

Understanding the effects of changes in banking regulations on infrastructure financing in South Africa

A Dissertation
presented to

The **Development Finance Centre (DEFIC)**
Graduate School of Business
University of Cape Town

In partial fulfilment
of the requirements for the Degree of
Master of Commerce in Development Finance

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December 2022

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Abstract

South Africa is the only African member of the Basel Committee on Banking Supervision (BCBS), the body responsible for setting global prudential banking standards, and as such, has adopted Basel III regulatory standards in the Banks Act 94 of 1990 (Banks Act). This study aims to establish whether the regulatory reforms, particularly the transition from Basel II to Basel III, adversely impacted commercial banks' appetite for infrastructure financing. It also aims to determine whether the reforms increased infrastructure debt pricing for borrowers, drove up related costs borne by the banks, and whether they were implemented by the local regulator, the Prudential Authority (PA), after applying the proportionality principle as recommended by the BCBS. Finally, it recommends measures to mitigate the adverse effects of the regulatory reforms for the consideration of the regulators and banks.

For this exploratory qualitative study, in-depth interviews were conducted with the heads of infrastructure finance and capital management experts from four of the five largest commercial banks in South Africa, known as the 'Big 5' SA banks. Collectively, these five banks cover virtually the entire infrastructure debt financing sector in South Africa. Recordings of the interviews conducted on MS Teams were transcribed, and a thematic analysis based on Braun and Clarke's six-step framework was employed to analyse the qualitative data. A hybrid deductive and inductive coding approach was used, which entailed deriving codes from the philosophical framework and deriving codes directly from the qualitative data to get the benefits of both methods.

The findings indicate that regulatory reforms have not adversely affected banks' appetite to finance infrastructure projects, with all the banks seeking to increase their exposure partially due to institutional investors interested in investing in infrastructure assets increasing demand. The respondent banks all noted that they have had to adapt their strategies due to the regulatory reforms, such as keeping the loans on book during the early construction and ramp-up phase and thereafter selling down the long end of the assets, which have become too expensive for banks to hold to institutional investors. Additionally, the banks have redirected their attention towards delivering a greater range of advisory services. This includes mitigating risks during the early stages and taking on the role of Lead Arranger (LA) or Mandated Lead Arranger (MLA) to organize syndicated loans. The findings indicate that the reforms have increased debt financing costs mainly due to liquidity match-funding requirements and higher regulatory capital requirements, with most of these costs, passed on to the borrower by the banks. Regulatory reforms relating to derivatives have significantly increased hedging costs for risk

management in infrastructure projects. The findings also indicate that the PA may not have effectively applied the proportionality principle in adopting the Basel III reforms as they were implemented fully and, in some instances, with additional conservatism compared to the Basel III accord.

The key recommendations for the regulators, particularly the PA, were to harmonise regulatory reforms across economic sectors by factoring in national priorities such as job creation and economic growth. The PA could also phase implementation of the reforms over a longer timeframe to allow banks to better adapt to the regulatory changes. Additional recommendations for the PA were to make concessions to the banks concerning infrastructure assets by relaxing some of the regulatory reforms and introducing regulations (e.g., Regulation 28 governing the assets in which pension funds can invest) to incentivise other sectors of the economy to support infrastructure investment. The PA could also consider introducing regulatory concessions enabling commercial banks to compete with their development finance institution (DFI) counterparts to make infrastructure development economical. Banks were recommended to expand their related product offering, especially those beneficial to institutional investors. It was also recommended that the bank use groupings such as the Banking Association of South Africa (BASA) to undertake credible, in-depth research to support their engagement with the regulators regarding the adverse effects of regulatory reforms prior to their local adoption.

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List of Acronyms

AE	Advanced economy (i.e., developed economy)
AML/CFT	Anti-money laundering and countering financing of terrorism
AT1	Additional tier 1 (capital or ratio)
BCBS	Basel Committee on Banking Supervision (Bank of International Settlements)
BIS	Bank of International Settlements
BSD	Bank Supervision Department (replaced by Prudential Authority)
CAR	Capital adequacy ratio
CCB	Capital conservation buffer
CCR	Counterparty credit risk
CCS	Cross-currency swaps
CCUS	Carbon capture utilisation and storage
CCyB	Countercyclical buffer
CDG	Center for Global Development
CET1	Common equity tier 1 (capital or ratio)
CVA	Credit valuation adjustment
DFI	Development finance institution
D-SIB	Domestic systemically important banks
D-SIFI	Domestic systemically important financial institution
EAD	Exposure at Default (credit balance owing at time of default)
EMDE	Emerging market and developing economy
EME	Emerging market economy
EURIBOR	Euro Interbank Offered Rate
FI	Financial institution
FSB	Financial Stability Board
FSI	Financial Stability Institute (Bank of International Settlements)
FSR	Financial Sector Regulation Act 9 of 2017
FRTB	Fundamental Review of the Trading Book
FSCA	Financial Sector Conduct Authority
G-SIB	Global systemically important banks
G-SIFI	Global systemically important financial institution
GFC	Global Finance Crisis of 2007-8
GHOS	Group of Governors and Heads of Supervision

HQLA	High quality liquid assets
IBOR	Interbank Offered Rate
ICAAP	Internal Capital Adequacy Assessment Process
ICASA	Independent Communications Authority of South Africa
IRS	Interest rate swaps
IFRS	International Financial Reporting Standards
JIBAR	Johannesburg Interbank Acceptance Rate
LCR	Liquidity coverage ratio
LIBOR	London Interbank Offered Rate
LA	Lead Arranger
LGD	Loss Given Default (the loss incurred in the event of default)
LR	Leverage ratio
MDB	Multilateral development bank
MLA	Mandated Lead Arranger
NERSA	National Energy Regulator of South Africa
NSFR	Net stable funding ratio
PA	Prudential Authority (of the South African Reserve Bank)
PD	Probability of Default (expected default frequency)
PRASA	Passenger Rail Agency of South Africa
QIS	Quantitative impact study
RFR	Risk-Free Rate
RWA	Risk-weighted asset
SARB	South African Reserve Bank
SIBs	Systemically important banks
SIFIs	Systemically important financial institutions
T1	Tier 1 (capital or ratio)
T2	Tier 2 (capital or ratio)
WBG	World Bank Group

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Louis Masereka Mukiraine

1 CHAPTER 1: INTRODUCTION

1.1 Background to the study

Banking is a highly regulated sector as it is essential for any modern economy since banks act as primary financiers of the local economy, supporting all other sectors through their role as financial intermediaries between savers and users of capital (Drigă & Dura, 2014). As banks' activities have become more complex over time, there has been a need to adapt regulations in response to their increasing complexity to avert excessive risk-taking, which can trigger financial crises such as the Global Financial Crisis of 2007-8 (GFC). The need to improve bank regulation inspired the central bank governors of the Group of Ten (G10) countries to establish the Basel Committee on Banking Supervision (BCBS) within the Bank of International Settlements (BIS) in 1974 as the primary global setter of prudential regulation of banks. The BCBS was established after international currency and banking markets were thrown into disarray, triggering events such as the collapse of Germany's Bankhaus Herstatt in June 1974. The BCBS has since expanded its membership to 45 members comprising central banks and bank supervisors from 28 jurisdictions (BIS, 2021). The BCBS' mandate is "to strengthen the regulation, supervision, and practices of banks worldwide with the purpose of enhancing financial stability" (BIS, 2018). The oversight body of the BCBS is the Group of Governors and Heads of Supervision (GHOS) (GHOS, 2012).

The Basel framework, which was established by the BCBS in collaboration with member central banks, central bank governors, and global commercial banks, has undergone significant developments over the years and has become the worldwide benchmark for the prudential regulation of banks (BIS, 2018). The Basel framework has undergone several iterations in a bid by the BCBS to respond to the increasing complexity in the banking sector and global financial markets.

Basel I, also known as the 'Basel Capital Accord', was introduced by the BCBS in July 1988, with a primary focus on credit risk and the introduction of capital adequacy as a crucial measure of banks' health. The Latin American Debt Crisis in the 1980s raised concerns for the BCBS, as major international banks experienced weakening capital adequacy ratios (CARs) during a time of increasing global risk. CARs are a measure of a bank's solvency, which considers the bank's eligible capital as a proportion of its asset base, with some balance sheet elements, such as intangible assets, not recognised due to their inability to be liquidated in high-stress situations and thus are deducted from accounting equity. The BCBS, with the backing of G10 governors, agreed

to cease capital erosion in their banking systems and work together to achieve greater consistency in capital adequacy measurement. This resulted in a consensus on risk measurement through a weighted approach for banks' on and off-balance sheet exposures, introducing the concept of risk-weighted assets (RWAs). Basel I was amended multiple times, including *'The Amendment to the Capital Accord to incorporate market risks'* in January 1996, as it was intended to evolve with the changing and complex banking environment. (BIS, 2021).

In June 2004, the BCBS issued the revised capital framework, *'International Convergence of Capital Measurement and Capital Standards,'* commonly referred to as the Basel II Accord or Basel II. This updated framework consisted of three pillars: 1) minimum capital requirements, expanding on the standardised rules from Basel I, 2) supervisory review of institutions' internal capital adequacy assessment process (ICAAP), and 3) disclosure usage as a means of enhancing market discipline and promoting the adoption of sound banking practices. Basel II aimed to improve the assessment of underlying risk for regulatory capital requirements and better address recent financial innovation. The focus of Basel II was mainly on the banking book (i.e., typically instruments held to maturity), prompting the BCBS to address the trading book (i.e., typically instruments readily available for sale), which contributed significantly to the problems leading to the GFC (BIS, 2021). Before the Lehman Brothers collapse in September 2008, the need to fundamentally reinforce the Basel II framework was already evident. Inappropriate incentive structures, poor governance, and inadequate risk management resulted in the banking sector entering the GFC with excessive leverage and inadequate liquidity buffers. The mispricing of credit and liquidity risks and excessive credit growth illustrated the dangerous combination of these factors. To address and mitigate these risk factors, the BCBS issued *'Principles for sound liquidity risk management and supervision'* in the same month as the Lehman Brothers' failure (BIS, 2021).

Basel II.5 was an interim framework bridging the transition from Basel II to Basel III in an attempt by the BCBS to respond rapidly to the learnings from the GFC, particularly regarding risks in the trading book. Nought Welling, then chairman of the Basel Committee and president of the Netherlands Bank, stated that “the proposed enhancements will help ensure that the risks inherent in banks’ portfolios related to trading activities, securitisations and exposures to off-balance-sheet vehicles are better reflected in minimum capital requirements, risk management practices and accompanying disclosures to the public” (Sawyer, 2009). Basel II.5 was published while Basel III was still under development and predominantly focused on changes to the market risk framework

and trading book capital changes in response to lessons learned from the GFC. The rules finalised in July 2009, with a further adjustment in June 2010, required banks to significantly change their trading book calculations for implementation from 31 December 2011. This timetable was 6 years ahead of the expected implementation of some of the more controversial elements of the Basel III framework (Pengelly, 2010).

In December 2010, '*Basel III: A global regulatory framework for more resilient banks and banking systems*' was issued by the BCBS (BIS, 2021), primarily in response to the experiences of developed countries during the GFC (Beck, 2018). The enhanced framework revised and strengthened the three pillars established under Basel II and extended it in several areas (BIS, 2021). Basel III, as the prudential standard forming the basis of South African banking regulation, is the focus of this study and will therefore be discussed in more detail than the prior frameworks.

Key reforms introduced by Basel III to be phased in from 2013 to 2019 in accordance with the transitional arrangements included but were not limited to (BIS, 2021): i) stricter requirements for the quality and quantity of regulatory capital supply, particularly the emphasis of the central role of common equity, ii) the imposition of a Capital Conservation Buffer (CCB) an additional layer of common equity, which if breached limits pay-outs such as dividends to shareholders to help adhere to the minimum common equity requirement, iii) imposition of a Countercyclical Capital buffer (CCyB) which restricts participation by banks in systemic credit booms so as to reduce losses during credit busts, iv) the introduction of a leverage ratio, stipulating the minimum amount of Tier 1 or loss absorbing capital relative to banks' total assets both on and off balance sheet irrespective of risk weighting, v) the introduction of liquidity requirements measured through the Liquidity Coverage Ratio (LCR), a short-term measure intended to ensure that enough liquidity is on hand to cover funding requirements for the next 30-day period of stress, and the Net Stable Funding Ratio (NSFR), a longer-term ratio intended to address mismatches in maturity between assets and funding across the entire balance sheet, vi) additional regulatory requirements for Systemically Important Banks (SIBs) including loss absorbency and strengthened arrangements for cross-border supervision and resolution. Figure 1 **Error! Reference source not found.** below illustrates the extent of the increase in capital requirements during the transition from Basel II/II.5 to III:

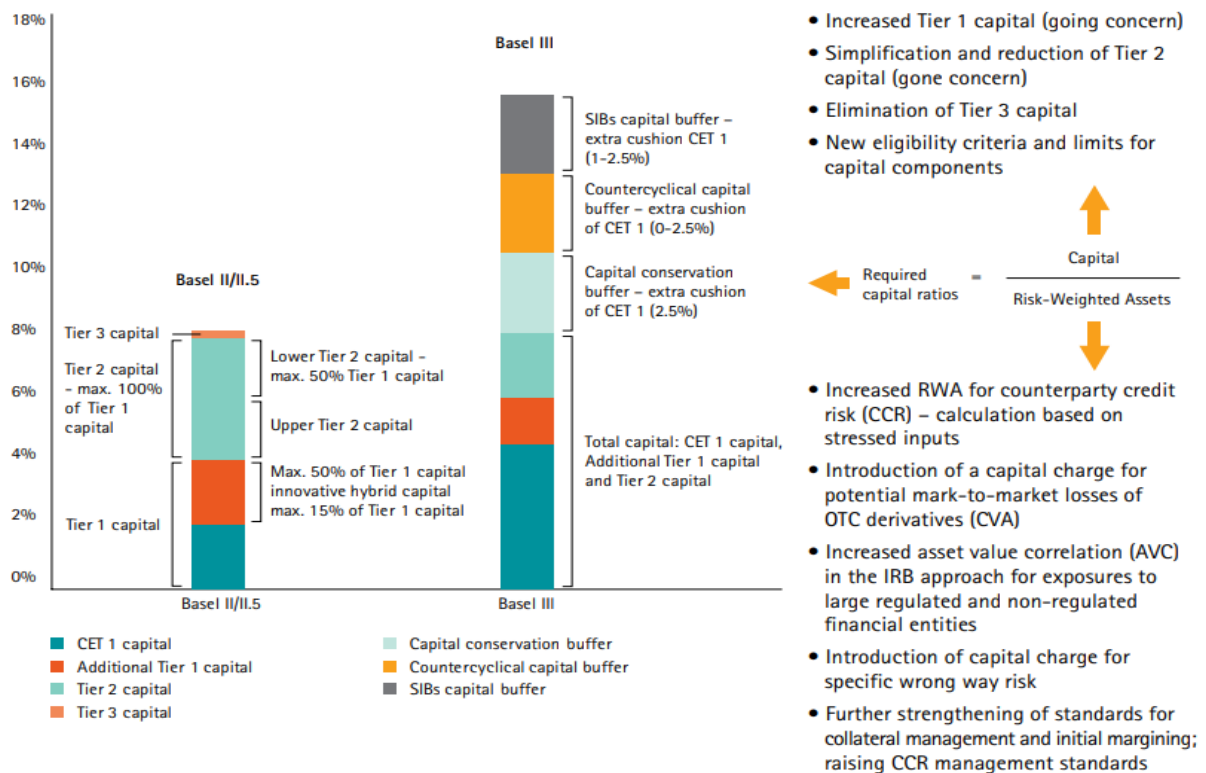


Figure 1: Illustration of higher capital requirements in transition from Basel II/II.5 to Basel III

Source: Auer et al. (2015, p.4)

As evidenced in Figure 1, Basel III significantly increased banks' regulatory capital required to absorb unexpected losses, compounding SIBs to almost double the previous regulatory capital requirements (Auer et al., 2015).

Basel III represents a comprehensive change to the Basel framework, and from 2011 the BCBS shifted its focus to refinements in the calculation of capital requirements, with risk-based capital requirements expanded to cover (BIS, 2021): i) in 2012, capital requirements for banks' exposure to central counterparties, ii) in 2013, margin requirements for non-centrally cleared derivatives and capital requirements for banks' equity invested in funds, iii) in 2014, introduction of a standardised approach for assessing counterparty credit risk (CCR) which improved on previous methodologies for measuring CCR associated with derivative transactions, iv) in 2014, the introduction of Large Exposures limits to curtail the maximum loss which a bank could sustain in the event of the abrupt failure of a major counterparty, as well as a more robust framework for measuring the capital requirements for securitisations, v) in 2016, a revised market risk framework was introduced on the back of the fundamental review of the trading book (FRTB) capital requirements and vi) a consolidated and enhanced public disclosure framework with additional requirements to reflect the development of the Basel standards.

The Basel III regulatory framework, informally known as 'Basel IV' and published in December 2017 as *Basel III: Finalising post-crisis reforms*, proposes to strengthen the capital requirements for banks. It introduces new standards for calculating capital requirements for credit risk, market risk, credit valuation adjustment (CVA) which measures the market value of counterparty credit risk, and operational risk. The final reforms also include a revised leverage ratio (i.e., a measure of the extent of gearing), a leverage ratio buffer for Systemically Important Banks (SIBs), and an output floor for capital, limiting the use of internal models to reduce risk-based capital requirements. A primary objective of these final reforms was to limit the excessive variability in international banks' RWAs which at the peak of the GFC had caused stakeholders to mistrust banks' reported RWAs and resulting capital ratios. 'Basel IV' is therefore intended to address the deficiencies of Basel II pre-GFC and create a regulatory foundation for a resilient banking system that supports the real economy (BIS, 2021).

Banking regulatory reforms often have unintended consequences that may make it more difficult or expensive for commercial banks to engage in certain revenue-generating activities or financing certain assets. Examples are the spill over effects of implementing Basel III on cross-border flows from developed economies to emerging markets and developing economies (EMDEs). Cross-border flows in the form of bank lending to EMDEs peaked in 2007 at just under USD500 billion, excluding inflows to China, before declining to nil by 2016, mainly due to U.K., U.S. and the Eurozone banks reducing their cross-border lending to EMDEs. The decline in cross-border flows was also due to other factors, such as deleveraging financial institutions (FIs) in developed markets like the U.S., but the adoption of Basel III also appears to be an important factor (Rojas-Suarez, 2018).

