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Head: Economic Research Department
South African Reserve Bank
P O Box 427
Pretoria 0001

Tel. +27 12 313 3911

Regulation and bank lending in South Africa: a narrative index approach

Xolani Sibande,[*] Dumakude Nxumalo,[†] Keaoleboga Mncube,[‡] Steve Koch[§] and Nicola Viegi[**]

Abstract

The extension of affordable credit is key to financial inclusion but it could reduce the stability of the financial sector. Macroprudential policy, on the other hand, is designed to mitigate financial sector risk. Thus, inclusion and macroprudential regulations may be in opposition. This study estimates and contrasts the impact of these potentially contradictory regulations on the bank lending rates and volumes of South Africa's largest banks. Our results suggest that macroprudential policy is working as intended, as it is associated with increases in interest rates on unsecured lending rates and decreases in short-term secured and mortgage lending rates. Inclusion-focused regulation is associated with increased bank lending rates in unsecured credit. We observe a decrease in the growth of unsecured lending for households and an increase in secured lending for corporates. We find that the estimated effects of financial inclusion initiatives largely overlap with – rather than offset – the estimated effects of macroprudential policy.

JEL classification

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Keywords

Bank lending, narrative methods, finance regulation

[*] Corresponding author. South African Reserve Bank. Email: xolani.sibande@resbank.co.za

[†] Department of Economics, University of Pretoria. Email: dumakude.nxumalo@up.ac.za

[‡] Department of Economics, University of Pretoria. Email: keaoleboga.mncube@up.ac.za

[§] Department of Economics, University of Pretoria. Email: steve.koch@up.ac.za

[**] Department of Economics, University of Pretoria. Email: viegin@gmail.com

1. Introduction

The extension of affordable credit is a key component of financial inclusion.[1] As a consequence of South Africa's apartheid history, levels of financial inclusion were significantly low at the dawn of the country's democracy (Hawkins 2004). Increasing levels of financial inclusion have thus been a government imperative post-1994 and have been pursued through financial sector regulatory reforms. However, research indicates that increasing financial inclusion through credit extension may reduce financial stability (García and José 2016). Conversely, macroprudential policies are intended to achieve stability in the finance sector, ultimately lowering lending to meet increased bank capital requirements. However, these outcomes may vary with the banking system. For example, a healthier banking system can sustain higher lending capacity, or regulatory pressure may prompt more risk-taking (see Merrino, Lesame and Chondrogiannis 2024). The different objectives of financial inclusion and macroprudential policies may thus offset one another.

In this paper, we first estimate the realised impacts of separate regulatory developments related to macroprudential policy and financial inclusion to determine whether these initiatives meet their intended goals.[2] Second, we consider whether these two regulatory approaches are contradictory, using a panel data approach to estimate the impact of different regulatory developments on bank rates and three-month changes in bank lending volumes.

To measure regulatory developments, we develop narrative indices that comprehensively measure all developments relevant to our study. This approach is consistent with various studies that consider the effect of macroprudential reforms on lending volumes (Eickmeier, Kolb and Prieto 2018; Richter, Schularick and Shim 2019; Budnik and Rünstler 2020; Rojas, Vegh and Vuletin 2022; Fernández-Gallardo

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1 Financial inclusion is a multi-faceted concept that relates to the ability of individuals and businesses to access affordable transaction, payment, saving, credit and insurance products (World Bank 2024). This paper focuses on the aspect of inclusion related to the greater use of affordable credit.

2 For the purpose of this analysis, we distinguish between macroprudential and financial inclusion regulations. However, the paper's focus is broader and is primarily about bank regulation. The regulations included in the narrative indices are described in Annex 6.

Romero and Lloyd 2023). However, the paper extends this type of analysis by considering the impact of financial regulations that are geared to inclusion. It also presents a dataset comprising public and confidential bank data related to the four largest banks in South Africa, allowing us to analyse how the largest banks in South Africa respond to the two potentially opposing regulations.

Our analysis differs from existing literature in the following respects. First, we consider the impact of regulatory developments on both lending volumes and bank pricing. To the best of our knowledge, this paper is the first in South Africa to consider the impact of bank regulation on bank pricing. Second, we measure bank responses in disaggregated customer segments, as opposed to assessing changes in aggregate lending. This approach allows us to measure whether bank responses vary across different customer segments. Third, the analysis considers separate models for each of the narrative indices, allowing us to estimate heterogeneity in bank responses in the face of different regulations. This approach allows us to infer whether these two regulatory approaches are aligned with their objectives and consistent with each other.

Our results indicate that macroprudential policy is working as intended to achieve financial sector stability. We find that macroprudential regulation results in increases in interest rates in unsecured lending and decreases in secured lending and mortgage rates. Macroprudential regulation is also associated with positive growth in lending volumes in unsecured and secured credit, but decreased growth rates of mortgage lending. We estimate that inclusion-focused initiatives result in increased bank lending rates for unsecured credit to households and decreased growth in the unsecured lending volumes to households. We also observe increases in the growth of secured lending to corporates and a decrease in secured lending rates paid by those corporates. Rather than these two regulatory approaches offsetting one another, the estimated impacts of financial inclusion initiatives largely overlap with those estimated for macroprudential policy. This is likely because inclusion-focused regulation may be at odds with its stated objectives.[3]

[3] We note that these results are specific to bank lending to all borrowers, but non-bank financial institutions (NBFIs) also provide lending. Our analysis does not capture the impacts of inclusion-focused regulatory developments on lending by NBFIs.

The paper is structured as follows. First, we provide a comprehensive review of the literature, showing how banks have responded to macroprudential and financial regulation intended for inclusion. Second, we describe the construction of the narrative indices. Third, we describe the data and methodology. Fourth, we discuss the results and conclude.

2. Literature review

This paper covers and contributes to various strands of the literature, including the response of banks to macroprudential reforms and efforts aimed at enabling financial inclusion. Our construction of narrative indices on macroprudential and financial inclusion reforms is informed by literature on narrative methods of identification.

2.1 Macroprudential regulatory developments

The objectives of macroprudential reforms are well documented and continue to expand, with further reforms being introduced to create resilient banking systems.[4] The ongoing debate about the implications of the reforms, particularly on the lending behaviour of banks, provides further insight into the costs and benefits of reforms intended to make banking systems more resilient.

Work on the costs or unintended consequences of macroprudential reforms dominates the debate. Noss and Toffano (2016) note that tightened macroprudential capital requirements can cause banks' costs of funding to rise and, in turn, prompt banks to pass these increases on to borrowers in the form of high interest on loans and/or reductions in extended credit. Deli and Hasan (2017) show that higher capital requirements lead banks to reduce their risk-weighted assets, implying a downward shift in lending to meet capital requirements. Noss and Toffano (2016) use a vector autoregressive (VAR) model to estimate the effect of changes in banks' capital requirements on lending in the United Kingdom (UK) and find that tighter capital

[4] See Kashyap et al. (2004), Basel Committee on Banking Supervision (BCBS) (2006), Cohen and Scatigna (2016) and Cerutti et al. (2017), among others.

requirements are associated with a reduction in lending, with the effect on corporate lending more pronounced than on household lending.

Aiyar, Calomiris and Wieladek (2016) studied the interaction of capital requirements and monetary policy and the response to these policies by UK banks. They found that banks reduce lending in response to tighter capital reforms and monetary policy. They also exploit the heterogeneity of banks by differentiating between small and big banks, finding that large banks only react to tighter capital requirements, while small banks react to both policies. Deli and Hasan (2017) analysed the effect of macroprudential reforms on banks in 125 countries, finding weak negative effects of capital stringency on loan growth, especially for well-capitalised banks. Mirzaei and Samet (2022) found similar results for banks in 91 countries, where small, less-capitalised and less-liquid banks loaned less in response to stringent capital requirements than well-capitalised and highly liquid banks. Angelini et al. (2015) studied the impact of capital requirements on national output using various dynamic stochastic general equilibrium models. They found that a one percentage point increase in the capital ratio translates to a 0.09% loss in output relative to the level that would have prevailed without capital tightening.

Work on the potential effect of macroprudential reforms in emerging markets is limited, but Fang et al. (2022) investigated the impact of rising capital requirements on lending in Peru. They used bank-level lending data and bank-specific capital buffers and found that higher capital requirements are associated with lower credit extension. However, the effects vary according to economic conditions and bank characteristics, where less-capitalised, less-liquid and less-profitable banks react more to tighter capital requirements. The effects are also more pronounced during economic downturns. In the case of South Africa, Maredza (2016) investigated the impact of increased bank requirements and, in particular, those introduced under Basel II on the cost of intermediation. Results from a panel of 10 banks show that tighter capital requirements increase the cost of intermediation, with the net interest margin serving as a proxy for the cost of intermediation. Gumata and Ndou (2017) assessed the impact of Basel III in the form of liquidity coverage ratio and net stable funding ratios on credit growth. Their decomposition exercise shows that Basel III contributed to the contraction in credit after the global financial crisis. Most recently, and similar to this paper, Sibande

and Milne (2024) used data from the big four banks to study the effect of Basel III capital requirements on the supply of bank credit in South Africa. They found weaker evidence of the impact of capital requirements on the supply of bank lending. Makrelov and Pillay (2024), using data on big and small banks, examined how decisions around the size of excess capital as well as monetary and financial stability actions affect sectoral lending in South Africa. Their findings indicate that holding additional capital affects banks' lending, especially for small banks.

This paper contributes to work that analyses the impact of Basel-related regulations in emerging countries (and in South Africa in particular) by constructing a narrative account of macroprudential policies. This provides historical documentation of major developments in macroprudential regulation. As existing work largely focuses on bank lending volumes, the paper further contributes by analysing the impact of the policies on bank lending rates.

2.2 Developments in financial-inclusion regulation

It is broadly accepted that financial inclusion is key to development. Greater access to credit, savings accounts and transactional services enable individuals to store money safely, make and receive payments, and invest for the future (Demirgüç-Kunt et al. 2021). Empirical studies have also shown that greater levels of financial inclusion are associated with lower levels of poverty. Mahalika, Matsebula and Yu (2023) estimate such a relationship for South Africa through the regression of poverty levels on a derived measure of financial exclusion. On a macro level, studies have associated financial inclusion with greater economic growth, employment and lower inequality (Demirgüç-Kunt and Singer 2017). Ozili (2021) recognises financial inclusion as a strategy that could be used to achieve the United Nations' sustainable development goals.[5]

[5] More specifically, Yap, Lee and Liew (2023) conducted a cross-country analysis examining the relationship between seven Sustainable Development Goals (SDGs) and financial inclusion. They found statistical evidence indicating that greater financial inclusion is associated with SDGs 2 (ending hunger), 5 (reducing gender inequality) and 8 (promoting economic growth).

The creation of or changes in financial regulation has been used to increase financial inclusion in various jurisdictions, with different degrees of success. Chen and Divanbeigi (2019) found that close to two of three national regulatory and supervisory entities in the world further financial inclusion by, among other measures, increasing consumer protection and financial literacy to ease entry, and supporting the creation of non-traditional financial service providers. They found that a supportive regulatory environment enables the growth of service providers and the provision of products that meet the needs of various customers, thereby furthering financial inclusion. While governments have pursued a wide array of regulatory changes to enhance inclusion, this study focuses on greater access to and use of affordable credit products. Relevant financial sector regulatory efforts include the creation of inclusive financial institutes, credit databases, newly designed financial products, the promotion of technology as a method to deliver financial products, lending regulations and the provision of subsidised funding (Yoshino and Morgan 2016). Consumer protection measures are also touted as necessary to support financial inclusion (Yoshino and Morgan 2016). A number of these developments overlap with inclusion-related developments initiated by South African authorities that are considered in this study. Further discussion is provided below of empirical analyses of these types of regulatory developments and their effect on credit extension.

