Developments in bank funding costs in South Africa

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South African Reserve Bank

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Abstract

This paper provides an assessment of developments in South African bank funding costs since the global financial crisis. We construct aggregate bank funding cost proxies by weighting the average cost of different forms of bank funding in South Africa and compare these to a summary measure of actual bank funding costs based on a one-off survey of major banks. We show that, in contrast to the behaviour of advanced economy banks, South African banks have not significantly adjusted their funding composition since the global financial crisis. However, we show that bank funding costs have increased over recent years, in line with higher money market liquidity premia, a higher policy rate and higher market interest rates. A one-off survey of the six largest banks suggests that our average funding cost proxy is within a plausible range of actual bank funding costs and follows a similar profile over time.

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1   Introduction[1]

Banks fund loans by obtaining funding from several sources, the most important being deposits (from households, businesses, corporates and other banks) and issuances of debt. Bank funding costs are crucial to the transmission of monetary policy. Changes in the Reserve Bank repurchase (repo) rate affects the lending rates applying to borrowing by consumers and firms because of the impact of the policy rate on banks' cost of funding. The composition and cost of bank funding therefore have important implications for the provision of credit and consequently for economic output and inflation. Bank funding costs also have financial stability implications. To the extent that banks pass-on funding cost changes to lending rates, debt service costs and the number of non-performing loans could be affected. Apart from impacting credit losses, changes in bank profitability will affect the level of bank capital, with associated solvency and financial stability implications. Monitoring bank funding costs helps the Reserve Bank understand changes in bank funding conditions and whether funding cost changes could be contributing to excessive risk taking or rapid growth of credit extension.

Before the global financial crisis (GFC), policy rates and global bank funding costs were closely correlated. The GFC, together with subsequent regulatory changes, saw banks in many advanced economies shift to more stable sources of funding, such as retail deposits and long-term wholesale debt. Internationally, the spread between the cost of these types of funding and policy rates has become more volatile, driven in particular by variation in funding conditions. This paper gives an overview of recent developments in bank funding by constructing a bank funding cost proxies for the South African banking sector.

In contrast to the behaviour of advanced economy banks, the funding composition for the South African banking sector has been relatively stable since the GFC, although there have been important shifts at individual bank level. We show that bank funding costs have increased over recent years, in line with a higher policy rate and higher market interest rates.

This paper is the first in a series on a range of analytical questions related to the impact of financial market conditions and regulatory changes on the banking sector and transmission of monetary policy. In this paper, we construct aggregate bank funding cost proxies by weighting the average cost of different forms of bank funding in South Africa and compare these to a summary measure of actual bank funding costs based on a one-off survey of major banks. Our focus is on the cost of funding bank liabilities, future work will provide an assessment of the impact of changes in prudential regulations since

the GFC on the asset side of bank balance sheets and the implications for the cost of bank funding.

2 Background

Since the GFC, the margin between bank lending rates and the repo rate has steadily increased (Figure 1). This has led to concerns over the possibility that the pass-through of monetary policy to lending rates has weakened and that banks are abusing their market power. But to understand the drivers of changes in bank lending rates, it is important to understand developments in bank funding costs. Bank funding costs are affected by monetary policy because banks frequently need to borrow funds overnight at a margin over the repurchase rate. As a result, the current and expected levels of the repurchase rate affect both the yield curve and bank lending rates, even though banks only use their Reserve Bank settlement accounts for liquidity purposes (as opposed to a source of funding). But bank funding costs also depend on the costs of different forms of bank funding, and banks may change their funding mix depending on changes regulations and in the relative costs of such sources of funding. In response to changes in funding costs, banks may, depending on the level of competition and economic conditions, choose to pass-on these changes to their customers or absorb them and accept a decline in the profitability of their lending business. This paper unpacks the drivers of changes in bank funding costs as measured using the Reserve Bank's regular survey of banks (which provides data back to 2008), and discusses the impacts that regulatory changes since the GFC have had on the composition and cost of bank funding. Future papers will develop the data necessary to investigate the contributions of policy changes, funding costs and other factors to deposit and lending rates.

Figure 1: Average mortgage rate and the policy rate
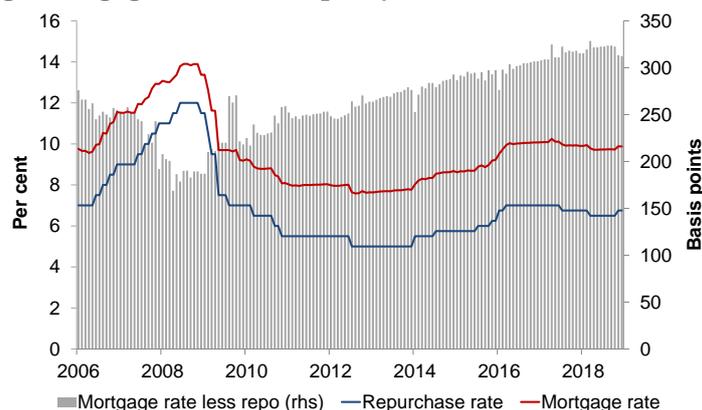
Note: Mortgage rates are calculated using the weighted sum of flexible and fixed mortgage rates. Source: BA930.

3 The composition of bank funding

In many advanced economies, banks' use of short-term wholesale debt funding[2] (defined here as debt maturing within 6 months or less) has substantially declined following the GFC as banks reshaped their liabilities towards deposits and long-term wholesale sources (defined here as funding with residual maturity of more than 6 months).[3] In part, this reflected banks' desire to reduce rollover risk associated with having to refinance wholesale funding as it matures. Another factor that contributed to this shift is a reassessment of pricing and counter-party risk following the GFC. These developments also reflect actions by banks to prepare to meet Basel prudential requirements being phased in following the GFC that require a larger proportion of funding from relatively stable sources (Basel Committee on Banking Supervision 2014).

Figure 2 plots a decomposition of the nominal funding base of South African banks. Ahead of the GFC, South African banks had significant capital buffers and funded a large share of their liabilities from relatively stable sources, so did not have to shift their funding base significantly in response to changes in global bank capital standards post-GFC. In contrast to banks in advanced economies such as those in the euro area or Australia, the composition of funding in South Africa has remained relatively unchanged since around the time of the GFC (Black and Titkov 2019 and European Central Bank 2016).[4] In South Africa, banks have predominantly funded through deposits, representing over 70 percent of total South African bank liabilities. Wholesale deposits, defined here as deposits by non-bank financial and non-financial corporates, including government and parastatals (see full definitions in Table 1 in the Appendix), contribute around 65 percent of total deposits (Figure 4), which are generally less 'sticky' (i.e. more reactive to changes in interest rates) and expensive to source than household deposits (Chiu and Hill 2018). Also in contrast to international experience, the share of deposits has not risen substantially since the GFC, although household deposits have increased somewhat as a proportion of total deposits (Figure 3).[5] Figure 5 also shows that there have not been any dramatic changes in the forms of deposits across the banking sector since the disaggregated data became available in 2012. There are a number

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[2]Such wholesale funding consists of repurchase agreements, collateralised borrowing, and foreign currency funding and debt securities issued by banks for a fixed term.

[3]Data constraints prevent an alternative definition of short- and long-term funding.

[4]An international comparison is made difficult by the inclusion of Negotiated Certificate of deposits (NCDs) in bank deposits in the official bank survey. In South Africa, NCDs are closer to commercial paper than money market securities, overstating deposits as a share of total bank funding relative to equivalent calculations for some other economies. According to data from Strate, NCDs had a weighted maturity of over 4 years in aggregate in 2014, which has fallen to closer to 1 year recently.

[5]Among the largest banks, the share of retail deposit funding has increased, while the share of institutional funding (i.e. excluding corporate and retail deposits) has fallen since the GFC (and the share of corporate deposits has risen for some and fallen for other banks).

of potential explanations for the high share of deposits in South African banks' funding mix. These include a relatively low contractual savings rate, the precautionary saving behaviour by households and corporates and the liquidity preference of the regulated funds management industry.