This study investigates the effects of South African banking regulatory reforms on infrastructure debt financing provided by South African commercial banks, given the significant contribution of infrastructure projects in supporting economic development and growth. For South Africa, this is particularly important given the government's constrained ability to fund infrastructure projects due to its limited resources coupled with ballooning public debt. Infrastructure investment needed is estimated at ZAR1.5 trillion over the next 10 years, which will be sourced from banks, DFIs and institutional investors such as asset managers and pension funds to finance its infrastructure plans (Bloomberg, 2020).

Gesellschaft (2021) indicates that private sector funding for infrastructure in Africa, which includes debt finance from private commercial banks, decreased substantially from 2010 to 2017, as illustrated in the column chart below.

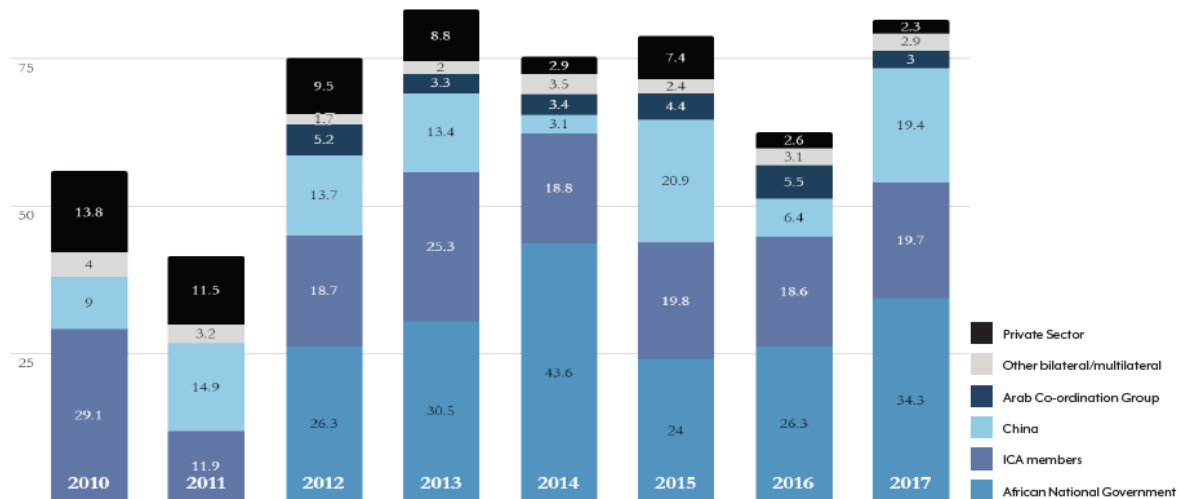


Figure 2: Africa infrastructure financing in USD billions by funding sources over time

Note: Pre-2012 ICA reports do not factor in African government expenditure and do not separate the Arab Group from non-ICA funders, so 2011 and 2010 data are from the 2012 reports)

Source: ICA, 2018, 2017, 2013 & 2012 as cited by Gesellschaft (2021, p.10)

Figure 2 suggests that there is scope for commercial banks to play an even more significant role in funding infrastructure development in Africa if they have the right incentives. The Infrastructure Consortium for Africa (ICA) is a group of members from the public and private sectors, including the G8 countries, South Africa, Spain and African institutions such as the African Union Development Agency (AUDA-NEPAD), the African Union Commission (AUC) and other financial institutions like Afreximbank. The ICA is not a funding agency but a platform providing critical knowledge and standards on financing infrastructure programmes and projects in Africa. Its members are involved in financing infrastructure, however, hence their inclusion in the above column chart. The mandate of the ICA is to promote and encourage increased investment in infrastructure on the African continent. (Gesellschaft, 2021).

This study explores the evolution of South African banking regulation concerning the Banks Act 94 of 1990 (Banks Act) and its effects on infrastructure debt financing advanced by South African commercial banks. The South African Reserve Bank (SARB) is the only African member of the BCBS (Nketcha-Nana, 2019) and has adopted the Basel III framework in its banking regulations.

Consequently, changes introduced by the Basel III framework will be the primary focus of the study in the context of local regulatory changes.

The Financial Sector Regulation Act 9 of 2017 (FSR Act) was signed into South African law on 21 August 2017, giving effect to the so-called ‘Twin Peaks’ model of regulating the financial sector, including banking. This has resulted in the amendment of the Banks Act such that references to the Registrar of Banks and the Bank Supervision Department (BSD) are now replaced with the Prudential Authority (PA) (Shawe & Colegrave, 2020).

Table 1 below illustrates the differences between the Basel III standard and its local adoption in South Africa and the West African Economic and Monetary Union (WAEMU) spanning its eight member countries. South Africa is the only African country to fully adopt Basel III in its banking regulations within the initial transitional arrangements’ timeframe (Nketcha-Nana, 2019).

Table 1: Basel III regulatory framework adoption in WAEMU and South Africa

		BCBS deadlines/ Transition periods (b)	Basel III standards	WAEMU (c)	South Africa
Capital	Minimum common equity Tier 1 capital	Jan 2013- Jan 2015	4.5%	5%	4.5%
	Minimum Tier 1 capital	Jan 2013- Jan 2015	6%	6%	6%
	Minimum Total capital adequacy ratio		8%	9%	8%
	Capital conservation buffer	Jan 2016 – Jan 2019	2.5%	2.5%	0 – 2.5%
	Min. total capital + conservation buffer		10.5%	11.5%	8% - 10.5%
	Capital countercyclical buffer	Jan 2016 – Jan 2019	0% - 2.5%	0% - 2.5%	0 – 2.5%
	Minimum leverage ratio	Jan 2018	3%	3% (d)	4%
	GSIB – Additional min. capital requirement	Jan 2016 – Jan 2019	0% - 3.5%	N/A (e)	N/A (e)
	DSIB- Additional min. capital requirement	Jan 2016 – Jan 2019	(f)	(f)	(f)
Liquidity	Minimum liquidity coverage ratio (LCR)	Jan 2015	100%	100% (g)	100%
	Net stable funding ratio (NSFR)	Jan 2018	100%	100% (g)	100%

Notes:

1 The green fill in the above table denotes standards implemented within the BCBS agreed timeframes.

2 As per the Basel III framework for Domestically Systemically Important Banks (D-SIBs), the additional minimum requirement is specified by the national or regional authorities occasionally.

Source: (Nketcha-Nana, 2019, p.9)

Some African countries, such as Nigeria, opted for partial implementation of Basel III, adopting the aspects their bank supervisor deemed suitable for their country. On the other hand, the Central

Bank of West Africa not only adopted Basel III but prescribed a capital adequacy ratio 3.5% higher than required by Basel III (Nketcha-Nana, 2019).

For many EMDEs, infrastructure finance remains a major concern due to the size of the funding gap due to the limited funding sources available in these countries. Infrastructure finance typically takes the form of project finance lending, which for both EMDEs and developing economies increased steadily between 2000 and the GFC before dipping during the GFC. While project finance lending in developed economies quickly recovered post the GFC, even increasing beyond post-crisis levels, it has stalled in EMDEs. While this may be partially explained by the decrease in cross-border flows to EMDEs from advanced economies, as previously mentioned, deleveraging of banks, the turn of the commodity cycle and increased regulatory tightening is also thought to have contributed to this trend (Beck, 2018).

Under the Basel III framework, several changes to the regulatory standards could affect infrastructure lending advanced by commercial banks. New liquidity requirements in the Net Stable Funding Ratio (NSFR) introduced with Basel III compel banks to match fund longer-term lending, (e.g., infrastructure lending) with similar longer-term funding, which may not be available. The other liquidity requirement introduced with Basel III, the Liquidity Coverage Ratio (LCR), will force banks to hold more cash-like assets for project funds. Finally, due to the uncertainty over further regulatory tightening since the transition post-GFC from Basel II to Basel II.5, Basel III, and the finalisation of Basel III reforms, informally dubbed Basel IV, there may be some reluctance by the commercial banks to commit to longer-term funding structures (Beck, 2018). The Large Exposures rule, which stipulates how much a bank can be exposed to a particular obligor or project, may limit lending, especially by smaller banks. Basel III also ushered in tightening capital requirements for infrastructure projects, making borrowing costs more expensive. Collectively, these are some of the key regulatory developments which may make infrastructure lending less attractive for commercial banks.

1.2 Research problem

There have been questions posed regarding whether changes in South Africa's banking regulations, particularly the Banks Act, have adversely affected commercial banks' appetite to finance both local and cross-border infrastructure projects, which are key to local and regional economic development and growth. The current literature on the effects of changes to banking regulations, especially the most noteworthy being the transition from Basel II to Basel III, mainly

concentrate on the effects on banks and less on the unintended consequences on other sectors such as infrastructure financing.

Where the current literature explores the unintended consequences of adopting Basel III on developing economies, the subject is broadly covered in a general sense, considering several EMDEs across different continents. The current literature does not look at South Africa specifically in detail despite it being the only African country that has fully adopted Basel III in its banking regulation (Ozili, 2019). South Africa also has the most developed financial markets, as evidenced by its position in 2020 as number one in the Absa Africa Financial Markets Index ratings with a score of 89 out of 100, according to a research report by the Official Monetary and Financial Institutions Forum (OMFIF) (Kruger, 2020). South Africa was found to have the largest and most liquid financial markets, the best regulation, the most robust legal frameworks, and the best access to foreign exchange and investment capital on the African continent (Kruger, 2020). These factors, as well as South Africa's status as an EMDE, make it an ideal case study for assessing the effects of adopting Basel III on infrastructure debt financing provided by commercial banks in EMDEs, and, consequentially, on their development and economic growth.

This study aims to fill the gap in academic research by examining the effects of banking regulation changes on infrastructure financing in South Africa as a developing economy. Given the country's efforts to expand industrialisation and foster inclusive economic growth, there is a need for substantial infrastructure investments from both the public and private sectors. The study draws on South Africa's robust banking sector as a source of information to identify challenges and potential solutions to mitigate the effects of banking regulation changes on infrastructure financing.

The study aims to answer the following research questions:

1. Have the changes in South Africa's banking regulation adversely affected local commercial banks' appetite to finance infrastructure projects and increased infrastructure debt financing costs borne by the banks?
2. Have local banks engaged in infrastructure financing activities changed their strategies and infrastructure financing-related service offerings due to the regulatory reforms?

3. Have the regulatory reforms adversely affected the debt pricing for the borrower, and if so, which changes in South Africa's banking regulations have had the greatest effect on commercial banks' infrastructure debt financing costs for the borrower and why?
4. Did the PA apply the principle of proportionality as recommended by the BIS in adopting Basel III in local banking regulations to promote the soundness of financial institutions without imposing excessive regulatory burdens on the banking sector?
5. What measures could be considered by local regulators to prevent regulatory reforms from adversely affecting infrastructure financing costs and commercial banks' appetite to fund infrastructure projects?
6. What measures could be considered by the commercial banks to mitigate any adverse effects of regulatory reforms on the cost of financing infrastructure projects and, in so-doing, support economic growth?

1.3 Research objectives

The objectives of the study are to:

1. Establish whether the changes to South Africa's banking regulations have adversely affected infrastructure debt financing costs borne by the bank and the willingness of commercial banks to fund infrastructure projects.
2. Establish whether banks have changed their strategies and service offerings regarding their infrastructure financing activities due to South Africa's banking regulatory reforms.
3. Establish whether South Africa's banking regulatory reforms have increased the pricing of infrastructure debt financing for borrowers, identify which changes to banking regulations, if any, have had the largest adverse effects on infrastructure debt financing costs for the borrower.
4. Establish whether the Prudential Authority applied the principle of proportionality in adopting Basel III regulatory reforms to promote the soundness of financial institutions without imposing excessive regulatory burdens on the banking sector, which could adversely affect economic growth in the EMDE.

5. Suggest measures for consideration by local regulators to mitigate the unintended consequences of regulatory changes on the appetite of commercial banks to finance infrastructure and mitigate increases in financing costs, and
6. Recommend ways in which commercial banks could mitigate the adverse effects of regulatory changes on debt financing costs for infrastructure so that available financial resources can be more beneficially deployed to support economic development and growth.

1.4 Scope and justification of the study

The study is mainly concerned with the regulatory changes from Basel II to Basel III under the Banks Act. Its purpose is to examine how these changes impact banks' willingness to finance infrastructure projects and how they affect private debt financing costs in South Africa. Any negative effects on debt financing costs will have consequences for all citizens of the country because public resources will not be as effective in addressing the infrastructure deficit in South Africa.

According to AfDB (2018), "Infrastructure projects are among the most profitable investments any society can make. When productive, they contribute to and sustain a country's economic growth, providing the financial resources to do everything else" (p.xvi). The study is therefore important in assisting local policymakers to better understand some of the unintended consequences of adopting Basel III on infrastructure financing provided by commercial banks, which for South Africa as an EMDE remains a crucial driver of development and economic growth.

The study seeks to understand whether the PA could have been more circumspect in adopting Basel III regulatory reforms in South Africa, given the country's developmental needs and economic growth challenges.

The study is also intended to propose possible measures to mitigate the adverse effects, if any are identified, of the regulatory reforms from the perspectives of regulators and commercial banks.

1.5 Organisation of the study

Chapter 1 is an introduction providing some background on the history of the Basel framework as well as local banking regulatory changes focusing on the transition from Basel II to Basel III.

The literature review in Chapter 2 critically analyses existing literature on the effects of banking regulatory changes on infrastructure financing in South Africa, highlighting gaps in the existing literature.

This is followed by Chapter 3, in which the research methodology employed is described, including the data collection methodology and data analysis approach. In the research methodology, the study's limitations are also highlighted.

The results of the data analysis are presented in Chapter 4 based on the different regulatory factors identified as having had the largest adverse effect on infrastructure financing advanced by commercial banks.

Finally, in Chapter 5 the study's conclusions are presented, and recommendations are made on how banks and regulators can consider mitigating the adverse effects, if any, of regulatory changes on banks' appetite to bring infrastructure loans on-book as well as mitigating the adverse effects on debt financing costs. The potential opportunities for further studies to build on this research are then discussed in closing.

2 CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter examines both the positive and negative outcomes of banking regulatory reforms focusing on the transition from Basel II to Basel III. It explores the empirical literature on the impacts of Basel III regulatory reforms, particularly in emerging markets and developing economies (EMDEs), with a focus on infrastructure financing. Finally, the chapter provides a synopsis of the literature and emphasises the gaps in the current research.

2.2 Theories relevant to the study

This section considers the major theoretical frameworks pertinent to the study. A theoretical framework uses established theories or theories in research to convey the researcher's values and provide a lens for how the study will process new knowledge. It is a convergence of existing knowledge and previously formed ideas about complex phenomena, the researcher's epistemological dispositions and a methodically analytical approach (Collins & Stockton, 2018). Collins & Stockton (2018) caution against overly relying on theory in research as it could prevent the relevance and importance of research data from emerging, and further choosing to centre the study on a particular theory introduces the threat of being myopic. Overrelying on a theory may also result in a tendency towards or the perception of confirmation bias. A balanced centring of theory, however, could conversely aid the researcher in identifying existing predispositions and links to epistemological inclinations, consequentially assisting the researcher with data coding and interpretation (Collins & Stockton, 2018).

The theories below could help explain the factors influencing the effects under investigation in this study.

2.2.1 Theory of financial intermediation

Traditional financial intermediation theory is primarily based on transaction costs, according to Gurley and Shaw (1960), as well as information asymmetry, emphasising that the primary role of intermediaries is to reduce the frictions of transaction costs and information asymmetry. Initially, financial intermediation theory was developed to account for deposit-taking institutions and issuers of insurance policies that distribute funds to companies, but there have since been significant changes in financial markets in recent decades. Despite information asymmetry and

transaction costs having decreased, intermediation has increased largely due to new markets for innovative financial products such as futures and options (Allen & Santomero, 1998).

In their work, Allen & Santomero (1998) propose a revised perspective that emphasises the two distinct roles of financial intermediaries: enabling risk transfer and engaging with the ever-growing complexity of financial markets. Financial intermediaries also facilitate access to the financial sector, with decreased participation costs (such as the cost of acquiring knowledge about how to effectively engage with financial markets and participate in them regularly) being a critical factor in explaining recent developments, according to the authors.

As an intermediary in any economy, the banking sector's role is also viewed as threefold: i) obtaining information about companies and their management and, in so doing, improving capital allocation and promoting good corporate governance (Diamond, 1984), ii) managing the risk associated with cross-sectional inter-temporal liquidity risk and thereby improving investment efficiency and supporting economic growth (Allen & Gale, 1999; Bencivenga & Smith, 1991) and iii) tapping into economies of scale by mobilising capital (Tufano, et al., 1995).

In the context of infrastructure finance, commercial banks act as financial intermediaries providing debt financing in a more traditional intermediation role and providing risk mitigation through access to financial instruments such as swaps to help hedge some of the risks in infrastructure finance transactions. In so doing, they facilitate both risk transfer and participation in financial markets.

2.2.2 Neoclassical theory of risk

In the 1930s, Marshall A. and A. Pigou developed the ideas of John Mill and William C. Senior presented in a '*Classical theory of risk*' to lay the foundations for the neoclassical theory of risk, which posits that enterprise behaviour should be influenced by the concept of 'marginal utility' such that if two alternative projects are expected to generate the same profit, the one with less risk must be chosen. According to the theory, businesses operate under uncertain or economically risky conditions where profit is a random variable (Bojinov, 2016).

Regarding the principles of the neoclassical theory of risk, Lange (1971) explains that "the enterprise that operates under conditions of uncertainty and whose risk is a random variable is guided in its operations by two criteria: 1) the amount of the expected profit and 2) the extent of

possible fluctuations in profit” (p.168). So, according to the theory, enterprises seek to maximise their risk-adjusted return.

This theory suggests that commercial banks looking to maximise return on a risk-adjusted basis would allocate their financial resources to advancing less risky, shorter-tenor loans with similar or better returns than long-dated infrastructure loans. This is further compounded by EMDEs having lower credit ratings than the developed economies (Griffith-Jones & Kraemer, 2021) which results in typically low-rated infrastructure projects within these geographies that may be perceived as too risky by large commercial banks.

