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Implications of macroeconomic stabilization policies on financial intermediation

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April 2023

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Implications of Macroeconomic Stabilization Policies on Financial Intermediation

Stephanie Kimani*

Abstract

Effective policies to stabilize macroeconomic conditions are essential for economic growth. In the context of this study, policymakers pursue these macroeconomic stability objectives by adjusting fiscal and monetary policy. The study used impulse response functions (IRFs) derived from vector autoregressive (VAR) models to analyze how these policy changes affected credit allocation. Results show that monetary policy changes through CRR and CBR manipulation have a longer lasting impact on private sector credit compared to fiscal policy changes. Due to its direct impact on bank liquidity, CRR changes impact private sector credit more directly compared to variations in CBR. This implies that when macroeconomic stabilization is urgent, adjusting the CRR to influence private sector credit would be more useful. Meanwhile, fiscal policy, as illustrated through total government spending and revenues, tends to impact the quantum of private sector credit instantaneously. However, the impact is short-lived given the evolving nature of the sovereign's wallet. Further, the results show that prudent fiscal consolidation (raising government revenues or reducing government spending or a combination of both) support lending to the private sector..

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1.0 Introduction

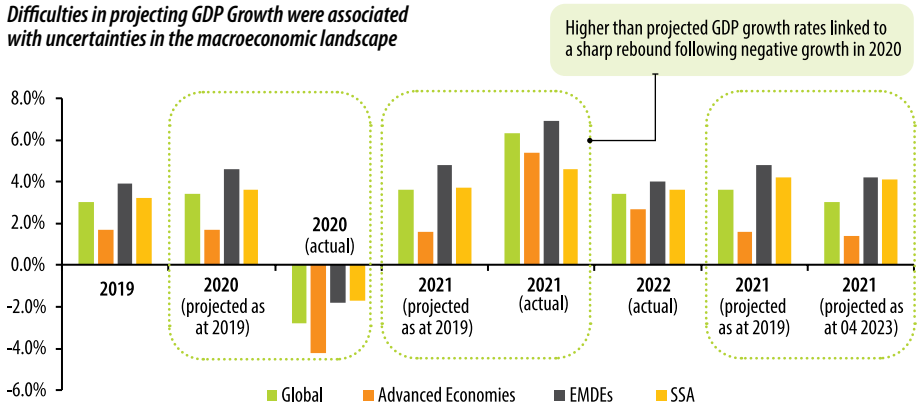
Early evidence suggests that macroeconomic instability has generally been associated with a poor economic growth performance (Easterly and Kraay, 1999).

This is anchored on the premise that private investment and spending, a key driver of economic activity, tends to be significantly and negatively influenced by uncertainty and macroeconomic instability (Ramey, 1995).

Macroeconomic stability therefore remains necessary for any successful effort to enhance economic growth thus any policies intended to stabilize macroeconomic conditions are critical. Stabilization policies in this case are in response to a change in circumstance to which results in economic instability. The IMF identifies two main sources of economic instability, exogenous shocks (e.g., trade shocks, wars, climate change shocks, shocks to capital flows etc.), and inappropriate policies (e.g., excessively loose fiscal policy that can make fiscal deficits unsustainable) that tend to result in economic disequilibrium and result in crises.

In recent times, the COVID-19 pandemic, the Russian-Ukraine war, and climate change shocks have been key sources of macroeconomic instability. These shocks have certainly had a profound impact on both economic and political thinking as well as in the conduct of policymaking.

Figure 1: GDP growth projections and outcomes considering macroeconomic instability



Source: IMF, World Economic Outlook October 2019 and April 2023

The key macroeconomic variables that tend to reflect economic disequilibrium are inflation rates, economic (GDP) growth rates, exchange rates and interest rates. The importance of these variables cannot be gainsaid given their influence on private sector confidence, spending, investments, and overall economic growth outcomes.

To strengthen and enhance macroeconomic stability, policymakers must define an attainable set of goals that target these macroeconomic variables. To note, macroeconomic stability exists when key economic relationships are in balance, albeit not necessarily in exact balance.