Figure 2: The composition of bank funding
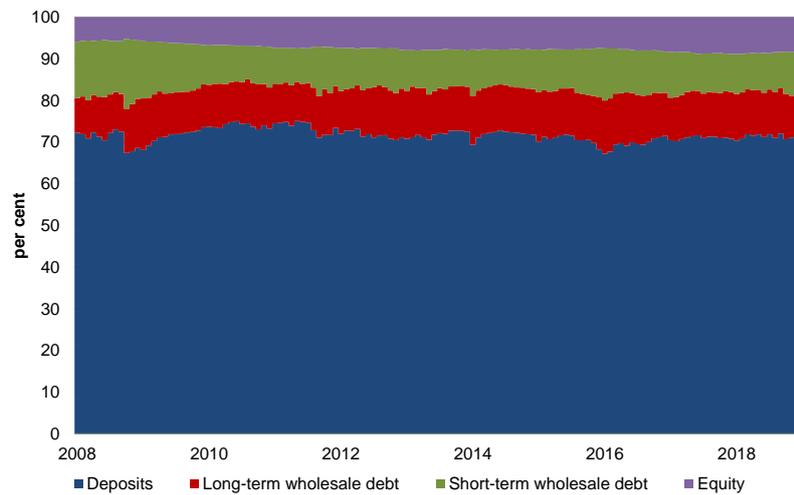
Note: The short-term is defined as maturities of 6 months or below, and the long-term has duration of greater than 6 months.
Source: BA900.

Figure 3: A breakdown of total deposits
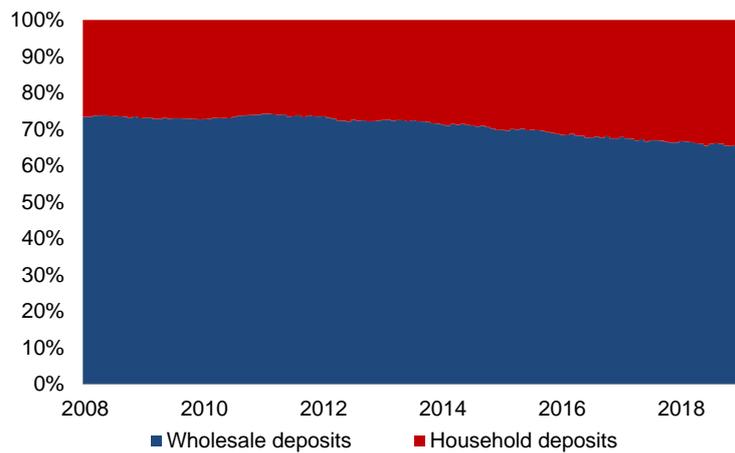
Note: Wholesale deposits consists of deposits of financial and non-financial companies at banks. Source: BA900.

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Figure 4: A breakdown of total deposits (2018 average share)
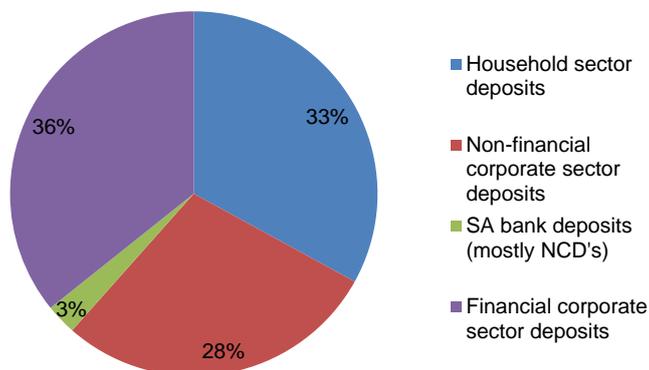
Note: The financial corporate sector consists of the Public Investment Corporation (PIC), public financial corporates, insurers, pension funds, money and non-money market unit trusts and fund managers. The non-financial corporate sector is made up of the local government, public non financial corporates and private non financial corporates. Source: BA900.

Figure 5: The composition of deposits by type
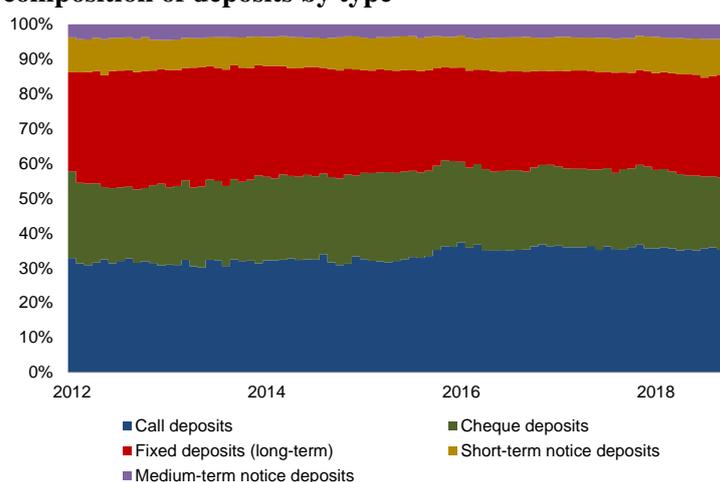
Source: BA930.

Wholesale debt funding, which consists of the issuance of bonds and other financial instruments by banks to large institutional investors, tends to be an important marginal source of bank funding (i.e. funding for new loans). Figure 2 shows that long term debt issues has represented about 10 percent of total funding, a similar proportion to short term wholesale debt long term wholesale funding. While the share of short term domestic wholesale funding has not changed since the GFC, the share of long term wholesale funding that is domestically-sourced has increased (Figure 6). One factor that has contributed to the reduction in the share of foreign funding is the rising cost of such funding given the banking sector's exposure to South African sovereign debt

for liquidity purposes and recent sovereign rating downgrades. Unfortunately, the lack of granularity in data available prevents detailed assessment of the profile of wholesale funding. However, Figure 7 shows that a relatively high proportion of wholesale funding has a short residual maturity, with around 50 percent of such funding having a maturity of less than 6 months, and over 35 percent of which having a residual maturity of 1 month or less. Changes to bank regulation since the GFC require that banks increase their liquidity buffers and proportion of stable long-term funding. Figure 22 in the Appendix shows that the average Liquidity Coverage Ratio (LCR), which requires that banks hold a high proportion of high-quality liquid assets, has risen since early 2014, and is close to 120 percent currently. It also shows that the Net Stable Funding Ratio (NSFR) for the banking system has risen over time and exceeds the Basel III regulatory minimum (100 percent from 1 January 2018) for the 5 largest banks.

Figure 6: Composition of banks' wholesale funding
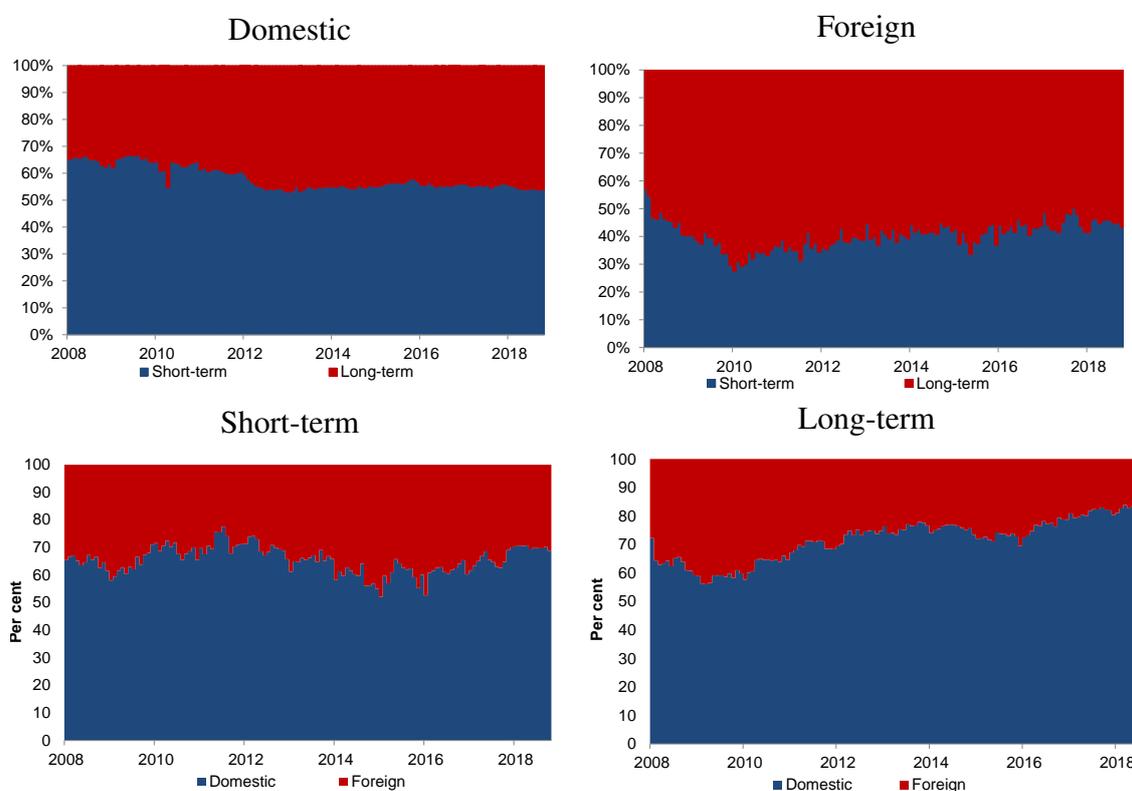
Note: Domestic currency and foreign currency wholesale funding is represented as a share of total bank funding (excluding equity and securitisation). The short-term is defined as maturities of 6 months or below, and the long-term has duration of greater than 6 months. Source: BA900.