2.2.3 Agency theory

In his seminal work *‘The Wealth of Nations’*, Adam Smith posited how the joint-stock company’s emergence and growing prevalence created a perilous divide between owners and managers. Smith noted that directors managing other people’s money were unlikely to guard it with the same vigilance as if it were their own; therefore, negligence and profligacy must prevail in the management of such companies (Smith, 1776). However, more recent hypotheses on modern agency theory posit that “principal-agent relationships should reflect the efficient organisation of information and risk-bearing costs” (Eisenhardt, 1989, p.59, as cited by Bendickson et al., 2016).

Agency theory typically offers two perspectives: the principal-agent problem and governance mechanisms. The theory stems from an economic view of risk-sharing between principals and agents, while the two parties may adopt different approaches to addressing the problem (Bendickson et al., 2016).

In the context of infrastructure financing, the relationship between the project sponsor (i.e., the principal) and the commercial banks (i.e., the agents) providing debt financing and access to risk-reducing financial instruments could be seen as a principal-agent relationship. The project sponsor may be a government body, state-owned enterprise (SOE), or DFI with the aim of achieving its developmental mandate to enhance economic growth and quality of life. On the other hand, the banks concentrate primarily on the commercial aspects of the deal, although non-financial elements may also be considered. The tension between the principal and agent could, in part, account for the banks' reaction to challenging regulatory reforms in this study since increased capital, liquidity, and other expenses that eat into commercial margins could make infrastructure projects less appealing for banks to finance.

2.3 Empirical literature on the effects of Basel III reforms on infrastructure financing

The G20 Finance Ministers and Central Bank Governors highlighted the importance of long-term investment financing, including infrastructure financing, in supporting job creation and inclusive economic growth (FSB, 2013b). At their November 2012 meeting, they requested the Financial Stability Board (FSB), in collaboration with relevant international organisations, to perform a diagnostic assessment of the regulatory factors influencing long-term investment financing (FSB, 2013b). The FSB is an international organisation tasked with monitoring and making recommendations about the global financial system and promoting international financial stability. It does so by coordinating the efforts of national financial authorities and standard-setting bodies in developing strong, effective regulatory supervisory and other financial policies (FSB, 2022). The FSB noted that “the most important contribution of financial regulatory reforms to long-term investment finance is to promote a safer, sounder and therefore more resilient financial system” (FSB, 2022).

In February 2013, the FSB reported its preliminary findings to the G20 on the regulatory factors impacting the availability of long-term infrastructure financing. The FSB members identified the regulatory reforms that may affect infrastructure finance as: Basel III, over-the-counter (OTC) derivatives market reforms, interbank offer rate (IBOR) benchmarking rate reforms, as well as changes to the accounting and financial regulatory frameworks (e.g., IFRS 9 dealing with forward-looking expected credit losses for provisioning, IFRS 16 providing a single lessee accounting model, IFRS 17 dealing with insurance contracts) for different types of institutional investors (e.g., pension funds, insurance companies, asset managers, private equity funds and sovereign wealth funds). Although the reforms were not targeted at long-term finance, they have changed incentives for different financial institutions participating in the infrastructure finance market. The reforms have also changed the costs associated with varying transaction types within the infrastructure finance space (FSB, 2013a).

The Financial Stability Institute (FSI) of the BIS suggests that the Core Principles for Effective Banking Supervision (BCPs) are the standards used worldwide to create prudential regulations and supervisory policies for banking systems. One of the principles is proportionality, which means that regulatory standards for banks should be proportionate to the banking sector’s sophistication and risk profile. This concept entails regulating financial institutions to promote soundness while avoiding excessive regulatory burdens. To do this, financial institutions' regulators should deeply understand the institutions' activities, risks associated with their business models, and their impact

on the financial system and the broader economy. The calibration of requirements should not impose high compliance costs on any financial institution without a prudential justification. For example, the FSI notes that Pillar 1 standards only apply to internationally active banks, and regulators are not obliged to extend the full set of Basel standards to banks that are not internationally active, even in BCBS member jurisdictions (Hohl et al., 2018).

In collaboration with Harvard Kennedy School's Mossavar-Rahmani Center for Business and Government, the World Bank Group (WBG) presents findings from a study on the impact of derivatives regulation on infrastructure finance in emerging markets and developing economies (EMDEs). The WBG study expands on the 2018 study by the FSB, which analysed the effects of financial regulatory reforms on infrastructure finance both quantitatively and qualitatively. As data on OTC derivatives transactions was not readily available, the WBG study relied solely on qualitative analysis. The WBG conducted the survey between November 2017 and March 2018, and it featured a balanced sample of 10 infrastructure finance banks operating in EMDEs, as well as derivatives trading desks and providers within the region. Despite the relatively small sample size, the survey covers a significant portion of infrastructure debt finance in EMDEs, as highlighted by the FSB. The participating banks include ANZ Bank, Banco Santander, BNP Paribas, Citigroup, First Gulf Bank, Mizuho Bank, Société Generale, Standard Bank of South Africa, Standard Chartered Bank, and Sumitomo Mitsui Banking Corporation. A round table was held in London in March 2018, which the project sponsors and derivatives providers attended. The WBG study's findings were categorised into four main areas, which are further discussed below (Konidaris, 2020):

i) Effects on appetite for and bankability of infrastructure projects

Figure 3 below illustrates the effects of the regulatory reforms on the bankability of infrastructure projects:

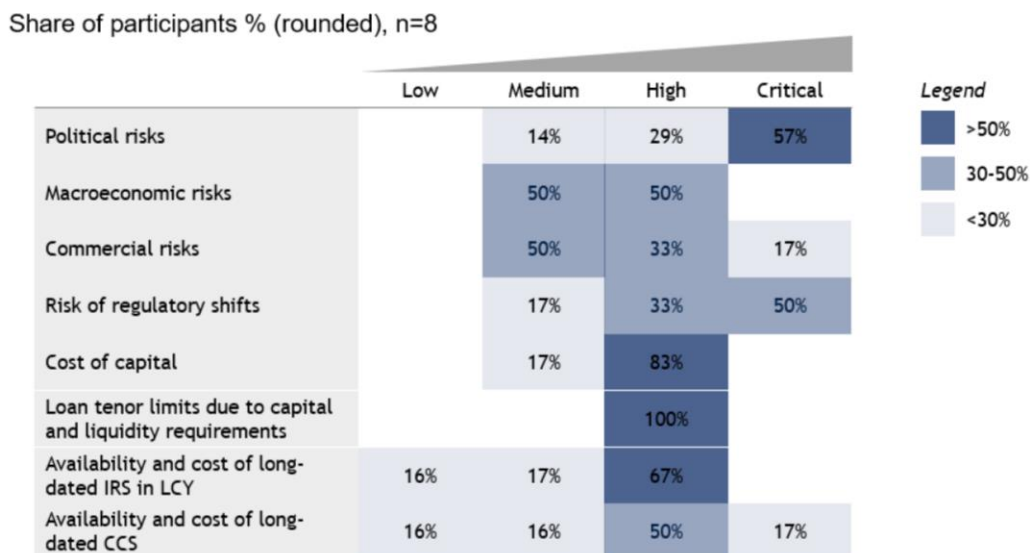


Figure 3: Relative impact on bankability of infrastructure projects in emerging markets

Source: Konidaris (2020, p.29)

As illustrated in Figure 3, respondents indicated that the cost and availability of infrastructure hedges are highly [i.e., 67% for interest rate swaps (IRS) and 50% for cross-currency swaps (CCS)] or critically (17% for CCS) influential on the financial viability of the projects and consequentially their bankability. In Sub-Saharan Africa, regulatory reforms effects were more material for IRS but less for CCS. Half the respondents noted the risk of regulatory shifts as critical. The results of the WBG survey indicate that Basel III reforms have increased pricing, decreased the tenor and reduced availability of long-dated OTC derivatives. (Konidaris, 2020).

Figure 4 below illustrates results on bankability and appetite for infrastructure finance projects as per the respondents due to the effects of the regulatory reforms:

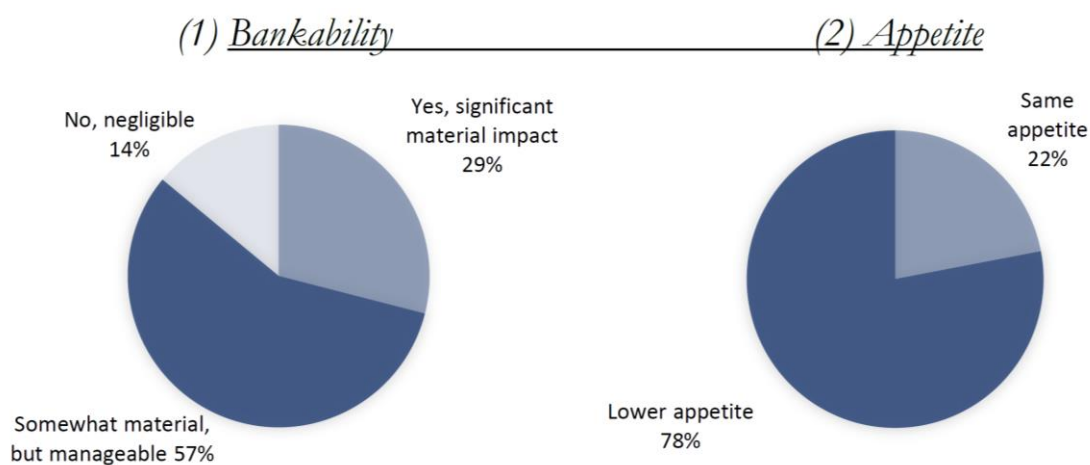


Figure 4: WBG survey results on bankability and appetite for infrastructure finance in EMDEs

Source: Konidaris (2020, p.30)

As shown in Figure 4, results of the WBG survey were 57% of surveyed banks indicated the regulatory reforms had a somewhat material but manageable effect on bankability, while 29% indicated that they were significant and material. Most respondents (i.e., 78%) specified that the regulatory reforms had resulted in a lower appetite for infrastructure projects in EMDEs, mainly due to the inability to hedge risks (Konidaris, 2020).

ii) Compromises in infrastructure finance risk management and transaction structures

Figure 5 below illustrates the extent to which the surveyed banks passed on cost increases as a result of the regulator reforms to the customer:

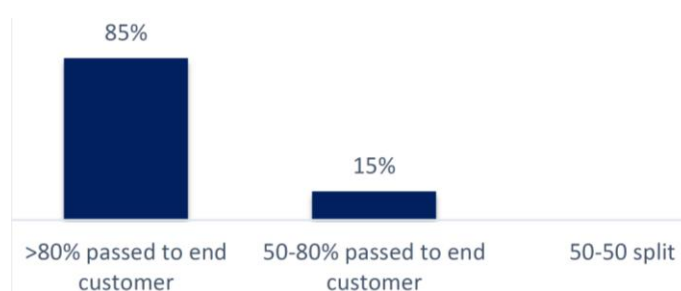


Figure 5: WBG survey results on banks passing cost increases on to borrowers

Source: Konidaris (2020, p.31)

As illustrated in Figure 5, nine of eleven derivative providers indicated that over 80% of the cost increases due to regulatory reforms are passed on to the customers, while the remaining two indicated that 50% to 80% of the cost increases were passed on to the customers. Half of the respondents reported the banks' profit margins decreasing by 10% to 25%, while a quarter indicated a drop in profit margins of 25% to 50%. Respondents reported that some infrastructure projects were underhedged due to elevated costs, shorter tenors and unavailability of hedging instruments leaving investors partially exposed to currency and interest rate risk (Konidaris, 2020).

iii) Alternative infrastructure financing structures

As described in Table 2, alternative financing structures can be used to offset or bypass the effect of regulatory reforms but also come with challenges (Konidaris, 2020).

Table 2: Alternative financing structures to reduce or bypass the effects of regulatory reforms

Financing Structures	Description
Options-based hedges	To reduce capital charges, banks are exploring structured options in the more liquid EMDEs to mitigate risk, such as zero-cost or reduced-cost

Financing Structures	Description
	collars that reduce the premium paid for the option. These structures offer some flexibility but do not provide adequate protection.
Loans with embedded derivatives	Banks embed derivatives in loans to reduce regulatory costs, including inflation-adjusted or interest-rate-adjusted loans. It results in a simpler arrangement for project sponsors, but the unwind costs should there be a debt restructure introduces challenges.
Guarantees	Guarantees de-risk and improve the project's creditworthiness in EMDEs and the main support used to enhance the credit exposure is External Credit Agency (ECA) cover but does not perform the same role as hedges and is often unavailable in sub-investment grade EMDEs. Guarantees from DFIs and sovereign swap guarantees are sought by banks financing infrastructure projects to reduce capital costs.
Short-term lending structures	Structures such as mini-perms and cash sweeps of 7-8 years are increasing in popularity than traditional amortising facilities. They can reduce loan and swap tenors but do not mitigate long-term risk, increase refinancing risk, and can increase costs through a price buffer. As a result, mini-perms are attractive in geographies (e.g., developed economies), and projects with low refinancing risk can be challenging in EMDEs.

Source: Konidakis (2020, p.33)

The alternative financing structures, as described in Table 2, present a means for infrastructure project sponsors to work around some of the effects of the Basel III regulatory reforms (Konidakis, 2020).

iv) Changes to lending business models

In a survey conducted by the WBG, respondents stated that the profitability of combining a loan with a derivative in infrastructure financing has declined due to the decrease in the profitability of derivative trades. This has resulted in banks being less interested in engaging in infrastructure lending. Additionally, the regulatory costs associated with infrastructure lending and derivatives transactions in EMDEs have increased, making these activities less profitable for banks than before the GFC. As a result, some banks have decided to decrease or even stop long-term lending in EMDEs, and instead focus on origination, syndication, and distribution activities in the infrastructure financing space. Nowadays, many banks fund a limited amount of lending for infrastructure finance to highly rated clients, meaning only the best quality projects get funded.

This poses a significant issue for EMDEs with pressing infrastructure development needs but fewer highly rated infrastructure projects (Konidaris, 2020).

Basel III was primarily developed in response to the experience of developed countries during the GFC, but it is expected to eventually be adopted by most EMDEs. The impact will be less on aggregate credit volumes but more on the composition thereof, with certain segments, such as infrastructure and SMEs, facing higher financing costs (Beck, 2018).

As illustrated in Figure 6, Garcia-Kilroy & Rudolph (2017) noted that project finance lending steadily increased in both advanced and emerging market economies (EMEs) between the early 2000s and the GFC.

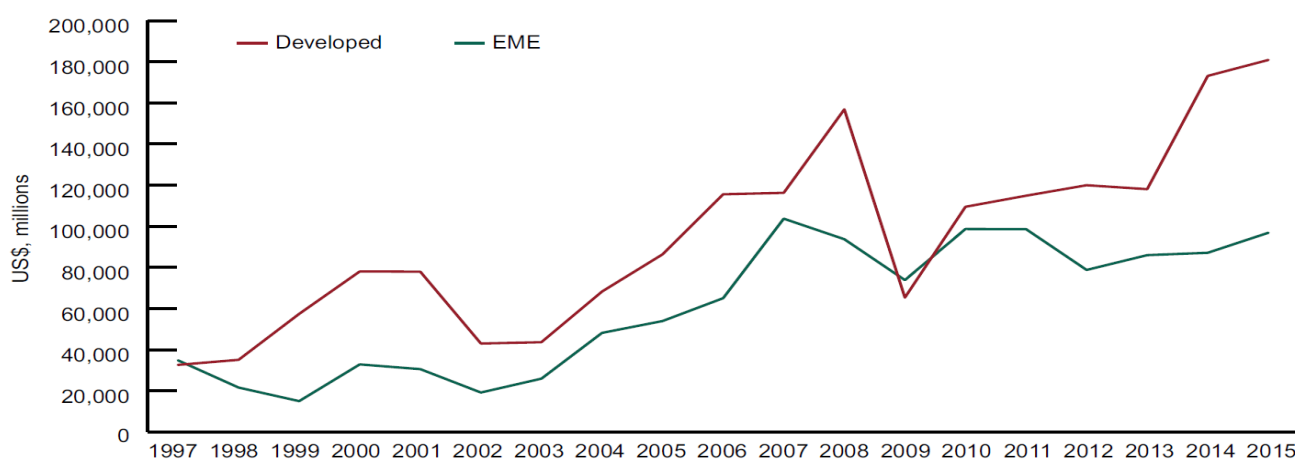


Figure 6: Project Finance Lending to Emerging Markets and Developing Economies

Source: Project Finance International as cited by Garcia-Kilroy & Rudolph (2017, p.29)

As shown in Figure 6, project finance lending in developed economies recovered rapidly after the GFC but stalled in EMEs (Garcia-Kilroy & Rudolph, 2017). Some banks in developed countries wound down their project finance portfolio outright, and while this may be partially explainable by the decline in cross-border flows from developed countries and partly by swings in the commodity cycle, tightening regulatory action is likely to have played and may continue to play an increasing role in the future. The implementation of the Basel III framework has introduced various changes that can impact banks' infrastructure lending. These include the Large Exposures rule, which limits a bank's exposure to a particular borrower or project. Infrastructure projects are often large, hindering lending, especially for smaller banks. Additionally, capital requirements for infrastructure projects have tightened, leading to higher lending costs. Furthermore, new liquidity requirements under the NSFR and LCR have made it necessary for banks to respectively match

longer-term lending with longer-term funding and hold more HQLA for project finance facilities. Moreover, the increased uncertainty over future regulatory reforms has resulted in banks being unwilling to commit to longer-term financing (Garcia-Kilroy & Rudolph, 2017).

In some of the current literature, means to counteract the effects of regulatory reforms in EMDEs are put forward. The Organisation of Economic Cooperation and Development (OECD) notes that several instruments and incentives can be deployed in EMDEs to support infrastructure financing within the modern banking regulatory framework (OECD, 2015). The OECD, founded in 1961, is an inter-governmental organisation of 38 democratic nations with market-based economies across Europe, Asia and the Pacific. The member governments cooperate to develop policy standards for promoting sustainable economic growth and social well-being worldwide (OECD, 2021). The OECD (2015) noted that ballooning public debt, elevated public debt-to-GDP ratios and sometimes public sector inability to provide efficient, long-term investment spending in many economies has led to a reduction of public funds earmarked for infrastructure development.

