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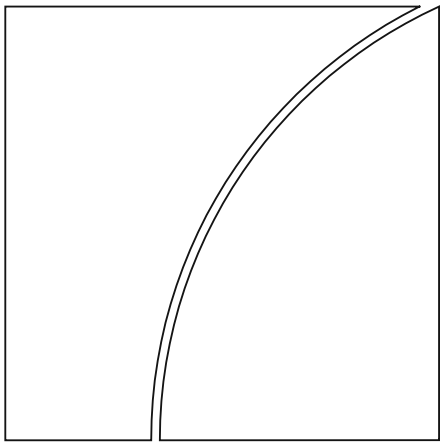

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The effectiveness of macroprudential policies during the Covid-19 pandemic in sub-Saharan Africa

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The effectiveness of macroprudential policies during the Covid-19 pandemic in sub-Saharan Africa[1]

Executive summary

Macroprudential policies have attracted considerable attention in the aftermath of the Great Financial Crisis (GFC). An important part of the lessons learnt from the GFC, which started in 2007 in the United States and affected financial systems around the world, was the need to adopt a macroprudential perspective in the oversight and regulation of the financial industry. An associated lesson was understanding that macroprudential policies could be employed to increase the resilience of financial institutions and reduce the amplitude of the financial cycle.

The Covid-19 pandemic was a test case for the effectiveness of macroprudential policies. Over 10 years after the start of the GFC, financial authorities had a broader toolkit to respond to the next global shock to the financial sector, ie the outbreak of the Covid pandemic in early 2020. Macroprudential instruments appeared especially well suited to respond to the pandemic, given the temporary nature of the source of stress. Where macroprudential policies had been put in place in the years prior to the pandemic, granting authorities the flexibility to adjust them during times of crisis, authorities could respond to the pandemic by relaxing macroprudential requirements. They could subsequently tighten such requirements again once the worst of the pandemic's effects were over.

The objective of this paper is to assess the effectiveness of macroprudential policies deployed in response to the Covid-19 pandemic in a sample of African countries. Although the pandemic was a truly global shock, studies on the effectiveness of the macroprudential response have tended to focus on advanced economies. To the extent that the impact of macroprudential policies during the pandemic may be affected by idiosyncratic aspects of the structure of the domestic banking sector – such as the types of financial firms, intensity of banking penetration and degree of financial inclusion – the findings of such studies may not be directly applicable to countries with different banking sector structures. In this light, this paper explores the impact of macroprudential policies on bank lending in Africa. It focuses on the African countries that most actively used macroprudential instruments prior to and during the pandemic. As a result, the paper focuses on Mauritius, South Africa and the eight countries in the West African Economic and Monetary Union (WAEMU).[2] All selected countries released macroprudential instruments in response to the pandemic, especially Mauritius and South Africa.

The paper finds evidence of the effectiveness of macroprudential policies in responding to the pandemic. Macroprudential policies were employed to maintain bank lending throughout the worst phase of the pandemic. In the analysis, the relaxation of macroprudential requirements is shown to have had a positive effect on bank lending flows in the selected countries, and the impact is generally stronger than in normal, ie non-pandemic, times. The effect is, however, not homogeneous, and is stronger in the

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[2] Members countries are Benin, Burkina Faso, Côte D'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo.

case of WAEMU. Possible concerns about capital flight and inflation triggered an early reversion of accommodative macroprudential policies in South Africa and Mauritius, likely dampening the effectiveness of the macroprudential response in those jurisdictions.

As authorities complete their macroprudential toolkits, some general lessons can be drawn. Authorities in the selected African countries responded swiftly to the pandemic, and in alignment with major economies elsewhere. Timeliness may have helped to increase the effectiveness of the response and would be an important criterion to consider in future times of stress. Second, macroprudential policies were not used in isolation, and their combination with monetary and other policies at the outset of the pandemic may have enhanced their effectiveness. Such consistency across policy domains was more challenging in the exit phase, and it requires careful coordination across policy domains. Third, while there is evidence of the impact of macroprudential policies on lending, the limitations of the macroprudential toolkit at the authorities' disposal may have affected the countries' capacity to respond. Jurisdictions that have yet to complete their macroprudential toolkit would benefit from doing so as this would provide the relevant authorities with additional levers with which to respond to possible future shocks.

Section 1 – Introduction

1. **The Covid-19 pandemic represented an unprecedented shock to the global economy and, starting in early 2020, authorities around the world took extraordinary containment measures.** Benefiting from lessons learnt in the response to the Great Financial Crisis (GFC) that started in 2007, authorities opted to respond in a rapid and substantial way. Monetary and fiscal authorities undertook unparalleled fiscal and monetary stimulus such as income transfers, job support measures, public guarantee programmes, provision of liquidity facilities, release of reserve requirements, asset purchases and benchmark rate cuts. It is estimated that by mid-2021 over $16 trillion in fiscal support had been injected into the global economy to help support economic activity and prevent collapse (IMF (2021)).[3] Most of these measures were taken in the early stages of the pandemic and helped soften the blow to economic activity and employment.

2. **Financial sector authorities also responded expeditiously.** Central banks and supervisory authorities adopted a wide range of policy measures with a view to ensuring that liquidity sufficient to sustain the flow of credit to households and firms remained in the financial system.[4] In particular, prudential and accounting treatments of expected credit losses were temporarily loosened, as were capital and liquidity requirements. Global standard-setting bodies (SSBs) supported these initiatives – promoting them in crisis communications and enhancing cross-country coordination (BCBS (2020a,b) and Borio and Restoy (2020)).

3. **Among these measures, the use of macroprudential instruments deserves special attention.** While macroprudential instruments had been employed by some jurisdictions prior to the GFC, especially among emerging market economies, their adoption had become widespread since the GFC.[5] In the aftermath of the GFC, global SSBs promoted the use of macroprudential tools to complement the microprudential approach typically adopted by supervisory authorities until then. SSBs also developed a conceptual and regulatory framework around the use of macroprudential instruments (see FSI (2017), IMF et al (2016), FSB (2010) and BCBS (2010, 2019)).

4. **A growing literature has attempted to assess the effectiveness of macroprudential policies during the pandemic.** The evidence in the literature so far is mixed and, where an impact has been detected, the analysis has focused on specific issues only.[6] For instance, in their review of the literature, Biljanovska et al (2023) found that, on balance, macroprudential policy can be used to address specific vulnerabilities in crisis situations such as the Covid-19 pandemic. They also identified areas in which further work was needed to firm up results.[7] Avezum et al (2024) found that the release of macroprudential capital buffers served to mitigate the procyclicality of credit to households during the pandemic. Couaillier et al (2021), however, found that the release of macroprudential capital buffers only produced the desired results on lending for banks with ample capital space over and above regulatory buffers. Bergant and

[3] Of the $16 trillion of government spending in response to the pandemic, the IMF estimated that the largest part took place in advanced economies ($9 trillion). Most of the rest originated in emerging market economies ($4 trillion) and low-income developing countries ($2 trillion).

[4] See for instance English et al (2021) and BCBS (2021) for a review of monetary policy and regulatory measures, respectively.

[5] See Borio et al (2023) for an overview on the adoption of macroprudential policies.

[6] Carstens (2021) offers a broader perspective, discussing the overall framework, how it may be employed in response to the pandemic and what the associated risks may be.

[7] These areas include the role of macroprudential policy in strengthening the resilience of the financial system, and the interaction between macroprudential measures and other policies. The authors also encourage continued efforts to explore new methods, and to enhance data quality and granularity on macroprudential policy changes in order to better quantify effects and better calibrate the range of macroprudential policy tools.

Forbes (2023) found that while there was a degree of positive impact from macroprudential policies, the use of such policies is severely constrained by how much they had been tightened prior to the pandemic. In a similar fashion, but taking a narrower perspective, Igan et al (2023) found that tighter macroprudential policies prior to the pandemic contributed to banks' resilience during the pandemic itself.

5. **Most of the Covid-19-related literature focuses on a rather homogeneous sample of countries.** Although the pandemic was a truly global shock, affecting a large number of countries with different degrees of financial deepening, the empirical analysis has tended to focus on banking data from advanced economies. This partly reflects data availability issues, as well as the fact that the most intense impact of the Covid-19 pandemic was registered in some Asian countries, Europe and North America. To the extent that the impact of macroprudential policies during the pandemic may be affected by idiosyncratic aspects of the structure of the domestic banking sector – such as the types of financial firms, intensity of banking penetration and degree of financial inclusion – the findings may not be directly applicable to countries with different banking sector structures.

6. **This paper reviews the use of macroprudential instruments in selected sub-Saharan Africa and their effectiveness in maintaining the provision of credit to the economy in response to the Covid-19 pandemic.** So far, research on loan growth during the Covid-19 pandemic in Africa has been limited. To fill this gap, this paper focuses on three African jurisdictions. One is a monetary union, ie the West African Economic and Monetary Union (WAEMU).[8] The second is South Africa, the largest economy in the region. In both sets of countries, banks are mostly regional or domestic. The third country covered in the paper is Mauritius – a jurisdiction with a different structure in the banking sector and a relatively large component of foreign-owned banks. Overall, these countries were selected as they were among the most active users of macroprudential measures on the continent prior to and during the pandemic.[9]

7. **The paper partly relies on confidential data.** Some of the banking sector and macroeconomic data are not usually available to external researchers on a quarterly basis, as used in this paper. Considering the relatively short length of the Covid-19 pandemic, the availability of these data at a quarterly frequency allows the analysis to track the impact of macroprudential policies on bank credit in a way that would otherwise be impossible.

8. **The rest of the paper is organised as follows.** Section 2 introduces the concept of a macroprudential framework and key references, as well as the definition of a macroprudential toolkit used in this paper. Section 3 describes the use of macroprudential policies in Africa and explains the selection of sample countries in the paper. Section 4 presents some stylised facts about the banking sector in the selected countries, and reviews their macroprudential, monetary and fiscal policies during the pandemic. Section 5 presents the findings of the empirical analysis on the effectiveness of macroprudential policies in the selected countries. Section 6 concludes.

[8] Member countries are Benin, Burkina Faso, Côte D'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo.

[9] Larger countries, while in principle interesting because of the size of their economies, are not included in the analysis because of their less intense use of macroprudential measures.

Section 2 – Macroprudential policies and their implementation in Africa

9. **Macroprudential measures are now part of the policy toolkit of financial sector authorities.** The prudential regulations known as Basel III were developed in the aftermath of the GFC. A novel feature of Basel III in comparison with earlier vintages of the Basel prudential framework is the development of financial instruments to manage the exposure of the financial system to systemic risks.[10] Since the launch of Basel III, several countries have introduced macroprudential measures into their prudential frameworks.

10. **A macroprudential framework aims to increase the resilience of the financial system and limit systemic risk.** This is the risk of widespread disruption to the provision of financial services that is caused by an impairment of all or part of the financial system.[11] Such risk can cause serious negative consequences for the real economy. To achieve this goal, financial authorities with macroprudential powers deploy policies that operate through the cross-sectoral and time dimensions of systemic risk.[12] For policies affecting a specific sector in the financial system, ie the time dimension, authorities are required to meet two intermediate policy objectives. The first is increasing the financial system's resilience to aggregate shocks by strengthening the loss-absorbing capacity of banks. The second is containing the accumulation of systemic risks (ie reducing the likelihood and intensity of potential shocks).[13] For policies targeting the cross-sectoral dimension, authorities' intermediate objective is primarily to reduce the probability that a shock will propagate across financial entities.[14]

11. **Broadly speaking, several instruments compose the macroprudential toolkit.** The set of macroprudential instruments varies across countries[15] and there is no globally agreed definition of what may or may not be considered a macroprudential measure. One measure that was explicitly designed with a macroprudential objective, and therefore clearly falls within a narrow definition of a macroprudential measure, is the countercyclical capital buffer (CCyB). This tool is expected to increase the resilience of banks against possible future shocks by building up resources during periods of macro-financial exuberance, particularly when credit growth is deemed excessive. In turn, such resources can be released during downturns.[16] However, not many jurisdictions had positive CCyB levels at the time when the pandemic started, making this instrument unusable in response. A broader concept of macroprudential

[10] Some countries, especially emerging market economies, introduced policies similar to what later became known as macroprudential policies already in the late 1970s, given the need to insulate their financial sectors from global shocks.

[11] The discussion on macroprudential policies is relatively recent, starting in the early 2000s. See for instance Crockett (2000) and Borio (2003). See Coelho and Restoy (2023) for a classification of macroprudential policies.

[12] The cross-sectoral (or structural) dimension refers to the distribution of risk within the financial system at a given point in time. The time dimension refers to the evolution of systemic risk over time. As a result, the cross-sectoral dimension is primarily concerned with the relative magnitude of systemic risk, while the time dimension is interested in the absolute level of systemic risk (Borio (2003) and Borio et al (2022)).

[13] Examples of instruments used to address the time-dimension of systemic risk are countercyclical capital buffers and borrower-based measures (eg limits to debt service-to-income ratios).

[14] An example of commonly used instruments to achieve this intermediate policy objective is capital surcharges for systemically important financial institutions.

[15] For instance, the South African Reserve Bank (SARB) defines a macroprudential instrument as follows: "Any policy instrument, regardless of the institutional authority with whom it vests, that at the direction of the SARB is explicitly applied to (i) mitigate vulnerabilities in the financial system and/or reduce systemic risk; thereby (ii) improving the resilience of the financial system; in turn (iii) protecting and enhancing financial stability in South Africa" (SARB (2024)).

[16] BCBS (2015) establishes that in order to "make decisions regarding the level of the countercyclical capital buffer add-on, domestic authorities are required to monitor credit growth and make assessments of whether such growth is excessive, leading to the build-up of system-wide risk".

instruments includes all measures that can be used to help contain systemic risk.[17] This is the approach taken, for instance, by the International Monetary Fund (IMF), and adopted in its database of macroprudential policies, the Integrated Macroprudential Policy (iMaPP) database.[18] That data set includes not only specific macroprudential instruments such as the CCyB,[19] and borrower-based measures such as loan-to-value limits, but it also includes other tools such as leverage ratio limits, constraints on dividend payouts and minimum liquidity requirements. While the latter are relevant to the containment of systemic risks, they are often characterised as microprudential instruments. In this paper, the scope of macroprudential policies is aligned with the one used by the IMF. This is necessary for consistency with the empirical analysis conducted in the second part of the paper, which draws on the iMaPP database.

12. **Initially, in the 1980s and 1990s, African countries were shielded from global financial crises due to their limited integration into global financial networks.** Across the financial crises that had significant cross-border impacts, such as the 1980s Latin American crisis and the East Asian crisis of 1997-988, the impact on Africa was muted. This reflected the fact that the financial systems in most African countries were in their infancy, and were in general not closely connected to those in major financial centres or emerging market economies outside the continent. Even within Africa, national financial systems were not closely integrated, with the exception of regional monetary unions.