Figure 7: Maturity profile of bank wholesale funding
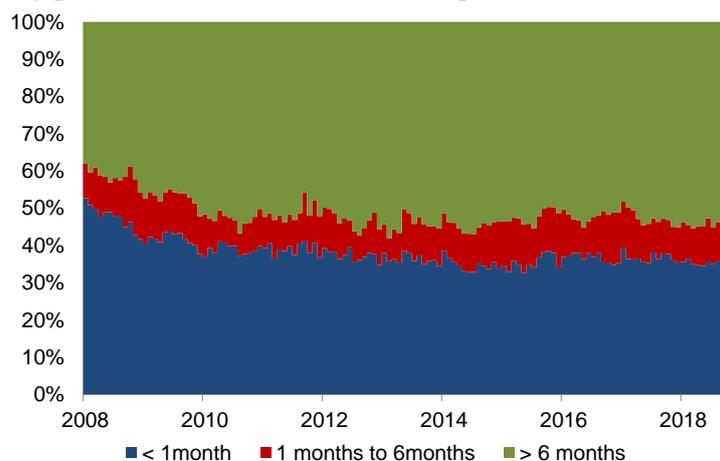
Unlike many banking systems with similar levels of sophistication and capital market depth, the contribution of foreign funding to total liabilities is low and has declined since the GFC to slightly over 10 percent currently (Figure 8).[6] A large proportion of foreign funding is also in local currency terms. In part, this reflects South African exchange control regulation that limits the foreign currency exposure of banks (defined as the difference between total foreign currency assets and liabilities) to 10 percent of net qualifying capital and reserve funds. The foreign currency component of foreign loans is also around 10 percent, while the foreign currency share of total liabilities is around 8 percent (Figure 9). This means that while the exposure of the banking sector to foreign shocks and the consequences of rand volatility are rather limited, the funding sources of South African banks is less diversified than in overseas banking systems. Data availability prevents assessment of the maturity structure of banks' foreign currency funding or the extent to which there exists unhedged foreign exchange exposures.[7]

Bank funding comes in 'unsecured' or 'secured' forms, depending on whether funding is secured against collateral. One example of the latter is repurchase agreements, which involve an agreement where a bank sells an asset, such as a government bond, to secure funding and buying it back at an agreed future date and agreed higher price. Repurchase agreements however make up less than 3 percent of total bank liabilities. Another way for banks to raise secured funding is by securitisation (such as pooling assets as collateral for secured funding through special purpose vehicles). In South Africa,

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[6]A large proportion of the decline observed in Figure 8 reflect the consolidation of the foreign operations of one of the large banks.

[7]South African banks do not raise a large proportion of their funding from foreign sources, and where banks raise foreign funding to originate foreign currency assets, they appear to run conservative mismatch positions between foreign assets and liabilities. However, data on bank hedging practices is not available at present.

this also represents a small proportion of total funding at around 3 percent of total bank liabilities, mainly reflecting securitisation of residential mortgages and vehicle loans.[8] Shareholder equity currently represents about 8 percent of total bank liabilities. Equity is not a regular source of bank financing and has also varied little over time.[9]

Figure 8: The share of foreign liabilities in total liabilities
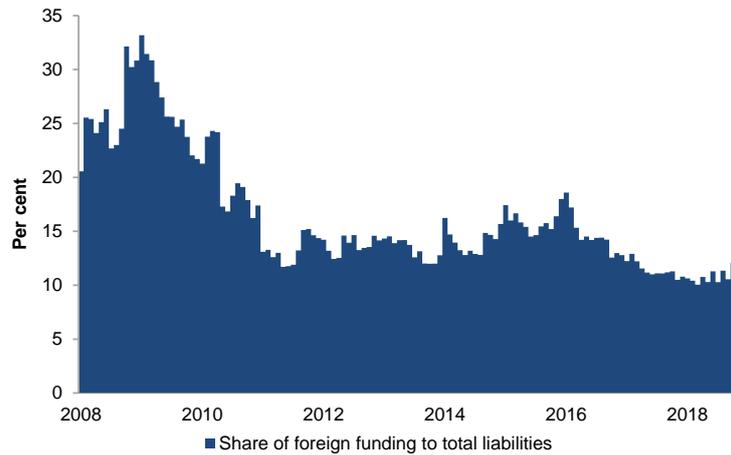
Source: BA900.

Figure 9: Foreign currency liabilities and foreign currency loans
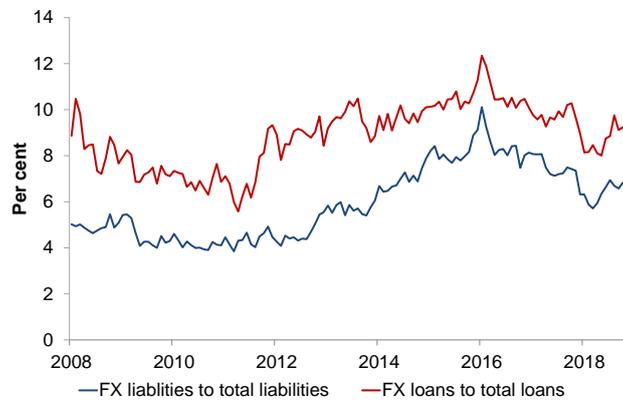
Source: BA100 and BA900.

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[8]Issuance of covered bonds are not currently allowed in South Africa. Covered bonds have recourse to specific pools of assets (such as mortgages) in the event of a bank default while also representing a residual claim on the assets of the issuing bank. Apart from attracting a more diversified investor base, covered bonds also allow banks to issue at longer maturities than conventional bonds. Risk premia in the covered bond market can, however, increase dramatically during times of financial turmoil, raising refinancing costs.

[9]Future work could incorporate the cost of bank equity in additional bank funding cost proxies.

4   Developments in the cost of bank funding

The cost to banks of different forms of funding depend on several factors. On-call deposit rates, for example, are affected by the repo rate, as well as government risk free rates and the level of competition for deposits among banks. The relative cost of wholesale debt funding depends on risk-free rates, the liquidity premium between deposits and longer-term debt and credit spreads on wholesale funding. These will vary depending on financial market conditions, while the credit spreads will depend on bank and instrument characteristics and the macroeconomic environment. Bank funding costs are therefore affected by monetary policy, conditions in the interbank market and the strength of banks' balance sheets.

Measurement of bank funding costs using market data is difficult in South Africa. There are, for example, no risk-free money market interest rate benchmarks currently available in South African financial markets (see South African Reserve Bank 2018). The secondary market for Treasury bills is also illiquid in South Africa, given the long tenor of most government debt issuance and prudential regulations that incentivise banks to hold these instruments until maturity. The 3 month Johannesburg Interbank Agreed Rate (JIBAR) is the most commonly used reference rate against which financial market contracts are reset. As pointed out in South African Reserve Bank (2018), there are unfortunately several problems with the JIBAR as an interest rate benchmark. The NCD rates which JIBAR is based on may not accurately reflect market pricing given the sporadic issuance at a 3 month tenor and the dominance of non-bank financial corporate deposits as a source of funding at that maturity. Figure 10 shows how the spread between the repo rate and the 3 month JIBAR rate increased from 2012 onwards. Two possible explanations are expectations of future monetary policy tightening and changes in bank credit risk. But another factor that appears to have had a particularly large contribution to this spread has been an increase in the liquidity premium embedded in money market rates. Figure 11, for example, shows how the cost of issuing a 12 month NCD has risen relative to repo.