The OECD (2015) reported that budgetary pressures in some countries had been worsened by commercial banks aiming to strengthen their balance sheets and rebuild capital and liquidity buffers, partially due to tighter banking sector prudential regulation. To tackle these challenges and reduce infrastructure financing risks, especially business risks arising from industry fluctuations, the OECD (2015) proposed various policies and tools for governments to attract capital investment in the infrastructure finance industry. These measures are categorised into six groups and are aimed at reducing demand risk, stabilising free cash flows from the project, maintaining project bankability, or can be tailored to specific finance instruments (Hellowell et al., 2014, as cited by OECD, 2015). These tools and policy actions could have cost implications and potential side effects that must be considered before deployment. Some compensation may be required to offset these effects. Table 3 below overviews the types of measures and associated instruments and/or incentives for infrastructure finance (OECD, 2015).

Table 3: Incentives and financial risk mitigants for infrastructure finance

Type of Measure	Instrument
1. Guarantees, realised directly by Government or by its own controlled agency or development bank	1. Minimum payment, paid by contracting authority
	2. Guarantee in case of default
	3. Guarantee in case of refinancing
	4. Exchange rate guarantees
2. Insurance (private sector)	1. Wrap insurance, technology guarantees, warranties, commercial and political risk insurance
3. Hedging (private sector)	1. Derivatives contracts such as swaps, forwards, options etc.
4. Contract design, paid by contracting authority	1. Availability payment mechanisms
	2. Offtake contracts
5. Provision of capital, realised directly by Government or by its own controlled agency or development bank	1. Subordinated (junior) debt
	2. Debt: 2.1 at market condition 2.2 at lower interest rate
	3. Equity: 3.1 at market conditions 3.2 at more advantageous conditions
6. Grants, generally delivered by contracting authority, even if some dedicated fund at national level may exist. Tax incentives can be delivered by national or local authorities	1. Lump sum capital grant
	2. Revenue grant: 2.1 Periodic fixed amount (mitigating the demand risk) 2.2 Revenue integration (it leaves the demand risk on the private player)
	3. Grant on debt interests
	4. Favourable taxation schemes for SPV
	5. Favourable taxation schemes for equity investors

Source: OECD (2015) and Vecchi et al. (2015, p.51)

The illustrated financial tools for risk management have the ability to mitigate economic losses to an asset by reducing objective risks or by addressing subjective risks, which are hard to measure and may include political factors like taxation, expropriation issues, legal environment, and regulatory ambiguity. Certain instruments may not be employed to mitigate risks directly but offer partial protection or enable risk-sharing with the public sector (OECD, 2015).

Inderst & Stuart (2014) note other ways to promote infrastructure investing in EMDEs without using debt finance from banks, notably via institutional investors. Some EMDEs have relatively well-developed capital markets while others are still ‘frontier markets’; depending on the type of environment, different financing options are available. Figure 7 illustrates the existing infrastructure financing in EMDEs by the various sources of funding (Inderst & Stuart, 2014).

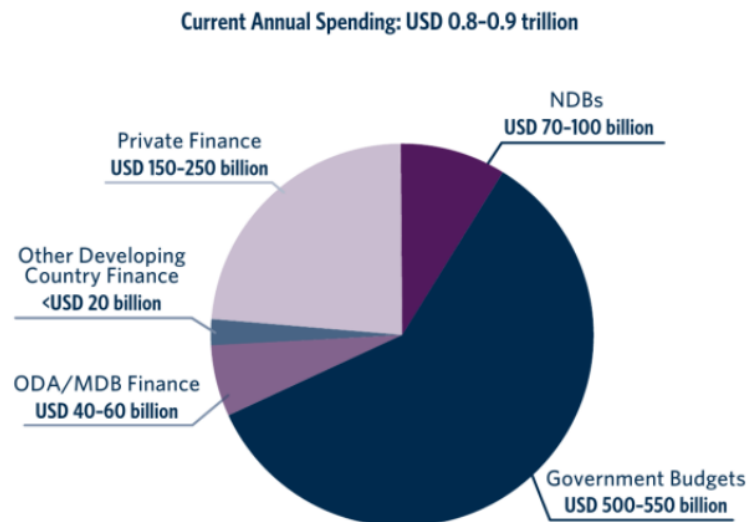


Figure 7: Project Finance Lending to Emerging Markets and Developing Economies

Notes: MDBs are multilateral development banks, NDBs are national development banks and ODA is official development assistance

Source: Bhattacharya et al. (2012) as cited by Inderst & Stewart (2014, p.4)

As shown in Figure 7, government budgets provide the bulk of the financing, with private finance, including banks being the second largest source (Inderst & Stewart, 2014).

According to an analysis, EMDE states have various "leadership models" for managing institutional funding of infrastructure development in developing nations. One such model is the use of public pension reserve funds (PPRFs) or social security reserve funds (SSRFs) for infrastructure investment, as seen in countries like South Africa, Botswana, Ghana, and Malaysia. These funds, which are sizable and have additional objectives like stimulating economic growth and developing capital markets, may face political pressure on their board and executive management (Inderst & Stewart, 2014).

Another model is leadership from innovative private sector investors, for instance, a private wealth fund or progressive corporate pension plan (Inderst & Stewart, 2014). Their managers may look at successful examples in other countries to find potential paths for their funds. Problems frequently plaguing this model are prohibitive regulations or other investment constraints impeding the private sector firms from developing innovative investment approaches.

A third model uses a new capital market instrument that enables institutional investors to invest directly or indirectly in an infrastructure project. The private sector often leads this in the financial services industry, cooperating closely with governments. Examples are infrastructure bonds in

Kenya and trust structures in Peru and Mexico. Regulations can also impede this model and it may take time to take the instrument to market due to its novelty.

The fourth is a regional fund leadership model whereby establishing a regional infrastructure fund (e.g., Pan African Infrastructure Development Fund) can facilitate the participation of institutional investors seeking exposure to infrastructure assets. They provide an opportunity for the international diversification of assets and are typically initiated by regional or international DFIs (Inderst & Stewart, 2014).

Basel III regulatory reforms are expected to significantly impact banks' capacity and motivation to deploy domestic and foreign savings, which could have dire consequences for economic development and poverty reduction, particularly for EMDEs. There have been unintended spillover effects of Basel III on the stability, composition and volume of cross-border inflows to EMDEs, as mentioned in the introduction, due to its implementation by AEs. These inflows, which are critical for supporting infrastructure development in EMDEs due to low domestic savings rates and underdeveloped capital markets in many EMDEs, have shown a decreasing trend since 2007. This decline is illustrated graphically in Figure 8, with the reduction mainly attributable to banks from the U.S., the Eurozone and the U.K (Rojas-Suarez, 2018).

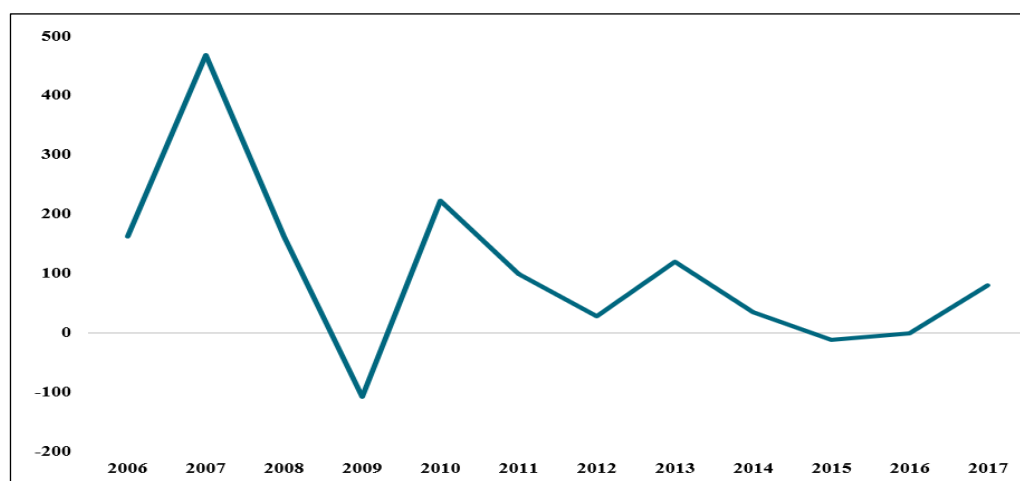


Figure 8: Cross-border Bank Lending to EMDEs (USD billions)

Note: Data based on FX and break-adjusted changes in equity values, excludes China

Source: BIS Locational Banking Statistics by residence as cited by Rojas-Suarez (2018)

Numerous factors are driving the decreasing trend in cross-border bank loans to EMDEs from AEs, including deleveraging, quantitative easing processes post-GFC, wider enforcement of anti-money laundering and countering financing of terrorism (AML/CFT) and increased competition from the non-banking sector (Rojas-Suarez, 2018). The tightening of banking regulations,

particularly through Basel III, and the Dodd-Frank Act in the U.S., seems to be another important factor in the decline in cross-border inflows to EMDEs (Rojas-Suarez, 2018). Cross-border lending by U.S banks to AEs has shown an upward trend in recent years, while cross-border lending to EMDEs has seen a steady decline, as illustrated below (Rojas-Suarez, 2018):

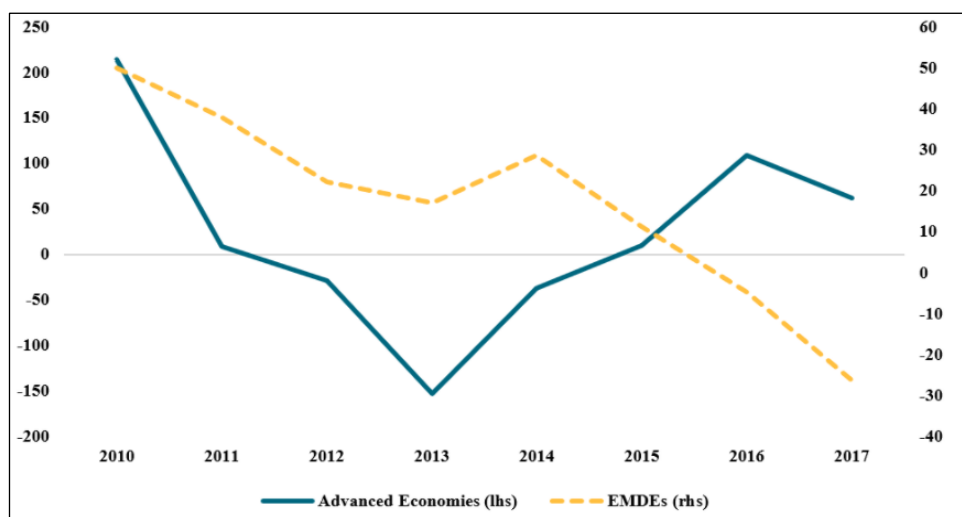


Figure 9: US BIS-Reporting Banks' Lending to EMDEs vs. Advanced Economies (USD billions)

Note: Data based on FX and break-adjusted changes in equity values, excludes China

Source: BIS Locational Banking Statistics by residence as cited by Rojas-Suarez (2018)

It is evident that Basel III is altering the landscape of global finance, and although it was designed to strengthen financial stability, it is having unintended consequences, as demonstrated by the decline in cross-border lending to EMDEs from developed countries (Rojas-Suarez, 2018).

Basel III regulations were introduced to strengthen the global banking system, making it more resilient to systemic shocks and reducing the risk of bank failure. However, there are concerns about potential unintended consequences for access to finance in EMDEs, as the regulations were designed for developed economies and may not be appropriate for countries where banks are the main source of formal finance, and financial markets and non-bank financial institutions have limited involvement. Additionally, the standards were developed primarily for global banks that operate in multiple countries and may not be suitable for countries with mostly locally incorporated banks that lack an international presence (Nketcha-Nana, 2020).

Nketcha-Nana (2020) reviewed several studies on the impact of Basel III on access to finance and presented two insights. Firstly, compliance with stricter regulations could lead to reduced credit supply as banks adjust their strategies. They may raise additional capital and liquidity, passing on the costs to borrowers through higher lending rates, which could decrease the demand for loans.

Alternatively, they may shift their asset portfolios towards more liquid and less risky assets, replacing high-risk loans with lower-risk ones or reducing loan maturities, potentially impacting infrastructure lending. Secondly, the negative effects of higher capital and liquidity ratios could vary across countries and banks, with minimal impact in regions where these ratios are already high (Nketcha-Nana, 2020).

The third and final insight from Nketcha-Nana's (2020) review of Basel III's impact on access to finance is that it may lead to a positive outcome of substitution towards non-bank lending. Non-banking financial institutions are not subject to Basel III regulations, giving them a competitive advantage in areas where they compete with banks. This substitution effect could partially offset the reduction in bank credit, particularly in countries with broader opportunities for substituting different types of finance. Additionally, as banks increase their capital and liquidity to meet the new regulations, they will become safer and more resilient, potentially having a positive effect on lending.

Basel III regulations have a preferential treatment for sovereign exposures, which can create risks if sovereign and banking sectors experience stress, as happened during the GFC. In addition, countries can assign zero risk weight for domestic sovereign exposures, leading banks to build up domestic foreign exposures. This build-up of sovereign exposure on banks' balance sheets is a concern for small economies and EMDEs, where sovereign debt is increasingly being funded in local currencies, limiting banks' ability to diversify their assets. This poses several challenges, including the adoption of the LCR, which includes sovereign debt as high-quality liquid assets (HQLA). This limits banks' infrastructure lending in these economies as banks need to hold more liquid assets for project finance facilities. This is especially relevant for EMDEs with dollarised economies, membership in common monetary areas, or a notable amount of sovereign bonds issued in foreign currency (BCBS, 2014).

2.4 Summary of the literature

Basel III is the most extensive financial regulatory standard issued post-GFC but is seldom a topic of discussion by developmental economists, with related debates and discussions mostly within financial circles in the public and private sectors and mostly within the advanced economies (Rojas-Suarez, 2018). Most of the literature indicates that the Basel III regulatory reforms have had adverse consequences on the financing of infrastructure by commercial banks. The literature also indicates that the regulatory reforms have led to increased participation in the infrastructure funding space by non-banking financial institutions not subject to banking regulations.

The 2018 FSB study evaluating the effects of global regulatory reforms on infrastructure financing in EMDEs and the complementary 2018 WBG study on derivatives regulation effects on EMDEs are the closest in their intent to this study. The FSB study made a great contribution to this topic due to the quantitative approach included in that study. Where the FSB and WBG studies differ from this study is in focus as they consider several EMDEs across different continents and not the South African context specifically. This study improves on the FSB and WBG studies by the consultation with four of the five largest South African commercial banks active in the infrastructure financing space, compared to the one South African bank (i.e., Standard Bank) in the WBG study. It therefore focuses on South Africa-specific effects as the continental leader in banking stability and the only African member of the BCBS.

The research carried out by CGD, as documented in Beck (2018) and Rojas-Suarez (2018), as well as the research conducted by Nketcha-Nana (2019 and 2020) for CAHF, have similar limitations to the FSB and WBG studies, even though they also examine some of the key aspects considered in this study. These dimensions involve the Large Exposures rule, stricter capital requirements, and new liquidity requirements under the LCR and NSFR measures that were introduced with Basel II.5 and III. This study contributes to the current knowledge by presenting the specific experiences of most of the D-SIB commercial banks in South Africa involved in infrastructure financing.

The transition from Basel II to Basel III has brought with it significant regulatory reforms and those of particular interest to this study are increased capital requirements, especially for credit and market risks; new liquidity requirements encapsulated in the NSFR and LCR; non-risk-based leverage ratio; the Large Exposures rule and general regulatory uncertainty over the extent of the tightening regulatory environment. The tightening regulatory environment aimed at increasing financial stability can affect the composition of banks' loan portfolios, with banks reducing lending to riskier segments (Beck, 2018). A positive effect of the banking reforms is the substitution of non-bank lending to compensate, at least partially, for the decrease in bank credit (Nketcha-Nana, 2020).

The current body of knowledge seems to support the view that changes to banking regulation have had the unintended consequence of making infrastructure financing less attractive to banks due to higher financing costs and the impact of such loans on key risk metrics such as LCR, NSFR, LR and CARs. Some literature also highlights the regulatory reforms' positive effect in supporting the banking system's stability, even in EMDEs like South Africa. However, most of the related

literature is more general in focus and lacks case studies on specific, major emerging market economies such as South Africa. As a result, there is scope for a more targeted study into the effects of banking regulatory changes on EMDEs such as South Africa. This study aims to establish whether South African commercial banks' appetite to put infrastructure loans on their loan books has diminished and assesses the extent of these effects since they represent a gap in the current literature.

3 CHAPTER 3: RESEARCH METHODOLOGY

3.1 Research process

The South African banking sector is the only one in Africa to have fully adopted Basel III, as was discussed in the introduction, and the country's infrastructure development needs, as indicated by the South African government, made South Africa an ideal test case. Also, the highly developed banking sector, with local commercial banks involved in infrastructure financing across Sub-Saharan Africa, made them excellent sources of information for the study. Furthermore, with the declining infrastructure spending at all levels of government, given South Africa's steadily increasing public debt (Ramokgopa, 2021), it is important to understand whether the regulatory reforms introduced to bring stability to the local banking sector inadvertently exacerbated the situation due to elevated infrastructure debt financing costs.

There is an abundance of information in the public domain about the effects of banking regulatory reforms on banks' operations as they transition through the various Basel Accords. The BCBS, which consults widely with its members and the international banking community to issue the Basel Accords and related amendments, is an important source of information, particularly regarding the regulations' intended purpose. This study references the BCBS and FSI frequently due to the wealth of information available in their standards and publications on the impact of regulatory reforms on the macroeconomic and banking environments. Other reliable sources, such as the FSB, OECD, WBG, and specialised research bodies like the CDG, were also consulted to obtain a comprehensive macro view of the regulatory reforms' effects on infrastructure development in EMDEs. Infrastructure development is critical as modern economies need various facilities such as transportation, telecommunications, energy, water, health, housing, and education to function effectively and promote economic activity. Infrastructure development is therefore widely considered a prerequisite for any economy's development (Rao, 2013).

