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COVID-19, Policy Interventions, Credit Vulnerabilities and Financial (In)Stability

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COVID-19, Policy Interventions, Credit Vulnerabilities and Financial (In)Stability

By Gillian Kimundi

Abstract

At the 2014 Michel Camdessus Inaugural Central Banking Lecture (IMF), Janet Yellen posed the following question, ". . . How should monetary and other policymakers balance macroprudential approaches [. . .] in the pursuit of financial stability?" This conversation has become more critical following the effects of COVID-19 on economic and financial indicators globally. Using sector-level measures of financial stability, this study seeks to investigate the effect of monetary and fiscal policy interventions on the stability of the banking sector and determine the role (if any) played by the credit environment on financial stability's response to policy interventions. A Bayesian Threshold VAR model is estimated using quarterly data from (Q1) 2005 to June (Q2) 2021, where the Threshold variable is the Credit to GDP Gap, used to define high vs low credit environments. Facilitating the analysis and discussion using expansionary policy interventions implemented during the COVID-19 period (CBR reduction, lower reserves, higher fiscal spending and tax reliefs), the results indicate that the expansionary policy stances have clear implications on financial stability aggregates capturing credit risk (NPL Ratios) and liquidity risk (depository moments). Secondly, policy effects on financial stability indicators vary depending on the credit environment they are implemented in. More of the indicators respond poorly to expansionary fiscal and monetary policy action in a high credit environment. Based on this response, it is arguable that this credit cycle presents a vulnerability to the sector, rather than evidence of financial deepening. The results also point out a critical aspect relating to the choice of monetary policy action. Lower reserves are followed by more negative responses in financial stability aggregates in both credit environments, especially those related to credit risk. Policy recommendations following these results are also discussed.

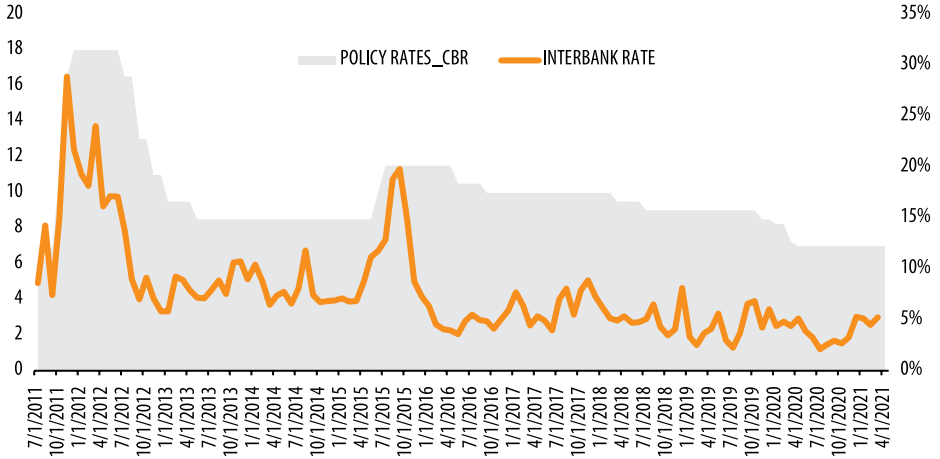
1.0 Background of the Study

The Central Bank of Kenya works towards achieving and maintaining general price stability and holds a critical role in policy formulation *"that enhances rather than destabilizes stability of the financial system"* (Central Bank of Kenya, 2013). In the midst of the pandemic, the Central Bank of Kenya implemented a package of measures to mitigate the pandemics' adverse economic effects and ensure liquidity management across the banking sector and the interbank market was maintained. During the year, against a backdrop of uncertainties rooted in the pandemic, the Monetary Policy Committee held a series of meetings. The Central Bank Rate was initially lowered from 8.25% in March 2020, to 7.25%, and subsequently to 7.00% in April 2020. The Cash Reserve Requirement Ratio was also lowered from 5.25% to 4.25%, effectively *"releasing KES.35.2 billion as additional liquidity availed to banks to directly support borrowers that are distressed as a result of COVID-19"1*. In January 2021, the MPC concluded that *"the current accommodative monetary policy stance remains appropriate"* and retained the Central Bank Rate (CBR) at 7.00 percent. As at the most recent Monetary Policy Statement in June 2021, the rate remains.

The Kenya Financial Stability Report from October 2020 highlights other measures taken up including suspension of defaulting borrowers listing with the Credit Reference Bureaus and commercial banks' renegotiation and restructuring of loan terms for borrowers. The 25th Monetary Policy Committee Report also reports a decline in short-term rates in the economy and remained below the CBR in the 6 months to October 2020. This reflects improved liquidity in the market following the reduction in the CBR and CRR earlier in the year. Specifically, Treasury Bill Rates (91-Day, 182-Day and 364-Day) declined during the six months leading to October 2020 and, the interbank rate averaged 2.92% in this 6-month period, compared to 4.76% in the six months leading to April 2020. However, the average interbank volumes took a decline from approximately 11.5 bn in 2019 to 10.6 bn in 2020.

1 (Monetary Policy Committee, March 23, 2020)

Figure 1: Trend in Central Bank Rate and Interbank Rates



On the fiscal end, The National Treasury also implemented a series of reliefs to increase disposable income through 100% tax relief to persons earning gross monthly income less than or equal to KES 24,000; Income Tax Rate (Pay-As-You-Earn) reduced from 30% to 25%; Corporation Tax reduced from 30% to 25%; turnover tax rate reduced from 3% to 1% for all Micro, Small and Medium Enterprises (MSMEs); VAT reduction from 16% to 14%, temporary suspension of the listing with the Credit Reference Bureaus of individuals, Micro, Small and Medium Enterprises (MSMES) and corporate entities whose loan account fall overdue or is in arrears. 2020 was generally marked by a declining proportion of tax revenue collected. Government Expenditure as at end of 2020 recorded a marked increase of 6.2% from end of 2019.

Overall, the year recorded growth in private sector credit, showing resilience in the midst of the pandemic and its adverse effects on most sectors in the economy. The graph below shows that the Year over Year Growth of Private Sector Credit (computed monthly) since 2017. The annual averages of the Y-o-Y Growth are 10.5%, 3.4%, 3.7%, 5.8% and 8.2% for 2016, 2017, 2018, 2019 and 2020 respectively. Increased lending to the private sector, especially from December 2019 is attributed to the repeal of the Interest Rates Capping Law in November that year. The decline in the credit growth in the preceding years followed the series of banks collapses and the onset of the Interest Rate Capping Policies in September 2016. The 2020 growth in the private sector credit is considered to have followed from: *(1) "...the positive impact of removal of*

Figure 2: Y-o-Y Growth in Private Sector Credit

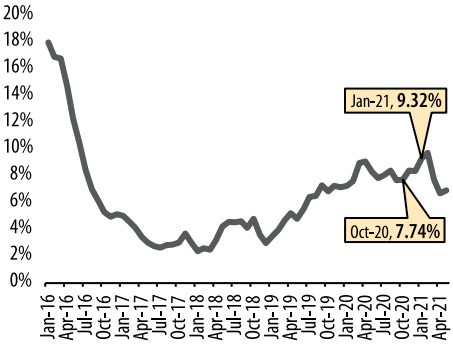
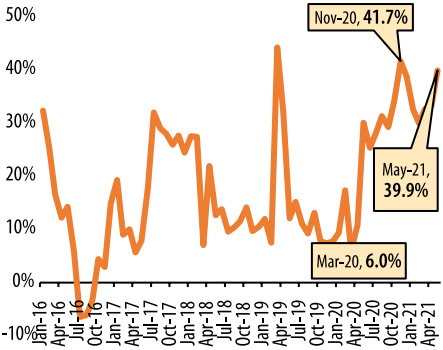


Figure 3: Y-o-Y Growth in Government Credit



Data Source: Central Bank of Kenya Monetary Statistics

interest rates controls and (2) monetary policy easing." Central Bank data shows that at the same time, credit to the central government accelerated. This is attributed to the fact that the government switched to domestic sources of finance to fund the widening budget deficit (and COVID-19 related spending).