13. **Since the 2000s, with the deepening of capital markets and the presence of correspondent banks, African countries have increased their connection to the global financial system.** By the time of the GFC, Africa's financial sector, especially in countries like South Africa, Mauritius and the franc zone of the Financial Community of Africa (FCA)[20] had become more globalised and integrated into the global financial system. For instance, between 2000 and 2015, over 15 African countries entered the eurobond market, up from only three at the beginning of the period. Similarly, Bank for International Settlements' international banking statistics show a consistent and sustained increase in the cross-border claims of reporting banks on "emerging Africa and the Middle East" from the mid-2010s.[21]

14. **With deeper integration into global markets, the banking sector in African countries became more exposed to global crises.** This was, for instance, the case with the GFC, and many studies have been conducted on the impact of this crisis on Africa, showing a negative impact on African countries (see IMF (2009), Songwe (2011) and Akinsola (2020)). In respect of South Africa, Hollander and Havemann (2021) show that the country suffered a credit squeeze following the GFC.

[17] This is in line with the definition of macroprudential policy used by the IMF, namely "the use of primarily prudential tools to limit systemic risk" (see IMF (2013) and IMF et al (2016)).

[18] The iMaPP database is publicly available on the IMF website, it is based exclusively on survey information reported by IMF member countries and territories. It contains information on macroprudential policies and corresponding institutional set-ups from 1990 until 2021.

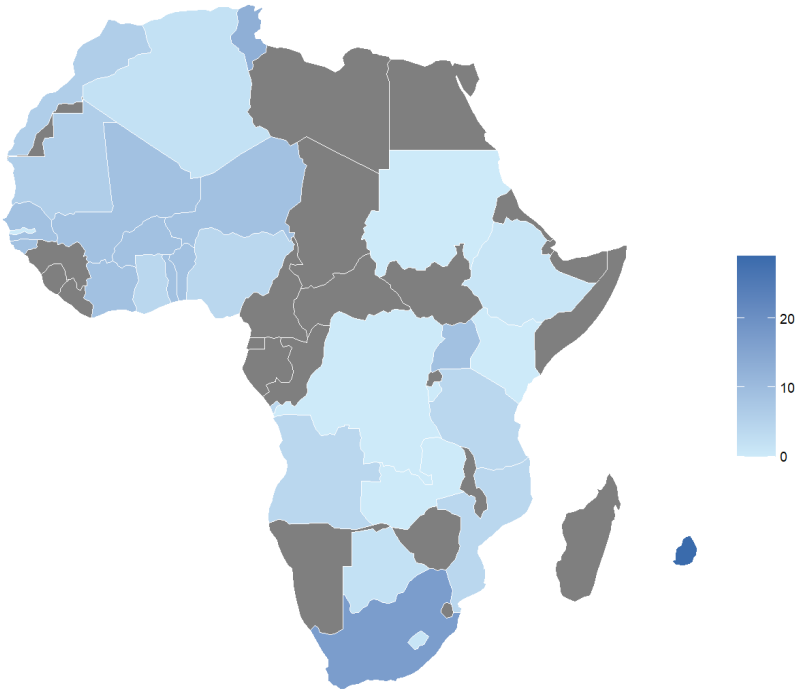
[19] A complement to the CCyB is the sectoral CCyB (SCCyB). The BCBS states that while a bank's additional capital requirements following the activation of the CCyB depend on total risk-weighted assets, a SCCyB is a more targeted measure to directly address the build-up of risk in a specific sector (see BCBC (2019)).

[20] The CFA franc zone is an economic and monetary area bringing together France and 15 countries in sub-Saharan Africa. The WAEMU countries are part of the CFA franc zone.

[21] See several issues of the *Statistical release: BIS international banking statistics and global liquidity indicators* (eg BIS (2024)).

Total use of macroprudential policies in Africa

Number of policy implementations across all iMaPP measures in the period 2017–21 Graph 1



The size of Mauritius is not represented to scale. Its magnitude has been increased for the purposes of visualisation. Countries for which data were not available in the iMaPP database are depicted in grey.

Source: IMF IMaPP database.

15. **In response to the GFC, African countries began to introduce macroprudential policies.** In the late 2010s, following the launch of the Basel III package, most jurisdictions in Africa began to adopt regulation to put in place institutional frameworks for macroprudential policies. This included the establishment of dedicated agencies or the allocation of new powers to existing ones, as well as the introduction of specific tools to respond to systemic risk. By the time of the Covid-19 pandemic, over two thirds of African jurisdictions had in place institutional frameworks for implementing these policies (Ozli (2019)). Box 1 provides more details about the macroprudential framework in selected jurisdictions.

Box 1

Macroprudential framework in Mauritius, South Africa and the West African Economic and Monetary Union①

Mauritius

The central bank, Bank of Mauritius (BOM), introduced macroprudential policies, starting in the mid-1990s, in line with the BOM mandate. According to the Bank of Mauritius Act 2004 "the Bank is mandated to ensure the stability and soundness of the financial system of Mauritius". The institutional framework has been strengthened since a 2015 International Monetary Fund Financial Sector Assessment Program (IMF FSAP) found the country lacked a formal macroprudential body. In particular, the BOM was designated as the macroprudential authority of Mauritius in August 2021. The BOM Act is currently under review and this review is expected to clarify the financial stability objectives and provide for an enabling framework for the macroprudential authority (IMF (2024b)).

The existing Financial Stability Committee includes the heads of the BOM, the Financial Services Commission, the Financial Intelligence Unit, the financial secretary and the minister of finance, and is chaired by the minister of finance. It serves as a forum to regularly review and ensure the soundness and stability of the financial system. Coordination on surveillance and policy formulation between the BOM and the Financial Services Commission on financial stability issues are addressed at the level of the Joint Coordination Committee between the two financial sector regulators, co-chaired by a deputy governor from the BOM and the head of the Financial Services Commission.

South Africa

Following the Financial Sector Regulation (FSR) Act of 2017, the institutional arrangement for macroprudential policies in South Africa is composed of two key entities. One is the Financial Stability Oversight Committee (FSOC), comprising the South African Reserve Bank (SARB), Prudential Authority (PA), Financial Sector Conduct Authority (FSCA), Financial Intelligence Centre (FIC) and National Credit Regulator (NCR). The other is the SARB itself. However, although FSOC is a statutory committee, it is advisory and does not have legal powers. Some instruments that may be deployed in support of macroprudential policy objectives vest with the SARB and/or the PA. In such a case, the Governor of the SARB directs the relevant SARB and/or PA stakeholder to deploy the macroprudential instrument. For instruments that do not vest with the SARB and/or PA, a consultation process may be followed. Although the Governor of the SARB can direct a financial sector regulator to implement or deploy an instrument unilaterally, in practice it is more likely that this will follow a consultation, at least bilaterally (ie between the SARB and the relevant authority) or multilaterally (eg at FSOC).② The powers of the SARB are enhanced when a systemic event is declared by the Governor of the SARB (the Governor will consult with or, in exceptional circumstances, inform the minister of finance). The Covid-19 pandemic, however, was not declared a systemic event.

South Africa has introduced a number of macroprudential instruments in its framework and most of them were available as of January 2018. According to the Integrated Macroprudential Policy (iMaPP) database, this includes the countercyclical capital buffer (CCyB), capital conservation buffer, leverage ratio, liquidity tools (ie the Liquidity Coverage Ratio, net stable funding ratio and a liquid asset ratio in place since the 1990s), capital surcharges for domestic systemically important banks, Pillar 2 capital requirements and forward-looking loan provisioning (IFRS9).

Although South Africa is one of the most active users of macroprudential policies on the continent, there are some limitations. As discussed in IMF (2022a), the framework does not include borrower-based measures, sectoral capital buffers or risk weights. This likely reflects the fact that the National Credit Act imposes certain repayment limits and obligations on lenders, which act as borrower-based instruments but are not within the SARB or PA's powers. Further, available instruments address banks only. For these reasons, the IMF considers South Africa to have been less active in terms of macroprudential policies than its global emerging market economy peers. A bias in favour of inaction may have been increased by the requirement for a systemic event to be declared before the SARB could take steps to maintain or restore financial stability. However, the CCyB could not, in any case, have been used in response to the pandemic, as in South Africa it has been at 0% since its introduction in 2016.

West African Economic and Monetary Union

The West African Economic and Monetary Union (WAEMU) is composed of eight members: Benin, Burkina Faso, Côte D'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo.

These countries strengthened their macroprudential framework in 2018, following the passage of a new regional law (see IMF (2024a)).

Macroprudential policies are set at the same time, and with the same specifications, in all WAEMU members. Following the IMF classification, these policies include measures covering capital requirements (the CCyB), the capital conservation buffer, limits on the leverage ratio, capital surcharges for systemically important institutions (introduced in 2022), limits on leverage for systemically important institutions, limits on distribution, liquidity measures (liquid asset ratio), customer-related requirements (household sector capital requirements and corporate sector capital requirements), limits on gross foreign exchange positions and measures to address risks from interconnectedness (additional risk weights on exposures between financial institutions).①

The macroprudential toolkit is focused on banks. The central bank of the monetary union, the Central Bank of West African States (BCEAO), plays a key role in defining macroprudential policies, but it does not have exclusive decision-making powers. The governance of macroprudential policies is shared between the Central Bank and the committee in charge of preserving financial stability (Le Comité de Stabilité Financière (CSF-UMOA). Macroprudential supervision in the Union is coordinated by the BCEAO, as part of its financial stability mission. According to IMF (2022b), the CSF-UMOA does not have enough powers to ensure the implementation of the macroprudential policies it recommends. In addition, its composition is tilted in favour of government representatives. The final institutional structure for macroprudential policies is currently being formalised.

At the time of the Covid-19 pandemic, the authority in charge of activating the CCyB had not been designated and modalities for implementing the buffer had yet to be defined. As a result, despite its introduction in the macroprudential framework in 2018, the CCyB could not be used during the pandemic. Other macroprudential measures were employed, such as the capital conservation buffer.

① See the tables in Annex 2 for more details about the macroprudential policies contained in iMaPP for the sampled countries. ② See SARB (2024) for more on the framework.

16. **The intensity with which macroprudential policies were used is not homogeneous.** Among countries covered in the iMaPP, the most intense use of these policies since 2017[22] was in Mauritius, followed by South Africa, Tunisia and the WAEMU countries (see Graphs 1 and 2). Earlier data show an even less intense use of these policies across jurisdictions in Africa.

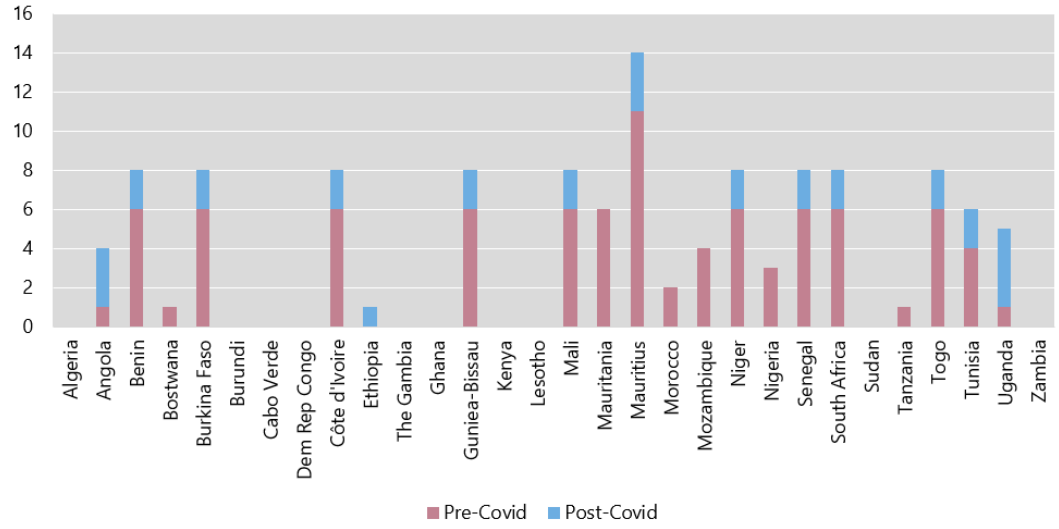
17. **Before the Covid-19 pandemic, most macroprudential measures taken were of a tightening nature.** Across the continent, the number of tightening measures was almost double that of loosening, with the exception of Ghana. While country-specific drivers apply, the preponderance of restrictive measures is likely to have been driven by abundant global liquidity, a commodity boom and inflation concerns. In addition, the fact that countries were in the process of setting up their macroprudential frameworks – building up capital buffers, to the extent that authorities planned to introduce non-zero buffers in normal times and tightening prudential requirements to meet global standards – automatically tilted macroprudential policies towards a restrictive stance.

[22] The analysis in the paper focuses on the years 2017–23, in order to capture the macroprudential framework in the lead up to the Covid pandemic, and afterwards.

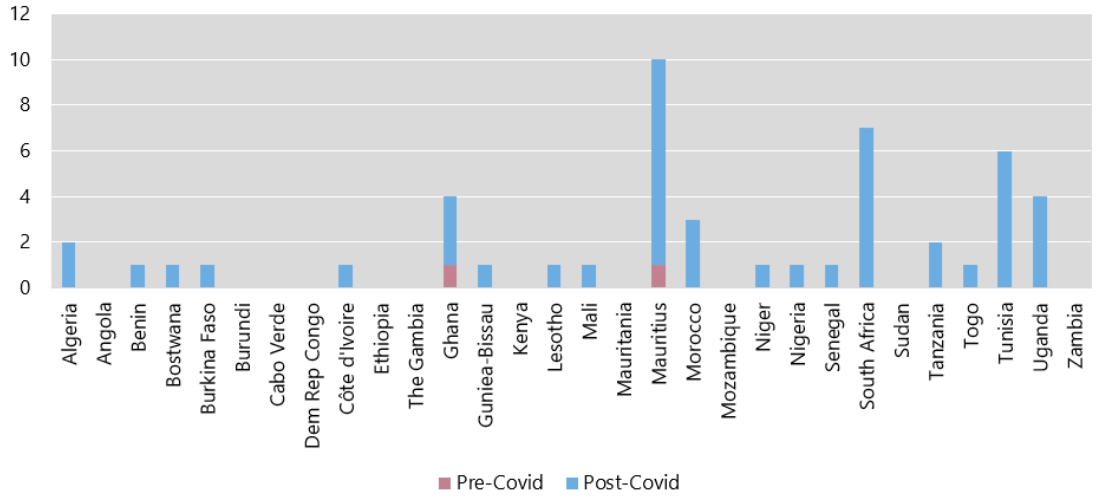
Tightening and loosening of macroprudential policies in Africa

Number of policy implementations across all iMaPP measures in the period 2018–21 Graph 2

A. Tightening



B. Loosening



The pre-Covid period includes 2018, 2019 as well as January and February 2020, while the post-Covid period includes the remaining months until December 2021 (the last available year in the IMF iMaPP database at the time of writing). The total count of post-Covid loosening measures for South Africa has been adjusted as one measure was classified under both "capital" and "other".

