Consultation paper on selected interest rate benchmarks in South Africa

August 2018

South African Reserve Bank

Contents

Boxes

List of abbreviations

BIS	Bank for International Settlements
Code	Jibar Code of Conduct, Governance Process and Operating Rules
CIS	collective investment scheme
CSD	central securities depository
EMMI	European Money Markets Institute
ETP	electronic trading platform
EU	European Union
FCA	Financial Conduct Authority
FMLG	Financial Markets Liaison Group
FRA	forward rate agreement
FSB	Financial Services Board
FSCA	Financial Sector Conduct Authority

FX	foreign exchange
GB	government bond
GC	general collateral
IOSCO	International Organization of Securities Commissions
ISDA	International Swaps and Derivatives Association
Jibar	Johannesburg Interbank Average Rate
JSE	JSE Limited
LCR	liquidity coverage ratio
Libor	London Interbank Offered Rate
MPC	Monetary Policy Committee
MPG	Market Practitioners Group
NCD	negotiable certificate of deposit
NBFC	non-bank financial corporate
NT	National Treasury
OIS	overnight index swap
OSSG	Official Sector Steering Group
PN	promissory note
repo	repurchase
RFR	risk-free rate
RRWG	Reference Rate Working Group
Sabor	South African Benchmark Overnight Rate
SARB	South African Reserve Bank
SASFR	South African Secured Financing Rate
Sonia	Sterling Overnight Index Average
STeFI	Short-Term Fixed-Interest [Index]
TBMWG	Treasury Bill Market Working Group
tom next	tomorrow next day
UK	United Kingdom
US	United States
Working Group	Working Group on Rand Interest Rate Benchmarks
ZARibor	South African Rand Interbank Overnight Rate

Preface

The purpose and objective of this consultation paper is to propose the reform of key interest rate benchmarks used in South Africa. The motivation behind these reform proposals is multifaceted. On the one hand, there is a need to enhance existing interest rate benchmarks by underpinning them with transaction data. On the other hand, the reform agenda seeks to promote the development and adoption of additional credit-based and risk free interest rate benchmarks in order to enable market participants to have choices of different reference rates that are 'fit for purpose'. The new and reformed Ibor Plus and risk-free interest rate benchmarks (Ibor RFRs) will serve different purposes. For typical credit products, a credit-based interest rate benchmark is regarded as appropriate as it provides a hedge against adverse changes in the credit risk embedded in the underlying instrument. However, for other purposes, especially derivative contracts, an alternative reference rate that is closer to risk-free may be more appropriate.

Another objective of this consultation paper is to propose a suite of reliable and robust interest rate benchmarks that could be used by market participants. This will promote efficient pricing in the domestic financial markets through improved transparency. The introduction of one or several of the proposed interest rate benchmarks can, in the long run, have important implications for the execution of the dual mandates of the South African Reserve Bank (SARB) and related policies in this regard. Insofar as it serves as a reference for a large number of contracts, any short-term benchmark rate plays a key role (i) in the transmission of monetary policy decisions through the interest rate channel to the broader economy; and (ii) in maintaining financial stability to the extent that it assists with the timely and accurate measurement of financial and market risk.

Following the publication of this consultation paper, the SARB will allow a two-month period for all relevant stakeholders to provide comments on all reform proposals as well as on proposals for new risk-free and risk-inclusive interest rate benchmarks.

All comments and general queries relating to this consultation paper should be sent to the SARB at sarb-wgrirb@resbank.co.za using the response template provided as annexure 5.

The deadline for comments is 26 October 2018.

The SARB intends to set up an independent body to be referred to as the Market Practitioners Group (MPG) soon after the consultation paper is published for input into the design and operationalisation of the benchmark proposals. The MPG will comprise members of the SARB, the Financial Sector Conduct Authority (FSCA), as well as senior professionals from a variety of institutions, reflecting different market interest groups active in the domestic money market. The mandate of the MPG shall be:

i. to review the proposed changes to existing interest rate benchmarks;
ii. to assess the proposed interest rate benchmarks against the design criteria consistent with the IOSCO principles for financial benchmarks;
iii. to facilitate decisions on the choice of interest rate benchmarks to be used as reference interest rates for financial and derivative contracts;
iv. to agree on a model for the collection of transaction-level data from which to calculate credible interest rate benchmarks;
v. to draft a transition plan from current to new interest rate benchmarks;
vi. to agree on fall-back arrangements for each interest rate benchmark that is used as a reference interest rate;
vii. to provide input into the drafting of codes of conduct, where relevant; and
viii. to assist in the design of a surveillance framework for all key interest rate benchmarks in the domestic money market.

Executive summary

A.1. Background

A.1.1. Globally, a wide range of benchmarks is used across various markets, including interest rate, equity, credit, commodity and foreign exchange (FX) markets. Some of these benchmarks are used as reference interest rates that underpin the pricing of wholesale and retail financial contracts worth trillions of dollars, or to measure the performance of investment funds. As a result, certain reference rates are deeply embedded in financial systems, especially in loan and interest rate derivative contracts. These interest rate benchmarks play an important role in the functioning of modern financial markets. They are designed to be representative of wider market conditions, providing participants with information about the 'going price' and thereby reducing information asymmetry.

A.1.2. Furthermore, within the macroeconomic policy space, interest rate benchmarks are used for purposes of informing as well as judging the effectiveness of monetary policy. In this regard, interest rate benchmarks are, or can be, used as operating targets for monetary policy implementation frameworks as well as to gauge the effectiveness of transmission of monetary policy from the central bank's policy rate to the broader cost of capital and other economic variables. For financial stability policy, interest rate benchmarks and overnight interbank transactions can be used in monitoring frameworks to indicate stress in certain sectors.

A.1.3. Given their widespread use for performance measurement or as reference rates in financial contracts, it is vital that consumers and market participants are confident that interest rate benchmarks – particularly those that lie at the heart of systemically important markets – are credible, trustworthy and

accurate. A sound framework is required to produce interest rate benchmarks that are at the centre of well-functioning markets.

A.1.4. Global interest rate benchmarks such as the London Interbank Offered Rate (Libor) and other major 'Ibors' are examples of benchmarks that play a fundamental role in the global financial system. Subsequent to the events related to the actual and attempted manipulation of Libor in 2012, there has been a coordinated response from international regulators and central banks[1] to improve the robustness, reliability and transparency of interest rate benchmarks, particularly those that have been identified as systemically important. To give effect to this, the Financial Stability Board (FSB) established a high-level Official Sector Steering Group (OSSG) of regulators and central banks. In July 2014, the OSSG published a report, which proposed recommendations for enhancing existing benchmarks for key interbank unsecured lending markets by underpinning these benchmarks to the greatest extent possible with transaction data (Ibor Plus). The OSSG also recommended the development and adoption of risk-free interest rate benchmarks (Ibor RFRs) where appropriate, given that there are certain financial transactions, including many derivative transactions, better suited to reference rates that are closer to risk-free. Subsequent to the release of that report, the OSSG published a series of progress reports on the implementation of its 2014 recommendations.

A.1.5. Since July 2014, the administrators of the most widely used Ibors have taken steps to strengthen their respective Ibors in order to meet the objectives set for Ibor Plus. These steps include reviews of respective benchmark methodologies and definitions; data collection exercises;

[1] These include the *Wheatley Review of Libor as well as* a report by the Bank for International Settlements (2013), the development of the Board of IOSCO Principles for Financial Benchmarks and the Financial Stability Board's initiatives on benchmark reforms.

feasibility studies; consideration of transitional and legal issues; and broad consultations with submitting banks, users and other stakeholders.

A.1.6. The OSSG members have also made progress in identifying potential risk-free rates (RFRs) and, in some cases; strategies have been identified to create liquidity in the underlying markets for the newly developed RFRs.

A.1.7. As work on developing RFRs proceeds, several authorities are considering how to facilitate the availability of RFRs at terms longer than overnight.

A.1.8. Against this backdrop, and based on international trends, it has become apparent that the current design of interest rate benchmarks in South Africa is not fully aligned with the new global standards for the design of interest rate benchmarks.

A.2. The South African perspective

A.2.1. In South Africa, Jibar is the key money market benchmark used as a reference interest rate for financial instruments and derivatives; with the three-month Jibar rate being the most widely used and accepted reference for South African rand-denominated financial contracts. It is estimated that the total value of outstanding derivative and non-derivative contracts that reset against the three-month Jibar rate exceed R40 trillion. Jibar is also a key input in the determination of the Short- Term Fixed-Interest (STeFI) Index, which is a non-tradable index used for benchmarking money market portfolios. These two main uses of Jibar highlight the extent to which Jibar is entrenched in the domestic money market, thus underscoring its importance both as a reference rate and as a channel for transmitting monetary policy.

A.2.2. As part of good governance, the SARB regularly reviews all aspects of Jibar. The 2011 review of Jibar focused on both the methodological and governance aspects of the Jibar determination process. For this purpose, the Reference Rate Working Group (RRWG)[2] was established. The review culminated in the release of the Jibar Code of Conduct, Governance Process and Operating Rules (Jibar Code), first published in March 2013. Since then, as part of the ongoing reassessment process, further changes have been effected, based on experience of working with the Jibar Code.

A.2.3. In 2015, the SARB embarked on a data collection exercise aimed at establishing the extent to which Jibar remained an appropriate and representative sample of banks' money market funding. The outcome of the exercise revealed that banks predominantly funded themselves by issuing wholesale deposit liabilities. It was also found that negotiable certificate of deposit (NCD) issuance during the period under review was concentrated in the medium- to longer-term space (i.e. 6 to 12 months), while the vast majority of financial contracts reset against the three-month rate.

A.2.4. The findings of the SARB analysis raised questions with regard to the robustness, representativeness and credibility of Jibar. The SARB also concluded that there were insufficient transactions in the NCD market for it to meet the International Organization of Securities Commissions' (IOSCO) requirements on data sufficiency and benchmark design. Not only was there insufficient transaction data to view the NCD market as 'active', but the benchmark is also not based on transaction data. Furthermore, the inflexibility of three-month Jibar relative to moves in the three-month

[2] The Reference Rate Working Group was established as a working group of the Money Market Subcommittee of the Financial Markets Liaison Group to assume the responsibility for the first revision of Jibar and, after the first publication of the Jibar Code of Conduct, Governance Process and Operating Rules, the continuation of research around the enhancement of domestic interest rate benchmarks.

Treasury bill yield also indicated that the key three-month Jibar rate was not reflective of market conditions.

A.2.5. The SARB also worked with the RRWG to reform the current money market overnight interest rate benchmark Sabor. The SARB already requested banks in 2014 to submit proposals on how to revise Sabor. The key concern with regard to Sabor is that it currently includes FX swaps that are structurally different from other subcomponents of the benchmark.

A.2.6. Subsequent to the 2015 data collection exercise, the SARB requested banks to submit proposals on how to revise and improve Jibar. Proposals regarding Sabor and Jibar were tabled at FMLG meetings in 2014 and 2016, respectively, but they were not deemed adequate. Resolutions was taken that the SARB should conduct a comprehensive review of interest rate benchmarks and draft a consultation paper on reforms in the domestic market. The SARB Working Group on Rand Interest Rate Benchmarks (Working Group) was established for this purpose, with representation from various departments within the SARB and led by the Financial Markets Department. In the research process, consultations were held with large domestic banks, asset managers, hedge funds, relevant industry bodies, the FSCA, the JSE Limited (JSE), and the central securities depositories (CSDs). Following these consultations, transaction data was collected from the five largest domestic banks.[3] In the analyses of these data, various approaches to calculate and publish additional benchmark rates, overnight rates and RFRs were considered and form the basis of the recommendations contained in this consultation paper.

[3] Standard Bank, Nedbank, FirstRand Bank, Absa Bank and Investec Bank.

A.3. Findings

A.3.1. The Working Group conducted research on various interest rate benchmarks and key findings (KF) in respect of Jibar are as follows:

KF.1. Within the wholesale market, fixed and floating-rate deposits comprise the largest source of funding, ahead of NCDs. Within the NCD universe, three-month NCDs, which are used as a basis for calculating the three-month Jibar, account for less than 3% of total issuance.

KF.2. Jibar is based on indicative rates and not actual transactions. In addition, there are insufficient transactions in the NCD market for Jibar to meet the IOSCO principles of benchmark design.

KF.3. While market participants recognise that Jibar falls short of IOSCO standards, there appears to be some reluctance to changing it due to concerns about the cost and complexity of transitioning to a new reference rate. However, market participants believe that the calculation methodology should be changed.

A.3.2. In considering various alternatives to the current Jibar calculation methodology, the Working Group found the following:

KF.4. Sporadic issuance of three-month NCDs means that a mere change to the data collection methodology will not address the concerns about data sufficiency in the Jibar calculation process.

A.3.3. The Working Group went further to investigate the possibility of basing Jibar on observable transactions in related markets. One option was to anchor Jibar to observed promissory note transactions as a related market. Upon investigating this alternative, the Working Group found the following:

KF.5. The volume of promissory notes (PNs) in circulation is too small to make a significant improvement to the calculation of Jibar.

A.3.4. Another related market considered was the market for fixed-rate wholesale deposits. In this regard, the Working Group found the following:

KF.6. On a daily basis, non-bank financial corporate (NBFC) deposits range between R10 billion and R30 billion. As such, this deposit category adds substantial volume per day to the universe of transactions that underpin the proposed reformed Jibar.[4]

KF.7. NCD issuance typically ranges between 0% and 2% of the transaction universe of the proposed reformed Jibar, while NBFC deposits account for approximately 98%. Effectively, this makes the proposed reformed Jibar an interest rate on wholesale NBFC deposits. The reformed Jibar averages 20 basis points above the current Jibar, but exhibits a similar degree of volatility.

KF.8. The volume and frequency of NBFC deposits is large enough to address the issues of data sufficiency and mismatch with the volume of contracts that reset against Jibar.

KF.9. The reformed Jibar based on NCDs and NBFC deposits is a more accurate reflection of banks' actual wholesale funding costs.

A.3.5. In line with the Bank for International Settlements' (BIS) recommendation for a multiple rate approach and the long-term vision to create more interest rate benchmarks that are fit for purpose, the Working Group proposes a solution, which requires the development of credit risk-inclusive reference rates to be used for the pricing of unsecured on-balance sheet items as well as RFRs for collateralised transactions. With respect to the former, the Working Group investigated the possibility of developing a term deposit benchmark comprising all deposit categories and found that:

KF.10. Fixed-rate wholesale deposits constitute a large portion of total wholesale bank funding. An interest rate benchmark derived from

[4] Reformed Jibar refers to the hybrid Jibar, which is explained in Section 3.3.3.

this market would thus allow for the formulation of an interest rate that provides a better reflection of the realities of the domestic money market.

KF.11. From a data sufficiency point of view, the statistics on daily volume and number of transactions of wholesale bank deposits provide reasonable comfort that an interest rate benchmark derived from this market will be IOSCO-compliant.

KF.12. A term deposit benchmark based on current fixed-rate wholesale deposit transactions complies with the IOSCO principles of data sufficiency and presents a viable alternative to a reformed Jibar.

A.3.6. The Working Group also conducted a review of Sabor, with the intention to reform the benchmark as well as propose additional overnight interest rate benchmarks. This research revealed the following:

KF.13. Sample data on overnight FX swaps – a subcomponent of Sabor – are inadequate as the underlying data was found to be insufficient, highly concentrated and not necessarily observable.

KF.14. It is difficult to justify the inclusion of FX swaps in the Sabor calculation as FX swaps are structurally different from deposits (i.e. FX swaps are secured, while deposits are unsecured), are not a directly observable rate as they are implied from FX forward points and are subject to regulatory constraints that cause pricing frictions.

KF.15. An interest rate based on unsecured overnight interbank deposits is required. Furthermore, given the minimal credit and liquidity risks of the underlying transactions, such a rate could be considered as a near RFR.

A.3.7. Lastly, in light of the global shift towards the use of RFRs as reference interest rates for derivative contracts, the Working Group holds a view that such benchmarks should be calculated and published in South Africa. On the one hand, these RFR benchmarks will serve as ‘fall-backs’ in the case

that unsecured benchmarks are permanently discontinued and, on the other hand, will facilitate policymakers' task in monitoring the transmission of monetary policy. In conducting its research on RFRs, the Working Group found the following:

KF.16. There are no risk-free money market interest rate benchmarks currently published in the South African financial markets.

KF.17. The secondary market for Treasury bills in South Africa – a potential source market for calculating term RFRs – is illiquid, mainly due to banks buying and holding Treasury bills for prudential reasons.

KF.18. The government bond (GB) repurchase (repo) market in South Africa, which the Working Group considered as the primary choice for overnight and one-week RFRs, is not a general collateral (GC) market in the true sense, as the former is driven by holders of bonds who need to fund their long bond positions.

KF.19. Activity in longer GB repos is scarce and this presents a challenge for using GB repos as a basis for calculating term RFRs.

KF.20. While the GB repo rate is a secured rate, it trades at a spread above the unsecured overnight rate, the Sabor.

A.4. Key recommendations

A.4.1. With respect to Jibar, the Working Group's key recommendations (KR) are that:

KR.1. The current calculation of Jibar be phased out and that a transaction-based rate, comprising NCDs and NBFC deposits, be introduced to reform the current Jibar.

A.4.2. With respect to the overall use of interest rate benchmarks, the Working Group recommends that:

KR.2. Risk-inclusive reference rates be used for the pricing of unsecured on-balance sheet (Jibar-linked) items and risk-free reference rates be used for collateralised transactions and derivative contracts.

A.4.3. With respect to developing an additional risk-inclusive benchmark, the Working Group recommends that:

KR.3. A term deposit benchmark be introduced, which could also serve as an alternative to the proposed reformed Jibar. This deposit benchmark will be based on eligible deposit transactions from all banks. Furthermore in order to leverage on deposit data more exhaustively, an interpolated benchmarking methodology be considered as a fall-back in times where there are insufficient data within the standard maturity buckets.

A.4.4. With respect to Sabor, the Working Group recommends that:

KR.4. Sabor be reformed and renamed Sabor Money Market which reflects eligible overnight unsecured funding from all banks, including funding obtained at the prevailing repo rate, but excluding overnight FX swaps.

KR.5. A new interest rate based solely on eligible overnight interbank transactions from all banks, the South African Rand Interbank Overnight Rate, (ZARibor) be calculated, and be considered as a near RFR.

A.4.5. With respect to RFR benchmarks, the Working Group recommends:

KR.6. An improvement in the liquidity of the secondary market for Treasury bills. Steps in that direction entail the inclusion of Treasury bills in the GB electronic trading platform (ETP), the use of primary dealers to quote prices, a Treasury bill repo facility and the daily collection of transaction data.

KR.7. A South African Secured Financing Rate (SASFR) be calculated, based on supplementary repos conducted with the SARB as well as overnight funding in the GB repo market.

KR.8. SASFR as the reference interest rate for the overnight index swap (OIS) market.

KR.9. GB repo and/or SASFR be used as overnight RFRs for South Africa. Furthermore, if designated as a near RFR, ZARibor could also be used for that purpose.

KR.10. The development of a broader GC repo market with a broader pool of collateral than the current GB repo market.

Chapter 1
Introduction

1.1. Credible benchmark and reference interest rates are essential for the smooth and effective functioning and monitoring of the financial system, both for financial market participants and regulators. These interest rate benchmarks are intended to serve as accurate and reliable indicators of the economic realities of the underlying markets they measure. Reliable interest rate benchmarks are those that, for example, help measure portfolio performance, provide an accurate indication of liquidity conditions in the overnight money market, and assist in the implementation and transmission of monetary policy. It is important to ensure that an adequate suite of benchmark interest rates exists and that their calculation methodologies, characteristics and governance adhere to global best practices.

1.2. Cases of actual and attempted market manipulation and false reporting of global interest rate benchmarks – most notably in the case of the Libor in 2012 – together with a post-crisis decline in liquidity in unsecured interbank funding markets undermined confidence in, and reliability and robustness of, existing interest rate benchmarks globally. International regulators and central banks responded with coordinated efforts to improve the resilience and transparency of these interest rate benchmarks, particularly those used as reference interest rates or those that have been identified as systemically important. In addition to reviewing existing interest rate benchmarks, regulators have also committed to broadening the suite of interest rate benchmarks where necessary, in order to enable market participants to have choices of interest rate benchmarks that are ‘fit for purpose’.

1.3. One of the most important reference rates in South Africa is the Jibar, calculated for various maturities up to 12 months. The three-month Jibar is also used by commercial banks to price a sizeable portion of assets and liabilities on and off their balance sheets. The SARB is constantly in

consultation with market participants to discuss ways of enhancing existing interest rate benchmarks as well as the need for the development of additional ones. Against this backdrop and based on international trends, it has become apparent that the current design of Jibar is not aligned with the global standard for financial benchmarks. In particular, a review exercise conducted by the SARB revealed that Jibar is increasingly based on a dwindling component of money market activity. In further consultations between the Working Group and market participants, it was found that the calculation methodology for Jibar could benefit from refinements. Similar and other concerns were raised for yet another key, but not as widely used, benchmark in the domestic market – the Sabor. Market participants have also emphasised the need for a risk-free yield curve as a benchmark for cash-collateralised derivative contracts.

1.4. In light of this, the FMLG prioritised the revision of Jibar and Sabor in the domestic market. The objective of these revisions is to calculate benchmark rates that will comply with global standards in order to ensure the credibility of the local financial markets. The first revision of Jibar occurred towards the end of 2011, before the Libor crisis of 2012. For this review, the RRWG was established. The review culminated in the drafting and publication of the Jibar Code. This Code has subsequently been revised to improve the governance standards of Jibar. The existence of the Code has given additional credibility to the Jibar rate-setting process.

1.5. Notwithstanding the latter review efforts and given the coordinated efforts to improve the resilience and transparency of global interest rate benchmarks, the objective of this consultation paper is to propose a suite of reliable and robust interest rate benchmarks that could also be used as reference rates by market participants. This will promote efficient pricing in the domestic financial markets through improved transparency. Greater transparency will also support the SARB’s analyses of monetary policy

transmission as well as the monitoring of conditions in financial markets with the ultimate aim of achieving and maintaining financial stability.

1.6. Chapter 2 of the consultation paper provides an overview of international recommendations and reforms in respect of interest rate benchmarks, as well as the design of interest rate benchmarks. In Chapter 3, the consultation paper reviews the current design of Jibar and Sabor and proposes reforms and alternatives, such as a term-deposit benchmark. Chapter 4 discusses proposals for risk-free benchmarks. In Chapter 5, the consultation paper reviews the importance of credible interest rate benchmarks for monetary and financial stability policy frameworks. Chapter 6 summarises the recommendations and provides milestones for the way forward.

Chapter 2

International perspective on interest rate benchmark reforms

Overview

Chapter 2 provides a background to the official institutions' responses to the actual and attempted market manipulation and false reporting of global interest rate benchmarks used as references. These incidents, together with post-crisis declines in liquidity in unsecured interbank funding markets, have undermined confidence in the reliability and robustness of existing interbank interest rates. The key recommendations of the Official Sector Steering Group (OSSG) are summarised, interest rate benchmarks are defined, and the International Organization of Securities Commissions' (IOSCO) principles for the design of financial benchmarks are discussed. This chapter reflects the context of the global standards and practice which informed the proposals to reform and strengthen existing benchmarks and to propose alternatives in order to address the deficiencies in existing benchmarks.

Additional information on global interest rate benchmark reforms as well as progress with the reform of unsecured and risk-free interest rate benchmarks are discussed in Annexures 1 and 2.

2.1 Interest rate benchmarks and reference interest rates defined

2.1.1 A wide range of benchmarks exists across countries and markets, including interest rate, equity, credit, commodity and FX markets. Broadly, interest rate benchmarks, discussed in this consultation paper, are similarly defined in the literature.[5] The Financial Services and Markets Act 2000 in the United Kingdom (UK), as amended by the Financial Services Act 2012, states that a benchmark means an index, rate or price that:

2.1.1.1 is determined from time to time, by reference to the state of the market;

2.1.1.2 is made available to the public (whether free of charge or on payment); and

[5] This is based on IOSCO publications, the *Fair and Effective Markets Review* published by the Bank of England and the consultation paper by the European Securities and Markets Authority (ESMA) titled 'Principles for benchmark-setting processes in the EU'.

2.1.1.3 is used for reference for purposes of:

i. determining payoffs under financial or other contracts relating to investments;

ii. determining the price at which investments may be bought or sold, or the mere value thereof; or

iii. measuring investment performance.

2.1.2 In investment circles, almost all benchmarks are indices, although not all indices are benchmarks. The terms ‘benchmarks’ and ‘indices’ are often used interchangeably, but in their purest, theoretical sense, they describe different things.

2.1.3 The EU Benchmarks Regulation defines an index as a figure that is publicly available and is regularly determined, either by applying a formula or other calculation or making an assessment on the basis of the value of one or more underlying assets/prices (including estimated prices, actual or estimated interest rates, quotes and committed quotes, or other values or surveys). An index becomes a benchmark within the scope of the EU Benchmarks Regulation when:

2.1.3.1 it is used to determine the amount payable under a financial instrument or financial contract, or the value of a financial instrument; or

2.1.3.2 it is used to measure the performance of an investment fund for tracking returns or computing the performance fees.

2.1.4 Annexure 1 provides a list of major interest rate benchmarks, including Libor, the Euro Interbank Offered Rate (Euribor) and the Tokyo Interbank Offered Rate (Tibor). These interest rate benchmarks are collectively referred to as ‘Ibors’ and play a fundamental role in the global financial

system. The overnight interest rate benchmarks in these jurisdictions are also summarised in the annexure.

2.2 The nature and use of interest rate benchmarks

2.2.1 Some interest rate benchmarks are used as reference interest rates that underpin the pricing of wholesale and retail financial contracts worth trillions of dollars globally, or to measure the performance of investment funds. The OSSG (Financial Stability Board, 2014) defines reference interest rates as "[…] interest rates underpinning a wide array of financial instruments used in global financial markets". Reference rates are therefore commonly used interest rates that link payments in a financial contract to standard money market interest rates. As a result, certain reference rates are deeply embedded in financial systems, especially in loan and interest rate derivative contracts.

2.2.2 Interest rate benchmarks can either be secured or unsecured. Secured interest rates are based on transactions that are backed by collateral but do not necessarily exclude credit risk (hence they are referred to as 'near RFRs'). Where there is no credit risk, an interest rate benchmark is referred to as being 'risk-free'. Typically, RFRs are based on financial instruments that are government guaranteed or backed by government-guaranteed collateral. Unsecured rates are based on transactions that are not backed by any collateral.

2.2.3 These interest rate benchmarks play an important role in the functioning of modern financial markets. They are designed to be representative of wider market conditions, providing participants with information about the 'going price' and thereby reducing information asymmetry. Increased transparency about the pricing of financial instruments encourages greater market participation and improves market efficiency and integrity. Within the

macroeconomic policy space, interest rate benchmarks are also used for purposes of informing and judging the effectiveness of monetary policy. For financial stability policy, interest rate benchmarks are used in monitoring frameworks to indicate stress in certain sectors. For monetary policy, interest rate benchmarks are, or can be, used as operating targets for monetary policy implementation frameworks and to gauge the transmission of monetary policy to the desired intermediate and end targets. The use of interest rate benchmarks for these purposes underscores their importance and thus the need for them to be robust and reliable as indicators of conditions in the underlying market(s) to the greatest extent possible. Moreover, interest rate benchmarks must exhibit a great amount of proximity to underlying policy rates or other short-term money market interest rates.

2.2.4 Cases of actual and attempted market manipulation and false reporting of global interest rate benchmarks used as references, together with post-crisis declines in liquidity in unsecured interbank funding markets, have undermined confidence in the reliability and robustness of existing interbank interest rates. This represents a potential source of vulnerability and systemic risk as well as risks of widespread market disruptions. Some interest rate benchmarks are considered systemically important, with the potential to cause financial instability if they become unavailable or lose integrity. Given their widespread use for performance measurement or as reference rates in financial contracts, it is vital that consumers and market participants are confident that interest rate benchmarks – particularly those that lie at the heart of systemically important markets – are credible, trustworthy and accurate. This makes a sound framework for producing interest rate benchmarks essential for well-functional markets.

2.2.5 Subsequent to the series of Libor-related incidents in 2012, there has been a coordinated response from international regulators and central banks to

improve the resilience and transparency of interest rate benchmarks, particularly those that have been identified as systemically important. That response included:

i. the *Wheatley Review of Libor*;[6]
ii. a report by the BIS in March 2013, titled 'Towards better reference rate practices: a central bank perspective';
iii. the development of IOSCO principles (see Annexure 3);
iv. the Financial Stability Board's initiatives on interest rate benchmark reforms, including the establishment of the OSSG in July 2013 and the publication of a report by the Market Participants Group titled 'Reforming interest rate benchmarks' published in March 2014;
v. the OSSG paper titled 'Reforming major interest rate benchmarks' published in July 2014; and
vi. the OSSG publication in subsequent years of interim reports on the implementation of the OSSG's July 2014 recommendations.

2.2.6 Parallel to initiatives in other forums and jurisdictions – including work by IOSCO, the European Banking Authority/European Securities and Market Authority, and the UK *Wheatley Review* – the March 2013 BIS report provides recommendations on how to improve reference interest rate practices from a central banking perspective. Further, the report reflects on the possible risks for monetary policy transmission and financial stability that may arise from deficiencies in the design of reference interest rates, market abuse or from market participants using reference interest rates, which embody economic exposures other than the ones they actually want or need.

[6] Martin Wheatley was the head of the UK Financial Services Authority and led the review of Libor. The review found fundamental problems with the calculation and supervision of the Libor-setting process and it was ultimately concluded that Libor should be reformed.

2.2.7 The BIS[7] report's crucial impact on the extensive debates on interest rate benchmarks stemmed from its emphasis that reform efforts would not be sufficient if they focused only on enhancements to governance and control standards. In addition to these two focus areas, the BIS report also raised concerns about the appropriateness of the processes and methodologies used in formulating interest rate benchmarks and emphasised the need and objective for a range of benchmark interest rates that are suitable for different purposes (multiple rates approach). This underscored the need for interest rate benchmarks to reflect developments in their underlying markets. In this regard, the report highlighted the sharp contraction in market activity since 2007, which has raised concerns about the robustness and usefulness of reference interest rates based on term unsecured interbank markets, particularly in periods of stress. Since the publication of this report, there have been some changes in market behaviour, which include:

2.2.7.1 an increase in secured wholesale lending, while unsecured lending has declined sharply (except for short maturities);

2.2.7.2 the development of the overnight index swap (OIS) market, which has provided tools to lock in term rates while incurring much reduced credit exposures; and

2.2.7.3 global markets trending towards the central clearing of derivatives, resulting in increased standardisation and the use of collateral in such transactions. Relevance of unsecured rates as references and valuation inputs for derivatives are less evident.

[7] 'Towards better reference rate practices: a central bank perspective', BIS, March 2013.

2.2.8 In 2013, following the BIS recommendations, the IOSCO Board published a set of principles (IOSCO principles) to be adopted by benchmark administrators to improve the robustness and integrity of financial market benchmarks in general. The IOSCO principles, discussed in more detail below, were endorsed by the Group of Twenty (G20) FSB as the global standard for financial benchmarks. Among other things, the IOSCO Board outlined principles for the design of benchmarks, including requirements in terms of data sufficiency, their accuracy in representing the underlying market and their robustness in times of market stress.[8] To be deemed credible, benchmarks need to comply with these principles.

2.2.9 Echoing the spirit of these design principles, in 2014 the OSSG recommended enhancing existing benchmarks for key interbank unsecured lending markets (Ibor) by underpinning them to the greatest extent possible with transactions data (Ibor Plus), and promoting the development and adoption of RFRs, where appropriate (Ibor risk-free). Annexure 2 elaborates on the evolution of the official interest rate benchmark reform recommendations. The annexure also provides a summary of progress with the implementation of the OSSG's recommendations on global interest rate benchmark reforms.[9]

2.3 The design of interest rate benchmarks

2.3.1 In designing both secured and unsecured interest rate benchmarks, there is great emphasis on ensuring they are robust and reliable, and are subjected to a common and consistent regulatory framework.[10] In 2013, pursuant to this realisation, the IOSCO Board published the Principles for Financial Benchmarks[11] that are intended to promote the reliability of

[8] Annexure 3 provides a summary of the IOSCO principles.
[9] This discussion is based on the OSSG implementation report of October 2017.
[10] See the latest EU Benchmark Regulation as an example outside of official sector initiatives.
[11] See Annexure 3 for a comprehensive summary of the principles.

benchmark determination as well as to address their governance, quality and accountability mechanisms. These principles have since been used as the basic properties that new and existing interest rate benchmarks should satisfy in order to minimise fragility. The Working Group on Sterling Risk-Free Reference Rates is one example of a work stream that has used the IOSCO principles as basic design criteria for its proposed sterling-secured risk-free reference rate.[12]

2.3.2 Similarly, in this consultation paper, the design criteria for the interest rate benchmarks proposed are based on IOSCO principles (Annexure 3) as the basic selection criteria. In particular, this consultation paper focuses on the quality of the benchmark requirements (principles 6, 7 and 8) and certain aspects of the quality of the methodology requirements (principles 11 and 12), while detailed discussions and/or proposals on governance will be dealt with during the operationalisation phase of the proposals. With respect to the criteria on the quality of the benchmark, the following selection criteria will apply:

2.3.2.1 Benchmark design

This principle requires that a benchmark be designed in such a way that it results in an accurate and reliable representation of the economic realities of the interest it seeks to measure. The design should consider the following:

i. adequacy of the sample used to represent the interest rate benchmark;
ii. relative size of the underlying market, where the volume of trading in the market that references the benchmark can be used as a basis to judge the size;

[12] See the paper titled 'Sonia as the RFR and approaches to adoption' published by The Working Group on Sterling Risk-Free Reference Rates in June 2017.

iii. distribution of the underlying market among market participants in order to avoid market concentration; and
iv. market dynamics.

