08/09].
- VAN DYK, F. 2011. *Basel III: An Overview of The Safer 'Safety Net'*. Johannesburg, South Africa: The South African Financial Markets Journal.
- WARNOCK, C. V. & WARNOCK, E. F. 2008. Markets and Housing Finance. *Journal of Housing Economics*, 17, 239 - 251.
- WINTERBOER, T., GROSSKOPF, J., BEYERS, S., ACKERMAN, K., NATSAS, C., LIM AH TOCK, I. & VAN VELDEN, L. 2011. *South Africa - Major Banks Analysis* [Online]. Johannesburg, South Africa: PriceWaterhouseCooper's. Available: <https://www.pwc.co.za/en/assets/pdf/major-banks-analysis-march-2011.pdf> [Accessed 2017/08/28].
- WORLD BANK 2015. Global Finance Development Report. *Long-Term Finance*. Washington, DC: Publishing and Knowledge Division, The World Bank.
- WU, D., HUANG, J.-Z. & HONG, H. 2013. The Information Content of Basel III Liquidity Risk Measures. *Journal of Financial Stability*, 15, 91 - 111.
- YADAV, R., VAN DRUTEN, E., HELLAWEEL, F., SAWAN, R., SULLIVAN, W. & WILSON, D. 2014. Impact of Regulations on Bank Lending. Available: https://www.capgemini.com/resource-file-access/resource/pdf/the_abcs_of_basel_i_ii_iii.pdf [Accessed 2017/03/02].

Appendix

A1. The Basel Framework Implementation Timeline for South Africa¹

	2013	2014	2015	2016	2017	2018	2019	Global	
Capital	Minimum Common Equity Capital (CET1) ²	4.50%	5.50%	6.50%	6.25%	6.00%	5.50%	5.00%	4.50%
	Minimum Tier 1 Capital	6.00%	7.00%	8.00%	8.00%	8.00%	8.00%	8.00%	6.00%
	Minimum Total Capital ³	9.50%	10.00%	10.00%	9.75%	9.50%	9.25%	9.00%	8.00%
	Capital Conservation Buffer				0.625%	1.25%	1.875%	2.20%	2.50%
	Domestic Systemically Important Banks ⁴				<0.875%	<1.75%	<2.65%	<3.5%	
	Minimum Required Capital (MRC) ratio	9.50%	10.00%	10.00%	11.25%	12.50%	13.75%	15.00%	
	Counter Cyclic Buffers - regulatory discretion	<2.5%	<2.5%	<2.5%	<2.5%	<2.5%	<2.5%	<2.5%	2.50%
	Capital Instruments that no longer Qualify as T1 or T2	Phased out at 10% p.a over 10 year horizon beginning 2013							
	Leverage Ratio	Disclosure starts 1 Jan 2015, still to be calibrated						4.00%	3.00%
Liquidity	Liquidity Coverage Ratio (LCR)	Observation	60.00%	70.00%	80.00%	90.00%	100.00%		
	Net Stable Funding Ratio (NSFR)							Introduce Minimum Standard	

¹ Phase - in - arrangements (shaded areas indicate transition periods, all dates are as of 1 January of that year)

² Includes Pillar 2A for CET1

³ Excludes Pillar 2B add-ons

⁴ Aggregate Pillar 2A and D - SIB will not exceed 2% of CET1, 2.5% of T1 and 3.5% of MRC

Source: RMB Global Markets Research Regulatory Update: Basel III

A2. Changes in Capital Ratios

Description	Basel II	Basel III
Common Equity Requirement	2.00%	4.50%
Tier 1 Capital	4.00%	6.00%*
Tier 2 Capital	4.00%	2.00%
Total Capital	8.00%	8.00%
Tier 3 Capital	Exists	Phase Out
Capital Conservation Buffer	N/A	2.5% of Common Equity Tier 1
Counter Cyclic Buffer	N/A	0 - 2.5% of RWA

*Tier 1 now excludes hybrid instruments, so will be phased out

Source: financetrainingcourse.com

A3. Liquidity Coverage Ratio

i.) High Quality Liquid Assets

High Quality Liquid Asset Portfolio (HQLA)		
Asset - type	Min/Max% of HQLA	Weighting Factor
Level 1 asset		
Coins & notes		
Central bank reserves	Min 60%	100%
Treasury Bills		
Central bank debentures		
Government bonds		
Level 2 A assets		
Sovereign & Public Sector assets (Risk weight < 20%) ¹	Max 40%	85%
Corporate securities AA- or higher		
Covered bonds AA- or higher		
Level 2 B assets		
RMBS	Max 15%	75%
Corporate securities A+ to BBB		50%
Listed equities		50%
Committed liquidity facility	Max 40%	100%

Source: Nedbank Group Limited Basel III & IFRS 9 Investor Presentation (November 2015)

ii.) Net Cash Outflows 0 to 30 Days

NCOF 0 to 30 Days		
Client-type / Tenor	LCR Positive / LCR Negative	Run-off Factor
Cash Outflows		< 30 Days
Deposit Outflows		
Retail & SME deposits		10%
Operational deposits		25%
Non-operational deposits: Non-financial commercial deposits		40%
Non-operational deposits: Financial Wholesale Deposits		100%
Unsecured Funding Outflows		
Capital Market Instruments		100%
Secured Funding Outflows		
Level 1 assets repo (sell / buy)		0%
Level 2 assets repo (sell / buy)		15%
Other Outflows		
Derivatives & other outflows		100%
Committed/Uncommitted credit & liquidity facilities		5% to 10%
Cash Outflows		< 30 Days
Secured Lending Inflows		
Level 1 assets reverse repo (buy/ sell)		0%
Level 2 assets reverse repo (buy/sell)		15%
Other Inflows		
Retail & commercial entity loans & advances		50%
Financial entity loans & advances		100%
Derivative & other inflows		100%

Source: Nedbank Group Limited Basel III & IFRS 9 Investor Presentation (November 2015)

A4. NSFR Composition

Client-type / Tenor	ASF		
	< 6 mths	> 6 mths < 1 Year	> 1 Year
Qualifying Capital	100%	100%	100%
Retail & SME Deposits	90%	90%	100%
Non-financial Commercial Deposits	50%	50%	100%
Financial Operational Deposits	50%	50%	100%
Financial Non-Operational Deposits	0%	50%	100%
Repo Transactions	0%	50%	100%
Other Liabilities	0%	50%	100%
Asset-type / Tenor	RSF		
	< 6 mths	> 6 mths < 1 Year	> 1 Year
Coins & notes, excess central bank reserves	0%	0%	0%
Loans to Financial institutions secured by Level 1 assets (Reverse Repos)	10%	50%	100%
Loans to Financial institutions	15%	50%	100%
Loans to Retail & SME customers (maturity < 1 year)	50%	50%	-
Residential Mortgages (Risk weight < 35%) (LTV<80%)	50%	50%	65%
Loan to Non-Financial entities (Risk weight < 35%) (AAA to AA-)	50%	50%	65%
Loan to Non-financial customers (Risk weight > 35%) (LTV>80%, A+ or less)	50%	50%	85%
Exchange traded equities, commodities, Initial margin against derivatives	-	-	85%
Non performing loans / Derivative assets	100%	100%	100%
All other on-balance sheet assets	100%	100%	100%
Off-Balance sheet obligations	5%	5%	-

Source: Nedbank Group Limited Basel III & IFRS 9 Investor Presentation (November 2015)