Regulations that lead to credit databases that include relevant credit-related information on individuals and firms reduce the level of asymmetry between lenders and borrowers. Banking markets are characterised by informational asymmetries, where a lender may not know the creditworthiness of a potential borrower. In such instances, banks may choose to ration credit (Stiglitz and Weiss 1981). This imbalance in information may also have an impact on banks' ability to enter credit markets. Dell'Ariccia, Friedman and Marquez (1999) show that when a potential entrant bank is unable to differentiate good from bad borrowers, that bank is likely to be deterred from entering the market. Dell'Ariccia (2001) suggests that this barrier to entry is lessened when banks are able to gain proprietary information about borrowers over time. However, gaining such information provides banks with market power over clients,

where older creditworthy clients are charged higher rates.[6] Martinez Peria and Singh (2014) estimated the impact of credit-information-sharing systems on bank lending to firms. The credit information schemes they considered included credit bureaus and public credit registries that capture information on borrowers, thus decreasing the informational asymmetry that characterises credit markets. They found that following the introduction of a credit bureau, firms had greater access to finance, lower interest rates, longer maturity terms and more working capital.

National authorities also use consumer protection mechanisms to support financial inclusion. These are usefully summarised by Yoshino and Morgan (2016) as the creation of agencies that regulate credit extension. Consumer protection initiatives implemented by these agencies include the provision of guidelines to be followed when conducting affordability assessments and providing consumers with information on legal recourse following fraud. Yoshino and Morgan (2016) write that consumer protection could further financial inclusion, as it increases consumer trust in financial services, supporting usage. Chen and Divanbeigi (2019) suggest that inclusion-focused regulatory measures affect financial inclusion. Their index of regulatory measures captures many regulations and consumer protection initiatives that support interest rate disclosures to customers.

In South Africa, the National Credit Act (NCA) of 2006 led to a host of changes in credit market regulation, including provisions to increase disclosure of the costs of credit to protect credit customers from reckless lending, the regulation of interest rates and the creation of national credit institutions such as the National Credit Regulator (Goodwin-Groen and Kelly-Louw 2003). Chipeta and Mbululu (2012) studied the effect of the announcement and implementation of the NCA on the growth of credit extension in South Africa. Using regression analysis, the authors found the NCA to be associated with greater loan growth in credit cards, overdrafts and other conventional loans, as well as total credit to the private sector. De Wet, Botha and Booyens (2015) assessed the impact of the NCA on levels of over-indebtedness and found no evidence of its

[6] Dell'Ariccia (2001) proposes that this is a function of their two-period model, noting that over extended periods, creditworthy customers may seek to switch credit providers in pursuit of lower interest rates. However, a lower proclivity to switching may affect this prediction.

effect in South Africa. According to Makhaya and Nhundu's (2016) qualitative analysis of Capitec's entry into the banking industry, the NCA provided certainty in unsecured lending that enabled Capitec to provide larger loan amounts over extended periods of time. This is significant, as Capitec's growth in the banking industry is underpinned by its growth in the low-income market (Makhaya and Nhundu 2016).

Other initiatives, such as interest rate caps applied to bank lending volumes, have also been implemented by regulatory authorities to support financial inclusion. Yoshino and Morgan (2016) report that such interest rate caps are applied in Bangladesh, India, Indonesia and Thailand. Interest rate caps presumably support inclusion by artificially lowering the cost of lending for customers, who would otherwise have been charged interest rates above the specified caps. However, this type of regulation can adversely affect inclusion by restricting credit supply (Yoshino and Morgan 2016), thus reversing the proposed gains in inclusion. Barua, Kathuria and Malik (2016) found that allowing banks to price risk without constraint is likely to support financial inclusion in the long term.

A number of changes have been made to the regulations accompanying the NCA since its inception. While research into the impact of the NCA on bank lending is limited, none of the changes to the NCA has been subject to empirical study. South Africa's national inclusion framework has also made fundamental changes to financial sector regulations to increase inclusion. Furthermore, the country's financial ministry has developed a draft national policy framework specifically aimed at increasing financial inclusion for individuals and firms. No empirical research has assessed the impact of this suite of regulatory developments on inclusion outcomes in South Africa.

2.3 Methods of identification

In this paper we use narrative methods to identify bank responses to regulatory reforms. As outlined earlier, evidence of the response of bank lending to macroprudential reforms is based on the assumption that an increase in aggregate regulatory capital represents a negative credit supply shock and will have a negative effect on credit extension (Noss and Toffano 2016). As such, our narrative accounts of macroprudential reforms implicitly proxy for credit supply shocks. Ramey (2016)

describes the narrative method of identification as the construction of a time series from historical documents to identify the reason and/or quantities associated with a particular change in a variable. The construction of narrative accounts is particularly intended to isolate the shocks or effects of a policy intervention (Angelopoulou 2007). By constructing a narrative series of macroprudential reforms, we aim to address challenges relating to the identification of macroprudential reforms and their impact.

The identification strategy has historically been used to identify monetary and fiscal shocks.[7] However, the approach has increasingly been used to analyse and identify capital reforms. For instance, Budnik and Rünstler (2020) analysed the dynamic effects of macroprudential policies in the United States (US) by constructing a set of policy measures related to capital requirements following the Basel III accords. The narrative instruments take a value of -1 and 1 in the case of tightening and easing of capital requirements respectively, and 0 otherwise. Their results show that tightening capital requirements induces a persistent decline in corporate credit. They further find that the impact of a change in capital requirements is concentrated more in corporate credit than household credit. Eickmeier, Kolb and Prieto (2018) also assessed the dynamic effects of bank capital regulation in the US, using the narrative approach to construct an exogenous capital regulation index that captures exogenous changes in bank capital regulation. Their results show persistent declines in corporate and investment loans and real estate loans following changes in the capital regulation index. Recent work by Richter, Schularick and Shim (2019), Rojas, Vegh and Vuletin (2022) and Fernández-Gallardo Romero and Lloyd (2023) has used this approach to identify the effects of specific or individual policies under Basel macroprudential regulations.

This paper thus supplements the growing empirical literature that applies narrative methods of identification to examine bank responses to regulatory reforms. It considers the entirety of Basel-related macroprudential regulations and not individual or specific regulations, providing a robust documentation of macroprudential reforms. As previously described, existing work has analysed the effect of both the easing and

[7] For instance, Romer and Romer (1989, 1997 and 2004) use the approach to identify new measures of monetary policy shocks. Romer and Romer (2010), Ramey (2011) and Ramey and Zubairy (2018) use the approach to identify fiscal or tax shocks.

tightening of macroprudential regulations. In the construction of this narrative series, however, we found no evidence of regulatory easing, and so only the tightening of macroprudential regulations has been captured.

3. Narrative indicators

3.1 Macroprudential reforms

This section describes the actions and events used to construct a set of macroprudential measures or indicators introduced following the Basel II agreements and accords. The indicators represent credit supply shocks, following Noss and Toffano (2016) and Deli and Hasan (2017), among others. The construction is based on historical documents that record the actions and events that have led to the implementation of macroprudential regulations. We consulted circulars issued by the South African Reserve Bank (SARB) to commercial banks in South Africa, annual reports of commercial banks and the SARB, and the risk and capital management reports of commercial banks. We only consulted reports from the big four commercial banks in South Africa, as they account for over 90% of banking industry assets.[8] We also consulted documents published and issued by the Basel Committee on Bank Supervision (BCBS) that contain communications between the BCBS and the SARB about the implementation of Basel regulations.[9]

To sift the information in the documents, we identified the actions and events that are most important in the construction of our narrative indicators. For the set of macroprudential indicators that proxy for credit shocks, the criteria imposed were such that: (i) actions and events are specific in their intentions, and (ii) actions and events might imply a change in bank behaviour with respect to the adjustment of capital buffers and/or the attachment of greater risk weights to certain lending products or lending markets. From this, we were able to build a series of two narrative indicators z_t, defined such that $z_t = 1$ for the event dates of announcements and communications

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8 The big four banks are Standard Bank, Absa, Nedbank and FirstRand.

9 The policy indicators capturing macroprudential reforms are not bank-specific. For instance, banks in our panel may, at their discretion, increase their capital buffers in addition to minimum requirements. However, the minimum macroprudential (predominantly capital requirement) reforms are applied uniformly across banks.

about regulations intended to be passed and the drafting of such regulation, which we call $Draft$. The second indicator is such that $z_t = 1$ for the event dates of the implementation of the regulation, which we call $Implementation$. For dates where $Draft$ and $Implementation$ were not observed, $z_t = 0$. Where possible, we also tracked the actions and events from the date they were communicated and/or announced, issued or published ($Draft$) until the date they were introduced or implemented ($Implementation$).

It is hoped that the decomposition of the actions and events can help identify anticipation effects following the drafting of regulation not yet implemented. For instance, Eickmeier, Kolb and Prieto (2018) used a narrative index of bank regulatory capital in the US to analyse the macroeconomic effects of a tightening in bank capital requirements. They found that bank assets (loans) and industrial production fall six months before new rules come into effect. These anticipation effects are captured by the banks' actions between the date a regulation is first proposed and the date the final rule is communicated. Anticipation effects are thus based on the notion that banks have information on proposed regulations and when they will be implemented and can act before those regulations are implemented – for instance, by taking advantage of less stringent requirements on credit extension before tighter requirements are introduced. The documents we used to construct our narrative indicators contained details that enabled us to exploit such anticipation effects.

Importantly, we do not identify the impact of individual regulations and requirements under the Basel Accords but consider the Basel regulations in their entirety. For instance, different Basel regulations (such as capital and liquidity requirements) target different instruments, but the Basel regulations as a whole are aimed at creating resilient and robust banking systems through higher bank capital requirements (Cohen and Scatigna 2016; Cerutti et al. 2017).

For example, we categorise the implementation of Basel II on 1 January 2008 as an implementation indicator. We categorise as a $Draft$ indicator the directive 1/2009 (1 of 2009) issued by the SARB on 4 February 2009, which announced the approach banks should follow when applying capital floors: "Modelled capital should not be below

80% of the capital requirements under Basel I to ensure capital levels do not fall below prudent level".

Following Basel II, banks are allowed to use internal models to determine risk weights and, in turn, capital levels. However, capital floors ensured capital requirements did not fall below a certain percentage of banks' capital requirements under the Basel I framework (BCBS 2006). This, in essence, implies greater risk weight to riskier credit products. For instance, Imbierowicz, Kragh and Rangvid (2018) show that Danish banks reduce their lending on loans with higher risk weights in response to higher capital requirements, including approaches to capital floors. A further example of a $Draft$ indicator tracked until implementation is from 31 July 2009, when the BCBS announced "measures to strengthen the 1996 rules governing trading book capital and to enhance the three pillars of the Basel II framework (Basel 2.5)." This was intended to introduce higher capital requirements to capture the credit risk of complex trading activities, promote the build-up of capital buffers that could be drawn down in periods of stress and strengthen the quality of bank capital (BCBS 2009). On 8 October 2010, the SARB endorsed the BCBS communication and gave notice to banks to prepare for the implementation of the framework. Basel 2.5 was eventually implemented on 1 January 2012. A detailed account and timeline of the indicators can be found in Annex 6.

3.2 Reforms to finance regulations

The finance regulations that we consider in this paper relate to the implementation of the NCA of 2005, the wholesale restructuring of financial sector regulation in South Africa and the drafting of a national framework for financial inclusion. These developments were selected because they relate to a series of regulatory reforms intended to increase financial inclusion in South Africa. "Financial inclusion" is here understood as access to useful and affordable financial products, in line with the World Bank's definition (2024), although we focus specifically on credit products. We capture and review regulatory developments intended to facilitate greater access to credit products and/or reduce their cost. These developments are summarised in the variable $FinReg$, which is recorded as 1 following the presentation of publicly available draft or final finance regulations and as $FinReg = 0$ otherwise. The type of regulatory

developments we captured within $FinReg$ are described below. A detailed review of each of these regulations is provided in Annex 6.