Source: IMF iMaPP database.

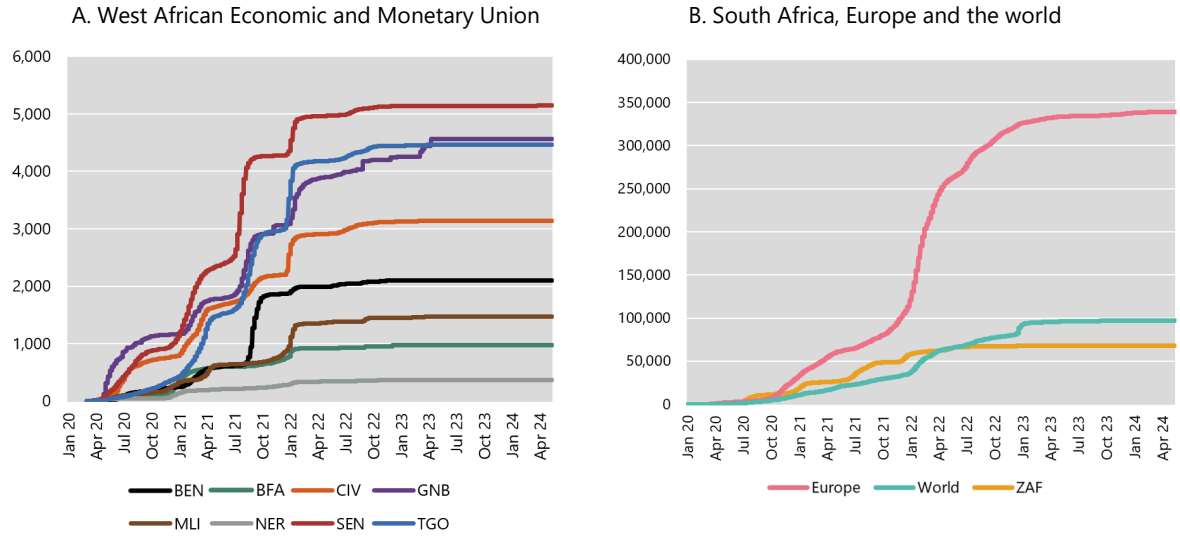
18. **The rest of the paper discusses the use of macroprudential policies in 10 sub-Saharan African countries – in three monetary jurisdictions.** Across Africa, the most intense use of these policies prior to the pandemic, whether tightening or loosening, and during the pandemic, is consistently reported

by Mauritius, South Africa, and the WAEMU countries. The paper therefore focuses on these, with the exception of Tunisia.[23]

Section 3 – Macroeconomic policy responses in selected sub-Saharan African countries

19. **The Covid-19 pandemic spread to Africa in early 2020, but in a more limited way than in other parts of the world.** According to World Health Organization data, the first cases of Covid-19 in Africa were recorded in February 2020, and by May of that year the pandemic had spread to all African countries. Incidences, however, were not homogeneous across the continent. South Africa was among the most severely hit countries, at levels more closely comparable with Europe or other parts of the world (Graph 3).

Total Covid-19 cases per million – South Africa hardest hit in Africa — Graph 3



BEN = Benin; BFA = Burkina Faso; CIV = Côte d'Ivoire; GNB = Guinea-Bissau; MLI = Mali; NER = Niger; SEN = Senegal; TGO = Togo; ZAF = South Africa.

The database is available on the website Our World in Data from the World Health Organization (WHO). Information from Mauritius (see Mauritius Ministry of Health and Wellness (2021 and 2022) shows that the number of cases was contained until mid-2021, jumped to around 20,000 cases by end-2021 and levelled off by mid-2022 to around 38,000 cases (the population of Mauritius slightly exceeds one million).

Source: Our World in Data, WHO.

20. **Countries around the world, including in Africa, responded promptly to the pandemic, and the global response was based on several measures, such as macroprudential policies.** Across the world, once countries started registering a large number of cases, authorities responded in a forceful way with a similar policy mix across jurisdictions, including accommodative fiscal and monetary measures.

[23] Although Tunisia was also an active user of macroprudential policies, it is not covered in the paper due to limitations in data availability. The rest of the paper focuses on the 10 selected countries in sub-Saharan Africa.

Macroprudential policies were, in principle, especially well suited to respond to a pandemic; the presumably temporary impact on the economy could be addressed by releasing macroprudential buffers, thus facilitating ongoing credit provision to the economy by banks.

21. **The selected sub-Saharan countries activated several policies to complement the release of macroprudential requirements.** As discussed in the following subsections, countries relied on monetary policy in the form of reductions to key policy rates and monetary injections into the banking sector. Fiscal policy was also expansionary, although with some cross-country variations reflecting the available policy space in different countries.

Monetary policy

22. **Monetary policy was actively used during the pandemic response, via adjustments in key policy rates.** The response was broadly similar across the sample countries. In all cases, the key policy rate was reduced at the outset of the pandemic (Graph 4). Reversion to pre-pandemic levels started at the end of 2021 in South Africa and in 2022 for the other countries in the sample. At the time, decisions about monetary policy were also affected by considerations as to whether the Covid-19-related shock would have transitory or permanent effects on price levels. Countries with relatively higher levels of inflation may have been especially sensitive to the risk of introducing long-term changes in inflation rates (see Annex 1).

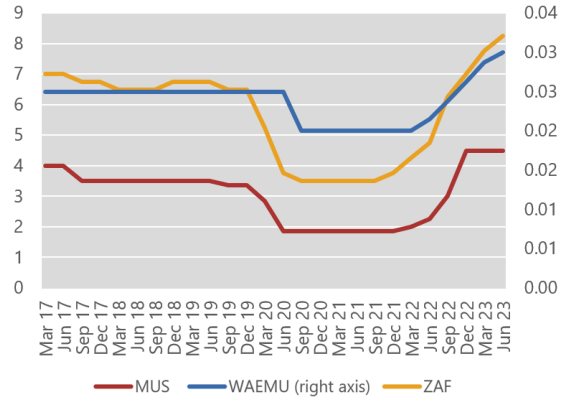
23. **Countries also provided liquidity injections into the banking system.** As a precaution against higher losses during a time of financial sector stress, banks may have responded by reducing lending and hoarding liquidity. In turn, they may also have become less willing to provide liquidity in the interbank market. To help alleviate the sharp tightening of financial conditions, central banks provided additional liquidity to the banking sector, in particular injecting it via special monetary policy auctions. The central bank of the WAEMU, the Central Bank of West African States (BCEAO), was especially active in the use of this policy tool, with a substantial and sustained increase in liquidity injections during the early phases of the pandemic. South Africa employed this tool too, but initially more sparingly, with a strong increase in 2021. In Mauritius, the central bank did not increase liquidity injections during the pandemic in a material way. A possible driver of the more cautious response in Mauritius and South Africa may have been concerns about domestic inflation rates which were recording a relatively strong increase at the time. This imbalance may have been especially important in the case of Mauritius, as a small open economy with substantial cross-border capital flows.

Monetary policy indicators

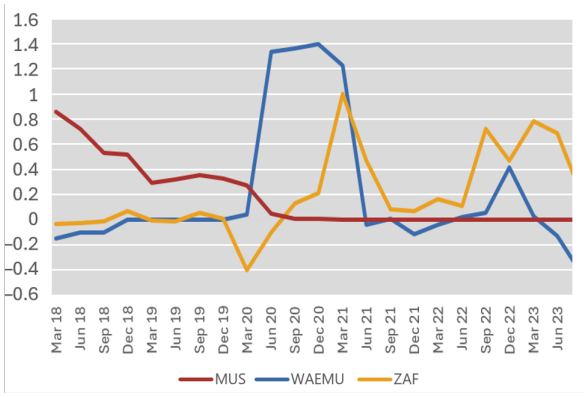
In per cent

Graph 4

A. Key monetary policy rates



B. Year-on-year growth of monetary injections



MUS = Mauritius; WAEMU = West African Economic and Monetary Union; ZAF = South Africa.

Sources: BCEAO; BOM; SARB.

Fiscal policy

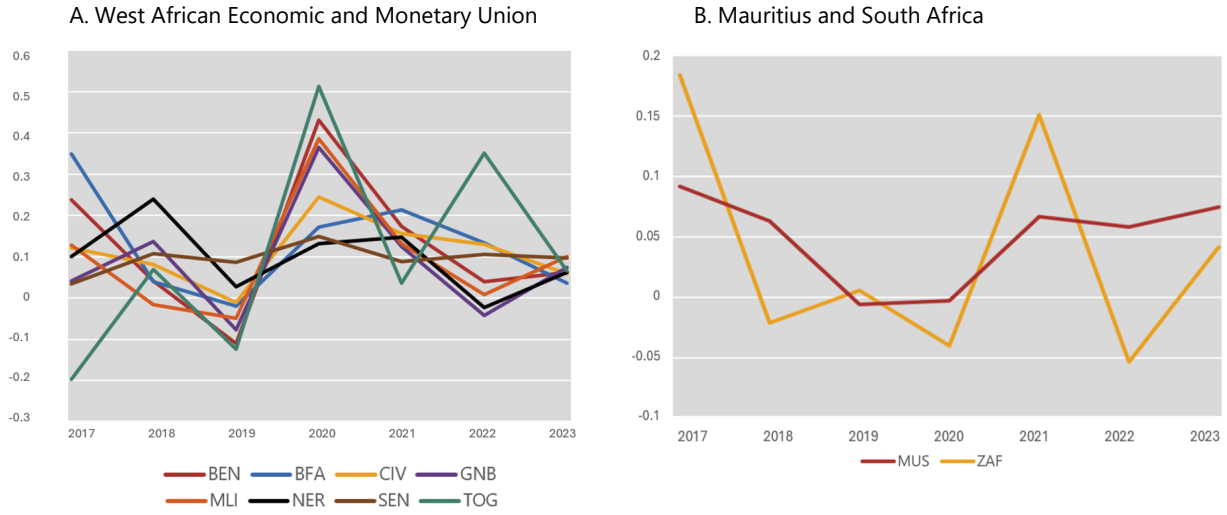
24. **Most countries responded to the pandemic with expansionary fiscal policies.** Fiscal policy was used around the world to respond to the Covid-19 pandemic. Governments offered various measures of income support to companies and employees, as well as tax holidays. They also increased healthcare spending, and provided guarantees to loans offered to non-financial companies. Although the mix of fiscal-related measures was different across countries, not least reflecting the fiscal space with which they entered the pandemic (see Bergant and Forbes (2023)), countries generally experienced a marked increase in fiscal outlays during the pandemic.

25. **A common pattern emerges among WAEMU countries.** In all countries, expenses increased markedly at the beginning of the pandemic in mid-2020 (Graph 5). After this spike and by 2022, expenditure growth returned to pre-Covid levels and was mostly flat. Togo was the only exception, as it experienced another upsurge in expenditure in 2022, before its expenditure growth converged to that of the other WAEMU countries one year later.

Government expenditure growth rates

In per cent

Graph 5



BEN= Benin; BFA= Burkina Faso; CIV= Ivory Coast' GNB= Guinea-Bissau; MLI= Mali; MUS= Mauritius; NER= Niger; SEN= Senegal; TOG= Togo; ZAF= South Africa.

Source: African Development Bank Socio-Economic database.

26. **The response in South Africa was somewhat delayed.** The increase in fiscal expenditures started in 2020 and peaked in 2021. Fiscal expenditure was already higher in South Africa, in relation to GDP, than in the other countries in the sample, at around 35% in 2020 – slightly above that in Mauritius, and well above the 20–25% range in the WAEMU countries (see Annex 1).

27. **Mauritius experienced a smoother adjustment in fiscal expenditure.** Like other countries in the sample, Mauritius's fiscal stance was restrictive just before the pandemic. In 2020, after the pandemic had begun, it reversed course, allowing spending to grow at a faster rate – although more moderately than in South Africa – and on a comparable scale to the WAEMU countries, but somewhat later than them. However, Mauritius allowed fiscal expenditure to continue expanding after the worst of the pandemic.

Section 4 – The macroprudential policy response in selected sub-Saharan African countries

Recent developments in the banking sector

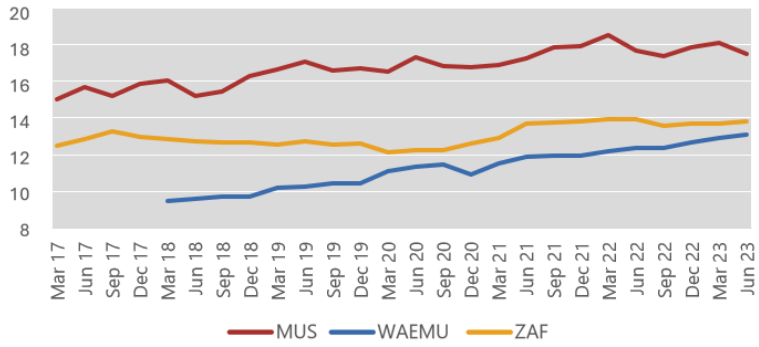
28. **The South African banking system is significantly larger than that of Mauritius or the WAEMU.** South Africa is the largest economy in Africa. The total assets of South African banks exceeded $400 billion in 2022, while for banks in WAEMU total assets were no more than $60 billion. Although Mauritius is an even smaller economy, the banking sector is relatively large, with total bank assets of $42 billion. The banking sector in WAEMU countries is dominated by two countries, Côte d'Ivoire and Senegal, which represent over 50% of the banks and over 60% of the banking assets. More than 20% of banks are regional in nature and operate in more than half of the jurisdictions in WAEMU. In the case of Mauritius,

foreign banks play an important role in the banking industry. The banking sector is composed of 19 banks, of which five are local banks.

29. **On average, banking sectors were well capitalised at the onset of the pandemic.** Graph 6 shows that in all cases Common Equity Tier 1 (CET1) capital ratios were well above 10% at the start of the pandemic in all cases. They remained above this threshold even during the pandemic. CET1 ratios continued to grow in all selected countries, even during the pandemic.

Common Equity Tier 1 capital as a percentage of risk-weighted assets

In per cent Graph 6



MUS = Mauritius; WAEMU = West African Economic and Monetary Union; ZAF = South Africa.