Three main facts arise from the discussion above (i) monetary policy easing improved liquidity conditions in the economy (ii) fiscal measures were put in place to stimulate spending and production from households and businesses and (iii) credit growth in the economy took an upward trend in 2020 for both private sector and central government. One question arises – what do these facts imply about the financial stability of the banking sector? According to regulator reports[2] , the capital adequacy ratios in the sector remained stable, albeit lower than previous years, which indicated an increased efficiency in capital utilization. However, NPL ratios deteriorated in 2020 (*gross NPLs to gross loans increased to 13.1% as at June 2020 from 12.0% in 2019).* This is a clear reflection of households' (and firms') struggle to maintain disposable income (business income) given salary reductions, lay-offs, restriction of movement, declining business patterns, etc. The gross NPLs grew 14.6% in the first half of 2020 compared to a 5% annual growth rate between end of 2018 and end of 2019. Such statistics show a clear picture that the pandemic exacerbated pre-existing asset quality challenges in the sector, as seen through this growth rate.

Marmefelt (Nov 2020), in a dialogue on current developments in the European Union during COVID-19, indicates that interventions by policy makers at the time involved strongly complementary monetary and

2 (Monetary Policy Committe of Central Bank of Kenya, October 2020)

fiscal policy, but both were responses to COVID-19 and not necessarily an outcome of *"an emergent monetary-fiscal nexus"*. The author also highlights that credit growth in a declining economy does indicate an increase in liquidity in the economy but invites financial instability *(due to potential debt-deflation* (Fisher, 1933) *-- a rise in the overall value of debt causing defaults)* and malinvestments *(which cause liquidation)* considering the production structure at that point in time. Generally, the author suggests that an injection of liquidity into the economy can cause malinvestment due to the overoptimism in profit opportunities in an environment of overwhelming uncertainty, as was seen during the COVID-19 crisis.

In light of these arguments, and against the backdrop of the pandemic and the related Central Bank and Government interventions, this study seeks to:

1. To investigate the response of banking sector stability indicators to monetary and fiscal policy interventions

2. To investigate the role of the credit environment in the financial stability response to policy interventions

The objectives contribute to empirical work at the intersection of financial stability (prudential), monetary and fiscal policy formulation. The paper is inclined to offer recommendations on the appropriateness of policies in the context of a crisis and potential interlinkages in the pursuit of financial stability, price stability and fiscal stability.

2.0 Brief Literature Review

2.1 Central Bank Policy and Financial Stability

According to an IMF Report on Monetary Policy and Financial Stability (2015), the theoretical association between monetary policy and financial stability comprises of two links – the first being between policy interest rates and key financial variables (including leverage ratios, level of household debt, bank risk taking behaviour, real estate/housing prices and credit spreads), and the second being between the financial variables and the probability of a crisis, or generally *"large disturbances to economic conditions".* Theoretically, it is suggested that the manner in which monetary policy and interest rates affect financial variables differs -: In the short term, a tightening policy stance (higher interest rates) may weaken financial stability by (i) reducing household earnings and firms' profitability, (ii) increasing the interest rate burden, and finally (iii) reducing asset prices which are all detrimental to the financial conditions of households and firms. Defaults and delinquencies in loan repayments begin to arise. However, in the medium term, the effects may very well reverse as households, firms and financial institutions adapt their behaviour by reducing leverage and potentially reducing risk taking behaviour of financial intermediaries.

Moreover, literature in the area suggests that aside from the transmission channels above between monetary policy and financial stability, the two are inherently interlinked. Financial stability is often touted as being essential for the effective conduct and transmission of monetary policy. According to Billi & Verdin (2014), as much as price stability continues to be the monetary policy target for most major Central Banks, many central banks now consider financial stability agenda in the design and implementation of monetary policy frameworks. Conversely, in the absence of price stability (when there is deflation or in the economy), this increases the likelihood of financial turbulence, further highlighting how the two agenda are mutually reinforcing.

Locally, in addition to monetary policy formulation and implementation, The Central Bank of Kenya is mandated to conduct financial system stability assessments at both macro-prudential (system-wide) and micro-prudential (institutional) levels. Macroprudential analysis is critical to establish the stability of the overall financial system, which is achieved locally using quantitative and qualitative assessment frameworks based on the International Monetary Fund (IMF) Financial Soundness Indicators (FSI). According to Svensson (2011), it is however crucial to differentiate between monetary policy and macro-prudential/financial stability policy. Even so, the author suggests that monetary policy interventions should be conducted while taking financial stability policy into consideration, and vice versa. This is supported by Aswathi & Anand (Sept 2020), who suggest that monetary policy and financial stability are intertwined and that often the interlinkage is complex and mutual. There are differing schools of thought in this regard, pointing to whether monetary policy should focus on financial stability as an outcome. One school of thought suggests that monetary policy should be focused on price stability and not financial stability (advises against "leaning against the wind" policies). According to Borio (2014), achieving monetary and financial stability at the same time has proved elusive in several regimes, including gold standard regimes, inter-war years, Bretton Woods and Post-Bretton Woods regimes. (Bernanke, 2015) argues that monetary policy is "far from ideal" for the macroprudential task. This view is supported by Svensson (2017). On the other hand, the second school of thought argues that monetary policy should be pursued to contain financial risks. Carauna (2011) suggests macroprudential policies alone are not sufficient and monetary policy is key in attaining financial stability. Billi & Verdin (2014) argue that financial stability should be a key objective in monetary policy.

In a public address speaking on the same debate, Yellen (2014) posed the question -- *"How should monetary and other policymakers balance macroprudential approaches and monetary policy in the pursuit of financial stability?"* In the discussion, Yellen (2014) argues that in promoting financial stability, monetary policy as a tool faces significant limitations. Further, it is suggested that a more balanced assessment, would be to increase the focus of monetary policy on financial stability, but not give it a central role at the risk of harming macroeconomic performance. Yellen (2014) suggests that policymakers must monitor the evolving risks to the financial sector and have a realistic assessment of macroprudential tools and their ability to influence these developments. Similarly, The Bank for International Settlements (BIS)[3] has also contributed heavily to this debate on monetary policy and financial stability supporting the augmented role of monetary policy. Specifically, they quote: *"Financial stability is too large a task for prudential frameworks alone. Monetary policy strategies also need to lean against the build-up of financial imbalances even if near-term inflation remains low and stable."*

3 (Borio & Shim, What can (macro-)prudential policy do to support monetary policy?, 2007)

2.2 The Role of the Credit Environment

A survey of literature by Tobias & Liang (2014) highlights that *"financial stability reflects a resilient financial system that is less likely to amplify adverse shocks; financial instability arises when negative shocks are amplified by vulnerabilities, leading to non-linear outcomes and tail events."* In this definition, Vulnerabilities refer to amplification mechanisms that amplify adverse shocks whereas, risks are the realizations of these adverse shocks. In the same paper, the authors highlight that accommodative monetary policy following financial frictions can increase risks to financial stability due to build ups in financial vulnerabilities such as *"excess credit of households and businesses, and high leverage or maturity transformation at financial intermediaries."* Therefore, since accommodative policy can create a trade-off between the improvement of current financial conditions and increasing financial vulnerabilities, careful consideration needs to be given to financial stability risks in the formulation and implementation of monetary policy.

According to Borio & Tsatsaronis (2011), rapid private credit growth is considered a vulnerability, and has been found to be a robust predictor of banking crises. Its cumulative growth as reflected by the credit-to-GDP gap for the private non-financial sector is considered a high-quality indicator for the likelihood of financial instability. Schularick & Taylor (2012) provide evidence using annual data from 1870 to 2008 for 14 advanced economies that faster credit growth is associated with a higher probability of a financial crisis. Adrian, Covitz, & Liang (2013) suggest that the leverage of non-financial sectors can amplify the wealth effects. Highly indebted households and nonfinancial businesses are more susceptible to negative shocks to their incomes or their asset values. Due to this, they may have to sharply cut spending and investment (reinforcing the effects of the shocks). As such, researchers and policymakers have developed measures of the financial vulnerability of the economy, including excess nonfinancial-sector credit often referred to as macro financial "imbalances". When these imbalances are high, the economy is viewed as being more fragile and less resilient to adverse shocks. This measurement has been encouraged by the Basel Committee on Banking Supervision (2010) in using excess private nonfinancial credit as an indicator of expected future losses to the banking system.