The first type of development we consider is related to the national credit regulations, which are issued by the Minister of Trade and Industry (South Africa 2006) and relate to the application of the NCA. Over time, the Department of Trade and Industry has issued government notices inviting public comment on proposed amendments to these regulations and, after consultation, final regulations are published in the Government Gazette. The Ministry has put forth notices and final regulations related to: (i) Debt Counselling Regulations (2012); (ii) removal of adverse consumer credit information and information relating to paid-up judgements (2013, 2014a); (iii) various changes in credit regulation (2014b, 2015a); and (iv) limitations on fees and interest rates (2015b, 2015c). The intention to promote financial inclusion underlies all these notices and regulations. Roestoff et al. (2009) suggest that debt-counselling regulations could help over-indebted consumers restructure their debt, which directly relates to the affordability of credit products. Applicable regulations from 2013 and 2014 relate to government efforts to remove adverse credit information from credit bureaus to increase consumer access to credit products.

The second type of development relates to the restructuring of financial regulation in South Africa. The Financial Sector Regulation Act of 2017 set up two authorities: the Prudential Authority, which sits within the SARB, and the Financial Sector Conduct Authority (FSCA). These institutions have different mandates, but both promote financial inclusion (Presidency 2017).

The draft of the Conduct of Financial Institutions Bill proposes the consolidation of a number of financial sector laws to better regulate the conduct of institutions that provide financial services and products. According to the bill, the FSCA will provide standards for firms regarding the provision of financial products and services, relating to, inter alia, charging structures, pricing methodologies, financial product features and the identification of appropriate and inappropriate target markets. This enhanced regulation will further financial inclusion (South Africa 2018), as improved regulation

will provide consumers with greater security, which is necessary to increase the use of financial sector products.

The final development we consider is the drafting of a national policy framework for financial inclusion. National Treasury (South Africa 2020) reports that financial inclusion in South Africa is high, but the usage of financial products by low-income earners is low. Small, medium and micro enterprises are also reported to receive minimal services from financial institutions. National Treasury (2020) has proposed a number of initiatives to encourage the use of credit products by individuals and businesses with low access.

4. Data and methodology

Our dataset is collected from various sources. The primary data of interest in our analysis are bank lending volumes and rates, which are supplemented by bank- and market-related variables that serve as controls. Below, we describe how we measure bank lending volumes and rates in those segments. We also describe the bank- and market-specific controls we use in our analysis.

Across all the bank-specific data collected, we restrict our focus to four banks: Absa, First National Bank, Nedbank and Standard Bank. These banks account for the bulk of banking assets in the industry and have continuous bank lending and rates data, enabling our panel data analysis.

We capture bank responses in the following customer segments: (i) non-financial corporate unsecured lending; (ii) household unsecured lending; (iii) total unsecured lending; (iv) commercial mortgages to corporates and households; (v) residential mortgages to households; (vi) total mortgage lending; (vii) leasing and instalment sales to corporates; (viii) leasing and instalment sales to households; and (ix) total leasing and instalment sales. The disaggregation allows us to measure important differences in bank responses in the different customer segments. This approach is consistent with Sibande and Milne (2024).

4.1 Bank lending data

Bank lending data are obtained from banks' monthly disclosure of assets and liabilities to the Registrar of the SARB (BA900 data). These data are publicly available and are reported as prescribed by a "BA900" form in the Banks Act.[10] We aggregate all bank assets relevant to the customer segments described above. For instance, a bank's unsecured household lending volumes are estimated as the sum of that bank's household credit card and overdraft debt, as well as other household loans and advances. Further details on the individual bank assets that comprise the various customer segments are set out in Annex 2.

4.2 Bank lending rates data

As with bank-reported asset and liability data, banks are required to report their lending rates to the SARB as prescribed by a "BA930 form" in the Banks Act, but these rates are not publicly available. We pair our bank lending volumes data with corresponding bank lending rates data, sourced from BA930 data. The BA930 data contain average rates weighted by the amounts due to the bank at the time of reporting across various customer segments. The customer segments for which rates data are reported are described further in Annex 3.

We use the BA930 data to estimate weighted average rates that are consistent with the customer segments we use in our analysis. The formula below shows how we estimate weighted average rates for our nine customer segments. CS_j refers to the total number of banking assets pulled from the BA900 data to form customer segment j , where $j \in [1,9]$. $w_{b,i}^{j}$ is the weight for each bank's asset i in customer segment j for bank b. It is calculated as that bank's asset value divided by the total value of the bank's assets in that customer segment j.

$$Rate_{b,j} = \sum_{i=1}^{CS_j} w_{b,i}^{j} P_{b,i} \qquad (1)$$

[10] See https://www.gov.za/sites/default/files/gcis_document/201605/40002gen297.pdf

Table 1: Descriptive statistics

Series	Median	SD	Min.	Max.	IQR	Obs.
Lending growth						
Three-month change in log commercial mortgages to corporates and households	1.06	1.50	-1.43	6.91	1.67	209
Three-month change in log household unsecured lending	1.53	2.64	-10.40	10.08	2.07	209
Three-month change in log leasing and instalments to corporates	1.04	2.05	-4.94	6.82	2.32	209
Three-month change in log leasing and instalments to households	1.30	1.31	-2.56	4.75	1.57	209
Three-month change in log non-financial corporate unsecured lending	1.54	3.03	-9.17	13.68	3.47	209
Three-month change in log residential mortgages to households	0.80	0.65	-0.78	2.86	0.82	209
Three-month change in log total leasing and instalments	1.25	1.25	-2.10	3.58	1.48	209
Three-month change in log total mortgage lending	0.98	0.74	-0.11	3.97	0.79	209
Three-month change in log total unsecured lending	1.60	2.35	-5.57	10.85	2.74	209
Lending rates						
Commercial mortgages to corporates and households rate	8.06	1.05	6.16	9.99	1.55	156
Household unsecured lending rate	14.17	2.63	4.78	15.67	2.19	156
Leasing and instalments to corporate rate	9.40	0.84	7.05	10.46	1.38	156
Leasing and instalments to households rate	10.63	0.96	8.85	11.91	2.06	156
Non-financial corporate unsecured lending rate	7.26	0.75	6.02	8.48	1.28	156
Residential mortgages to household rate	8.64	1.24	6.78	10.28	2.27	156
Total leasing and instalments rate	10.26	0.91	8.29	11.44	1.75	156
Total mortgages lending rate	8.40	1.17	6.59	10.19	1.99	156
Total unsecured lending rate	9.58	1.04	6.30	10.74	1.46	156
Macroprudential regulation narrative indices						
Draft index	0.00	0.23	0.00	1.00	0.00	212
Implementation index	0.00	0.24	0.00	1.00	0.00	212
Financial regulation narrative index						
Finance regulation index	0.00	0.25	0.00	1.00	0.00	212
Controls						
Repo rate	6.00	1.94	3.50	12.00	1.75	204

4.3 Methodology

We use a panel-data approach to estimate the impact of the different regulatory developments on bank rates and three-month changes in bank lending volumes. Our analysis covers January 2009 to February 2020. We estimate using robust standard errors clustered at bank level (see Zeileis 2004) to ensure estimates are robust to heteroskedasticity and serial correlation. The clustering also ensures that the model recognises that the banks are from the same population (see Fang et al. 2022).

The three-month change in lending is calculated as the log difference in lending at t and $t-3$.[11] The log differences are then multiplied by 100. This approach is consistent with Aiyar, Calomiris and Wieladek (2016), Deli and Hasan (2017), Fang et al. (2022) and Mirzaei and Samet (2022).

$$Rate_{b,t}^{c} = \alpha_1 Index_t^i + \tau_b^c + \lambda_t^c + \alpha'^{\Omega^c} + \epsilon_{b,t}^c \qquad (2)$$

$$Lending_{b,t}^{c} = \beta_1 Index_t^i + \tau_b^c + \lambda_t^c + \beta'\Omega^c + \epsilon_{b,t}^c \qquad (3)$$

In this formulation, $b \in [FNB, Absa, Nedbank, StandardBank]$; t is the time period; c is the credit category; and $i \in [Draft_t, Implementation_t, FinReg_t]$. Therefore, $Lending_{b,t}^{c}$ is the bank-level three-month growth in lending and $Rate_{b,t}^{c}$ is the bank-level lending rate. Ω^c is a matrix of controls that includes return on assets and total capital adequacy ratios measured at bank level, as well as the repo rate. τ_b^c captures the bank fixed effect, λ_t^c are the monthly time fixed effects and $\epsilon_{b,t}^c$ are the error terms.

5. Results

5.1 Responses to regulation

Tables 2 and 4 show the results from the estimation of Equation 2 with standard errors clustered at bank level. Tables 3 and 5 relate to Equation 3, where the dependent

[11] A visual test of the correlations between the response variables and our narrative indices is provided in Figures 4 and 6 in Annexes 7 and 8 respectively. There is a stronger co-movement between the narrative indicators and three-month change in lending, because the three-month growth rates are less volatile than the one-month changes.

variable is the log difference in lending volumes between t and $t-3$, also clustered at bank level.

With regard to the impact of macroprudential regulation and bank lending rates, we find that interest rates on unsecured lending rise while those on secured lending and mortgages fall – both by less than 1%. The results are consistent and significant when considering the effect on households and corporates. Household unsecured lending and mortgage rates have a stronger reaction than corporate rates. Total unsecured lending rates increase by about 2.5%, while lending rates on secured loans and mortgages fall half a percentage point. Lending rate increases on household unsecured loans exceed those in corporate unsecured lending rates (more than 3% relative to a 2% increase in corporate unsecured lending rates). However, secured and mortgage lending rates for corporates decline more than secured and mortgage lending rates on households.

We find that the draft indicator for the impact of macroprudential regulation and bank lending growth is associated with a 2% increase in secured lending and less than a 1% decline in mortgage lending. The signs of the coefficients are consistent and significant for unsecured lending to both corporates and households, as well as for mortgage lending to corporates and households. However, lending to households has a stronger reaction than lending to corporates; following regulatory implementation, total unsecured lending falls by approximately 2%, while the effect on total secured lending is insignificant. The results are consistent for unsecured lending to corporates and households (although the coefficient on unsecured household lending is insignificant).

For both lending rates and volumes, we find a greater (and statistically significant) bank response following macroprudential regulatory implementation than for the draft indicator. The results hold when we include controls, as shown in Table 10.

Table 4 shows the relationship between lending rates and financial regulations seeking to enhance inclusion. For both corporates and households, we estimate that inclusion-related regulations are associated with decreases in secured lending rates of 0.3% and

0.2%. With the inclusion of controls, corporate lending rates decrease by 0.1% and the statistical significance in household lending rates in the secured segment is lost (Table 11). There were statistically significant increases in corporate and household lending rates of 1% and 1.5% respectively in the face of inclusion-focused regulation. With controls, the 0.9% increase in the unsecured lending rates to households is the only statistically significant result across customer types.