Sources: BCEAO; BOM; SARB.

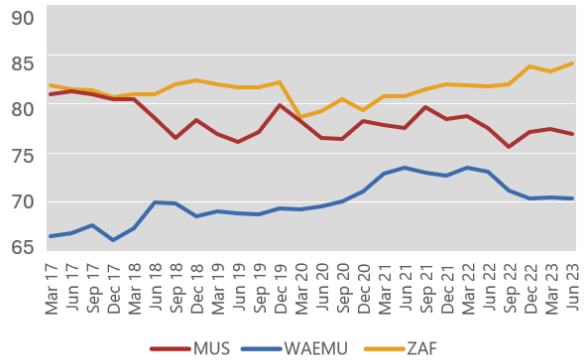
30. **Deposits performed differently across the selected countries during the pandemic.** Deposits over total assets were highest in South Africa, possibly motivating a more modest injection of liquidity in the banking sector by the South African Reserve Bank (SARB) during the pandemic (see Graph 7). At the same time, banks in South Africa experienced more subdued growth in deposits, which continued in 2021. A possible explanation is that the lockdown in South Africa was not only more severe but also lasted longer than in most of Africa.

Banking indicators – customer deposits

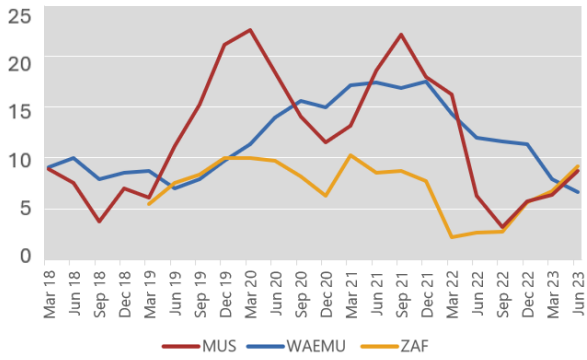
In per cent

Graph 7

A. Deposits over total assets



B. Deposits – year-on-year growth



MUS = Mauritius; WAEMU = West African Economic and Monetary Union; ZAF = South Africa.

Sources: BCEAO; BOM; SARB.

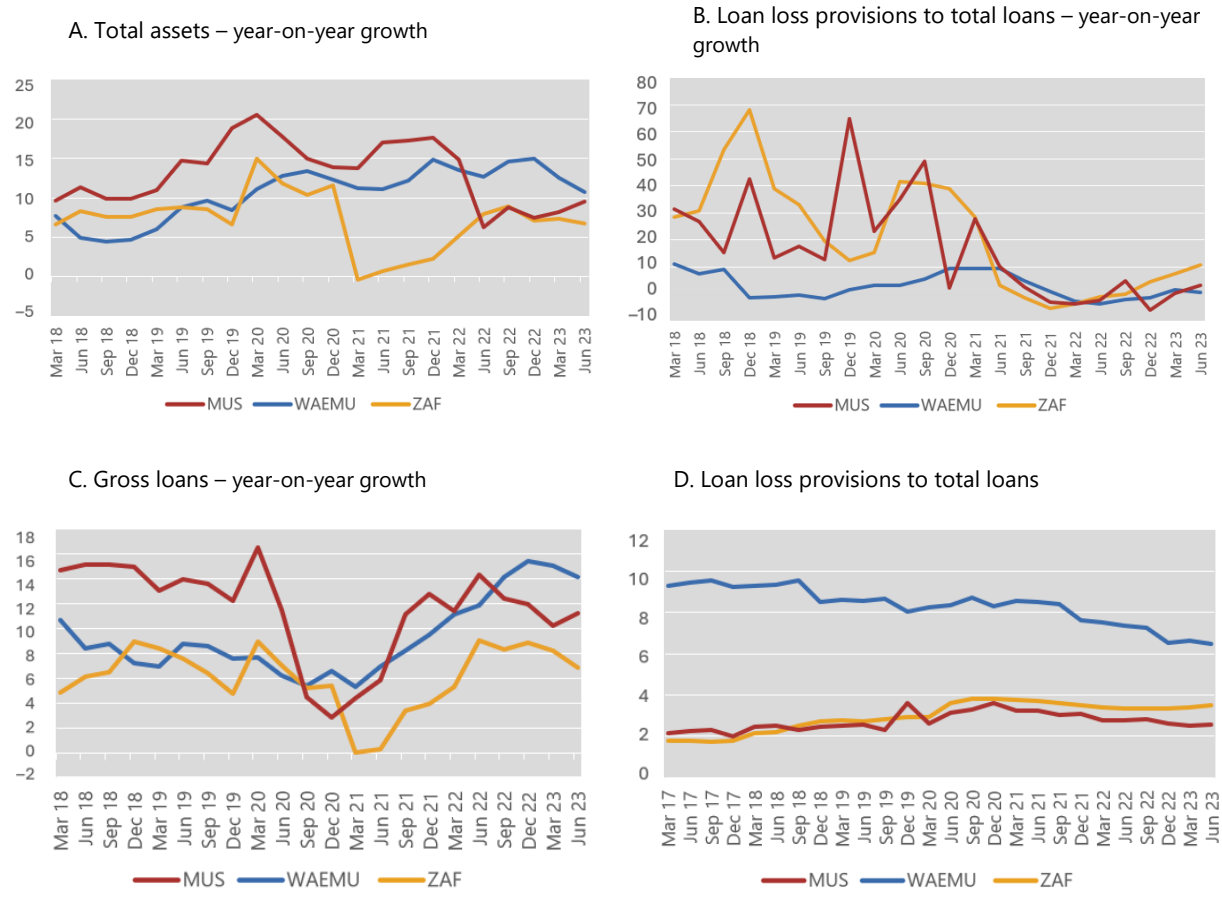
31. **Gross loan growth slowed during the crisis, across the whole sample, before picking up post-crisis.** As shown in Graph 8, the drop was more severe in Mauritius. One possible factor driving this dynamic could be the exit of, or substantial reduction in activity by, foreign banks. However, post-pandemic, the pickup in loan growth has been strong for Mauritius, even if it has not reached post-pandemic levels.

32. **Banks in the three jurisdictions took different approaches to adjusting provisioning during the pandemic.** Banks in South Africa and Mauritius broadly took a distinct approach: their provisions as a share of gross loans increased during the early phases of the pandemic and stabilised thereafter. For banks in WAEMU countries, where provisions as a share of gross loans were high by historical standards prior to the pandemic, they dropped during the pandemic and continued to drop afterwards.

Banking indicators – assets and provisions

In per cent

Graph 8



MUS = Mauritius; WAEMU = West African Economic and Monetary Union; ZAF = South Africa.

Sources: BCEAO; BOM; SARB.

Macroprudential policies

33. **To varying degrees, the selected African countries loosened macroprudential requirements to respond to the pandemic.** As documented in Graph 9 and Annex 2, the relevant authorities in Mauritius, the WAEMU countries[24] and South Africa loosened some of their macroprudential requirements in 2020.[25] Such measures were in line with the recommendations of the Basel Committee on Banking

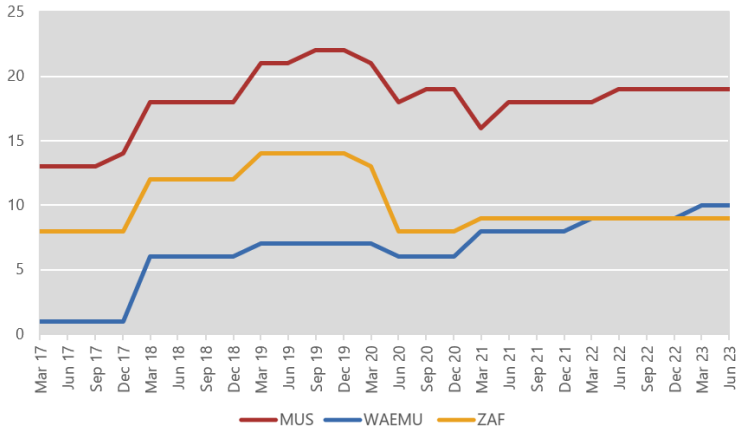
[24] See for instance BCEAO (2020) for a list of measures, other than macroprudential ones, introduced by the BCEAO in the monetary union.

[25] The analysis is based on the IMF iMaPP database. Reporting by national or regional authorities may be slightly different (eg SARB reported its early macroprudential measures in response to the pandemic in SARB (2020)). For comparability across countries, the measures in the iMaPP database are not revised in this paper on the basis of domestic publications by the relevant authorities.

Supervision (BCBS)[26] and were introduced by prudential authorities worldwide at the time. These recommendations included, among others, the deferral of the Basel III prudential standards for banks, including specific requirements related to the treatment of market risk and Pillar 3 disclosures, as well as clarifications concerning the impact of government guarantees on loan classifications and the amendment of transitional arrangements for the regulatory treatment of expected credit loss accounting.

Effective macroprudential stance

Cumulative number of tightening (+) and loosening (–) macroprudential measures — Graph 9



MUS = Mauritius; WAEMU = West African Economic and Monetary Union; ZAF = South Africa.

This macroprudential stance indicator is a cumulative measure of the various macroprudential policies, including tightening and easing, implemented by local authorities since 2000. It should be noted that each macroprudential policy measure is presented as an index in the iMaPP database. It is therefore possible to create another aggregate index.

Source: IMF iMaPP database, supplemented by BCEAO, BOM and SARB for the post-2021 datapoints.

34. **The starting point of their macroprudential policies was not homogeneous.** Taking the credit-to-GDP gap[27] as an indicator of the tightness of credit conditions, analysis by domestic or international authorities indicates that the selected countries faced different situations just before and during the Covid-19 pandemic. SARB (2022) shows that in South Africa, credit was significantly above long-term conditions in the first months of 2020, but it reversed abruptly during the same year, and the credit-to-GDP gap turned negative by early 2021. In Mauritius, on the other hand, credit remained above trend for most of the pandemic: the gap turned positive, for both households and corporates around mid-2020 and continued to be positive at least until end-2021 (Bank of Mauritius (2022)). For the WAEMU countries, IMF (2024a) shows that the gap remained positive throughout the pandemic, although at lower levels than during the earlier peak in 2016. Overall, this could suggest that SARB may have been more careful in releasing macroprudential requirements due to concerns relating to the preceding credit boom. At the opposite end, Mauritius entered the pandemic with relatively weak credit conditions, possibly reducing authorities' concerns about tiggering an excessive credit expansion.

35. **Mauritius, WAEMU and South Africa's macroprudential measures in response to the Covid-19 pandemic mostly related to capital buffers.** For the WAEMU countries, the BCEAO introduced a

[26] See BCBS (2020a,b) for the measures introduced by the BCBS and its oversight body, the Group of Central Bank Governors and Heads of Supervision, to alleviate the impact of the pandemic.

[27] The credit-to-GDP gap is the difference between the credit-to-GDP ratio and its long-run trend. It aims to quantify the notion of "excessive credit" in an intuitive and easy to measure way.

single measure, in June 2020, corresponding to the postponement by one year of the transition to the Basel II/III bank prudential requirements. This implied that the capital conservation buffer (CCoB) would remain unchanged at end-2020 from its 2019 level, which was 1.25%.

36. **In South Africa, a range of measures were introduced in relation to capital requirements.** In particular, in April the authorities authorised banks to draw down the CCoB, which had last been increased to 2.5% in 2019. At the same time, they also reduced the Pillar 2A minimum capital requirement, temporarily reducing it to zero (ie banks were allowed to conduct business with a 0% Pillar 2A capital requirement). In June, they also they announced a postponement of the implementation of certain aspects of the Basel III standard.[28] The authorities in South Africa also introduced two measures aimed at moderating the required amount of loan loss provisions, in March[29] and in May.[30] Finally, concerning liquidity, the minimum Liquidity Coverage Ratio (LCR) requirement was lowered to 80%, from 100% in April.

37. **Mauritius was an early adopter of macroprudential measures, and unwound some of them during the pandemic.** Mauritius introduced macroprudential measures earlier than other countries in Africa, launching several of them in the first half of the 2010s, and a few others more than a decade prior. Moreover, these measures covered several aspects of the banking business, including balance sheet requirements (eg capital buffers, loan loss provisioning, limits on distributions and capital charges for systemically important banks), additional requirements related to the banks' exposures (eg risk weights for real estate-related exposures, caps on loan-to-value and debt service-to-income ratios) and liquidity requirements. During the pandemic, some of these pre-Covid provisions were unwound on a temporary basis. The return to pre-Covid conditions was more prolonged in Mauritius than in the WAEMU or South Africa. The first response started in March and April 2020, as in the WAEMU and South Africa, but more measures were released later in 2020, and a few in early 2021. The macroprudential response at the time of the pandemic hinged on capital buffers (CCoB), credit risk (provisions, risk weights and credit impairments) and limits on household lending (caps on loan-to-value and debt service-to-income ratios).

38. **The macroprudential response was short-lived.** In all of the selected countries, there was a return towards tightening macroprudential measures twelve months after the initial response in early 2020, together with a tightening of monetary policy. The recovery of real economic growth, positive credit-to-GDP gaps in WAEMU and Mauritius, and the acceleration of inflation were likely drivers of the rapid correction in the macroprudential stance (see Annex 1). In addition, the impact of the Covid-19 pandemic was relatively more muted on the continent, with the exception of South Africa, than in other parts of the world. Among the more open financial systems within the sample, a concern about capital outflows may have also supported early normalisation of the macroprudential stance. South Africa in particular has an active money market and real investment yields became more attractive abroad. This was due to interest rates rising in advanced economies, notably the United States, as well as worsening fiscal balances at home

[28] This refers to a postponement from 1 January 2021 to 1 April 2021 of the standardised approach to counterparty credit risk; capital requirements for bank exposures to central counterparties; capital requirements for banks' equity investments in funds; revisions to the securitisation framework; total loss-absorbing capacity holdings; and large exposures framework. At the same time, the authorities postponed the introduction of the output floor, with a staggered schedule that envisaged the completion of the full application of the floor in January 2028 instead of in January 2027.

[29] A guidance note by SARB introduced certain amendments to International Financial Reporting Standard (IFRS) 9 concerning the recognition of credit losses. These measures covered various issues, such as payment holidays and restructured credit exposures.

[30] A guidance note by SARB provided additional relief in the treatment of credit risk and the application of IFRS 9, covering the same areas as the note issued in March.

and the depreciation of the domestic currency. As a result, there was a risk that capital in search of higher returns, especially that of non-resident investors, would move away from South Africa.[31]

Section 5 – An illustration: quantifying the impact of macroprudential policies on lending in selected sub-Saharan African countries

39. **This section covers the empirical analysis conducted to provide an illustration of the impact of macroprudential policies on bank lending.** The analysis builds on work in the literature on financial crises in credit markets and macroprudential policies, in particular Mathur et al (2023), Alessi and Detken (2018) and Garang et al (2022).