2.3.2.2 Data sufficiency

This principle requires that data used to construct an interest rate benchmark must be sufficient to accurately and reliably represent the interest measured. Furthermore, the data should be based on prices or rates that have been formed by the competitive forces of demand and supply in an active market, and should be anchored by observable transactions. In applying this criterion, consideration should be given to other forms of data where transaction data is not available. This means that a need to apply the waterfall approach might arise where there is no observable transaction.

2.3.2.3 Hierarchy of data inputs

This principle requires benchmark administrators to make guidelines available on the hierarchy of data inputs to be used when determining an interest rate benchmark. In addition to actual transaction data, the principle makes provision for the use of other inputs, such as executable bids and offers as well as expert judgement. Specifically, this principle requires that, in general, the hierarchy of data inputs should include:

i. where a benchmark is dependent on submissions, the submitters' own concluded arm's-length transactions in the underlying interest or related markets;
ii. reported or observed concluded arm's-length transactions in the underlying interest;
iii. reported or observed concluded arm's-length transactions in related markets;
iv. firm (executable) bids and offers; and

v. other market information or expert judgments.[13]

Of importance is that this requirement does not restrict an administrator from employing multiple data inputs even when there is an observable transaction. This discretion rests with the administrator, as long as it improves the quality and integrity of the benchmark.

2.3.3 Subsequent to the IOSCO guideline on the hierarchy of data inputs, the OSSG provided further guidance on the sequence of preferred data inputs – the waterfall approach. This waterfall approach requires that benchmark determination is based on the following information content:

i. transaction data;
ii. live, tradable prices; and
iii. expert judgment.

2.3.4 The Working Group's proposals will be based on this waterfall approach. It is possible that in using a waterfall approach, there may be methodological differences in how a benchmark is determined. This may result in level differences in the interest rate, which the Working Group, along with market participants, will need to deliberate and agree on. Furthermore, more clarity is required in terms of when and how each of the types of data defined in the waterfall approach will be applied.

2.3.5 In addition to these IOSCO requirements, the Working Group will consider additional design criteria when developing its proposals[14]. The design criteria are, among other things, informed by the need and use of a particular interest rate benchmark and include the following requirements:

i. minimal opportunities to manipulate the benchmark;

[13] See IOSCO Principles for Financial Benchmarks and/or Annexure 3.
[14] Reference in this regard was also made to the work of the Working Group on Sterling Risk-Free Reference Rates in a paper titled 'Criteria to consider for new GBP RFR' published in December 2016.

ii. sensitivity to market conditions (including proximity to the underlying policy rate, changes in regulatory requirements and policy frameworks);
iii. ability to monitor and possibly improve monetary policy transmission via the interest rate channel;
iv. ability to enhance the information content of the monitoring frameworks;
v. where relevant, suitability as a reference rate in wholesale and retail markets; and
vi. the extent to which an interest rate benchmark reflects funding costs, where such an interest rate benchmark is designed to capture the cost of funding.

2.3.6 The Working Group further recognises that in instances where the proposals contained in this consultation paper reform existing benchmarks, there may be some disruptions. Therefore, consideration will be given to end-user needs such as ensuring, to a reasonable extent, close proximity between new and existing interest rate benchmarks as well as a smooth transition to new interest rate benchmarks. For this reason, the Working Group's proposals will be designed in such a way that they are relatively easy to adopt and transition from existing benchmarks to new benchmarks. It is equally important that, while recognising the need to serve the interests of the domestic money markets, consideration be given to designing interest rate benchmarks that are internationally recognised. The use of IOSCO principles as part of the basic design of the proposed interest rate benchmarks gives effect to this.

2.3.7 In applying these criteria, the Working Group is cognisant of the possibility of not being able to satisfy all the criteria. However, all reforms and alternative proposals contained in this consultation paper must, at the very least, be as close as possible to achieving the objectives of each criterion.

Where these criteria cannot be satisfied and it is necessary but not possible to do so in the present time, the Working Group will outline proposals on how this can be achieved in future.

Chapter 3

The South African perspective

Reform of, and alternative proposals for, existing interest rate benchmarks

Overview

Chapter 2 discusses, among other things, the global standard for the design of interest rate benchmarks. The design of interest rate benchmarks currently available in South Africa is not fully aligned with these standards. Consequently, this chapter assesses the appropriateness of existing benchmarks as well as alternatives to (specifically) Jibar and Sabor aimed at enhancing the credibility of interest rate benchmarks in South Africa. The chapter contains proposals to reform the aforementioned interest rate benchmarks and, where reform is not a viable solution, proposals for alternatives.

The research conducted revealed that:

i. the three-month Jibar is the most widely referenced benchmark in South Africa, yet there are insufficient transactions in the Negotiable Certificates of Deposit (NCD) market for Jibar to meet the IOSCO requirement on data sufficiency and benchmark design;

ii. Jibar calculations are based on indicative screen prices as opposed to actual transactions; and

iii. the inclusion of overnight foreign exchange (FX) swaps in the calculation of Sabor creates challenges both related to data frequency and concentration, as well as structural differences with overnight deposits

Against this backdrop, the Working Group recommends that:

i. the current calculation of Jibar be phased out;

ii. a transaction-based hybrid rate, comprising both NCDs and non-bank financial corporate (NBFC) deposits, be introduced as a reform to the current Jibar;

iii. a term deposit benchmark be introduced as an alternative to the reformed Jibar;

iv. in order to leverage on deposit data more exhaustively, an interpolated benchmarking methodology be considered as a fall-back in times where there are insufficient data within the standard maturity buckets;

v. Sabor be reformed and renamed Sabor Money Market which reflects all overnight unsecured funding, including funding obtained at the prevailing repo rate, but excluding overnight FX swaps; and

vi. a new rate based solely on overnight interbank transactions (South African Rand Interbank Overnight Rate, ZARibor) be calculated and considered as a near risk-free rate (RFR).

3.1 Background

3.1.1 The current design of key interest rate benchmarks in South Africa is not fully in line with the principles discussed in Chapter 2. As mentioned, Jibar is the key interest rate benchmark used as a reference in the South African market and represents the domestic equivalent of Ibor Plus.[15] The three-month Jibar rate is the most widely used and accepted benchmark and reference interest rate for South African rand-denominated financial contracts such as interest rate derivatives and the pricing of banks' balance sheet items. It is estimated that the total value of derivative and non-derivative contracts that reset against the three-month Jibar rate exceed R38.0 trillion and R2.0 trillion respectively (see Table 1). Jibar is also a key input in the determination of the STeFI Index, which is a non-tradable index used for benchmarking money market portfolios.

Table 1 Jibar footprint in the South African financial markets[16]

		Amount outstanding (ZAR billion)		% growth since 2015
Derivatives that reset against Jibar	Forward rate agreements	R	26,821	72
	Interest rate swaps	R	9,654	52.3
	Cross-currency swaps	R	745	6
	Other	R	645	-16.7
Non-derivative assets that reset against Jibar	Secured assets	R	19	65.9
	Unsecured assets	R	968	25.4
	Liabilities	R	766	10.6

Source: SARB

3.1.2 These two main uses of Jibar highlight the extent to which Jibar is entrenched in the domestic money market, thus underscoring its

[15] See Annexure 4 for indices, interest rate benchmarks and reference interest rates calculated in the domestic market.
[16] These statistics are based on the results of a 2017 data collection exercise done by the Financial Markets Department of the SARB and reflect the notional value of outstanding contracts of selected banks as at 31 August 2017.

importance both as a reference rate and as a channel for transmitting monetary policy (see Chapter 6). However, over time, shifts in the funding behaviour of banks, which are considered important in the Jibar determination process, has called into question the reliability of Jibar, especially when taking into account the design criteria described in the preceding chapter.

3.1.3 Another important, but not as widely used, interest rate benchmark in the domestic money market is Sabor (see paragraph 4.5 for details about the construction of Sabor).[17] This interest rate benchmark is, among other things, used to determine interest expenses on margin cash placed under the SARB's main refinancing operations as well as payoffs on tax and loan account deposits. This also follows a number of interactions with market participants where concerns were raised about compliance with the IOSCO principles and global best practice standards. These concerns relate to the current data collection methodology (which relies on submission) as well as the validation of transactions in the underlying markets.

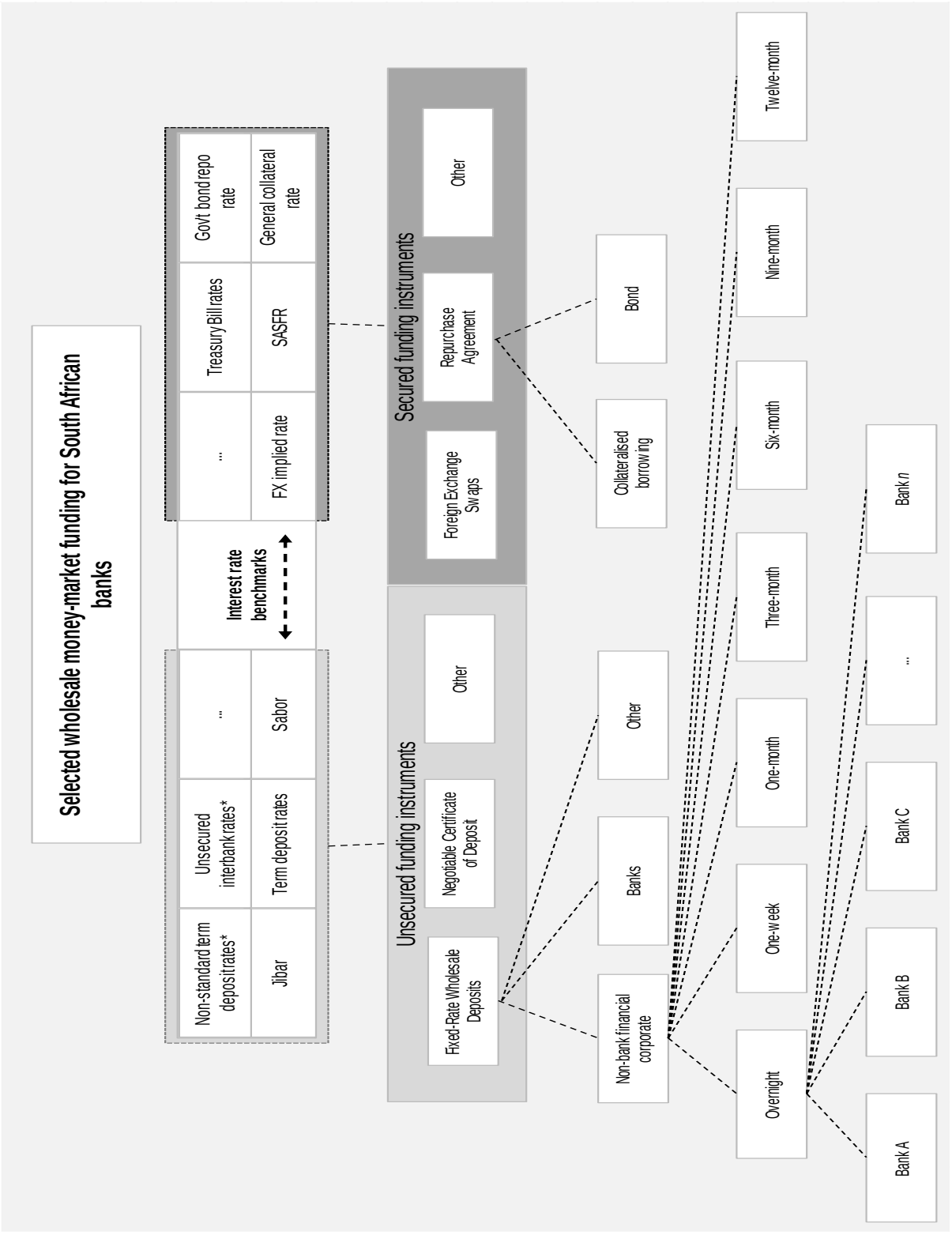
3.1.4 Against this backdrop, this consultation paper proposes plans to reform (with the intention to strengthen) the aforementioned interest rate benchmarks and, where reform is not a viable solution, to propose possible alternatives. The review is also being carried out in support of the SARB's strategic initiatives which, among other things, seek to maximise the effectiveness of monetary policy and enhance frameworks for systemic risk identification and monitoring. These strategic initiatives are in support of the SARB's mandate of achieving and maintaining price and financial stability. The newly developed or reformed interest rate benchmarks should therefore improve the efficiency and effectiveness of monetary policy

[17] There are other key interest rate benchmarks that are published in the domestic market but do not form part of this review. Annexure 4 provides a summary of some of the major interest rate benchmarks in the domestic financial market.

transmission as well as its transparency. Going forward, the very short maturity interest rates in the money market are expected to play an increasingly important role in the implementation of monetary policy. Moreover, the interest rate benchmarks proposed in this consultation paper should support the financial stability framework for macroprudential surveillance and aid the formulation of financial stability policy. The rationale for this is that monitoring and understanding developments in the money markets is important, both in judging the effectiveness of monetary policy implementation and as an input into the SARB's overall assessment of monetary and financial conditions, which in turn informs its monetary and financial stability policy decisions.

3.1.5 The manner in which the SARB envisages the structure of short-term wholesale money market interest rates in South Africa is depicted in Figure 1. The figure also details a bottom-up account of how the interest rate benchmarks proposed in this consultation paper will be determined.

Figure 1 A stylised depiction of selected wholesale money market funding for South African banks



3.1.6 According to the depiction, a bank can raise short-term funds with maturities ranging from overnight to 12 months using a variety of secured and unsecured funding instruments. Examples of unsecured funding instruments include fixed-rate wholesale deposits, certificates of deposits and promissory notes, while examples of secured funding instruments include repos and FX swaps. The list of funding instruments and counterparties included in the chart is not exhaustive. The top part of the pyramid shows the volume and interest rate information from the underlying secured and unsecured funding markets could be used to determine interest rate benchmarks. As the proposals show, various alternatives are considered, such as hybrid or blended interest rate benchmarks, where reference is made to related markets instead of one specific market. The remainder of this chapter provides specific details on how each of the interest rate benchmarks depicted in the chart will be determined, considering both the methodology and the underlying market.

3.2 The context for Jibar reform

3.2.1 As part of normal good governance, and in line with the global drive to enhance the credibility of reference rates, the SARB reviews, on a regular basis, all aspects of the structure of Jibar. In 2011, the SARB conducted a review of Jibar, which focused on both the methodological and governance aspects of the Jibar determination process. The review revealed that while there were no fundamental concerns around the Jibar determination process, certain aspects of the governance process could benefit from enhancements and formalisation. In line with this finding, the review recommended an establishment of a code of conduct with clear operating rules for the affected parties. Following the publication of the IOSCO principles, the SARB and the FSCA conducted a gap analysis of the existing Jibar Code, which resulted in further enhancements that were implemented in 2015.

3.2.2 In 2015, the SARB embarked on a data collection exercise aimed at establishing the extent to which Jibar remains an appropriate and representative sample of banks' money market funding. The exercise further sought to determine the size of the NCD market (used as a basis for Jibar) relative to derivative contracts that reference the benchmark.[18] The objective, scope and conclusions of this review are discussed in Box 1.

Box 1 The 2015 data collection exercise: The structure of bank funding

In 2015, the Financial Markets Department of the South African Reserve Bank (SARB) embarked on a data collection exercise to investigate the composition of short-term bank funding, with specific focus on analysing shifts into other funding instruments by the contributing banks. This investigation formed the start of the current review process discussed in this consultation paper. The initiative was triggered by the observed stagnation in the volumes of negotiable certificate of deposit (NCD) funding from which Jibar is derived, and sought to evaluate and understand the impact of Basel III regulation on the funding behaviour of banks and the implications for interest rate benchmarks. The scope of the review, which focused on the five main contributors to Jibar, covered:

- unsecured funding transactions carried out in rand with maturities of up to one year;
- funding transactions, with the exclusion of operational deposits as set out in regulation 26(12) of the Regulations relating to Banks;
- deposit transactions larger than R20 million, which had to include deposits raised by all business units of a bank;
- transactions classified by maturity, ranging from demand to long term (i.e. overnight to 366 days);
- the daily notional value of derivatives that reset against Jibar, specified by type of contract, including but not limited to forward rate agreements, interest rate swaps and cross-currency basis swaps, classified by the Jibar maturity it resets against (overnight, three-month, etc.); and
- the daily volume of non-derivative assets and liabilities that resets against Jibar, listed separately as aggregate secured and unsecured assets as well as liabilities, classified by the Jibar maturity they reset against (overnight, three-month, etc.).

The trends identified in the analysis were not surprising and revealed that Jibar could potentially be vulnerable to manipulation. Furthermore, questions were raised with regard to its credibility and whether it met the IOSCO requirements on the quality of financial benchmarks. Among other things, the former concern was informed by the mismatch between the aggregate volume of the derivative and non-derivative contracts that reset against the three-month Jibar rate, and the volume of three-month NCDs that are used to calculate the Jibar rate on which these contracts reset.

[18] The 2011 and 2015 reviews are among many other reviews and consultations conducted by the SARB with respect to Jibar and other key reference rates.

While the SARB was comfortable that the Jibar Code provides a good governance framework, the very low issuance volumes, particularly in the three-month maturity, presented a major concern.

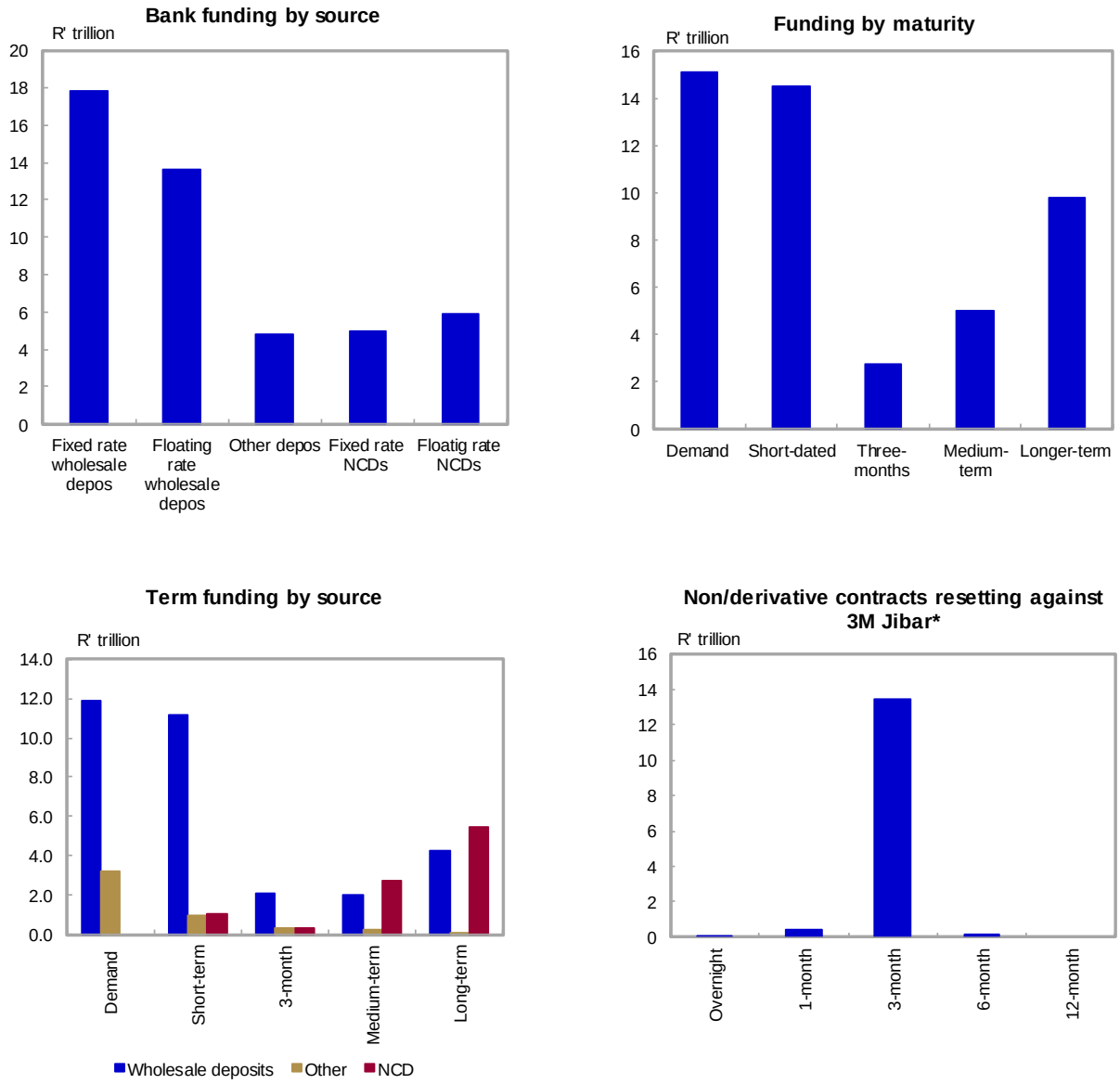
3.2.3 The outcome of the exercise (some of the results are depicted in Figure 2) revealed that banks predominantly funded themselves by taking in wholesale deposits. NCDs comprised the third-largest source of funding. It was also found that NCD issuance during the period under review was concentrated in the medium- to longer-term space (i.e. 6–12 months). The three-month point, which is used as a basis for calculating the three-month Jibar, had the lowest share of NCD flows. Less than 3% of all NCDs issued during the covered period had a maturity of three months. Instead, wholesale deposits were the dominant source used to raise shorter-term funding up to and including three-months.

3.2.4 Notwithstanding this distribution of fund flows, a majority of derivative instruments as well as bank assets and liabilities reset against the three-month Jibar rate.

KEY FINDING 1

Within the wholesale market, fixed and floating-rate deposits comprise the largest source of funding, ahead of NCDs. Within the NCD universe, three-month NCDs, which are used as a basis for calculating the three-month Jibar, account for less than 3% of total issuance.

Figure 2 Findings of the Jibar review exercise as at November 2015



* The totals shown in this figure reflect outstanding derivative and non-derivative contracts for the six-month period covered in the 2015 data collection exercise.

Source: SARB

3.2.5 As with the Financial Conduct Authority's (FCA) concerns relating to Libor[19], the two key findings of the SARB analysis raised questions with regard to the robustness, representativeness and sustainability of Jibar, and thus its credibility. Low volumes of the underlying three-month NCD markets (especially relative to other types of funding) informed the representativeness concern, while the fact that Jibar could potentially be vulnerable to manipulation informed the robustness concern. On the basis of these findings, the SARB concluded that there were insufficient transactions in the NCD market for it to meet the IOSCO requirement on data sufficiency and benchmark design. Not only was there insufficient transaction data to view the NCD market as 'active', the inflexibility of the three-month Jibar relative to moves in the three-month Treasury bill yield (and the 1x4 forward rate agreement) indicated that the key three-month Jibar rate was not reflective of market conditions.

KEY FINDING 2

Jibar is based on indicative rates and not on actual transactions. In addition, there are insufficient transactions in the NCD market for Jibar to meet the IOSCO principles of benchmark design.

3.2.6 Subsequent to the 2015 review, the SARB requested banks to submit proposals on how to revise and improve Jibar. Proposals in this regard were tabled at the FMLG[20] meeting in October 2016. The FMLG also considered

[19] Reference is made to the Chief Executive of the FCA's remarks on the future of Libor. The full text is available at https://www.fca.org.uk/news/speeches/the-future-of-libor

[20] The Financial Markets Liaison Group (FMLG) is a domestic market forum. It functions as a consultative committee, chaired by the Deputy Governor: Markets and International of the SARB, with representatives from the Financial Markets and National Payment System departments of the SARB, the treasurers and heads of global markets of the large banks in South Africa, National Treasury and the International Banking Association. The FMLG comprises four subcommittees, namely the Money Market Subcommittee (MMS), Fixed Income and Derivatives Subcommittee (FI and DS), Foreign Exchange Subcommittee (FX Subcommittee), and the Financial Market Infrastructure Subcommittee, which is currently dormant. The Reference Rate Working Group (RRWG) and the Bond Market Development Committee (BMD) also function under the auspices of the FMLG subcommittees. The RRWG was established as a working group of the MMS to assume the responsibility for the first revision of Jibar and, after the first publication of the Jibar *Code of*

proposals for the refinements of Sabor and a resolution was taken that the SARB would draft a consultation paper on interest rate benchmark reforms in the domestic market. An internal working group – the Working Group was established for this purpose, with representation from various departments within the SARB. In the research process, consultations were held with the largest domestic banks, asset managers, hedge funds and the relevant stakeholders such as the FSCA, JSE, the Association for Savings and Investment South Africa (ASISA) and the CSDs.

3.2.7 The consultations focused on a number of pertinent issues relating to the review of interest rate benchmarks, and Jibar in particular, given that it is firmly entrenched in the domestic market. The engagements sought to understand market participants' views on the current Jibar and their conceptual understanding of the rate. It further sought to gauge the stance of the various stakeholders with respect to proposed enhancements, including changing the composition of the reference rate, broadening its base and/or changing the calculation methodology. The following insights were gained from the consultations:

3.2.7.1 Jibar, in its current format, is not an 'interbank average' rate. It is merely an average derived from the mid-rates as posted on contributing banks' NCD trading screens. Although it is unclear what Jibar should reflect currently, there is a broad consensus that, conceptually, Jibar is supposed to reflect bank funding costs as well as give an indication of interest rate expectations in the market.

3.2.7.2 In line with the SARB's view, based on the 2015 data collection exercise, market participants agreed that Jibar fell short of the IOSCO requirement of data sufficiency. However, while there was an agreement that a better

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Conduct, Governance Process and Operating Rules, the continuation of research around the enhancement of domestic interest rate benchmarks.

reference rate is required, there was a fair amount of opposition to the proposal of changing the composition of Jibar in order to broaden its base. This, according to market participants, would trigger a costly transition. Several market participants were particularly concerned about potential legal implications of the change.

3.2.7.3 While market participants recognised the concern about Jibar's inherent vulnerability to manipulation, they were of the view that both the current data collection methodology (i.e. harvesting of prices off screens by the calculation agent instead of submissions by contributing banks) as well as the governance arrangements around the rate determination process limit the scope for untoward behaviour by banks.

3.2.7.4 For various reasons, including a change in the credit quality of banks, the current calculation methodology is not necessarily appropriate. The fact that it required an elimination of the top and bottom 25th percentiles from a small sample size compounded the representativeness problem. Consideration should therefore be given to increasing the number of contributors, while also recognising that their issuance of NCDs may be sporadic.

KEY FINDING 3

While market participants recognise that Jibar falls short of IOSCO standards, there is reluctance to changing it due to concerns about the cost and complexity of transitioning to a new reference rate. However, market participants believe that the calculation methodology should be changed.

3.2.8 Upon considering the outcomes of the 2015 data exercise and the 2017 consultations, and notwithstanding the absence of allegations or evidence of manipulation and/or possible collusion, the SARB deems it appropriate to reform Jibar. The SARB considers the stagnant volumes in the underlying three-month NCD market vis-à-vis double-digit growth of on- and off-balance sheet items (see Table 1) that reset against the three-month Jibar

rate as a threat to the robustness of Jibar as a reference rate. The SARB is also concerned about the sustainability of the rate in a world where less reliance is placed on NCD funding as well as its inherent vulnerability to manipulation given the level of activity in NCD issuance, the sample size of contributing banks and the calculation methodology.

3.2.9 Furthermore, as is evident from the consultations held with market participants, it has become apparent that, at present, there is no clear conceptual understanding of what Jibar is meant to reflect. From a monetary policy point of view, the fact that Jibar – being a key reference rate – is not representative of the level of money market rates is also a concern. For the SARB, it is important that there is clarity on the transmission of policy rates to other money market rates and, eventually, private sector borrowing costs in the economy. It is against this backdrop and in keeping up with international best practices that the SARB considered the reform of Jibar. This, together with the rigidity of the rate relative to other short-term money market interest rates, led the SARB to believe that the composition of Jibar needs to be more representative of bank unsecured wholesale funding costs.

3.2.10 In light of these concerns, the SARB's Jibar reform proposals aim to broaden the coverage or transaction universe of Jibar to ensure that the rate is based on more volumes. The reform also aims to improve the robustness of Jibar by changing its calculation methodology and its framework for surveillance. Along with all other governance-related reform proposals, details of changes in the surveillance framework will be discussed during the operationalisation phase.

3.2.11 Three possible reforms are outlined below. Note that while Jibar reform proposals focus mostly on the three-month tenor, the methodologies described apply to all other tenors as well.

3.3 Jibar reform proposals

3.3.1 Methodology-adjusted Jibar

3.3.1.1 Jibar is compiled and published by the JSE (the calculation agent) using data from five contributing banks. Contributors buy their own instrument from the market, at the quoted bid rate, and sell it to the market at the offer rate; the latter reflects the rate at which a bank funds itself in the market. As with Libor, there are formal guidelines for the inclusion and/or exclusion of contributing banks. However, this is predominantly based on the scale of activity in the NCD market and the availability of executable bid and offer rates. As such, only five banks meet these criteria.

3.3.1.2 On a daily basis, between 09:15 and 09:45, the JSE harvests bid and offer rates off the contributing banks' NCD trading screens and calculates the mid-point rates for five maturities, namely one, three, six, nine and twelve months. Screen prices reflected on each bank's NCD trading screen should be good for a trade size of between R20 million and R100 million for all NCD issuances settling within seven business days following the trade date (i.e. up to T+7 settlement). Once the mid-rates for all contributing banks have been obtained, they are ranked in a descending order. The highest and lowest 25th percentile mid-rates are eliminated and the remaining 50th percentile rates are averaged to determine Jibar rates for the respective maturities.

A simple average method $\frac{\sum_{i=1}^{n} x_i}{n}$ (for i=1,.., n and n=3) is used to determine the average rate that is then published daily at 10:00 by the JSE, on Reuters.

3.3.1.3 The Working Group reviewed this calculation methodology and holds a view that the Jibar determination process can benefit from a more comprehensive methodology. Instead of using quoted rates as the first data input, the methodology should take account of transaction data obtained from Strate. This view of the Working Group is, among other things, informed by the following observations:

3.3.1.3.1 The method of discarding the highest and lowest 25th percentile mid-rates from an already thin dataset distorts the benchmark's ability to represent the economic realities of the underlying market in an accurate and reliable manner. In order to improve the adequacy of the sample and volume of the underlying NCD market relative to the derivative and non-derivative markets that reference Jibar, consideration should be given to increasing the sample size by incorporating as many contributors as possible.[21] This, of course, should be done without unnecessarily subjecting the benchmark to undue volatility and distortions that could be caused by the sporadic issuance by other NCD issuers and other unintended consequences.

3.3.1.3.2 Theoretically, the current calculation methodology is relatively more sensitive to errors, outliers and potentially manipulative behaviour. Therefore, there is a need for a better calculation methodology to improve the integrity of Jibar as an interest rate benchmark.

3.3.1.4 The proposal to change the methodology, while maintaining the underlying market, is the closest to keeping Jibar in its current format. However, as the number of contributing banks increase, the calculation methodology will

[21] Under the current calculation method, Jibar is derived from mid-rates of Jibar contributors' (banks with official NCD trading screens) bid and offer rates. If the calculation method is based on actual transactions, the number of contributors and transactions will increase. Some banks issue NCDs, but do not have official trading screens.

also change, resulting in the new Jibar rate being a volume-weighted average of all NCDs meeting the eligibility criteria discussed above. The volume-weighted average will reflect the daily average rate at which NCDs are traded so that:

$$Jibar = \frac{\sum_{i=1}^{n} \prod_{i=1}^{n} (x_i, y_i)}{\sum_{i=1}^{n} x_i}$$

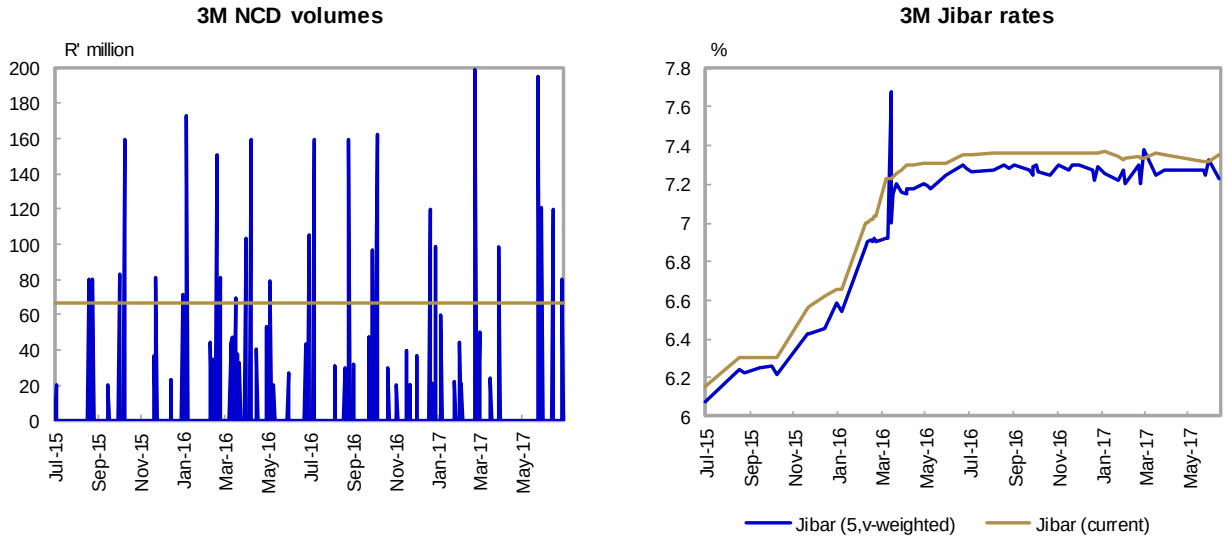
3.3.1.5 where x_i is the notional value of NCDs per bank, y_i is the actual traded rate for each bank's NCD and n (for n = 5) is the number of contributing banks. The consequence of this methodology is that for each period t, Jibar will be calculated for value at time t-1. As opposed to the current process where Jibar is determined for same-day value, the new methodology which is based on actual transactions will result in the rate being calculated for value yesterday (i.e. one-day look-back). Similarly, the weighting used to determine each bank's contribution to Jibar will be determined using notional volumes of NCD trades at time t-1.