A related discussion is shared by the International Monetary Fund (2015a), which highlights that the Global Financial Crisis was a stark reminder that price stability is not enough for financial stability. The authors indicate that financial crises are costly, and central bank policy should aim to decrease the likelihood of crises, rather than deal with the repercussions ex-post. The IMF report suggests that the costs of clean up after the Global Financial Crisis proved to be large. This was especially seen in cases where there was high pre-crisis credit growth and housing price appreciation, which was significantly correlated to the drop in GDP and rise in household loan delinquencies in the two year-period post the crisis. The informative conclusion from the study is

that the probability of a crisis increases non-linearly as credit growth increases, suggesting that a range of indicators e.g., equity and house prices, credit growth, and the output gap should be monitored when judging stability risks and the scope of monetary policy interventions.

A study on the role of private nonfinancial credit in conditioning the response to shocks to financial conditions and to monetary policy is carried out by Aikman, et al (2016) in the United States from 1975 to 2014. A key result from the analysis is that the transmission of monetary policy depends (nonlinearly) on the credit gap. When the credit gap is low, shocks to monetary policy unsurprisingly led to an increase in unemployment, a contraction in GDP, and a decline in credit. However, when credit gap is high, a tightening in monetary policy does not necessarily lead to contracting financial conditions and lower output, inflation or credit. According to the authors, the evidenced ineffectiveness of monetary policy in a high credit gap state is key in the evaluation of monetary policy or macroprudential policies in reducing vulnerabilities and future crises. As much as the empirical debate on this are suggests separation of the roles of monetary and macro-prudential policy, the authors suggest the inherent importance of successful macroprudential policies in limiting vulnerabilities such as high credit-to-GDP gaps to ensure effective monetary policy transmission. Bauer & Granziera (2017) investigate the impact of monetary policy shocks on the likelihood of a financial crisis. Their Impulse responses from a panel VAR model of 18 advanced countries reveal that in the short run, following an unexpected tightening policy, the debt-to-GDP ratio rises. As a consequence, there is an increased likelihood of a financial crisis. However, in the long run, it is found that output recovers, but higher borrowing costs lead to deleveraging of the private sector. The lower debt-to-GDP ratio reduces the likelihood of a financial crisis. The results suggest that in the long run, monetary policy can lead to a less risky financial system, but the same policy could fuel instability in the short run.

A number of empirical studies have looked into the link between the monetary policy stance and risk-taking behaviour of banks, which increases vulnerabilities. Particularly, monetary policy influences both the quantity and the quality of credit. The risk-taking effects depend importantly on the amount of bank capital, where higher levels of capital mitigate incentives to reduce the quality of credit. Jiménez, et al (2012) analyse the effects of monetary conditions on loan activity using individual records depending on the bank capital and liquidity ratios. The registry data is from Spain, and they find that lower rates lead to greater risk-taking and more credit to riskier firms. The effect is found to be more pronounced in banks with lower capital. Dell'Ariccia, Laeven, & Suarez (2013) find that ex-ante risk taking is negatively associated with increases in short-term policy interest rates. However, in this case the relationship is found to be less pronounced for banks with low capital or during episodes of financial and economic distress when capital is eroded. Paligorova & Santos (2017) study the

corporate loan pricing policies of U.S. banks and find evidence that loan spreads for riskier firms become lower in periods of monetary policy easing (lower rates). The result is driven by banks with higher risk appetite.

This brief review shares evidence that monetary policy affects the build-up of vulnerabilities—particularly excess credit. Even so, more research is needed to robustly understand the linkages that run from monetary policy to credit, and the effects of credit on the vulnerability and risks to financial stability

2.3 Fiscal Policy and Financial Stability

According to Dumičić (2019), fiscal policy has several interlinkages with the overall financial system and real economy, and as such, has clear macroprudential potential. However, literature exploring the linkages between fiscal policy and financial stability is scarce. Different fiscal measures including public debt management, government spending and tax policies, which are generally aimed at economic activity and higher employment, have the capacity to directly and indirectly affect systemic risk and capacity of the financial system to absorb and recover from potential shocks. Consistent, clear and stable tax policies and strategies that are not subject to sudden shocks are essential in maintaining the stability of the financial system. Additionally, higher levels of public debt are detrimental to the countercyclical role of fiscal policy. Public debt unsustainability also places additional pressure on other economic policies which may impede the government's intervention in crisis situations.

In light of the ongoing pandemic/crisis (and previous ones, most notably the Global Financial Crisis), extraordinary measures have been taken, not only by monetary policy authorities but by Governments (globally), in a bid to prevent collapse of the economy. A 2016 report from Bank of International Settlements argues that fiscal policy needs to be essential part of a macro-financial stability framework. The report indicates that growing fiscal risks weaken the financial system in two ways -- directly, "*by undermining deposit guarantees and by weakening banks' balance sheets through losses on their public debt holdings" and indirectly, "by limiting the ability to stabilise the economy through countercyclical fiscal policy".* BIS (2016) suggest that fiscal policy should be much more countercyclical. Such that in times of a financial boom, the policy generates a budgetary surplus and creates a fiscal leeway for subsequent contractions in the financial cycle. In contrast however, governments have been seen to increase mandatory expenditure in times of economic growth, which still lead to a negative primary balance despite growth in economic development. In a crisis then, fiscal policy's manoeuvring space becomes substantially limited. The report further suggests that the *close two-way link between balance sheets of banks and the public sector* raises the potential for an adverse feedback loop, as was seen in the euro area debt crisis.

Gordon & Leeper (2005) argue that in economic downturns, countercyclical fiscal policies have detrimental effects including an increase government indebtedness, an increase in future debt service

obligations implying that counter-cyclicality is a necessary but not a sufficient condition for soundness in the economy. In contrast, in an assessment of savings banks, Piluso & Ricciuti (2008) show evidence that government expenditure has a significantly negative effect on the loans-to-liabilities ratio, has no effects on total assets, whereas taxes have significantly negative effects on loans and total assets. In a study by Baldacci et al (2009) investigating the effectiveness of fiscal policy in shortening the duration of systemic banking crisis episodes and whether the composition of the fiscal policy response matters in this task, the authors find support that fiscal expansions shorten the duration of these crises. Additionally, the study finds that reducing *consumption taxes is more related to shorter crises as compared to income tax reductions,* since the effect of consumer tax reductions is more widespread.

Speaking on public debt, Clark & Large (2011), highlight that higher level of public debt inhibits the countercyclical capacity of fiscal policy, and pose a similar question aligned to the preceding discussion on monetary and prudential policy, *"Should "macroprudential policy" be regarded as a genuinely distinct policy "silo" with its own distinct instruments?"* The authors suggest that alternatively, macroprudential policy could be shorthand for other policy makers considering systemic financial developments in formulation of fiscal, monetary, and other "conventional" policies. Munteanu & Göndör (2012) investigate the role of fiscal policy in stabilization policy in Romania, based on the proposition that relevant relations exist between credit cycles and fiscal policy. The authors analyse the relationship between banking sector fluctuations and taxation and public spending during the period 2008-2011. The results suggest that Romania's pro-cyclical fiscal policy is destabilizing over the period, augmenting the argument that pro-cyclical fiscal policy does not assist in stabilizing the financial system.

In summary, there seems to be quite some support for the ability of countercyclical policy to stabilize the economy and the banking sector in a crisis or a downturn. However, there is definitely no consensus in this debate. There is brief evidence provided on the detrimental effect of growing public debt on the efficacy of countercyclical fiscal policy. Beyond the effect of fiscal policy on stability, a consistent theme presents itself in the preceding paragraphs, on whether and how and prudential policies need to be considered in the formulation of fiscal policy. However, a crucial research gap that exists in literature linking policy and financial stability mandates is the role played by the credit environment in the formulation and implementation of monetary and fiscal policy that supports financial stability. This study seeks to contribute to the discussion by exploring the effect of monetary and fiscal policy stances on financial stability measures in different credit environments.