Figure 10: Spread between repo and 3 month JIBAR
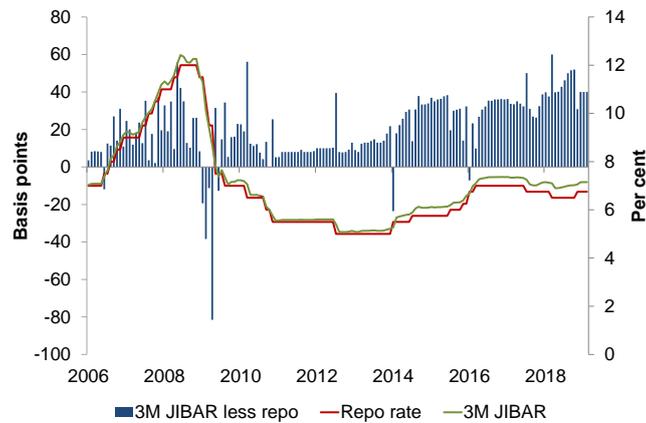
Source: Bloomberg, author calculations.

Figure 11: Liquidity spread estimate (0-12 months)
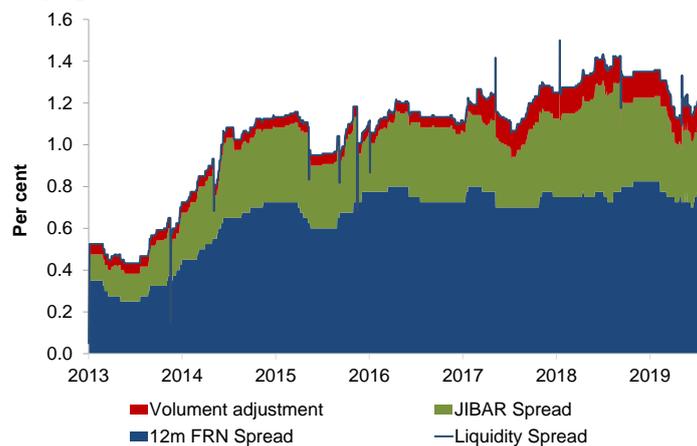
Source: Bloomberg, author calculations. A volume adjustment is added to account for an immediacy premium applying to large trades. The JIBAR spread is the difference between 3 month JIBAR and repo, and the 12 month Floating Rate Note (FRN) spread is the NCD spread over an equivalent swap rate.

The actual rates at which banks can fund in the short-term wholesale market tend to be lower than JIBAR, while they have tended to be higher for long-term wholesale funding. By way of example, Figure 12 depicts the spread between deposit rates and maturity matched money-market interest rates. Pre-GFC, rates on call deposits were about 250 basis points lower than the overnight repo rate, while the 1-month deposit rate was around 120 basis points lower than the 1 month JIBAR. Competition for wholesale term and household deposits has intensified following the GFC, which has seen these spreads narrow dramatically.[10] Intensification of competition for retail deposits has

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[10]Figure 23 in the Appendix shows that the spreads between different types of household deposit

benefitted savers and reflect the scarcity of savings in the economy. The spread on short-term wholesale funding relative to commonly used reference rates has been volatile but also higher on average post-GFC (Figure 13). The failure of African Bank in 2014 saw a tightening in financial conditions and spike in NCD spreads to JIBAR. Longer-term wholesale funding costs have been relatively stable since the GFC and higher than maturity matched reference rates (Figure 14).[11]

Figure 12: Spreads between deposits and money market rates of equivalent maturity
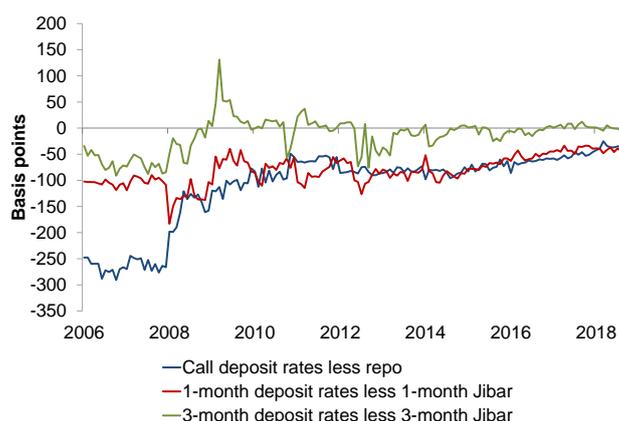
Source: Bloomberg, author calculations.

rates has been reasonably steady since the GFC. Fixed-rate deposits are subject to penalties for early withdrawal, and tend to attract a premium over call deposits, depending on the regulatory classification of the depositor.

[11]Unfortunately, bank credit default swaps are not actively traded in South Africa, so the spread of new unsecured wholesale issuance over existing bonds rates cannot be estimated. One factor that may have contributed to the observed increase in some components of wholesale funding costs is South Africa's sovereign downgrades by raising risk premia on bank debt and affecting the value and eligibility of sovereign bonds as collateral for secured funding, repurchase agreements and derivative positions on a cross border basis. Prudential requirements to increase holdings of liquid assets has seen banks increasing their ownership of government bonds, leading to higher sovereign risk exposure.

Figure 13: Short-term wholesale funding spreads
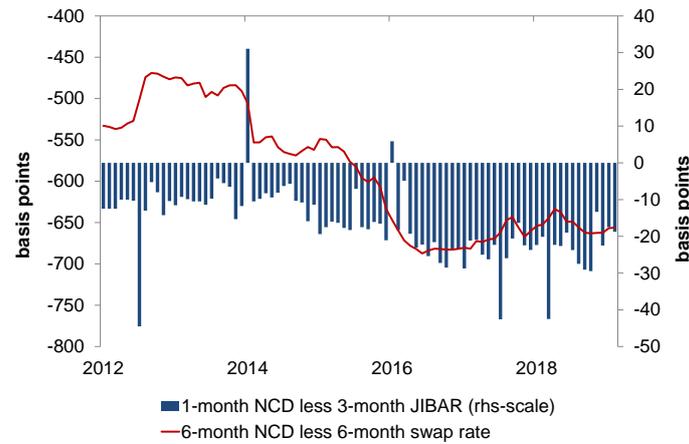
Source: Bloomberg, author calculations.

Figure 14: Long-term wholesale funding spreads (over equivalent swap rates)
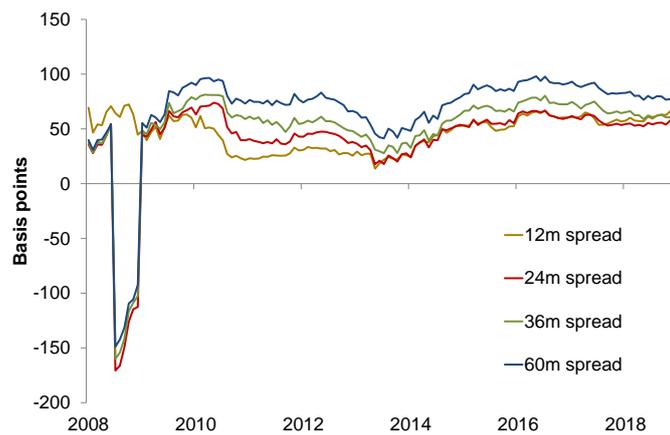
Note: The spreads are weighted across three of the top five banks in South Africa (FNB, Nedbank and ABSA) to allow comparison back to 2008, where the weights represent each bank's market share in total liabilities of the three banks. Source: Bloomberg, author calculations.

5   Bank funding cost proxies for South Africa

In this section, we construct aggregate bank funding cost proxies by weighting the average cost of different forms of bank funding in South Africa using publicly available information, and then compare these proxies to a summary measure of actual bank funding costs based on a one-off survey of major banks.