3.2 Research philosophy

The starting point in the research process is typically determining the research paradigm employed. The research paradigm or philosophy is imperative to the study as it informs the methodological approach used in the investigation to answer the research question(s) (Ragab & Arisha, 2018). The interpretivist research philosophy, the basis of this study, places more emphasis on qualitative analysis over quantitative analysis and is critical of positivism (Dudovskiy, 2021). While the qualitative-positivist is likely to identify a small set of previously identified variables (Lee, 1989

as cited by Naidoo, 2019), the qualitative-interpretive researcher seeks an in-depth, socially rich understanding and would contend that experimental and quasi-experimental methods are incapable of describing the complexity of organisational phenomena (Walsham, 1995 as cited by Naidoo, 2019).

Since the research philosophy employed for this study was interpretivism, qualitative methods were adopted as a research strategy. The choice of this philosophy for the study was due to the researcher's view that although the various commercial banks were subject to the same local regulatory framework, their responses to the challenges and opportunities introduced by regulatory reforms could differ quite significantly, which is analogous to the multiple realities contemplated under interpretivism.

Ontology refers to the branch of philosophy concerned with the study of the nature of reality and the essence of its existence (Burrell & Morgan, 1979, as cited by Ragab & Arisha, 2018), with the two main ontological viewpoints being subjective and objective (Ragab & Arisha, 2018). Under objectivism, reality is viewed as a concrete structure existing external to humans and holds that the world predates individuals and will continue to exist as a tangible entity regardless of people's actions. This represents the predominant view adopted in the study of the natural sciences (Holden & Lynch, 2004, as cited by Ragab & Arisha, 2018). Subjectivism, in contrast, holds that individuals create reality and that the world is merely a projection of the human mind (Morgan and Smircich, 1980, as cited by Ragab & Arisha, 2018). Objectivists believe in a single reality, while subjectivists believe that multiple realities can coexist according to different views of the world (Ragab & Arisha, 2018). This study used a subjectivist ontology due to the 'multiple realities' experienced by the various commercial banks regarding how the regulatory reforms under investigation have affected their operating models and strategies.

Since this study is based on an interpretivist research philosophy, an inductive research approach was employed, which typically starts with observations and then proceeds to propose theories towards the end of the process based on the observations. According to (Bernard, 2011), "inductive research involves the search for patterns from observation and the development of explanations – theories – for those patterns through a series of hypotheses" (p.7).

Under the inductive approach to research, hypotheses or theories are generally not formulated at the beginning of the study, allowing the researcher to change direction and formulate theories as the study progresses (Dudovskiy, 2018). Importantly, this does not mean that theories should be

disregarded when formulating the research questions and objectives using the inductive approach. The inductive approach aims to establish meaning from the qualitative data collected to identify patterns and relationships to build a theory but does not prevent the researcher from applying existing theory in formulating research questions to be investigated (Saunders, 2012).

Merriam-Webster (2021) defines axiology as “the study of the nature, types and criteria of values and value judgements, especially in ethics”. The axiology focuses on what the researcher values, which informs the aims of the research. The axiology of the interpretivist philosophy adopted for this study acknowledges that the researcher is a part of what is being studied, is inseparable from it and will be inherently subjective or biased (Saunders, M., Lewis, P. & Thornhill, A., 2012 as cited by Dudovskiy, 2018). The researcher is well versed on the details of the regulatory reforms contemplated in this study, having worked for over twelve years in balance sheet management, with a particular focus on capital management and asset and liability management (ALM) and is therefore suitably equipped to make valid inferences from the observations. The researcher appreciates the effects of regulatory changes on capital and liquidity costs while acknowledging the need for infrastructure development to drive economic growth, accelerate job creation, facilitate trade and improve the general quality of life of South Africans and Africans. The provision of public goods to improve quality of life and economic productivity are essential factors in the researcher’s value system. These values are aligned with the aims and objectives of development finance in general and would be instrumental in supporting those aims and objectives for the benefit of society at large.

3.3 Research design

The research design for this study is exploratory, involving an open and flexible approach to ensure comprehension of the respondent banks’ experiences in the face of local banking regulatory reforms. It also aims to generate new insights regarding the effects of the regulatory reforms on infrastructure debt financing provided by the banks in an EMDE such as South Africa. Exploratory research is conducted to establish the nature of the problem and is not intended to provide conclusive evidence but help in better understanding the problem (Saunders, 2012).

Empirical studies in finance have tended to rely on a large number of financial observations providing robust statistical power and analysis of cross-sectional variation while establishing that finance researchers have a limited ability to analyse non-quantifiable issues (Baker, Singleton & Veit, 2011, as cited in Dewasiri et al., 2018, p.1). However, given the nature of this research problem, a qualitative research design was deemed the most appropriate. Quantitative measures

would not easily account for non-financial drivers of a bank's strategy, such as the prevailing global focus on sustainability and ESG, translating into financing renewable energy projects and social infrastructure. Social infrastructure includes but is not limited to water supply infrastructure, waste management and treatment facilities, schools, universities, clinics, hospitals and community parks, which may not be as financially lucrative to fund as other projects. Social infrastructure plays a vital role in a country's economic development and in improving its residents' quality of life, so in the long term, it is beneficial for banks to help fund social infrastructure. Notwithstanding the above, there are links between ESG and financial performance (Baraldi, 2019), but they are not always direct.

Quantitative measures would also be inadequate to provide insights into the strategic intent in banks' decisions to fund priority sectors of the economy, some of which may not be as lucrative as others. These priority sectors are conducive to improving quality of life and, therefore, directly and indirectly support economic growth to create a more economically active society. The resulting increasingly economically active society benefits commercial banks since more population members will utilise their services.

3.4 Sampling

A non-probabilistic sampling approach, also known as non-random sampling, was used for this study due to its nature and the questions it seeks to answer. This is because a small sample of representative banks was targeted for the study since most banks registered in South Africa, particularly the smaller banks, except the branches of large international construction banks, do not participate in infrastructure financing. Therefore, a random, probability-based sample would be inadequate to address the study's objectives. Non-probability sampling has some advantages, namely that it offers the possibility to reflect descriptive comments about the sample, it can prove to be cost and time-effective compared to probability sampling, and it is effective when conducting probability sampling is unfeasible or impractical. It also has some drawbacks, however, such as an unknown portion of the entire population being excluded from the sample group. It also has some drawbacks, however, such as: i) an unknown portion of the entire population is excluded from the sample group, which could result in underrepresentation of the entire population, ii) it yields a lower level of generalisation of research findings as compared to probability sampling and iii) creates difficulty in estimating the sample variability and understanding possible bias therein.

Dudovskiy (2018) notes that in non-probability sampling, the sample size is somewhat ambiguous and needs to account for a wide range of research-specific factors in each case. Typical considerations in terms of sample size for non-probability sampling appear in Table 4 below:

Table 4: Typical sample sizes for non-probability sampling

Nature of Study	Typical Sample Size
Semi-structured, in-depth interviews	5 – 25
Ethnographic	35 – 36
Grounded theory	20 – 35
Considering a homogeneous population	4 – 12
Considering a heterogeneous population	12 – 30

Source: Saunders, M., Lewis, P. & Thornhill, A. (2012) as cited by Dudovskiy (2018, p.134)

A Judgement Sampling method was selected as the non-probability sampling technique due to the researcher's familiarity with South Africa's commercial banking sector and ability to identify the banks relevant to this study. As of March 2021, these five banks, also known as the 'Big Five' (Big 5 SA banks), represented about 90.1% of total banking assets in South Africa valued at approximately ZAR5.818 trillion (total banking assets valued at about ZAR6.457 trillion), according to the Prudential Authority (Business Tech, 2021). The banking asset market share as of 31 March 2021 is illustrated in Figure 10 below:

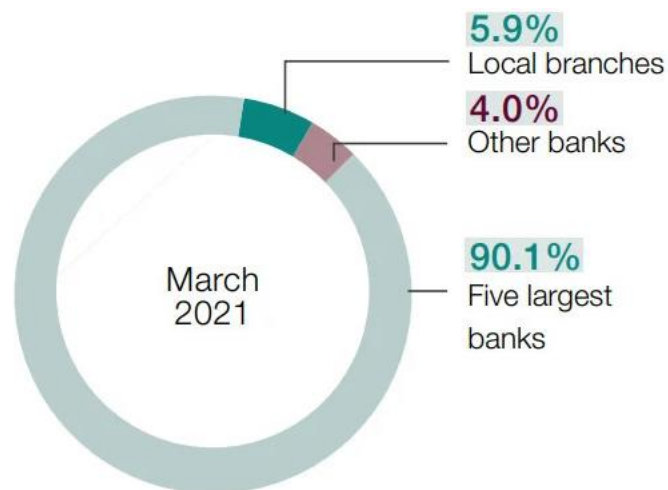


Figure 10: South African banks market share of total banking assets as of 31 March 2021

Source: Business Tech (2021)

According to the Prudential Authority, 31 commercial banks in South Africa are made up of 18 local registered banks and 13 local branches of foreign banks (SARB PA, 2022). As of 31 March

2021, the other 13 registered banks represented only 4% or approximately R381 billion of the banking assets, with the remaining 5.9% or approximately R258 billion held by the 13 local branches of foreign banks, as illustrated in Figure 10. Note that the Big 5 SA banks' coverage of infrastructure banking assets is higher than 90.1% since, among the five banks, they virtually account for the entire infrastructure debt financing market provided by the South African banking sector via their investment banking businesses. The next largest bank by assets, Capitec Bank, is predominantly a retail bank that has only recently started offering business banking services after it acquired Mercantile Bank on 7 November 2019 (Business Tech, 2019). Capitec Bank did not engage in infrastructure financing activities when compiling this study based on a review of its integrated reports for 2019, 2020, and 2021 financial years; hence they were not targeted for interview. Infrastructure lending is typically offered through the banks' investment banking divisions or similar functions but note that Capitec did not engage in investment banking when compiling this study. Infrastructure projects are sizeable by nature requiring long-term financing, often in a mix of foreign and local currency such that even the Big 5 SA banks tend to syndicate loans when providing private infrastructure debt. These aspects of infrastructure debt financing and the sophistication of this service offering make it difficult for smaller South African banks to operate in this area of banking. Some local branches of large international banks, notably the Industrial and Commercial Bank of China (ICBC) and China Construction Bank (CCB), also provide some infrastructure debt financing, but it is insignificant compared to the Big 5 SA banks and the focus of the study is on South African banks in any case.

The Big 5 SA banks are also the 5 most dominant banks in the Southern African region, with one being the largest on the African continent (Ford, 2022). The regional dominance of these banks further justifies the selection of the sample of five banks targeted for this study. For this reason, a sample including most of the five large banks was deemed adequate for the study. Had the researcher wanted to extend the sample size effectively, no other representative South African banks were suited for inclusion in the study outside the Big 5 SA banks. The nature of the study was semi-structured, in-depth interviews conducted with four of the five largest South African banks since one of the banks elected not to participate.

For this study, South African commercial banks are the units of analysis identified since they are the institutions subject to banking regulations and are active in the infrastructure financing space, typically providing senior debt and derivatives to hedge the risk associated with infrastructure loans.

3.5 Data collection procedure

As noted above, the data collection techniques associated with interpretivist studies entail using small samples, in-depth investigations and qualitative data (Dudovskiy, 2018). The primary data collection instrument used for the study was semi-structured in-depth interviews, as mentioned in 3.4, conducted with selected commercial banking professionals within the sample of South African commercial banks. The heads of the infrastructure financing teams within the commercial banks sampled were the respondents targeted during the primary data collection exercise due to their knowledge and practical experience on the subject. Representatives from the capital management function of the bank were also considered as they work closely with heads of infrastructure on technical matters related to the Basel III regulatory reforms.

The interviews with the four commercial banks were conducted virtually via Microsoft Teams due to COVID-19 challenges and related protocols such as social distancing at the time of the interviews (i.e., H2 2021). Interviews took between 30 and 45 minutes. An interview questionnaire was developed to help standardise the interview for all respondents, although additional questions were posed based on the respondents' answers (refer to APPENDIX A). The virtual interviews on Teams were recorded and then transcribed for the qualitative data to be put into a format conducive to the qualitative analysis described in 3.6. The respondents were requested to sign the UCT Interview Consent Form, including a confidentiality declaration to not attribute responses provided to the associated banks. The transcripts and recordings were shared with the respondent for review and comment.

To maintain anonymity regarding the specific information provided by the banks as agreed before the interviews, all information collected from the respondent banks is presented without attributing specific responses to the associated respondent banks. The selected responses to questions posed during the interviews based on the codes identified have been anonymously attributed to Bank A, Bank B, Bank C and Bank D as well their respective representatives, Respondent A, Respondent B, Respondent C and Respondents D in Chapter 4 below.

3.6 Methods of data analysis

Qualitative approaches are extremely diverse, complex and nuanced (Holloway & Todres, 2003, as cited by Braun & Clarke, 2006), but thematic analysis is the foundational qualitative analysis method that researchers should learn as it gives them core skills that will be instrumental for

conducting numerous other forms of qualitative research. Thematic analysis is a technique for identifying, analysing and reporting themes or patterns within a qualitative dataset (Braun & Clarke, 2006). Thematic analysis minimally organises and describes a qualitative dataset in rich detail, frequently going even further and helping to interpret various facets of the study (Boyatzis, 1998, as cited by Braun & Clarke, 2006). The analytical framework adopted for this interpretive study was thematic analysis.

Braun & Clarke (2006) provide a six-step framework for performing thematic analysis, which is described in the below table:

Table 5: Braun and Clarke’s six-step framework for performing a thematic analysis

Analysis Phase	Process Description
1. Familiarise yourself with the data	This phase entails reading and re-reading the transcripts to become familiar with the entire body of data.
2. Generate the initial codes	In this phase, the data is systematically organised meaningfully into defined codes (i.e., coding). The codes may have some overlap.
3. Search for the themes	The themes, which are patterns capturing a significant characteristic of the data relevant to the research question into which the codes are to be organised are identified.
4. Review the themes	The themes identified in phase 3 above are reviewed and modified. Where themes overlap, consideration should be given to whether they are actually separate themes and, if not, consider collapsing them into a single theme.
5. Define the themes	This phase represents the final refinement of the themes to “...identify the ‘essence’ of what each theme is about.” It is also important to understand how the themes relate to each other. A thematic map is useful for illustrating the relationship between the themes.
6. Document the findings	The final step is to document the findings of the thematic analysis in support of the study and use them to conclude the response to the research questions.

Source: Braun & Clarke (2006)

Transcripts of the questions and responses from the interviews conducted with representatives from the four banks were analysed using Braun and Clarke’s six-step framework for the thematic

analysis described in Table 5 above. The transcripts were documented in MS Word and uploaded to the NVivo software to create the qualitative dataset. The qualitative analysis research software NVivo Release 1.7 was used to assist with coding the data and performing the analysis (QSR International Pty Ltd, 2020).

A hybrid of inductive and deductive thematic coding was used for this study to incorporate the benefits of each approach. Deductive coding can save time and ensure that the areas of interest to the study are coded, but it introduces a risk of bias and of missing other important themes in the data. Inductive coding is a more iterative process requiring more time and is more thorough than deductive coding (Medelyan, n.d.). Inductive coding, also called ‘open coding,’ entails the derivation of codes directly from the qualitative data (i.e., the transcribed interviews with the respondents), while deductive coding, also called ‘concept-driven coding,’ is derived from the philosophical framework (Fereday et al., 2006) or from the themes which the researcher as already identified as pertinent to the study (Medelyan, n.d.). The inductive coding through multiple, detailed reviews of the qualitative data helped assure the researcher that no important codes or themes were missed during the data analysis. The deductive and inductive coding result was the 12 codes defined in Table 6 below, with ‘D/I’ in parentheses denoting deductive and inductive codes and ‘I’ denoting inductive codes. Note that all the deductive codes were noted to also be inductive codes, although the reverse was not the case.

Leverage was deliberately omitted as a code because it was not raised as a concern by any respondent banks. It was therefore deemed immaterial and of little relevance to the study. The codes defined in the table below were the final ones identified for use in the qualitative analysis:

Table 6: Codes used in qualitative analysis and their definitions

No.	Code	Definition
1	Appetite code (D/I)	This code deals with the banks’ deliberate intent to either grow or scale back their infrastructure loan books due to the regulatory reforms. It captures the banks representatives’ responses, specifically regarding their appetite for financing infrastructure loans. There is a directly related theme, as shown in the next table hence the distinction made by using ‘code’ in the nomenclature.
2	Capital (D/I)	The ‘ <i>Capital</i> ’ code examines the effects of regulatory reforms on the regulatory capital requirements associated with infrastructure loans.

No.	Code	Definition
3	Derivatives and Hedging (D/I)	The ' <i>Derivatives and Hedging</i> ' code groups banks' representatives responses regarding the effects of new derivatives legislation, some of which are linked to Basel III regulatory reforms, affecting the cost of hedging project risks (e.g., interest rate risk, currency risk, inflation risk, etc.)
4	Large Exposures (D/I)	This code groups the Large Exposures rule-related responses from the banks' representatives regarding its effects (if any) on infrastructure debt financing.
5	Funding and Liquidity (D/I)	The ' <i>Funding and Liquidity</i> ' code groups the banks representatives' responses relating to the liquidity measures (i.e., LCR and NSFR) and the consequences of adopting these measures, such as the matched funding requirements mentioned in some interviews.
6	Non-Basel reforms (I)	This code groups the banks' representatives responses concerning non-Basel regulatory reforms that have affected their infrastructure debt finance activities.
7	Strategy code (D/I)	This code groups related responses from the banks' representatives regarding strategy and the influence of the various other codes on the banks' strategy in terms of infrastructure lending. It captures the respondents' feedback making specific reference to their strategy relating to their infrastructure financing activities. There is a directly related theme, as shown in the next table hence the distinction made by using 'code' in the nomenclature.
8	Substitution (I)	The ' <i>Substitution</i> ' code groups content from the qualitative data relating to alternatives to debt finance from commercial banks, which have largely come about due to the banks representatives' restrictions resulting from the banking regulatory reforms.
9	Regulatory risk (I)	This code groups the banks representatives' responses related to the risk of regulatory changes, which could result in unforeseen consequences on the banks' activities relating to infrastructure financing. It includes the banks' responses to the question relating to the expected effects of 'Basel IV'.
10	Pricing code (D/I)	The <i>Pricing</i> code is closely linked to most of the above codes (especially <i>Capital</i> , <i>Derivatives and Hedging</i> , <i>Large exposure</i> , <i>Funding and Liquidity</i> and <i>Regulatory risk</i>) and looks at the effects of the reforms on the cost of debt that the borrower incurs. It captures the respondents feedback making specific reference to their pricing of infrastructure debt. There is a directly related theme, as shown in the next table hence the distinction made by using 'code' in the nomenclature.