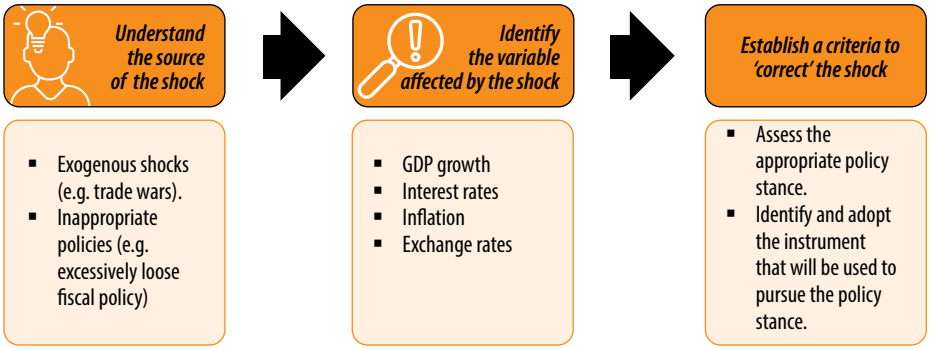
More broadly, the IMF identifies two considerations that underlie macroeconomic policy adjustments. First, policymakers need to assess the appropriate policy stance to adopt given a set of circumstances either by tightening or easing fiscal and/or monetary policy. Secondly, the instrument used to pursue the policy stance needs to be identified and adopted.

According to Issing (2005), the optimal degree of stabilization depends on whether the observed macroeconomic fluctuations constitute efficient responses of the economy to shocks or whether the fluctuations are partly due to economic frictions, to be addressed with the tools of stabilization policy.

Further, the type of policy adjustment needed for macroeconomic stabilization would depend on whether the source of shock/instability is a permanent (i.e., systemic) external shock or the result of earlier policy missteps. However, should the source of instability be identified as temporary (i.e., a one-time event), the IMF suggests that it may be prudent for a country to accommodate it.

In this study, policymakers pursue these macroeconomic stability goals through the adjustment of fiscal and monetary policy. Further, instances of economic instability are defined as periods of high inflation or low economic growth or a combination of both.

Figure 2: Steps to consider when addressing macroeconomic shocks as outlined by the IMF.



Source: IMF, Chart is Authors own

Fiscal policy may be conducted by adjusting tax rates or government spending. However, for lower income and emerging and developing economies (EMDEs) like Kenya, institutional limitations and a narrower tax base means that the efficacy of adjusting tax rates remain weak.

In this regard, it comes as no surprise that most of the corrective fiscal actions are linked to adjustments in government spending.

Meanwhile, monetary policy in Kenya is largely communicated through adjustments of the key policy rate, CBR (Central Bank Rate) as well as the Cash Reserve Ratio (CRR).

Most recently, the shift to a risk-based pricing model has resulted in an increased correlation between the CBR and private sector credit through the interest rate channel. This is as commercial bank adjust their benchmark lending rates in line with changes in the key policy rate CBR.

Even though changes in the CRR have been minimal over the years, its direct influence on money supply and thus impact on the quantum of bank funds available for lending makes it an important metric for the conduct of monetary policy.

During times of high inflation, the need for fiscal restraint strengthens and there is need to prioritize and/or reduce spending. On a secondary level, this would help manage the budget deficit and appetite for local deficit financing at a time when higher inflation raises interest rate expectations.

Meanwhile, monetary policy would tighten to rein in inflation by virtue of an increase in the key policy rate. However, to avoid destabilizing the financial system the upward adjustment of the key policy rate, CBR, would be gradual.

During times of economic downturns, fiscal policy may turn expansionary by virtue of increased spending either for social support or through increased spending on development/infrastructure projects. However, considering subdued revenues, a widening budget deficit would raise the sovereign's local debt appetite, infringing on the private sectors' ability to access that much more financing for investment and consumption.

Elevated sovereign debt appetite would as well place upward pressure on interest rates. This would counter more accommodative monetary policy at a time when the central bank would be seeking to remain supportive of economic conditions i.e., by curtailing upward pressure on interest rates.