3.0 Data and Methodology

The variables are primarily constructed from banking sector-level data provided by the Central Bank of Kenya. Generally, the variables involved here include measures of financial stability based on balance sheet items, variables representing the various policy measures/tools (both monetary and fiscal), macroeconomic variables that influence sector-level stability. The study will use quarterly data from March (Q1) 2005 to June (Q2) 2021.

3.1 Financial Stability Measures

Financial stability measures are the core dependent variables in this analysis and are based on monetary and financial aggregates which speak to the (il)liquidity and vulnerability of the banking sector. For robustness, the study considers alternative measures including a measure of Asset Quality (Non-Performing Loans to Gross Loans Ratio), Capital Adequacy (Non-Performing Loans to Total Capital), the Volatility of Deposits and the Skewness of Deposits.

According to the IMF Financial Soundness Guide, Asset Quality of bank loans refers to the timely manner with which borrowers are meeting their contractual obligations. This can be captured by the ratio of Non-Performing Loans (net of provisions) to Total Gross Loans; the non-performing loans are facilities which payments of principal and interest are past due by three months or more.

Capital Adequacy is measured by taking the value of NPLs (net of provisions) as a ratio of Total Capital. Capital is measured as total capital and reserves in the sectoral balance sheet. The indicator is a measure of the capacity of bank capital to withstand losses from NPLs.

The two ratios discussed above focus on Credit Risk (in connection with bank loans). To capture Liquidity Risk in association with banks' liabilities, the analysis uses the volatility and skewness of deposits. The volatility of deposits refers to the likelihood that depositors will, at a short notice, withdraw funds from the system

in response to a perceived weakness in an individual deposit taker or in the whole banking system4. According to Nana & Samson (2014), the volatility of deposits captures the withdrawal or liquidity risk for banks, in the sense that the greater the uncertainty banks have on their volume of deposits, the higher the likelihood of retaining precautionary reserves to mitigate the probability of a liquidity crisis. However, the authors suggest that the use of volatility alone is insufficient due to the fact that positive volatility is acceptable while variability on the downside is not. Positively (negatively) skewed deposits imply a probability of large (small) amounts of deposit inflows. Therefore, the risk of a liquidity shortage is lower with positively skewed deposits.

The volatility and skewness of deposits in every quarter are calculated as forward-looking estimates that incorporate deposits over the current and next two quarters. This is done so as to assess the effect of lagged policy variables (below) on future volatility or skewness of deposits.

i) Other Variables

To capture monetary policy interventions, the core policy tools including the Central Bank Rate and the Reserve Requirements (measured by Commercial Bank Reserves with the Central Bank) are used. To capture fiscal policy interventions, the study uses the ratio of government expenditure to total government revenue and grants. According to IMF Guidelines for Fiscal Adjustment, a commonly used indicator to assess fiscal policy is the balance, i.e., the difference between revenues and grants, and expenditure and net lending. A deficit (surplus) suggests an expansionary (contractionary) fiscal policy stance. For this study, a related ratio of government expenditure to revenue is constructed to capture the budget deficit/surplus, such that the higher the ratio, the larger the government budget deficit (increased spending, tax reliefs, or both). Consequently, the ratio accounts for both the use of government spending and tax policies in the expansion or contraction of the economy.

Following analysis by Borio & Lowe (2002) and Borio & Drehmann (2009), this study argues that it the build-up of vulnerabilities or risks to financial distress can be recognized with unusually rapid growth in private sector credit and/or asset prices. Fluctuations in the credit-to-GDP ratio and asset prices are indications of the financial cycle. Borio (2014) defines the financial cycle as *"self-reinforcing interactions between perceptions of value and risk, attitudes towards risk and financing constraints, which translate into booms followed by busts."* One prominent measure of vulnerability is the credit to GDP gap (also referred to as the "Basel gap"). This is defined as the difference between the ratio of Private Sector Credit to GDP and its long-run statistical trend, as extracted from the Christiano-Fitzgerald (2003) filter. Overall, several empirical studies (Borio and Lowe (2002), Borio & Drehmann (2009), Aikman, et al (2017), Chen & Svirydzenka (2021)) have found that the credit-to-GDP gap to be one of the best early warning indicators of systemic banking crises, especially in emerging markets.

4 (International Monetary Fund, Financial soundness indicators compilation guide, 2019)

The cyclical component of the Credit to GDP ratio (financial cycle) is extracted using the Christiano-Fitzgerald Filter (Christiano & Fitzgerald, 2003). This filter is a band-pass type which seeks to separate the stochastic cycles from the trend. The assumption is that the underlying variable follows a random-walk process. The analysis specifies a 1-year (4 quarters) to 8-year (32 quarter) range to extract short-term cycles. This filter has been empirically applied in the estimation and analysis of financial cycles (including Drehmann, Borio, & Tsatsaronis (2012), Aikman, et al (2015), Oman (2019)). The Hodrick Prescott Filter which is typically used in the calculation of the gap is not used in this study due to the end of sample bias that arises with the filter. Given that the sample period under study here ends in 2021 (still within the COVID-19 period), the study seeks to avoid any bias that may arise from the HP filter estimates during this critical period.

However, a prominent criticism of the Credit to GDP Gap is that it could be an indication of either (1) excessive credit (vulnerability) or (ii) financial deepening. According to Baba, et al. (2020), periods whereby Private Sector Credit growth exceeds GDP growth could be an indication of proper financial intermediation signalling financial deepening. A positive gap may not necessarily point to excessive risk taking on the part of banks and borrowers. This criticism is quite relevant in the Kenyan context given the 2019 repeal of the interest rate capping regulations (effectively liberalizing lending activities by banks), just 4 months before COVID-19 cases hit the country. To this end, a positive gap could be an indication of a vulnerability or a policy-driven credit expansion. The response of the financial stability indicators in the different credit environments will therefore guide the study's conclusion as to whether any observed positive gaps are more benign, or dangerous vulnerabilities that can disrupt the stability of the sector.

Additional variables include a measure of the business cycle, the consumer price index and the intermediation spread. The business cycle is represented by the short-term cyclical component of GDP Growth, also extracted using the Christiano-Fitzgerald Filter. An assessment of the effects of inflation and the business cycle on financial stability is studied. The intermediation spread is measured *by the* gap between the average commercial bank lending and deposit rates *(Sinkey and Greenawalt (1991) and Keeton and Morris (1998) find that banks that charge higher interest rates later tend to have the highest NPLs)*. This particular measure is highly contextual for the Kenyan Banking sector given interest rate capping laws that were put in place in September 2016. A ceiling for lending rates was imposed, at 4 percentage points above the Central Bank Rate (10.5% at the time) and a floor on deposits at 70% percent of the Central Bank Rate. Following the cap, the intermediation spread for the sector dropped from 11.45% in Q2 2016, to 9.87% and 6.09% in Q3 2016 and Q4 2016 respectively. The average intermediation spread in the 13 quarters from September 2016 to November 2019 *(when the cap was repealed)* is 5.9% compared to 10.02% in a similar window before the cap was placed.

A summary of these variables is presented below:

VARIABLES	DESCRIPTION
Monetary Policy Rate	Central Bank Rate
Reserve Requirements	Log of Commercial Bank Reserves in the Central Bank
Fiscal Policy	Ratio of Total Government Expenditure to Total Revenue and Grants – higher ratio indicates a more expansionary fiscal policy stance
BUSINESS CYCLE	Short term cyclical component of the GDP growth
INFLATION	Logarithm of CPI
Intermediation Spread	Commercial Bank Average Lending Rates minus Deposit Rates
Financial cycle (THRESHOLD VARIABLE)	Deviation of the ratio of Private Sector Credit to GDP to its long run trend.