3.3.1.6 The use of a volume-weighted average methodology is preferred over the simple average methodology because it is relatively more robust to outliers – while equally more reflective of the average cost of funding in the market – and is less sensitive to erroneous and potentially manipulative trades. However, as this is based on actual transactions, the downside is that some volatility may be introduced by the credit rating of the issuer bank. For example, a top-rated bank could issue at a price on day one, and on day two, there might be an issuance by a lower-rated bank at a higher price, resulting in the top-rated bank reverting to the initial lower price the following day.

3.3.1.7 The characteristics of the reformed Jibar are summarised below. The left-hand chart in Figure 3 shows all eligible NCD transactions that have fallen

within the predetermined transaction size range since July 2015. The right-hand chart in Figure 3 compares the current (unweighted) Jibar to the reformed Jibar calculated as a volume-weighted mean.

Figure 3 Daily volumes and rates of three-month NCDs



Sources: Strate, SARB and Bloomberg Finance LP

3.3.1.8 The left-hand chart in Figure 3 shows a very sporadic primary issuance of three-month NCDs. In the period between July 2015 and June 2017, there were only 66 days (out of a total of 500 days[22]) where NCD issuance that satisfied the minimum transaction size requirement applicable to Jibar was recorded. During this period, the average issuance was only R66 million. The right-hand chart shows the resulting three-month Jibar rate.[23] While the reformed Jibar follows the same trend as the current one, there is a persistent spread of approximately 9.2 basis points on average, reflecting that actual NCD trades occur at a lower rate than is shown by the current Jibar. This is to be expected since the reformed Jibar (based on offer rates)

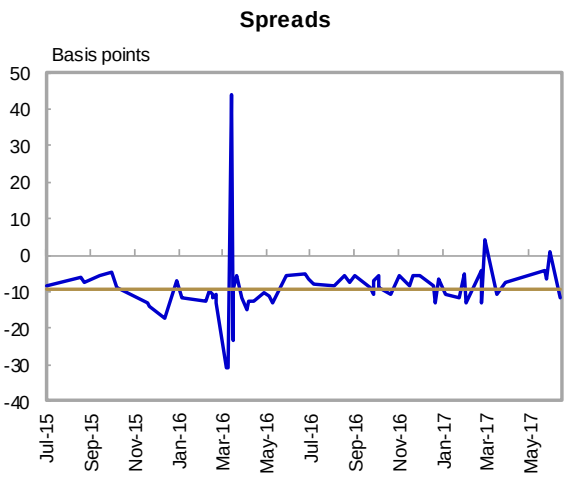
[22] The 500-day test period runs from 1 July 2015 to 30 June 2017 and excludes weekend days and public holidays as per the South African calendar.
[23] The chart only reflects Jibar rates for days where there was actual NCD issuance.

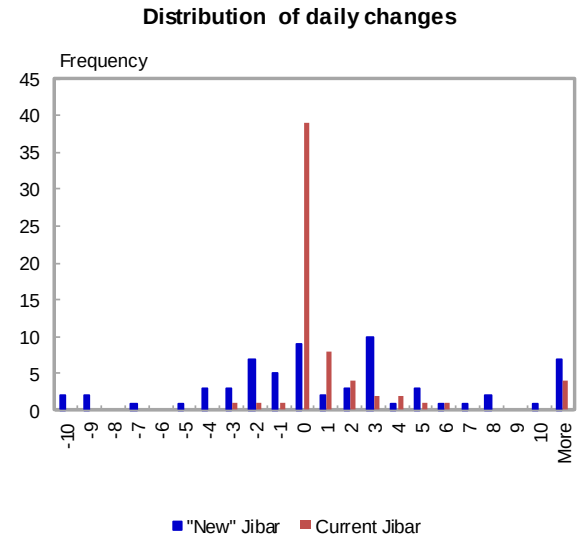
is a more accurate estimate of where NCD funding takes place as opposed to the current rate, which is based on mid-rates.

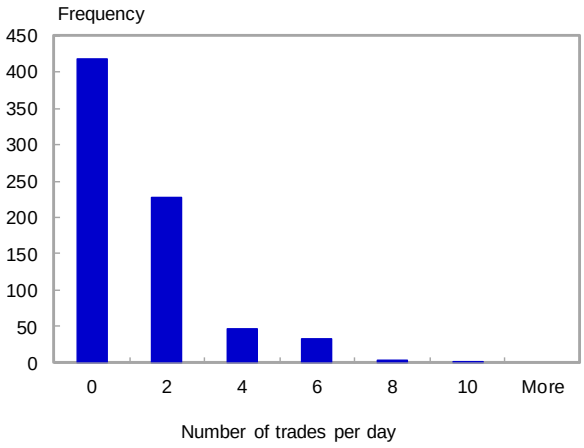
3.3.1.9 The spread between the reformed Jibar and current Jibar, however, displays some degree of volatility around its mean, reflecting greater volatility of Jibar under the new calculation method. Indeed, the right-hand chart in Figure 4 highlights a flatter, wider distribution of daily changes around zero than the current Jibar. Generally, this appears to be a more 'normal' distribution and suggests the new measure better captures the normal functioning of a money market, somewhat addressing the issue of Jibar stickiness. However, the spikes in the spread around March 2016 indicate that the proposed methodology does not eliminate the 'outlier' problem.

3.3.1.10 Other summary statistics pertaining to the reformed Jibar are shown in the bottom panel of Figure 4, along with a histogram of the number of daily eligible NCD trades.

Figure 4 Comparison of Jibar under the new methodology







Summary statistics

	Jibar	MA-Jibar
Mean	7.14	7.05
Median	7.32	7.23
Mode	7.36	7.30
Min	6.16	6.08
Max	7.37	7.68
Sample variance	0.12	0.13
Standard deviation	0.35	0.36
Average spread to current rate	-	-9.21
Correlation (Level)	-	0.97
Correlation (Daily changes)	-	0.32
Standard deviation of daily changes	0.06	0.15

Sources: Strate, SARB and Bloomberg Finance LP

3.3.1.11 Noting the above analysis, the view of the Working Group is that this proposal, although most favoured by market participants, does not address the concerns referred to in section 3.2. The Working Group is concerned about the sporadic issuance of NCDs (on average there are only transactions every third day) which would make the calculation of Jibar challenging, especially if the interest rate benchmark has to be calculated using observable, arm's-length transactions in the NCD market. Of further concern to the Working Group is that the number of NCD trades on days where there are actual trades is not enough for the benchmark to comply with the data sufficiency requirement of IOSCO.

KEY FINDING 4

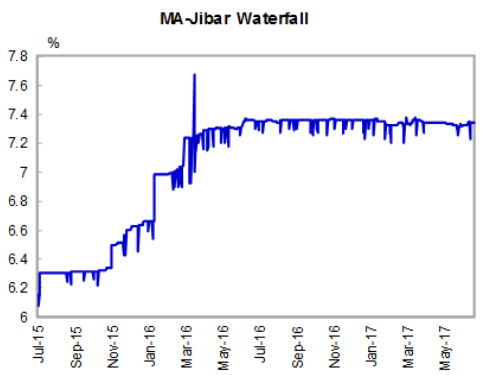
Sporadic issuance of three-month NCDs means that a mere change to the data collection methodology will not address the concerns about data sufficiency in the Jibar calculation process.

3.3.1.12 In line with the waterfall approach (see Chapter 2), the Working Group explored various other alternatives, one being the use of bids and offer rates as reflected on contributing banks' NCD trading screens.[24] Accordingly, Jibar will still be based on transaction data, with a one-day look-back. On days where there are no trades, which is more often than not, the benchmark will be derived from the 'indicative' prices of the previous day. Insofar as data collection is concerned, this requires that a dual process be run, where benchmark administrators collect both transaction-based data as well as a history of indicative prices.

3.3.1.13 This alternative, however, presents a few challenges. The first challenge is that, because there are no volumes accompanying these indicative bids and offer rates, it is not possible to use the volume-weighted methodology to determine Jibar. As such, the methodology will have to change to a simple average. This brings about the second challenge: Jibar derived as a simple average is, on average, 9 basis points above its volume-weighted counterpart (see Figure 3). A switch between these two methodologies introduces undue and undesirable volatility in Jibar. Figure 5 illustrates this point.

[24] Bid and offer rates reflected on bank NCD screens are used as proxies for live executable bids and offers as required under the waterfall approach. All bid and offer rates reflected on bank NCD screens are good for trades up to R100 million.

Figure 5 Methodology-adjusted Jibar under the waterfall approach



Summary statistics

	Current rate	MA-Jibar	MA-Jibar waterfall
Mean	7.14	7.05	7.06
Median	7.32	7.23	7.31
Mode	7.36	7.30	7.36
Min	6.16	6.08	6.08
Max	7.37	7.68	7.68
Sample variance	0.12	0.13	0.17
Standard deviation	0.35	0.36	0.42
Average spread to current rate	-	-9.21	-0.83
Correlation (Level)	-	0.97	0.99
Correlation (Daily changes)	-	0.32	0.30
Standard deviation of daily changes	0.06	0.15	0.05

Source: Strate, SARB and Bloomberg Finance LP

3.3.1.14 However, the principle that an interest rate benchmark should be anchored by observable transactions in an active market does not mean a benchmark must be constructed solely of transaction data in that specific market. The IOSCO principles make provision for use of observed transactions concluded at arm's-length in related markets (principle 8(c)). Accordingly, in the interest of ensuring the quality, integrity and robustness of Jibar as a key interest rate benchmark used as a reference rate in the domestic market, the Working Group explored the option of anchoring Jibar to observed transactions in related markets. For this purpose, the Working Group embarked on a data collection exercise (see Box 2) to collect transaction data from banks. These data, comprising deposit, promissory note (PN) and commercial paper information, were used to determine whether, in line with the principle of anchoring a benchmark on transactions from a related market, a blended or hybrid Jibar would be a viable alternative. The outcome of the back-testing exercise and related proposals is summarised in sections 3.3.2 and 3.3.3.

Box 2 The 2017 data collection exercise: Wholesale deposit funding

In July 2017, following consultations with the large banks active in the negotiable certificate of deposit (NCD) market in South Africa and as part of the preliminary research and drafting of this consultation paper, the SARB Working Group on Rand Interest Rate Benchmarks (Working Group) embarked on a data collection exercise. The purpose of this exercise was to collect relevant data that would inform the ultimate choice of new and alternative benchmark and/or reference rates based on the proposals of the Working Group.

To enable this, the South African Reserve Bank (SARB), through the Working Group, collected daily transaction data for fixed rate deposits for the period 1 July 2015 to 30 June 2017. The following requirements were specified in the data collection request:

1. Fixed-rate deposit transactions in South African rand, with maturities ranging from overnight to 12 months.

2. Only wholesale deposits, as defined for purposes of calculating banks' liquidity coverage ratios, including an indication of the number of transactions, volume and volume-weighted average rates for the following deposit categories:
   a. non-financial corporates;
   b. non-bank financial corporates;
   c. banks; and
   d. public sector.

3. Only deposit transactions larger than R20 million, including deposits raised by all business units of the bank.

In order to maximise the benefit from this data gathering exercise, the working group requested granular data for the assessment of typical benchmark tenors, with intermediate buckets included, to prevent unintended behaviour.

Further, the large banks were requested to provide the SARB with month-end balances of outstanding NCDs, promissory notes and commercial paper for the aforementioned two-year period. This data was used to test the 'soft-blended Jibar rate' proposal, where the Working Group sought to enhance the Jibar transaction universe with observed transactions in related markets.

3.3.2 Soft-blended Jibar rate

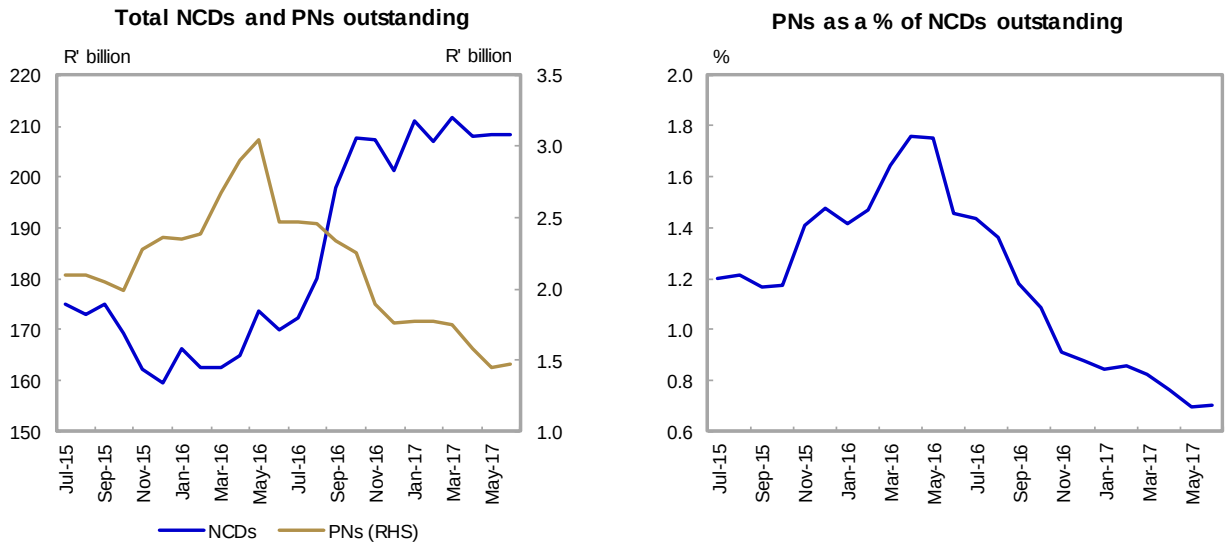
3.3.2.1 The soft-blend approach allows for broadening the volume of underlying transactions in the Jibar determination process, following the hierarchy of data inputs suggested by the IOSCO Board in its Principles for Financial Benchmarks. As described in Chapter 3, where a benchmark is based on transactions and data submissions are regarded as insufficient, a benchmark can be calculated using data inputs reported or observed in

related markets. Some important changes under this approach and ones through which this change will be achieved include the following:

i. The introduction of new instruments with similar characteristics to NCDs, namely PNs. A key characteristic of PNs considered in this regard is tradability, meaning that the new Jibar rate will be determined as a volume-weighted mean of NCD and PN offer rates, which are both tradeable.
ii. Increasing the number of days used to determine the 'buckets' of the standard maturities to capture off-standard maturities.
iii. In line with the initial reform proposal for Jibar, the soft-blended Jibar rate will be calculated as a volume-weighted average of all contributing banks.

3.3.2.2 For the soft-blend approach to be considered a viable alternative, it must result in a sizable increase in the average daily volume and number of transactions used for the calculation of the soft-blended Jibar rate. This would allow the soft-blended Jibar rate to comply with the IOSCO requirement of data sufficiency. The results of the soft-blend approach revealed that as at the end of the second quarter of 2017, PNs accounted for less than 1% of the total amount of NCDs and PNs outstanding. In nominal terms, this would amount to an additional R1.5 billion to the current NCD base or less than R0.66 million to the average daily volume base.

Figure 6 Month-end balances of outstanding NCDs and PNs



Source: SARB

KEY FINDING 5

The volume of PNs in circulation is too small to make a significant improvement to the calculation of Jibar.

3.3.2.3 The Working Group is of the view that the additional volume captured by including PNs is not sufficient to follow through on the soft-blend proposal. The inclusion of PNs does very little to improve Jibar's compliance with the data sufficiency requirement. In addition to the insignificant change in underlying volumes, the Working Group is concerned about the sustainability of PNs as a funding instrument for banks, especially since their outstanding volumes have, on average, been declining over the recent past.

3.3.3 Jibar as a hybrid

3.3.3.1 This reform proposal follows the same approach as the soft-blend Jibar rate, but with a different composition. As a hybrid, reformed Jibar will

comprise NCDs and a specific category (i.e. NBFCs) of fixed-rate wholesale deposits.

3.3.3.2 It is important to note that there are differences between NCDs and deposits (see Table 2). Deposits are non-tradable, non-transferable financial claims on banks, while NCDs are both tradable and transferable. Banks quote two-way prices on NCDs, indicating their preparedness to make a market in their own paper. By contrast, the pricing of deposits is not as transparent, since not all large banks have deposit screens quoting offers on deposit liabilities.

Table 2 Features of fixed-rate funding instruments under the hybrid proposal

	Negotiable Certificates of Deposit	Fixed Deposits
Term	Fixed	Fixed
Tradability	Tradable	Non-tradable
Listed/Over the Counter	Over the Counter	Over the Counter
Transparency of pricing	Published bids and offers	Bilaterally negotiated or relationship based

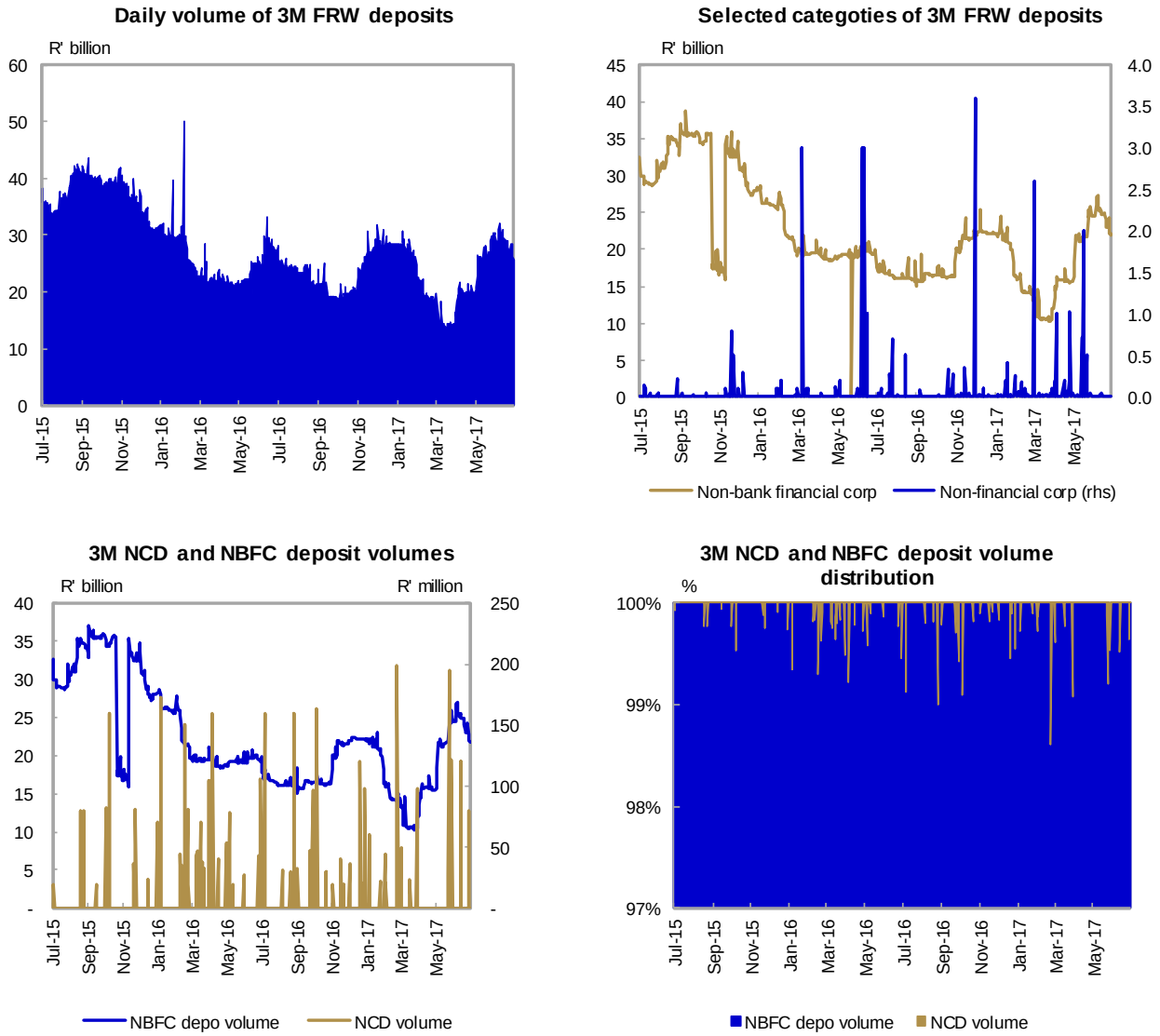
Source: Barclays Africa Group

3.3.3.3 Figure 7 shows daily volumes of three-month fixed-rate wholesale deposits and NCDs issued by the five big banks that are active in the NCD market. An analysis of the data shows that the daily volume of three-month fixed-rate wholesale deposits in South Africa is substantial and has ranged between R10 billion and R30 billion since the start of 2016. Importantly, the split in the daily volume of deposit flows shows that deposits of NBFCs (insurance companies, pension funds, money market funds, etc.) far outweigh those of other non-financial corporates whose occurrence appears too erratic to make a meaningful contribution to the calculation of an effective money market rate.

KEY FINDING 6

On a daily basis, NBFC deposits range between R10 billion and R30 billion. As such, this deposit category adds substantial volume per day to the universe of transactions that underpin the proposed hybrid Jibar.

Figure 7 Daily volumes of three-month fixed-rate wholesale deposits



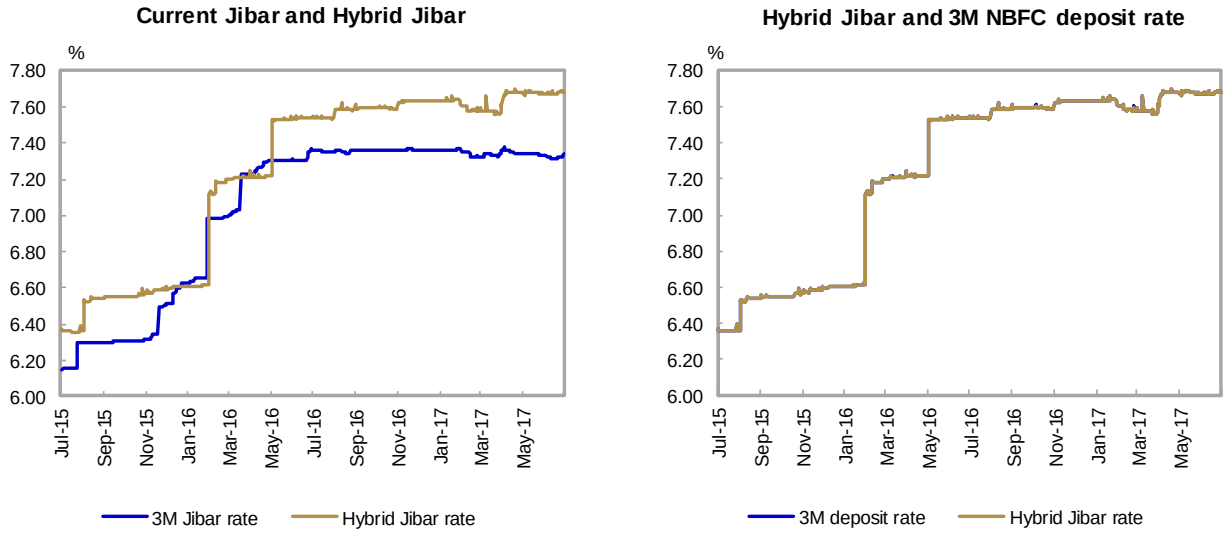
Note: FRW: fixed-rate wholesale; NFBC: non-bank financial corporate

Source: SARB

3.3.3.4 Figure 7 also shows that the volume of three-month NBFC deposits far outweighs that of NCDs. On a daily basis, NCD issuance typically ranges

between 0% and 2% of the total universe of deposit and NCD flows. Consequently, a reformed Jibar derived from NCDs and fixed-rate NBFC deposits as underlying financial instruments would, in effect, be an interest rate on a wholesale NBFC deposit. The right-hand chart in Figure 8 illustrates this point.

Figure 8 Comparison of current and hybrid Jibar



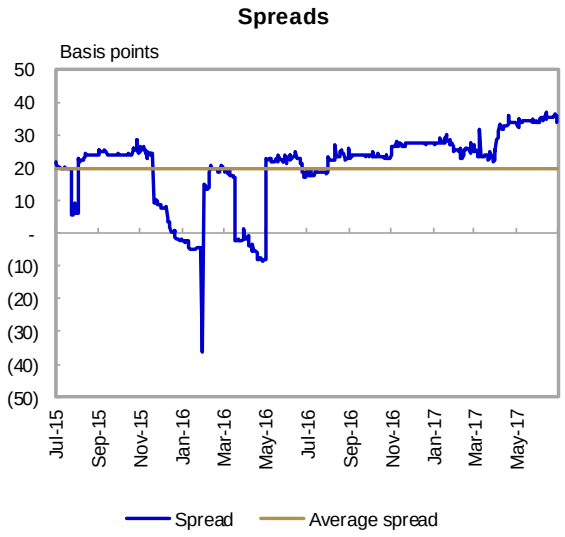
Source: SARB

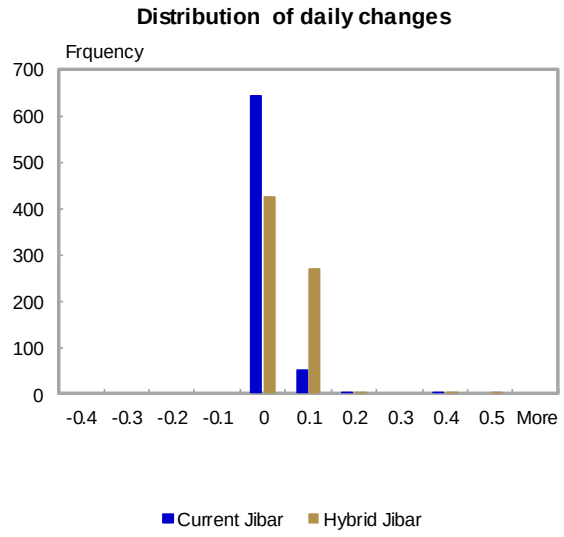
3.3.3.5 When compared with the current three-month Jibar, the reformed three-month Jibar shows a persistent positive spread, averaging 20 basis points during the test period. This reflects that NBFC fixed-rate deposits trade higher than NCDs. Other characteristics of the reformed Jibar are shown in Figure 9. The top panel of the figure shows that daily changes in the reformed rate exhibited a similar trend to the current Jibar. The respective sample standard deviations are 0.02 and 0.01.

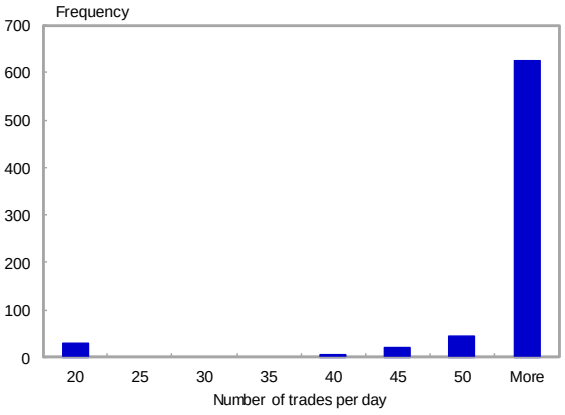
KEY FINDING 7

NCD issuance typically ranges between 0% and 2% of the transaction universe of the proposed reformed Jibar, while NBFC deposits account for approximately 98%. Effectively, this make the proposed reformed Jibar an interest rate on wholesale NBFC deposits. The reformed Jibar averages 20 basis points above the current Jibar, but exhibits a similar degree of volatility.

Figure 9 The reformed (hybrid) Jibar rate and its characteristics







Summary statistics

	Current rate	Hybrid Jibar
Mean	7.02	7.22
Median	7.30	7.54
Mode	7.36	6.36
Min	6.15	6.36
Max	7.38	7.70
Sample variance	0.19	0.23
Standard deviation	0.44	0.45
Average spread to current rate	-	19.96
Correlation (Level)	-	0.97
Correlation (Daily changes)	-	0.00
Standard deviation of daily changes	0.01	0.02

Source: SARB

3.3.3.6 As alluded to earlier, there are some notable differences between the current and reformed Jibar:

i. The reformed rate is calculated as an average of offer rates, whereas the current Jibar is based on mid-rates.

ii. On average, the reformed rate trades 20 basis points above the current Jibar. This spread is important to consider as market participants raised concerns about how differences in the current and proposed Jibar could lead to a costly transition.

iii. The reformed rate has almost (if not completely) no predictive power with respect to changes in the repo rate. As noted earlier, this would further curtail the use of Jibar along with other money market rates such, as rates on forward rate agreements as an indicator of interest rate expectations in the market.

iv. While the reformed rate does not lead changes in the repo rate, it adjusts instantaneously to changes in the policy rate.

3.3.3.7 According to the Working Group's assessment and notwithstanding the aforementioned differences, this methodology provides a solution to the data adequacy problem. The daily volume of the underlying NBFC deposits is not only sizable in nominal terms, but the number of trades is also much more than in the case of NCDs. Further, unlike the problem of the sporadic issuance of NCDs, banks issued deposit liabilities throughout the test period.

3.3.3.8 The data collection exercise of 2015 revealed a concerning mismatch between the aggregate volume of the derivative and non-derivative contracts that reset against Jibar (mostly3 months) and the volume of three-month NCDs that are used to calculate the Jibar rate on which these contracts reset. In this context, the proposed reformed Jibar would reduce the ratio of derivative and non-derivative instruments that reset against Jibar and the perceived systemic risk linked to such a mismatch. Whereas the notional value of Jibar-linked derivative and non-derivate transactions outstanding is estimated to be around R40 trillion, daily NCD flows upon which Jibar 'is based' averaged only R66 million per day during the period

under review. The introduction of NBFC deposits implies that the daily average of the basis for Jibar would increase by R22 billion a day.

KEY FINDING 8

The volume and frequency of NBFC deposits is large enough to address the issues of data sufficiency and mismatch with the volume of contracts that reset against Jibar.

3.3.3.9 Furthermore, the reformed rate's volume of three-month NBFC deposits is spread across the contributing banks, rather than being concentrated in a few. Such a wide distribution minimises the risk of a few banks dominating the average rate, while also ensuring that outliers (whether erroneous or manipulative) do not distort the rate, at least not to the same extent as would be the case if there was concentration.

3.3.3.10 Against the design criteria described in Chapter 2, the reformed rate provides a better indication of wholesale bank funding costs. This arises from the findings of the 2015 data collection exercise, which revealed that banks predominantly funded themselves by issuing fixed-rate wholesale deposit liabilities (see Figure 2).

KEY FINDING 9

The reformed Jibar based on NCDs and NBFC deposits is a more accurate reflection of banks' actual wholesale funding costs.

3.3.3.11 Importantly, Table 2 highlights some features of NCDs and fixed deposits, emphasising the differences in the tradability and transparency of pricing of these instruments. Box 3 provides a more detailed view of the RRWG in respect of this point. The test of the reform proposal also revealed that the deposit component accounts for at least 98% of the reformed Jibar universe, effectively making the fixed-rate wholesale NBFC deposit rate the new Jibar or, as proposed later, a viable alternative for Jibar.

Box 3 Reference Rate Working Group's view on the differences between NCDs and deposits

Negotiable certificate of deposit (NCD) rates are bearer instruments, which are tradable with a broad array of financial market participants who are willing to participate in the secondary market. These participants include banks, money market funds, asset managers, pension funds, corporate entities, and so on. By contrast, fixed-rate deposits are non-tradable, subject to penalties for early unwinding, and hence typically contractually sticky. They are priced based on a bank's strategic viewpoint of the importance of the overall client relationship. These differences in liquidity dynamics introduce a pricing bias, whereby banks are incentivised to 'pay up' for fixed-rate deposits as they can rely on such funds to the contractual maturity.

The evolving regulatory landscape further compounds the differential in pricing treatment of various clients, typically based on their regulatory classification. For instance, a bank is incentivised to 'pay up' for a deposit from corporate or public sector clients in relation to institutional deposits, as the nature of the client, in the eyes of the regulatory prescriptions, demands a varying degree of regulatory consequences. By way of example, NCDs are treated more punitively than fixed deposits in the Basel III liquidity coverage ratio (LCR), which requires a bank to hold more liquid assets against NCDs with a residual maturity in excess of 30 days, and ascribes a low level of stability to such liabilities under the Basel III net stable funding ratio (NSFR).

These dynamics suggest that, while a range of reformed risky interest rate benchmarks is plausible, they are unlikely to play a replacement role in the deep derivative market place where they stand to introduce significant economic consequences to derivative contracts that are presently in force. However, consideration could be given to the introduction of such benchmarks for prospective derivative contracts. This too will have its own complications, such as giving rise to dual derivative yield curves, which may impede secondary market liquidity and aggravate capital requirements on the banking industry due to the basis risk they will introduce. The adoption as a substitute will also introduce bias in the cost of funding for borrowers that place reliance on existing floating rate benchmarks which will translate into a dose of monetary policy tightening as a consequence of regulatory developments that banks need to adhere to.