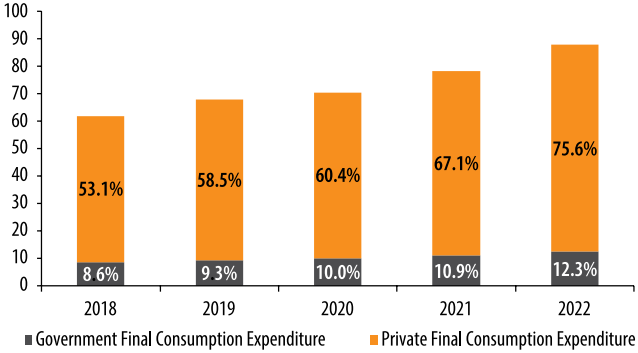
Certainly then, for the sake of social and economic welfare, monetary and fiscal authorities must work together to ensure that the economic environment remains stable and predictable – the efficacy and success notwithstanding.

2.0 Motivation of the Study

Ensuring macroeconomic stability remains critical in contributing to sustainable economic growth and development. This stability is pursued through sound economic policies that are critical in anchoring private sector activity – the greatest driver of economic growth.

Certainly, private investment is an important part of economic development and growth. More specifically in Kenya, private sector investment contributes over 70.00% to overall GDP growth.

Figure 3: Trends in Private Sector and Government Consumption (%) of GDP.



Source: Kenya Economic Survey 2023

For policymakers this should affirm the need to provide appropriate, clear, and transparent policy decisions as well as establish a track record of successful policy implementation to anchor private sector confidence.

That said, risks to private consumption expenditure and thus its overall contribution to economic growth lie in the access and supply to credit. The Central Bank of Kenya (CBK) estimates that a 1.00% increase in private sector credit contributes to a 0.06% increase in economic growth within three months and the impact to the economy is permanent.

Commercial banks, being key financial intermediaries, turn customer deposits, subject to regulatory requirements, into an indispensable source of funding for bank onward lending to customers (Woodford, 2010).

To this end, commercial banks are an important source of credit for borrowers without access to capital markets and thus indispensable to enhancing private investment within the economy.

In Kenya, despite well placed efforts towards fiscal consolidation, the fiscal space remains constrained and financing budget revenue shortfalls, has largely leaned towards the local debt market.

This is owing to the reality that tapping into international credit markets would expose the government to volatile macroeconomic shocks that contribute to prohibitive interest rates and consequent foreign exchange exposure that could be at the detriment to the economy and local currency once foreign debt falls due.

However, this has a consequence to the private sector. To be sure, commercial banks are the largest lenders to the sovereign and therefore the largest investors in government securities. Risk free lending to the government would result in a crowding out effect in credit markets thereby having significant consequences on private investments.

Meanwhile, it is believed that monetary policy works through the economy in a lagged manner with its efficacy linked to the nature of the monetary policy transmission mechanism and the prevailing fiscal policy stance.

The central bank's influence on macroeconomic conditions is associated with adjustments of key policy rates. This indeed has far reaching implications on the financing conditions in any economy as well as on the availability of credit and banks' willingness to assume specific risks.

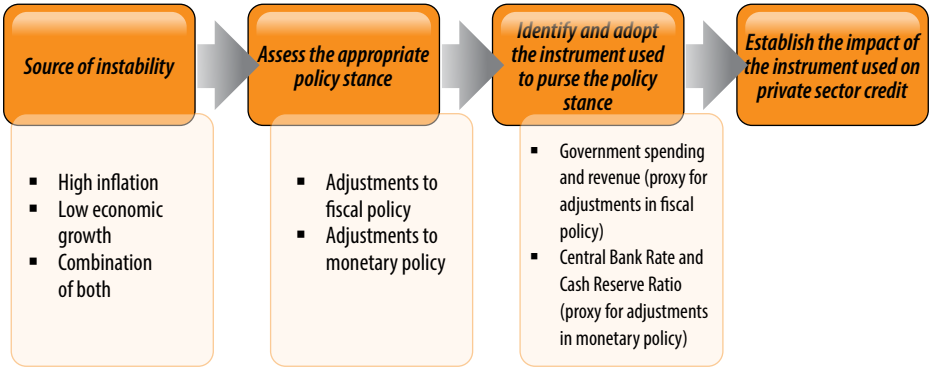
In Kenya, changes in CBR influence the direction of commercial bank base lending rates. Empirically, commercial banks tend to be quick to raising their lending rates amid a policy rate hike and slow to reducing their base lending rates once monetary policy turns accommodative.