5.1 Weighted average bank funding costs

We construct a weighted average cost of bank funding (*WACF*) proxy by volume-weighting estimates of the cost of different forms of bank funding, r, by the share of the respective form of funding in banks' total funding basket, w[12]:

$$WACF_t = \sum_{j=1}^{J} r_{j,t} w_{j,t} \tag{1}$$

where j is a form of funding and t the relevant month. Weights are based on stocks of outstanding liabilities from banks' balance sheets, and are dynamic in that they change on a month-to-month basis. The liabilities included in our measure are household and wholesale deposits as well as wholesale debt funding (WSD). For each type of bank funding, a matching reference rate is calculated from market-based interest rates. We express our WACF proxy as spreads with a relevant reference rate for funding at different maturities. For funding sources with a maturity of less than 6 months, we calculate the WACF as spreads over the 3 month JIBAR, as it is the most common benchmark rate used by banks when calculating their funding costs. Funding with a tenor longer than 6 months are matched to maturity equivalent interest rate swaps. Our WACF is calculated as:

$$WACF_t = WACF_t^{Deposits} + WACF_t^{WSD,ST} + WACF_t^{WSD,LT} \tag{2}$$

where the components are calculated as:

$$WACF_t^{Deposits,i,j} = \frac{\sum_{i,j=1}^{J} L_{i,j,t}^{Deposits}}{L_{i,j,t}^{Totalbanks}} * \left[Spread_t^{Deposits,i,j} \right] \tag{3}$$

$$WACF_t^{WSD,ST} = \frac{L_t^{WS,ST} + L_t^{WS,MT}}{L_t^{Totalbanks}} * \left[Spread_t^{WSD,ST} \right] \tag{4}$$

$$WACF_t^{WSD,LT} = \frac{L_t^{WS,LT}}{L_t^{Totalbanks}} * \left[Spread_t^{WSD,LT} \right] \tag{5}$$

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[12]For similar approaches see Illes et al. (2015) or Cook and Steenkamp (2018). Olds and Steenkamp (2020, forthcoming) will provide updated bank-level estimates of various funding costs proxies based on the publicly available BA form data.

where $Deposits_i$ with $i = Retail, Wholesale$ (includes government and interbank deposits) and $j = SST, LT$, where ST refers to deposit items with a residual maturity of up to 12 months, and LT reflects a residual maturity of more than 12 months. For wholesale debt, SST is wholesale debt items with a residual maturity of up to one month, MT is a residual maturity of more than 1 month but less than 6 months and LT refers to debt with residual maturity of longer than 6 months. The costs of funding for the different funding components used are calculated as follows:

$$Spread_t^{Deposits_{i,j}} = Weighted\,rate_{i,j,t} - JIBAR_t^{3m} \tag{6}$$

$$Spread_t^{WSD,ST} = \frac{L_t^{WSD,ST}}{L_t^{WSD,SST} + L_t^{WS,MT}} * [NCD_t^{1m} - JIBAR_t^{3m}]$$
$$+ \frac{L_t^{WSD,MT}}{L_t^{WSD,SST} + L_t^{WSD,MT}} * [NCD_t^{6m} - Swap_t^{6m}] \tag{7}$$

$$Spread_t^{WSD,LT} = \frac{1}{4} * [NCD_t^{12m} - Swap_t^{12m}] + \frac{1}{4} * [NCD_t^{24m} - Swap_t^{24m}]$$
$$+ \frac{1}{4} * [NCD_t^{36m} - Swap_t^{36m}] + \frac{1}{4} * [NCD_t^{60m} - Swap_t^{60m}] \tag{8}$$

where the overall cost of deposits, $Spread_t^{Deposits,i,j}$, is calculated by applying weighted average rates to each deposit category from the BA930 survey of the South African Reserve Bank in which banks report their own weighted rates for each deposit category. These rates are then aggregated and weighted across all 36 registered banks based on outstanding balances as a share of total bank liabilities ($L_t^{Totalbanks}$). The weights in $Spread_t^{WSD,ST}$ and $Spread_t^{WSD,LT}$ are based on outstanding loan balances by category from the BA900 survey. The deposit spread is based on the 3 month JIBAR since a weighted deposit rate is used. The funding spread for 1 month wholesale debt funding is based on the 3 month JIBAR given the lack of an overnight index swap at this maturity in the South African market. At a 6 month maturity, $Swap_t^{6m}$ is calculated using the combination of the 3 month JIBAR and the 3*6 forward rate agreement rate. NCD spreads for maturities of 12 months or more are calculated as the difference between NCD ask rates (of different maturities of three of the largest banks in South Africa for which data is available over a long sample) and rates on maturity matched interest rate swaps ($Swap$). The spreads are then weighted by the corresponding bank's share of liabilities to the total of these three banks. For each tenor, we use the average weighted spread of these three banks as indicative of the average market spread. Owing to a

lack of data describing the maturity structure of long-term wholesale debt in BA survey forms, we are unable to determine whether South African banks have extended their wholesale funding tenor to increase their proportion of stable funding and reduce the risk associated with rolling over maturing wholesale debt. We are also unable to assess how these changes may have affected bank funding costs. For this reason, the long-term wholesale debt component of our funding cost proxy is calculated as a simple average of the four reference rates for wholesale debt with maturities over 12 months (12, 24, 36 and 60 month maturities, respectively). This implies an average maturity of about 3 years for the long-term wholesale debt component of our proxy. Figure 15 shows the average original maturity of long term wholesale funding since 2013/4 when Basel 3 regulations were implemented, which suggests that this is a reasonable approximation, at least on average over the sample considered. However, this data suggests that banks have not, in aggregate, increased the tenor of their wholesale issuance since the GFC. In fact, banks' most commonly used marginal funding source is issuance of NCDs, with issuances increasingly becoming focuses at a 12 month tenor, as can be seen in the decline of the weighted average wholesale funding maturity.[13]

Figure 15: Estimated weighted average maturity of new long term wholesale funding
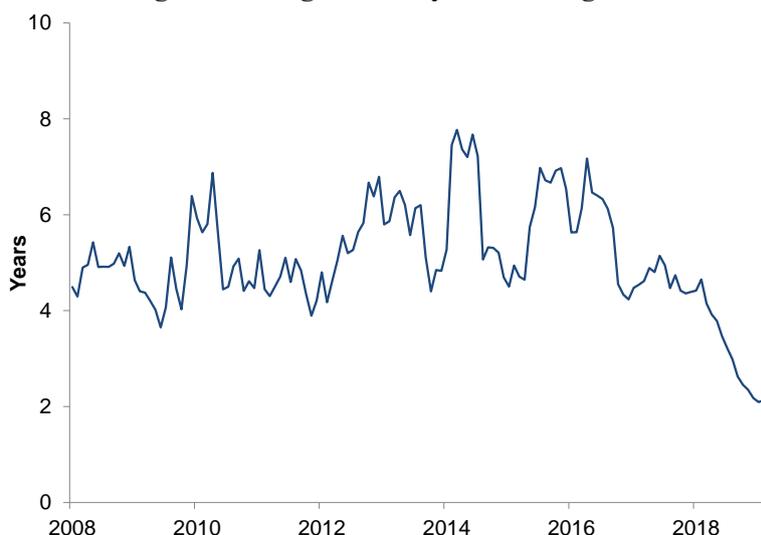
Notes: Calculated as the weighted average of the original maturities of debt issuances (data from the Johannesburg Stock Exchange (JSE)) and NCD issuances with maturity equal to or greater than 12 months (data from Strate from 2016 onwards).

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[13]Under the Basel III LCR rules, banks must hold a larger proportion of liquid assets against NCD funding with a residual maturity over 30 days, and that NCDs are viewed as less stable than other sources of funding in the calculation of the NSFR. Since the implementation of LCR and the NSFR, large banks have complied with these regulations by funding a larger share of their wholesale deposits using NCDs, particularly at a 12 month tenor.

Figure 16 plots the weights of each of the components of the funding cost proxy. Around 2011, there was a shift to more long-term wholesale deposit funding (the yellow component) and a decline in the proportions of short-and long-term wholesale debt funding (the dark blue and green components), but since then the relative shares of the different components have been fairly stable. Figure 17 shows that long-term wholesale deposit spreads, as well as short-term and long-term retail deposit spreads, decreased after peaking around the end of 2009. However, these spreads have edged higher from 2016 onwards, while the other component spreads have been relatively stable over recent years.