3.3.3.12 At a fundamental level, the Working Group is concerned about Jibar. In the early part of Chapter 3, the Working Group highlighted a number of issues with the current Jibar process, including the shift in the commercial

banks' funding behaviour as the main reason for questioning the reliability and robustness of Jibar as a reference rate. In line with these concerns, the Working Group recommends that the current calculation method of Jibar be phased out. The exact timing and operational arrangements around this proposal will be considered along with all relevant stakeholders, as described in Chapter 6.

RECOMMENDATION 1

The Working Group recommends that the current calculation method of Jibar be phased out, and that a transaction-based rate, comprising NCDs and NBFC deposits, be introduced to reform the current Jibar.

3.3.3.13 In line with this recommendation, and while the Working Group acknowledges the differences between NCDs and deposits, both from a regulatory treatment point of view and, consequently, from a pricing point of view, the hybrid Jibar is recommended as a viable improvement for the current Jibar. In the interim, market participants should consider using this reformed Jibar (hybrid) as a reference interest rate for all affected financial contracts. While the current Jibar reflects t date convention, the reformed Jibar will be calculated for value at time *t,* but based on transactions as at time *t-1*.

3.3.3.14 In the long term, the Working Group intends to design more interest rate benchmarks that are considered fit for purpose. The Working Group's preferred solutions aligned with this long-term objective are (i) risk-inclusive reference rates to be used for the pricing of unsecured on-balance sheet (Jibar-linked) items; and (ii) risk-free reference rates for collateralised transactions. With respect to risk-inclusive rates, the reformed Jibar is recommended as the most viable alternative to the current process as it will best reflect the domestic equivalent of Ibor Plus. Notwithstanding the Working Group's recommendation, market

participants will also have a choice to use a term deposit benchmark as discussed hereunder. With respect to a risk-free reference rate, this can take two forms: either it can be derived from general collateral repos (as is the case in the United States (US) with the Secured Overnight Financing Rate) or it can be derived from the secondary market for Treasury bills. In the sections that follow the option of a deposit benchmark is explored. Risk-free interest rate benchmarks are dealt with in Chapter 4.

RECOMMENDATION 2

The Working Group recommends that risk-inclusive reference rates be used for the pricing of unsecured on-balance sheet (Jibar-linked) items and risk-free reference rates be used for collateralised transactions and derivative contracts.

3.4 Term deposit benchmark[25]

3.4.1 As a means to further explore the evolution of interest rate benchmarks in South Africa in order to broaden the current set, as well as to introduce long-term sustainability of short-term interest rates, the Working Group considered developing a term deposit benchmark, using transactions from all banks. Indeed, one of the important considerations of interest rate benchmark proposals contained in this consultation paper, as outlined in the introductory section, is the need for multiple benchmarks that will be sustainable over the long term. In the domestic wholesale money market, characterised by numerous funding transactions, it is estimated that deposit (fixed and floating) accounts constitute approximately 77% of total wholesale bank funding.[26] Thus, developing an interest rate underpinned by deposits would allow for a formulation of an interest rate benchmark that provides a better reflection of the realities of the wholesale money market. This section sets out the Working Group's proposal for the development of

[25] The Working Group would like to acknowledge Absa for its contribution on work to develop a term deposit benchmark for the South African money market.
[26] See outcome of the 2015 data collection exercise.

the deposit benchmark. The section also provides some key characteristics of the benchmark, based on data collected during the 2017 data collection exercise.

KEY FINDING 10

Fixed-rate wholesale deposits constitute a large portion of total wholesale bank funding. An interest rate benchmark derived from this market would thus allow for the formulation of an interest rate that provides a better reflection of the realities of the domestic money market.

3.4.2 Similar to the Sterling Overnight Index Average (Sonia), the term deposit benchmark will comprise a range of bilaterally negotiated deposits, except the South African benchmark will extend beyond the overnight tenor to capture eligible deposits with standard maturities of up to 12 months. The deposit benchmark will be compiled using data provided by local banks, subject to the following requirements:

3.4.2.1 The deposit is categorised as a fixed-rate deposit in South African rand, with maturities ranging from overnight to 12 months.

3.4.2.2 Deposit is regarded as 'wholesale', as defined for purposes of calculating banks' LCR under the Basel III regulations.

3.4.2.3 A counterparty to the relevant deposit contract is categorised either as:

i. non-bank financial corporate;
ii. non-financial corporate;
iii. bank; or
iv. public sector.

3.4.3 In addition to these requirements, a minimum transaction size of R20 million, which must include all deposits raised by all business units of a bank, will apply. The classification of deposit transactions into the four

main categories will serve a number of objectives. While some of these will be made available for public consumption, some will be used by the SARB for market analysis purposes. Chapter 6 discusses the use of interest rate benchmarks in the policy framework in more detail.

3.4.4 The benchmark tenors that will be considered for the deposit curve are overnight; one week; and one, three, six, nine and twelve months, where transaction data for each day will be averaged into one volume and rate for each benchmark tenor for each bank. Individual bank data will then be aggregated and a single deposit rate and underlying volumes will be calculated and published on a daily basis as a volume-weighted average fixed rate. The underlying data used to calculate the term deposit benchmark will be based on actual transactions. The consequence of this is that on any given day t, the published deposit rate will be for value at time *t-1.*

3.4.5 As discussed earlier, the Working Group's preferred calculation methodology is the volume-weighted mean. However, various other calculation methodologies were considered. These methodologies were recommended to the SARB by the RRWG and seek to employ industry wholesale transactional level data in two distinct approaches. The first approach is tenor benchmarking, which is similar to the volume-weighted mean method. The second approach is guided by a need to leverage data more exhaustively and includes non-standard benchmark tenors, that is, interpolated benchmarking. The interpolated benchmarking methodology is described below. It must be noted that this interpolated methodology will only be used as a fall-back in times where there is insufficient data within the standard maturity buckets. This will ensure that the term deposit benchmark is underpinned by transaction data to the greatest extent possible.

3.4.6 Interpolated benchmarking

3.4.6.1 In addition to standard maturities, the 2017 data collection exercise described in Box 3 classified non-standard maturity transaction data into five buckets. These buckets were defined in such a way that they capture all non-standard maturity transactions falling between one week and 12 months as follows:

i. Bucket 1: 10–26 days
ii. Bucket 2: 34–87 days
iii. Bucket 3: 95–178 days
iv. Bucket 4: 186–269 days
v. Bucket 5: 277–360 days

3.4.6.2 For each bucket, all relevant transaction data is used to determine the average duration as well as the average interest rate. The resulting duration points and interest rates are then interpolated (linear regression) to determine the desired standard-maturity points. The volume-weighted bucket rate is determined as:

$$DR\_B = \frac{\sum_{i=1}^{n} \prod_{i=1}^{n} (x_i, y_i)}{\sum_{i=1}^{n} (x_i)}$$

where:

DR_B *volume-weighted bucket rate*
x_i *volume per bucket*
y_i *interest rate per transaction*

Similarly, the volume-weighted duration is determined as:

$$D = \frac{\sum_{i=1}^{n} \prod_{i=1}^{n} (x_i, d_i)}{\sum_{i=1}^{n} (x_i)}$$

where:

D *volume-weighted duration*

x_i *volume per bucket*

d *duration per transaction*

so that the benchmark fixed rate is:

$$DR = DR\_B_1 + (DR\_B_2 + DR\_B_1) * \frac{(D_0 - D_1)}{(D_2 - D_1)}$$

where:

DR *benchmark fixed rate*

DR_B1 *deposit rate in minimum tenor duration*

DR_B2 *deposit rate in maximum tenor duration*

D0 *number of days on node point*

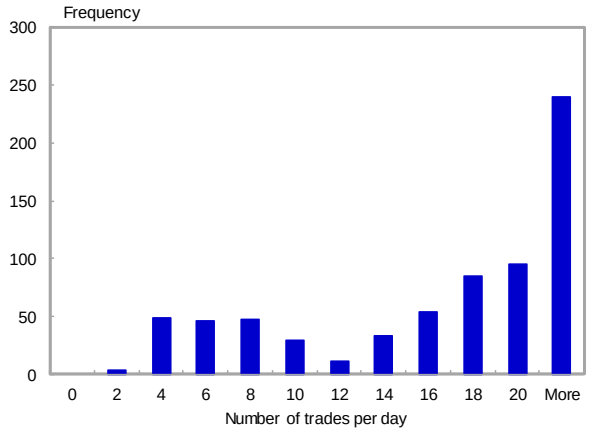
D1 *number of days in minimum tenor bucket*

D2 *number of days in maximum tenor bucket*

3.4.7 The characteristics and properties of the term deposit rates based on fixed-rate wholesale deposit data collected during the SARB's 2017 data collection exercise are discussed with reference to Figure 10.

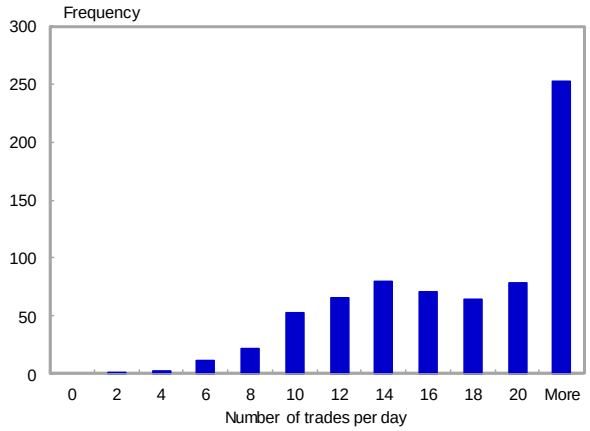
Figure 10 Characteristics of term deposit benchmarks[27]

a. Volume and rate summary statistics: overnight deposit rate



Summary statistics	O/N deposit rate
Mean	6.65
Median	6.92
Mode	7.20
Min	4.44
Max	7.20
Sample variance	0.21
Standard deviation	0.46
Average volume per day (R' bn)	1.60
Minimum volume (R' bn)	0.02
Maximum volume (R' bn)	25.3
Minimum trades per day	2.00

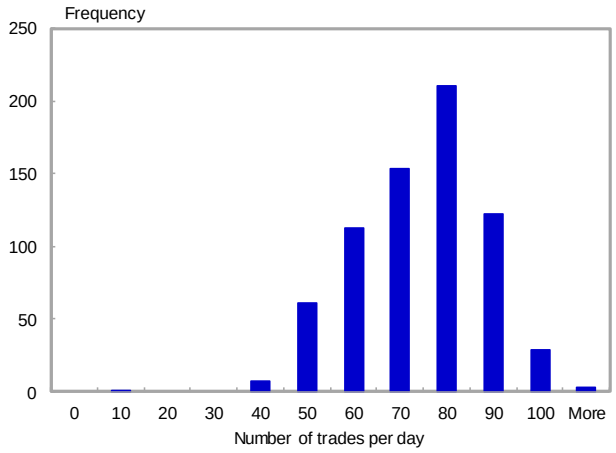
b. Volume and rate summary statistics: one week



Summary statistics	1W deposit rate
Mean	6.61
Median	6.84
Mode	6.89
Min	5.64
Max	7.05
Sample variance	0.17
Standard deviation	0.41
Average volume per day (R' bn)	2.30
Minimum volume (R' bn)	0.02
Maximum volume (R' bn)	27.7
Minimum trades per day	2.00

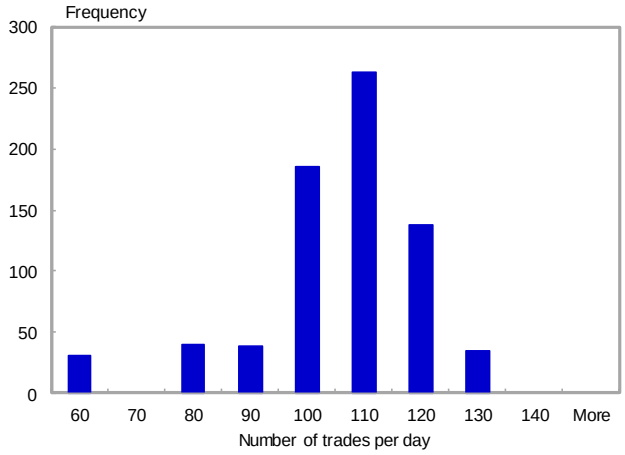
[27] All summary statistics in this section are based on 731 daily observations. On days where there are no trades (i.e. weekend days and public holidays), the last valid value is carried over.

c. Volume and rate summary statistics: one month



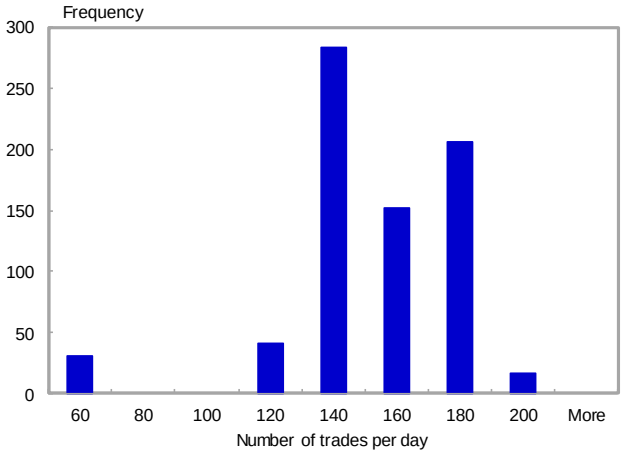
Summary statistics	
	1M deposit rate
Mean	6.89
Median	7.19
Mode	6.44
Min	5.96
Max	9.14
Sample variance	0.22
Standard deviation	0.47
Average volume per day (R' bn)	1.00
Minimum volume (R' bn)	0.02
Maximum volume (R' bn)	10.4
Minimum trades per day	2.00

d. Volume and rate summary statistics: three months



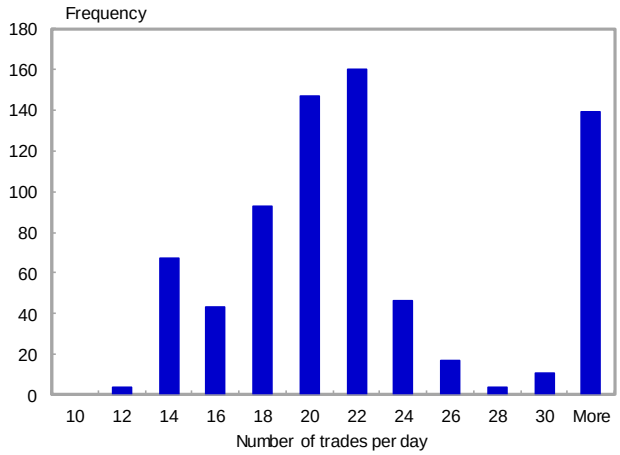
Summary statistics	
	3M deposit rate
Mean	7.18
Median	7.51
Mode	6.49
Min	6.26
Max	10.30
Sample variance	0.27
Standard deviation	0.52
Average volume per day (R' bn)	5.27
Minimum volume (R' bn)	0.02
Maximum volume (R' bn)	36.1
Minimum trades per day	3.00

e. Volume and rate summary statistics: six months



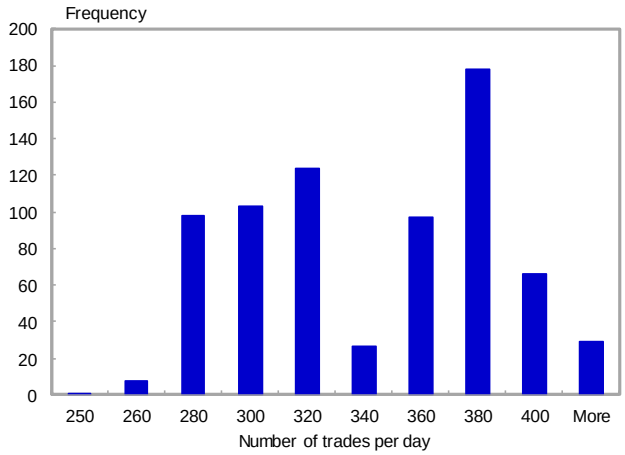
Summary statistics	
	6M deposit rate
Mean	7.59
Median	7.79
Mode	6.84
Min	6.84
Max	8.61
Sample variance	0.24
Standard deviation	0.49
Average volume per day (R' bn)	2.12
Minimum volume (R' bn)	0.02
Maximum volume (R' bn)	8.33
Minimum trades per day	1.00

f. Volume and rate summary statistics: nine months



Summary statistics	12M deposit rate
Mean	7.81
Median	7.62
Mode	7.45
Min	7.05
Max	8.56
Sample variance	0.30
Standard deviation	0.55
Average volume per day (R' bn)	0.38
Minimum volume (R' bn)	0.02
Maximum volume (R' bn)	1.71
Minimum trades per day	12.00

g. Volume and rate summary statistics: twelve months



Summary statistics	12M deposit rate
Mean	8.08
Median	8.10
Mode	7.51
Min	7.25
Max	8.72
Sample variance	0.26
Standard deviation	0.51
Average volume per day (R' bn)	6.05
Minimum volume (R' bn)	0.02
Maximum volume (R' bn)	36.3
Minimum trades per day	3.00

Source: SARB

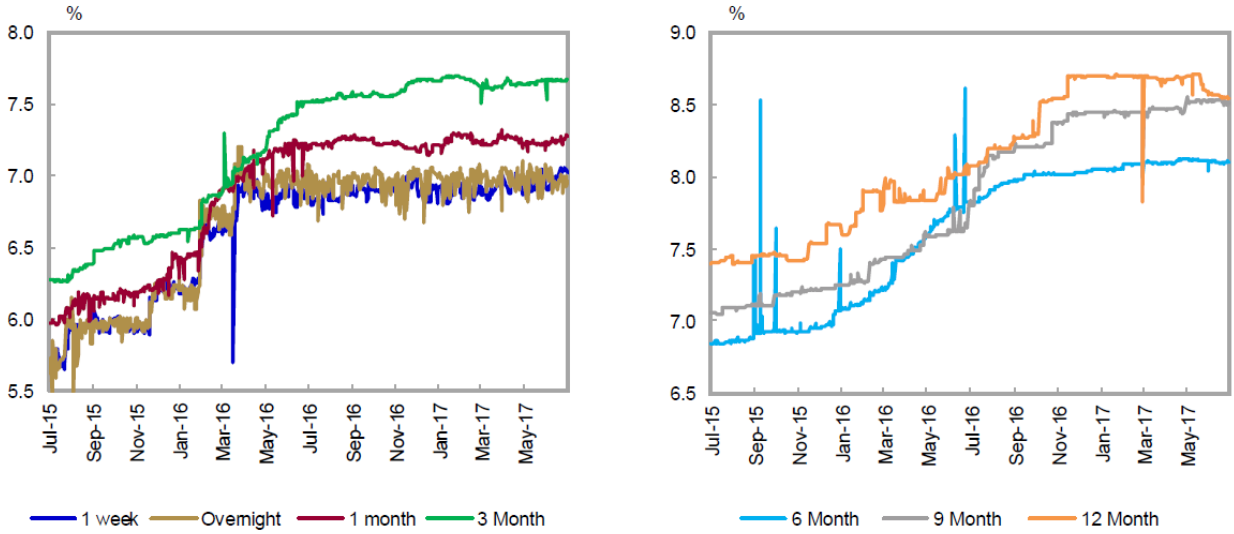
3.4.8 As shown in Figure 10, there is sufficient transaction data and volume available to allow for the development of term deposit rates that are aligned to the IOSCO principles. Figures 10 (a) to (g) provide details of the number and volume of transactions per day for the respective tenors during the period under review. From a data sufficiency point of view, these statistics provide reasonable comfort that the proposed term deposit benchmark is IOSCO-compliant.

KEY FINDING 11

From a data sufficiency point of view, the statistics on daily volume and number of transactions of wholesale bank deposits provide reasonable comfort that an interest rate benchmark derived from this market will be IOSCO-compliant.

3.4.9 Figure 11 shows the resulting term-deposit benchmark rates whose summary statistics are also shown in Figures 10 (a) to (g).

Figure 11 Benchmark deposit rates



Source: SARB

3.4.10 As alluded to earlier, the reformed Jibar is recommended as the most viable alternative to Jibar. However, the Working Group deems it appropriate to allow market participants to make a choice between reformed Jibar and the term deposit benchmark. It is instructive to note that the Working Group does not necessarily recommend the term deposit benchmark as the preferred alternative to Jibar, but merely as an additional candidate that could be considered as part of market choice for the pricing of balance sheet items. From a benchmark design perspective, the Working Group regards the term deposit benchmark as being IOSCO-compliant. The benchmark

also presents an opportunity to develop new credit products. Similar to the reformed Jibar, the deposit curve will be calculated for a value at time t-1.

KEY FINDING 12

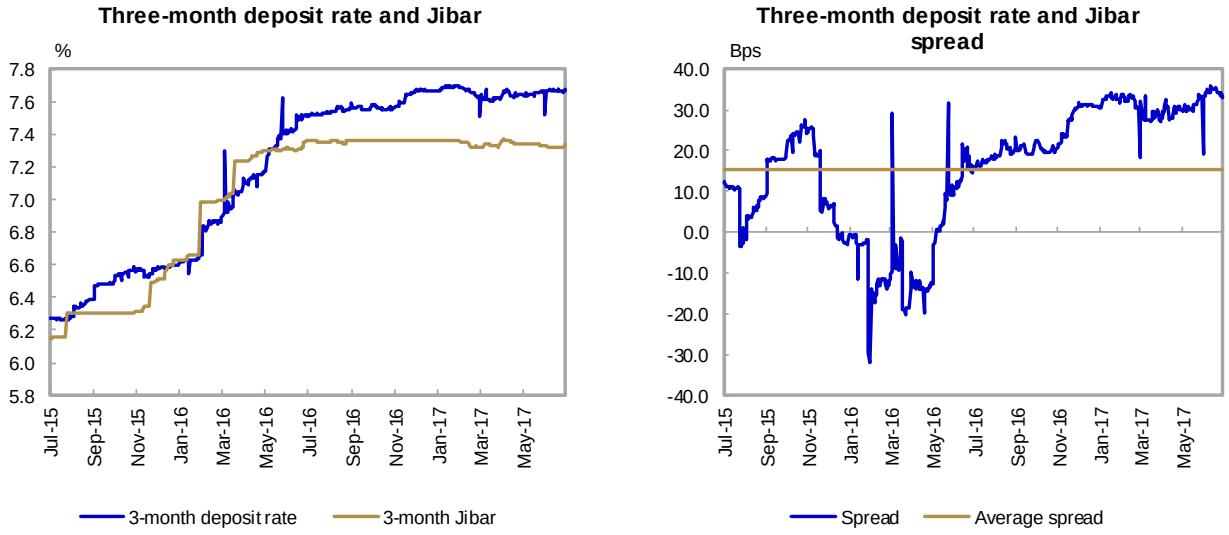
A term deposit benchmark based on current fixed-rate wholesale deposit transactions complies with the IOSCO principles of data sufficiency and presents a viable alternative to a reformed Jibar.

3.4.11 If the three-month deposit rate is selected as an alternative to Jibar, various transitioning matters will need to be considered. As with Jibar, one of the potential issues to be considered is the level difference between the current Jibar and the three-month deposit rate. As Figure 12 shows, the three-month deposit rate trades as an average spread of 15.5 basis points above the current Jibar.

RECOMMENDATION 3

The Working Group recommends that a term deposit benchmark be introduced, which could also serve as an alternative to the reformed Jibar. This deposit benchmark will be based on eligible deposit transactions from all banks. Furthermore, in order to leverage on deposit data more exhaustively, the Working Group also recommends that an interpolated benchmarking methodology be considered as a fall-back in times where there are insufficient data within the standard maturity buckets.

Figure 12 Comparison of three-month Jibar and the three-month deposit rate



Sources: SARB and Bloomberg Finance LP

3.4.12 Whether or not market participants opt to use the term deposit benchmark, the SARB will still calculate and publish this benchmark as part of its endeavours to monitor the transmission of monetary policy, its mandate for financial stability as well as oversight of market functioning and integrity.

3.5 The context for Sabor reform

3.5.1 In addition to Jibar reform, the Working Group is building on the work done by the RRWG to reform the current money market overnight interest rate benchmark and to develop an interbank overnight interest rate benchmark. The reform proposals in respect of the money market overnight interest rate benchmark (currently Sabor) originated from the lack of confidence (on the part of market participants) in the current format of the interest rate benchmark, such as compliance with IOSCO principles and global best practice standards. The reform is also informed by the search for an appropriate operating target for monetary policy amid proposed changes to the current monetary policy implementation framework.

3.5.2 Sabor is currently calculated as a volume-weighted average interest rate of overnight funding. The SARB, as a calculation agent, determines and publishes Sabor on a daily basis for a value at time t, but based on transactions as at time t-1. The rate provides the market and the SARB with benchmarks for interest rates paid on overnight funding, and serves as a mechanism to enhance transparency and price discovery in the overnight market. It is also used as an indicator of liquidity conditions.

3.5.3 Sabor is compiled using three different interest rate elements, namely:

i. the interest rate paid on overnight funding in the interbank market (excluding any funding at the repo rate);

ii. the interest rate paid on call deposits of each contributing bank's top 20 clients (Top 20 call deposits); and

iii. interest rates paid on overnight and tomorrow next day (tom next) rand funding in the FX forward market.

3.5.4 The Top 20 call rate is the weighted average of the 20 highest interest rates paid by banks on demand deposits from non-bank clients. It excludes rates with a fixed link to the prime rate, the SARB's repo rate, or any other term rate. The rate is determined by using the interest rates paid on deposits as the first criterion, and the size of the deposits as the second criterion, where the second criterion is only used to determine the cut-off point of the deposits to be included in the calculation. The latter is only applicable in the event that there are a number of clients receiving the same rate as client number 20. Client deposits are first ranked in a descending order, according to the rates that they receive on their deposits, and then according to the size of their deposits – ranked in a descending order. In cases where clients have various accounts, the weighted average rate per client is used (i.e. not the rate on an individual deposit).

3.5.5 The overnight FX rate is a weighted average rate of rand deposits raised by a bank on an overnight and tom next basis in the forward FX swap market. All transactions such as transactions with banks, non-banks and non-residents are included. In the case of banks, intragroup transactions are not included if both parties are banks. All overnight FX-related transactions are reported on the settlement date and not on the transaction date.

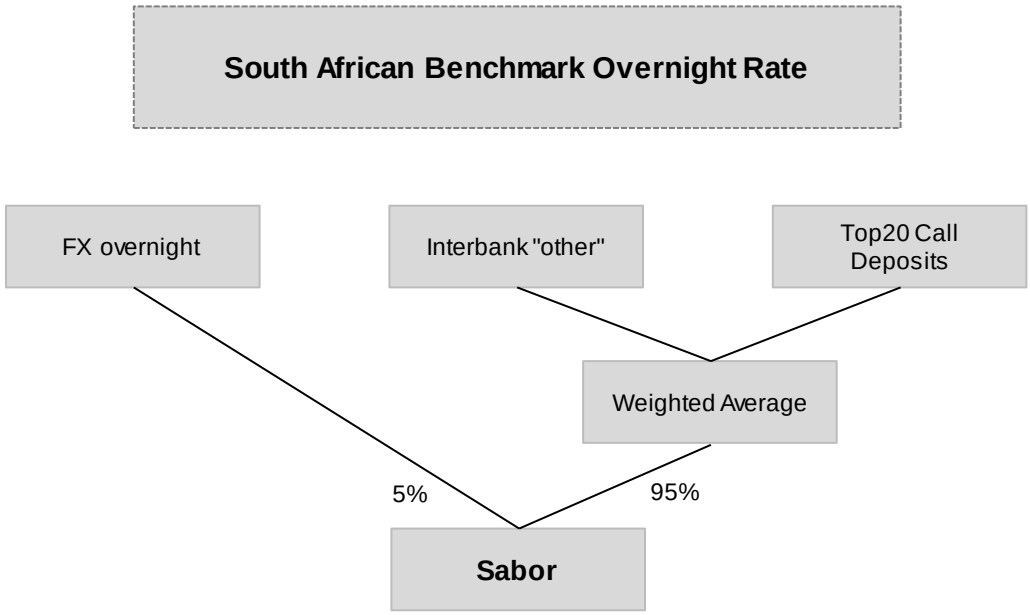
3.5.6 To determine the average overnight rate, different weights are assigned to each of the above subcomponents, that is, interbank overnight funding, non-bank wholesale deposit funding and rand funding obtained in the FX swap market. The weight distribution to each of the subcomponents is as follows:

i. 95% allocation for interbank funding at a rate other than the current repo rate and Top 20 rate; plus

ii. 5% allocation for implied rand interest rates on FX swaps.

3.5.7 Figure 13 provides an illustration of how Sabor is determined.

Figure 13 Construction of the South African Benchmark Overnight Rate



Source: SARB

3.5.8 At present, there is no validation process for Sabor inputs, although there is an internal compliance risk function at the SARB that is responsible for sign-off. All contributing banks are required to submit their volume and interest rate information pertaining to the three funding sources described above. This is done electronically via an online platform as well as via email to the SARB. The current framework for data collection does not allow for pre- and post-submission validation of inputs to detect and evaluate suspicious inputs. Furthermore, unlike Jibar, there is no code of conduct for Sabor. Where a benchmark is based on a submission, as is the case with Sabor, the IOSCO principles (principle 11) require that an administrator develops guidelines (i.e. a code of conduct) covering a host of operational rules for the relevant benchmark. However, these are issues that, as noted in Chapter 2, will be dealt with during the operationalisation of the proposals contained in this consultation paper.

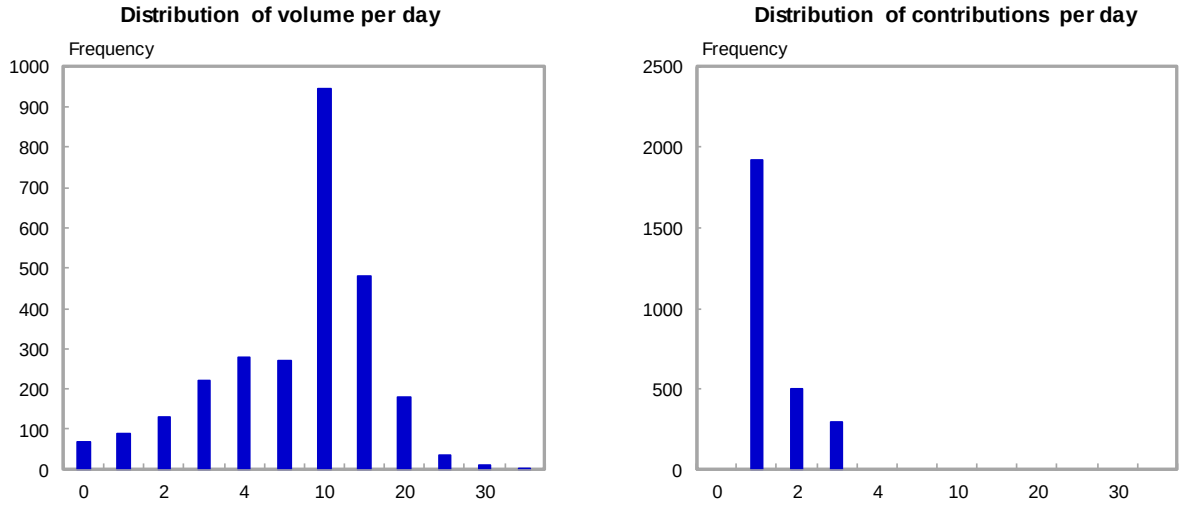
3.5.9 Outside of these governance issues, the design of Sabor is also not optimal when considered alongside the design criteria discussed in Chapter 2. Much of the misalignment emanates from the adequacy of the sample data of funding in the overnight FX swap market. Two criteria bear relevance:

i. the adequacy of the sample used to represent the interest rate benchmark (principle 6(a)); and

ii. the distribution of the underlying market among market participants in order to avoid market concentration (principle 6(d)).

3.5.10 An analysis conducted by the Working Group found that there are instances where banks do not submit data on overnight funding raised in the FX swap market. This is shown on the left-hand frequency distribution chart in Figure 14. Secondly, and probably more concerning, the Working Group found that the distribution of the submission is concentrated in nature, with one bank submitting most of the data.

Figure 14 Overnight FX swap volumes and contributions



Source: SARB

KEY FINDING 13

Sample data on overnight FX swaps – a subcomponent of Sabor – are inadequate as the underlying data was found to be insufficient, highly concentrated and not necessarily observable.

3.5.11 Upon investigating these findings, most A1 banks[28] indicated to the SARB that, typically, they do not use FX swaps in the same-day overnight market as a mechanism to raise rand deposits to fund themselves on an ongoing basis. The various reasons for this include the fact that most banks are habitually long rand, and interest rates are usually higher than alternative sources where they can raise rand in the local money market.

3.5.12 Moreover, there is a fundamental difference between FX swaps and the other components of Sabor (i.e. Top 20 call deposits and interbank deposits). FX swaps are technically secured instruments, but in the current calculation methodology, FX swaps are included in Sabor, which explains the 5% weighting of FX swaps in the calculation of the current Sabor. In the new proposals, the Working Group does not recommend the inclusion of FX swaps in the calculation of unsecured overnight rates, nor does it recommend its inclusion in any secured overnight benchmark, given that it is unobservable and references an offshore rate (USD Libor). FX swaps provide an implied rate and, therefore, it cannot be regarded as an observable rate. Furthermore, due to exchange control, there are regulatory constraints in accessing this market, resulting in some degree of pricing friction.

[28] Absa, FirstRand, Investec, Nedbank, Standard Bank.

KEY FINDING 14

It is difficult to justify the inclusion of FX swaps in the Sabor calculation as FX swaps are structurally different from deposits (i.e. FX swaps are secured, while deposits are unsecured), are not a directly observable rates as they are implied from FX forward points and are subject to regulatory constraints that cause pricing frictions.