Estimation

Parameter Estimation will be done using a Bayesian Threshold Vector Autoregressive model. The models are estimated over disjoint subsamples whereby the threshold is determined by the credit-to-GDP gap. As aforementioned, the credit to GDP gap is the difference between the ratio of Private Sector Credit to GDP and its long-term trend, extracted from the Christiano-Fitzgerald Filter described above. Specifically, we estimate different models when the gap is high (i.e., it is above its trend, positive gap, implies a high credit environment) and another set of models when the gap is low (below the trend, negative, implies a low credit environment). This disjointed analysis allows the analysis to investigate the non-linear dynamics between financial stability and policy interventions in periods of high versus low excess credit.

$Y_t = \sum_k \beta'_{1k} Y_{t-k} + \varepsilon_{1t}$ if Credit to GDP gap>0

$Y_t = \sum_k \beta'_{2k} Y_{t-k} + \varepsilon_{2t}$ if Credit to GDP gap<0

Y_t denotes the is a vector of endogenous VAR variables including measures of financial stability, monetary and fiscal policy intervention measures/variables, and other variables such as business cycle, inflation and intermediation spread, as detailed in the preceding section. The error term is captured by $\varepsilon_t \sim N(0, \sigma^2)$

Maximum likelihood estimation is used for Bayesian Analysis. However, Bayesian analysis[5] departs from the traditional approach solely based on using the data provided in the parameter estimation. Here, the analysis incorporates prior beliefs of the researcher about the parameters in the estimation. The prior belief of the parameters (the regression coefficients and the error variance), combined with the likelihood function from the data produces a posterior distribution of the parameters, β,σ^2, according to the Bayes Law, such that:

$$H(\beta,\sigma^2|Y_t) = \frac{F(Y_t|\beta,\sigma^2)\times P(\beta,\sigma^2)}{F(Y)}$$

Simply, the posterior distribution is a product of the likelihood, $F(Y_t|B,\sigma^2)$ and the prior, $P(B,\sigma^2)$ divided by the marginal likelihood. The Bayesian VAR analysis assume that all estimated parameters are random and as such a probabilistic interpretation can be given to the effect of a variable on the dependent variable. Interval hypothesis testing can be done post estimation to establish the probability of the coefficient lying in a specified interval. One disadvantage often quoted regarding VAR models is that there are many parameters being estimated, which is especially detrimental for small datasets due to the loss in loss of degrees of freedom when maximum likelihood estimation is used. Such overparameterized models tend to produce poor forecasts. However, with prior selection in Bayesian inference, it is possible to shrink higher-lag parameters and effectively reduce the effective number of lags.

To establish the prior for the coefficients and the coefficients and the error variance, the study uses the conjugate Minnesota Prior which assumes that the error variance is unknown *(according to Blake & Mumtaz, Applied Bayesian Econometrics for Central Bankers)*. The Minnesota prior (which is so named after its origins at the Federal Reserve Bank of Minnesota) holds the prior belief that the endogenous variables in the VAR follow either a random walk process or an AR (1) process. The prior for coefficient vector β is an MVN prior. The regression vector β is formed by the endogenous-variables lag coefficients. The conjugate Minnesota prior assumes that the expected value for all β coefficients is zero, with the exception of the self-variables first-lag coefficients in each equation, which have a n expected value of 1. Therefore, given that $\beta \sim N(\beta_0,\Omega_0)$, the prior mean vector is a mix of 0s and 1s, where the 1s correspond to the self-variable first lag. The Minnesota prior assumes that there is no correlation between the coefficients. The Minnesota covariance matrix Ω_0 is therefore a diagonal matrix, and its diagonal is formed by the prior variances of β which are based on the OLS estimates of error variances.

5 Blake & Mumtaz, Applied Bayesian econometrics for central bankers

The covariance parameter Σ has an inverse-Wishart prior with a scale matrix and degrees of freedom α_0:

$$\Sigma \sim InvWishart(\alpha_0, S_0)$$

The inverse Wishart distribution is considered a multivariate version of the inverse Gamma distribution used in the context of a Bayesian linear regression model. The default values are $\alpha_0 = K+2$ and $S_0 = (\alpha_0 - K - 1)\Sigma_0$, where Σ_0 is the OLS estimate of the covariance matrix.

Now, when estimating the posterior distribution of multiple parameters, it is necessary to derive the marginal posterior distribution (from the joint posterior distribution). This process requires analytical integration which will done by the Gibbs Sampler. The probabilities of the coefficients being negative (less than 0) will also be provided to indicate the probability of an inverse relationship.

4.0 Analysis and Presentation of Results

4.1 Brief Descriptive Analysis

The Figures 4 and 5 below depict the general trend in the financial stability indicators used in this analysis. The trend in the NPL Ratios (as a ratio of Gross loans and advances and as a ratio of Total Capital) has been on an upward trend since 2015 - 2020 figures show slight increases in the ratios.

Figure 4: Net NPL to Gross Loans and Advances

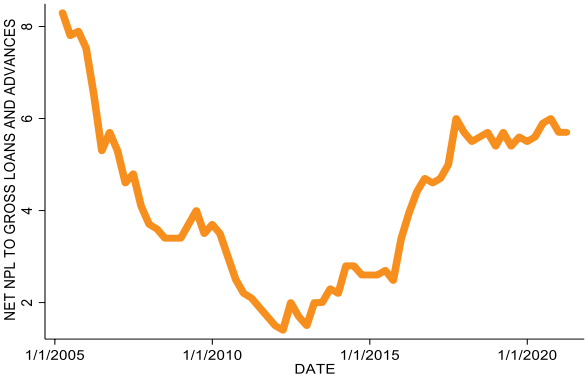
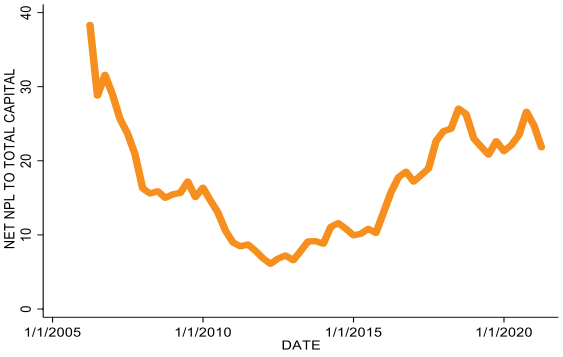


Figure 5: Net NPL to Total Capital



The figure below plots the skew of the deposits which exhibits a pattern across the quarters, such that the average skew in the March quarter is typically negative (-0.588), increasing in June to an average of 0.20, registering the highest value in September at 0.42 and finally decreasing towards the end of the last quarter (December) at 0.24. The average skew for 2019 is 0.39 and this declined to a negative average skew of -0.004 in 2020. As is seen in the chart below, the relative volatility declines below the average (red line) in 2020. Estimates show that the average relative volatility of deposits is 0.024 in 2019 and this declines to 0.015 in 2020.