Figure 16: Weighted average bank funding component weights
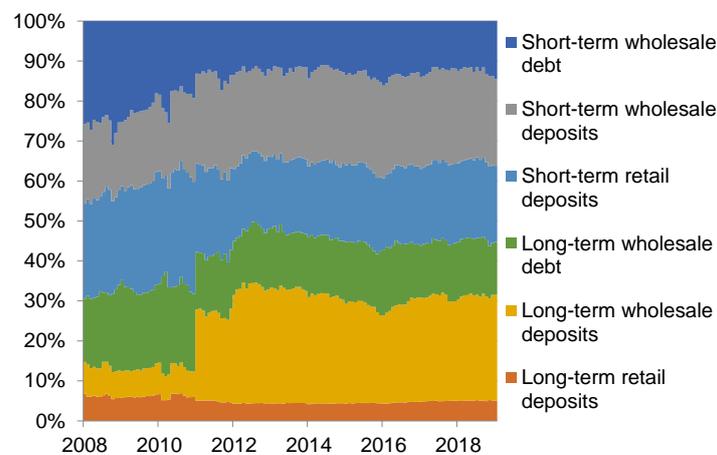
Source: BA900, BA930, author calculations.

Figure 17: Weighted average bank funding spreads

Source: Bloomberg, author calculations.

17
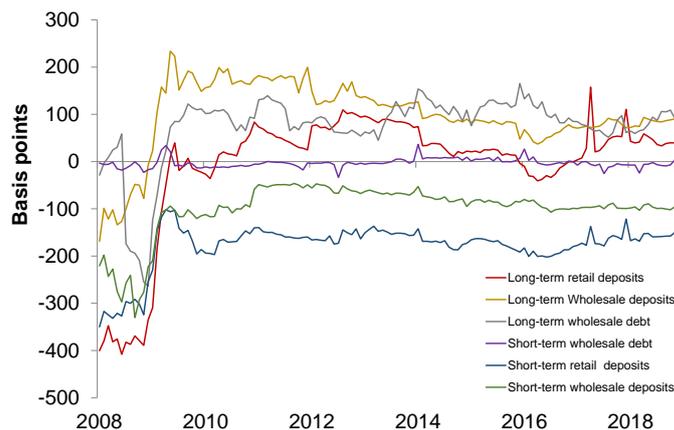
5.2 Marginal bank funding costs

To assess how the costs of sourcing new bank funding has changed over time, we also create an alternative proxy based on flows of new funding instead of total outstanding liabilities as in the previous sub-section.

To compute a weighted average marginal cost of bank funding (WAMCF) proxy, we use deposit data from the BA930 survey and JSE data on bank debt issuance. Since there is no data available on new deposits funding, we use monthly changes in outstanding deposit balances to proxy the volume of new deposits. The WAMCF is thus calculated as the sum of the estimated costs of these two components:

$$WAMCF_t = WAMCF_t^{\Delta Deposits} + WAMCF_t^{Debt issues} \tag{9}$$

where the components are calculated as:

$$WAMCF_t^{\Delta Deposits,m,n} = \frac{\sum_{m,n=1}^{J} \Delta Deposits_{m,n,t}}{Marginal\, funding_t} * [Rate_t^{Deposit,m,n} - JIBAR_t^{3m}] \tag{10}$$

$$WAMCF_t^{DebtIssues,t,w} = \frac{\sum_{p=1}^{J} DebtIssues_{p,t}}{Marginal\, funding_t} * [Fundingspread_t^{DebtIssues,p}] \tag{11}$$

$$Rate_t^{Deposits_{m,n}} = Weightedrate_{m,n} \tag{12}$$

where $Deposits_m$ is an aggregation of components $m =$ Retail, Wholesale (including government and interbank deposits), where Δ denotes the monthly change, for a maturity breakdown of $n = ST_D, LT_D$, and ST_D refers to deposit items with an unexpired maturity of up to 12 months, and LT_D reflects unexpired maturity of over 12 months. $DebtIssues_{p,t}$ is the amount of debt issued by the banking sector in month t where p includes floating rates notes (including callables), fixed rate notes and credit-linked notes. The two funding components together sum to total $Marginal\, funding_t$.

As with the $WACF$ measure, weighted deposit rates are calculated by applying weighted average rates to each deposit category from the BA930 survey. The banking sector average funding cost for listed debt in a given month ($Fundingspread_t^{DebtIssues,p}$) is estimated as the volume weighted funding cost of all listed debt instruments for that particular month. These spreads are easily observable from floating rate debt instruments linked to 3 month JIBAR, however for fixed rate debt instruments, these are estimated as a spread over a rate on an interest rate swap of similar maturity as the debt instrument. Our methodology assumes that all non-zero coupon fixed rate debt instruments have vanilla bullet profiles and that they have no embedded optionality, i.e. they

18

pay fixed coupons on regular intervals before maturity and final coupon and notional at maturity. The drawback to this methodology is that amortising or accreting profiles will also be treated as bullet profiles and that nominal spreads on debt instruments with embedded options are taken as is without adjusting for optionality which might over- and under-estimate the funding spreads for callable and puttable debt instruments, respectively.[14] The spreads on zero coupon debt instruments are estimated as the difference between the rate on the zero coupon debt instrument and the zero coupon swap rate of corresponding maturity. The zero coupon swap curve is calculated by bootstrapping the interest rate swap curve at issue date into zero coupon swap rates, with cubic splines used for interpolation. When expressed as fixed rates instead, rates are calculated as the sum of the funding spread for a particular debt instrument and the rate on the interest rate swap with a similar maturity.

Figure 18 plots the weights used to construct the marginal proxy. Marginal funding is usually dominated by wholesale deposits, which are predominantly NCD-based, although there have been some periods where a large proportion of marginal funding has come from increases in deposits. Given the volatility of these weights, we present the marginal proxy as a 6 month rolling average of estimated marginal funding costs.

Figure 18: Marginal bank funding component weights
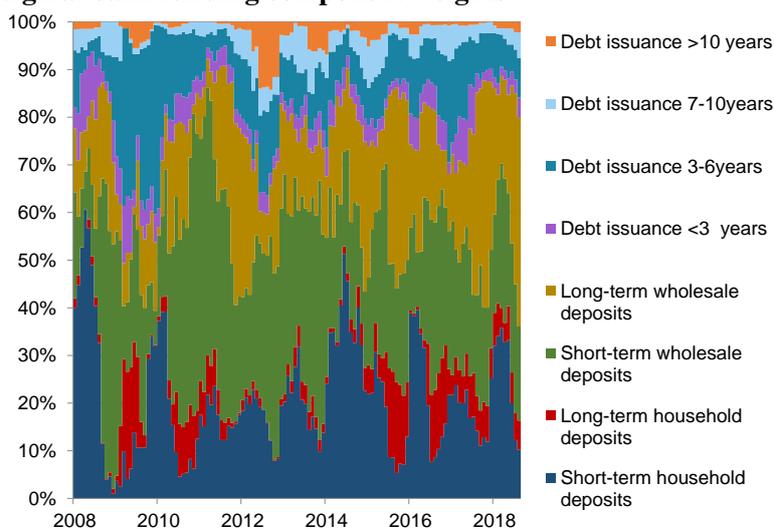
Source: JSE, Strate, author calculations.

Figure 19 shows the component funding spreads for the marginal proxy. Post-GFC, funding short-term deposits has typically come at a cost below the 3 month JIBAR rate,

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[14]Debt issuances with complex issuance terms (such as amortising structures) are excluded from our sample. Nevertheless, our estimates cover 98 percent of the volume of debt issuances over the sample. A full description of the methodology and bank-level issuance information will be provided in Naidoo et al. (2020, forthcoming).

while issuing debt and long-term deposits have come at a cost greater than JIBAR.