No.	Code	Definition
11	Proportionality code (D/I)	The respondents' opinions on whether they believe the PA applied the proportionality principle in adopting Basel III regulatory reforms in the Banks Act are grouped under this code, so it includes a lot of overlap across other codes. It captures the banks' responses on whether the regulator adopted the Basel III regulatory reforms after due consideration of the local macroeconomic environment and South Africa's specific economic challenges. There is a directly related theme, as shown in the next table hence the distinction made by using 'code' in the nomenclature.
12	Suggestions code (I)	The suggestions for the regulators provided by the respondents are grouped under this code, which includes a lot of overlap across other codes. It captures the responses provided by the banks making specific suggestions for the local banking regulator. There is a directly related theme, as shown in the next table hence the distinction made by using 'code' in the nomenclature.

The themes in Table 7 below were then identified and defined based on the research questions the study seeks to answer (i.e., using a deductive process). The codes above were then grouped under the themes based on their relevance and instrumentality in analysing the identified themes. Note that although the themes were adjudged to be distinct by the researcher during the refinement phase and believed to focus on different aspects of the research question, there was an overlap of the codes over the identified themes, as illustrated in Figure 11. One could argue that appetite and strategy are related, but from the researcher's perspective, the former pertains to the desire to go long or reduce exposure, while the latter focuses on how the bank plans to implement this in lights of the regulatory constraints. Although pricing is associated with strategy, this study primarily examines its impact on the borrower's perspective.

Table 7: Themes used in qualitative analysis and their definitions

No.	Theme	Definition
1	Appetite	Groups the codes dealing with the appetite theme concerning the research problem.
2	Strategy	Groups the codes dealing with the strategy and service offering theme concerning the research problem and effects on infrastructure lending activities.
3	Pricing	Groups the codes dealing with the debt pricing theme concerning the research problem and effects on infrastructure lending.

prominence of the themes due to the number of codes and references from the qualitative data, they are: 1) Strategy with 8 codes and 104 references, 2) Pricing with 7 codes and 87 references and 3) Appetite with 6 codes and 87 references 4) Suggestions with 6 codes and 74 references and finally 5) Proportionality with 6 codes and 71 references.

The codes of Capital, Funding and Liquidity, Non-Basel reforms and Regulatory Risk were noted to feature across all five themes identified.

3.7 Reliability and validity

The qualitative nature of the study relies on a small sample of respondents to collect primary data. Although only four banks responded via interviews, these four banks provide the vast majority of infrastructure debt financing advanced by South African banks for local and regional infrastructure projects (Cuesta, 2022). Furthermore, the five banks targeted, including the four which responded, are all domestic systemically important banks (D-SIBs) and would therefore be subject to considerable regulatory scrutiny from the PA. This makes them ideal subjects to respond to questions relating to the effects of Basel III regulatory reforms on their infrastructure financing activities. The below table summarises the roles and experiences of the respondents from four of the five Big 5 SA banks as of December 2022 while trying to maintain their anonymity:

Table 8: Bank Representatives Interviewed

Bank	Indicative Designation	Related Experience	Pseudonym
Bank A	Head of Structured Finance	> 8 years of power and infrastructure (2 years in role)	Respondent A
Bank B	Head of Power and Infrastructure	> 17 years of power and infrastructure (3.5 years in role)	Respondent B
Bank C	Head of Infrastructure Finance	> 13 years of power and infrastructure (3 years in role)	Respondent C
Bank D	1. Head of Energy and Infrastructure 2. Executive: Energy and Infrastructure	1. >10 years of power and infrastructure (9.5 years in Energy and Infrastructure team) 2. > 15 years of power and infrastructure (13 years in Energy and Infrastructure team)	Respondents D

The respondents representing the banks were the heads and co-heads of the infrastructure teams with significant infrastructure financing experience, individually and collectively, as illustrated in Table 8 above. This assures that sufficiently experienced banking professionals with the requisite seniority to provide an overview of the bank's infrastructure strategy and related activities were consulted for this study.

As a qualitative interpretivist study, there is tension between the individuals representing the institutions and the banks since the respondents interviewed were individuals representing the banks. The risk is, therefore, that the banking professionals interviewed would respond based on their individual opinions, which may not necessarily reflect the position or experience of the banks. Given the nature of the responses provided, however, which were frequently coloured with specific experiences of the banks as recounted by the banking professionals, they seemed, for the most part, indicative of the banks' specific experiences.

Primary data sourced through interviews can also result in artificial bias if the questions posed are designed to elicit a particular response. Dudovskiy (2021) notes that despite the bias, which is a downside of interpretivist research, a positive aspect is that "primary data generated via Interpretivism studies might be associated with a high level of validity because data in such studies tend to be trustworthy and honest" (p.56). The standard questions were developed objectively to establish the banks' experiences due to the regulatory reforms (refer to APPENDIX A). Since many of the responses given were different from the researcher's expectations, this gave some comfort that personal bias has not unduly influenced the qualitative data collected to support the study.

3.8 Research limitations

The interpretivist philosophy has the main disadvantage of the subjective nature of the approach, which allows much room for bias on the researcher's part. Additionally, the primary data collected in interpretivist studies cannot be generalised as personal values and viewpoints heavily influence the data. As a result, the data's representativeness and reliability may be somewhat undermined (Dudovskiy, 2018). This means that the study's conclusions may not be generalised; therefore, the interpretation of the observed phenomena is specific to the South African context, biased towards the researcher's viewpoint and not necessarily applicable to other developing economies that have adopted similar banking regulatory reforms. On the other hand, however, the primary data

produced in interpretivist studies could be associated with a great level of validity as it tends to be trustworthy and honest (Dudovskiy, 2018).

The unwillingness of one of the five banks targeted to participate in the study, as discussed in 3.5, was a further limitation, but given that it was not the largest nor the second or third largest bank in the sample, the remaining four respondent banks still provided comprehensive coverage of the local banks engaged in infrastructure lending.

Another limitation was that the interview with one of the respondent banks did not yield as rich responses as the other three banks, as the representative from its Capital Management team could not attend the interview and provide more detail on the effects of the Basel III reforms. However, the responses provided by this bank were still very relevant to the study's objectives and have therefore been included in the analysis.

The respondent banks discussed in 3.7 were all unwilling to share any quantitative data, regardless of offers to enter into non-disclosure agreements and despite the emphasis on UCT's ethical declaration regarding data collection. The granularity of the quantitative data available in the public domain, most notably as reported in the banks' Pillar 3 disclosures, was assessed and adjudged to be insufficiently granular to perform the quantitative analyses necessary to support the study. This is because most of the banks did not publish a breakdown of the various banks' loan books showing the contribution of infrastructure loans relative to the total loan book by exposure and risk measures (e.g., RWAs) in their Pillar 3 disclosure reports. Similarly, the banks did not publish quantitative data on the contribution of infrastructure exposures to liquidity requirements and leverage. The quantitative data might have mitigated some of the subjectivity intrinsic in the qualitative nature of the study but also may not have been as useful as the qualitative data in garnering the insights necessary to answer the research questions.

3.9 Conclusion

The study employed a qualitative research approach based on an interpretivist epistemology to understand the experience of the respondent banks to the host of banking regulatory reforms as a result of the adoption of Basel III in the Banks Act. An exploratory research design was adopted to establish the nature of the problem and answer the research questions formulated in 1.2.

A non-random sampling approach was employed, given the nature of the study, through semi-structured, in-depth interviews with a relatively small sample size of four of the Big 5 SA banks

since one of the banks elected not to participate. The remaining four banks still provided adequate coverage of the private infrastructure debt financing advanced by South African commercial banks for the study. The heads and co-heads of the infrastructure financing teams within the four large banks were the respondents representing each of the large banks, which were the units of analysis.

A thematic analysis using Braun and Clarke 6-step framework was employed by adopting a hybrid of deductive and inductive coding to perform the qualitative analysis to incorporate the benefits of both approaches. The strategy was the primary theme and included 8 of the 12 codes, followed closely by Pricing and Appetite with 7 and 6 codes, respectively. Proportionality and Suggestions are approximately the same, with 6 codes each, although they are slightly smaller than the Appetite theme, which also had 6 codes.

There was an overlap of codes across themes, with the codes Capital, Funding and Liquidity, Non-Basel reforms, and Regulatory Risk featuring across all five themes identified.

4 CHAPTER 4: RESEARCH FINDINGS AND DISCUSSION

4.1 Effects on banks' appetite for infrastructure financing transactions

The respondents from all four banks which agreed to the interviews indicated that the regulatory reforms did not adversely affect their appetite for infrastructure financing and were actively looking to increase their exposure to infrastructure. Table 9 below summarises the factors influencing the respondent banks' increased appetite for infrastructure financing activities notwithstanding the regulatory reforms according to them:

Table 9: Factors affecting banks' appetite to fund infrastructure assets in spite of reforms

Respondent Bank	Driving Factor	Effect on Appetite
Bank A, B, C and D	Increase in demand for infrastructure assets driven by institutional investors counteracting adverse effects of banking regulatory reforms	Increase in bank's appetite for funding infrastructure projects in general
Bank A, B, C and D	Sustainability considerations (especially ESG)	Increase in appetite for funding infrastructure projects which support sustainability (e.g., renewable power plants)
Bank A and C	Infrastructure development considered an engine for local and regional economic growth	High appetite for funding infrastructure projects
Bank D	Infrastructure viewed as a foundational pillar across Sub-Saharan Africa (SSA) driving economic growth across the region	High appetite for funding infrastructure projects across SSA
	Supporting infrastructure development in key strategic sectors for South Africa	Increase in appetite for funding infrastructure projects in South Africa with a focus on key sectors (e.g., energy, water, transportation)

Respondents from all four banks reported that the regulatory reforms relating to capital had adversely affected pricing due to the long tenor of infrastructure assets (i.e., typically 20 years), but they all stated that this did not adversely affect the banks' appetite.

Similarly, the reforms relating to matched funding liquidity requirements per the NSFR had adversely affected pricing for all the respondent banks due to the long tenor of infrastructure assets,

which would require liabilities of a similar tenor to fund these assets but noted that did not adversely affect their appetite.

Additionally, all the respondents interviewed mentioned the consideration of non-financial aspects in selecting infrastructure deals to which they wished to increase their exposure. In particular, a common theme across the banks was the ESG context, which influenced banks' decisions to fund projects, with the banks actively seeking to increase their exposure to projects supportive of addressing ESG-related challenges (e.g., renewable energy technologies). Conversely, they indicated a decrease in the banks' appetite to finance projects which adversely affected ESG (e.g., fossil fuel-related projects such as coal extraction). Note that all four respondent banks are listed on the Johannesburg Stock Exchange (JSE), which has listing requirements relating to ESG in the form of *JSE's Sustainability and Climate Disclosure Guidance*.

All the respondents indicated that despite regulatory risks such as the finalisation of the Basel III reforms, informally dubbed 'Basel IV', and other unknown future regulatory reforms, they would still be looking to increase their exposure to infrastructure.

Respondent C, in particular, mentioned that because Bank C was part of a larger banking group, it had access to multiple balance sheets with an asset manager and pension fund, which could carry longer-dated assets on their balance sheets without the onerous regulatory requirements for banks. Note that three of the four respondents represented a much larger banking group and, therefore, could adopt a similar strategy. Respondent C added that if Bank C were a standalone bank without alternative balance sheets to use, it would likely have reduced its infrastructure exposure by as much as 50% purely due to the adverse effects of the regulatory reforms.

Respondents D specifically noted that the regulatory reforms relating to derivatives had an effect on pricing as a result of the long tenor of infrastructure assets which would require derivatives of a similar tenor that have become expensive to hedge the risk associated with the assets, but they stated that this did not affect Bank D's their appetite. This is partly because the increase in pricing driven by capital, hedging and liquidity costs was mostly passed on to the borrower. The pricing effects of the regulatory reforms are unpacked in 4.3.

Respondents D further noted that despite the move to divest from fossil fuels, Bank D continued to finance some fossil fuel-related projects such as gas, which is viewed as a transitional due to the dire economic needs of the country and the richness of fossil fuel deposits in South Africa. This is due to the ongoing debate regarding whether the 'E' should take priority over the 'S' in

ESG as the urgent need for job creation persists while also trying to address climate risk. The same applies to the coal-use projects where pollution mitigation is incorporated into the plant using carbon capture, utilisation and storage (CCUS).

4.2 Effects on banks’ strategy in relation to infrastructure financing transactions

All the respondents indicated that the banking reforms have necessitated that their banks adapt their strategies relating to infrastructure financing activities to remain competitive. There are various ways in which they have done so, including shifting their focus to other aspects of the infrastructure financing value chain than the provision of debt finance. These include providing related specialised financial advisory services such as structuring, facilitating the derisking of projects during the construction and ramp-up phase and playing Lead Arranger (LA) or Mandated Lead Arranger (MLA) role, which facilitates and leads a group of lenders and/or investors in a syndicated loan to finance the project.

Other changes in the strategy of the banks concerning their infrastructure financing activities and their driving factors are summarised in Table 10 below:

Table 10: Effects of regulatory reforms on banks’ infrastructure strategies

Respondent Bank	Driving Factor	Strategic Response
Bank A and B	Sustainability focus, especially ESG	Shift financing to projects which support sustainability (e.g., renewable energy) and divest from fossil fuels
Bank C and D	Sustainability focus, especially ESG	Increase in financing sustainable projects such as renewable energy power plants and gradually divest from fossil fuels. To support local economic growth, however, continue to finance gas-fired stations over coal-fired as the former is considered a transitory energy source
Bank A and C	Match funding requirement for NSFR a challenge for long-dated assets	Carry assets on the balance sheet during early construction and ramp-up phase and then sell down long end to institutional investors to offset the need for long-dated funding to match the assets

Respondent Bank	Driving Factor	Strategic Response
Bank A	Increased regulatory capital charge for long-dated assets	Loans are structured around risks, for instance, the loan margin charged to the borrower may be ratcheted up after 5 years and then again after 10 years and so forth to compensate the bank for the additional capital to be held against the long-dated assets. Additionally, the bank churns the infrastructure loan book to keep the early phase (i.e., construction and ramp-up) on the balance sheet and sell down the long end to institutional investors
Bank B	Increased regulatory capital charge for long-dated assets (including the imposition of a 20% LGD for project finance transactions for banks on A-IRB)	Long projects tenors are broken into shorter loans over the life of the asset
	Match funding requirement for NSFR a challenge for long-dated assets	Typically no match funding for tenors beyond 5 to 6 years, instead infrastructure project is broken down into shorter tenor loans with different risk profiles depending on the project phase
Bank C	Increased regulatory capital charge for long-dated assets (including the imposition of a 20% LGD for project finance transactions for banks on A-IRB)	Focus on originating the assets, structuring the assets and helping derisk and ramp up the asset, then carrying assets on the balance sheet during construction and ramp-up phase, then sell down long end to institutional investors to reduce elevated capital charge associated with long-dated assets particularly in the bank's project finance book. Transfer of long end to the asset manager and pension fund within the banking group also employed
Bank D	Increased regulatory capital charge for long-dated assets (including the imposition of a 20% LGD for project finance transactions for banks on A-IRB)	Carry assets on the balance sheet during construction and ramp-up phase, then sell down long end to institutional investors to reduce elevated capital charges associated with long-dated assets. The bank originates assets it is confident it

Respondent Bank	Driving Factor	Strategic Response
Bank D		can sell down to the market later. Transfer of long end to the asset manager and pension fund within the banking group also employed
	Match funding requirement for NSFR a challenge for long-dated assets	Carry assets on the balance sheet during construction and ramp-up phase, then sell down long end to institutional investors to offset the need for long-dated funding. Churn the balance sheet and reinvest in new infrastructure assets
	Derivatives regulatory reforms	Absorb a portion of the cost increases associated with derivatives, which adversely impacts the bank's profit margin but pass on the bulk of the cost increases to borrowers (i.e., typically the SPVs in project finance transactions). For very long tenors, however, the pricing of derivatives has become prohibitively expensive, making the availability of suitable derivatives for hedging an issue

As highlighted in Table 10, the adaptation of the four respondent banks' strategies has also entailed a shift towards funding ESG-supportive projects and divesting from funding ESG detrimental projects such as fossil fuel-related (to an extent), as mentioned in 4.1. This is also necessitated by the respondent banks all being listed on the JSE and, therefore, subject to the Sustainability and Climate Disclosure Guidance listing requirements of the exchange.

Respondent A added in their response that "infrastructure assets sit well on a bank's balance sheet through construction because the banks are well set up in terms of their skill sets and experience to manage the risk during the construction period, and a couple of years thereafter." So the challenge of long-dated assets is addressed by keeping the assets on book during the construction and ramp-up phase and shortly thereafter, when the projects have been significantly derisked, as indicated in Table 10. Subsequently, the bank looks to sell down the derisked assets to institutional

investors such as private equity players, pension funds, asset managers and wealth funds who are not deterred by the long tenor of the assets as they are not subject to restrictive banking regulations.

Respondent A further stated that in the deal approval process, due consideration was given to which sectors the deal would be in, noting that “you will absolutely go for the opportunity where there's the most impact because the bank wants to be associated with projects where there's a benefit to society.” So notwithstanding its focus on the commercial aspect of the deals they fund, commercial banks also look at the developmental impact on society. However, due to the latter's developmental mandate, they may not give it as much weight as DFIs.

Respondent A also mentioned that the Large Exposures rule was an important consideration for the bank but did not affect its strategy as the bank already actively managed sector and single-name concentrations making it highly unlikely to breach the exposure limits for single borrowers prescribed by the reform. If exposures to borrowers become excessive, the bank looks to sell them down to institutional investors with an increasing appetite for holding such assets in their investment portfolios.

Respondent B highlighted that during the deal approval process, consideration was given to whether it was in a priority sector such as power, transport (i.e., especially roads and rail networks, ports and airports), healthcare, telecommunications and social infrastructure. Other considerations Respondent B highlighted were ESG, corporate social responsibility and other non-financial factors in addition to the expected financial return. Bank B admitted that as a commercial bank and not a DFI, it generally would not pursue a deal expected to generate returns below a particular hurdle rate in financial performance. Where the deal returns were expected to be slightly above the hurdle but very strongly supportive of the non-financial factors, however, the deal would likely be accepted.