Figure 6: Skewness of Deposits

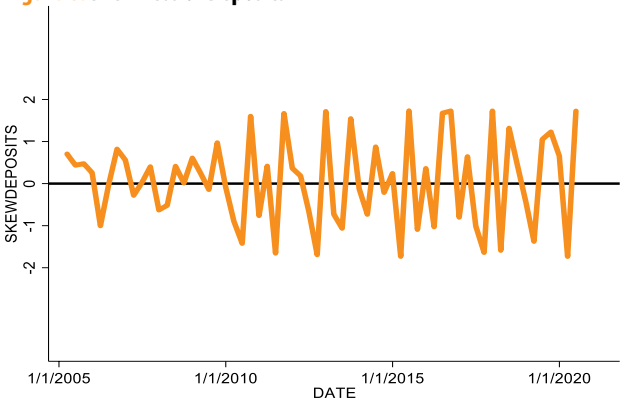


Figure 7: Relative Volatility of Deposit

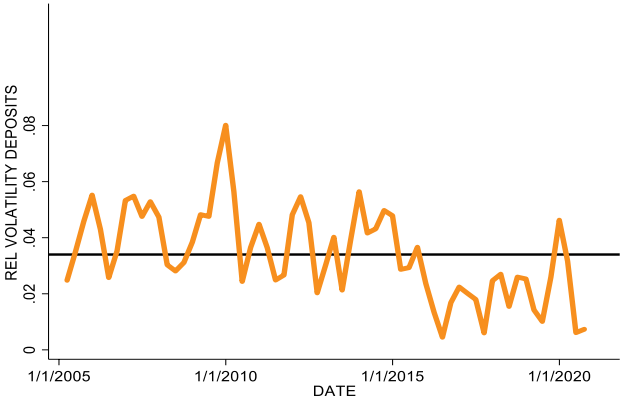
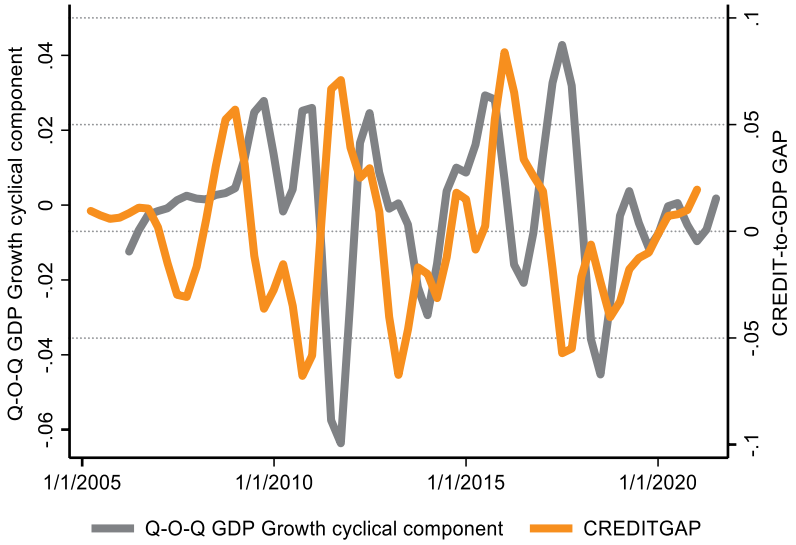


Figure 8 below plots the threshold variable, CREDIT-to-GDP gap *(secondary axis on the right)*, against the measure of the business cycle *(cyclicality in the Q-O-Q GDP growth, primary axis on the left)*. The credit-to-GDP gap is negatively correlated to the business cycle, at least contemporaneously and at the first lag. When the credit to GDP gap is high (positive values), there is an upturn in the business cycle after 2, 3, and 4 quarters (positive correlation). The correlation statistics show strong positive links between the financial cycle (lagged) and the business cycle.

Figure 8: Credit-to-GDP gap (Financial Cycle) vs Business Cycle

	Gap	L1.Gap	L2.Gap	L3.Gap	L4.Gap
Correlation to Business Cycle	-0.30	-0.15	0.25	0.57	0.54



The Credit to GDP gap in the 2020 and 2021 quarters is on an upturn with values crossing the zero threshold (characterising the COVID-19 period as a high credit environment). As aforementioned, at this stage, the study does not seek to conclude whether the positive gap is a vulnerability or an indication of recovery (financial deepening), until the response of financial stability indicators to the different policies is inferred in the two (high vs low) credit environments.

4.2 Lag Length Selection

For the VAR estimation, lag length selection is critical. The analysis here compares 6 models with lag lengths of 1 to 6, for each financial stability measure (NPL/Gross Loans, NPL/Total Capital, Deposit Skew and Deposit Volatility). Each of the six models in each case are assumed equally probable a priori. The table below shows the posterior model probabilities **(P(M|y)),** where the model with the highest probability is the best model. These computed probabilities allow comparison to see which model is more likely among considered models given the observed data. From the results presented below, the best (most probable) model for each of the financial stability measures uses one lag:

NPL/Gross Loans	Log (Marginal Likelihood)	P(M)	P(M|y)
bvar1 (1 lag)	-1.06	0.17	1.00
bvar2 (2 lags)	-23.83	0.17	0.00
bvar3 (3 lags)	-40.51	0.17	0.00
bvar4	-68.70	0.17	0.00
bvar5	-91.01	0.17	0.00
bvar6	-109.79	0.17	0.00

NPL/Total Capital	Log (Marginal Likelihood)	P(M)	P(M|y)
bvar1 (1 lag)	46.67	0.17	1.00
bvar2 (2 lags)	31.50	0.17	0.00
bvar3 (3 lags)	-101.14	0.17	0.00
bvar4	-123.97	0.17	0.00
bvar5	-146.21	0.17	0.00
bvar6	-163.41	0.17	0.00

Deposit Skew	Log (Marginal Likelihood)	P(M)	P(M|y)
bvar1 (1 lag)	72.88	0.17	1.00
bvar2 (2 lags)	60.07	0.17	0.00
bvar3 (3 lags)	30.90	0.17	0.00
bvar4	1.45	0.17	0.00
bvar5	-24.39	0.17	0.00
bvar6	-55.58	0.17	0.00

Deposit Volatility	Log (Marginal Likelihood)	P(M)	P(M|y)
bvar1 (1 lag)	367.85	0.17	1.00
bvar2 (2 lags)	345.60	0.17	0.00
bvar3 (3 lags)	325.09	0.17	0.00
bvar4	282.71	0.17	0.00
bvar5	259.26	0.17	0.00
bvar6	219.70	0.17	0.00

4.3 Model Results

The summary of Bayesian Threshold VAR results is presented in the form of impulse response functions, which show the effect of a one standard deviation shock in one variable (the impulse variable) on a given response variable. The effect of policy shocks on the financial stability measures are traced out over 20 quarters (5 years). Each of the impulse response plots depends on the level of the credit-to-GDP gap. The discussion here is motivated by empirical literature's proposition that higher levels of financial imbalances (positive credit-to-GDP gaps) leave the system more vulnerable to negative shocks. In addition, following the observed trend in the Credit-to-GDP gap, the COVID-19 period is characterised as a high credit period. To draw inference on the effect of policy interventions -- particularly during the COVID-19 period, the policy shocks imposed in this analysis closely follow the expansionary actions implemented at the time, including Lower Central Bank Rates, Lower Reserves, and higher government expenditure. Even so, the results here could be generalized to understand the effects/consequences of expansionary policies implemented in any other high or low credit environment.

4.3.1 Impulse Variable: Central Bank Rate (Negative Shock)

Figure 9: Response: NPL/Gross Loans

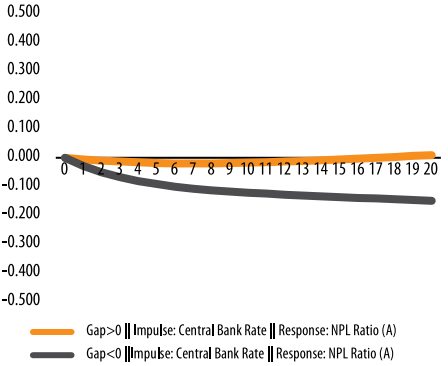
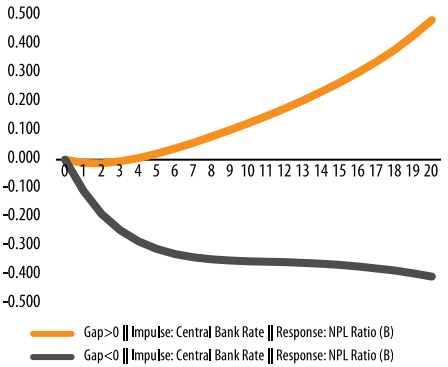


Figure 10: Response: NPL/Total Capital



The green lines report the mean impulse response to a negative CBR shock when the credit-to-GDP gap ratio is positive (henceforth referred to as a *"high credit environment"* to imply that credit growth is higher than GDP growth). The black lines report the mean impulse response to a negative CBR shock to when the credit-to-GDP gap ratio is negative (henceforth referred to as a *"low credit environment"*). A negative shock to the policy rate draws different responses from the NPL ratios -- In a low credit environment, a reduction in the CBR is followed by a reduction in the NPL Ratios. In a high credit environment, there is a negligible decrease in the NPL/Total Loans ratio, with a more pronounced increase in NPL/Total Capital Ratio.