3.6 Sabor reform proposals

3.6.1 The Working Group considered these findings and is concerned that the sample size and concentration issues affect the ability of the FX subcomponent of Sabor to provide an accurate and reliable representation of the economic realities of interest rates paid on overnight and tom next rand funding in the FX swap market. While the Working Group is satisfied that taking into account all subcomponents of Sabor results in ample coverage to allow the interest rate benchmark to be a more reliable indicator of the cost of raising rand funds in the overnight money market, the design of this interest rate benchmark can benefit from some refinements. Accordingly, the Working Group is proposing to change the design of Sabor. Moreover, the Working Group is proposing a new overnight money market interest rate benchmark that will capture interbank funding only. The remainder of this chapter sets out more detailed proposals for the reform of Sabor as well as for the new rand overnight interbank interest rate benchmark.

3.6.1.1 Sabor Money Market

3.6.1.1.1 Sabor Money Market is a name given to the reformed version of Sabor. An important reform proposal is that the interest rate benchmark will be measured as a volume-weighted average of all unsecured overnight wholesale deposits, from all banks. The new Sabor Money Market excludes all rand funding raised in the FX swap market, but includes interbank deposit funding raised at the prevailing repo rate. In the current

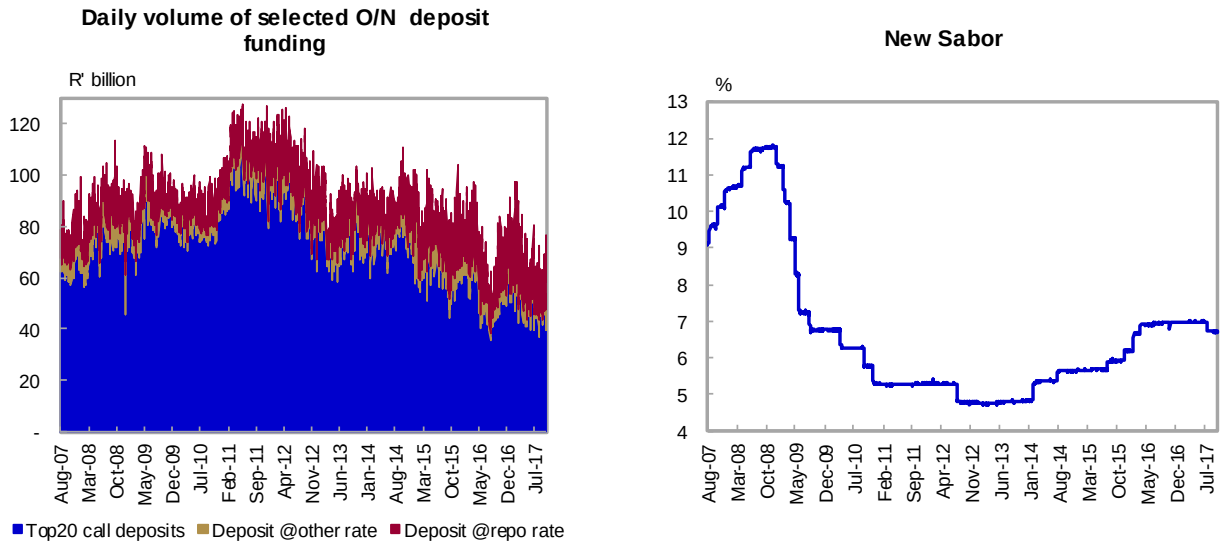
Sabor design, the latter is not included in the calculation. The new interest rate benchmark, like the current Sabor, also excludes deposits with the central bank (standing facility and supplementary repos).

RECOMMENDATION 4

The Working Group recommends that Sabor be reformed to Sabor Money Market, which reflects eligible overnight unsecured funding from all banks, including funding obtained at the prevailing repo rate, but excluding overnight FX swaps.

3.6.1.1.2 The characteristics of the new Sabor Money Market interest rate benchmark are shown in Figures 15 to 17. All calculations are based on daily Sabor submissions from 1 August 2007 to 30 September 2017.

Figure 15 Unsecured deposit volumes and rates in the overnight money market



Source: SARB

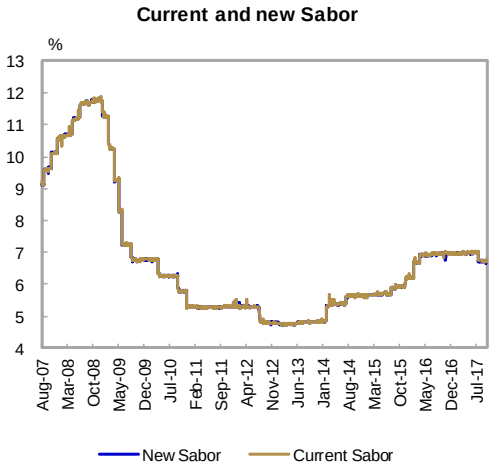
3.6.1.1.3 As with the current Sabor, Top 20 deposits dominate the underlying basis for Sabor Money Market. Interbank deposit funding done at the prevailing repo rate is the second biggest subcomponent of the new benchmark. In this new composition, the Working Group has noted the declining trend

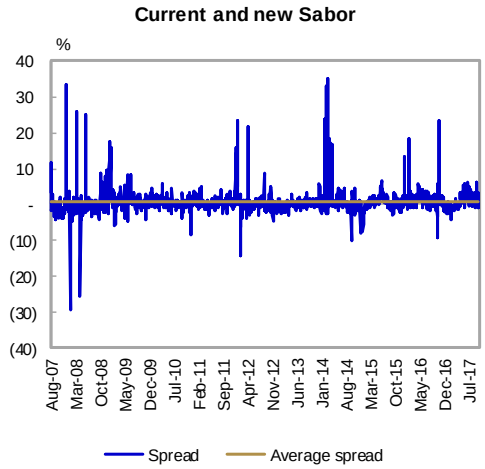
in Top 20 call deposit volumes and is concerned about the potential impact it may have on the benchmark's compliance with the IOSCO principles on data sufficiency. As such, the Working Group proposes that the overnight call deposit universe should be expanded to incorporate all deposits of R20 million and higher. These additional data were not available at the time of drafting these proposals. Accordingly, the characteristics of Sabor Money Market discussed hereunder do not account for this. Furthermore, due to a lack of data on the number of trades,[29] the assessment of compliance with the IOSCO requirement for data sufficiency is based on volumes per day, rather than the number of trades. Given the possibility of large volume trades, which may result in fewer trades per day than is regarded as sufficient, Sabor Money Market's compliance with the IOSCO principles may need to be reassessed once granular transaction data become available.

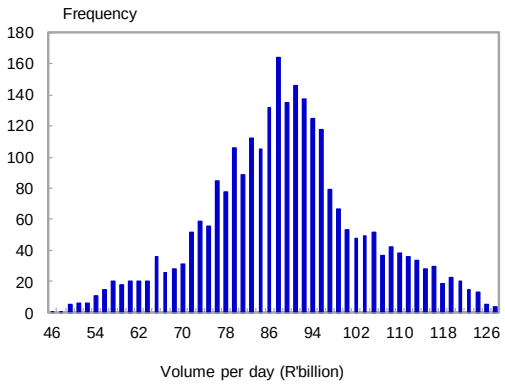
3.6.1.1.4 The Sabor Money Market is shown in the right-hand chart of Figure 15 and is compared with the current Sabor in Figure 16. The average spread between these two interest rate benchmarks is less than a basis point, although there are instances where there are spikes of up to 30 basis points.[30]

[29] The current data collection methodology does not make provision for submitters to report the number of trades per day.
[30] These spikes are observed on either side of zero.

Figure 16 Comparison of current Sabor and Sabor Money Market







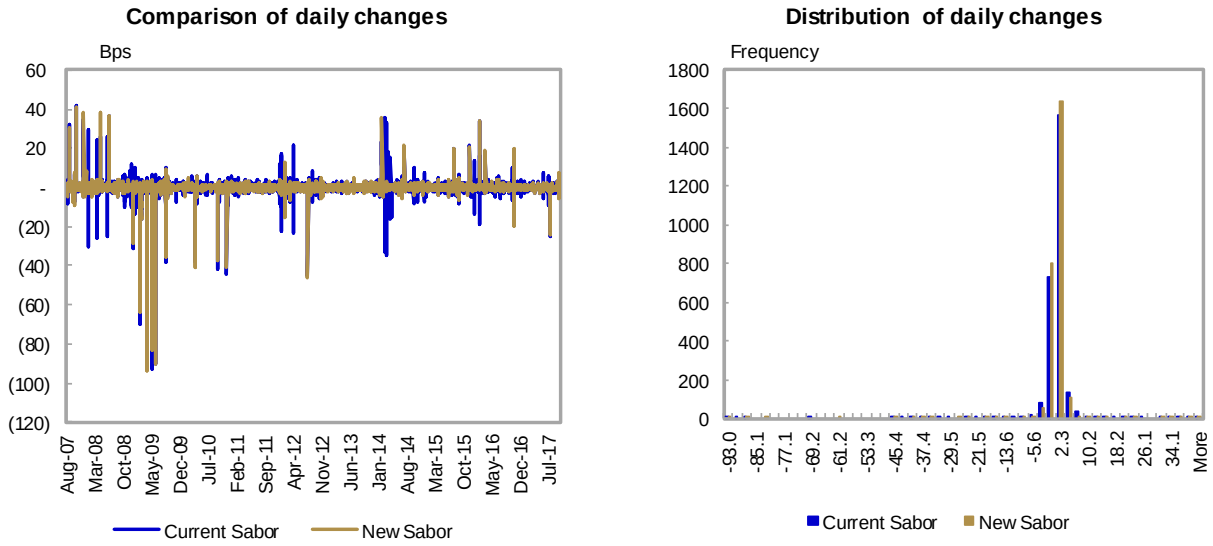
Summary statistics

	Sabor	Sabor MM
Mean	6.72	6.71
Median	5.93	5.92
Mode	5.28	10.63
Min	4.72	4.73
Max	11.87	11.8
Sample variance	4.13	4.13
Standard deviation	2.03	2.03
Average spread to current rate (bps)	-	0.58
Correlation (Level)	-	1.00
Correlation (Daily changes)	-	0.81
Standard deviation of daily changes	5.24	4.58

Source: SARB

3.6.1.1.5 In terms of volatility, changes in the Sabor Money Market exhibit a similar trend to Sabor. The standard deviation of daily changes in the two interest rate benchmarks is 5.24 and 4.58 respectively.

Figure 17 Comparison of daily changes in the current Sabor and Sabor Money Market



Source: SARB

Box 4 Unsecured overnight interest rates as an operating target for monetary policy implementation

Monetary policy implementation frameworks have evolved over time with the change in monetary policy objectives. There is therefore no 'one size fits all' monetary policy implementation mechanism. Most central banks nowadays announce an operating target in order to ensure focused and effective monetary policy implementation. The operating target for monetary policy implementation is an interest rate that is pivotal in the transmission of monetary policy, which the central bank can control with direct and immediate effect, on a day-to-day basis. This is achieved through the use of its monetary policy instruments. In the proposed new monetary policy implementation framework, which will be submitted to the Governors' Executive Committee for approval, it is proposed that a target for overnight interest rates be announced. The operating target must be a rate with limited inherent volatility, otherwise random moves in the rate could be incorrectly construed as signals of potential policy changes. Many central banks have selected a target or targets for either a secured or unsecured market interest rate and have in fact occasionally switched from one to the other.

The three main funding buckets of banks' treasury operations are the cash market (deposits), repurchase transactions and the foreign exchange (FX) forward market. The latter two represent secured funding. The selection of an operating target depends on the ability of the central bank to influence interest rates in these funding buckets. From experience, the SARB can indeed influence the implied rates in the FX forward market, but these rates can be extremely volatile, while the transition to the other segments of the overnight market is often insufficient. Similarly, interest rates in the repo market are often driven by demand and supply for the underlying collateral, rather than by the demand for cash. Interest rates in the cash market are always (and immediately) impacted by the underlying demand and supply of bank reserves (cash) in the interbank market.

The proposed Sabor Money Market comprises all unsecured overnight wholesale deposits. From previous analyses, it was confirmed that these rates indeed adjust according to changes in money market liquidity conditions. Therefore, by altering the demand and supply of bank reserves in the system, the South African Reserve Bank (SARB) will be able to influence unsecured overnight interest rates in the market and also potentially influence the term deposit curve, with overnight unsecured rates acting as the anchor for the deposit curve.

3.6.1.2 ZARibor

3.6.1.2.1 The Working Group recommends the introduction of a new interbank overnight rate, namely the ZARibor. In addition to the rate being an interbank interest rate benchmark, limiting the scope for ZARibor to interbank deposits only is further informed by the fact that the rate could be considered for use in the SARB's financial stability monitoring framework to determine the network structure of the domestic interbank market.[31] This network structure considers interbank loans as one of the most vital measures of interconnectedness between banks.

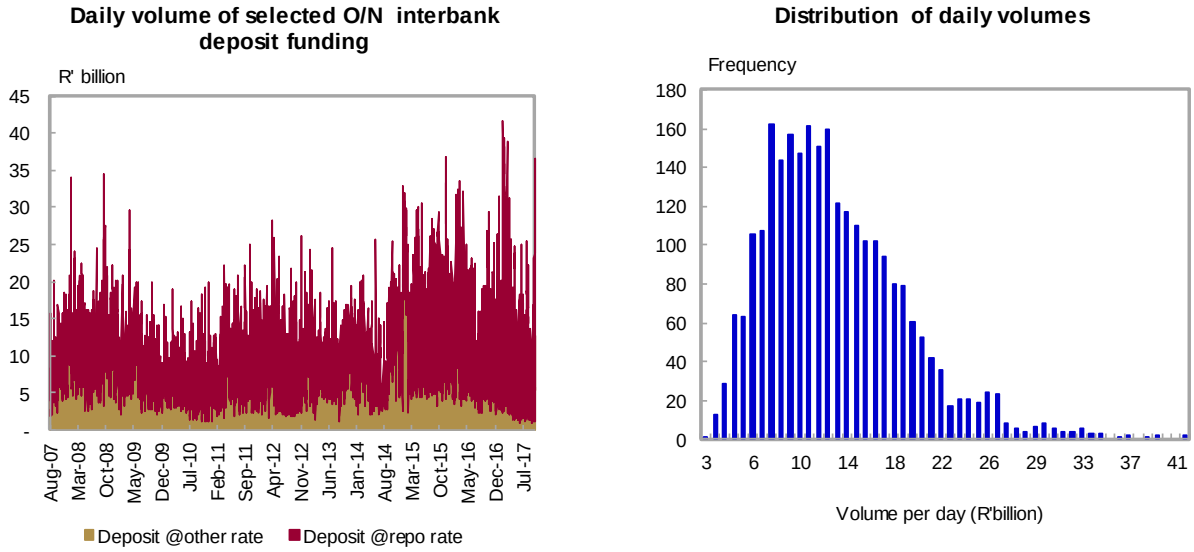
RECOMMENDATION 5

The Working Group recommends that a new interest rate based on solely on eligible overnight interbank transactions from all banks, the South African Rand Interbank Overnight Rate (ZARibor) be calculated and be considered as a near RFR.

3.6.1.2.2 The characteristics of the proposed new ZARibor are discussed with reference to figures 18 to 20. All calculations are based on daily Sabor submissions from 1 August 2007 to 30 September 2017.

[31] The SARB monitors the network structure of the South African overnight interbank market in order to determine the systemic importance of individual banks. This is done by using an index of network systemic importance, which takes into account a bank's size, its interconnectedness as well as its substitutability in the overnight interbank market. The suite of interest rate benchmarks recommended for adoption will allow the SARB to enhance this monitoring framework through enhanced cross-sectional analysis of the interest rate landscape.

Figure 18 Average daily volume of the new ZARibor

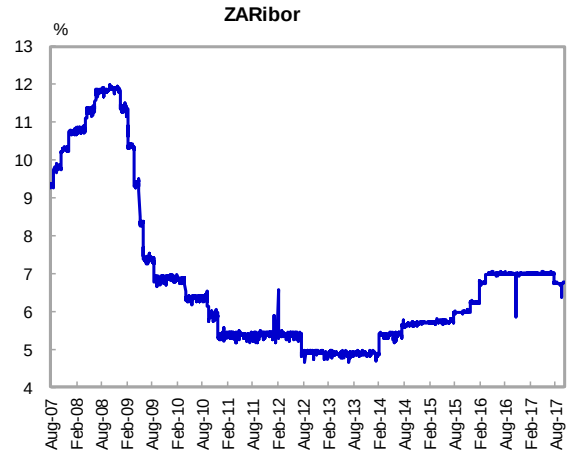


Source: SARB

3.6.1.2.3 The average volume on which ZARibor is based was R13 billion per day during the period under review. The distribution of average interbank deposit flows per day is shown in the right-hand chart of Figure 18.

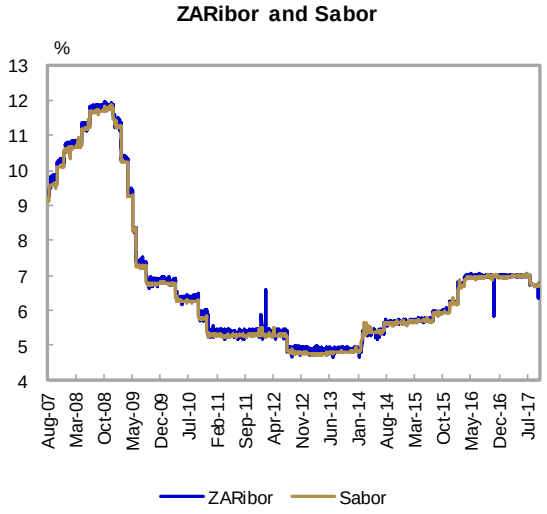
3.6.1.2.4 The resulting ZARibor is shown on the left-hand chart of Figure 19, where it is also compared with the current Sabor. The average spread between these two interest rate benchmarks measured -7 basis points during the period under review. This shows that interbank deposits are priced slightly lower than the Top 20 client deposits, which comprise NBFC deposits, financial corporate deposits and public sector deposits.

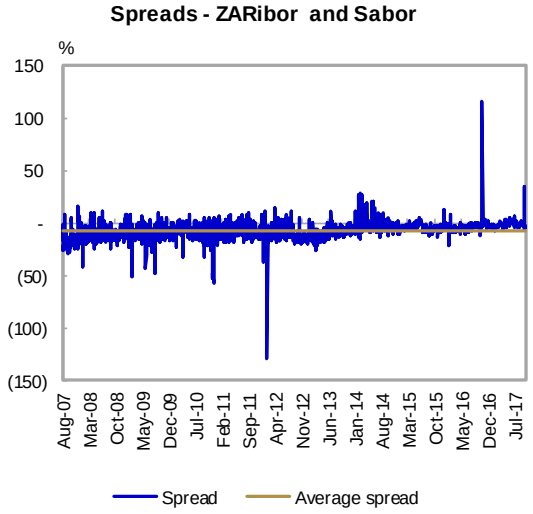
Figure 19 ZARibor and selected summary statistics



Summary statistics

	ZARibor
Mean	6.79
Median	5.98
Mode	10.79
Min	4.65
Max	11.97
Sample variance	4.18
Standard deviation	2.04
Average volume per day (R' bn)	12.92
Minimum volume (R' bn)	2.64
Maximum volume (R' bn)	41.74
Minimum trades per day	-

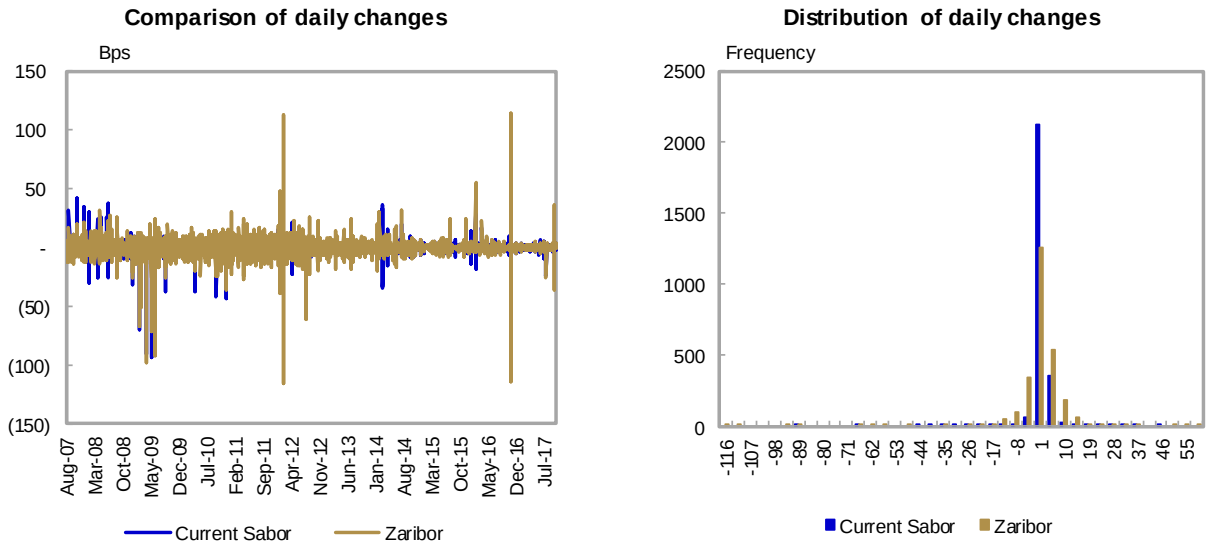




Source: SARB and Bloomberg Finance LP

3.6.1.2.5 In terms of volatility, changes in ZARibor exhibit a similar trend to Sabor. During the period under review, daily changes were concentrated in the -10 to 15 basis point range.

Figure 20 Comparison of daily changes in ZARibor and current Sabor



Source: SARB

3.6.1.2.6 The Working Group proposes and recommends that ZARibor be considered as a near risk-free benchmark. However, this will require extensive engagements with market participants. Typically, an interest rate is regarded as risk-free if the risk of financial loss in the underlying security whose interest is being measured is zero, over a given period. However, given the risk characteristics of overnight interbank deposits, including minimal credit and liquidity risks, an overnight interest rate such as ZARibor can be considered as near risk-free.

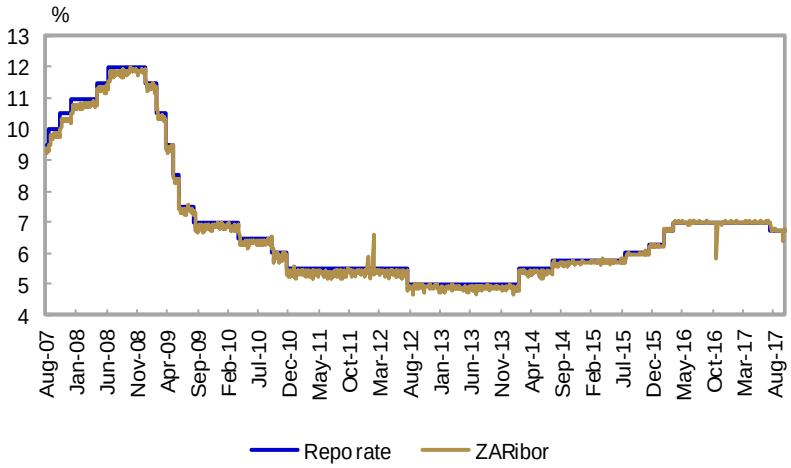
KEY FINDING 15

An interest rate based on unsecured overnight interbank deposits is required. Furthermore, given the minimal credit and liquidity risks of the underlying transactions, such a rate could be considered as a near RFR.

3.6.1.2.7 Furthermore, were ZARibor to be adopted as a near risk-free benchmark, and depending on how and for what it is used, the MPG would need to consider how the market will transition from ZARibor (as a near RFR) to a risk-free benchmark when the latter has been developed.

3.6.1.2.8 Figure 21 compares ZARibor to the domestic equivalent of a secured interest rate. ZARibor trades at a spread of at least 10 basis points below the supplementary repo rate, underscoring the rates potential as a near risk-free equivalent.

Figure 21 ZARibor and supplementary repo rate



Source: SARB

3.6.1.2.9 The Working Group's proposals on the reform of overnight interest rate benchmarks are built upon the RRWG's proposals for the development of an overnight interbank interest rate as well as a broader money market interest rate. For the broader money market rate, the Working Group proposes Sabor Money Market, calculated as a volume-weighted average interest rate on all overnight deposits. As is the case with Sabor, and by virtue of being transaction-based, both interest rates will be calculated for value at time *t*, using transaction data from time t-1. Unlike the current Sabor, Sabor Money Market will exclude rand funding raised in the FX swap market. Sabor Money Market will also not be limited to Top 20 call deposits, but include all wholesale deposits of R20 million and above.

3.6.1.2.10 For the overnight interbank rate, the Working Group proposes ZARibor as a measure of interest for deposit funding between banks. The Working Group also proposes that ZARibor be designated as a near RFR. While either Sabor Money Market or ZARibor could be designated as a near RFR, the Working Group's preference is for the latter to be used as a near RFR. This is in line with practices in other jurisdictions where unsecured interbank rates were selected for this purpose (see Annexure 3). In addressing possible concerns of elevated overnight volatility in times of severe market stress, the Working Group proposes the central bank policy rate (repo rate) as a fall-back rate. With ZARibor also recommended as a possible RFR, market participants will have a choice of three RFRs as reference interest rates for interest rate derivatives. This is the subject of the next chapter.

Chapter 4

Risk-free interest rate benchmarks in the South African financial markets

Overview

In light of global shifts towards the use of risk-free rates (RFRs) as reference interest rates for derivative contracts, the Working Group is of the view that such benchmarks should be calculated and published in South Africa, both to provide 'fall-backs' in the case that unsecured benchmarks are permanently discontinued, and to facilitate policymakers' task in monitoring the transmission of monetary policy.

The Working Group considered three alternatives for the calculation of risk-free overnight rates:

i. Government bond (GB) repo rates should be considered as the primary choice for overnight and one-week RFRs, although these rates exclude 'special' trades that skew price distribution in a way that does not reflect underlying funding conditions in the market.
ii. Consideration should also be given to calculating an interest rate benchmark 'South African Secured Financing Rate (SASFR)', reflecting all forms of secured money market funding, namely GB repo transactions plus supplementary repo transactions with the SARB. This rate could, in particular, serve as the reference for developing an OIS market.
iii. South African Rand Interbank Overnight Rate, (ZARibor).

For term RFRs, the Working Group recommends the following steps:

i. An improvement in the liquidity of the secondary market for Treasury bills. Steps in that direction entail the inclusion of Treasury bills in the GB electronic trading platform (ETP), the use of primary dealers to quote prices, a Treasury bill repo facility, and the daily collection of transaction data from Strate.
ii. The development of a broader general collateral (GC) repo market with a broader pool of collateral than the current GB market.

4.1. Risk-free benchmarks in the domestic market

4.1.1. As discussed in Chapter 2, there is a global shift from unsecured rates to RFRs for use as references in derivative contracts. The importance of RFRs in South Africa has been highlighted in various subcommittees of the FMLG

and in consultations with market participants, where a need was emphasised for a risk-free yield curve for the derivative market (in particular the OIS market). However, at present, no risk-free money market interest rate benchmarks are published in the South African financial markets.

KEY FINDING 16

There are no risk-free money market interest rate benchmarks currently published in the South African financial markets.

4.1.2. In addition to the uses described above, and in line with OSSG recommendations, RFRs can serve as 'fall-backs'[32] in circumstances where unsecured benchmarks are permanently discontinued, or as part of contingency plans. RFRs will also be useful for monetary policymakers since the pass-through of policy rates across the term risk-free curve would assist in monitoring the transmission of monetary policy. This is because RFRs are not affected by credit risk considerations, which makes them 'cleaner' representations of interest rate views.

4.1.3. Various alternatives can be considered as underlying markets for calculating RFRs. The choice depends on a number of considerations, some of which are included in the IOSCO principles (see Chapter 2. For purposes of this consultation paper, the Working Group considered the following alternatives: (i) the secondary market for Treasury bills for a term risk-free benchmark; and (ii) the overnight GB repo market as a possible basis for the calculation of an overnight RFR for the domestic market. This chapter deals with these alternatives as well as a hybrid secured overnight rate – the South African Secured Financing Rate (SASFR) – composed of GB repos and SARB supplementary repo market activity. The rate implied

[32] An interest rate benchmark that can be used if the reference rate for a contract is unavailable.

from the FX swap market, which is a secured market, was not considered as it is not a directly observable rate, as mentioned earlier.

4.2. Secondary market for Treasury bills

4.2.1. National Treasury (NT) issues Treasury bills with maturities ranging from 91 days to 365 days as part of its regular short-term funding activities. Treasury bill auctions are conducted every week (on Fridays) by the SARB as the NT's funding agent. All counterparties that are part of the Central Bank Management System's (CBMS) Money Market Internet System (MMIS) can participate in NT's Treasury bill auctions.

4.2.2. Currently, the secondary market for Treasury bills in South Africa is illiquid. This is mainly due to banks holding Treasury bills for prudential reasons, that is, to comply with the liquid asset requirement (LAR) and the liquidity coverage ratio (LCR). Treasury bills also qualify as eligible collateral for the SARB's refinancing operations. In addition, the total return benchmark used by most money market fund managers is the STeFI, and Treasury bills are not included in this index. The Treasury bill market is, therefore, dominated by buy-and-hold strategies by the banking sector. Furthermore, secondary market activity is predominantly in the short-term maturity spectrum of the curve, although turnover is too low for it to be considered an active market.

KEY FINDING 17

The secondary market for Treasury bills in South Africa – a potential source market for calculating term RFRs – is illiquid, mainly due to banks buying and holding Treasury bills for prudential reasons.

4.2.3. Unlike government bonds, there are currently no repos on Treasury bills and price discovery is insufficient. This is mainly due to the lack of dedicated

Treasury bill trading screens and/or market makers. Therefore, it is difficult to purchase Treasury bills in the secondary market.

4.2.4. Despite the current state of the Treasury bill market, the Working Group considers Treasury bills a potentially useful and appropriate basis for calculating term RFRs. This view has similarly been echoed in various committee structures in the domestic market, where a need to develop a liquid secondary market for Treasury bills was expressed. A Treasury Bill Market Working Group (TBMWG) comprising representatives from NT, SARB, the five large South African commercial banks, Strate and the JSE was established in June 2017 to draft proposals to achieve this objective. Below is a list of interventions proposed by the TBMWG as possible action steps that can be taken to enhance liquidity in the secondary market in order to derive a risk-free term curve:

i. Introduce market makers or primary dealers who will quote two-way prices on Treasury bill trading screens. This would entail Treasury bill market makers making use of Reuters and/or Bloomberg screens to continually quote two-way secondary market prices.
ii. Build a local carry/buy and sell-back market, using Treasury bills as collateral (in addition to using government bonds).
iii. NT could increase Treasury bill issuances across all maturities and could also issue Treasury bills of non-standard maturities, if the demand exists for such instruments.
iv. NT could develop a script-lending facility for Treasury bills, as it is the case for government bonds.
v. Enhance the ETP for government bonds to also include Treasury bills.
vi. Pending the finalisation of the process to trade Treasury bills on the ETP, daily transaction data could be obtained from Strate to calculate the risk-free curve.
vii. The process adopted by the JSE/Strate with regard to determining the closing market pricing for listed government bonds could act as a

template for the RFR benchmark determination for 'on-the-run' Treasury bills.

4.2.5. The Working Group's preferred intervention is the inclusion of Treasury bills in the ETP. However, given that the current phase of the ETP is focused on government bonds and that it may take some time to include Treasury bills, the Working Group proposes that consideration be given to interventions (a) and/or (f) above. These interventions entail emulating the current Jibar process to determine daily Treasury bill rates, which will require banks to quote two-way prices. Furthermore, the Working Group proposes that the responsibilities of primary dealers in this regard be outlined in a Treasury bill code of conduct, which will include prescribed trading hours and predefined volumes. This approach could reasonably achieve consistent pricing guidance, thus enabling a benchmark formulation methodology to emerge.

RECOMMENDATION 6

The Working Group recommends an improvement in the liquidity of the secondary market for Treasury bills. Steps in that direction entails the inclusion of Treasury bills in the GB electronic trading platform (ETP), the use of primary dealers to quote prices, a Treasury bill repo facility and the daily collection of transaction data.

4.2.6. To aid the long-term goal of enhancing liquidity in the secondary market, the SARB is considering enhancing the strength of its open market operations toolkit by including Treasury bills (purchased in the secondary market) in its monetary policy portfolio. It is envisioned that this may be used actively in the SARB's liquidity management operations.

4.2.7. The secondary Treasury bill market, once fully developed, will support the calculation of an IOSCO-compliant risk-free interest rate benchmark, as trading will take place on the ETP and observable transactions will be

available. The tenors that can potentially be calculated are three, six, nine, and twelve months.

4.3. Government bond repo market

4.3.1. The Treasury bill market could potentially serve as a basis for term RFRs. To provide for an overnight anchor, the Working Group explored the possibility of using government bond repo market (GB repo) as a basis for calculating RFRs in the domestic funding market. GB repos could also be considered as a basis for term RFRs; however, as discussed later, repo market activity beyond the one-week tenor is sparse. The GB repo market is a dynamic cash market that takes into account the funding liquidity conditions in the market and the pressure that emanates from banks that need to raise local currency to fund their long bond positions. This is secured financing and could be an alternative to unsecured money market instruments.