As discussed in 4.1, Bank C also had the benefit, like two of the other three respondent banks, of being part of a larger financial services group with an asset manager and pension fund which could carry the long-dated assets on their balance sheets without incurring the capital and liquidity costs that the bank would. Therefore, the strategy in this regard was similar to Bank A's in selling down the longer end of its infrastructure book. It also benefited from using the related group companies' balance sheets to carry these long-dated assets.

Respondent C further noted that market fundamentals had changed, necessitating an adaptation, not so much a change in an overall strategy. Respondent C stated that “market fundamentals have

made it quite clear that, going forward, banks are probably best able to structure, package and then distribute those types of assets, once they're derisked to counterparties that are best able to handle the financing requirements". This is because institutional investors would not have the same restrictions as those imposed on the banks due to the regulatory reforms.

Respondent C added that it has become obvious that banks' whole play in the infrastructure finance space revolves around originating the assets, structuring the assets and, helping them derisk and ramp up, then transferring them to the market. Therefore at financial close, Bank C would not price the deal based on how much it would cost the bank (i.e., to hold the asset for 20 years), including the required return, but rather priced it where the market would take it (i.e., plus margin), which is lower than where the bank can hold it.

Respondent C also mentioned that in terms of strategy, Bank C sought to support sectors that were a priority for South Africa which was informed by various government initiatives such as the Integrated Resource Plan 2010–30 (IRP 2010-30) promulgated in March 2011, the National Infrastructure Plan 2050 (NIP 2050 promulgated through the Infrastructure Development Act No.23 of 2014, section 4(a)) and National Development Plan 2030 (NDP 2030) published by the National Planning Commission in August 2012 among others. Respondent C noted that despite the ESG agenda, the bank appreciated the dichotomy between economic growth, job creation, and environmental concerns, given that South Africa still has a lot of fossil fuels in the ground that can drive that growth. Hence it was still funding some fossil fuel-related deals, as mentioned in 4.1, although in the long-term looking to eventually divest from these fully.

Respondents D indicated that in contrast to Bank B's strategy, Bank D's Capital Management team viewed breaking the project debt down into shorter tenors as regulatory arbitrage, so this was not condoned by this conservative bank. They held the view that to break up the loan into shorter tenors, you would need to have the ability to not automatically roll (i.e., when the loan is renewed or 'rolled over' instead of being repaid in full at the end of its term) the second loan but in reality, you would have to roll it automatically. To contend with the long tenor of infrastructure assets, Bank D adopted a strategy similar to that of Bank C, as highlighted in Table 10 above.

Respondents D highlighted that Bank D strategically targeted financing assets that they were confident would sell down and enable them to churn their balance sheet. One of the reasons they highlighted was their concern regarding regulatory risk in that they could not be certain of what

further regulatory reforms to anticipate down the line over the 20-year tenor typical of infrastructure assets that could impact the bank.

4.3 Effects on infrastructure debt pricing for borrowers

All four respondents confirmed that the Basel III regulatory reforms significantly adversely affected debt pricing, mainly driven by increased liquidity, capital and hedging costs for long-dated infrastructure loans. Table 11 below summarises some of the effects on pricing of the regulatory reforms as indicated by the banks' representatives:

Table 11: Effects of Basel III regulatory reforms on debt pricing for borrowers

Respondent Bank	Driving Factor (Regulatory Reform)	Effect on Pricing
Bank A, B, C and D	Increased regulatory capital charge for long-dated assets	Increased cost of regulatory capital mostly passed on to the borrower
	Match funding requirement for LCR a challenge for long-dated assets	Increased liquidity costs mostly passed on to the borrower
Bank D (although this would apply to all other respondent banks)	Derivatives regulatory reforms increasing hedging costs	Increase in hedging costs passed on to borrowers via derivative pricing

From a matched funding perspective South Africa has an industry-wide structural mismatch whereby short-term liabilities fund long-dated assets, which introduces funding risk if the liabilities cannot be rolled to continue funding the long-dated assets. The regulatory reforms for liquidity via the Basel III NSFR include a requirement that the available stable funding (i.e., the funding liabilities) is equal to or more than the required stable funding (i.e., the funded assets) on an ongoing basis (Diesel et al., 2022).

All respondents stated that most of the increase in these costs was passed on to the borrower via the loan pricing of infrastructure assets. Higher capital charges, as per Table 11, were compounded by all the respondent banks being D-SIBs and therefore subject to a further capital add-on (i.e., per the Banks Act, the aggregate requirement for Pillar 2A systemic risk add-on and D-SIB capital add-on as a percentage of total RWAs will not exceed 2.0% for CET1, 2.5% for Tier 1 and 3.5% for the total CAR). Market risk regulatory capital requirements also increased due to the Basel III

reforms, which introduced revised capital rules for market risk as well as counterparty credit risk (CCR) and credit valuation adjustment (CVA) associated with the derivatives.

Respondent B indicated that Bank B's infrastructure loan pricing comprises several elements; i) a reference rate which is typically JIBAR, ii) a risk margin which is stable over the life of the project, iii) a liquidity cost which tends to be volatile over time due to fluctuations in the cost of liquid assets and iv) statutory costs informed mainly by the regulatory capital charge for holding the asset which tends to increase over the life of the loan. Respondent B noted that regulatory reforms have significantly impacted the last three driving up the price of debt as the costs are typically passed on to the borrower.

Respondent C noted that "as a result of Basel, what has become evident is that banks can't necessarily provide long-term financing, particularly for infrastructure in a cost-competitive manner, especially given the long-term nature of the assets and the fact that, usually, the financing, whether it be equity or debt, would need to match the nature of the asset to be able to meet the requirements, particularly if the government procures the infrastructure." Respondent C added that the requirements for the government would be threefold; i) value for money, ii) affordability and iii) risk transfer. The first two have been negatively affected by the regulatory reforms resulting in banks' inability to provide long-term debt finance cost-effectively. The South African public ultimately bears the increased debt cost for borrowers when the government is the client and negatively affects the amount of infrastructure that can be unlocked with the available public resources. Respondent C mentioned that of the main contributors to the increased debt pricing, the liquidity premium due to matching funding requirements of the NSFR was the largest contributing factor.

Respondent D highlighted that the pricing of infrastructure loans has increased dramatically due to the regulatory reforms and has more than doubled during the phase-in of Basel III reforms. This increase was mainly due to the need to match fund due to the NSFR liquidity requirements and the additional capital the bank has to hold for long-dated assets as a direct result of the Basel III regulatory reforms. From a funding perspective, before the Basel III reforms, 20-year loans could be rolled on 3-month JIBAR and the cost of liquid assets (liquids) was less than 30 bps, whereas now, with the adoption of the LCR, the cost of liquids is over 1% and sometimes as much as 160 bps. Capital and hedge pricing were the following significant effect on costs, which increased dramatically due to the regulatory reforms associated with derivatives. Respondents D noted that "to give an idea, a long-dated interest rate swap now costs maybe 100 bps over and above the

mids, whereas if you were doing a 5-year, you're looking at 40 bps, so the impact of tenor on the capital has been what's had a massive impact on infrastructure, both on loan and the hedge side.”

Debt pricing has also been affected by non-Basel regulatory reforms, notably, the IFRS 9 accounting standard, which became effective for annual financial periods beginning on or after 1 January 2018, although early adoption was permitted. In addition to a revised classification and measurement framework for credit exposures, IFRS 9 introduces a forward-looking, risk-based approach to provisioning using expected credit losses (ECL). ECL is computed as a function of the credit parameters Probability of Default (PD) representing the expected default frequency, Loss Given Default (LGD) or the loss expected to be realised at default and the Exposure at Default (EAD) or the credit balance at the time of default discounted for the time value of money considerations. One of the requirements is the staging of credit exposures based on whether there have been significant increases in credit risk (SICR). Under the IFRS 9 accounting standard, there is recognition of lifetime ECL for Stage 2 exposures (i.e., delinquent exposures typically over 30 days past due but less than 90 days past due) and Stage 3 exposures (i.e., defaulted exposures typically over 90 days past due) by using lifetime parameters for PD and LGD instead of the 12 months required for Stage 1 exposures (i.e., for newly originated and performing exposures typically less than 30 days past due) (Fsi, n.d.).

Respondent A mentioned that debt pricing for Bank A has also been affected by the IFRS 9 loan provisions the bank has to hold against its credit exposures as the tenor comes into their calculation (i.e., lifetime ECL for Stage 2 and Stage 3 credit exposures). Of course, as previously noted, the tenors are typically very long. Stage 2 and 3 exposures will materially affect the level of provisions that have to be raised against the credit exposures.

The effect of the Interbank Offered Rate (IBOR) transition and the move away from LIBOR and EURIBOR and others to new risk-free rate (RFR) fallbacks under the global IBOR transition due to the proneness of the previous reference rates to manipulation through the collusion of the large banks may also have impacted the USD, EUR, GBP and non-ZAR denominated loans. This would affect all the banks but was not raised as a concern by any of them when asked what other regulatory reforms have materially impacted their infrastructure financing activities.

The banks all expected an increase in pricing due to the finalisation of Basel III, informally referred to as ‘Basel IV’, but expected to be impacted differently due to differences in their risk quantification approaches, particularly for credit risk. For banks on the slotting approach, such as

Bank A, the imposition of the 72.5% of standardised RWAs output floor (i.e., the minimum permissible RWAs regardless of the bank's approved RWA quantification approach) would adversely affect capital, but not to as great an extent as the banks on the Advanced Internal Ratings-Based Approach (A-IRB) (i.e., Banks B, C and D). The A-IRB is the most sophisticated approach for credit risk capital whereby banks determine their credit parameters using their internally calibrated methodology and the A-IRB formulation prescribed in the banking regulations. This is due to the conservatism already built into the slotting approach whereby the credit exposure is 'slotted' into one or four risk buckets with different risk weightings (i.e., 70%, 90%, 110% and 250%). According to Respondent A, the bulk of Bank A's exposure was in the 70% risk-weighting category. For the banks on A-IRB, applying a standardised RWA output floor was expected to materially increase their credit risk RWAs and, consequently, the regulatory capital they will be required to hold. Bank C had just been approved to go onto the A-IRB by the PA in 2021, so the final Basel IV reforms would effectively unwind the benefits of moving to A-IRB, which would have required considerable resources of Bank C to get approved by the regulator. Respondent D acknowledged that introducing the standardised RWAs output floor would level the playing field across the competitor banks because it would become less important which approach for credit risk the bank was on in terms of the credit risk capital charges.

The promulgation by the PA of regulations to impose a 20% LGD floor for project finance transactions (i.e., the minimum permissible LGD is 20%) promulgated through '*Directive 6/2021 issued in terms of section 6(6) of the Banks Act, 1990*' on 6 October 2021 would further increase the credit risk regulatory capital required to be held for these assets and thereby contribute to an increase in debt pricing payable by borrowers. Respondent D mentioned a Moody's study which showed that on a typical 20-year lifespan for an infrastructure loan, the recovery rate around 7 to 10 years down the line was close to 100% (note that Recovery Rate = 1 – LGD), so the 20% LGD floor was probably excessive for this type of credit asset. Respondent D noted that as much as 95% of its project finance book is infrastructure debt which would therefore be affected by this regulatory reform.

Respondent B noted that as a largely A-IRB bank, applying the 72.5% of standardised RWAs output floor under the regulatory reforms, this is expected to materially increase the capital charge for credit risk. Under 'Basel VI', the A-IRB cannot be applied to certain exposure types, such as large and mid-sized corporates, banks, and other financial institutions, with only the Foundation Internal Ratings-Based (F-IRB) approach and Standardised Approach (SA) permissible for these

exposures, which could also result in some increase in the pricing of infrastructure loans. The SA applies prescribed risk weightings while the F-IRB allows for the use of the bank empirical PDs but prescribed LGD and other credit parameters for non-retail exposures (e.g., infrastructure loans). The application of input floors under the regulatory reforms to some of the credit parameters, such as PD and LGD for certain types of exposures and EAD floors based on a combination of on and off-balance sheet exposure are also expected to adversely impact infrastructure loan pricing. For the Rest of the African subsidiaries of the SA parent, the impact of the output floor will have no effect.

According to Respondents D, the bank included cost increase clauses in loan agreements with clients because of regulatory risk and uncertainty regarding the reforms that would occur over the typical 20-year lifespan of infrastructure assets. There is generally a fixed price payable for providing infrastructure which limits the banks' ability to increase tariffs the way they do in normal corporate lending. So whereas the bank may legally be entitled to claim increased costs from the project, the project may be unable to absorb those cost increases. Note that infrastructure is often financed through project finance structures such that the project itself is responsible for servicing the infrastructure debt. Therefore, Bank D needs to be confident that it can get the assets off-book early in the project's life to safeguard against regulatory risk. Respondents D also noted that the 'Basel IV' reforms impacting the treatment of sovereigns would also likely have an adverse effect. All these factors are expected to drive further increases in the price of infrastructure debt payable by the borrower.

4.4 PA's application of the proportionality principle

Most respondents (i.e., except Respondent A) believed that the PA could have applied the proportionality principle more effectively in adopting the Basel III regulatory reforms in the South Africa's banking regulations. The reasons for their positions are summarised in Table 12 below:

Table 12: Respondent banks' opinion on the PA's application of the Proportional Principle

Bank Representative	Did the PA effectively apply Proportionality Principle?	Justification for their position
Respondent A	No opinion offered	n/a
Respondent B	No	Basel III was largely a response to the failures during the GFC, but as South Africa was not as severely impacted as the advanced economies, the PA could have given more leeway in the local adoption of Basel III

Bank Representative	Did the PA effectively apply Proportionality Principle?	Justification for their position
Respondent C	No	<ul style="list-style-type: none"> - The PA could have given some concessions in the local implementation of Basel III, especially with regards to the timing of implementation of the regulatory reforms, as the local banking sector had not been as severely impacted by the GFC as the advanced economies - The PA could have made concessions for a key sector such as infrastructure finance since infrastructure development is an engine for economic growth needed by South Africa and the SSA region - The PA imposed additional reforms entailing the 20% LGD floors for project finance exposures in Oct 2021 in addition to the initial Basel III reforms
Respondents D	No	<ul style="list-style-type: none"> - Basel III was largely a response to the failures during the GFC, but as South Africa was not as severely impacted as the advanced economies, the PA could have given more leeway in the local adoption of Basel III - The PA could have made concessions for a key sector such as infrastructure finance since infrastructure development is an engine for economic growth needed by South Africa and the SSA region - The regulatory reforms imposed on the parent of the banking group usually have adverse impacts on the bank's Rest of its African subsidiaries, which are still on Basel I or II in their local regulations - The PA imposed additional reforms entailing the 20% LGD floors for project finance exposures in Oct 2021 in addition to the initial Basel III reforms

Respondent C added that ideally, Regulation 28 should have been finalised (i.e., the regulation incorporated into the Pension Funds Act 1956, which limits the amount and the extent to which a pension fund may invest in particular assets) earlier to permit pension funds to start playing in the infrastructure finance space before the banks started having several headwinds to contend with due to the regulatory reforms. Respondent C further indicated that South Africa's secondary market for infrastructure needed to be developed further, although this was not attributed to the PA's actions so that more infrastructure bonds could be listed and more actively traded.

In addition to the previous concerns, Respondents D highlighted that the African subsidiaries of the bank are also affected by the Basel III regulations. This is because long-term or foreign currency transactions often use the South African balance sheet, given that the bank is headquartered there. As a result, the subsidiaries are subject to the complete set of Basel III requirements. Respondents D added that the local infrastructure sector had taken a major hit pre-2018, as there were effectively 10 years of little to no infrastructure investment under the previous regime (i.e., Jacob Zuma presidency), which decimated the local construction sector (e.g., cement manufacturers were brought to their knees). Resultantly, there was a need for regulators to intervene to help this sector recover. The PA could therefore have been much more circumspect of the needs of the local economy, the level of development of local markets and, therefore, could have made more concessions in implementing the regulatory reforms.

4.5 Suggestions from the banks' representatives for the local banking regulator(s)

Respondent A suggested that the PA should consider levelling the field across competitor commercial banks in terms of the capital held against infrastructure assets as currently, competitor banks can be on the same infrastructure deal, but because of the bank's approved capital quantification approach, one will have significantly higher capital requirements for essentially the same risk. They caveated that it would be understandable if it was, say, a concentration risk or large exposure issue that required a competitor bank to hold additional capital relative to its peer(s) but not due to project risk.

Respondent B suggested that given South Africa's status as an EMDE, the reforms have been more punitive than in developing economies. Therefore, the PA could make concessions on the local implementation of the Basel III reforms by relaxing some of the elements that would be restrictive to infrastructure development, a critical engine for economic growth. This would primarily include the aforementioned capital, funding and liquidity and hedging costs. Respondent B was also of the view that the PA could try to level the playing field between commercial banks and DFIs, the latter which can afford to price lower on their debt financing as they do not have to comply with onerous banking regulations. This would facilitate a lower overall cost of infrastructure which would benefit the government and, by implication, the consumers of public goods.

Respondent C suggested that the PA consider the broader needs of the country and not just a narrow focus on the banking sector by taking into account the government's strategic initiatives, such as the National Infrastructure Plan 2050 and IRP 2010-30, in its local adoption of regulatory reforms. So the focus on national priorities is imperative when implementing local regulatory

reforms. Also, the PA and other local regulatory bodies should facilitate the involvement of private capital through institutional investors by developing a conducive regulatory framework to support investment in infrastructure development.

Respondents D suggested that the PA should consider South Africa's current position as an EMDE in its local adoption of banking regulatory reforms, as the country's needs are quite different from its AE counterparts. Also, given that South Africa was not as severely impacted by the GFC, which Respondents D was of the view that Basel III was largely designed as a response to, more concessions supportive of infrastructure financing could have been made in the local adoption of Basel III. As a result of fully adopting the Basel III reforms, infrastructure financing has become very expensive for the consumer due to the various factors highlighted, which is counterproductive to the aims of economic growth and job creation. Respondents D added that capital relief should be given to infrastructure projects particularly in the face of government off-takers, as cost increases are eventually borne by the consumers of public goods. It also suggested that relief regarding match funding requirements should be given as they are very stable assets and typically do not follow the economic cycle. So Respondents D believed that the PA should review the elements of the regulatory reforms which drive up pricing, notably liquidity, capital and hedging costs, and other future reforms such as the finalisation of Basel III.