Table 2: Macroprudential regulation and lending rates

	Total			Corporates			Households		
	Unsecured	Secured	Mortgage	Unsecured	Secured	Mortgage	Unsecured	Secured	Mortgage
Draft model									
Draft index	0.383***	-0.387***	-0.495***	0.326***	-0.449***	-0.199	0.398***	-0.359***	-0.597***
Implementation model									
Implementation index	2.59***	-0.51***	-0.61**	2.29**	-0.73***	-0.77**	3.05***	-0.41***	-0.58**
Num. obs.	580	580	580	580	580	580	580	580	580
Bank fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Monthly fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: * p < 0.1, ** p < 0.05, *** p < 0.01

Table 3: Macroprudential regulations and lending volumes (three months) results

	Total			Corporates			Households		
	Unsecured	Secured	Mortgages	Unsecured	Secured	Mortgages	Unsecured	Secured	Mortgages
Draft model									
Draft index	0.624	2.232**	-0.194***	0.414	0.890***	-0.405**	0.999**	3.109**	-0.156*
Implementation model									
Implementation index	1.82***	0.51	-0.62**	2.33***	1.24*	-1.44**	0.62	-0.09	-0.27**
Num. obs.	580	580	580	580	580	580	580	580	580
Bank fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Monthly fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: * p < 0.1, ** p < 0.05, *** p < 0.01

Table 4: Financial regulation and lending rates results

	Total			Corporates			Households		
	Unsecured	Secured	Mortgage	Unsecured	Secured	Mortgage	Unsecured	Secured	Mortgage
Finance regulation model									
Finance regulation index	1.196***	-0.240***	-0.286	1.010**	-0.324***	-0.332	1.463***	-0.190**	-0.285
Num. obs.	580	580	580	580	580	580	580	580	580
Bank fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Monthly fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: * p < 0.1, ** p < 0.05, *** p < 0.01

Table 5: Finance regulation and lending volumes (three months) results

	Total			Corporates			Households		
	Unsecured	Secured	Mortgage	Unsecured	Secured	Mortgage	Unsecured	Secured	Mortgage
Finance regulation model									
Finance regulation index	-0.496	-0.063	-0.084	-0.535	1.187***	-0.197	-0.348	-0.811	-0.065
Num. obs.	580	580	580	580	580	580	580	580	580
Bank fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Monthly fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: * p < 0.1, ** p < 0.05, *** p < 0.01

Table 5 shows lending volumes and indicates that financial regulations are associated with a 1.2% increase in lending volume growth to corporates in the secured segment. This declines to 0.8% when controls are included (Table 12), and there is a statistically significant decrease of 0.5% in lending volume growth to households in the unsecured segment.

5.2 Discussion

5.2.1 Macroprudential regulatory changes

This analysis supplements existing work that examines the consequences of macroprudential regulation in emerging markets, similar to Sibande and Milne (2024) and Makrelov and Pillay (2024). However, our results are not directly comparable to other studies. First, we consider both the effects of anticipated regulatory changes captured by the pre-announcement of a regulation and the eventual implementation of that regulation. Second, we consider the effect of pre-announced regulations on loan growth and interest rates on lending for secured, unsecured and mortgage loans.

There are two possible ways to examine credit supply growth following stringent regulatory reforms (positive coefficients on lending volumes). The first is by considering anticipation effects, where banks use information about a proposed regulation and when it will be implemented. They can adjust credit supply upwards and take advantage of less stringent requirements before tighter requirements are introduced.

The second possibility considers portfolio rebalancing, where banks reduce their relatively riskier loans by reducing unsecured lending. This rebalances their portfolios to more prudent ones, such as secured lending (Deli and Hasan 2017), because macroprudential reforms attach greater risk weights to certain loan portfolios, such as unsecured credit. For instance, in response to higher capital requirements, banks in Denmark retrenched more of their lending portfolio with higher risk weights (Imbierowicz, Kragh, and Rangvid 2018). Similarly, Cappelletti et al. (2019) find that banks classified as other systematically important institutions (O-SIIs), which face added capital requirements, reduce credit to households and financial sectors and shift their lending to less risky counterparts within the non-financial corporations sector. The

four banks in our sample are classified as systematically important (SI) banks and face additional capital requirements.

The portfolio rebalancing possibility is stronger when we consider implementation effects, particularly on lending rates. We observe a decline in secured lending rates and an increase in unsecured lending rates as greater risk weights are attached to unsecured credit. This is reinforced by the fact that corporate unsecured lending volumes increase following implementation, but it has no effect on household lending. Household (unsecured) lending appears to have greater risk weights, as the effect on the respective lending rate is more than the effect on the corporate unsecured lending rate.

Despite tighter macroprudential reforms, results around regulatory implementation, especially for unsecured lending, show an increase in unsecured lending that is driven by corporate unsecured lending. This suggests that banks continue to lend to higher-quality clients in the unsecured lending space (seemingly corporates) at relatively higher rates despite the implementation of stringent regulatory measures. In line with the portfolio rebalancing possibility, this is not the case for any lending to households, although the implementation effect on lending rates is more pronounced on household unsecured lending than on corporate unsecured lending.

Table 2 shows similar evidence for the draft indicator, where secured lending increases relative to unsecured lending (rightward shift in the secured-loan supply curve). These effects are stronger for household unsecured lending than for corporate secured lending. We also find evidence of an increase in household unsecured lending during the pre-announcement stage, which is not the case for corporates. This may indicate that banks take advantage of less stringent requirements on household unsecured lending, with an increase in the supply of loans and the interest rates on these loans before more stringent requirements are implemented. Conversely, Bridges et al. (2014) find that, on average, an increase in capital requirements reduces loan growth for commercial real estate (mortgages), other corporate and household secured lending, while unsecured lending is relatively weak.

Our results show that mortgage lending declines in all specifications, as do interest rates on mortgages. The results suggest that banks tighten downpayment requirements on mortgages following regulatory reforms, reducing the risk associated with mortgage lending. However, tighter deposit requirements on mortgages tightens access to mortgage credit, hence the decline in mortgage-lending volumes for all specifications in Table 2. Similarly, when reforms propose stringent credit constraints, high-quality mortgage borrowers benefit from reduced interest rates on mortgages. In addition to reducing lending volumes, the reduction in mortgage lending rates could also arise from a reduction in the demand for mortgage finance. For instance, data from the national accounts show that mortgages accounted for 61% of household liabilities in 2008 but had declined to only 47% by 2020. However, they also show that mortgage lending margins increased after 2008, which is more consistent with supply shortfalls than demand deficits in the mortgage lending market.

A paper by Anthonyrajah and Malwandla (2022) reports that banks have reduced their relative exposures to mortgages and increased their exposure to loan classes intended for consumption. It also notes that the introduction of the net stable funding ratio (NSFR), which forms part of Basel III, may lead to higher funding costs on retail mortgages relative to unsecured retail loans. These costs can be shifted to consumers through higher mortgage lending rates (which do not show up in our results) and/or the rationing of mortgage lending for a given lending rate.

Results for the $Draft$ indicator in Tables 2 and 3 show that implementation effects are stronger than announcement effects for unsecured lending rates and volumes. These stronger implementation effects may reflect the endogenous reaction of banks to pre-announced regulatory actions, thereby influencing (overestimating) the effects of regulatory implementation. For instance, Fernández-Gallardo Romero and Lloyd (2023) and Fang et al. (2022) control for possible anticipation effects by distinguishing between macroprudential policies with and without implementation lags, as these can have different effects on macroeconomic variables. Fernández-Gallardo Romero and Lloyd (2023) use only announcement dates to identify the effects of macroprudential policies. They also identify macroprudential policies that have no implementation lags, which are captured by the announcement date. In the spirit of Mertens and Ravn

(2012), they also identify macroprudential policies with implementation lags, which are defined as policies with significant delays (of at least 90 days) between the announcement and enforcement or implementation date. Policies with implementation lags could influence bank responses, as they would have significant time to endogenously react to the prudential regulations ahead of implementation.

A further challenge in this research and the construction of our macroprudential narrative indices is thus to disentangle and distinguish policies with and without implementation lags. Similar challenges arise when constructing leads and lags for our macroprudential narrative series to identify any lag effects and whether banks adjust their lending before actual implementation dates, as per Fang et al. (2022).

Despite these challenges, the construction of our narrative macroprudential indices and the use of data on bank lending rates contributes significantly to the growing empirical work analysing the effects of macroprudential policy in South Africa and emerging markets globally.

5.2.2 Finance regulatory changes

After accounting for possible confounders, the results pertaining to inclusion-focused financial sector reforms indicate that these regulatory developments are associated with increases in unsecured lending rates for households and a decrease in secured lending rates for corporates. Inclusion-focused financial sector developments are associated with decreased growth in unsecured lending to households and with increased growth in secured lending to corporates.

A number of the regulatory developments were motivated by government intentions to improve access and lower the costs of financing for individuals and entities with limited access. These developments include the removal of adverse information at credit bureaus, reducing the periods that adverse information can be kept by those bureaus and providing guidance to facilitate debt restructuring in cases of risky and/or reckless lending. According to the National Credit Regulator (South Africa 2014c), some of these developments were intended to enable greater consumer access to affordable credit and to employment opportunities. The National Credit Regulator (South Africa

2013) stated that negative credit information hinders access to affordable credit for individuals who have paid their debts and thus decided to remove adverse credit information relating to individuals who have paid their debts. However, our results suggest that, on average, South African households have paid higher interest rates on unsecured credit following these regulatory developments. The growth of unsecured lending volumes to households also dropped, impeding access to and use of affordable credit, thus negatively affecting financial inclusion.

This result is likely driven by the increase in the informational asymmetry that the regulations introduce. Banks are financial intermediaries that collect deposits and issue loans, but they face default risk to extend loans (Freixas and Rochet 1997). To lessen this risk, banks rely on information about individuals and firms that can be sourced from credit bureaus or other institutions (Freixas and Rochet 1997). The regulatory developments we consider in this paper limit the amount of information available to banks and the periods that information can be retained.

The adjustment to the maximum interest rates specified in the NCA regulations may also explain the decreases in the lending volume growth and higher interest rates in unsecured lending to households. In 2015, the Minister of Trade and Industry proposed changes to the maximum interest rates and initiation fees that credit providers could charge consumers (South Africa 2015b), with final changes coming into effect that same year (South Africa 2015c). The net effect of the adjustments on five of the seven credit types was that the maximum interest rate on credit facilities was lowered by 2.9 percentage points and by 7.9 percentage points for unsecured credit (based on the prevailing repo rate). The maximum rates set for other credit types increased marginally by 0.1 percentage points or had no change at all. Initiation and service fees were increased above the limits set in the 2006 regulations. Yoshino and Morgan (2016) propose that this type of rate regulation can restrict credit supply. Barua, Kathuria and Malik (2016) suggest that flexible interest rate setting could promote financial inclusion more effectively than consumer protection regulation that seeks to constrain rate determination.

Our secured lending category refers to all loans provided by banks that use an underlying customer asset as collateral should a borrower face bankruptcy, mitigating default risk (Freixas and Rochet 1997). Following the regulatory developments, we note that unsecured lending volume growth to households decreased, while secured lending volume growth to corporates increased. This development likely reflects banks' shift to safer credit categories. As the regulations we consider primarily affect secured and unsecured lending to households, it appears that banks do not shift from unsecured to secured lending within households. Instead, they appear to direct credit supply to corporate credit customers.

6. Conclusion

This paper has examined the impact of regulation on the bank lending rates and volumes of South Africa's largest banks. The regulations under consideration are macroprudential regulations intended to achieve stability in the finance sector, as well as financial regulations intended to achieve greater inclusion. These two forms of regulation are potentially in conflict: one may limit credit supply to achieve stability, while the other may increase risk through greater credit extension. We used narrative indices to comprehensively measure all regulatory developments relevant to our study.

The effects of these regulations on bank pricing and lending are estimated through panel models separated by the different types of regulations we consider. We find that macroprudential regulation results in increases in unsecured lending interest rates, while those on secured lending and mortgages decrease. Our results also show that macroprudential regulations are associated with positive growth in lending volumes in unsecured and secured credit, while mortgage-lending growth rates decrease. Our estimates around inclusion-focused initiatives indicate that they are associated with increased bank lending rates for unsecured credit and with decreased growth in unsecured lending volumes to households. We also observe increases in the growth of secured lending to corporates and a decrease in the secured lending rates paid by those corporates.

The impact of these two notionally contradictory policies is consistent with respect to secured lending volume growth and rates to corporates, as well as the unsecured lending rates paid by households. The opposite effect is observed with respect to unsecured lending volumes to households: inclusion efforts lower usage, whereas macroprudential efforts increase usage.

Overall, our results indicate that macroprudential policy is working as intended to achieve financial sector stability. However, inclusion-focused regulation may be at odds with its stated objectives of increasing the extension of affordable credit.