4.3.2. However, it should be noted that the GB repo market in South Africa is not a GC repo market in the true sense. In GC repo markets, the rate determination process is driven by institutions that are long cash and want to lend these monies on a secured basis. Therefore, these institutions are indifferent to which bonds they receive, hence the term 'GC'. In South Africa, the repo market is driven by holders of bonds who need to finance their long bond positions, and therefore it is driven by demand for cash. The consequence is that the GB repo rate[33] has tended to converge to the level of cash borrowing, rather than cash deposits. This is reflected by the current GB overnight repo rate, which is trading above the current Sabor (see Figure 22).

[33] The GB repo rate refers to the rate at which cash is raised in the market against government bonds.

KEY FINDING 18

The government bond (GB) repurchase (repo) market in South Africa, which the Working Group considered as the primary choice for overnight and one-week RFRs, is not a general collateral (GC) market in the true sense, as the former is driven by holders of bonds who need to fund their long bond positions.

4.3.3. At times, the speculative sector (a reference to the market participants who need to fund trading positions via the repo market, as they are not naturally long cash) develops a short position in a specific bond due to large investor demand. In this instance, as the repo transaction is driven by a demand for a specific bond, and the repo market does not have supply of this, the repo rate on this bond will decline as holders of the bond use this as an opportunity to fund their long position at a lower rate, that is, they trade 'special'. The repo rate for such a bond will be forced below the GB repo rate. The inclusion of these 'special' transactions may skew the distribution of the rate in a way that does not reflect market conditions for overnight funding. Therefore, the calculation methodology for the rate should take into account the effect of 'specialness' on the distribution of rates and should remove these rates.

4.3.4. In South Africa, all repo market transactions are reported to the JSE and settled through Strate, with participation from both bank and non-bank counterparties. The current repo market in South Africa is a single stock repo market as opposed to a basket of collateral used in other countries, and does not allow for collateral substitution yet. Only South African GBs are used as repo collateral. The market for repos against a broader collateral pool (GC repo) is very much in its infant stage. However, there are ongoing initiatives to improve the current mechanics of the domestic repo market.

4.3.5. In terms of the liquidity of the broader repo market, large volumes of repo transactions are concentrated at the shorter maturities (overnight and one

week).[34] As depicted in figures 22 and 23, there is a fair amount of trades in both the overnight and one-week tenors, although large volumes in the latter are mainly concentrated on Tuesdays. In longer tenors, activity is sparse and this presents a challenge for using GB repos as a basis for calculating term RFRs.

KEY FINDING 19

Activity in longer GB repos is scarce and this presents a challenge for using GB repos as a basis for calculating term RFRs.

4.3.6. Notwithstanding these constraints, the Working Group considered the calculation of overnight and one-week GB repo rates – see figures 22 and 23 for the outcomes – to serve as short-term anchors for term RFRs. Similar to the unsecured rates discussed in Chapter 3, the overnight and one-week GB repo rates shown below are determined as volume-weighted averages. The following definitions and restrictions were applied:

i. An overnight repo is one where the difference between the settlement period of the first and second legs of the repo transaction is one day.

ii. A one-week repo is one where the difference between the settlement period of the first and second legs of the repo transaction is greater than one day, but less than or equal to five working days.

iii. A minimum transaction size for a nominal repo traded is at least R50 million.

4.3.7. Due to the current structure of the data used to calculate GB repo rates in this consultation paper, no adjustments were made to account for the impact of bonds that are trading special. While various statistical techniques can be applied to account for 'specialness', none of them can do so accurately, given how the current database is designed. The current data

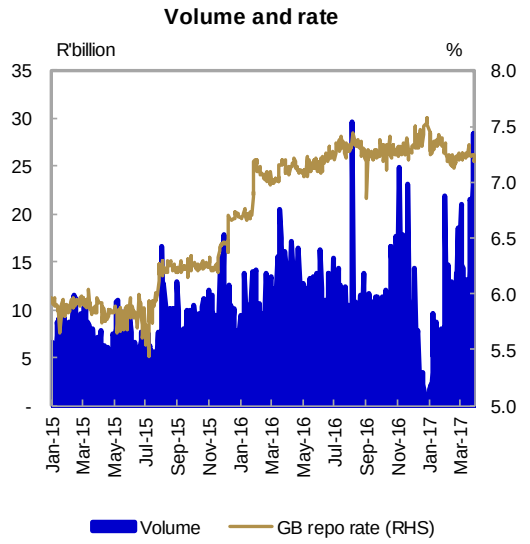
[34] In the overnight tenor, the first leg of the repo trade settles T+0 up to T+2, while in the one-week tenor, trades settle T+2 up to T+5.

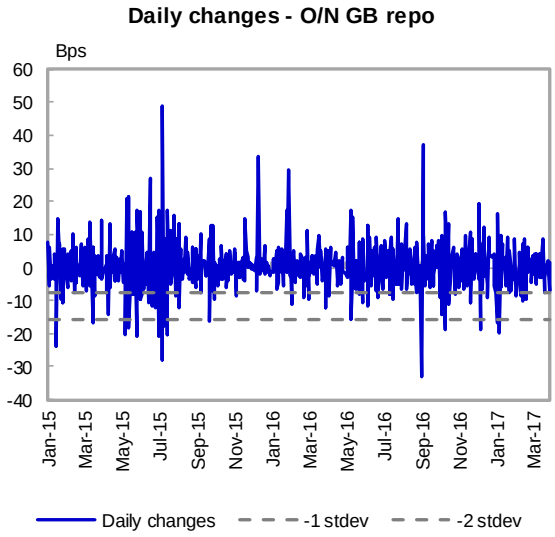
collection platform will need to be modified to clearly indicate if a bond is trading special so as to allow benchmark administrators to account more accurately for the effect of ‘specialness’ on the distribution of the underlying carry rates. An alternative method that can be considered is ‘tailing the data’. This is done by eliminating all bonds whose carry rate is below a predefined threshold. This threshold can be determined for each bond as an average rate adjusted by a measure of variability during a given period (i.e. a standard deviation).

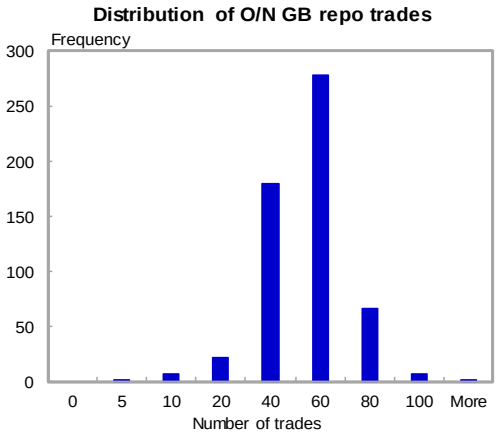
4.3.8. Figures 22 and 23 illustrate the resulting GB repo rates. The data on repo transaction volumes and the carry rates used to compute GB repo rates presented in the figures were obtained from the JSE and cover the period January 2015 to March 2017. The data include banks, asset managers, institutional investors and brokers.

4.3.9. As Figures 22 and 23 show, daily average volumes are estimated at R9 billion and R16 billion for the overnight and one-week tenors respectively. Given these volumes and the number of trades per day in each tenor, there appears to be sufficient data to calculate an overnight and one-week RFR based on GB repos. The Working Group is reasonably satisfied with the volume of trading of both overnight and one-week GB repos, although it is yet to be determined whether the size of the repo market in relation to the market that will use GB repos as a reference rate would be satisfactory.

Figure 22 Overnight GB repo rate

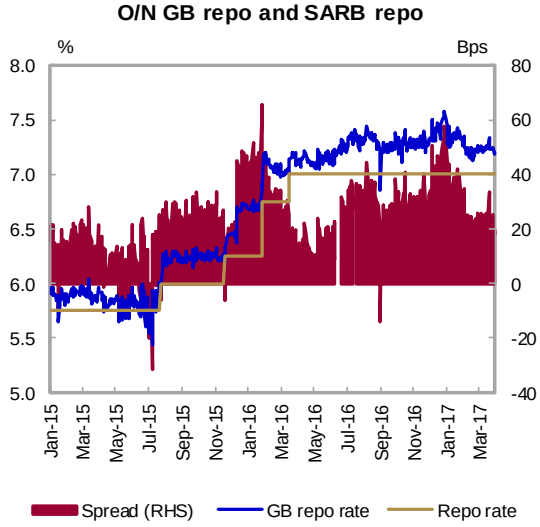


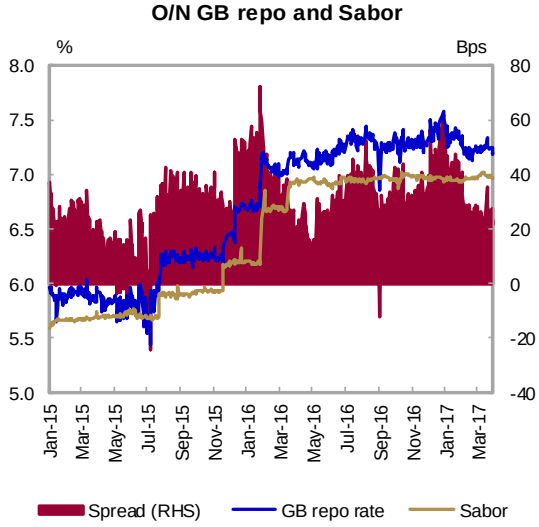




Summary statistics

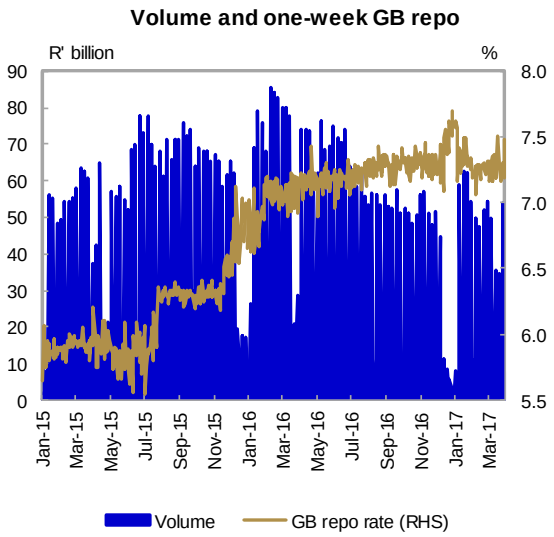
	O/N GB repo rate
Mean	6.69
Median	7.02
Mode	
Min	5.44
Max	7.58
Sample variance	0.37
Standard deviation	0.61
Average volume per day (R' billion)	9.04
Minimum volume (R' billion)	0.39
Maximum volume (R' billion)	29.66
Minimum trades per day	4.00

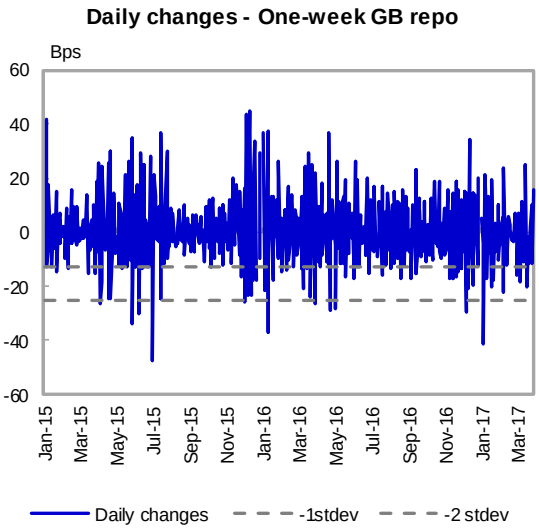


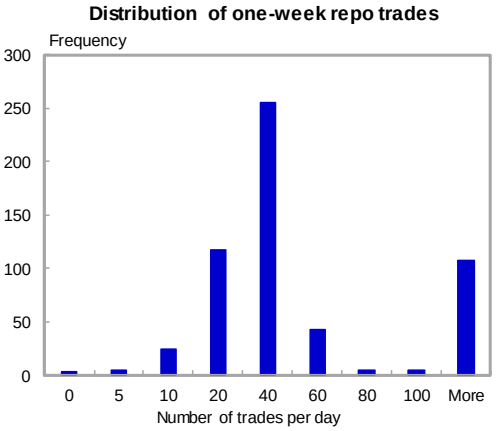


Sources: JSE and SARB

Figure 23 One-week GB repo rates

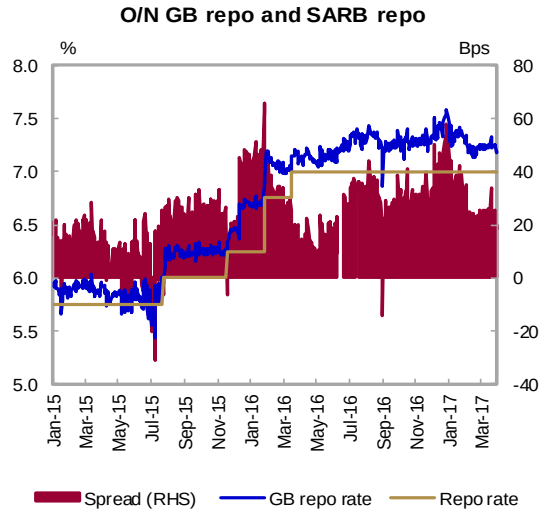


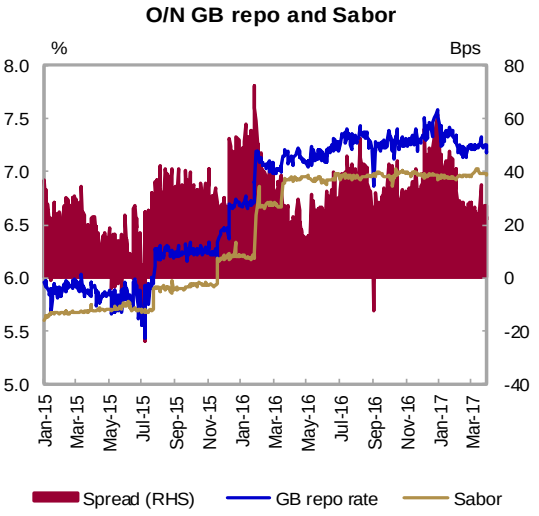




Summary statistics

	1W GB repo rate
Mean	6.72
Median	7.03
Mode	
Min	5.55
Max	7.70
Sample variance	0.35
Standard deviation	0.59
Average volume per day (R' billion)	16.06
Minimum volume (R' billion)	0.00
Maximum volume (R' billion)	85.49
Minimum trades per day	0





Sources: JSE and SARB

4.3.10. The introductory remarks in section 4.3 alluded to the uniqueness of the GB repo market in South Africa which, consequently, causes GB repo rates to trade at levels closer to those of cash borrowing rates than lending rates. Figures 22 and 23 illustrate this point for both overnight and one-week GB repos. As mentioned, because GB repo rates are anchored on actual trades, the resulting interest rates are for a value at time t but based on transactions at t-1. The overnight rate trades, on average, 22 basis points and 28 basis points above the policy rate and the unsecured overnight rate (Sabor) respectively. The one-week rate trades 25 basis points and 31 basis points above the respective rates.

KEY FINDING 20

While the GB repo rate is a secured rate, it trades at a spread above the unsecured overnight rate, the Sabor.

4.3.11. The GB repo offers a viable solution for short-term RFRs. In complying with the IOSCO principles for benchmark design, both the overnight and one-week GB repo rates are derived from observable transactions. In both instances, there are sufficiently high numbers of trades and volumes. Depending on the prevalence of 'special trades', which have not been excluded from the data yet, these statistics (number of trades and volumes) may need to be revised once the necessary adjustments have been made, and may require a reassessment to determine if these risk-free benchmarks are still IOSCO-compliant. However, there are reasons to be concerned. Activity in the repo market is not widely distributed – at least one participant dominates the market. Furthermore, the GB repo market in South Africa is not a GC market in the true sense, as it is driven by holders of bonds who need to finance long bond positions. As a consequence, the resulting GB repo rates tend to converge to the level of cash borrowing, rather than cash deposits. This is not consistent with the general expectation for RFRs to trade below unsecured rates.

4.4. South African Secured Financing Rate

4.4.1. As part of developing multiple interest rate benchmarks, the Working Group considered another variation of a secured interest rate – the South African Secured Financing Rate (SASFR). This interest rate is intended to represent the cost of raising secured funding in the domestic market. As a benchmark, SASFR is meant to incorporate all forms of secured financing that allow the benchmark to provide a truer reflection of the economic realities of the underlying secured market. To be IOSCO-compliant, SASFR should be anchored in observable transactions. By definition, this requires that funding raised in the FX forward market be excluded for reasons given in section 3.5.10

4.4.2. In light of these considerations, the Working Group proposes that SASFR be calculated as a volume-weighted average rate of supplementary repo transactions conducted with the SARB as well as overnight funding in the GB repo market. In the latter case, only repo transactions on GBs should be included. Consideration could also be given to including equity repos, which constitute another form of secured financing. However, as equity is collateral, the effective secured rate should reflect the credit quality of the underlying asset, so while it is a secured rate, it should not be included in an RFR.

RECOMMENDATION 7

The Working Group recommends that a South African Secured Financing Rate (SASFR) be calculated, based on supplementary repo transactions conducted with the SARB as well as overnight funding in the GB repo market.

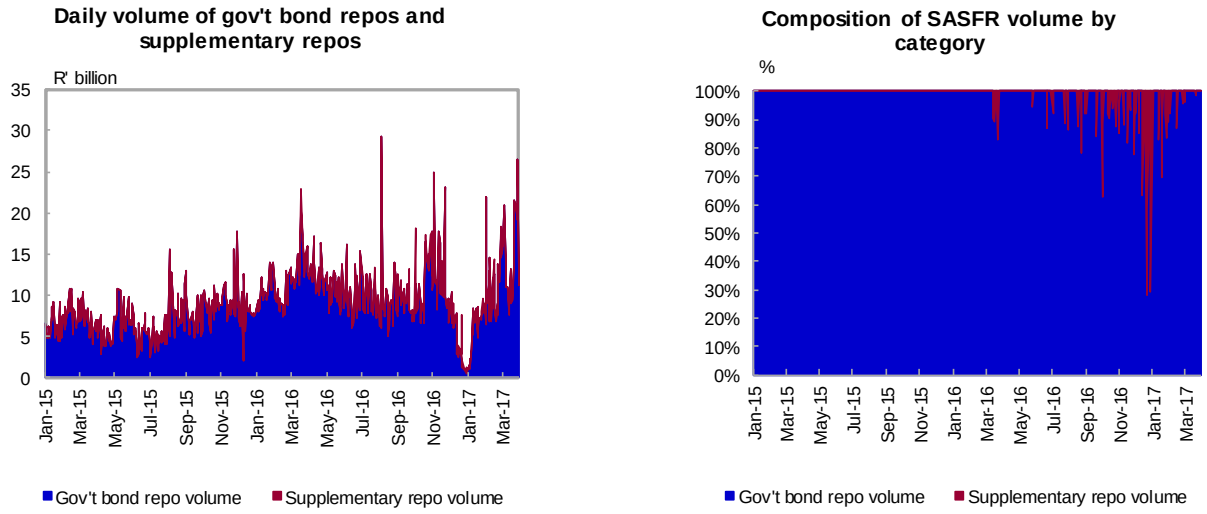
4.4.3. This secured interest rate benchmark could be considered as a reference interest rate for the OIS market. The benchmark will also be used for the SARB's monitoring, alongside FX swap rates and ZARibor as respective measures of interest in repo, FX and cash markets (i.e. the three funding

buckets). Figure 24 shows the volume distribution between these two subcomponents of SASFR.

RECOMMENDATION 8

The Working Group recommends SASFR as the reference interest rate for the OIS market.

Figure 24 Selected overnight secured funding instruments

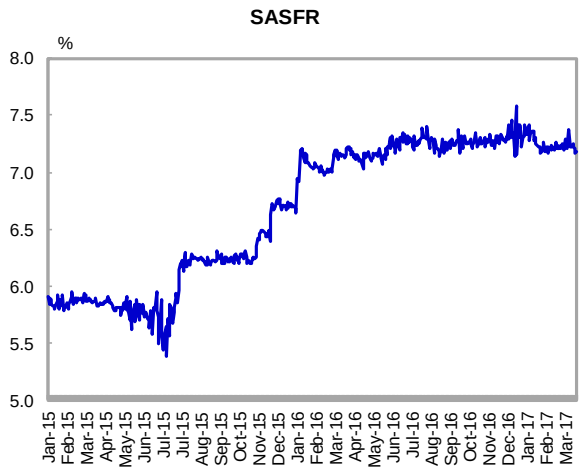


Sources: JSE and SARB

4.4.4. Overnight GB repos accounted for roughly 99% of the underlying volume for SASFR. Supplementary repo volumes, which were reintroduced by the SARB only in March 2016, accounted for less than half a per cent during the period under review. In nominal terms, the daily average transaction volume of both categories is R9.04 billion.

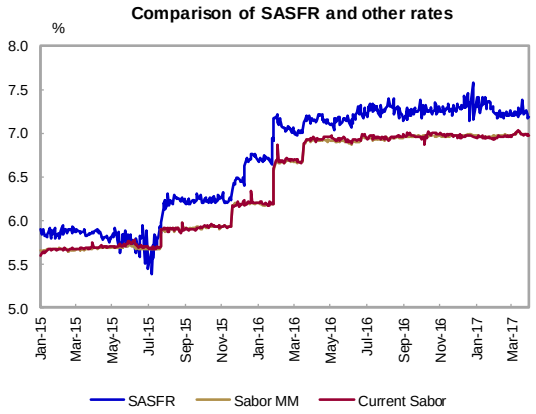
4.4.5. The resulting SASFR is shown in Figure 25, along with other variations of Sabor. Note, however, that the Sabor Money Market and ZARibor are based on unsecured funding, while SASFR represents secured funding.

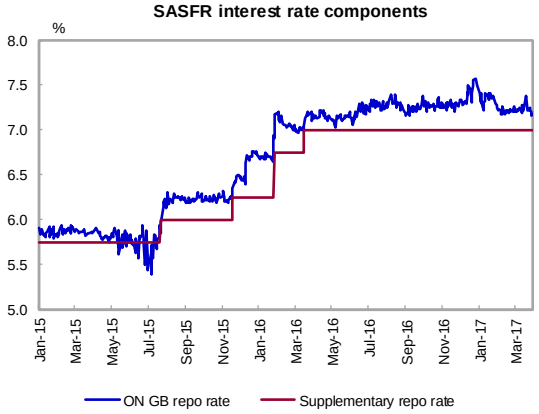
Figure 25 SASFR and selected overnight funding interest rate benchmarks



Summary statistics

	SASFR
Mean	6.67
Median	7.03
Mode	
Min	5.39
Max	7.58
Sample variance	0.38
Standard deviation	0.61
Average volume per day (R' billion)	9.04
Correlation with Sabor (Level)	0.98
Correlation with Sabor (Daily changes)	0.1
Standard deviation of daily changes	7.16





Sources: JSE and SARB

4.4.6. The longer-term objective for the domestic market, in line with the global preference, is to use RFRs in derivative contracts. For overnight RFRs, the Working Group recommends two possible rates for consideration, namely the GB repo and SASFR, with ZARibor (if designated as a near RFR) serving as an additional benchmark for this purpose. Once the platforms and market infrastructure for the calculation of a fully-fledged secured overnight rate are developed and fully operationalised, a proper GC overnight repo rate could be added.

RECOMMMENDATION 9

The Working Group recommends that the GB repo and/or SASFR be used as overnight RFRs for South Africa. Furthermore, if designated as a near RFR, ZARibor could also be used for that purpose.

4.4.7. As is the case with other OSSG member countries, the challenge is for the domestic market to calculate term RFRs. Possible platforms for this purpose include a tri-party collateral management system for the calculation of a GC repo rate, with maturities from overnight to at least three months and a liquid secondary market for Treasury bills. Progress has been reported on both initiatives, but more work needs to be done.

RECOMMENDATION 10

The Working Group recommends the development of a broader GC repo market with a broader pool of collateral than the current GB repo market.

Chapter 5

The use of interest rate benchmarks in policy frameworks

Overview

Chapter 5 analyses how an improved set of interest rate benchmarks, that more accurately reflect the actual cost of funding in specific markets and at specific tenors, can be used to improve both the implementation of monetary policy and the monitoring of stability in the South African financial system.

With respect to monetary policy effectiveness, the Working Group is of the view that:

i. analysts and policymakers alike should have a clear understanding of the different factors underlying market rates, including credit and liquidity risk, term premiums and expectations of future changes (or not) in monetary policy; and
ii. although the current Jibar curve displays some rigidities which complicate such analysis, this is an issue that could potentially be circumvented through the use of an OIS as a key reference for money market derivatives.

The South African Reserve Bank (SARB) monitors the network structure of the South African overnight interbank market in order to determine the systemic importance of individual banks. This is done by using an index of network systemic importance, which takes into account a bank's size, its interconnectedness as well as its substitutability in the overnight interbank market. The suite of interest rate benchmarks recommended for adoption will allow the SARB to enhance this monitoring framework through enhanced cross-sectional analysis of the interest rate landscape. Understanding the drivers of specific market rates is also of paramount importance for financial stability, as it allows proper knowledge of risk sharing between lenders and borrowers. This chapter highlights how the lack of credible benchmarks could lead to the mispricing of risk and, in turn, the reluctance of counterparties to transact.

5.1 Background

5.1.1 The introduction of one or several of the proposed interest rate benchmarks can, in the long run, have important implications for the execution of the dual mandates of the SARB. Insofar as it serves as a reference for a large number of contracts, any short-term benchmark rate plays a key role (i) in the transmission of monetary policy decisions to the cost of (and remuneration of) capital in the broader economy; and (ii) in maintaining

financial stability to the extent that it assists with the timely and accurate measurement of financial and market risk. This chapter deals with these two specific matters.

5.2 Reference rates and monetary policy implementation

5.2.1 South Africa's current monetary policy implementation framework focuses on the size of the money market shortage as the key driver of monetary policy implementation. The implementation framework used for transmitting policy decisions to market interest rates, however, varies across central banks. While most central banks refer to a 'liquidity deficit', they do not necessarily pursue a framework where the focus is primarily on the quantity of central bank money in the system rather than on the price thereof. In many instances, central banks attempt to control both the quantity and the price of central bank money – a policy which has faced some criticism, with the argument that it results in an imperfect 'rationing equilibrium' (Buiter, 2016).

5.2.2 However, there are also a large number of central banks that use overnight rates as an operating target for monetary policy implementation. An operating target is a policy variable that a central bank can control, on a day-to-day basis, using open market policy instruments. The operating target is of utmost importance as it provides guidance to the central bank on how to perform operations on a daily basis and serves to communicate the stance of monetary policy to the market. Open market operations are conducted when overnight rates diverge from the operating target. As long as such open market instruments are easy to implement and effective, and the central bank's target is made clear, there should only be limited, short-lived deviations of the actual overnight rate from the target, as is the case for the US federal funds rate.

5.2.3 With many monetary policy frameworks that changed from targeting monetary aggregates to targeting inflation around the early 1990s, most central banks changed the focus of monetary policy implementation to the pricing of, and no longer the quantity of, central bank reserves.[35] To this effect, central banks announce an operating target, predominantly overnight rates. The overnight rates play an important role in the efficient pricing of financial instruments. By changing the demand and supply of central bank reserves, central banks can influence the price of these reserves in the system. The power and ability of central banks to implement monetary policy reside in the fact that they influence the demand and control the supply of central bank reserves in the market. This power is summarised by Claudio Borio (1997): "Currently virtually all the central banks … implement monetary policy through market-orientated instruments which they gear to influencing very short-term interest rates. They do so largely by determining the condition that equilibrates supply and demand in the market for bank reserves. It is in this relatively unglamorous and often obscure corner of the financial markets that the ultimate source of the central banks' power to influence economic activity resides."

5.2.4 However, while a central bank can effectively control the price of overnight money, not all deposits and loans in the economy are referenced to overnight rates – even in South Africa, where many bank loans use the prime rate (repo rate plus 350 basis points) as the reference. The amount of non-derivative contracts that reset off Jibar is a case in point. Therefore, to ensure that monetary policy decisions – which primarily affect the overnight rate – are effectively transmitted to the whole term structure of interest rates, it is important for a central bank to understand the linkages

[35] 'Central bank reserves' refers to money created by the central bank in order to facilitate payments between commercial banks – effectively, they are a type of IOU from the central bank to the commercial bank. Central bank reserves plus currency in circulation equals 'base money'. It is by virtue of its power, as the only issuer of this form of money, that a central bank can implement monetary policy.

between the policy rate and other market rates, be they Sabor, Jibar (for different tenors) or interest swap rates. To maximise the efficiency of the monetary policy transmission mechanism, market rates should reflect both actual changes in the policy rate as well as any guidance the central bank may be sending about its policy intentions, without undue volatility that might result from market participants trying to ‘guess’ these intentions.

5.2.5 Arguably, even in efficient markets, many factors (such as the risk of the borrower, the scarcity or not funding in a specific tenor or category) may influence the relationship between the overnight and other interest rates. Empirical evidence confirms the existence of a term premium on interest rates that rises as duration increases, as the longer the horizon, the higher the risk and uncertainty. But there may be cases – for instance, the current Jibar curve – where the slope appears too steep to purely reflect a term premium, and it therefore becomes difficult for a central bank (and private analysts) to disentangle that term premium from other factors affecting longer maturities (such as liquidity and the impact of regulations). This highlights the importance for policymakers to be able to calculate the closest possible estimate to a ‘risk-free’ curve, as they will then be able to measure the price of risk in other assets and, if needed, adjust policy accordingly.

5.2.6 The term structure of money market rates, as alluded to above, also plays another important role in allowing a central bank, as well as other observers, to assess how the market expects central bank policy to unfold over the next 12 months and beyond. The current Jibar curve is of limited use in the exercise and using a deposit curve is unlikely to remedy these limitations. This problem, however, can be circumvented by the use of money market derivatives, provided that the market for such derivatives is liquid enough and their reference rate is stable relative to the policy rate. At present, market participants use forward rate agreements (FRAs) as a measure of

repo rate expectations. However, FRAs are referenced to three-month Jibar, which has a poor track record of anticipating actual repo rate moves, and therefore complicates the interpretation of FRAs in the immediate run-up to Monetary Policy Committee (MPC) meetings. For example, there have been instances where the 1x4 FRA moves ahead of the announcement of the policy stance of the MPC, signalling at least some probability of a policy shift, yet this is not reflected (as financial theory suggests it should) in the three-month Jibar rate.

5.2.7 Shifting the reference of FRAs to a three-month deposit rate may not resolve the issue, as deposits (over the measurement period) proved equally, if not more, unable to predict the repo rate than Jibar. A more effective measure might be an OIS curve, as future contracts would be referenced to the overnight rate itself rather than to a (relatively inflexible) term interest rate. However, this would require the OIS market to be liquid for different maturity swaps to be an effective measure of market expectations of the overnight rate over the specific maturity, and for that overnight rate to deviate as little as possible from the policy target.

5.2.8 The above discussions show how valuable increased transparency will be to assess the effectiveness of monetary policy. In addition, the SARB has indicated that it is investigating changing its current shortage-based policy framework to a target rate-based system. Appropriate benchmark rates could, if anything, become even more relevant for policy implementation under such a system, especially for very short maturities.

5.3 Interest rate benchmarks and financial stability

5.3.1 Robust and reliable interest rate benchmarks as a prerequisite for financial stability

5.3.1.1 Interest rate benchmarks play a vital role in the financial system, including the banking system, as well as the economy and, as such, the use of these rates can have implications for financial stability. Interest rates are used by various market participants in contracts indexed to variable interest rates to value balance sheet items, and in derivative products, including swaps, options and forward contracts.

5.3.1.2 Manipulation of global reference rates in the past undermined the robustness and reliability of existing major reference interest rates, potentially reinforcing the decline in the liquidity in the unsecured interbank funding markets, which in turn made them more vulnerable to manipulation. Therefore, reliable and robust benchmarks are a prerequisite for having a stable financial system, as they could minimise the risk of a dysfunctional and disruptive market.

5.3.1.3 The BIS (2013) highlights four manners in which interest rate benchmarks could impact financial stability:

i. If there is a loss of confidence in a reference rate that is widely used, parties could stop transacting in instruments that reference it.

ii. Transferring risk-related costs associated with bank funding: under normal circumstances, reference rates allow banks to pass on the common bank component of their funding cost risk, generally to entities better able to manage these risks, thus enhancing the supply of credit (especially of floating rate-type financial instruments) and facilitating their financial intermediation role. However, mispricing or excessive volatility in reference rates could result in a sub-optimal transfer of risk, affecting both the demand for credit and the overall financial health of borrowers.

iii. Mispriced reference rates could spread inefficiencies in one market to other parts of the financial system. For example, if interbank market participants underestimate banking sector risks, the resulting under-

pricing of common bank risk could lead to excessive reliance on some types of funding and/or excessive system-wide leverage, as was the case before the global financial crisis. This is more pronounced when the reference rate is widely used.

iv. Valuation problems could emerge if a market participant uses a pricing model based on an unsecured interbank market reference rate to discount (for instance) interest swaps that are fully collateralised. The discrepancy between what the transaction requires and what the reference rate reflects implies an imperfect hedge, and basis risk increases as a result.