4.6 Summary and discussion on findings

In terms of the Large Exposures rule, none of the respondents expressed major concerns regarding this regulatory reform. This was partly because they already closely monitored sector and single-name concentration exposures which would highlight any Large Exposures issues. The Large Exposures rule would be more of a concern for smaller banks, but all the respondent banks have balance sheets in excess of R1 trillion in total assets. Also, large infrastructure projects are typically syndicated so that for even large infrastructure deals, the private debt exposure is typically shared across several of the Big 5 SA banks.

The Basel III regulatory reforms did not adversely affect the respondent banks' appetite for infrastructure assets as there has been an increase in their infrastructure loan books over the last 10 years, partly due to the increase in institutional investors' activities driving an increase in demand for infrastructure assets. The banks have, however, adapted their strategies relating to infrastructure to address the effects of the long tenors of those assets through a combination of changing focus to origination, structuring, derisking and selling down the longer end of the infrastructure assets, as well as maturity transformation of the assets by some.

The main regulatory reforms responsible for driving the increase in debt pricing in decreasing order of significance were the match funding costs due to liquidity requirements (i.e., mainly NSFR and not so much LCR), the reforms affecting regulatory capital the banks were obliged to hold and lastly hedging costs due to the regulatory reforms for derivatives. Note that the higher capital requirements also affected the banks' CARs due to the higher associated RWAs, the denominator in the CAR calculation. Other regulatory reforms, such as those relating to accounting standards like IFRS 9, which required that lifetime ECL be raised for credit assets that had shown a significant increase in credit risk (SICR), also increased the debt pricing.

It could be argued that the above findings support the theory of financial intermediation considered in 2.2.1 in both the classical sense of banks intervening in transactions costs and providing financial information to the market, as well as in the modified perspective with banks playing the role of facilitators of risk transfer and interacting with increasingly complex financial markets. The agency theory discussed in 2.2.3 may also be at play in that the principal being the project sponsor, which is often the government through one of its SOEs, and the banks being the agent, seek to share risk between the principal and agent from an economic perspective. The additional risk borne by the agent banks under the regulatory reforms is passed on to the principal borrower through increases in debt pricing. The findings are somewhat contrary to the neoclassical theory of risk discussed in 2.2.2 since the respondent commercial banks are all looking to increase their exposure to infrastructure finance, as discussed above. If the neoclassical theory of risk applied, they would instead seek to maximise their risk-adjusted returns by allocating their financial resources to less risky, shorter-tenor loans with similar or better absolute returns than long-dated infrastructure loans. It could be countered, however, that the neoclassical theory of risk explains the bank's strategy to keep the early stage of infrastructure projects on book and sell down the long end.

Most of the respondents believed that the PA could have applied greater circumspection in the local adoption of the Basel III reforms, given South Africa's status as an EMDE and the country's dire need for inclusive economic growth and job creation. The respondents offered a few suggestions for the PA's consideration which are discussed in 5.2.1.

5 CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions of the study

This section presents the four conclusions of the study in the context of the research objectives from 1.3. They specifically address the first four research questions listed in 1.2. Based on the findings discussed in the previous chapter, the following conclusions were arrived at concerning the research objectives of the study:

5.1.1 Basel III reforms have not adversely affected the banks' appetite to fund infrastructure

Based on the findings presented in 4.1, representatives from all four respondent banks indicated that the Basel III reforms did not adversely affect their appetite to fund infrastructure assets and were looking to grow their exposure to infrastructure. This was partly because institutional investors created a higher demand and larger market for long-dated infrastructure assets. Infrastructure was also viewed as a strategically important key driver of economic growth needed in EMDEs (i.e., in South Africa and the rest of Sub-Saharan Africa) and is therefore supported by all the banks.

5.1.2 Basel III reforms have compelled the banks to adapt their infrastructure strategies

The findings in 4.2 indicate that banks have had to adapt their strategies in light of the regulatory reforms. Some have opted to finance long infrastructure projects using shorter tenor loans over the project's life. Others have adopted a strategy of churning their infrastructure loan book once the projects have been derisked post the construction and ramp-up phase and shortly thereafter by selling the longer end down to institutional investors such as asset managers, pension funds, private equity funds and wealth funds. The use of other balance sheets within their financial services group, such as asset managers and pension funds, was also prevalent. The banks also opted to focus on other elements of the infrastructure value chain, such as origination, structuring, loan syndication and facilitating the derisking of the project in the early construction phase and ramp-up phase.

5.1.3 Basel III reforms have increased private debt financing costs for infrastructure

Based on the findings in 4.3, the Basel III regulatory reforms have significantly increased the costs of debt financing offered to the borrower, typically the government. This was driven mainly by match funding requirements of the long-dated infrastructure assets due to the NSFR, higher capital costs due to the long-dated infrastructure assets and higher hedging costs due to marked

increases in derivatives pricing. Loan pricing was also adversely impacted by non-Basel regulatory reforms, such as adopting the IFRS 9 accounting standard for estimating expected credit loss provisions.

5.1.4 The PA may not have applied the proportionality principle in adopting Basel III locally

As per the findings in 4.4, most respondent banks did not believe that the PA had effectively applied the principle of proportionality in the local adoption of the Basel III regulatory reforms. Their view was that concessions for infrastructure financing could have been made in the local adoption of the regulatory reforms given the country and the broader Sub-Saharan African region's dire need for economic growth and job creation of which infrastructure development was a major driver. The view from some of the respondents was also that since South Africa was not as adversely impacted by the GFC, which was one of the primary issues Basel III was designed to respond to, more concessions could have been made that would not have driven up the debt pricing so dramatically.

5.2 Recommendations

This section presents the study's recommendations in the context of the research objectives from 1.3. Five recommendations are made for the local regulators and two recommendations for the local commercial banks to address the last two research objectives articulated in 1.3. They specifically address the last two research questions listed in 1.2. The recommendations below were formulated based largely on the findings discussed in Chapter 4.

5.2.1 Recommendations for the regulators

Some potential measures identified which local regulators, especially the PA, could consider mitigating the adverse effects of regulatory reforms on infrastructure financing activities are presented below, borrowing from the findings in 4.5 and the conclusions in 5.1:

1. Firstly, the phasing of implementation of the regulatory reforms over a longer period could mitigate some of the unintended consequences

The effects of phasing in the new regulatory requirements over a long enough period could moderate some of the adverse effects and allow for the adoption of strategies by the banks, entailing the build-up of qualifying regulatory capital, which takes time. If local monetary policy can respond to the adverse effects of the regulatory reforms by easing monetary conditions, say by adjusting policy rates or facilitating local banks' access to liquidity, Banks

could adjust their strategies to comply with the new requirements without driving up the cost of credit. For instance, banks could accumulate retained earnings instead of adjusting lending costs or absorb additional costs associated with the new reforms by lowering operating expenses or reducing returns to shareholders instead of increasing lending rates. The ability of banks to increase pricing on their loans depends on numerous factors, including the elasticity of demand for loans in the economy and the extent of banking competition. Banks' ability to build higher capital ratios through retained earnings rather than downward lending adjustment will depend on their profitability (Nketcha-Nana, 2020).

2. Secondly, the PA should consider giving banks concessions for providing infrastructure loans by relaxing some of the regulatory requirements

This could entail reducing capital requirements and matching funding requirements for infrastructure assets, but it may be difficult to address hedging costs as derivatives are not employed solely in infrastructure finance. The South African banks most active in the infrastructure finance space are the Big 5 banks which are all D-SIBs. By virtue of being D-SIBs, they are already required to hold additional capital, so these concessions may not be deemed so unfair by the non-D-SIB competitor banks, particularly given the vital role played by infrastructure development as a driver of economic growth. The BCBS supports a well-considered local regulatory implementation of global banking standards as provided for in the Core Principles for Effective Banking Supervision (BCPs), specifically the proportionality principle.

3. Thirdly, the PA should seek broader consultation with other local regulatory bodies and harmonise regulatory reforms for the maximum benefit of the country and region

This recommendation may require the support of the SARB in terms of the mandate of the PA. Given that steps have already been taken to harmonise financial services regulation through the twin peaks model embodied in the SFSR Act, the PA should consult regulatory bodies and government departments in key strategic sectors before implementing major banking regulatory reforms that could impact national priority programmes. This would include the likes of NERSA, ICASA, PRASA, Department of Mineral Resources and Energy, Department of Transport, Department of Trade and Industry and Department of Water and Sanitation. This could be a broader South African government initiative that could be facilitated by setting up a National Regulatory Working Group so that various key

departments have an overview of the regulatory landscape nationwide. This would create a 'golden thread' that facilitates the harmonisation of all national regulations behind common national priorities and supports key government initiatives around infrastructure, such as the IRP 2010-30, NDP 2030 and NIP 2050.

4. Fourthly, the PA should consider measures to make the commercial banks better able to compete with the DFIs in the infrastructure financing space

Acknowledging that the mandates of DFIs are very different for commercial banks', the PA should explore what regulations relating to infrastructure financing it could revisit to improve banks' competitiveness compared to DFIs in providing debt funding for infrastructure. The amendments should still encourage the banks to engage in sound risk management practices while allowing them to better compete with the DFIs. This development would benefit the republic as it would reduce the debt pricing in general and give the government more 'bang for their buck'. The DFIs developmental mandates would still be relevant as they serve a different purpose.

5. Finally, the PA should introduce non-banking financial regulation to incentivise the participation of non-banking FIs in financing infrastructure projects

This would help develop the South African infrastructure market and could attract international funders to a larger, more liquid secondary infrastructure market. Regulation 28 for pension funds is a case in point as it facilitates the involvement of pension funds with considerable resources to deploy towards local and regional infrastructure development. In this regard, the PA could investigate what is being done in other progressive EMDEs in Asia, Central and South America and borrow relevant, effective regulatory initiatives from the advanced economies. This could catalyse infrastructure development across Sub-Saharan Africa by attracting large international players with considerable resources to help develop the continent and deepen the secondary infrastructure market.

5.2.2 Recommendations for the commercial banks

Based on the findings presented in 4 and the conclusions in 5.1, some recommendations are proposed for the South African banks. It should be noted that the banks with considerable resources have already formulated strategies to adapt their operating models as best they can to

the effects of the regulatory reforms, so the recommendations below exclude their current approaches.

1. Firstly, the banks should use collaborative bodies like the Banking Association of South Africa (BASA) to undertake insightful research to support their conversations with the PA

BASA “advances the industry's interests with its regulators, legislators and stakeholders, to make banking sustainable, profitable and better able to contribute to the country's social and economic development and transformation(BASA, 2019). Since all four respondent banks and the one Big 5 bank which opted not to participate in this study are BASA members, this would be the ideal body to undertake this task. By funding detailed, credible studies by academics collaborating with industry professionals on issues impeding the banking sector from achieving the aims of BASA, which are beneficial for South Africa as a whole, the banks can be more persuasive in their engagements with the PA regarding regulatory reforms under consideration. The banking regulator has a host of duties to attend to in regulating South Africa’s relatively well-developed financial sector, so it may overlook some of the potential adverse effects of regulatory reforms which it is contemplating for promulgation.

2. Secondly, the banks could help facilitate the structuring of innovative funding instruments for institutional investors

Due to the banks’ expertise in specialised finance, they should investigate what innovative capital market or hedging instruments they could help structure for the benefit of institutional investors. This could include offerings such as securitisation warehousing of infrastructure loans in an SPV or fund to facilitate the participation of other smaller investors looking to get exposure to infrastructure. This is an expanded advisory service offering to help deepen the secondary market for infrastructure and provide banks with another play since it is currently uncompetitive for them to carry long-dated infrastructure assets on-book to maturity. The banks should explore what related services are being beneficially offered in the markets of innovative EMDEs and AEs that could be adopted locally.

5.3 Suggestions for future research

For future research that can build on this study, the Prudential Authority could be consulted as it has a complete view of the banking population in South Africa and rich quantitative and qualitative

data from all the local banks. The PA could provide the banks' data anonymously, similar to how they use banks' data to provide an average industry view in the monthly banking sector reports they publish. The sample size could also increase, although the Big 5 South African commercial banks dominate the infrastructure lending sector. The PA could be convinced to support the research since the subject of this study will be of great interest as it aims to create stability in the banking sector but would also be invested in supporting local and regional development and economic growth. A mixed methods approach using the quantitative and qualitative banks' data from the PA could provide more conclusive findings than this exploratory study.

Subsequent studies could also gather information from institutional investors such as asset managers, private equity funds, pension funds and wealth funds, which are becoming more active in the infrastructure financing space, to get a view of to what extent they can be expected to fill the gaps left by the banks, particularly in the later tenor of the life of infrastructure assets.

The roles of DFIs and MDBs in closing the infrastructure gaps left by the banks would also be an important factor to understand so that a holistic view of the potential opportunities for other players in the infrastructure space is formed in this regard.

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APPENDIX A: STANDARDISED INTERVIEW QUESTIONNAIRE



MCom

Understanding the effects of changes in banking regulations on infrastructure financing in South Africa

Interview Questionnaire

The **Development Finance Centre (DEFIC)**
Graduate School of Business
University of Cape Town

In partial fulfilment
of the requirements for the Degree of
Master of Commerce in Development Finance

by

Louis Mukiraine

MKRL0U001

2021

Supervisor: Professor Nicholas Biekpe

Co-supervisor: Dr Misheck Mutize



Preamble

This document poses several questions to selected banking professionals regarding the impact of changes in South African banking regulations on their bank's appetite for infrastructure lending. The responses to the below questions will be used in an academic study to form a view on whether local regulatory changes have had an impact, and if so, the nature of the impact (i.e., adverse or favourable) and the extent of this impact on infrastructure lending. Finally, recommendations will be made on how to mitigate some of the adverse impacts (if any) from both a regulator's perspective as well as from the position of the commercial banks. The period of interest is the transition from Basel II to Basel III, including the Basel III phase-in period and will focus on the 10-year period from Dec 2010 to Dec 2020. From a quantitative analysis perspective, the study will not include the period 1 January 2021 to 1 January 2028 on the finalisation of Basel III as it is still ongoing (i.e., transitional arrangements for final Basel III reforms are from the period 1 January 2017 to 1 January 2028). However, the banks will be asked for their view on the impact of the final Basel III reforms.

For purposes of the questions below, infrastructure financing refers to the advancement of any form of debt, whether through direct loans (typically project finance loans) or other debt instruments.

The questions below include some data requests which will be instrumental in the quantitative aspect of the study. All data provided will be treated with the strictest confidentiality in line with the University of Cape Town's Ethics Policy and will not be used for any purpose other than supporting this study.

The interview via videoconferencing will take 45 – 60 minutes and will be recorded for video and audio.

Name of South African Bank: _____

Interview Questions

1. Please provide an overview of your role within your bank, especially in the context of infrastructure financing.
2. Did the bank participate in the various BCBS Quantitative Impact Studies (QIS) coordinated by the SARB prior to, and during, the initial Basel III phased implementation and would you be able to share the results which relate to impacts on capital adequacy, liquidity (i.e., LCR and NSFR) and leverage ratio to infrastructure lending?
3. Over the 10-year period under review, has the bank revised its strategy in terms of infrastructure financing due to the implementation of Basel III, and has this resulted in a move to reduce the size of the infrastructure loan book, or is the strategy to scale back funding of only certain types of infrastructure projects (e.g., fossil fuel related) while increasing exposure to other types (e.g. REIPPP rounds)?
4. What approach(es) does the bank use for the quantification of its credit RWAs, and specifically for its infrastructure lending exposures (i.e., Standardised Approach, Foundation Internal Ratings Based Approach or F-IRB, Advanced Internal Ratings Based Approach or AIRB)?

5. Which particular regulatory change(s) during the transition from Basel II to Basel III in terms of the Banks Act 94 of 1990 would you say had the most material impact on the bank's infrastructure lending activities?
6. When formulating its corporate strategy, does the bank consider the non-financial benefits of supporting certain sectors of the economy, such as the need in South Africa and Africa at large for infrastructure development as a driver of economic growth and to support job creation as well as improving quality of life in the region?
7. In your personal opinion, did the local regulator, the SARB's Prudential Authority or PA, consider the country's circumstances as a developing economy in its adoption of the Basel III framework locally or do you feel that it was implemented without due consideration of some of the potentially adverse consequences for a developing economy?
8. Do you expect the finalisation of the Basel III reforms, informally referred to as 'Basel VI', to have further material impacts on your bank's infrastructure lending activities and do you expect the impact (if any) to be adverse or favourable from the bank's perspective (linked to Q4 above)?
9. Do you have any ideas or suggestions which you would make to the Prudential Authority or PA to mitigate the adverse impact (if any) of regulatory changes on infrastructure lending and thereby facilitating the successful delivery of infrastructure?
10. **Data Request 1_Capital Adequacy:** historical quarterly data from 1 January 2010 to 31 December 2020 (i.e., quarterly data from 31 March 2010 inclusive)
 - a) Total RWA
 - b) Total credit RWA
 - c) Infrastructure lending credit RWA
11. **Data Request 2_Liquidity:** historical quarterly data from 1 January 2010 to 31 December 2020 (i.e., quarterly data from 31 March 2010 inclusive)
 - a) For LCR numerator: the total High-Quality Liquid Assets (HQLA) and the amount of infrastructure lending assets contribution (if any) to the HQLA
 - b) For LCR denominator: the total Cash Inflows over a 30-day time period and the infrastructure lending contribution to total Cash Inflows
 - c) For NSFR denominator: total Required Stable Funding (RSF) and amount of infrastructure lending's contribution to the RSF
12. **Data Request 3_Leverage Ratio (LR):** historical quarterly data from 1 January 2010 to 31 December 2020 (i.e., quarterly data from 31 March 2010 inclusive)
 - a) LR exposure measure (denominator): total eligible assets and infrastructure lending exposure portion of total eligible assets
 - b) Total Tier 1 capital and any contribution thereto of infrastructure lending (e.g., hybrid debt qualifying as Additional Tier 1 capital)

13. ***Data Request 4_Large Exposures Framework***: monthly data from 1 January 2017 to 31 December 2020 inclusive (i.e., from the start of the transitional arrangements for the final ‘Basel IV’ reforms to the end of 2020), total large exposures amount and infrastructure lending amount contribution to large exposures.