Data

40. **The data set used for the analysis is composed of confidential bank-level data provided by the Banking Commission of the WAEMU, the Bank of Mauritius (BOM) and the South African Reserve Bank (SARB).** The database includes quarterly loan data (at bank level) alongside a variety of other financial metrics that banks are mandated to report to their respective supervisory authorities, such as total assets, deposits and loan loss provisions. In comparison with publicly available data, which cover the banking sector only, the high level of granularity of the data provided by the above-mentioned authorities allows for the inclusion of several explanatory variables in the econometric analysis, and to reflect bank-specific developments. However, results are disclosed only in aggregate terms, per country or group of countries,[32] to preserve bank-level data confidentiality.

41. **The empirical analysis relies on an unbalanced panel data set.** The period covered spans from March 2017 to June 2023 with data at a quarterly frequency for all sampled countries. The Covid crisis period covers the quarters from March 2020 to March 2021 inclusive.

42. **Some banks qualified as outliers and were dropped from the sample.** The database suffers from some limitations, and data quality checks required the introduction of some adjustments. A few banks were dropped from the sample due to unusual and unexplained dynamics relating to loan loss provisions. A few other banks were excluded as the length of the data coverage was considered insufficient. In particular, in order to include only banks for which the data provided meaningful information about their behaviour both before and after the pandemic, banks with data points spanning less than two years before or after the Covid-19 crisis period were excluded from the sample.

43. **Linear interpolation was used to provide some of the missing data.** In a few cases, if one or two consecutive observations were missing for a given variable of an individual bank, the missing data was recalculated by the related intermediary means using the adjacent observations for the same bank.

44. **The final sample consists of an unbalanced panel of 2,442 observations for 123 banks.** The data cleaning process retained a large part of the original sample. For each country, at least three banks

[31] This would be the case in the event that prolonged support to the economy could trigger inflation and a currency devaluation.

[32] This is the approach taken in the case of the WAEMU countries, as monetary and macroeconomic policies are the same for all member countries. Prudential policies are also set at the regional level by the Banking Commission.

are included in the sample after data cleaning.[33] The proportion of banking sector assets included in the final sample remains above 65% in all cases, and in most cases significantly higher (see Table 1).

Banking sector sample, by country

Number of banks, total assets in national currency (thousands), as of December 2022 Table 1

		Initial database	Sample	% of initial database
WAEMU (total)	**Number of banks**	**112**	**94**	**84%**
BEN		12	10	83%
BFA		14	11	79%
CIV		27	20	74%
GBA		3	3	100%
MLI		13	12	92%
NGR		10	8	80%
SEN		22	19	86%
TGO		11	11	100%
WAEMU (total)	**Total assets (thousands)**	**60,243.3**	**55,342.2**	**92%**
BEN		5,891.1	4,173.4	71%
BFA		8,703.1	8,210.4	94%
CIV		21,369.8	20,036.4	94%
GBA		292.3	292.3	100%
MLI		7,109.5	6,764.4	95%
NGR		2,201.8	2,137.0	97%
SEN		10,657.0	9,709.6	91%
TGO		4,018.8	4,018.8	100%
ZAF	Number of banks	34	22	65%
	Total assets (thousands)	7,225,477.3	5,308,327.0	73%
MUS	Number of banks	8	7	88%
	Total assets (thousands)	1,585,696.2	1,549.487.3	98%
TOTAL	**Number of banks**	**154**	**123**	**80%**
	Total assets (thousands)	8,871,416.8	6,913,156.5	78%

Sources: BCEAO; BOM; SARB.

[33] Mauritius's banking sector is characterised by a relatively high number of foreign banks. These banks were included in the original sample, and their data were subject to the same review as for the other banks.

Model specification and methodology

45. **Given the focus of the analysis on the impact of macroprudential policies on lending, the dependent variable is loan growth.** This is expressed as the difference in a bank's loan level between two consecutive quarters, as a share of the bank's total assets. As discussed below, various control variables for both bank and country features, as well as policies, are included in the data set. The list and the description of all variables considered in this paper are available in the annex (see Annex 3).

46. **Independent variables are broken down into three groups.** Quantifying the impact of macroprudential policies on lending consists in isolating the effects of the main determinants of bank lending dynamics. Accordingly, three groups of independent variables are considered in this model. The first group is composed of bank-level factors linked to the bank's own lending policy and its performance (deposits and provisions); the second group refers to macroeconomic drivers, at the country level (GDP, the inflation rate (consumer price index (CPI)), and a Covid-19 pandemic dummy (COVID, defined as one for the quarters from March 2020 to March 2021 inclusive, and zero otherwise)); the third group of determinants is the set of policy tools (fiscal (government expenditure), monetary (key policy rate or monetary injections), microprudential (CET1 ratio) and macroprudential policies implemented by each country or group of countries.

47. **The key independent variable is the macroprudential policy in each country or group of countries.** The corresponding index of macroprudential measures is constructed as the sum implemented in a quarter across all categories according to the iMaPP database. Coverage in the database ends in 2021. For all sample countries, information on macroprudential measures was updated up to 2023 via submissions from the relevant authorities. In the regression, the index of macroprudential instruments in country c at time t is ($macropru_t^c$). The macroprudential policy measures included in the iMaPP database are listed in Table 2.

Macroprudential policy measures in iMaPP

Description of macroprudential measures included in the macroprudential policy indicator — Table 2

CCB (Countercyclical Capital Buffer)	A requirement for banks to maintain a countercyclical capital buffer. Implementations at 0% are not considered a tightening in dummy-type indicators.
Conservation	Requirements for banks to maintain a capital conservation buffer, including the one established under Basel III.
Capital	Capital requirements for banks, which include risk weights, systemic risk buffers and minimum capital requirements. Countercyclical capital buffers and capital conservation buffers are captured in their sheets respectively and thus not included here. Subcategories of capital measures are also provided in separate sheets, classifying them into household sector targeted, corporate sector targeted, broad-based and foreign exchange (FX)-loan targeted measures.
LVR (Leverage ratio)	A limit on leverage for banks, calculated by dividing a measure of capital by the bank's non-risk-weighted exposures (eg Basel III leverage ratio).
LLP (Loan Loss provision)	Loan loss provision requirements for macroprudential purposes, which include dynamic provisioning and sectoral provisions (eg housing loans).
LCG (Limits on Credit Growth)	Limits on growth or the volume of aggregate credit, household sector credit or corporate sector credit, and penalties for high credit growth. Subcategories of limits to credit growth are also provided, classifying them into household sector targeted, corporate sector targeted and broad-based measures.

LoanR (Loan Restrictions)	Loan restrictions that are more tailored than those captured in LCG. They include loan limits and prohibitions, which may be conditioned on loan characteristics (eg maturity, size, LTV ratio and type of interest rate of loans), lender characteristics (eg mortgage banks) and other factors. Subcategories of loan restrictions are also provided, classifying them into household sector targeted, or corporate sector targeted measures. Restrictions on foreign currency lending are mostly captured in LFC.
LFC (Limits on Foreign Currency)	Limits on foreign currency (FC) lending, and rules or recommendations on FC loans.
LTV (Loan-to-value ratio)	Limits to the loan-to-value ratios, applied to residential and commercial mortgages but also applicable to other secured loans, such as for automobiles. Other aspects of the LTV regulation are also covered, such as "speed limits" (ie a regulation on the percentage of new loans that can go above certain LTV limits).
DSTI (Debt Service to Income ratio)	Limits to the debt service-to-income ratio and the loan-to-income ratio, which restrict the size of debt service payments or the size of a loan relative to income (eg household income or net operating income of the company).
Tax	Taxes and levies applied to specified transactions, assets or liabilities, which include stamp duties and capital gains taxes.
Liquidity	Measures taken to mitigate systemic liquidity and funding risks, including minimum requirements for Liquidity Coverage Ratios, liquid asset ratios, net stable funding ratios, core funding ratios and external debt restrictions that do not distinguish between currencies.
LTD (Loan-to-Deposit Ratio)	Limits to the loan-to-deposit (LTD) ratio and penalties for high LTD ratios.
LFX (Limits on Foreign Exchange)	Limits on net or gross open foreign exchange (FX) positions, limits on FX exposures and FX funding, and currency mismatch regulations.
RR (Reserve Requirement)	Reserve requirements (domestic or foreign currency) for macroprudential purposes. This category may include measures used for monetary policy purposes as distinguishing measures for macroprudential or monetary policy purposes is often not clear-cut. A subcategory of reserve requirements is provided for those differentiated by currency (RR_FCD), as they are typically used for macroprudential purposes.
SIFI (Systemically Important Financial Institution)	Measures taken to mitigate risks from global and domestic systemically important financial institutions (SIFIs), which includes capital and liquidity surcharges.
Other	Macroprudential measures not captured in the above categories – eg stress testing, restrictions on profit distribution and structural measures (eg limits on exposures between financial institutions).

Source: IMF iMaPP database. The text is extracted from the iMaPP Table of Contents' definitions.

48. **The econometric analysis relies on a fixed effects panel model.** This statistical technique is used in panel data analysis when it is necessary to control for time-invariant characteristics of entities. Fixed effects estimation is suitable for this study because it allows for taking into account unobserved heterogeneity across banks that could bias the results. Each bank has unique and time-invariant characteristics that can impact their loan growth. Fixed effects control for such constant factors, ensuring that the estimated impact of macroprudential policy on banks' loan growth is not impacted by confounding factors.

49. **Various specifications are considered.** The chosen specification[34] represents a model for the loan growth rate for bank i at time t (LGR_{it}), incorporating a variety of macroeconomic and bank-specific factors. The dependent variable, LGR_{it}, is a function of the previous period's gross loans per total assets ($rlassets_{it-1}$), macroprudential requirements in country c and capital level at each bank ($macropru_t^c$ and $micropru_{it}^c$), the key monetary policy rate ($krate_t^c$), annual changes in the liquidity injected in the system by the central bank ($liquidity_t^c$), as well as the real GDP growth and inflation rate (GDP_t^c and CPI_t^c) of the country c where the bank is located. Additionally, the regression includes the bank's ratio of provisions per gross loans ($provisions_{it-1}$) and the ratio of deposits per total liabilities ($deposits_{it-1}$), both of which lagged by one period. The model also incorporates a bank-specific fixed effect (α_i) and an idiosyncratic error term (ϵ_{it}). Together, these variables aim to capture both the broad economic environment and specific bank characteristics that influence loan growth.

$$LGR_{it} = \alpha_i + \beta\, rlassets_{it-1} + \gamma\, f(macropru_t^c; micropru_{it}; krate_t^c; liquidity_t^c; GovExp_t^c)$$
$$+ \delta\, g(GDP_t^c\,; CPI_t^c\,; COVID_t^c) + \theta\, k(provisions_{it-1}; deposits_{it-1}) + \epsilon_{it}$$

50. **In order to estimate the impact of macroprudential instruments during the Covid-19 pandemic, the full sample can be split by date, as well as by country or group of countries.** For each group of countries, three equations are considered: the full sample period, the non-Covid period and the Covid-19 crisis period. The full sample period (*all*) starts in March 2017 and ends in June 2023 inclusive. The *crisis* period covers the time interval from March 2020 to March 2021 inclusive. The *no Covid* period covers the rest of the full time period, ie excluding the *crisis* period.

Results

51. **The results of the main specification show a significant effect of macroprudential policies on bank lending.** There is a significant and negative impact of macroprudential instruments (ie an increase in the macroprudential index (tightening) reduces lending). In other words, an expansionary macroprudential stance supports increases in bank lending (Table 3). This is the case when considering the whole sample period for all countries. For instance, a release of the macroprudential measures leads to an increase in loan growth of almost 0.3 percentage points in the same year when considering all countries in the sample, over the full time horizon.[35]

52. **Macroprudential policies were most effective during the pandemic.** The impact during the period of the Covid-19 pandemic has the highest level of significance and the highest value, irrespective of the specification. This holds true both when looking at the whole sample of countries, or breaking the analysis down by individual countries/groupings. Looking again at the full set of countries but considering only the Covid-19-related months, the impact of a release of macroprudential measures generates higher loan growth of 0.47 percentage points in the same year.

53. **The intensity of the impact of macroprudential policies varies across jurisdictions.** For South Africa and Mauritius, although the impact is negative over the entire sample period, only during the Covid-19 crisis interval do macroprudential measures have a significant impact on the availability of credit. For

[34] This specification was chosen on the basis of data availability, degrees of freedom and the quality of the results. Concerning the latter, this specification performed best in terms of the coherence between variables (signs and magnitudes), the stability of results across countries and subsamples (for instance, for the definition of the Covid-19 period, three different time intervals were considered) and the R-squared (even if small in most cases).

[35] Robustness checks are presented in Annex 4.

banks in the WAEMU countries, the impact is negative and significant across any chosen period. During the Covid-19 period, the impact becomes stronger.

54. **Concerning capital levels, their impact is significant only in normal times.** In most countries, the coefficient is not significant during the Covid-19 period. Overall, the limited impact may simply reflect the fact that banks' capital levels do not directly affect lending volumes.

55. **The impact of monetary policy is country/region specific.** Its impact is significant only for WAEMU banks. A decrease in the policy key rate helped to sustain loan growth, especially during the crisis. The coefficient almost doubled between normal and pandemic periods.

56. **Fiscal policies have a more muted impact.** The increase in government expenditures supported lending growth in South Africa and Mauritius, but not in the WAEMU countries, and only during the pandemic period.

57. **Results concerning the impact on lending growth of bank-specific and macroeconomic variables are mixed.** Regarding the former, deposit growth is significant for the WAEMU countries, but not in South Africa and Mauritius. Concerning macroeconomic variables, real GDP growth is significant only in South Africa and Mauritius; neither GDP nor CPI are significant in the WAEMU countries.

58. **Overall, the analysis indicates that macroprudential measures are effective in supporting bank credit, while other variables are less impactful.** Macroprudential measures appear to affect loan growth across all specifications and were most effective during the Covid-19 pandemic. Capital levels, monetary policy intervention and fiscal support, as well as other bank-level indicators, show a more limited impact. This may suggest that macroprudential policies are especially well suited for use in times of crisis such as the Covid-19 pandemic.