Figure 11: Response: Deposit Skew

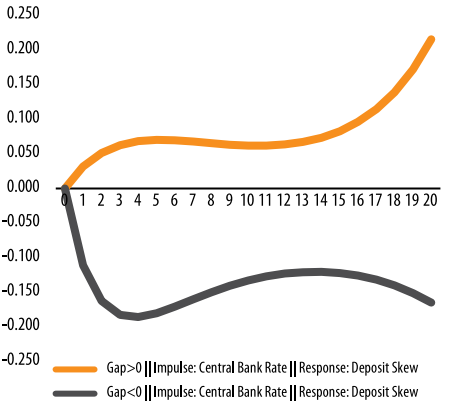
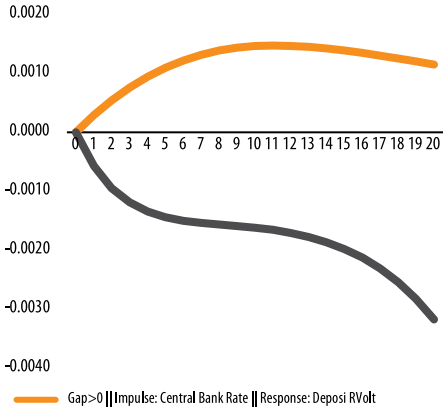


Figure 12: Response: Relative Vol of Deposits



An assessment of the deposit skew response shows that a CBR reduction is followed by a reduced skew in low credit periods, but higher skews in a high credit environment. The latter in a high credit environment could be attributed to the fact that credit creates deposits. Liquidity shortage risks are therefore more likely to happen for banks if such an expansionary stance is implemented in a low credit environment, possibly due to the fact that lower policy rates (and consequently increased lending and more favourable interest rate terms) may fuel consumption, rather than saving behaviour amongst depositors and borrowers.

On the other hand, a negative CBR shock increases the relative volatility of deposits (destabilizes) in a high credit environment, but reduces the volatility (stabilizes) when credit is low. This result may be attributed to fuelled consumer/spending behaviour by households and firms in the economy when there is a policy rate reduction in an already high credit environment, which leads to the pronounced fluctuations in deposits. The stabilizing effect of the expansionary policy in a low credit environment could point to adaptable saving/depository behaviour on the part of households and firms.

A summary of these effects is tabulated below: (N = Negligible/Null Effect, D = Destabilizing, S= Stabilizing)

	Negative Shock to CBR	
Credit Environment	**High**	**Low**
NPL/Gross Loans	N	S
NPL/Total Capital	D	S (Stronger)
Deposit Skew	S	D
Deposits Rel Volatility	D	S

4.3.2 Impulse Variable: Log Reserves (Negative Shock)

Figure 13: Response: NPL/Gross Loans

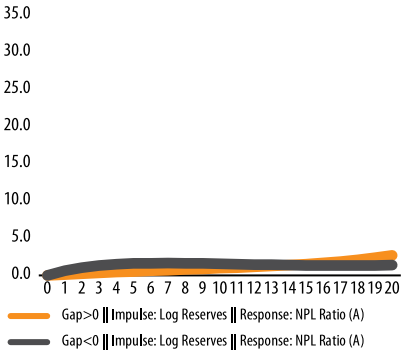
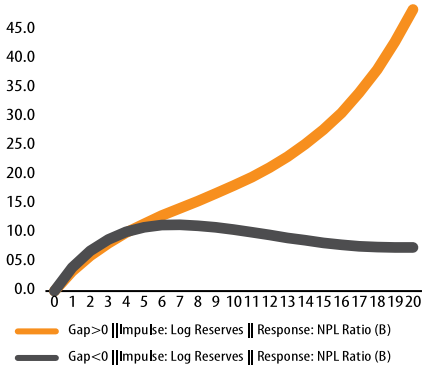


Figure 14: Response: NPL/Total Capital



A negative shock to the Commercial Bank Reserves (expansionary stance) is followed by an increase in the NPL ratios in both high and low credit periods, though, the response of the NPL/Total Capital in both periods is significantly more pronounced. Overall, the response of the NPL Ratios in a high credit environment is quite persistent. A comparison of financial stability responses to the two monetary policy shocks *(CBR, discussed in the preceding section, and Reserve Requirements)* shows differing results – the destabilizing effects are not equal. Of the two monetary policy tools, an expansionary stance in a high credit environment facilitated through reduced commercial bank reserve requirements (increased bank liquidity) may lead to significantly higher bank and borrower risk-taking behaviour, as compared to when the same is facilitated through the policy rate.

Figure 15: Response: Deposit Skew

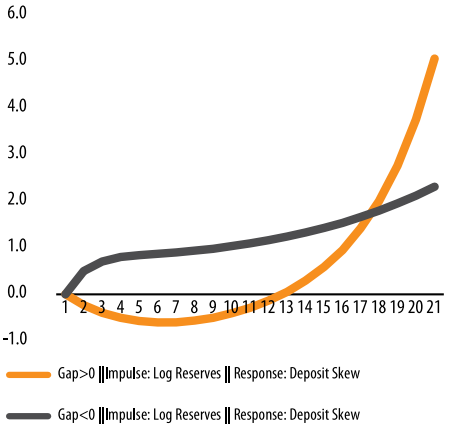
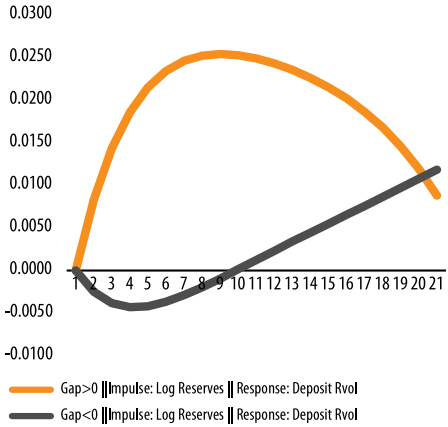


Figure 16: Response: Relative Vol of Deposits



The response of the deposit skew to the negative reserve shock is favourable in a low credit environment (skew increases persistently). However, in a high credit environment, a negative reserve shock is initially followed by a decrease in the skew for about 12 quarters (3 years), before a positive skew is seen. This indicates that this expansionary policy has a short-term destabilizing effect on the depository base of the sector, increasing the likelihood of liquidity shortages. The decreased skew could be a result of increased spending/consumption behaviour (rather than saving/depository) when an expansionary stance is implemented in a high credit environment. Looking at volatility of deposits, in a high credit environment, a negative reserve shock is followed by a sharp increase in the relative volatility, an effect that starts to die off after approximately 8 quarters. In a low credit environment, relative volatility declines (at least in the short term, for the first 10 quarters). Once again *(and similar to the results seen for the CBR reduction)*, the results in the two credit environments may point to more pronounced (diminished) fluctuations in spending/consumption patterns by households and business in high (low) credit environments, leading to the inferred volatility.

Table xx: A summary of these effects is tabulated below:

	Negative Shock to Log Reserves	
Credit Environment	**High**	**Low**
NPL/Gross Loans	D (Persistent)	D
NPL/Total Capital	D (Persistent & Larger)	D
Deposit Skew	D	S
Deposits Rel Volatility	D	S

4.3.3 Impulse Variable: Ratio of Government Expenditure to Government Revenue (Positive Shock)

Figure 17: Response: NPL/Gross Loans

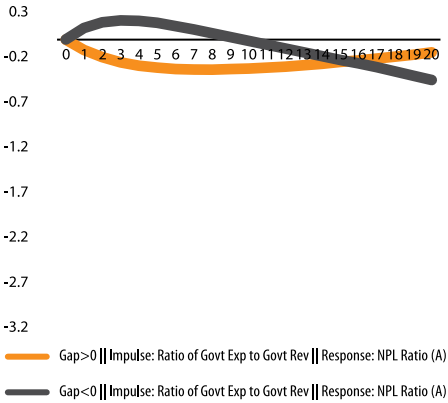
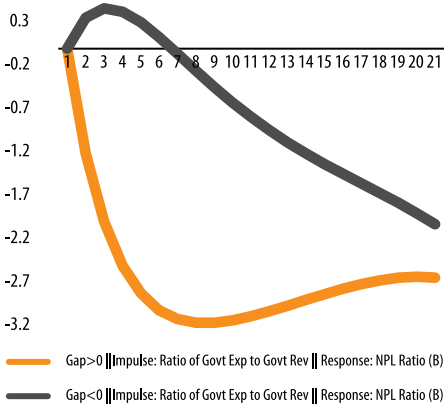


Figure 18: Response: NPL/Total Capital



The ratio of Government Expenditure to Government Revenue is a measure of the fiscal deficit. A positive shock to the ratio implies an increasing fiscal deficit (expansionary fiscal action). In a high credit environment, such an expansionary fiscal stance stabilizes the sector with a subsequent decline in both NPL ratios (especially pronounced for the NPL/Total Capital Ratio). The response is reversed in a low credit period - *at least in the short term,* where the same expansionary policy stance increases the credit risk ratios. These results could be attributed to crowding out effects, implying that an expansionary stance, typically accompanied by increased government borrowing, is inherently destabilizing to the financial sector, especially if private sector credit is shallow.