Annexures

Annex 1: Data sources

Table 6: Data sources

	Description	Availability	Source
Macroprudential narrative index	Narrative index of macroprudential regulations in South Africa	Public data	Own analysis
Competition narrative index	Narrative index of financial regulations in South Africa	Public data	Own analysis
BA900	Banking sector balance sheet data at a bank level	Public data	South African Reserve Bank
BA930	Banking sector lending rates at a bank level	Aggregated data are public Bank-specific data are private	South African Reserve Bank
Controls	Banking sector performance data at a bank level and general macroeconomic data	Aggregated data are public Bank-specific data are private	Prudential Authority, South African Reserve Bank, Statistics South Africa, Johannesburg Stock Exchange

Annex 2: Aggregation scheme

Table 7: Aggregation schema

BA900 categories	Item number	Sector	Aggregation key
Instalment sales	141	Financial corporate sector	-
	142	Non-financial corporate sector	g
	143	Household sector	h
	144	Other	-
Leasing transactions	146	Financial corporate sector	-
	147	Non-financial corporate sector	g
	148	Household sector	h
	149	Other	-
Farm mortgages	152	Non-financial corporate sector	d
	153	Household sector	d
	154	Other	-
Residential mortgages	156	Non-financial corporate sector	e
	157	Household sector	-
	158	Other	-
Commercial and other mortgages	160	Public financial corporates	-
	161	Public non-financial corporates	-
	162	Private financial corporates	d
	163	Private non-financial corporates	d
	164	Household sector	-
	165	Other	-
Credit cards	167	Financial corporate sector	a
	168	Non-financial corporate sector	b
	169	Household sector	-
	170	Other	-
Overdrafts	178	Public sector (includes public corporations and local government)	-
	181	Financial corporate sector	-
	182	Non-financial corporate sector	-
	183	Unincorporated business enterprises	a
	184	Other household sector	-
	185	Non-profit organisations serving households	b
Factoring debtors	187		-
Other loans and advances	189	Financial corporate sector	-
	190	Non-financial corporate sector	a
	191	Unincorporated business enterprises	-

BA900 categories	Item number	Sector	Aggregation key
	192	Other household sector	b
	193	Non-profit organisations serving households	-

The following aggregation scheme was followed based on Table 7, resulting in nine categories:

a. Non-financial corporate unsecured lending: Items 168 + 183 + 190
b. Household unsecured lending: Items 169 + 185 + 192
c. Total unsecured lending: Non-financial corporate unsecured lending + Household unsecured lending
d. Commercial mortgages to corporates and households: Items 152 + 153 + 156 + 163 + 164
e. Residential mortgages to household: Item 157
f. Total mortgage lending: Commercial mortgages to corporates and households + Residential mortgages to households
g. Leasing and instalments to corporates: Items 142 + 147
h. Leasing and instalments to households: Items 143 + 148
i. Total leasing and instalments: Leasing and instalments to corporates + Leasing and instalments to households

Annex 3: Bank lending rates weighting scheme

The loan quantities from the BA900s are linked to the lending rate data from the BA930s. Table 8 shows how the nine lending rate categories are compiled from items in the BA930. The weighted average lending rate for each month is calculated by multiplying the lending rate for each item in the category by the loan quantity in that category. For example, the monthly household unsecured lending rate takes rates of overdrafts, credit cards and other loans (respectively items 58, 65 and 66), and weights them by the loan quantities issued for overdrafts, credit cards and other loans (these loan quantities are obtained from the BA900s).

Table 8: Weighting schema

Sector	BA930 categories	Item number	Weighting key
Corporate sector	Overdraft rate	48	a and c
	Instalment sale agreements flexible rate	49	g and i
	Instalment sale fixed rate	50	-
	Leasing transactions flexible rate	51	g and i
	Leasing transactions fixed rate	52	-
	Mortgage advances flexible rate	53	d and f
	Mortgage advances fixed rate	54	-
	Credit card rate	55	a and c
	Other	56	a and c
Household sector	Overdraft rate	58	b and c
	Instalment sale agreements flexible rate	59	h and i
	Instalment sale fixed rate	60	-
	Leasing transactions flexible rate	61	h and i
	Leasing transactions fixed rate	62	-
	Mortgage advances flexible rate	63	e and f
	Mortgage advances fixed rate	64	-
	Credit card rate	65	b and c
	Other	66	b and c

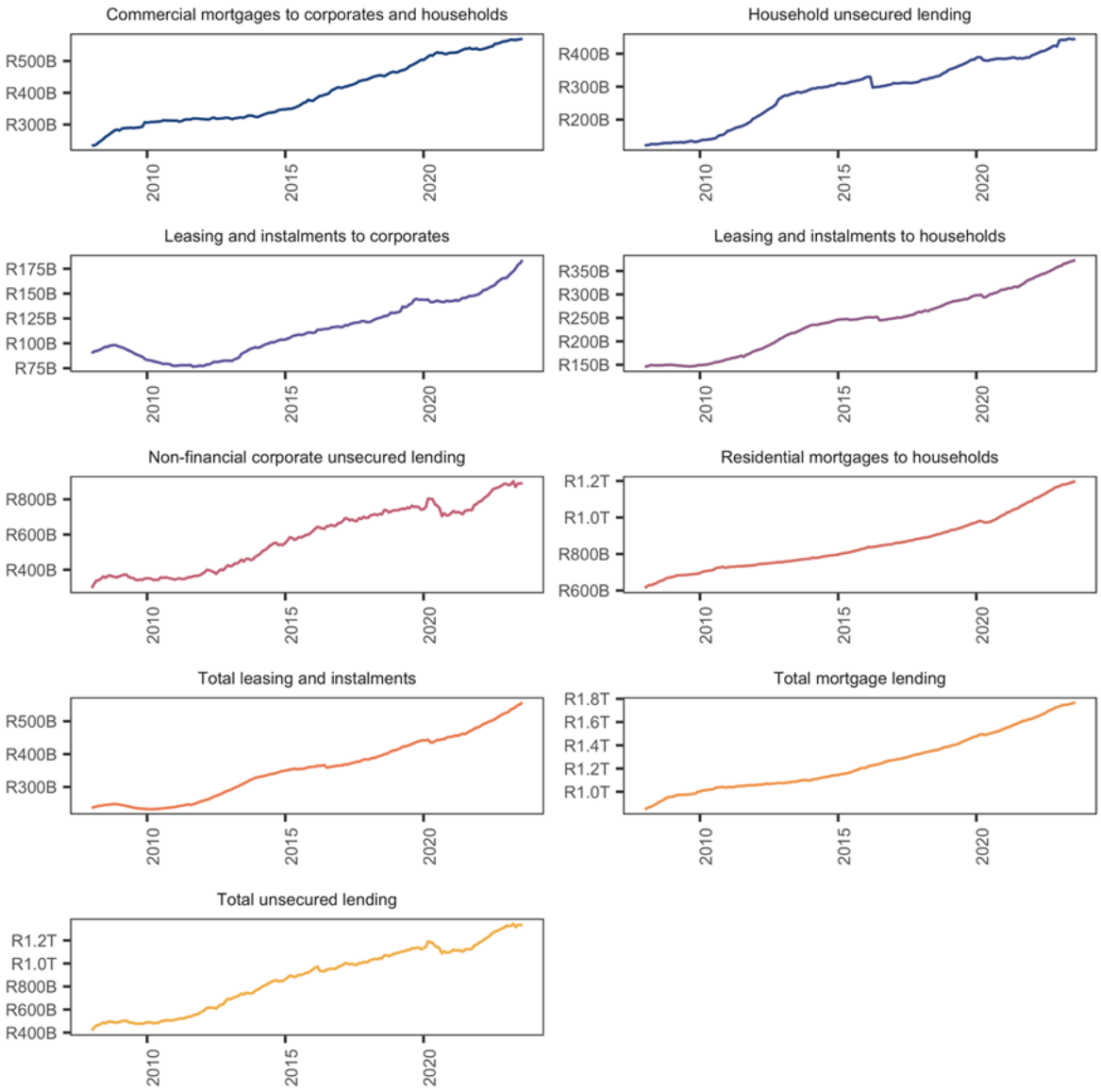
The nine categories are therefore as follows:

a. Non-financial corporate unsecured lending: Weighted average of items 55 + 48 + 56
b. Household unsecured lending: Weighted average of items 65 + 58 + 66
c. Total unsecured lending: Weighted average of items 55 + 48 + 56 + 65 + 58 + 66

d. Commercial mortgages to corporates and households: Weighted average of item 53
e. Residential mortgages to households: Item 63
f. Total mortgage lending: Weighted average of items 53 + 63
g. Leasing and instalments to corporates: Weighted average of items 49 + 51
h. Leasing and instalments to households: Weighted average of items 59 + 61
i. Total leasing and instalments: Weighted average of items 49 + 51 + 59 + 61

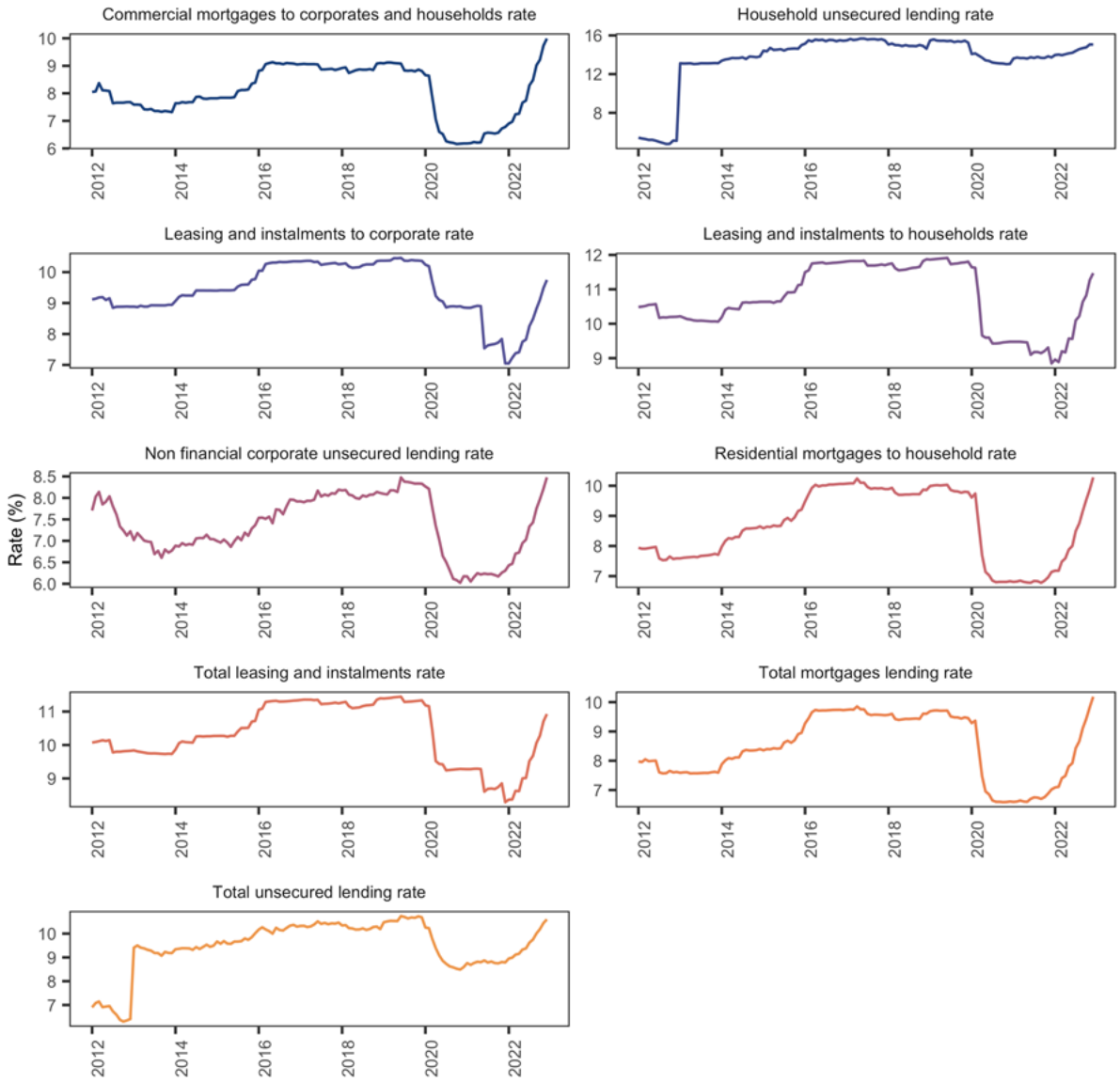
Annex 4: Aggregated bank lending

Figure 1: Total aggregated bank lending



Annex 5: Weighted lending rates (aggregated)

Figure 2: Weighted lending rates



Annex 6: Description of narrative events

A6.1 Macroprudential indicators

This section provides a detailed account of the narrative macroprudential indicators. The asterisk (*) indicates that the specific regulation is tracked from the date of announcement to the date of implementation.