Table 3

The impact of macroprudential policies on lending

	All countries			South Africa & Mauritius			WAEMU		
	All	No Covid	Covid	All	No Covid	Covid	All	No Covid	Covid
Lagged Loans to Asset	–9.714**	–8.041**	–23.925**	–0.706	–1.317	–1.234	–16.177**	–13.256**	–32.090**
	0.00	0.00	0.00	0.43	0.18	0.76	0.00	0.00	0.00
Macroprudential Policy Qtr on Qtr	–0.283**	–0.391*	–0.469*	–0.071	–0.111	–0.600**	–0.640**	–1.038**	–1.468**
	0.01	0.01	0.03	0.19	0.14	0.00	0.00	0.00	0.00
Microprudential Policy Qtr on Qtr	–1.661*	–1.485*	–4.965	–0.022	–0.013	0.156	–11.473**	–13.926**	–4.830
	0.02	0.03	0.28	0.94	0.96	0.97	0.00	0.00	0.39
Monetary Policy Key Rate Yr on Yr	–23.307**	–37.628	–36.467	3.713	1.299	20.974	–32.937**	–38.547*	–70.950*
	0.00	0.00	0.21	0.46	0.87	0.43	0.01	0.01	0.05
Gov't Expenditure as % GDP Yr on Yr	–5.988	0.333	12.400	6.334	4.144	66.681**	–14.269	–4.461	–38.796
	0.33	0.96	0.55	0.20	0.52	0.00	0.10	0.66	0.18
Real GDP Annual Growth	7.004*	–0.971	10.521	4.966**	–1.146	10.839**	5.699	9.210	–4.177
	0.01	0.80	0.12	0.00	0.54	0.00	0.46	0.32	0.90
CPI Annual Growth	2.437	1.854	–9.760	–2.280	–0.252	15.140	3.812	5.985	–22.410
	0.40	0.53	0.51	0.54	0.95	0.23	0.36	0.17	0.33
Lagged Provisions to Loans Ratio	–0.050	–0.077	0.217	–0.036	–0.012	0.051	–0.060	–0.095**	0.255
	0.08	0.01	0.20	0.32	0.75	0.76	0.09	0.01	0.21
Lagged Deposits to Loans Ratio	5.555**	5.767	10.161	0.346	0.511	–3.135	9.449**	9.230**	14.939*
	0.00	0.00	0.07	0.71	0.61	0.43	0.00	0.00	0.03
Covid	0.000	0.000	0.006	0.000	0.000	0.005	–0.018	–0.027*	0.272*
	0.19	0.48	0.34	0.44	0.19	0.05	0.15	0.04	0.01
Intercept	3.199**	2.807*	5.986	0.704	1.119	1.112	4.978**	3.777*	7.536
	0.01	0.03	0.18	0.42	0.25	0.73	0.00	0.04	0.19
Number of observations	2,442	1,857	585	667	522	145	1,775	1,335	440
R–squared	3%	4%	7%	3%	2%	24%	6%	8%	11%

* p<.05, **p<.01. The "All" sample period covers 2017–23; "Covid" is the period from Q1 2020 to Q1 2021 inclusive; "No Covid" is the remaining part of the "All" sample period.

Caveats

59. **The empirical analysis, while illustrative of the potential impact of macroprudential policies, suffers from some limitations due to data availability.** The crisis period during which authorities activated a relatively high number of macroprudential measures is short, covering only four quarters. The time interval was selected to match the most intense phase of the Covid-19 response and associated accommodative prudential stance, but the number of observations is inevitably small. Data limitations also do not allow for the identification of loan supply and demand, as there is no separate information on credit demand levels. Finally, the analysis does not distinguish between different types of lending, eg mortgages or lending to companies, due to data availability issues.

60. **Data limitations also affect the assessment of the effectiveness of individual macroprudential policies.** Although the empirical analysis shows that macroprudential policies were effective in supporting bank lending during the pandemic, it does not distinguish the intensity of the impact of individual macroprudential measures. It is possible that some measures may have been more effective than others, but such distinctions in outcome cannot be traced in the results of the empirical analysis.

61. **Another aspect is the interaction with other policies.** The effectiveness of macroprudential policies may be affected by their combination with other policy tools. Although the empirical analysis separates macroprudential, fiscal and monetary policy, possible interactions between them were not tested due to the limited sample size.

Section 6 – Concluding remarks

62. **The experience of selected jurisdictions in sub-Saharan Africa confirms that macroprudential policies can generally be helpful in responding to a systemic shock.** The Covid-19 pandemic was a major test for the effectiveness of macroprudential policies, as it was an unexpected event that deeply affected the financial system and the economy. Analysing the macroprudential response of selected African countries reveals that bank lending flows responded positively to the loosening of macroprudential requirements.

63. **A key takeaway from the experience in the selected countries concerns the speed of the initial response.** Possibly because of GFC-related lessons about the costs of delaying a policy response, the selected countries responded with considerable speed to the start of the pandemic. The fact that the response was equally rapid around the world, with swift support from global SSBs, reinforced the decisiveness of the authorities in charge. Such rapid responses are likely to have helped the banking sector to retain confidence in their lending relationships and refrain from excessive credit contraction.

64. **A second, associated lesson focuses on the appropriate policy mix.** In the selected African countries, the macroprudential policies were generally accompanied by supportive fiscal and monetary policies. This coordinated approach is likely to have enhanced the effectiveness of macroprudential policies. Importantly, such consistency is critical also in the exit phase, once the emergency is over. In the selected Africa countries, expansionary macroprudential policies were rolled back within one year, likely reflecting the assessment that the impact of the pandemic was relatively contained. But an additional factor may have been concerns about expansionary macroprudential policies conflicting with the need to keep inflation under control and discourage capital outflows. High levels of uncertainty at the outset of the pandemic about its length and intensity further complicated the choice of the most appropriate policy mix over time. When countries are pursuing conflicting objectives, such as price stability on the one hand

and loan growth on the other, there is a risk of inconsistency, requiring careful coordination across policy domains.

65. **Lessons from the selected jurisdictions need to reflect the set of available macroprudential tools at the authorities' disposal.** In comparison to non-African peers, African countries, including the 10 selected jurisdictions, made less use of the macroprudential policy lever. Limitations in their toolkit may have contributed to this policy choice. While Mauritius was an early adopter of macroprudential policies and benefited from a large toolkit, in the WAEMU countries and South Africa the toolkits were more limited. In addition, even where the institutional framework was in place, limited build-ups of macroprudential buffers provided authorities with only a narrow policy space within which to use macroprudential policies during the pandemic.

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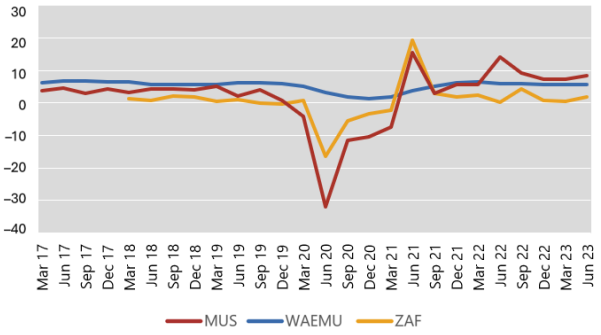
Annexes

Annex 1: Macroeconomic indicators in selected sub-Saharan African countries

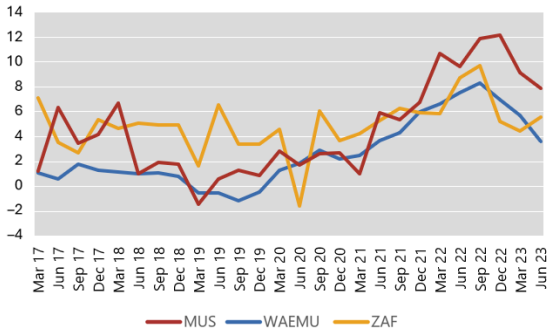
Real GDP and Inflation

Year-on-year change, in per cent — Graph A.1

A. Real GDP



B. Inflation



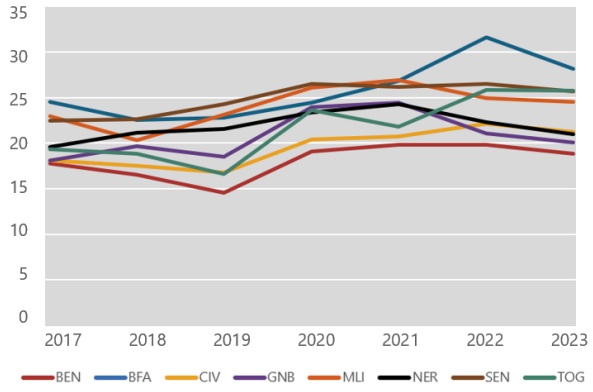
MUS = Mauritius; WAEMU = West African Economic and Monetary Union; ZAF = South Africa.

Sources: BCEAO; BOM; SARB.

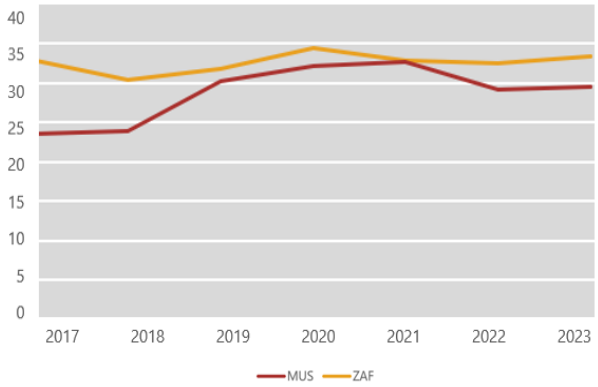
Government expenditure

As a percentage of GDP — Graph A.2

A. West African Economic and Monetary Union



B. Mauritius and South Africa



BEN= Benin; BFA= Burkina Faso; CIV= Ivory Coast' GNB= Guinea-Bissau; MLI= Mali; MUS= Mauritius; NER= Niger; SEN= Senegal; TOG= Togo; ZAF= South Africa.

Source: African Development Bank Socio-Economic database.

Annex 2: Macroprudential measures – detailed description in iMaPP

This annex provides a detailed list of measures introduced in Mauritius, South Africa, and the West African Economic and Monetary Union (WAEMU) countries since 2017. Changes related to the Covid response are highlighted in bold.

Mauritius – macroprudential policy measures

Description of macroprudential measures — Table A.1

Measures	Current calibration
Broad-based tools	
Capital conservation buffer (CCoB)	The Bank of Mauritius (BoM) implemented the Basel III capital standards starting 1 July 2014, requiring banks to maintain a minimum risk-weighted capital adequacy ratio (CAR) of 10.0%. The phased implementation of the CCoB began in January 2017, targeting a 2.5% CET1 capital by January 2020. Initially, the CCoB was set at 0.625% in 2017, increased to 1.25% in 2018, and 1.875% in 2019, with a planned rise to 2.5% by January 2020. **However, due to the Covid-19 pandemic, this final increase was postponed, first to May 2020, then to January 2021, and finally to April 2022. These delays aimed to provide banks with additional flexibility.** The full 2.5% CCoB requirement was reintroduced and became effective on 1 April 2022, aligning with the Basel III framework.
Forward-looking loan loss provisioning requirement	As of 1 January 2018, banks in Mauritius must adopt IFRS 9 and the expected credit loss approach for loan loss provisioning. The BoM instructed banks to follow the IFRS 9 application guidance issued by the International Accounting Standards Board (IASB) on 27 March 2020. **On 13 January 2021, the BoM introduced transitional arrangements for the regulatory capital treatment of IFRS 9 provisions. These arrangements permit financial institutions to add back a portion of their IFRS 9 provisions to their regulatory capital, phasing out over four years. Banks electing to apply these arrangements must disclose this in their audited financial statements. These measures, introduced to support the banking sector during the pandemic, aim to protect banks' capital base and allow them to build additional capital buffers to manage pandemic-related risks.**
Limit on distributions	Section 27(1) of the Banking Act 2004 restricts any deposit-taking institution from declaring, crediting, paying or transferring abroad any dividend, or making any transfer from profits unless three conditions are met: (i) the central bank must be satisfied that such actions will not contravene capital adequacy or liquidity requirements or impair future capital adequacy or liquidity; (ii) any impairment in the amount paid as stated capital or assigned capital has been rectified; and (iii) adequate provisions have been made for impaired credits. Effective 24 September 2020, the Guideline on Payment of Dividend was introduced, outlining detailed minimum criteria and requirements for deposit-taking institutions to declare or transfer profits. The main objective of this guideline is to ensure capital preservation, consolidate the financial positions of these institutions to absorb future losses and enhance the resilience of the financial system.
Capital surcharges for systemically important institutions	The BoM released the Guideline for Dealing with D-SIBs on 27 June 2014, outlining the methodology for classifying an institution as systemically important. D-SIBs were required to comply with higher capital requirements in a phased manner from 1 January 2016, to be fully compliant by 1 January 2019. The determination of D-SIBs is conducted annually based on end-June figures, and the same five banks have been identified as D-SIBs since the framework's introduction. D-SIBs must hold a capital surcharge ranging from 1.0% to 2.5% of their RWAs, based on their systemic importance scores and assigned bucket, with no banks in bucket 5. The phase-in of the additional CET1 capital requirements for D-SIBs was as follows: effective 1 January 2016, the CET1 capital surcharge was 0.25% for bucket 1, 0.375% for bucket 2, 0.5% for bucket 3 and 0.625% for bucket 4; on 1 January 2017, it increased to 0.5%, 0.75%, 1.0% and 1.25%, respectively; on 1 January 2018, it was raised to 0.75%, 1.125%, 1.5% and 1.875%, respectively; and by 1 January 2019, the surcharge reached 1%, 1.5%, 2% and 2.5%, respectively for the corresponding buckets.