Over the medium to long term, monetary policy adjustments influence expectations about the future direction of economic activity and inflation, thus affecting the price of money, asset prices, exchange rates as well as the quantum of consumption and investments.

This study is important as it seeks to examine the impact of macroeconomic stabilization policies, through adjustments in fiscal policy (proxied by government spending and revenue) and monetary policy (proxied by the central bank rate and the cash reserve ratio), on financial intermediation as proxied by private sector credit growth.

The study specifically seeks to understand the strength and significance of each of the policy mechanism to inform policymakers on the efficacy of each policy decision. This will follow the below criterion:

Figure 4: Steps to addressing macroeconomic shocks: Proposals by the IMF



Source: IMF, Chart is Authors own

The study seeks to answer the following research questions:

1. What is the strength and significance of changes in monetary policy on private sector credit?

2. What is the strength and significance of changes in fiscal policy on private sector credit?

3.0 Literature Review

Theories on impact of fiscal policy on private sector credit

From the classical standpoint, an increase in government expenditure financed by the local debt market tends to decrease the quantum of loanable funds to the private sector. Early evidence of this was highlighted by Barro (1997) who found that a decline in private investment, owing to the reduced supply of credit from commercial banks, may stem from an increase in government consumption.

Where government spending increases are funded out of domestic debt, interest rates must increase to bring the capital market into equilibrium, dampening private sector investment. This assertion is buttressed by the major assumption that money supply remains constant.

According to the Keynesian theory, increased government spending results in a minimal increase in the interest rate whilst increasing output and income. Further, it is argued that government expenditure increases private investment and thus demand for credit due to the positive effect of government spending on the expectations of the investors.

Their argument is based on the principle of the multiplier where a change in government spending induces a greater change in output.

Barro (1997) illustrates this point by explaining that in the Keynesian model an increase in aggregate demand leads to increased output, that entails more real income, hence a further increase in aggregate demand.

Further, Furceri and Sousa (2009), posit that the standard Real Business Cycle (RBC) model claims that an increase of government consumption will have a positive effect on investment: an increase of government consumption induces a rise in employment which, if sufficiently persistent, leads to a rise in the expected return to capital and, therefore, may trigger a rise in investment.

Theories on impact of monetary policy on private sector credit

According to Kahn (2010), in the context of the credit transmission channel, monetary policy affects the supply or relative pricing (the external finance premium) of loans by banks.

When tighter monetary policy causes banks to lose the use of some funds which cannot be replaced with other sources of funds then the relative cost of funds will increase, thereby decreasing the supply of loans to bank-dependent borrowers who are squeezed out, due to an increase in the external finance premium.

Kahn (2010) makes the distinction between the money view and the credit view transmission channel by stating that the analysis of the transmission process in monetary policy has traditionally focused on monetary aggregates whilst the credit view assesses the role of credit markets in the transmission of monetary policy.

Bernanke and Blinder (1988) quoted in Kahn (2010) show that in financially undeveloped economies, the credit view offers policymakers greater insight into long-term growth. The credit view of monetary policy suggests that the tightening of monetary policy will force banks to reduce their loans and securities.

4.0 Research Methodology

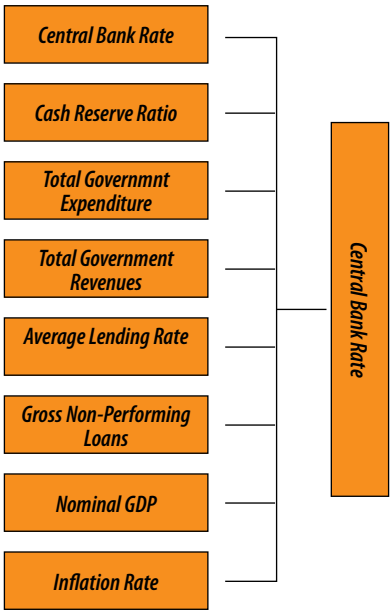
To assess the impact of macroeconomic stabilization policies on credit supply to the private sector the study as well takes into consideration other macroeconomic factors.