2008/01/01: Implementation

Basel II implemented until December 2011.

2009/02/04: Announcement, draft and passing of regulation

SARB issues directive 1/2009 (1 of 2009) announcing the approach banks should follow when applying capital floors. “Modelled capital should not be below 80% of the capital requirements under Basel I to ensure capital levels do not fall below prudent level.” Following Basel II, banks may use internal models to determine risk weights and, in turn, determine capital levels. However, capital floors ensure capital requirements did not fall below a certain percentage of banks’ capital requirements under the previous Basel I framework (BCBS 2006). This implies greater risk weight attached to riskier credit products. For instance, Imbierowicz, Kragh and Rangvid (2018) show that in response to higher capital requirements, including approaches to capital floors, Danish banks reduced their lending of loans with higher risk weights.

2009/07/31*: Announcement, draft and passing of regulation

BCBS announces “measures to strengthen the 1996 rules governing trading book capital and to enhance the three pillars of the Basel II framework (Basel 2.5).” This is intended to introduce higher capital requirements to capture the credit risk of complex trading activities, promote the build-up of capital buffers that can be drawn down in periods of stress and strengthen the quality of bank capital (BCBS 2009).

2010/10/08*: Announcement, draft and passing of regulation

SARB issues circular 3/2010 endorsing Basel 2.5 and giving notices to banks to prepare for its implementation.

2011/06/30*: Announcement, draft and passing of regulation

BCBS issues and publishes *Basel III: A global regulatory framework for more resilient banks and banking systems*.

2011/07/31: Announcement, draft and passing of regulation

After the global financial crisis, Cabinet adopts a proposal to shift to a Twin Peaks model of financial regulation in South Africa to improve the institutional structure that supports financial regulation. This is a signal of stricter oversight of the overall financial system.

2011/10/31: Announcement, draft and passing of regulation

Basel 2.5 is transposed into domestic law (next step is implementation).

2012/01/01: Implementation

Basel 2.5 takes effect: SARB minimum capital requirements (total CET1: 5.25%; total Tier 1: 7%; minimum regulatory capital: 8%; total regulatory capital for D-SIB: 9.5%)

2012/02/16*: Announcement, draft and passing of regulation

SARB issues guidance note 2/2012 announcing a new definition of total regulatory capital for Basel III, such as: (i) phasing out arrangements for non-common equity Tier 1 capital instruments that no longer qualify as regulatory capital under Basel III; (ii) transitional arrangements for Basel III implementation; (iii) treatment of disclosed reserves under Basel III.

2012/05/31*: Announcement, draft and passing of regulation

SARB issues guidance note G5/2012 announcing that it will provide liquidity facility to help banks meet the liquidity coverage ratio (LCR) and that cash reserves can be included as banks' high-quality liquid assets (HQLA) for calculating LCR. This follows results from quantitative impact studies by banks that found some banks would have shortfalls of around R140 billion in meeting the 100% LCR by 1 January 2019 due to their reliance on limited short-term funding availability of HQLA:

1. LCR requirements to be introduced at 60%, increasing by 10% to reach 100% on 1 January 2019.
2. Level 1 assets (stocks, funds or bonds) to comprise 60% of total HQLA, level 2 assets (less liquid) to constitute no more than the remaining 40%.
3. SARB proposes that the leverage ratio be set at 4% (meaning that banks' leverage should not exceed its capital by more than 40%).

2012/08/15*: Announcement, draft and passing of regulation

SARB transposes Basel III into law and publishes countercyclical capital buffer (CCyB) rules, set to be implemented on 1 January 2016.

2013/01/31*: Implementation

Basel III takes effect.

2013/08/20: Announcement, draft and passing of regulation

SARB issues guidance note 6/2013 announcing that banks' cash reserves may be included as part of their level 1 HQLA. Only equities listed on the JSE's main exchange and included in the Top 40 Index to be considered as level 2 HQLA (potentially limiting banks' ability to raise capital).

2014/01/31: Implementation

SARB minimum capital requirements increase to total CET1: 5.5%; total Tier 1: 7%; total regulatory capital: 8%; total regulatory capital for D-SIB: 10%.

2014/12/31: Announcement, draft and passing of regulation

SARB issues guidance note 8/2014 announcing the provision of a committed liquidity facility (CLF) to help banks meet the LCR. To access the CLF, however, banks need collateral of:

1. High-quality residential mortgage loans
2. Other loans and advances such as vehicle asset finance excluding unsecured loans
3. Domestically listed securities.

2015/01/31*: Implementation

LCR ratio is introduced/implemented at 60% compliance.

2015/12/31*: Announcement, draft and passing of regulation

SARB issues circular 8/2015 announcing timelines and targets in respect of the implementation of the CCyB. SARB requirements apply to bank-wide total risk-weighted assets:

- 0.625% on 1 January 2016
- 1.25% on 1 January 2017
- 1.875% on 1 January 2018
- 2.5% on 1 January 2019.

2016/01/31*: Implementation

CCyB is implemented and set at 0.625%.

2016/04/13*: Announcement, draft and passing of regulation

SARB issues directive 1/2016 to inform all banks of exposure limits in the classification of deposits and credit exposures to small and medium enterprises (SMEs), to be implemented on 1 July 2016. For instance, total exposure of a bank to an SME borrower, determined or calculated on a consolidated basis, at no time to exceed R12.5 million (greater limits on the value of a loan that can be extended to an SME).

2016/07/01*: Implementation

Implementation of exposure limits in the classification of deposits and credit exposures to SMEs announced on 2016/04/13.

2017/01/31*: Implementation

LCR ratio is introduced/implemented at 80% compliance, while CCyB increases to 1.25%.

2017/12/13*: Announcement, draft and passing of regulation

SARB issues directive 8/2017, instructing banks to comply with the net stable funding ratio (NSFR) framework and informing them of matters related to NSFR calibration, including a template to monitor NSFR compliance. The objective is to reduce funding risk over a longer time horizon by requiring banks to fund their activities with sufficiently stable sources of funding to mitigate the risk of future funding stress. Banks will be required to match their funding with their outflows, which may lead to a greater demand for longer-term funding. Longer-term funding will result in a greater cost of funding for banks (lower profitability and returns for banks possibly passed on to borrowers). Implementation to start on 1 January 2018.

2018/01/31*: Implementation

NSFR implemented following Directive 8/2017, CCyB increases to 1.875% and LCR is implemented at 90% compliance.

2019/01/31*: Implementation

CCyB increases to 2.5% (maximum) and LCR is implemented at 100% compliance.

A6.2 Finance regulation index

A6.2.1 Changes to regulations in the National Credit Act of 2005

The National Credit Act of 2005 was enacted to regulate the markets for customer credit. Its purpose is to develop, inter alia, credit markets that are accessible by all South Africans, correct the imbalance in negotiating power between consumers and credit providers, regulate the collection and sharing of consumer credit information, and prevent over-indebtedness. These and other efforts are intended to achieve a "fair, transparent, competitive, sustainable, responsible, efficient, effective and accessible credit market and industry, and to protect consumers."[12] The Act specifically provides the Minister of Trade and Industry with powers to issue regulations pertaining to the implementation of the Act.[13] These regulations were made available in May 2006.

The initial regulations pre-date the period assessed by this paper, but the proposed and later realised changes to these regulations occurred between 2012 and 2015. These developments are captured in $FinReg$.

2012 debt-counselling regulations

On 10 May 2012, the Minister of Trade and Industry published debt-counselling regulations that codified the process to be followed by debt counsellors and consumers when seeking various orders from a magistrate's court. These orders relate to the restructuring of debt following a debt counsellor's findings of consumer over-indebtedness, consumer difficulty to meet debt obligations and direct applications by consumers to the court following an adverse finding by debt counsellors. The regulations also provide that credit providers are expected to implement orders from

12 Section 3 of the NCA.

13 Section 171 of the NCA.

the court within 10 working days of receiving court orders from the debt counsellors and/or consumers (South Africa 2012).[14]

Roestoff et al. (2009) note that the provisions of the NCA relating to debt relief are to assist over-indebted consumers, prioritising their interests over those of credit providers. To achieve these outcomes, debt review negotiations require that credit providers have greater responsibility for the possible negative outcomes of credit provision.

2013 and 2014 draft and final credit regulations on the removal of adverse consumer credit information and information relating to paid-up judgements

In 2013, the Minister of Trade and Industry issued a notice about a proposal to remove adverse credit information from credit bureaus. This followed Cabinet's endorsement of a removal of adverse credit information project. The Minister proposed that all adverse findings be removed, even in cases of non-payment. This was intended to ensure that people with adverse credit information could still access credit (South Africa 2013).

On 26 February 2014, the Minister published final regulations informing credit bureaus that adverse credit information must be removed on all paid-up judgements (South Africa 2014a). While the final regulations were less ambitious than the proposal, the National Credit Regulator (South Africa 2014c) indicates that the regulations should enable consumer access to affordable credit and employment opportunities.

2014 and 2015 changes to the National Credit Regulations

On 1 August 2014, the Minister of Trade and Industry published draft national credit regulations proposing a host of changes to the 2006 regulations, as amended (South Africa 2014b). The proposals included criteria for credit providers to assess affordability and limit instances of reckless lending. Additional limits were imposed

[14] The initial draft regulations were published on 15 May 2009 and did not prescribe the period within which credit providers were to implement court orders issued after debt-counselling processes.

regarding when credit providers could share adverse consumer credit information with credit bureaus (for instance, information that consumers had not met their financial obligations could not be shared unless the consumer had missed their minimum obligations for three consecutive months). Changes were also made to the maximum periods that credit information could be kept by credit bureaus, with reduced retention periods proposed for many types of information: for instance, information relating to enquiries on a consumer's record be kept for two months instead of two years; information on liquidations be kept for five years rather than an unlimited period; and information on complaints initiated by customers be reduced from 18 months to six months. Other changes included explicit references to the registration and operation of payment distribution agents, as well as clarity on when credit information could be obtained for employment purposes.

By 13 March 2015, the Minister had issued a final set of proposed changes to the regulations (South Africa 2015a). Many of the 2014 proposals were accepted, some with changes. These included the explicit criteria for affordability assessments, changes to the retention periods for credit bureau information and additional limits on when adverse consumer credit information could be shared with credit bureaus.

2015 draft and final credit regulations on limitations on fees and interest rates

Section 42(1) of the 2006 credit regulations stipulates the maximum interest rates to be set on different types of credit (South Africa 2006). These include mortgages, credit facilities, unsecured credit, developmental credit, short-term credit, other and incidental credit agreements. Incidental and short-term credit rates were respectively capped at 2% and 5% per month. The limits for other rates were calculated at the repo rate scaled up by 2.2 and increased by fixed interest rates ranging between 5 and 20 percentage points depending on the credit type. The regulations also provided the maximum rand values for initiation and service fees, with the initiation fees varying by credit type.