Figure 19: Marginal bank funding spreads
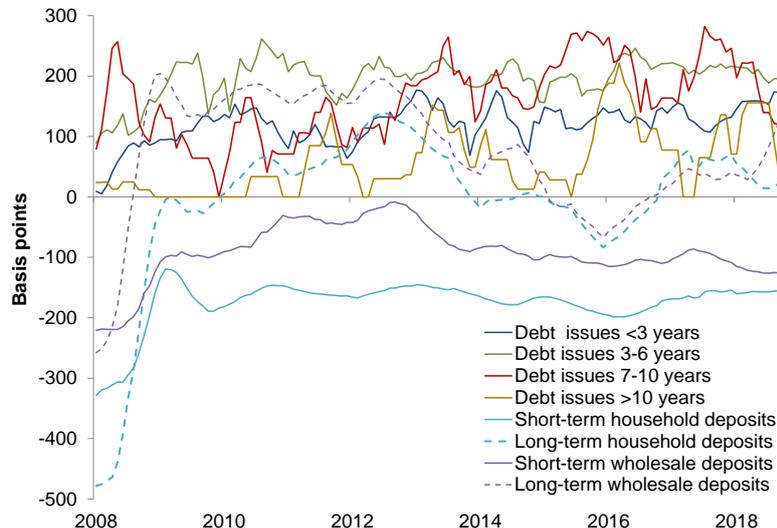
Source: Bloomberg, JSE, Strate, author calculations.

5.3 Actual funding costs proxy

Next, we construct an estimate of the average costs of funding bank liabilities from a one-off survey of South Africa's six largest banks. The survey covers banks' funding mix and respective costs for different categories of funding for the period January 2006 to December 2018. Given the sensitivity of the actual components funding costs at bank level, individual bank-level funding components are volume weighted and only an aggregate measure of actual funding costs presented.

Our actual funding cost (AFC) estimate is calculated as:

$$ACF_t = \sum_{b=1}^{6} ACF_{b,t} \tag{13}$$

which is the sum of the volume weighted ACF for each of the six banks in the one-off survey. The components are calculated as:

$$ACF_{b,t} = \sum_{j,f,b=1}^{J} \frac{Liabilities_{j,f,b,t}}{Total liabilities_t} * \left[Rate_{j,f,b,t} - JIBAR_t^{3m} \right] \tag{14}$$

where j is the type of funding by product type (i.e. deposits, debt securities, repurchase agreements and interbank funding), by funding sector f (i.e. households, banks, firms, institutional, government and foreign) for each of the six banks b, where t is the relevant

20

month and sum to $Total liabilities_t$.[15] $Rate_{j,f,b,t}$ is the interest rate for each form of funding for each bank. $Liabilities_t$ is the sum of all funding acquired by the six banks in the survey. The survey data is based on SA bank level data, with funding cost valuations in nominal terms. The actual funding cost proxy is expressed as a spread over the 3 month JIBAR as we do not know the maturity structure of some liabilities of some of the banks in the survey.

5.4 Comparison of funding costs proxies

Figure 20 plots the average funding cost proxy (expressed as a spread to reference rates used in the calculations described earlier), while Figure 21 re-expresses these in level terms to make them more easily interpretable. Our measure based on the current stock of funding provides an indication of the average cost of bank funding, while the marginal cost measure provides an indication of the cost of new bank funding for South African banks. Average bank funding costs, when expressed in funding spread terms, were more than 130 basis points dearer in January 2019 than in January 2008. Expressed in level terms, average funding costs are however substantially lower than pre-GFC levels, having fallen by almost 300 basis points. The fall in the proxy in level terms reflects the fall in market interest rates since the GFC, although they have risen by slightly more than market rates since troughing in late 2013. Between October 2013 and January 2019, average bank funding costs rose by 171 basis points, compared with 175 and 201 basis points in the case of the repo rate and the 3 month JIBAR, respectively.[16] In comparison, the latest datapoint for the marginal funding cost proxy is about 200 basis points higher than its pre-GFC level when expressed as a spread to relevant reference rates, although in level terms it is 230 basis points lower. Since October 2013, it has been volatile and the latest estimate is about 142 basis points higher in level terms, a slightly lower increase than in the case of the repo and JIBAR over the same period. Our estimates of actual funding costs suggest that funding has become costlier for banks since the GFC relative to reference rates. In spread terms, actual funding costs were almost 200 basis points higher than their pre-GFC level in December 2018, while they have been relatively flat over recent history. In absolute level, actual funding costs were 216 basis points lower than their pre-GFC level in December 2018. While our average funding cost proxy is slightly over 100 basis points higher than our estimates of actual funding costs, it follows a similar profile over time and is within a plausible range of actual bank funding costs.

[15]We have excluded the foreign funding component for one of the banks owing to anomalies in the data.

[16]Part of the variation in the spread between the absolute level of funding costs and JIBAR will reflect time variation in term and credit risk premia. Soobyah and Steenkamp (2020, forthcoming) show, for example, that the term premium embedded in South African government bonds has risen substantially over recent years.

Figure 20: Bank funding cost spreads

Average funding costs

Marginal funding costs

Actual funding costs
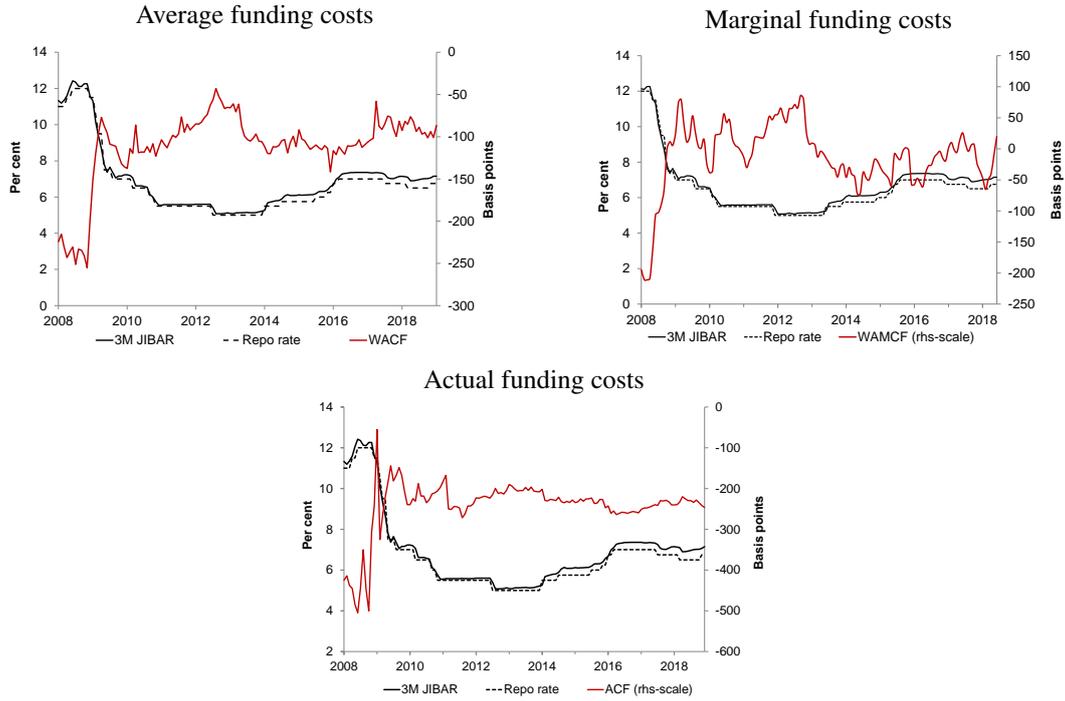
Note: Funding costs expressed as spread to reference rates as discussed in text.