The key variables of interest are **psc**: stock of private sector credit as the dependent variable and **cbr**: central bank rate, **crr**: cash reserve ratio, **tge**: stock of total government expenditure, **tgr**: stock of total government revenues, **lr**: lending rate, **npl**: gross non-performing loans, **gdp**: nominal gross domestic product and **r**: headline inflation rate as the independent variables.

All variables are in nominal terms. The functional model is thus specified as:

$$psct = f(cbrt, tget, tgrt, it, nplt, lrt, gdprt, rt, et)$$

Figure 5: Conceptual Framework



4.1 Data Sources, Definition of Variables and Expected Results

Data Sources

Our choice of variables was informed by the reviewed literature. The sample period for the study includes monthly data for the aggregate banking sector in Kenya as well as macroeconomic data for the period between 2009 and 2023.

The data will include aggregate bank level data, central bank data, government data and well as macroeconomic data. This data will be obtained from the Central bank of Kenya and the Kenya National Bureau of Statistics (KNBS).

Definition of Variables

Table 1: Definition of Variables

Variable	Variable	Variable
Private Sector Credit (PSC)	The study uses private sector credit as the main financial indicator.	Monthly aggregate level total bank loans to the private sector. Source: Central Bank of Kenya (CBK)
	The assumption is that private sector credit generates increases in investment and productivity to a much larger extent than credit to the public sector – thus is an important driver of economic growth.	
Central Bank Rate (CBR)	This is the lowest rate of interest the central bank charges on loans to banks.	Value of published c entral bank rate (CBR) Source: Central Bank of Kenya (CBK)
	CBR is reviewed bi-monthly at the monetary policy committee (MPC) meeting.	
Cash Reserve Ratio (CRR)	This is the proportion of total commercial bank deposits as required by law and held at the central bank.	Source: Central Bank of Kenya (CBK)
	When the central bank needs to significantly adjust the amount of money supply in the market, it can increase or decrease the ratio.	
	To facilitate commercial banks' liquidity management, commercial banks are currently required to maintain their CRR based on a daily average level from the 15th of the previous month to the 14th of the current month and not to fall below a CRR of 3 percent on any day.	
Total Government Expenditure	Total government spending as reported by the exchequer at any given month	Source: Central Bank of Kenya (CBK)
Total Government Revenue	Total government revenues based on actual receipts as reported by the exchequer at any given month	Source: Central Bank of Kenya (CBK)

Variable	Variable	Variable
Gross domestic product growth rate (GDP)	This is used as a proxy for the business environment. The business environment defines among other things the credit risk that banks may be exposed to. This measure represents factors beyond the private sectors control that influence credit allocation decisions and the performance of loans.	Source: Central Bank of Kenya (CBK)
Gross non-performing loans	Khemraj and Pasha (2009) and Farhan et al. (2012) posit that a lower number of NPLs should improve risk appetite and in turn enhance credit allocation to the private sector. During times of economic uncertainty, risk appetite diminishes thus tightening credit allocation. In part, the lending capacity of bank is limited by the quantum of customer deposits.	The outstanding amount of loans classified as substandard, doubtful, doubtful of loss, and loss Source: Central Bank of Kenya (CBK)
Lending Rate	The study uses the yield on loans as a proxy for the interest rate effect. Demetriades and Luintel (2001) argue that under imperfect competition, mild repression in or a 'fixing of' the lending rate has a positive effect on bank loans. That is, under government intervention with an interest rate fixed below the monopoly equilibrium level, it is optimal for bankers to increase the amount of loans. However, repressing interest rate levels below those that would prevail under perfect competition will likely reduce the amount of loans and consequently have a negative effect in the economy.	Average interest charged on bank loans extended to the private sector. Source: Central Bank of Kenya (CBK)
Headline Inflation Rate	Average change in the cost of goods and services in the economy	Source: Kenya National Bureau of Statistics (KNBS)