Other broad-based measures to increase resilience or address risks from broad-based credit booms	The Banking Act 2004 was amended effective 24 July 2017, to introduce an additional capital buffer and improve bank resilience by raising the minimum capital requirement from MUR 200 million to MUR 400 million in a phased manner. Banks were required to increase their capital to MUR 300 million by 1 July 2018, and to MUR 400 million by 1 July 2019. **On 5 March 2020, the BoM suspended the Guideline on Credit Impairment Measurement and Income Recognition, effective since January 2020. This suspension aimed to enable commercial banks to support enterprises facing cash flow and working capital difficulties due to Covid-19.**
Measures to mitigate risks from financial institutions' exposures to sovereigns	As per the Guideline on Standardised Approach to Credit Risk, effective 20 February 2018, claims on the government of Mauritius denominated and funded in Mauritius rupees must be assigned a preferential risk weight of 0%. Claims on other sovereigns denominated and funded in their local currency may be assigned a preferential risk weight as determined by the supervisory authority of the sovereign, subject to written approval by the BoM. In the absence of such approval, claims on other sovereigns in their local currency must be assigned risk weights based on their credit rating buckets. Additionally, claims on other sovereigns in a currency other than their local currency, as well as claims on the government of Mauritius denominated in a currency other than the Mauritius rupee, must be assigned risk weights according to rating buckets assigned by credit agencies.
Measures to address risks from financial institutions' cross-border exposures (including reciprocity)	The BoM released a Guideline on Country Risk Management effective April 2010 to ensure banks have a framework for identifying, measuring and managing country exposures, and making provisions accordingly. This guideline mandates banks to establish a robust country risk management system, with the board of directors of Mauritius-incorporated banks bearing primary responsibility for effective management. The assessment involves evaluating the nature of risks linked to individual country exposures and country conditions, necessitating thorough evaluations of risks associated with cross-border operations that might affect the bank's risk profile. Banks are required to set appropriate limits for individual country exposures. Furthermore, as announced and effective 4 September 2020, the BoM introduced a Guideline on Cross-Border Exposure to supplement existing guidelines and provide additional minimum standards for managing cross-border exposures, focusing on a risk-based management framework to mitigate primary cross-border banking risks.
Household sector tools	
Household sector capital requirements	The BoM revised risk weights for housing loans to address systemic risks, effective 1 July 2014, with further revisions in January 2015. Loans up to MUR 5 million are risk-weighted at 35%, loans between MUR 5 million and MUR 12 million at 100%, and loans exceeding MUR 12 million at 125%. For past due loans (over 90 days), the weights are 100%, 125%, and 150%, respectively. For claims secured by residential property for purposes other than purchase/construction, loans up to MUR 5 million are risk-weighted at 35% (LTV ≤ 80%) or 75% (LTV > 80%), loans between MUR 5 million and MUR 12 million at 75%, and loans over MUR 12 million at 100%. **Due to Covid-19, as of 19 May 2020, risk weights for residential property claims (excluding Integrated Resort Scheme (IRS)/ Real Estate Scheme (RES) loans) were adjusted: loans up to MUR 10 million at 35%, loans between MUR 10 million and MUR 20 million at 75%, and loans over MUR 20 million at 100%. The weights for Property Development Scheme (including IRS/RES) loans remained unchanged: 35% for loans up to MUR 5 million, 100% for loans between MUR 5 million and MUR 12 million, and 125% for loans over MUR 12 million. Claims not meeting all criteria in paragraph 35(a)–(f) of the Guideline on Standardised Approach to Credit Risk must be risk-weighted at 125%.**

Cap on loan-to-value ratio	On 4 October 2013, the BoM introduced the Guideline on the Computation of LTV Ratio for Residential and Commercial Property Loans, effective 1 January 2014. In January 2014, the definition of exempt facilities was broadened to include loans guaranteed by the government under approved schemes. In September 2014, the scope was extended to include refinancing of pre-existing loans for residential property. The guideline was revised on 4 July 2017, to set LTV limits: for first housing units, a maximum LTV of 100% for loans up to MUR 5 million, and 90% for any amount exceeding MUR 5 million; for second or subsequent properties, an LTV limit of 70%. This guideline was repealed on 6 July 2018, following the government's decision to remove LTV limits. **Due to the Covid-19 pandemic, effective 17 June 2021, the BoM set the maximum LTV ratio at 80% for self-employed individuals and contractual employees, and 100% for other individuals.** On 10 June 2022, the BoM clarified that banks could apply higher LTV ratios for self-employed individuals on a case-by-case basis, provided they conducted a robust credit risk assessment and ensured the individual's gross monthly income was at least MUR 100,000 over the past 12 months. In joint loan cases, the LTV ratio applied must depend on the main borrower's capacity to service the debt.
Cap on debt service-to-income ratio	On 4 October 2013, the BoM introduced DSTI measures, effective 1 January 2014, to prevent borrowers from becoming overleveraged when purchasing or constructing property. Changes were made on 3 January 2014 and 10 September 2014. In January 2014, "exempt facilities" included government-guaranteed loans under approved programmes. In September 2014, refinancing of credit facilities was conditioned so that the new DSTI ratio would not be more favourable to borrowers than the existing one. As of 3 January 2014, banks had to ensure that a borrower's DSTI ratio did not exceed 40% if their monthly gross income was less than MUR 200,000, or 50% if it was more. For joint applications by a husband and wife, the same limits applied based on their combined monthly gross income. **Following the Covid-19 crisis, effective 19 May 2020, the BoM determined that the DSTI ratio would not apply to credit concessions for those affected by the pandemic, requiring banks to keep evidence of bypassed DSTI ratios due to Covid-19.** Further amendments, effective 17 June 2021, mandated that the DSTI ratio for single and joint borrowers should not exceed 50%. In joint applications involving multiple borrowers, banks must determine each borrower's repayment instalment consistent with their repayment capacity.
Other measures to mitigate systemic risks from loans to the household sector	Based on section 100 of the Banking Act of 2004 and section 50 of the BoM Act of 2004, the BoM required banks to set aside additional portfolio provisions for housing loans and the personal sector to ensure early provisioning against future credit losses due to rising indebtedness and NPLs. Announced in the Guideline on Additional Macroprudential Measures on 4 October 2013, and effective 1 July 2014, this measure required an additional provision of 0.5% for housing loans from 1 July 2014. For the personal sector, the additional provision was 0.5% from 1 July 2014, increasing to 1.0% from 1 July 2015. This additional provision is over and above the existing portfolio provision prescribed by the Guideline on Credit Impairment Measurement and Income Recognition. **However, due to the Covid-19 pandemic, the BoM suspended the additional general provision requirement, in line with the suspension of the Guideline on Credit Impairment Measurement and Income Recognition, effective 5 March 2020.**
Corporate sector tools	
Corporate sector capital requirements	Announced on 4 October 2013, and effective 1 July 2014, the BoM implemented a macroprudential measure on corporate credit by revising risk weights for subsectors in the construction sector to address systemic risks posed by both existing and new loans. Banks must assign the following risk weights for fund-based and non-fund-based credit facilities granted for the purchase/construction of commercial real estate in Mauritius and secured by commercial real estate: loans up to MUR 75 million are risk-weighted at 100%, and loans greater than MUR 75 million at 125%. For past-due loans over 90 days, loans up to MUR 75 million are risk-weighted at 125%, and loans greater than MUR 75 million at 150%. The risk weights for claims secured by residential property under the Property Development Scheme (including IRS/RES) remained unchanged: 35% for loans up to MUR 5 million, 100% for loans between MUR 5 million and MUR 12 million, and 125% for loans exceeding MUR 12 million. Claims secured by residential property for purchase/construction in Mauritius that do not meet all criteria in paragraph 35(a)–(f) of the Guideline on Standardised Approach to Credit Risk must be risk-weighted at 125%.

Other measures to mitigate systemic risks from loans to the corporate sector	The BoM implemented additional portfolio provisions for the tourism sector and subsectors of the construction sector to ensure early provisioning against future credit losses due to rising corporate indebtedness and NPLs in these key sectors. This measure was announced in the Guideline on Additional Macroprudential Measures for the Banking Sector on 4 October 2013, and became effective on 1 July 2014, with revisions in January 2015. These additional provisions are over and above those stipulated by the Guideline on Credit Impairment Measurement and Income Recognition. Banks must set aside additional provisions according to a phased timeline: for loans to the commercial and residential property development and land parcelling subsectors (classified under the construction sector), the additional provision was set at 0.5% effective 1 July 2014, and increased to 1.0% effective 1 July 2015; for the tourism sector, the additional provision followed the same timeline and percentages. **However, these additional general provisions have been temporarily placed on hold following the suspension of the Guideline on Credit Impairment Measurement and Income Recognition, effective 5 March 2020, due to the Covid-19 pandemic.**
Liquidity tools applied to the banking sector	
Liquidity Coverage Ratio	On 17 October 2017, the BoM announced revisions to its Guideline on Liquidity Risk Management, incorporating the LCR framework in line with Basel III requirements. Effective 11 January 2021, large wholesale foreign currency deposits over MUR 12 billion of a transitory nature (not exceeding seven calendar days) from distinct depositors could be excluded from outflows when computing the LCR, subject to certain conditions. The consolidated LCR, covering both domestic and foreign currencies, was implemented at 60% on 30 November 2017. It was subsequently increased to 70% on 31 January 2018, further to 80% on 31 January 2019, and finally reached 100% on 31 January 2020.
Liquidity Coverage Ratio differentiated by currency	The Guideline on Liquidity Risk Management, announced on 17 October 2017, and effective from 30 November 2017, mandates the LCR by material currencies. The phased implementation of the LCR in foreign currencies was as follows: 60% effective 30 November 2017; 70% effective 31 January 2018; 80% effective 31 January 2019; and 100% effective 31 January 2020. The guideline also set the LCR in domestic currency at 100%, which went into effect on 30 November 2017.
Net foreign exchange positions	The BoM introduced the Guideline for Calculation and Reporting of Foreign Exchange Exposures of Banks on 5 July 1996. Effective 10 January 2011, a circular letter established a limit on banks' exposures in individual foreign currencies to 10% of their Tier 1 capital. This limit was withdrawn on 8 June 2016, through another circular letter, which instead imposed a daily overall foreign exchange exposure limit of 15% of Tier 1 capital for banks.

Policy actions taken as a result of the Covid-19 pandemic effects are in bold.

Source: IMF iMaPP Macroprudential Policy Survey. Country reports accessed by individual country and year (2021, latest available year at the time of writing). This table is a summary of the corresponding IMF Country Table, no further re-elaboration was performed.

South Africa – macroprudential policy measures

Description of macroprudential measures Table A.2

Measures	Current calibration
Broad-based tools	
Countercyclical capital buffer (CCyB)	Effective 1 January 2016, the CCyB framework was implemented; decisions regarding the CCyB, informed by indicators including the Basel Committee on Banking Supervision (BCBS) credit-to-GDP gap, are made at quarterly Financial Stability Committee (FSC) meetings, with subsequent updates to the South African capital framework, aligning with Basel III principles, with the transitional phase-in period concluding at end-2018 and a maximum CCyB of 2.5% if applied.
Capital conservation buffer (CCoB)	The CCoB, fully implemented since 1 January 2019, with a target buffer of 2.5%, was phased in as follows: from 1 January 2016, at 0.625%, increasing to 1.25% on 1 January 2017, then to 1.875% on 1 January 2018, and finally to 2.5% on 1 January 2019; **in response to the Covid-19 pandemic, banks were permitted to utilise the CCoB effective 6 April 2020, with the framework essentially aligning with the Basel III framework**.
Limit on leverage ratio	The amended regulations, effective as a minimum requirement from 1 January 2018, establish a 4% leverage ratio aligned with the Basel III framework, applicable to banks and banking groups on both solo and consolidated bases, with additional specifications for derivative exposure calculation issued by the Prudential Authority (PA) in Directive 7 of 2020, implemented from 1 January 2021.
Forward-looking loan loss provisioning requirement	IFRS 9, effective for financial years ending after 1 January 2018, introduced forward-looking loan loss provisions; **in response to the Covid-19 pandemic, the PA issued Guidance Notes 3 and 6 of 2020, aligning with international guidance, including considerations for relief granted to retail portfolios, macroeconomic modelling and modifications of contractual cash flows.**
Limit on distributions	**As of 6 April 2020, in response to the adverse economic effects of the Covid-19 pandemic, the PA recommended no distribution of dividends or cash bonuses to executive officers and material risk-takers in 2020, with further guidance issued on 18 February 2021, urging banks to conserve capital and consider the adequacy of their capital and profitability levels**, and on 10 March 2022, advising boards and shareholders to carefully assess dividend and bonus payments in light of economic conditions and potential uncertainties, emphasising prudent payout ratios.
Capital surcharges for systemically important institutions	Since January 2016, the South African Reserve Bank has imposed capital surcharges on domestic systemically important banks (D-SIBs), based on size, interconnectedness, substitutability, complexity and cross-border activity indicators, with six D-SIBs identified, fulfilling the requirement with various capital types, and the implementation aligns with Basel standards, assessed under the Regulatory Consistency Assessment Programme in June 2015.
Other broad-based measures to increase resilience or address risks from broad-based credit booms.	**Effective 6 April 2020, in response to the Covid-19 pandemic, the PA temporarily reduced the Pillar 2A minimum capital requirement to 0%, reinstating it to 1% effective 1 January 2022**, while urging banks to conserve capital and consider current economic conditions when making distributions; additionally, implementation of various Basel III standards were delayed due to pandemic-related concerns, with revised implementation dates for other regulatory reforms effective 9 July 2021, based on industry feedback and complexity considerations.
Limits on the size of exposures between financial institutions	As of 1 April 2022, South Africa implemented amended regulations concerning banks, aligning with the BCBS framework for controlling large exposures, including limits on exposures to global systemically important banks (G-SIBs) and domestic systemically important banks (D-SIBs). These regulations cap exposures between D-SIBs, G-SIBs and other banks at various thresholds, such as a maximum of 25% for exposures to non-D-SIB or non-G-SIB banks, a monthly average of 25% for exposures of non-D-SIBs or non-G-SIBs to D-SIBs or G-SIBs, and others.

Measures to address risks from financial institutions' cross-border exposures (including reciprocity)	Effective 8 December 2015, South Africa aligns with the Basel Framework by reciprocating CCyB rates set by other jurisdictions, requiring internationally active banks within South Africa to apply CCyB rates, up to 2.5%, on their private sector credit exposures in the host country.
Liquidity tools applied to the banking sector	
Liquidity Coverage Ratio (LCR)	The LCR requirements, initially aligned with Basel III, were phased in from 2015 to 2019, and were later temporarily lowered to 80% **in response to the Covid-19 pandemic in 2020, before being reinstated to 100% by April 2022, with interim adjustments in 2022 to 90%.**
Liquid asset ratio	Since the late 1990s, banks have been mandated to maintain Level 1 high-quality liquid assets equivalent to 5% of their adjusted liabilities, according to Form BA 310 and Regulation 27.
Net stable funding ratio (NSFR)	The NSFR requirements, initially published on 12 December 2012, were enforced from 1 January 2018, aligning with the Basel III NSFR framework and its related requirements.
Net foreign exchange positions	The combined effective net open foreign currency position of the reporting bank and its foreign operations must not surpass an amount equivalent to 10% of the net qualifying capital and reserve funds of the bank.
Tools to address systemic liquidity risk and fire sale risk in the non-bank sector	
Insurance companies	**On 16 April 2020, the PA and the Financial Sector Conduct Authority (FSCA) issued Joint Communication 1 of 2020, detailing regulatory and supervisory measures to mitigate Covid-19-induced stress on insurers, including permitting financially unsound insurers with solvency capital requirement ratios below 100% solely due to Covid-19 impacts to continue operations, urging suspension of discretionary dividend distributions, encouraging premium relief for policyholders, granting dispensations for over-exposed institutional investors regarding foreign asset holdings, and advising against drastic actions by insurers facing solvency issues without prior engagement with authorities.**

Policy actions taken as a result of the Covid-19 pandemic effects are in bold.