In 2015, the Minister of Trade and Industry proposed changes to these interest rates and initiation fees (South Africa 2015b), and final changes came into effect that same year (South Africa 2015c). The Minister provided a lower scalar by higher interest rate

premium for five of the seven credit types. The net effect of this adjustment would be that maximum interest rates on credit facilities decreased by 2.9 percentage points and by 7.9 percentage points for unsecured credit (based on the prevailing repo rate). The maximum rates set for other credit types increased marginally by 0.1 percentage points or had no change at all. Initiation and service fees were increased above the limits set in the 2006 regulations.

A6.2.2 Restructuring of financial sector regulation

Financial Sector Regulation Act

The Financial Sector Regulation Act of 2017 represented a structural shift in the regulation of financial institutions in South Africa, as it set up a framework for financial regulation and supervision.

The Act sets up two authorities with important regulatory powers. One is the Prudential Authority (PA), which sits within the South African Reserve Bank. The purpose of the PA is to ensure financial stability and the soundness of financial institutions and infrastructure, as well as to protect consumers against risks from financial institutions. The second authority is the Financial Sector Conduct Authority (FSCA),[15] created to protect financial consumers by promoting fair treatment and financial education and to maintain financial stability and market efficiency.

Both the PA and the FSCA were tasked with promoting financial inclusion, defined by the Act as a state in which all persons have “timely and fair access to appropriate, fair and affordable financial products and services” (Presidency 2017).

Draft and update of the Conduct of Financial Institutions Bill

In 2018, National Treasury presented a draft Conduct of Financial Institutions (COFI) Bill, which consolidates a number of the country’s financial sector laws. Existing financial sector regulation is focused on particular sectors: insurance companies are

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15 The FSCA replaced the Financial Services Board. See: https://www.fsca.co.za/TPNL/4/fsb4/proactive.html.

regulated by the Insurance Act, investment schemes by the Collective Investment Schemes Control Act and financial service providers by the Financial Advisory and Intermediary Services Act. The bill seeks to provide the FSCA with the power to regulate institutions that provide similar services and products (South Africa 2018a).

The COFI bill also proposes that the FSCA provide standards for the conduct of firms in providing financial products and services. This would cover, inter alia, firms' charging structures, pricing methodologies, financial product features and the identification of appropriate and inappropriate target markets (South Africa 2018a). National Treasury (South Africa 2018b) explains that this legislation would support greater financial inclusion, providing consumers with greater security when using financial sector products. A draft COFI bill was presented in 2018 and an updated draft in 2020 (South Africa 2020a).

A6.2.3 National financial inclusion policy

Draft financial inclusion policy report

In 2020, National Treasury issued a draft national policy framework for financial inclusion in South Africa. The existing state of financial inclusion is reported to be high in South Africa, but National Treasury notes that the use of financial products by low-income earners remains low and that small, medium and micro enterprises (SMMEs) are only marginally serviced (South Africa 2020b). On the back of these challenges, the draft national policy framework provides initiatives to support the three key pillars that National Treasury identifies as being important to financial inclusion: (i) deepening financial inclusion; (ii) improving access for SMMEs; and (iii) supporting more diverse providers of financial services.

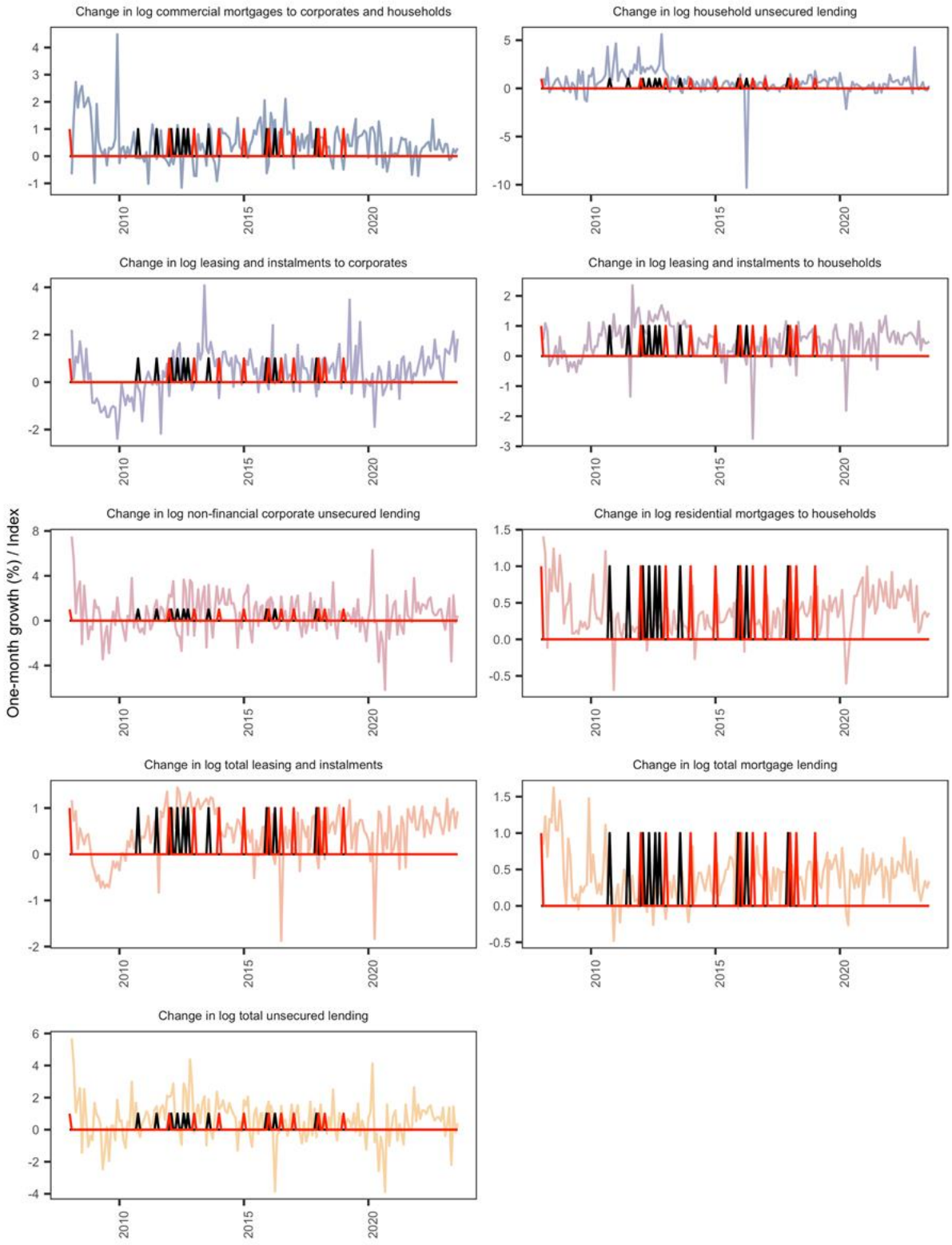
A number of initiatives identified by National Treasury (2020b) in the three pillars relate directly to credit extended by incumbent banks. To increase developmental loans to low-income families, the policy proposes that the government shares losses on defaults and uses a student's future income to assess the affordability of loans. The policy also calls for the use of different forms of collateral (such as a permission to occupy) to secure mortgage financing. SMMEs' access to financing will be supported

by improvements in credit infrastructure for small businesses, such as consideration of SMME payment data as relevant to determining access to credit. To support more providers of financial services, the framework promotes the development of cooperative banks to compete against incumbent banks, developing a licensing framework that supports the entry of new financial institutions and assessing the role of the state-owned bank.

The financial inclusion policy sets out a number of initiatives likely to affect when and how incumbent banks extend credit. The framework also proposes various programmes that would create additional financial institutions likely to compete with incumbent credit providers.

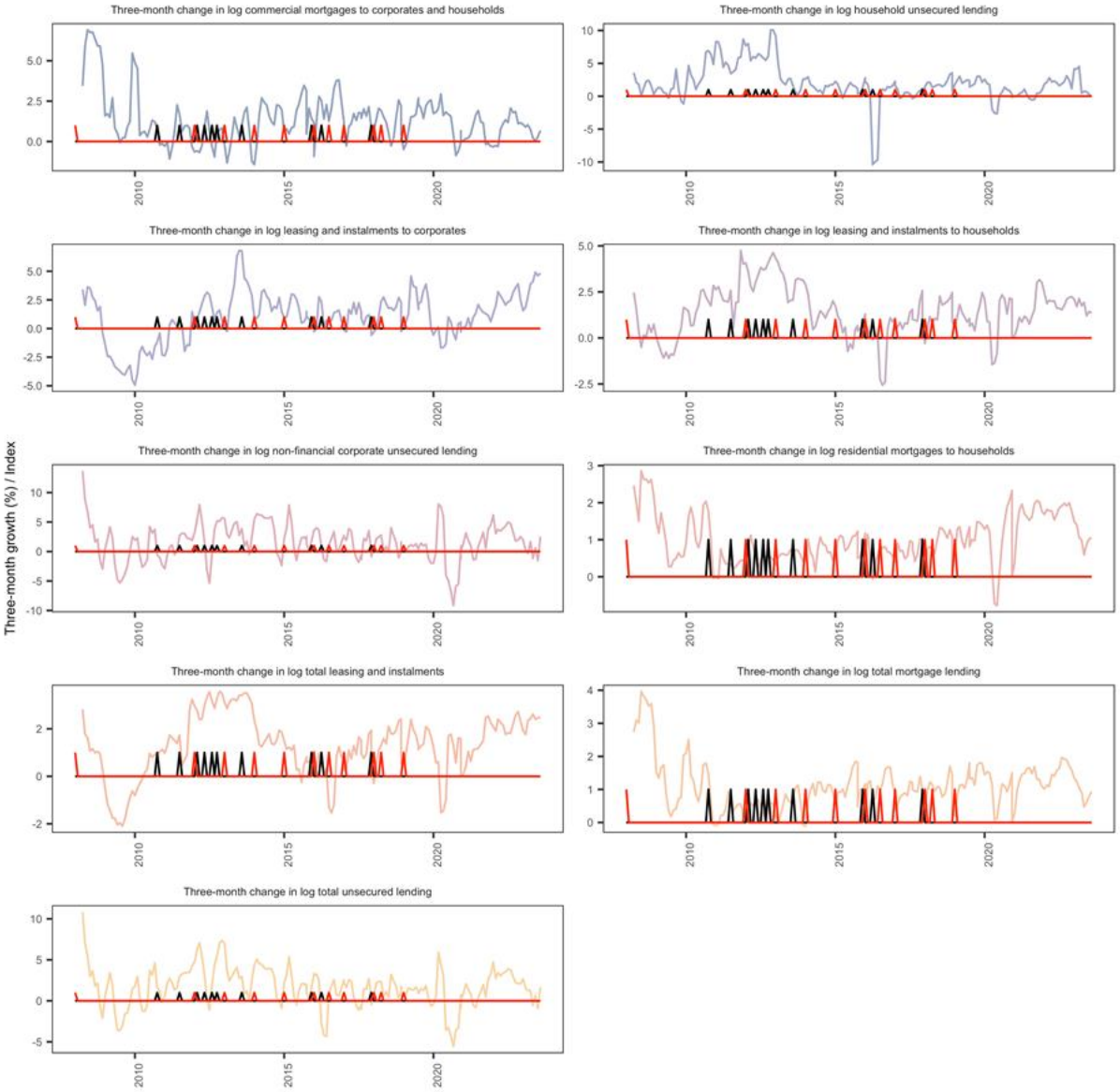
Annex 7: Macroprudential narrative indexes

Figure 3: One-month lending growth and macroprudential narrative index comparison



Note: The black line represents the draft index and the red line represents the implementation index.