Figure 21: Bank funding costs in levels

Average funding costs

Marginal funding costs

Actual funding costs

22
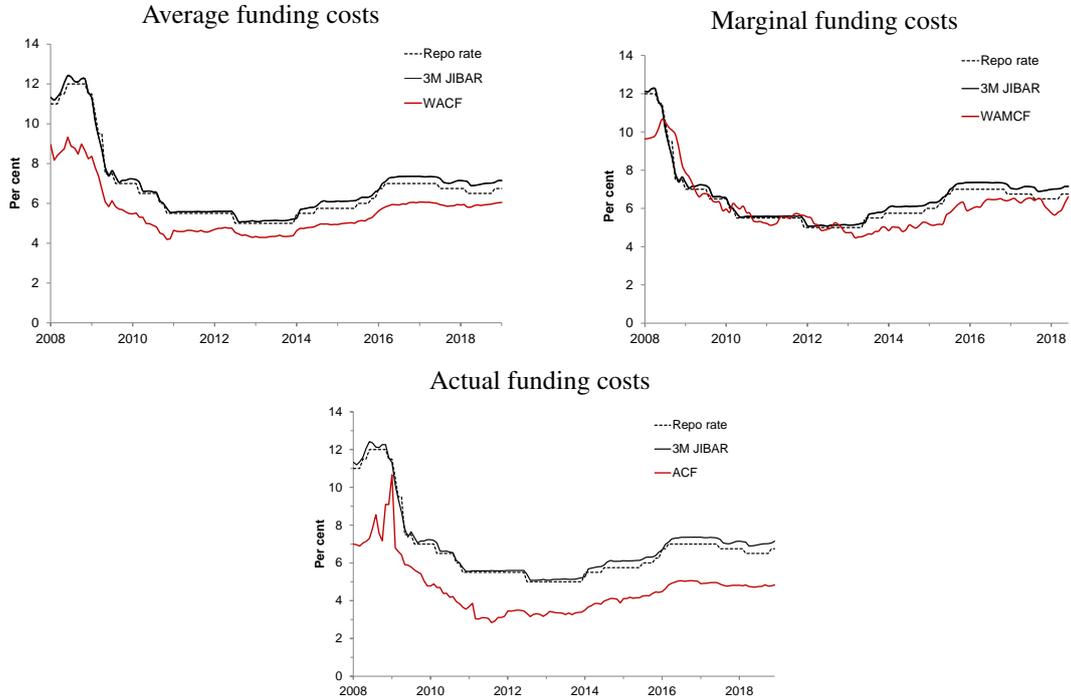
6 Conclusion

This paper gives an overview of recent developments in the composition and cost of bank funding in South Africa. Unlike many advanced economy banking systems, the composition of bank funding has not changed considerably since the GFC. This is because South African banks had funded a large share of their liabilities from relatively stable sources pre-GFC, and did not have to shift their funding base in response to changes in global bank capital standards. Instead, developments in bank funding costs have been driven by changes in the cost of different forms of funding, with retail and wholesale deposits increasing the most since the GFC. Another factor that differentiates South Africa's banking system is that a large proportion of bank funding comes from relatively stable sources such as domestic deposits. This implies that the South African banking sector is relatively sheltered from international funding conditions and volatility in the rand, although this also implies that funding sources are also less diversified than in overseas banking systems.

We construct indicators for monitoring funding conditions in the South African market. Our initial estimates suggest that aggregate bank funding costs have increased significantly since the GFC. Unfortunately, a lack of data prevents assessment of the extent to which this has reflected a correction from unusual levels or the impact that changes in prudential policy have had on bank funding costs. A one-off survey of the six largest banks suggests that while our average funding cost proxy is higher than estimates of actual funding costs, our proxy follows a similar profile over time and is within a plausible range of actual bank funding costs. Since our actual funding cost measure is based on a survey of large banks and smaller banks are likely to face higher funding costs, this measure likely represents a lower bound of actual funding costs for the industry as a whole.

Future papers will refine the methodologies used to construct our funding cost proxies and address a range of pertinent policy questions. Changes to banking liquidity standards, for example, have affected the effective costs of lending for South African banks by requiring banks to hold larger liquidity buffers. Papers in this series will develop more comprehensive funding cost measures, including ones that capture the impact of prudential regulations on the asset side of banks' balance sheets. This would allow the relationship between the policy rate, funding costs and bank lending rates to be modelled to assess how prudential regulations such as LCR and NSFR have affected funding costs and the transmission of monetary policy. Future work could also consider the implications of funding spreads for monetary policy.

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Appendices

Figure 22: Liquidity standard measures for the banking sector
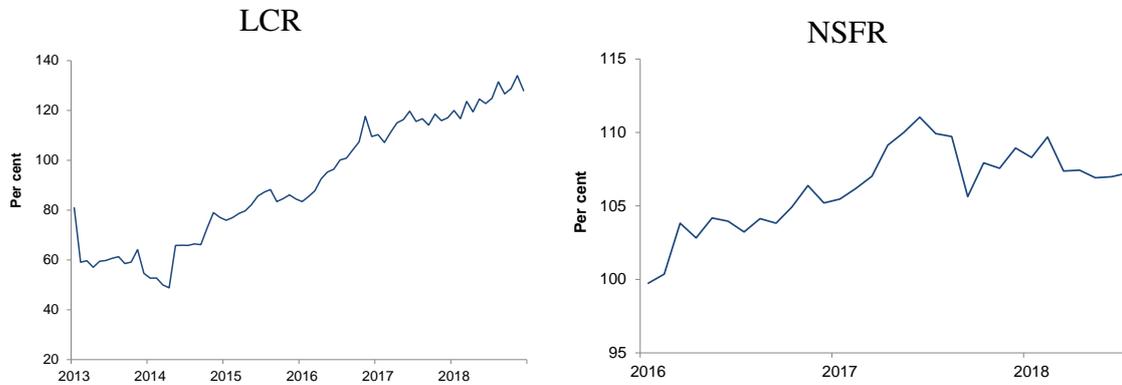
Note: The LCR is calculated as the ratio of high quality liquid assets (e.g. short-term government bonds) and net cash outflows over a 30-day period for the total banking sector. The NSFR is based on values for the 5 largest banks, weighted using their shares in combined liabilities, based on each bank's total available stable funding divided by total required stable funding. The committed liquidity facility is currently included in the calculation of NSFR. South Africa's NSFR deviates from the Basel III NSFR composition, incorporating a non-zero available stable funding factor to wholesale deposits. This means that the NSFR is higher than if South Africa did not deviate from the Basel available stable funding factor calculation.

Figure 23: Household deposit rates
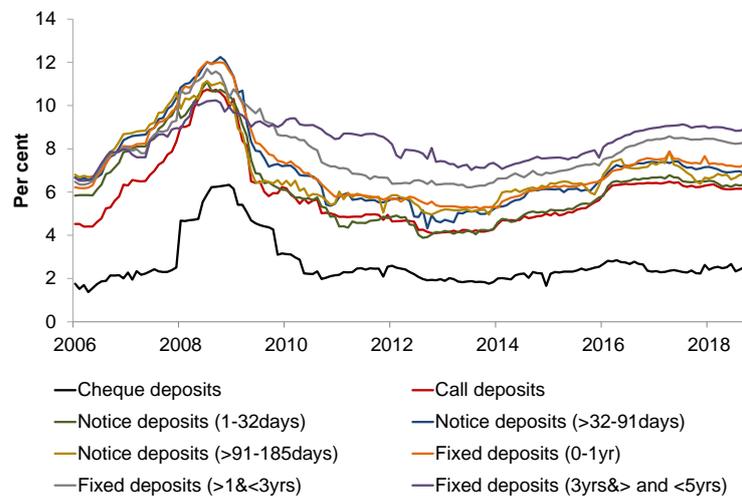
Source: BA930

Table 1: Data Definitions

Deposits	Definition
Wholesale deposits	All deposits (e.g. call, cheque, notice and fixed deposits) belonging to financial companies, non-financial companies, public corporations and the government.
Household sector	All deposits (e.g. call, cheque, notice and fixed deposits) from households, unincorporated business enterprises of households and non-profit organisations serving households.
Foreign deposits	All deposits belonging to South African banks, the government, financial and non-financial companies, and households denominated in foreign currency. For reporting purposes, the BA900 reports these transactions in rand terms.
Interbank deposits	Refers to funds held by one bank on behalf of another bank.
Wholesale funding	
Other borrowed funds	Consists of loans received under repurchase transactions and loans secured by collateral.
Foreign currency funding	Syndicated loans and collateralised borrowing in foreign currency.
Other liabilities to the public	Mostly comprises of debt securities issued by the bank (i.e. commercial paper, medium term notes, bonds and floating rate notes.) to obtain capital or funding. Other liabilities of public is also made up of transactions relating to credit in transit, including amounts held against certified or initialled cheques, outstanding travellers cheques issued, outstanding drafts issued, stop orders or other or other credits in transit in respect of mail or telegraphic transfers.
Other liabilities	Refers to liabilities in respect of derivative instruments, reported at market value.
Other types of funding	
Equity	Any amount obtained in respect of equity instruments (shares) issues by the bank, reserves and retained earnings.
Securitisation	The aggregate amount relating to investment by banks in instruments issued in respect of a securitisation scheme, such as investments in asset-backed securities or mortgage backed securities.