Source: IMF iMaPP Macroprudential Policy Survey. Country reports accessed by individual country and year (2021, latest available year at the time of writing). This table is a summary of the corresponding IMF Country Table, no further re-elaboration was performed.

WAEMU – macroprudential policy measures

Description of macroprudential measures Table A.3

Measures	Current calibration
Broad-based tools	
Countercyclical capital buffer (CCyB)	Effective 1 January 2018, the Prudential System for Credit Institutions and Financial Firms in the WAEMU mandates a countercyclical buffer of up to 2.5% of total RWAs in CET1 capital, with activation criteria set according to Central Bank of West African States (BCEAO) instructions.
Capital conservation buffer (CCoB)	As of 1 January 2018, the WAEMU requires institutions to establish a Basel III-aligned conservation buffer of CET1 funds, gradually increasing from 0.625% to 2.5% by 1 January 2022, with penalties for non-compliance. The conservation buffer rate in the WAEMU region was initially scheduled to increase from 1.25% to 1.875% starting 1 January 2020, as part of the transition to Basel II/III bank prudential requirements. However, **authorities extended the transition period by one year, keeping the rate unchanged at 1.25% by 26 June 2020.** By 1 January 2021, the rate increased to 1.875%, and by 1 January 2022, it further rose to 2.5%. Failure to meet annual required levels subjects banks to an earnings conservation requirement based on the CET1 ratio.

Limit on leverage ratio	Effective 1 January 2018, all institutions must adhere to a minimum leverage ratio of 3% (Tier 1 core capital to total exposures), with systemically important banking institutions (SIBIs) potentially subject to higher ratios.
Limit on distributions	Effective 1 January 2018, institutions must restrict distributions based on their CET1 ratio, retaining 100% of distributable profits if the ratio is between 5 and 5.625%, 80% if between 5.625 and 6.25%, 60% if between 6.25 and 6.875%, 40% if between 6.875 and 7.5%, and 0% if 7% or above.
Capital surcharges for systemically important institutions	Effective 27 March 2020, the Banking Commission of the West African Monetary Union (CBU) adopted and released the list of SIBIs, with a methodology based on BCBS criteria; regional SIBIs must build a capital buffer of 1% CET1 by 30 June 2023, with transitional levels of 0.40% by 30 June 2021, and 0.70% by 30 June 2022.
Limit on leverage ratio for systemically important institutions	Effective 2 July 2018, the CBU may require SIBIs to maintain a leverage ratio greater than 3%, and SIBIs must also adhere to higher governance, management control and risk control standards, including the establishment of additional specialised committees for appointment, remuneration and compliance functions.
Liquidity tools applied to the banking sector	
Liquid asset ratio	Since April 2018, pending the finalisation of the Liquidity Coverage Ratio (LCR), a provisional system for monitoring institutions' liquidity risk has been in place, which includes a liquidity ratio defined as the ratio of liquid and marketable short-term assets (up to three months) to short-term current liabilities or commitments by signature.
Household sector tools	
Household sector capital requirements	Effective 1 January 2018, exposures to retail customers receive a risk weight of 75%, with a higher weight if their gross portfolio deterioration rate exceeds a BCEAO-set threshold for two consecutive quarters; residential property loans receive a 35% weight if the debt service coverage ratio is ≤40% and LTV ratio is ≤90%, otherwise, the risk weight is 75% or 100% depending on additional criteria.
Corporate sector tools	
Corporate sector capital requirements	Effective 1 January 2018, corporate exposures are assigned risk weights between 20% and 150%, with weights exceeding 100% if the gross corporate portfolio deterioration rate surpasses a BCEAO-set threshold for two consecutive quarters; loans guaranteed by commercial real estate must have an LTV ratio not exceeding 90% to qualify for a 75% risk weight under Pillar 1.
Limits on foreign exchange positions	
Gross foreign exchange positions	Effective 1 January 2018, banks are prohibited from maintaining open foreign exchange positions due to the surrender requirement, but may receive individual dispensations from the BCEAO to hold working balances in correspondent accounts, up to 5% of total customer demand deposits, reducing net currency positions and associated capital requirements; institutions are exempt from calculating foreign exchange risk capital requirements if their foreign exchange transactions volume does not exceed 100% of eligible capital and their overall net foreign exchange position in foreign currency does not exceed 2% of effective capital, as outlined in paragraph 327 of the prudential framework.
Measures to mitigate risks from interconnectedness	
Additional risk weights on exposures between financial institutions	Effective 1 January 2018, additional weights are applied to exposures between institutions, including a weight of 250% for exposures to financial institutions failing to comply with solvency ratios and a weight of 1,250% for exposures to institutions with negative capital, where the exposure is deducted from the capital.

Policy actions taken as a result of the Covid-19 pandemic effects are in bold.

Source: IMF iMaPP Macroprudential Policy Survey. Country reports accessed by individual country and year (2021, latest available year at the time of writing). This table is a summary of the corresponding IMF Country Table, no further re-elaboration was performed.

Annex 3: Description of variables used in the empirical analysis

Variables

Description of variables used in the econometric analysis — Table A.4

Variable name	Variable definition	Source
LGR_t	Quarterly loan growth rate defined as the difference between gross loans at time t and t–1, divided by total assets at time t–1.	BCEAO, BOM and SARB
$nlassets_{t-1}$	Ratio of non-liquid assets at time t–1 to total assets at time t–1. Non-liquid assets are defined as total assets minus liquid assets. Liquid assets are the sum of cash and interbank transactions and securities that can be used as collateral on the interbank or monetary market.	BCEAO, BOM and SARB
$macropru_t$	Quarterly difference in the macroprudential policy indicator between time t and t–1. The indicator represents the sum of macroprudential policy actions implemented at time t across all the IMF's sub-groups of measures: CCB, conservation, capital, LVR, LLP, LCG, LoanR, LFC, LTV, DSTI, tax, liquidity, LTD, LFX, RR, SIFI, Other, as defined in the iMaPP database (see Table 2).	IMF iMaPP database, BCEAO, BOM and SARB[1]
$micropru_t$	Microprudential policy indicator at time t defined as the CET 1 capitall ratio. It represents the bank's common equity capital at time t as a share of total risk-weighted assets at time t.	BCEAO, BOM and SARB
$krate_t$	Monetary policy rate at time t.	BCEAO, BOM and SARB
$liquidity_t$	Amount of liquidity injected by the central bank in the economy at time t. This is the volume of liquidity provided (lent) by the central banks to banks at a fixed rate or by auction.	BCEAO, BOM and SARB
GDP_t	Yearly change in the real gross domestic product at time t.	BCEAO, BOM and SARB
CPI_t	Yearly change in the consumer price index at time t.	BCEAO, BOM and SARB
$provisions_{t-1}$	Ratio of provisions at time t–1 to gross loans at time t–1.	BCEAO, BOM and SARB
$deposits_{t-1}$	Ratio of consumer deposits at time t–1 to total liabilities at time t–1.	BCEAO, BOM and SARB
COVID	Dummy variable equal to 1 from Q1 2020 to Q1 2021 and equal to 0 otherwise.	

[1] The variable macropru is sourced from the IMF iMaPP database with additional data points for 2022 and 2023 provided by the BCEAO, BOM and SARB.

Annex 4: Robustness checks of the empirical analysis

67. **Two alternative specifications are considered: the first envisages a different treatment of fiscal policies**. In this case, fiscal policies are measured by the growth rate in government expenditures in the previous period. Lagged information about fiscal policies could be significant if banks decide on their lending policies based on earlier trends in fiscal expenditure. This pattern may have continued to hold during the pandemic period. Even as authorities changed their spending patterns as part of their Covid-19 response, they tended to stress that the changes would be sustained for some time, until the emergency was under control.

68. **This robustness check confirms the result of the main specifications.** The effectiveness of macroprudential policy, especially in the pandemic period, is unaffected by the change in the specification of fiscal policies. The same is true for the other independent variables (see Table A.5).

69. **The second robustness check modifies the treatment of both monetary and fiscal policies**. In this case, monetary policy is measured by a quantitative measure, ie the liquidity injected by central banks into monetary markets. As in the first robustness check, fiscal policies are measured by the growth rate in government expenditures over the previous period.

70. **This second robustness check also confirms the main results**. Macroprudential policies remain significant, especially when breaking down the sample by different groups of countries. For the banks in Mauritius and South Africa, as well as the WAEMU countries, macroprudential policies have a slightly stronger impact than in the base model during the Covid-19 pandemic (see Table A.6).

Table A.5

The impact of macroprudential policies on lending – alternative specification (1)

	All countries			South Africa & Mauritius			WAEMU		
	All	No Covid	Covid	All	No Covid	Covid	All	No Covid	Covid
Lagged Loans to Asset	–9.226**	–7.172**	–24.567**	–0.308	–0.634	3.059	–15.646**	–12.366**	–31.636**
	0.00	0.00	0.00	0.76	0.58	0.45	0.00	0.00	0.00
Macroprudential Policy Qtr on Qtr	–0.299**	–0.411*	–0.446*	–0.097	–0.166*	–0.687**	–0.628**	–1.065**	–1.496**
	0.01	0.01	0.04	0.10	0.05	0.00	0.00	0.00	0.00
Macroprudential Policy Qtr on Qtr	–1.617*	–1.374*	–5.097	–0.018	0.013	–0.536	–11.972**	–14.461**	–4.342
	0.02	0.04	0.27	0.95	0.97	0.89	0.00	0.00	0.44
Monetary Policy Key Rate Yr on Yr	–19.179*	–37.376**	–39.866	2.643	0.153	–4.145	–24.780	–34.941*	–58.328
	0.02	0.00	0.16	0.63	0.99	0.88	0.05	0.03	0.09
Lagged Gov't Expenditure as % GDP Yr on Yr	–0.713	0.530	0.600	1.050	3.073**	–0.502	–1.124	–0.543	1.932
	0.46	0.68	0.74	0.16	0.00	0.63	0.39	0.75	0.42
Real GDP Annual Growth	8.133**	–0.517	9.506	5.124**	–1.526	10.680**	11.869	11.628	15.520
	0.00	0.90	0.14	0.00	0.46	0.00	0.10	0.23	0.61
CPI Annual Growth	0.336	–0.445	–9.182	–1.582	–0.154	24.742	0.893	3.030	–19.986
	0.91	0.88	0.53	0.69	0.97	0.06	0.84	0.50	0.38
Lagged Provisions to Loans Ratio	–0.041	–0.074	0.227	–0.051	–0.038	–0.042	–0.052	–0.093*	0.241
	0.18	0.02	0.18	0.20	0.39	0.81	0.16	0.01	0.23
Lagged Deposits to Loans Ratio	5.528**	5.574**	10.170	0.419	0.484	–2.040	9.775**	9.431**	14.499*
	0.00	0.00	0.07	0.68	0.66	0.63	0.00	0.00	0.04
Covid	0.000	0.000	0.006	0.000	0.000	0.006*	–0.019	–0.027	0.274*
	0.41	0.80	0.34	0.45	0.28	0.03	0.15	0.05	0.01
Intercept	2.923*	2.439	6.438	0.361	0.595	–1.641	4.219*	3.159	6.133
	0.02	0.07	0.15	0.70	0.58	0.63	0.02	0.11	0.28
Number of observations	2200	1615	585	612	467	145	1588	1148	440
R–squared	3%	3%	6%	3%	3%	14%	6%	8%	11%

* p<.05, **p<.01. The "All" sample period covers 2017–23; "Covid" is the period from Q1 2020 to Q1 2021 inclusive; "No Covid" is the remaining part of the "All" sample period.

Table A.6

The impact of macroprudential policies on lending – alternative specification (2)

	All Countries			South Africa & Mauritius			WAEMU		
	All	No Covid	Covid	All	No Covid	Covid	All	No Covid	Covid
Lagged Loans to Asset	–8.975**	–6.546**	–24.878**	–0.370	–0.662	2.748	–15.833**	–12.508**	–31.634**
	0.00	0.00	0.00	0.71	0.55	0.50	0.00	0.00	0.00
Macroprudential Policy Qtr on Qtr	–0.265*	–0.356*	–0.351	–0.085	–0.171*	–0.656**	–0.662**	–0.937**	–1.598**
	0.02	0.03	0.18	0.16	0.04	0.00	0.01	0.01	0.00
Macroprudential Policy Qtr on Qtr	–1.620*	–1.420*	–4.330	–0.013	0.008	–0.901	–11.882**	–14.700**	–4.002
	0.02	0.04	0.35	0.97	0.98	0.82	0.00	0.00	0.48
Monetary Policy Key Rate Yr on Yr	0.455	2.857**	0.319	0.331	–0.312	0.641	–0.079	4.371**	–0.479
	0.22	0.01	0.57	0.44	0.67	0.30	0.87	0.00	0.51
Lagged Gov't Expenditure as % GDP, Yr on Yr	–0.482	0.264	0.752	1.015	3.072**	–0.560	–0.960	–0.827	1.989
	0.62	0.84	0.67	0.17	0.00	0.59	0.46	0.63	0.41
Real GDP Annual Growth	6.510*	0.649	6.565	5.334**	–1.529	11.656**	6.441	9.541	7.193
	0.01	0.87	0.30	0.00	0.44	0.00	0.35	0.32	0.81
CPI Annual Growth	–0.452	–1.873	–8.800	–1.732	0.352	24.690	1.028	2.058	–23.615
	0.88	0.54	0.55	0.66	0.94	0.06	0.81	0.65	0.30
Lagged Provisions to Loans Ratio	–0.035	–0.067*	0.249	–0.051	–0.037	–0.080	–0.046	–0.088*	0.257
	0.26	0.03	0.14	0.20	0.39	0.65	0.21	0.02	0.20
Lagged Deposits to Loans Ratio	5.470**	5.307**	9.838	0.380	0.511	–1.475	9.937**	9.646**	14.314*
	0.00	0.00	0.08	0.71	0.64	0.73	0.00	0.00	0.04
Covid	–0.001	–0.001	0.004	0.000	0.000	0.006*	–0.028*	–0.034**	0.256*
	0.13	0.15	0.50	0.55	0.16	0.04	0.02	0.01	0.02
Intercept	2.836*	2.053	7.254	0.403	0.592	–1.520	4.543**	3.191	7.377
	0.02	0.13	0.10	0.67	0.58	0.65	0.01	0.10	0.19
Number of observations	2200	1615	585	612	467	145	1588	1148	440
R–squared	3%	3%	6%	3%	3%	15%	6%	8%	10%

* p<.05, **p<.01. The "All" sample period covers 2017–23; "Covid" is the period from Q1 2020 to Q1 2021 inclusive; "No Covid" is the remaining part of the "All" sample period.