Figure 19: Response: Deposit Skew

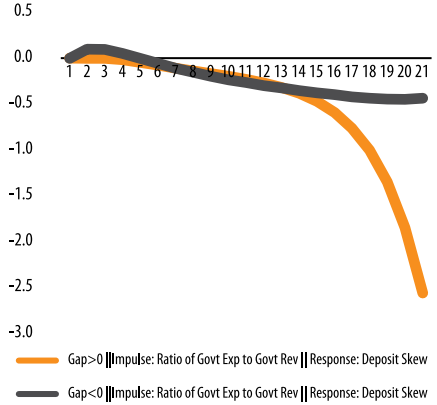
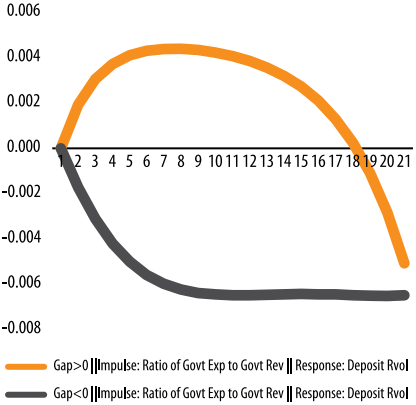


Figure 20: Response: Relative Vol of Deposits



On the other hand, expansionary fiscal policies decrease (destabilize) the deposit skew in a high credit environment. As such, increased government spending and/or reduced tax policies increase the likelihood of liquidity shortages for the banking sector in this credit environment. This is similar to the response to lower reserves and could similarly be attributed to increased consumption/spending patterns following an expansionary stance in a high credit environment. Relative volatility of deposits is destabilized by the same expansionary shock in a high credit environment. The effect starts to die off after the 6th quarter.

However, in a low credit environment, relative volatility declines following the shock. This overall analysis of the skew and volatility of deposits implies that as much as an expansionary policy is followed by a decline in the skew of depository amounts, the deposits are more stable in a low credit environment.

TableXX: A summary of these effects is tabulated below:

	Response to Positive Shock to Ratio of GE/GR	
Credit Environment	**High**	**Low**
NPL/Gross Loans	S	D
NPL/Total Capital	S	D
Deposit Skew	D	D
Deposits Rel Volatility	D	S

5.0 Conclusion and Recommendations

The summary of responses to the policy shocks is shown below for easier comparison:

Table 1: Impulse Response Results *(Impulse Variable = Policy Tool; Response Variable = Financial Stability Indicator) Arrows indicate the direction of the policy effect on the financial stability indicator (↓ indicates reduction, ↑ indicates increase)*

	Negative Shock to Central Bank Rate		Negative Shock to Reserves		Positive Shock to Ratio of Government Expenditure to Revenue	
Credit Environment	High	Low	High	Low	High	Low
NPL/Gross Loans	N →	S ↓	D ↑	D ↑	S ↓	D ↑
NPL/Total Capital	D ↑	S ↓	D ↑	D ↑	S ↓	D ↑
Deposit Skew	S ↑	D ↓	D ↓	S ↑	D ↓	D ↓
Deposits - Relative Volatility	D ↑	S ↓	D ↑	S ↓	D ↑	S ↓

N = Negligible/Null Effect, D = Destabilizing, S= Stabilizing

The objective of this paper has been to investigate the effect of the monetary and fiscal interventions on the aggregate financial stability of the banking sector and additionally, determine the role of the credit environment in the response of financial stability indicators to various policy interventions. The analysis and discussion is facilitated using the expansionary policy interventions implemented during the COVID-19 period ***(CBR reduction, lower reserves, higher fiscal spending and tax reliefs)***. The Threshold Bayesian VAR impulse response results summarized above show that the response to policy interventions differs depending on the credit environment. More specifically, a comparison of the two monetary policy actions (CBR and Reserve Requirements) indicates that lowering reserves may be responsible for increased risk-taking behaviour by banks and borrowers, explaining the more pronounced increase in NPL Ratios following

the policy in both high and low credit environments. On the other hand, the responses to fiscal policy interventions shows that an expansionary stance in an environment of low private sector credit levels is more detrimental to the stability of the banking sector. NPL ratios decline following an increase in government expenditure, but only in a high credit environment. Thus, as much as an expansionary fiscal stance may very well promote economic activity, this does not effectively translate to better quality of the loan portfolio if private sector credit is low, highlighting potential implications of crowding out effects. Also, an overall analysis of deposit volatility shows that both monetary and fiscal policy actions have the potential to destabilize the sector in high credit environments, but the deposits remain stable (less volatile) in low credit environments. As aforementioned, the results in the two credit environments could be attributed to more pronounced (diminished) fluctuations in spending/consumption patterns by households and business following policy easing in high (low) credit environments.

Overall, following from the highlighted results, the following 4 key points are important to note: Firstly, Monetary and Fiscal Policies have clear (unintended) consequences on financial stability aggregates capturing credit risk (NPL Ratios) and liquidity risk (depository moments). This supports the global conversation and agenda by policymakers in increasing the emphasis of their policies on financial stability, without diverting from the central role of macroeconomic performance. Secondly, the response of financial stability aggregates to the analysed expansionary stances varies depending on the credit cycle. As earlier indicated, a positive gap/high credit environment could be seen as either a vulnerability (pointing to unsustainable credit growth) or financial deepening. Based on the response of the financial stability indicators in a high credit environment, it is arguable that this credit environment presents a vulnerability, rather than a recovery from a low credit environment (e.g., after the repeal of Interest Rate Capping regulations). More of the indicators respond poorly to expansionary fiscal and monetary policy activity in a high credit environment, informing this conclusion that a positive credit to GDP gap presents a dangerous susceptibilities for the stability of the sector. Effectively, this means that theory, policy formulation and implementation need to consider the role of the credit environment when managing any unforeseen/unintended consequences to the stability of the sector. This calls for additional consideration of prudential policies to reduce the vulnerabilities associated with excess credit.

Thirdly, in high credit environments, the response of the credit risk indicators to expansionary fiscal policy and monetary policy actions is different. Expansionary fiscal policy is followed by improvements in the NPL ratios, while the converse is seen for expansionary monetary policy actions (CBR and reserves). While these results may not particularly point to a lack of synergy between monetary policy and fiscal policy actions, they do emphasize the need for a comprehensive analysis into the cohesive

formulation and implementation of the two in supporting prudential regulation of the sector. Lastly, the results point out a critical aspect relating to the choice of monetary policy action in the pursuit of financial stability agenda. On the one hand, policy rate reductions are more likely to maintain stability. Lowering reserves is followed by negative responses in financial stability indicators in both credit environments, especially those related to credit risk. As such, lower reserves may fulfil the primary mandate of stabilizing economic fluctuations but perform poorly in maintaining financial stability in either environment. As such, it is recommended that the use of reserves as a monetary policy tool in either credit environment be carefully assessed given the negative implications for financial stability, with possible control mechanisms on bank and borrower risk-taking behaviour.

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