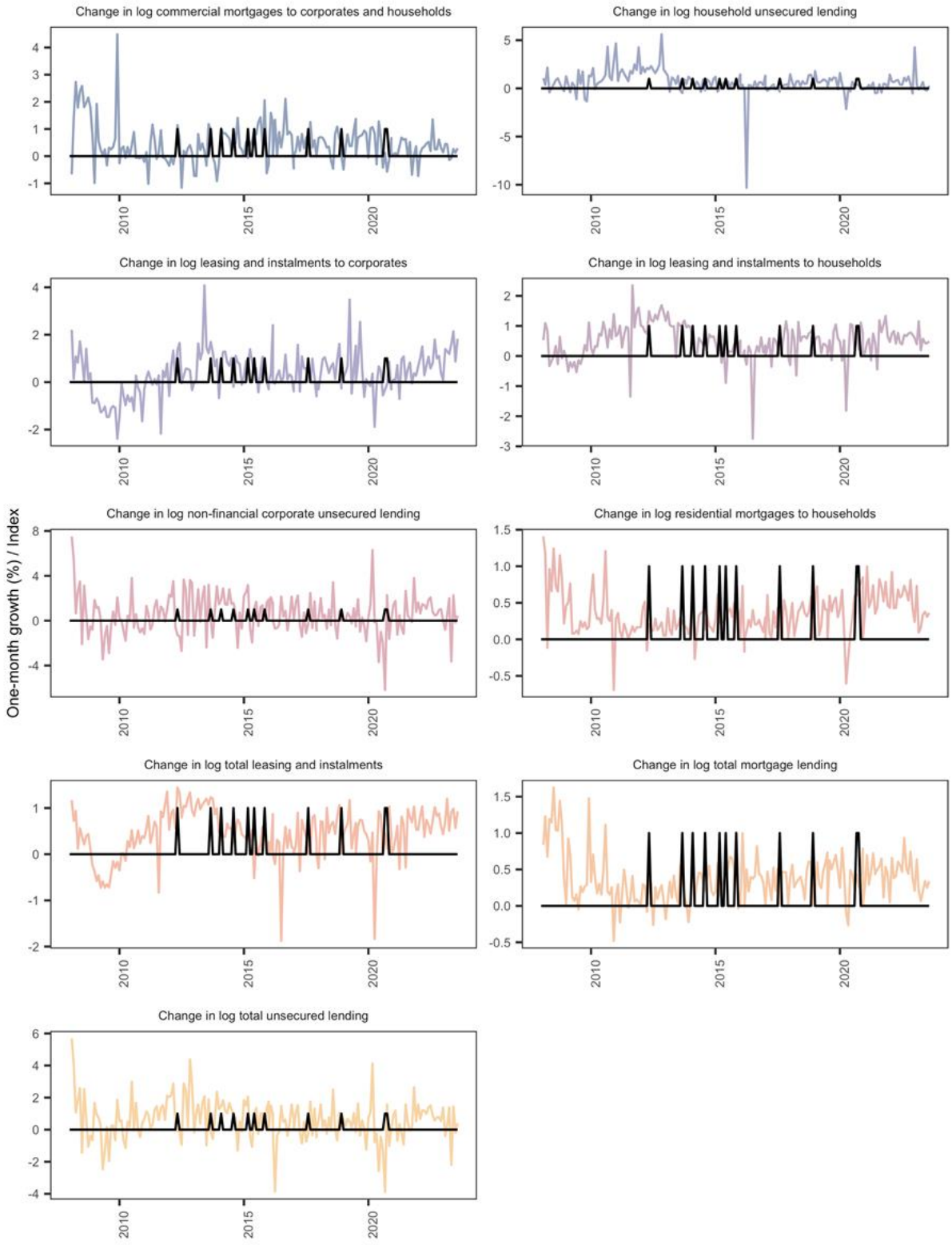
Figure 4: Three-month lending growth and macroprudential narrative indexes comparison



Note: The black line represents the draft index and the red line represents the implementation index.

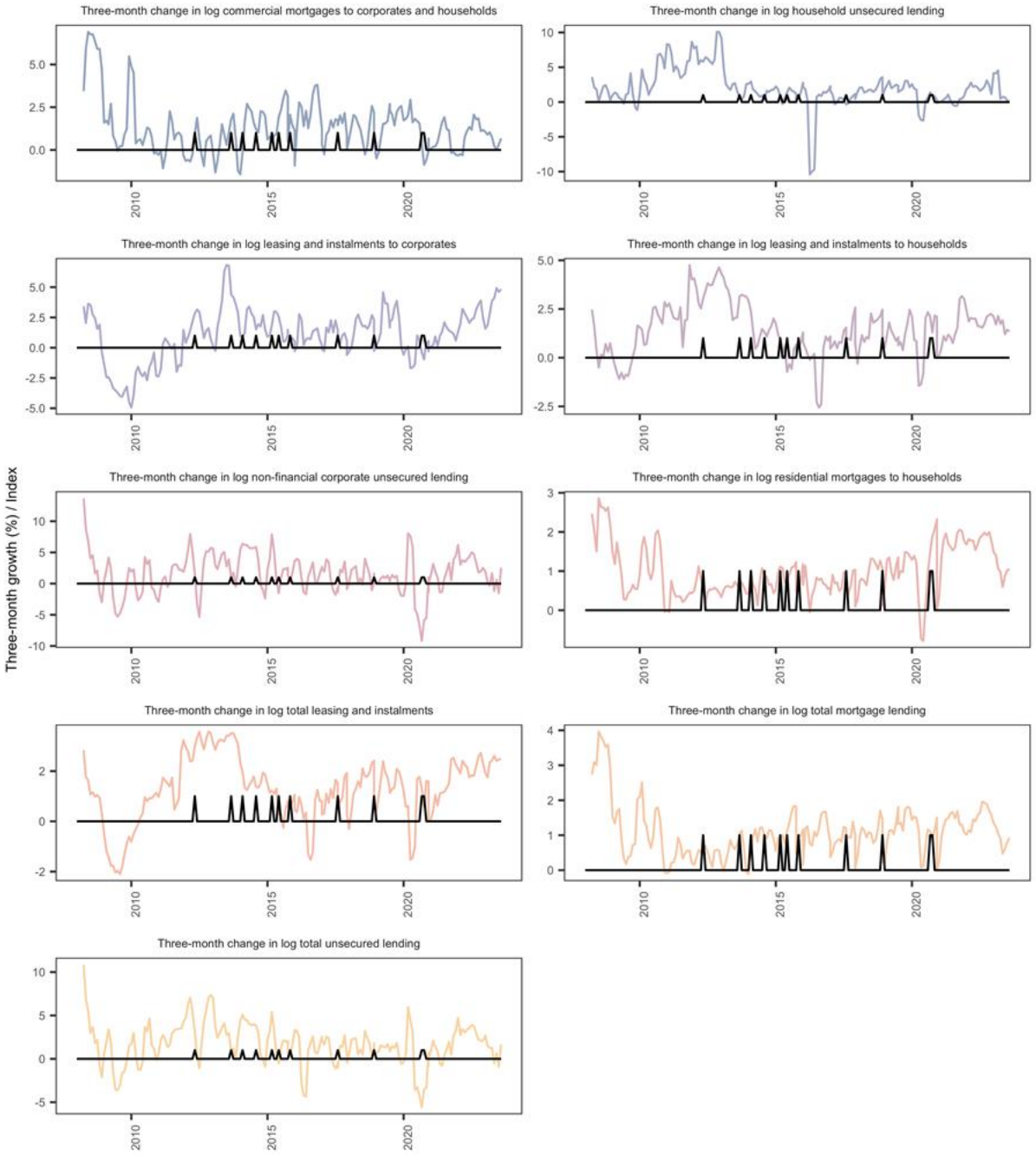
Annex 8: Financial regulation narrative indexes

Figure 5: One-month lending growth and financial narrative index comparison



Note: The black line represents the financial regulation index.

Figure 6: Three-month lending growth and financial narrative indexes comparison



Note: The black line represents the financial regulation index.

Annex 9: Results with controls

Table 9: Macroprudential regulation and lending rates with controls results

	Total			Corporations			Households		
	Unsecured	Secured	Mortgage	Unsecured	Secured	Mortgage	Unsecured	Secured	Mortgage
Draft model									
Draft index	0.420*	-0.378***	-0.472***	0.378	-0.441***	-0.182	0.404**	-0.350***	-0.571***
Return on assets	5.847***	-0.791**	-1.211	5.155***	-1.073	-1.124	6.013***	-0.643***	-1.285
Total capital adequacy ratio	0.715**	0.050	0.178	0.842**	0.030	0.118	0.392**	0.057	0.208
Implementation model									
Implementation index	1.05***	-0.40***	-0.49***	0.80	-0.56***	-0.64***	1.68***	-0.33**	-0.47***
Return on assets	5.72***	-0.75**	-1.16	5.06***	-1.01	-1.05	5.81**	-0.61**	-1.24
Total capital adequacy ratio	0.70***	0.06	0.19	0.83**	0.04	0.13	0.37**	0.06	0.22
Num. obs.	580	580	580	580	580	580	580	580	580
Bank fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Monthly fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: * p < 0.1, ** p < 0.05, *** p < 0.01

Table 10: Macroprudential regulations and lending volumes (three months) with controls results

	Total			Corporates			Households		
	Unsecured	Secured	Mortgages	Unsecured	Secured	Mortgages	Unsecured	Secured	Mortgages
Draft model									
Draft index	0.641	2.279**	-0.186**	0.423	0.891***	-0.375	1.035**	3.183**	-0.154
Return on assets	1.050	-4.139	-0.867	1.497	2.504**	-2.102	-0.613	-7.865	-0.332
Total capital adequacy ratio	0.233	0.278	0.035	0.185	0.141	0.201	0.352	0.362	0.001
Implementation model									
Implementation index	1.52***	1.19	-0.49**	1.98***	0.69	-1.18**	0.55	1.29	-0.21*
Return on assets	0.87	-4.26	-0.81	1.26	2.43**	-1.96	-0.67	-7.98	-0.31
Total capital adequacy ratio	0.21	0.25	0.04	0.16	0.13	0.22*	0.34	0.33	0.00
Num. obs.	580	580	580	580	580	580	580	580	580
Bank fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Monthly fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: * p < 0.1, ** p < 0.05, *** p < 0.01

Table 11: Finance regulation and lending rates with controls results

	Total			Corporates			Households		
	Unsecured	Secured	Mortgage	Unsecured	Secured	Mortgage	Unsecured	Secured	Mortgage
Finance regulation model									
Finance regulation index	0.595**	-0.068	-0.059	0.458	-0.106*	-0.138	0.927***	-0.038	-0.042
Repo rate	-0.084	0.718***	0.912***	-0.091	0.848***	0.708***	0.235	0.673***	0.985***
Return on assets	6.424***	-0.316	-0.498	5.871***	-0.537	-0.578	6.416***	-0.191	-0.504
Num. obs.	580	580	580	580	580	580	580	580	580
Bank fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Monthly fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: * p < 0.1, ** p < 0.05, *** p < 0.01

Table 12: Finance regulation and lending volumes (three months) with controls results

	Total			Corporates			Households		
	Unsecured	Secured	Mortgage	Unsecured	Secured	Mortgage	Unsecured	Secured	Mortgage
Finance regulation model									
Finance regulation index	-0.730	0.085	0.022	-0.781	0.817***	0.043	-0.496*	-0.385	-0.010
Repo rate	-0.739***	-1.390***	0.200*	-0.569***	-0.946***	0.454*	-1.135***	-1.706***	0.167
Return on assets	0.948***	-4.672	-0.719	1.453**	1.989	-1.648	-0.857	-8.432	-0.233
Num. obs.	580	580	580	580	580	580	580	580	580
Bank fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Monthly fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: * p < 0.1, ** p < 0.05, *** p < 0.01

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