5.3.2 Jibar, Sabor and financial stability

5.3.2.1 In the case of Jibar and Sabor, there are currently mixed opinions about the potential of these reference interest rates to cause systemic risk. On the one hand, there is a view that Jibar could easily be manipulated given the current methodology and coverage in terms of the number of contributors. Furthermore, the mismatch between volumes transacted in the NCD market on which Jibar is based and derivatives resetting against Jibar could potentially cause systemic risk. On the other hand, there is a view that Jibar is not a concern since the governance process is credible and there are clear operating rules. Generally, market participants seem to be aware of its shortcomings, specifically the mismatch between NCD issuance volume and the volume of derivate resets. Therefore, according to these market participants, the risk of pricing loans and deposits on the basis of an erroneous measure of funding costs – which is what could cause systemic risk – is low. Nevertheless, the SARB's analysis (see Box 2) raised questions with regard to the robustness, representativeness and sustainability of Jibar. Data insufficiency is of particular concern, emphasised by the low volumes of the underlying NCD markets relative to other types of funding, especially as far as three-month NCD issuance is

concerned. Equally worrying is the robustness concern that Jibar could potentially be vulnerable to manipulation. Lastly, the role of Jibar in benchmark indices should be taken into account (see Box 5). Against this background, suitable revision and/or adjustment to the currently available reference rates is warranted. Specifically, an RFR that can be used as a benchmark by collective investment schemes is required.

5.3.2.2 In fact, the OSSG (Financial Stability Board, 2014) notes that "shifting a material proportion of derivative transactions to an RFR would reduce the incentive to manipulate rates that include bank credit risk and would reduce the risks to bank safety and soundness and to overall financial stability." The shift stems from the fact that major interest reference rates (such as 'Ibors') are widely used in the global financial system as benchmarks for a large volume and broad range of financial products and contracts. The valuation of different products and contracts spans across global equity, cash and fixed income markets, with the possibility that adverse spillovers could be amplified and propagated across the global financial system, including South Africa.

Box 5 Short-Term Fixed-Interest Index

Benchmark interest rates can be used to measure the performance of a mutual fund. In South Africa, the Short-Term Fixed-Interest (STeFI) Index is a popular benchmark against which the performances of short-term fixed-interest or money market investments are measured. This benchmark index was constructed by Alexander Forbes, and is calculated and published daily by the JSE Limited.

STeFI is based on the Sabor and the various Jibar maturities – the JSE produces a suite of indices based on these rates. These rates are used for benchmarking purposes in money market portfolios. STeFI has become the industry benchmark for cash equivalent investments (i.e. up to 12 months). The STeFI composite index is comprised of:

1. the Sabor rate
2. the three-month Safex Jibar rate minus 10 basis points
3. the six-month Safex Jibar rate minus 10 basis points
4. the twelve-month Safex Jibar rate minus 10 basis points

It should be noted that STeFI is based on Jibar, which itself is based on bank debt instruments, and thus contains credit risk. There is no risk-free reference rate available to be used as a benchmark and, as such, STeFI is used as the primary benchmark by almost 16% of the number of collective investment scheme (CIS) funds domiciled in South Africa, which amounts to 29.4% of funds invested in South African-domiciled CISs. While roughly a third of these assets are managed by money market funds, the remaining 20% of the assets are managed by mostly income funds. Furthermore, using a benchmark that contains bank debt instruments could lead to higher interconnectedness among banks and CISs, since CISs are most likely to invest in bank debt. In fact, 90% of money market funds' assets were invested in instruments issued by banks at the end of December 2016 (SARB, 2017).

A key concern of the dominant role of STeFI is how it embeds systemic risk in the financial system. For the funds that track STeFI, a neutral risk position, when going back to benchmark, means continued credit exposure to the banking system. Off-benchmark, or yield enhancing investments would often entail going down the credit curve and investing in lower-rated entities. Investing in Treasury bills would usually mean investing in an instrument with a lower yield than the benchmark, as Treasury bills normally trade below the equivalent NCD rate. The construct of STeFI therefore entrenches to some extent credit risk in the money market and income fund portfolios. These portfolios should ideally be benchmarked against a total return index derived from RFRs, while funds with an explicit mandate to manage a money market credit portfolio should use STeFI. Consequently, developing an RFR curve out to a maturity of one-year should be seen as a priority for authorities and market participants.

5.3.3 Reference rates in the financial stability monitoring framework

5.3.3.1 Financial stability assessments are underpinned on monitoring procyclical or time-varying risks and cross-sectional (distribution) risks at any particular time. In both instances, authorities should monitor factors that might amplify or propagate the levels of vulnerability in the financial system as a whole, or of individual financial entities. Therefore, the assessment of the prevailing

level of systemic risk would depend on reliable and efficient measures of credit and market risk, which could depend on reference rates that capture the demand and supply factors influencing the cost of funding in the financial markets.

5.3.3.2 Interest rate benchmarks are important indicators of financial stability, given that widely used rates reflect general conditions in a well-defined market. For example, the characteristics of reference rates used in the loan market are an important influence on risk sharing between lenders and borrowers. Conceptually, different reference rates can be distinguished by the price (or risk) components they include, which can help determine their suitability for different uses. One standard way of decomposing market interest rates is to divide them into an RFR and several risk premiums. The significance of these risk premiums differs across instruments: the term premium tends to increase with the maturity of the underlying instrument; the liquidity risk premium depends on the ease with which the instrument can be traded; and the credit risk premium depends on the perceived credit quality of the borrower and, in secured funding markets, the collateral. Reference rates that are based on unsecured interbank markets comprise a RFR and a credit risk premium that reflects the perceived common credit risk of the sample of banks contributing to the reference rate (common bank risk).

5.3.3.3 There are several interest rate benchmarks that could be used for financial stability monitoring purposes. Volatility in an RFR can be a sign of ‘flight to safety’, whereas spreads between rates could be used to gauge the level of stress in the banking sector, bank default risk, changes in risk appetite and even bank profitability. Against this backdrop, the development of additional interest rate benchmarks, including RFRs, will be valuable for financial stability monitoring purposes.

Chapter 6
Key recommendations and next steps

6.1 Summary of objectives

6.1.1 The objective of this consultation paper is to propose the reform of, and alternatives for, interest rate benchmarks in South Africa. The motivation behind these reform proposals is multifaceted. On the one hand, there is a need to enhance existing interest rate benchmarks by underpinning them with transaction data. On the other hand, the reform agenda seeks to promote the development and adoption of additional Ibor Plus and Ibor RFR benchmarks in order to enable market participants to have choices that are 'fit for purpose'. The new and reformed Ibor Plus and Ibor RFRs will serve different purposes. For typical credit products, a credit-based interest rate benchmark is regarded as appropriate as it provides a hedge against adverse changes in the credit risk embedded in the underlying instrument. However, for other purposes, especially derivative contracts, an alternative reference rate that is closer to risk-free may be more appropriate. In the Ibor jurisdictions as well as the non-Ibor OSSG participating countries, progress towards Ibor Plus was constrained by low transaction volumes (or even a lack of transactions). Regarding the shift towards RFRs for derivative markets, the five Ibor countries announced preferences for overnight RFRs as replacements for their current Ibors. However, in calculating these RFRs, all jurisdictions experienced challenges relating to data sufficiency as well as liquidity of the underlying markets in maturities longer than one week.

6.1.2 As a participating member in international forums, and in recognition that credible interest rate benchmarks are essential for efficient financial markets, South Africa is committed to designing and administering its interest rate benchmarks in a manner that is consistent with global standards. However, the Working Group recognises the principle of

proportionality in that it may not be entirely possible to design interest rate benchmarks in line with these global standards due to domestic circumstances. South Africa is a developing economy and, while its financial markets are mature by emerging market standards, it still lacks the depth of developed markets. As such, the structure of its financial markets may not make it possible at this stage to implement financial benchmarks fully in line with the best practises as recommended by the IOSCO Board. This challenge is not unique to South Africa. Initiatives on a broad spectrum need to be effected to develop deep and liquid secured and unsecured markets and platforms to enable the calculation of benchmarks, which will meet and/or comply with global requirements and standards. The Working Group has, however, committed to a design that, at the very least, is as close as possible to achieving the objectives of the IOSCO agenda.

6.2 Findings of the Working Group

6.2.1 The Working Group conducted research on various interest rate benchmarks and key findings (KF) in respect of Jibar are as follows:

KF.1. Within the wholesale market, fixed and floating-rate deposits comprise the largest source of funding, ahead of NCDs. Within the NCD universe, three-month NCDs, which are used as a basis for calculating the three-month Jibar, account for less than 3% of total issuance.

KF.2. Jibar is based on indicative rates and not actual transactions. In addition, there are insufficient transactions in the NCD market for Jibar to meet the IOSCO principles of benchmark design.

KF.3. While market participants recognise that Jibar falls short of IOSCO standards, there appears to be some reluctance to changing it due to concerns about the cost and complexity of transitioning to a new reference rate. However, market participants believe that the calculation methodology should be changed.

6.2.2 In considering various alternatives to the current Jibar calculation methodology, the Working Group found the following:

KF.4. Sporadic issuance of three-month NCDs means that a mere change to the data collection methodology will not address the concerns about data sufficiency in the Jibar calculation process.

6.2.3 The Working Group went further to investigate the possibility of basing Jibar on observable transactions in related markets. One option was to anchor Jibar to observed promissory note transactions as a related market. Upon investigating this alternative, the Working Group found the following:

KF.5. The volume of promissory notes (PNs) in circulation is too small to make a significant improvement to the calculation of Jibar.

6.2.4 Another related market considered was the market for fixed-rate wholesale deposits. In this regard, the Working Group found the following:

KF.6. On a daily basis, non-bank financial corporate (NBFC) deposits range between R10 billion and R30 billion. As such, this deposit category adds substantial volume per day to the universe of transactions that underpin the proposed reformed Jibar. [36]

KF.7. NCD issuance typically ranges between 0% and 2% of the transaction universe of the proposed reformed Jibar, while NBFC deposits account for approximately 98%. Effectively, this makes the proposed reformed Jibar an interest rate on wholesale NBFC deposits. The reformed Jibar averages 20 basis points above the current Jibar, but exhibits a similar degree of volatility.

KF.8. The volume and frequency of NBFC deposits is large enough to address the issues of data sufficiency and mismatch with the volume of contracts that reset against Jibar.

[36] Reformed Jibar refers to the hybrid Jibar, which is explained in Section 3.3.3.

KF.9. The reformed Jibar based on both NCDs and NBFC deposits is a more accurate reflection of banks' actual wholesale funding costs.

6.2.5 In line with the Bank for International Settlements' (BIS) recommendation for a multiple rate approach and the long-term vision to create more interest rate benchmarks that are fit for purpose, the Working Group proposes a solution, which requires the development of credit risk-inclusive reference rates to be used for the pricing of unsecured on-balance sheet items as well as RFRs for collateralised transactions. With respect to the former, the Working Group investigated the possibility of developing a term deposit benchmark comprising all deposit categories and found that:

KF.10. Fixed-rate wholesale deposits constitute a large portion of total wholesale bank funding. An interest rate benchmark derived from this market would thus allow for a formulation of an interest rate that provides a better reflection of the realities of the domestic money market.

KF.11. From a data sufficiency point of view, the statistics on daily volume and number of transactions of wholesale bank deposits provide reasonable comfort that an interest rate benchmark derived from this market will be IOSCO-compliant.

KF.12. A term deposit benchmark based on current fixed-rate wholesale deposit transactions complies with the IOSCO principles of data sufficiency and presents a viable alternative to a reformed Jibar.

6.2.6 The Working Group also conducted a review of Sabor, with the intention to reform the benchmark as well as propose additional overnight interest rate benchmarks. This research revealed the following:

KF.13. Sample data on overnight FX swaps – a subcomponent of Sabor – are inadequate as the underlying data was found to be insufficient, highly concentrated and not necessarily observable.

KF.14. It is difficult to justify the inclusion of FX swaps in the Sabor calculation as FX swaps are structurally different from deposits (i.e. FX swaps are secured, while deposits are unsecured), are not a directly observable rate as they are implied from FX forward points and are subject to regulatory constraints that cause pricing frictions.

KF.15. An interest rate based on unsecured overnight interbank deposits is required. Furthermore given the minimal credit and liquidity risks of the underlying transactions, such a rate could be considered as a near RFR.

6.2.7 Lastly, in light of the global shift towards the use of RFRs as reference interest rates for derivative contracts, the Working Group holds a view that such benchmarks should be calculated and published in South Africa. On the one hand, these RFR benchmarks will serve as 'fall-backs' in the case that unsecured benchmarks are permanently discontinued and, on the other hand, will facilitate policymakers' task in monitoring the transmission of monetary policy. In conducting its research on RFRs, the Working Group found the following:

KF.16. There are no risk-free money market interest rate benchmarks currently published in the South African financial markets.

KF.17. The secondary market for Treasury bills in South Africa – a potential source market for calculating term RFRs – is illiquid, mainly due to banks buying and holding Treasury bills for prudential reasons.

KF.18. The government bond (GB) repurchase (repo) market in South Africa, which the Working Group considered as the primary choice for overnight and one-week RFRs, is not a general collateral (GC) market in the true sense, as the former is driven by holders of bonds who need to fund their long bond positions.

KF.19. Activity in longer GB repos is scarce and this presents a challenge for using GB repos as a basis for calculating term RFRs.

KF.20. While the GB repo rate is a secured rate, it trades at a spread above the unsecured overnight rate, the Sabor.

6.3 Key recommendations of the Working Group

6.3.1 With respect to Jibar, the Working Group's key recommends (KR) are that:

KR.1. The current calculation of Jibar be phased out and that a transaction-based rate, comprising NCDs and NBFC deposits, be introduced to reform the current Jibar.

6.3.2 With respect to the overall use of interest rate benchmarks, the Working Group recommends that:

KR.2. Risk-inclusive reference rates be used for the pricing of unsecured on-balance sheet (Jibar-linked) items and risk-free reference rates be used for collateralised transactions and derivative contracts.

6.3.3 With respect to developing an additional risk-inclusive benchmark, the Working Group recommends that:

KR.3. A term deposit benchmark be introduced, which could also serve as an alternative to the proposed reformed Jibar. Furthermore in order to leverage on deposit data more exhaustively, an interpolated benchmarking methodology be considered as a fall-back in times where there are insufficient data within the standard maturity buckets.

6.3.4 With respect to Sabor, the Working Group recommends that:

KR.4. Sabor be reformed and renamed to Sabor Money Market which reflects eligible overnight unsecured funding from all banks, including funding obtained at the prevailing repo rate, but excluding overnight FX swaps.

KR.5. A new interest rate based solely on eligible overnight interbank transactions from all banks, the South African Rand Interbank Overnight Rate, (ZARibor) be calculated, and be considered as a near RFR.

6.3.5 With respect to RFR benchmarks, the Working Group recommends:

KR.6. An improvement in the liquidity of the secondary market for Treasury bills. Steps in that direction entail the inclusion of Treasury bills in the GB electronic trading platform (ETP), the use of primary dealers to quote prices, a Treasury bill repo facility and the daily collection of transaction data.

KR.7. A South African Secured Financing Rate (SASFR) be calculated, based on supplementary repos conducted with the SARB as well as overnight funding in the GB repo market.

KR.8. SASFR as the reference interest rate for the overnight index swap (OIS) market.

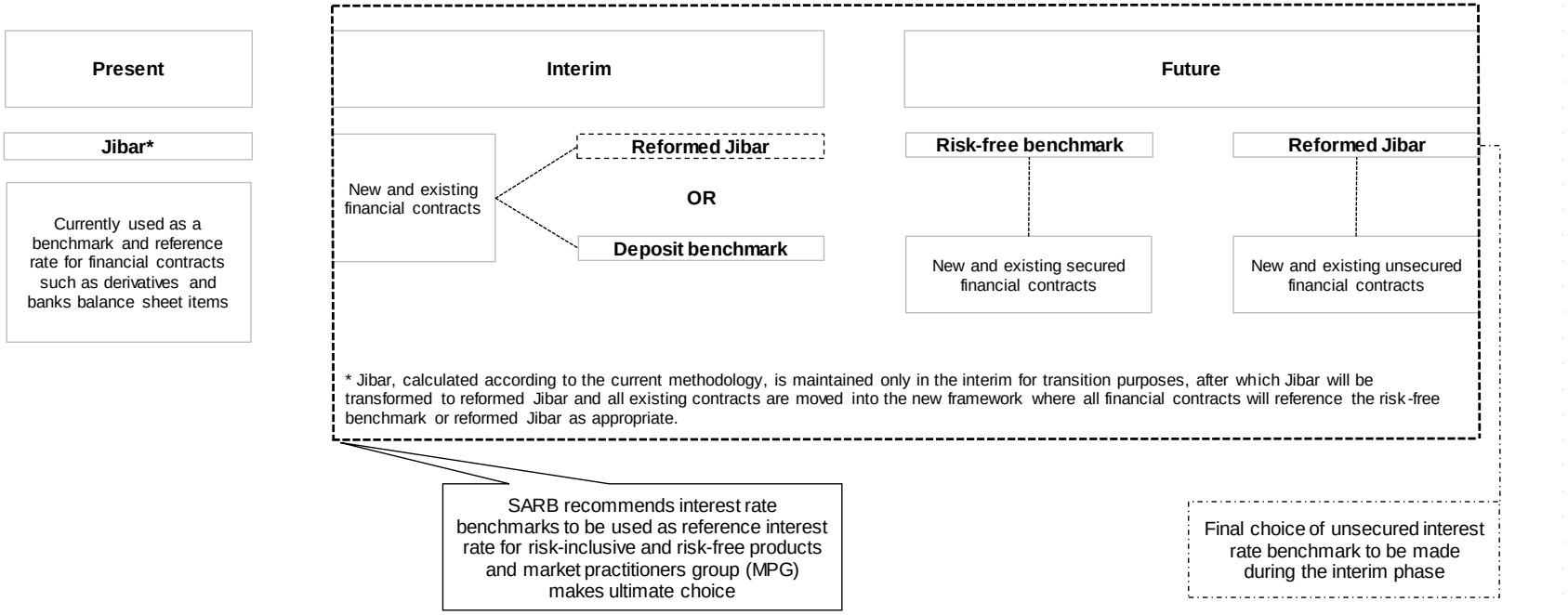
KR.9. GB repo and/or SASFR be used as overnight RFRs for South Africa. Furthermore, if designated as a near RFR, ZARibor could also be used for that purpose.

KR.10. The development of a broader GC repo market with a broader pool of collateral than the current GB repo market.

6.4 Road map for interest rate benchmark reforms in South Africa

6.4.1 Figure 26 illustrates the envisioned road map for the transition from the current reference interest rate dispensation to an environment that comprises multiple interest rate benchmarks that are fit for purpose and comply with the IOSCO principles for financial benchmark design.

Figure 26 Road map for interest rate benchmark reforms in South Africa



6.5 Next steps

6.5.1 Following the publication of this consultation paper, the Working Group will allow a two-month period for all relevant stakeholders to provide comments on all reform proposals as well as on proposals for new risk-free and risk-inclusive interest rate benchmark. All comments and general queries relating to this consultation paper should be sent to the SARB at sarb-wgrirb@resbank.co.za

6.5.2 The deadline for comments is 26 October 2018.

As indicated in the Preface, the SARB will also set up an MPG soon after the consultation paper is published to work on the design and operationalisation of the benchmark proposals. The MPG will comprised members of the SARB, FSCA, as well as senior professionals from a variety of institutions, reflecting different market interest groups active in the domestic money market. The mandate of the MPG shall be:

i. to review the proposed changes to existing interest rate benchmarks;
ii. to assess the proposed interest rate benchmarks against the design criteria consistent with the IOSCO principles for financial benchmarks;
iii. to agree on a model for the collection of transaction-level data from which to calculate credible interest rate benchmarks;
iv. to draft a transition plan from current to new interest rate benchmarks;
v. to agree on fall-back arrangements for each interest rate benchmark that is used as a reference interest rate;
vi. to provide input into the drafting of codes of conduct, where relevant; and
vii. to assist in the design of a surveillance framework for all key interest rate benchmarks in the domestic money market.

6.5.3 The terms of reference for the MPG will be drafted before the establishment of the group. The MPG will be accountable to the Deputy Governor: Markets and International in his capacity as Deputy Governor of the SARB.

6.5.4 With respect to (iv) above, benchmark administrators are required to have policies and procedures in place to allow for the cessation of a benchmark in the event that the incumbent benchmark is no longer representative of its intended interest. Furthermore, the administrator is required to take into account the views of stakeholders and any relevant regulatory and national authority in determining what policies and procedures are appropriate for a particular benchmark. The Working Group subscribes to this view.

6.5.5 The Working Group has also noted developments in international fora, which it recognises will further inform its own stance on transition planning. Cognisant of potential risks that could arise from changing reference interest rates in existing financial contracts and permanent discontinuation of widely used Ibors, the global official sector has actively engaged with the International Swaps and Derivatives Association (ISDA) to seek ways in which to minimize these risks. Consequently, ISDA has established a series of working groups for this purpose and is drafting fall-back arrangements for new derivative contracts as well as a future protocol to amend existing contracts.

6.5.6 With respect to (vi), the Working Group has not made any decisions on administrators of the proposed interest rate benchmarks. However, given the sensitivity of the information required to calculate some of the interest rate benchmarks, it is envisaged that the SARB will assume the benchmark administrator responsibility in some respects. As such, the Working Group is in consultation with the Business Systems and Technology Department (BSTD) of the SARB to devise plans on how to collect transaction data from all banks active in the domestic financial market to calculate the proposed interest rate benchmarks.

6.5.7 However, the data collection project is most likely a long-term solution. In the interim, subject to the acceptance of the proposed interest rate benchmarks, there is a plan to enhance and use the existing Sabor data collection platform for the proposed overnight interest rate benchmarks. The current platform will still need to be modified to ensure there are proper internal controls, especially to protect the security and integrity of the data. At the time of the 2017 trade data collection, banks indicated that the basis had been established, as an interim arrangement, to submit daily transaction data to the SARB.

6.5.8 In the case of the GB repo, the JSE collects and reports all transaction data. This arrangement will most likely continue, depending on how and for what purpose the GB repo transaction is used. Where the GB repo rate is used for purposes other than the SARB's monitoring framework, such as providing cash through a special repo under the settlement assurance model for the ETP for GBs, the Working Group recommends that the JSE be appointed as the administrator of the benchmark. In this case, the JSE's internal controls will also need to be assessed and, if necessary, updated for compliance with the relevant standard for benchmark administrators so as to protect the integrity of the data.

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Annexure 1
Key global reference rates

Key global reference rates

1. London Interbank Offered Rate

1.1. Libor or ICE Libor (previously BBA Libor) is an indicative interest rate, reflecting the rate at which banks offer to lend funds (wholesale money) to each other in the London interbank market. Libor is, therefore, a key benchmark interest rate that reflects how much it costs banks to borrow from each other, or the average of interest rates estimated by each of the leading banks in London that it would be charged were it to borrow from other banks. It is a polled rate, published each day at 11:00 and administered by the Intercontinental Exchange (ICE) Benchmark Administration (IBA). It is based on five currencies: US dollar, euro, pound sterling, Japanese yen and Swiss franc, and serves seven different maturities, that is, from overnight to twelve months.

1.2. The interbank unsecured lending market reduced significantly during and after the global financial crisis of 2007/08 and the level of activity was too low in some tenors to fully support an entirely transaction-based rate.

1.3. Each benchmark submitter to Libor developed its own methodology for establishing Libor submissions. This led to a variety of practices amongst benchmark submitters with a common starting point of their observable transactions in the market. It was deemed in the interest of users of Libor and benchmark submitters alike that a more unified transaction-based methodology be adopted.

2. Sterling Overnight Index Average (Sonia)

2.1. Introduced in March 1997 by the Wholesale Markets Brokers' Association, Sonia is the Sterling Overnight Index Average. It reflects bank (and building societies') overnight funding rates in the sterling unsecured market. The Bank of England (BoE) has recently completed a comprehensive review of the Sonia interest rate benchmark, with Sonia moving to the new basis on 23 April 2018.

2.2. At its introduction, Sonia was calculated from the rates submitted by the British Wholesale Markets Broker Association. Initially the rate was based on "brokered transactions" with limited transaction volumes. A key objective of the recent review was, among others, to broaden the transaction volumes. The reformed Sonia captures a broader range of overnight deposits, by including bilaterally negotiated transactions alongside brokered transactions. The BoE views the reformed Sonia as a near risk-free rate and a measure of the rate at which interest is paid on sterling short-term wholesale funds in circumstances where credit, liquidity and other risks are minimal.

3. Euro Interbank Offered Rate

3.1. Euribor was first published on 30 December 1998. The euro as currency was introduced on 1 January 1999 and Euribor replaced a lot of domestic reference rates, such as Pibor (France), Fibor (Germany), Mibor (Spain), etc. Euribor is published by the European Money Market Institution (EMMI) each day around 11:00, based on the estimated average interest rate at which Eurozone banks offer to lend unsecured funds to other banks in the wholesale money market (or interbank market).

3.2. Euribor and Libor are comparable rates and both come in different maturities, and as mentioned earlier, Libor rates come in different currencies, with overnight being the shortest maturity.

3.3. The EMMI initiated the “Euribor+ Project” with the objective of developing and evaluating a transaction-based benchmark determination methodology for Euribor, guided by the FSB’s criteria to ensure reference rates command widespread private and official sector support.

4. Euro Overnight Index Average (Eonia)

4.1. Eonia is the rate at which banks provide loans to each other with duration of one day. Therefore, Eonia can be considered as the one-day Euribor rate and is computed as a weighted average of all overnight unsecured lending transactions in the interbank market. Eonia was previously calculated by EMMI, but this function now resides with the European Central Bank (ECB).

5. Tokyo Interbank Offered Rate

5.1. Tibor is calculated by the Japanese Bankers Association (JBA) and is published daily at 11:00 as a reference rate based on the interest rates which banks offer to lend unsecured funds to other banks in the Tokyo wholesale money market (or interbank market). As with the euro, ICE also calculates a yen Libor (Euro yen), which reflects lending dominated by non-Japanese banks.

6. Tokyo Overnight Average Rate (Tonar)

6.1. The overnight Japanese yen Libor interest rate is the average interest rate at which a selection of banks in London are prepared to lend to one another in Japanese yen with a maturity of one day. The Tonar, calculated by the Bank of Japan, is the secured overnight rate for Tokyo city banks.

6.2. The JBA reformed the administration of JBA Tibor in line with the IOSCO Principles, to enhance the benchmark administrator's and reference banks' governance systems, in order to ensure the credibility and transparency of the JBA Tibor administration. The JBA introduced a code of conduct (The JBA Tibor Code of Conduct) to set forth the rules that reference banks should abide by as well as processes that they should have in place in connection with rate submission. The JBA also aimed to actively address challenges such as the enhancement of contingency plans and strengthening of monitoring of reference rates.

Annexure 2
The context of global interest rate benchmark reforms

The context of global interest rate benchmark reforms

1. Global interest rate benchmark reform recommendations

1.1 The crucial impact of the Bank for International Settlements' (BIS) report[37] in March 2013 on the extensive debates on interest rate benchmarks stemmed from its emphasis that reform efforts would not be sufficient if they focused only on enhancements to governance and control standards. Indeed, some cases of market manipulation have raised concerns about the appropriateness of the processes and methodologies used in formulating them. According to the BIS, and later the Board of IOSCO, interest rate benchmarks should also evolve to reflect developments in their underlying markets. In this regard, the report highlighted the sharp contraction in market activity since 2007, which has raised concerns about the robustness and usefulness of reference interest rates based on term unsecured interbank markets, particularly in periods of stress. Since the publication of this report, there have been some changes in market behaviour, which include:

i. an increase in secured wholesale lending; while unsecured lending has declined sharply (except for short maturities);
ii. the development of the overnight index swap (OIS) market, which has provided tools to lock in term rates while incurring much reduced credit exposures; and
iii. global markets trending toward central clearing of derivatives and resulting in increased standardisation and use of collateral in such transactions. Relevance of unsecured rates as references and valuation inputs for derivatives are less evident.

1.2 These trends point to the need to develop short-term interest rate benchmarks (STIR benchmarks) based on rates with minimal credit sensitivities, such as general collateral repo or OIS rates. Such benchmarks will likely coexist with

[37] (BIS, 2013) Towards better reference rates; a central bank perspective.

Ibors in the near term, given the large legacy volume of Ibor-based contracts and other financial products, but may well replace them over time.

1.3 In July 2013, the Board of International Organisation of Securities Commissions (IOSCO) published a set of principles (the IOSCO principle) to be adopted by benchmark administrators, to improve the robustness and integrity of financial market benchmarks in general. The principles were endorsed by the Group of Twenty (G20) Financial Stability Board as the global standard for financial benchmarks. Among other things, the Board of IOSCO outlined principles for the design of benchmarks, including requirements in terms of data sufficiency, their accuracy in representing the underlying market and their robustness in times of market stress.[38] To be deemed credible, benchmarks need to comply with these principles.

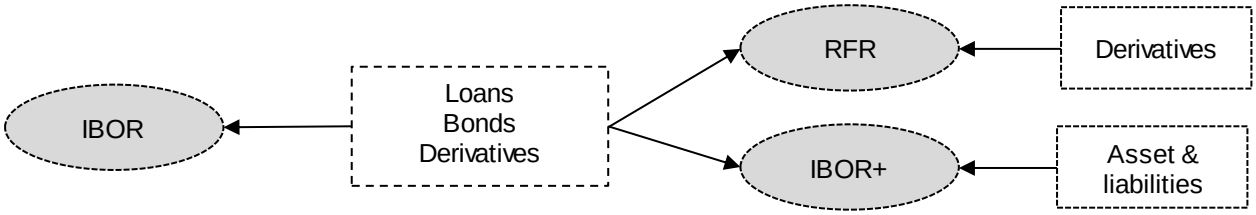
1.4 In response to cases of actual and attempted manipulation in relation to key interbank benchmark rates, together with the post-crisis decline in liquidity in interbank unsecured funding markets, the BIS report emphasised the need and objective for a range of benchmark interest rates that are suitable for different purposes (multiple rates approach). The G20 subsequently commissioned the Financial Stability Board to undertake a fundamental review of major interest rate benchmarks and plans for reform in order to ensure plans are consistent and coordinated, and that interest rate benchmarks are robust and appropriately used by market participants. The Financial Stability Board established the Official Sector Steering Group (OSSG) in July 2013, bringing together central banks and regulatory authorities to coordinate international work to review and reform interest rate benchmarks. The OSSG was assigned responsibility for coordinating and maintaining the consistency of reviews of existing interest rate benchmarks and for guiding a Market Participants Group (MPG), which was in turn tasked to examine the feasibility and viability of adopting additional reference rates and potential transition issues. The MPG provided its report to the OSSG in March 2014. The OSSG formed five currency subgroups – Euro, British pound, Swiss franc, US dollar and

[38] Annexure 3 provides a summary of the IOSCO principles.

Japanese yen. The Financial Stability Board decided that the OSSG should focus its initial work on the interest rate benchmarks that are considered to play the most fundamental role in the global financial system, with the expectation that reform in these major markets would provide an impetus for similar enhancements in other key markets. The OSSG published its report, “Reforming major interest rates” in July 2014.

1.5 Figure 1 reflects the proposed use of interest rate benchmarks in the OSSG report (FSB, 2014). For a number of purposes, typically credit products, a credit risk-based rate will remain completely appropriate. However, for other purposes, especially derivative contracts, an alternative benchmark reference rate that is closer to risk-free may be more appropriate. This underlines the argument in favour of a multiple rate approach, as this would contribute to overall financial stability by enabling market participants to have choices of interest rate benchmarks that are ‘fit for purpose’, which would improve the robustness against operational risks and reduce the incentive to manipulate specific interest rate benchmarks.

Figure 1 Proposed use of interest rate benchmarks



Source: Bank of Japan, 2016

1.6 Interest rate benchmarks can be decomposed into a RFR and several risk premiums, including a term premium, liquidity premium, credit risk premium as well as potentially a premium for obtaining term funding. Reference rates such as Ibors that are based on unsecured interbank markets reflect a premium for the credit risk of their contributing banks as well as potential term, liquidity and funding premiums. However, rates based on secured borrowing markets or for unsecured borrowing by sovereigns with little default risk would not contain this type of credit risk premium, and to the extent that they were based on more liquid markets, their liquidity premiums would also likely be

smaller. These rates would be credit risk-free or nearly so, though they could still contain other premiums.

1.7 The OSSG report (FSB, 2014) noted that a credit risk-free or near-RFRs would make sense for many derivative transactions. The desire for a credit risk-free or nearly risk-free rate may reflect, in part, an expectation of continued greater reliance on secured funding as well as ongoing structural changes in derivatives markets requiring greater use of collateral and shifts to central clearing. In some currencies, derivatives referencing these rates have been available for some time, but markets in these instruments are currently overshadowed by Ibor-linked instruments because of the depth and liquidity in these Ibor-linked markets. The report also included a number of recommended RFRs, for example, term OIS rates, compounded overnight interest rates, government bond yields (in some currencies), policy rates and secured funding rates.

1.8 Furthermore, the OSSG report (FSB, 2014) highlighted a need for a reference rate with bank credit risk. This is seen as more appropriate for products where there is a need to hedge general bank credit risk such as bank-provided credit products. The report points out that the Ibor family of reference rates originated with the use of Libor as a loan-pricing benchmark that allowed banks in London to hedge their cost of funds with their floating rate loan revenues, and that its use for this purpose is still popular. Because rates with credit risk are likely to continue to be traded, there will be a need for basis markets between them and the risk-free rates that may develop in order to allow market participants to properly hedge their risks.

1.9 The OSSG report also clarifies the waterfall approach, which is essential given that globally there is a decline in daily transactions from which interest rate benchmarks could be calculated. The waterfall approach states that when calculating benchmark rates, the order of preference for data inputs should be: 1) transaction-based data 2) live tradable prices, and 3) submissions or expert judgement.

1.10 The premiums embedded in RFRs will differ by instrument. For example, while general collateral (GC) repo rates would still likely contain a premium for obtaining term funding, OIS rates, which do not involve the exchange of any principal, would not.

2. Progress with implementation of OSSG recommendations

2.1 Following the Wheatley Review of Libor, the development of the IOSCO principles and the publication of the OSSG 2014 report on interest rate benchmark reform, some reforms have been implemented to improve the credibility of major benchmark rates, in particular the Ibors. Since July 2014, all administrators of the most widely used Ibors took major steps to strengthen Ibors in order to meet the objectives set for Ibor Plus. These steps include reviews of respective benchmark methodologies and definitions, data collection exercises, feasibility studies, consideration of transitional and legal issues, and broad consultations with submitting banks, users and other stakeholders. This work has also been undertaken in liaison with relevant international authorities.

2.2 In the 2017 progress report on implementation of the July 2014 OSSG recommendations, it is acknowledged that particularly in the case of Libor (but also in other jurisdictions), for some currencies and tenors, underlying reference transactions are scarce given the lack of activity in the money market. Submissions therefore remain based on a mixture of factors including transactions, expert judgement and other market prices. However, it remains challenging to ensure the integrity and robustness of benchmarks based on expert judgement submissions, and it is uncertain whether the banks that were asked to submit such judgements can be relied upon to continue do so over the medium to longer term. Following discussions of the FCA with the central banks of the Libor currencies and the supervisory authorities of submitter banks from the EU, Japan, Switzerland and the US, concerns were raised about the long-term sustainability of Libor.

2.3 Given the inadequate level of interbank loans and the pronounced decline in other short-term wholesale bank borrowings, panel banks have increasingly had to rely on 'expert judgment' in determining their daily contributions. This decoupling of submissions from the interbank lending, which are purported to be tracked, undermines the utility of fixing as a benchmark and, thus, the regulators' motivation to eventually rid the market of Libor. Given its fundamental flaws, the FCA argued that Libor should be replaced with an alternative benchmark.

2.4 In July 2017, the FCA in the UK indicated that Libor would be phased out over a period of approximately four years. This was intimated by the Wheatley report of 2012. The FCA stated that it would no longer compel the current set of Libor panel banks to supply submissions after year-end 2021.

2.5 While the OSSG recommendations were directed at the three major Ibors, OSSG member authorities, benchmark administrators and market participants from other jurisdictions, including Australia, Switzerland, Canada, Hong Kong, Mexico, Singapore and South Africa, have also taken steps towards reforming existing rates in their own jurisdictions, given the importance of these rates to their domestic markets and in some jurisdictions their role as international financial centres.

3. Developments in global risk-free interest rate benchmarks

3.1 In the 'Progress report on implementation of July 2014 FSB recommendations',[39] feedback was provided on the identification by OSSG members of new or existing RFRs that could be used in place of Ibors on a range of contracts, particularly derivatives. In some instances, existing unsecured interest rate benchmarks are designated as near-risk free rates.

3.2 The OSSG members have made progress in identifying potential RFRs and in some cases, strategies were identified to create liquidity in the underlying

[39] See report dated 10 October 2017.

markets for the newly introduced RFRs. This includes initiatives by the non-Ibor members like Australia, Brazil, Canada, the EU, Hong Kong, Japan, Mexico, Singapore and South Africa. The main developments around the selection of RFRs in the five Libor currencies are discusses in the subsequent paragraphs. In section 2.6, the practice and context of designating unsecured overnight interest rates as near-risk free benchmarks are discussed. The progress in those five Libor currencies, including the planning for adoption of the selected benchmarks, has assumed greater importance after the announcement that the FCA will not sustain Libor after 2021 and, where Libor is currently relied upon, a transition to alternative rates has to be completed by then.

3.3 The Alternative Reference Rates Committee (ARRC)[40] in the US selected the Secured Overnight Financing Rate (SOFR), originally known as the Broad Treasury Financing Rate (BTFR), as the recommended alternative benchmark rate for USD Libor. This rate will be calculated as the volume-weighted mean of transactions data from US Treasury markets, rather than the bank submissions that underpinned Libor. The NY Fed will be responsible for publishing the rate and described it as the 'most comprehensive' of a range of overnight rates proposed, representing a 'broad measure of overnight Treasury financing transactions'. This rate is, therefore, proposed as the rate that represents best practice for use in certain new US dollar derivatives and other financial contracts.

3.4 While Libor is an unsecured rate used primarily in term unsecured transactions, SOFR is an overnight secured rate comprised of Tri-Party repo, general collateral finance (GCF) repo and cleared bilateral repo transactions, settled by the Fixed Income Clearing Corporation (FICC). The ARCC announced its decision to use SOFR instead of the OBFR as an alternative to Libor after considering a variety of factors in selecting a broad repo rate. These

[40] AARC is a group of private market participants convened by official sector agencies to identify a set of alternative US dollar reference interest rates and to identify an adoption plan of these alternative rates.

factors, included, *inter alia*, the depth of the underlying market and its likely robustness over time, the rate's usefulness to market participants and whether the rate's construction, governance and accountability would be consistent with the IOSCO principles for financial benchmarks. The ARRC is in the process of refining its proposed transmission plans and developing implementation options.

3.5 In Europe, European OverNight Index Average (Eonia)[41] remains the near-risk free alternative reference rate for Euribor (see section 2.6). While European authorities already consider Eonia as the appropriate RFR, a number of steps are being undertaken to strengthen Eonia. The European Money Markets Institute (EMMI) and market participants are exploring the feasibility of a new RFR based on (GC) repo transactions. In addition to the new repo index, the European Central Bank (ECB) has announced that it aimed at producing a euro unsecured overnight rate before 2020 based on data already available to the Euro-system, and the calculation of an ECB-developed overnight rate similar to Sonia in the UK. The Belgium Financial Services and Markets Authority, ESMA, the ECB and the European Commission announced the launch of a new working group tasked with the identification and/or for adoption of a 'risk-free overnight rate', which can serve as a basis for an alternative to current benchmarks.

3.6 In April 2017, the Working Group on Sterling Risk-Free Reference Rates announced Sonia as its preferred RFR to be used in sterling derivatives and relevant financial contracts (section 2.6). This sterling risk-free rate will be the alternative to Libor. In addition to the reformed SONIA, the Group, in late 2016, identified two other "candidate RFRs" that were already available, or soon-to-be:

[41] The 2014 Report stated that EONIA is a reference overnight rate set since 1999 by the EURIBOR-EBF. It is directly anchored in the cash market (unsecured deposit market) and it is based on real transactions and on a panel representing a wide range of banks across the euro area, and a derivatives market based on such reference interest rate already exists (Overnight Index Swaps, also called EONIA swaps in EUR).

i. Sterling Repo Index Rate (RIR) – an overnight rate based on repurchase agreements collateralised by UK gilts ('gilt repo') conducted across the Brokertec platform, produced by NEX Data.

ii. Sterling Secured Overnight Executed Transactions (Sonet) – an overnight rate based on all gilt repo transactions cleared through LCH and all delivery-by-value gilt repo transactions settled through Euroclear's CREST system, produced by FTSE-Russel.

3.7 As work on developing RFRs proceeds, several authorities are considering how to facilitate the availability of RFRs at terms longer than overnight. In a White Paper on the use of Sonia for the calculation of a term RF curve in the UK, the Working Group proposed two distinct methodologies on how Sonia, as the near RFR, could be used to extrapolate a RF term curve – see Box 1.

Box 1 A term risk-free rate for the UK market

Following the recommendation of SONIA as the RFR, the Working Group on Sterling Risk-Free Reference Rates (BoE Working Group) published a paper (BoE, 2018) titled, "Sonia as the RFR and approaches to adoption"[42]. The Working Group invited engagement from current and potential users of Sonia to seek feedback on, amongst others, whether a term RFR might be necessary.

While the BoE Working Group's recommended RFR, Sonia, is an overnight rate, interest payments for financial products are typically made at less frequent intervals. For products referencing Libor, payments are made corresponding to the term of the Libor rate referenced. Since Libor is a term rate, these payments are known in advance at the beginning of the payment period.

Consistent with the choice of RFR, the BoE Working Group's preference is that, in the future, market participants would use the overnight rate but with cash flows generated

[42] SONIA as the RFR and approaches to adoption, BoE, 2017

from the average of realised daily Sonia fixings over the desired tenor, or payment frequency. This average could either be a simple mean or a daily compounded interest rate over the period – the current convention for sterling OIS products.

A disadvantage of the approach might be that interest payable is not known until the end of the payment period; i.e. they are 'backward-looking'.

The BoE Working Group recognises that some participants may prefer a term benchmark, so cash flows can be known in advance with certainty. As such, there could be interest in 'forward-looking' term alternatives, which could be derived from the RFR yield curve – in common with the current approach to using Libor.

The BoE Working Group identified two potential methods for calculating a forward-looking RFR using pricing data from Sonia-referencing derivative markets. One is to take the fixed leg of a set maturity OIS contract (e.g. three or six months) as the term reference rate. Such a rate could, for example, be produced either from executable quotes for OIS on regulated electronic trading platforms; or by using rates on executed transactions of OIS on a particular day. Alternatively, term fixings could be derived from Sonia futures order book data. In order to fix constant maturity three and six month OIS rates, it may be necessary to interpolate between futures settlement dates.

A disadvantage of creating a forward-looking term RFR is that both methods would require the development of an additional benchmark 'fixing'. In the absence of strong controls and governance, this could create an additional fragility for benchmark users. The robustness of the ultimate benchmark becomes a function of the depth of the derivatives market referencing the RFR, rather than a function of depth of overnight unsecured cash market.

Therefore, the BoE Working Group on Sterling Risk-Free Reference Rates' view is that for many purposes it may be most appropriate to encourage broader adoption of overnight RFR fixings (i.e. a backward-looking RFR), but is seeking further views on whether a term RFR would be necessary.

3.8 Japanese and Swiss authorities have conducted a survey of money-market activity in their jurisdictions and in Japan, and a range of options for an RFR is being explored, including the uncollateralised overnight call rate, GC repo rate, and the OIS rate. UK and US authorities have both convened working groups comprised of the largest broker dealers in their currencies to identify potential alternative RFRs and to develop implementation plans to promote their use. Once a wider range of RFRs have been identified, some consideration may also be needed for coordination among authorities in later phases of the development of RFRs and related term markets, particularly if these rates are referenced in cross-currency transactions.

3.9 As for the transition to RFRs, the 2014 OSSG (FSB, 2014) report did not set a deadline for any transitions to RFRs. However, questions surrounding the long-run viability of some Ibors underline the importance of those transitions. Limited progress has been made to date on the migration from the major Ibors to alternative RFRs, even where they are available.

3.10 While progress has also been made in strengthening some Ibors, member authorities have noted that changes in the structure of funding markets may affect the long-term sustainability of certain Ibor currency-tenor pairs and thus need to be carefully monitored. RFRs have been identified in major markets, but work remains to be done to make recommendations for an effective transition plan from major Ibors to RFRs, and where appropriate, both in derivatives markets and in funding markets more broadly. In parallel, a private sector effort led by ISDA, at the request of, and in liaison with the OSSG, is examining the issue of derivative contract robustness to risks of interest rate benchmark discontinuation.

3.11 In all jurisdictions, unsecured interbank transactions have dwindled substantially, mainly due to Basel III regulations. The global shift to RFRs as a fall back for Ibor Plus, and also as the preferred benchmark rate to replace the Ibors, has also encountered challenges that will take time to address. In most jurisdictions, progress has been made with respect to overnight RFRs. However, the markets for secured term interest rate benchmarks are illiquid

and slow to develop. Several regulatory changes have been introduced or are being considered to enhance the liquidity in the repo markets. As such, there are no obvious immediate alternatives for the Ibors (be it Ibor Plus or Ibor RF), especially for the three-month maturity which is of systemic importance in key global markets. Globally, the intention is clearly stated for the shift to RFRs and programmes are also announced for the gradual move towards it as well as for the strategies to change markets and regulations to this effect. However, it is also accepted that the current Ibors will continue to exist for the immediate future, until terminated at pre-determined future dates.

4 Designating overnight interbank rates as near-risk free overnight rates

4.1 United Kingdom

4.1.1 In July 2015, the BoE published a paper titled, 'A new sterling money market data collection and the reform of Sonia: public consultation'. This was preceded by the recommendation in August 2014 by the Fair and Effective Markets Review (FEMR) that Sonia be made a regulated benchmark. This recommendation was implemented in April 2015. Furthermore, the objectives for the reform of Sonia included, among others, "….to broaden the coverage of Sonia to include overnight unsecured transactions negotiated bilaterally as well as those arranged via brokers". At the time, Sonia was already widely used by wholesale market participants, among others, as the reference interest rate for the sterling OIS market.

4.1.2 In its October 2016 consultation paper titled "The reform of Sonia", the BoE elaborated on its intention to replace the description of Sonia as "…(an) index tracking actual market overnight funding rates", with a more explicit definition of the underlying interest. In doing so, the BoE has had regard to the main users of Sonia, specifically: as a reference rate in interest rate derivative contracts; as a rate for the remuneration of cash collateral; and a reference point for the standard sterling discount curve. In all these applications, Sonia is used as a proxy for near risk-free interest rates. In this context, "near-risk free" refers to interest rates where the influence of liquidity, credit and other

risks premia are minimal. These engagements culminated in the adaption of the BoE's proposed definition of the underlying interest of Sonia as: "…. a measure of the rate at which interest is paid on sterling overnight wholesale funds in circulation where credit, liquidity and other risks are minimal." The adoption of this proposal was not without challenges by market participants, e.g. with respect to the interpretation of credit, liquidity and other risks especially in times of general market stress.

4.1.3 In its March 2017 report on consultation feedback on the reform of Sonia, the need for further market consultation was emphasised and specific feedback was sought on:

i. The development and promotion of interest rate derivative products which reference the RFR, including the design of a futures contract;
ii. The appropriate scope of adoption of the RFR across broader financial markets beyond derivatives - such as loan or bond markets - including whether a term RFR might be necessary; and
iii. The potential scope for voluntary conversion of legacy portfolios, which currently reference Libor to reference the RFR.

4.2 Eurozone

4.2.1 Since its introduction in 1999, Eonia, as an unsecured overnight interest rate benchmark based on real transactions, was used as a reference interest rate in derivative contracts. In line with the OSSG recommendations, Eonia was selected as the near-risk free alternative reference rate to EURIBOR. The administrator of the Eonia, the EMMI, is leading a reform process of this interbank benchmark in euro, with the aim of making it compliant with the European Benchmark Regulation (EMR). In this context, Eonia was designated as a critical benchmark by the EU Commission under the BMR in June 2017, "…in light of the crucial importance of Eonia for interbank market and the high number of derivatives in the Union referencing it".

4.3 Japan

4.3.1 In December 2016, the Study Group on Risk-Free Reference Rates (Study Group) identified the uncollateralised overnight call rate as the Japanese yen risk-free rate. In identifying the JPY risk-free rate, the Study Group considered the following three properties: (i) the risk-free nature of the rate; (ii) the depth of the market underlying the rate; and (iii) ease of use in financial transactions (particularly derivatives transactions). Regarding the risk-free nature of the rate, although some counterparty credit risk is included in the uncollateralised overnight call rate since it is an unsecured rate, that risk is limited to the extent that it is for overnight transactions, and the rate is regarded as nearly risk-free.

4.4 Switzerland

4.4.1 In Switzerland, the National Working Group on Swiss franc (CHF) reference interest rates recommended that Swiss Average Rate Overnight (Saron) should replace the Tomorrow/next Overnight Index Swap (Tois) fixing as a benchmark prior to 29 December 2017. With the discontinuation of Tois fixing at the end of 2017, the focus of the National Working Group on Swiss Franc Reference Rates NWG is currently on the ongoing transition from Tois fixing to Saron, rather than on a transition away from CHF Libor. However, Saron is also the alternative to Libor (CHF RFR). The Tois fixing is primarily used as the floating leg for OIS in CHF and for CHF cash collateralised derivative contracts as an applicable interest rate.

4.5 Australia

4.5.1 The risk-free benchmark for the Australian dollar is the interbank overnight cash rate (cash rate), which is administered by the Reserve Bank of Australia (RBA). The RBA has reviewed the methodology for the cash rate to ensure alignment with the IOSCO Principles. Since the beginning of May 2016, the cash rate has been calculated directly from market transactions data rather than from submissions of each participant’s aggregate transactions and is

already widely used as a risk-free benchmark in derivatives contracts such as OIS.

4.6 Brazil

4.6.1 The adoption of alternative risk-free rates such as the Selic rate, the average interest rate on overnight repurchase agreements, which are collateralised by government debt securities, compiled by the BCB, has been slow. However, the Bank of Brazil has implemented some measures to boost the use of the Selic rate as reference rate, including through the establishment of FX swaps indexed to the Selic rate.

4.7 Hong Kong

4.7.1 Hong Kong has an existing transaction-based rate, the Hong Kong Dollar Overnight Index Average (Honia), which is calculated based on Hong Kong dollar overnight unsecured interbank transactions conducted through selected brokers. Honia is also the reference rate for Hong Kong dollar OIS.

4.8 Singapore

4.8.1 Unlike other jurisdictions where Ibor rates are used in derivatives, Singapore dollar (SGD) derivatives mainly reference the Singapore Dollar Swap Offer Rate (Sor), which is a foreign exchange implied rate. Work will continue to review alternative near risk-free rates for the SGD market. Possible options currently under consideration include the Singapore Overnight Rate Average (Sora), administered by the Monetary Authority of Singapore (MAS).

Annexure 3
IOSCO Principles for Financial Benchmarks

IOSCO Principles for Financial Benchmarks

Category	Principle	Intention
Governance: These Principles are intended to ensure that Administrators will have appropriate governance arrangements in place in order to protect the integrity of the Benchmark determination process and to address conflicts of interest.	[1] Overall Responsibility of the Administrator	The retention by the Administrator of primary responsibility for all aspects of the Benchmark determination process, such as the development and determination of a Benchmark and establishing credible and transparent governance, oversight and accountability procedures. This Principle makes clear that, regardless of the particular structure for Benchmark determination and administration, there should be an overall entity which is responsible for the integrity of the Benchmark.
	[2] Oversight of Third Parties	The adoption by the Administrator (and its oversight function) of clearly defined written arrangements setting out the roles and obligations of the parties involved in the Benchmark determination and the monitoring of any third party's compliance with those arrangements. This Principle reflects the concern that any outsourcing of functions should be subject to oversight by the Administrator. This Principle applies only where activities relating to the Benchmark determination process are undertaken by third parties, for example with respect to collection of inputs, or where a third party acts as the Calculation Agent or Publisher of the Benchmark.
	[3] Conflicts of Interest for Administrators	The documentation, implementation and enforcement of policies and procedures for the identification, disclosure, management and avoidance of conflicts of interest, including the disclosure of any material conflicts of interest to Stakeholders and any relevant Regulatory Authority. This framework should be appropriately tailored to the level of existing or potential conflicts of interest identified by the Administrator and should seek to mitigate existing or potential conflicts of interest created by the ownership or control structure or due to other interests arising from the Administrators' staff or wider group in relation to Benchmark determinations. This Principle is intended to address the vulnerabilities that create incentives for Benchmark manipulation
	[4] Control Framework for Administrators	An appropriate control framework at the Administrator for the process of determining and distributing the Benchmark, which should be appropriately tailored to the materiality of the potential or existing conflicts of interest identified, and to the nature of Benchmark inputs and outputs. The control framework should be documented, available to any relevant Regulatory Authority and Published or Made Available to Stakeholders. Among other things, a control framework should include an effective whistle blowing mechanism in order to facilitate early awareness of potential misconduct.
	[5] Internal Oversight	An oversight function to review and provide challenge on all aspects of the Benchmark determination process, which should be appropriate to the Benchmark in question (i.e., including its size, scale and complexity) and provide effective oversight of the Administrator. The oversight function and its composition should include consideration of the features and intended, expected or known usage of the Benchmark and the materiality of existing or potential conflicts of interest identified. A separate committee or other appropriate governance arrangements should carry out the oversight function.
Quality of the Benchmark: These Principles are intended to promote the quality and	[6] Benchmark Design	The design of a Benchmark should take into account generic design factors that are intended to result in a reliable representation of the economic realities of the Interest that the Benchmark seeks to measure and to eliminate factors that might result in a distortion of the price, rate, index or value of that Benchmark. The factors presented are generic and non-

Category	Principle	Intention
integrity of Benchmark determinations through the application of design factors that result in a Benchmark that reflects a credible market for an Interest measured by that Benchmark. The Principles also clarify that a variety of data may be appropriately used to construct a Benchmark, as long as the Data Sufficiency Principle is met (i.e., based on an active market).		exclusive illustrations.
	[7] Data Sufficiency	The data used to construct a Benchmark should be based on prices, rates, indices or values that have been formed by the competitive forces of supply and demand (i.e., in an active market) and be anchored by observable transactions entered into at arm's length between buyers and sellers in the market for the Interest the Benchmark measures. This Principle recognizes that Bona Fide observable transactions in active markets provide a level of confidence that the prices or values used as the basis of the Benchmark are credible. Principle 7 does not mean that every individual Benchmark determination must be constructed solely from transaction data. Provided that an active market exists, conditions in the market on any given day might require the Administrator to rely on different forms of data tied to observable market data as an adjunct or supplement to transactions. Depending upon the Administrator's Methodology, this could result in an individual Benchmark determination based predominantly, or exclusively, on bids and offers or extrapolations from prior transactions. Provided that an active market exists, Principle 7 does not preclude Benchmark Administrators from using executable bids or offers as a means to construct Benchmarks where anchored in an observable market consisting of Bona Fide, Arms-length transactions. For example, this approach might be appropriate in a market where overall transaction volume is high over sustained periods, though on any given day there might be more firm bids and offers than posted transactions taking place. The Principle also recognizes that various indices may be designed to measure or reflect the performance of a rule-based investment strategy, the volatility or behaviour of an index or market or other aspects of an active market. The Principle also does not preclude the use of non-transactional data for indices that are not designed to represent transactions and where the nature of the index is such that non-transactional data is used to reflect what the index is designed to measure. For example, certain volatility indices, which are designed to measure the expected volatility of an index of securities transactions, rely on non-transactional data, but the data is derived from and thus anchored in an actual functioning securities or options market.
	[8] Hierarchy of Data Inputs	The establishment of clear guidelines regarding the hierarchy of data inputs and the exercise of Expert Judgment used for the determination of Benchmarks. This Principle is intended to make transparent to users the manner in which data and Expert Judgment may be used for the construction of a Benchmark. This Principle is not intended to create a rigid checklist or otherwise restrict an Administrator's flexibility to use inputs consistent with the Administrator's approach to ensuring the quality, integrity, continuity and reliability of its Benchmark determinations, setout in the Benchmark Methodology, provided that the Data Sufficiency Principle is met.
	[9] Transparency of Benchmark Determinations	The publication with each Benchmark determination, to the extent reasonable without delaying the Administrator's publication deadline, of a concise explanation sufficient to facilitate a Subscriber's or Market Authority's ability to understand how the Benchmark determination was developed, as well as a concise explanation of the extent to which and the basis upon which judgment, if any, was used by the Administrator in establishing a benchmark determination.

Category	Principle	Intention
		Benchmarks that regularly publish their Methodologies would satisfy principle 9 when derived from data sourced from Regulated Markets or Exchanges with mandatory post- trade transparency requirements. In addition, a Benchmark that is based exclusively on executable quotes as contemplated by Principle 7 would not need to explain in each determination why it has been constructed with executable bids or offers, provided there is disclosure in the Methodology.
	[10] Periodic Review	The periodic review by the Administrator of the conditions in the underlying Interest that the Benchmark measures to determine whether the Interest has undergone structural changes that might require changes to the design of the Methodology (e.g., the Interest has diminished to the extent that it can no longer function as the basis for a credible Benchmark). In order to facilitate Stakeholders' understanding of the viability of a Benchmark, a summary of such reviews should be Published or Made Available when material revisions have been made to a Benchmark, including the rationale for the revisions.
Quality of the Methodology: These Principles are intended to promote the quality and integrity of Methodologies by setting out minimum information that should be addressed within a Methodology, which should be Published or Made Available so that Stakeholders may understand and make their own judgments concerning the overall credibility of a Benchmark. The Methodology should also address the need for procedures that control when material changes are planned, as a means of alerting Stakeholders to these changes that might affect their positions, financial instruments or contracts. The Principles also establish that Administrators should have credible policies in case a Benchmark ceases to exist or Stakeholders need to transition to another Benchmark. These policies are intended to encourage Administrators and Stakeholders to plan prospectively for the possible cessation of a Benchmark. These Principles also address vulnerabilities in the Submission process (e.g., conflict of interest, improper communication between Submitters and Administrators,	[11] Content of the Methodology	The documentation and publication of the Methodology used to make Benchmark determinations, with sufficient detail to allow Stakeholders to understand how the Benchmark is derived and to assess its representativeness, its relevance to particular Stakeholders, and its appropriateness as a reference for financial instruments.
	[12] Changes to the Methodology	The publication of the rationale of any proposed material change in its Methodology, and procedures for making such changes. These procedures should clearly define what constitutes a material change, and the method and timing for consulting or notifying Subscribers (and other Stakeholders where appropriate, taking into account the breadth and depth of Benchmark use) of changes.
	[13] Transition	Clearly written policies and procedures that address the need for possible cessation of a Benchmark, due to market structure change, product definition changes, or any other condition, which makes the Benchmark no longer representative of its intended function. These policies and procedures should be proportionate to the estimated breadth and depth of contracts and financial instruments that reference a Benchmark and the economic and financial stability impact that might result from the cessation of the Benchmark. The Administrator should take into account the views of Stakeholders and any relevant Regulatory and National Authorities in determining what policies and procedures are appropriate for a particular Benchmark. Administrators should encourage Subscribers and Stakeholders to have robust fall-back provisions in contracts or financial instruments that reference a Benchmark.
	[14] Submitter Code of Conduct	The development of guidelines for Submitters ("Submitter Code of Conduct, which should be available to any relevant Regulatory Authorities and Published or Made Available to Stakeholders. Note: This Principle is only applicable to a Benchmark based on Submissions. Applies potentially to Risk-free rate methodology.
	[15] Internal Controls over Data Collection	Appropriate internal controls over the Administrator's data collection and transmission processes - when an Administrator collects data directly from a Regulated Market, Exchange or other data aggregator, which address the process for selecting the source, collecting the data and protecting the integrity and confidentiality of the data.

Category	Principle	Intention
selective Submission of data) by outlining the responsibilities that should be undertaken by Submitters (i.e., a Submitter Code of Conduct). These clear the Administrator's responsibilities to have internal controls over the collection of data from regulated sources.		
Accountability: These Principles establish complaints processes, Documentation standards and audit reviews that are intended to provide evidence of compliance by the Administrator with its quality standards, as defined by these Principles and its own policies. The Principles also address making the foregoing information available to relevant Market Authorities.	[16] Complaints Procedures	The establishment and publication of a written complaints policy by which Stakeholders may submit complaints concerning whether a specific Benchmark determination is representative of the underlying Interest it seeks to measure, application of the Methodology to a specific Benchmark determination and other Administrator decisions in relation to a Benchmark determination. This Principle is intended to promote the reliability of Benchmark determinations through Stakeholder input and alert Market Authorities to possible factors that might affect the reliability of determinations.
	[17] Audits	The appointment of an independent internal or external auditor with appropriate experience and capability to periodically review and report on the Administrator's adherence to its stated criteria and the requirements of the Principles. The frequency of audits should be proportionate to the size and complexity of the Administrator's operations. Under certain circumstances (i.e., appropriate to the level of existing or potential conflicts of interest identified by the Administrator) an Administrator should appoint an independent external auditor to periodically review and report on the Administrator's adherence to its stated Methodology criteria. These provisions are intended to promote compliance with the Principles and provide confirmation to relevant Market Authorities and Stakeholders of such compliance.
	[18] Audit Trail	The retention of written records by the Administrator for five years, subject to applicable national legal or regulatory requirements. This Principle is intended to safeguard necessary documents for Audits. Additional requirements apply for Benchmarks based on Submissions.
	[19] Cooperation with Regulatory Authorities	Relevant documents, Audit Trails and other documents addressed by these Principles shall be made readily available by the relevant parties to the relevant Regulatory Authorities in carrying out their regulatory or supervisory duties and handed over promptly upon request. This is intended to facilitate a Regulatory. Authority's ability to access information that might be needed to determine the reliability of a given Benchmark determination or to access information that might be needed to investigate misconduct.

Annexure 4
Indices, interest rate benchmarks and reference interest rates in South Africa

Indices, interest rate benchmarks and reference interest rates in South Africa

Item	Category	Calculation Agent	Data Sources	Compilation processes
1) Jibar	Reference Rate	JSE Ltd	On-screen rates for standard tenors contributed by: • ABSA Bank • Investec Bank • Nedbank • Standard Bank • Rand Merchant Bank	The daily calculation and publication of Jibar is important for the efficient functioning of the South African money, capital and interest rate derivatives markets. These rates are important reference rates in the domestic financial market and are used for determining the reset rate for OTC interest rate swaps and FRAs. The Jibar is compiled for one, three, six, nine and 12-month maturities from local banks' bid and offer rates on bank NCDs. The information is harvested by the JSE Ltd between 9:15 and 10:45:00 daily. The three-month rate is the reference for all ZAR OTC interest rate derivatives as well as the Jibar futures listed on the JSE Ltd. This benchmark is currently governed by the SARB through the RROC.
2) Repo (and Prime) rate	Reference Rate	Repo: SARB Prime rate: determined by South African commercial banks	The current weightings, as measured by interbank funding, are as follows:	The main financial rates currently used in South Africa is the Repo rate and the Prime Rate (Repo rate +X). The Repo rate is fixed by the SARB and cannot be manipulated. The main international rates (Libor, Tibor, Euribor, etc.) are also used in South Africa for various related financial instruments. Derivative MTM: Many of the derivatives listed on the JSE do not trade transparently on-screen and there are, therefore, processes in place to combine traded data with polled quotes from active market participants in order to create a MTM level for the relevant instrument (future or option).
3) The Safex O/N Rate	Benchmark Rate	SAFCOM	All entities where the deposits are placed are South African banks registered with the SARB.	This is the weighted average rate earned on the initial margins gathered by Safcom and then placed with deposit banks. It is an actual invested rate rather than a polled rate, like Overnight Libor.
4) Listed Bond Mark-to-Market	Settlement Price	JSE Ltd	Order and trade data from activity in the JSE-listed bond market, including registered PDs, South African banks registered with the SARB, inter-dealer brokers and members.	Not normally considered in the "benchmark" category, but due to the lack of transparency in the local bond market, the JSE Ltd follows a daily process of polling the PDs (at 16:30) for closing levels on benchmark government bonds. These levels are then used to determine the levels of many other bonds (e.g. corporate bonds) by applying spreads to these polled yields. The process is algorithmic and has no discretion apart from seeking to correct input errors. Other bonds may be valued based on their last traded price at a certain reference time, or using a best-bid-best-offer approach at a specified reference time
5) Interest Rate Derivative Mark-to-Model	Settlement Price	JSE Ltd	Settlement price of underlying interest rate spot contract, combined with interest rate and volatility inputs	The process depends on the nature of the product and the complexity of the pricing model. Some valuations are determined algorithmically, e.g. index options and single-stock futures and others which require some discretion, e.g. "Can-Do" products (exotic options structures). Averaging and trimming may be used, depending on the product.
6) Swap and Government bond yield curves	Benchmark Curve	JSE Ltd	Inputs include JIBAR rates, bond settlement yields, and, FRA & Swap rates contributed by South African banks registered with the SARB.	The process is algorithmic and has no discretion apart from seeking to correct input errors. The algorithm has been developed by the JSE with consultation with the market and the Actuarial Society of South Africa (ASSA). The process does not use any trimming or averaging; it simply takes the inputs and through the algorithm creates the outputs.

7) Short Term Fixed Interest (STeFI) Index	Benchmark Index	JSE Ltd	SABOR, Jibar inputs and published rates	The STeFi is calculated daily. The index measures the return of money market instruments y using the following assumptions: a. The index invests only in Call Deposits and NCD instruments maturing in their different categories. b. All instruments are held to maturity. c. Valuation of instruments is based on daily issuance. This implies that a category valued on a certain day will have the average rate of all the instruments in issuance in that particular category, based on the yield at issue. d. If an instrument must be valued at a maturity between the different categories, linear interpolation should be used to obtain the rate on that specific day. e. Income is reinvested as it is received. Instruments are valued on an accrual basis. f. Daily rates and index calculations will be supplied by SAFEX. The JSE Ltd produces a suite of indices based on these rates. They are used for benchmarking purposes in money market portfolios. The STeFI is not a tradable index in any way, but represents an average interest rate applied to a notional portfolio. The current weightings, as measured by interbank funding, are as follows: -Call Deposit Index: SARB – IBCALL/SABOR (15%) -3 month NCD rates: SAFEX JIBAR min 10 basis points (30%) -6 month NCD rates: SAFEX JIBAR min 10 basis points (35%) -12 month NCD rates: SAFEX JIBAR min 10 basis points (20%)
8) JSE Fixed Income Index Series	Benchmark Index	JSE Ltd	JSE-published bond settlement prices	Index tracks a notional basket of bonds on a total return basis. Bonds are selected using a dual-ranking methodology which incorporates both issued amount outstanding as well as secondary market liquidity. The ALBI index includes the top 20 ranked fixed coupon bonds, while the CILI covers the top 15 ranked inflation-linked bonds. Each index has multiple sub-indices by issuer class and term bucket.

Annexure 5
Comment template

Comment template
Consultation paper on selected interest rate benchmarks in South Africa – August 2018
Comments due by 26 October 2018
(Please fill in your comments and send it as an email attachment to sarbwgrirb@resbank.co.za)

Name of Organisation/Individual:
Contact Name and Details:

Finding no.	**Comment or suggestion**
Recommendation no.	**Comment or suggestion**
General comments	