Table 2: Expected Results

Variable Name	Notation	Expected Sign (Study)
Private Sector Credit	psc	
Central Bank Rate	cbr	(-)
Cash Reserve Ratio	crr	(-)
Total Government Expenditure	tge	(-)
Total Government Revenue	tgr	(+)
Non-Performing Loans Ratio	nplr	(-)
Lending Rate	lr	(-)
Economic Activity	gdp	(+)
Headline Inflation Rate	r	(-)

Empirical Model

To analyze these implications of macroeconomic stability policy on credit allocation, the study utilized impulse response functions (IRFs) employed via vector autoregressive (VAR) models. Impulse response functions (IRFs) enable us trace the transmission of the policy shock on bank lending to which the paper derives useful tools in the assessment of economic policies.

The VAR model has proved useful in describing the dynamic behavior of economic and financial time series. The VAR model is also used for structural inference and policy analysis. In structural analysis, certain assumptions about the causal structure of the data under investigation are imposed, and the resulting causal impacts of unexpected shocks or innovations to specified variables on the variables in the model are summarized. These causal impacts are then summarized with impulse response functions (IRFs).

Target population

The main target population is the Kenyan banking sector as the main providers of credit to the private sector as well as policy makers given the need to understand the the implications of macroeconomic stability policies on financial intermediation through the credit channel.

Data Analysis

The collected data was analyzed using trend analysis with tabular representations that explicitly revealed trends among the different data sets. Diagnostic tests were performed to ensure no violation of assumptions of normality, homogeneity, stationarity, heteroscedasticity and serial correlation using the Stata software package version 16.

Econometric Processing and Analysis

Unit Root Test

This test established whether the data variables have a unit root or not. That is, whether the data variables are stationary and at what level of integration.

Correlation Test

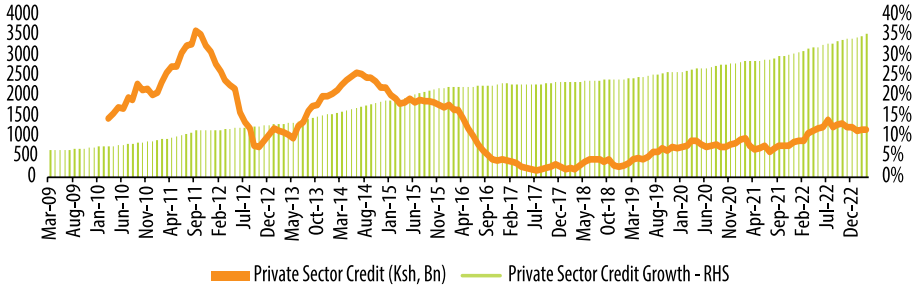
The study employs the serial correlation described in Born & Breitung (2016) for the variables. The underlying concept of the test is to regress current demeaned residuals on past demeaned and bias-corrected residuals (up to order lags) using a heteroskedasticity and autocorrelation robust estimator. A Wald test is then performed on the estimated coefficients. The test calculates the Q (p) statistic that is asymptotically equivalent to this Wald test. Born & Breitung (2016) have verified that the test in its current form is also valid for unbalanced panels. It might be slightly oversized (rejects the null too often), but this is still a matter of debate).

5.0 Research Findings and Discussion

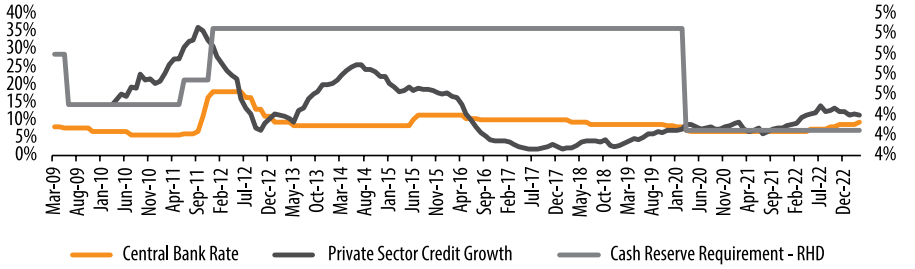
This chapter presents the results of the econometric analysis. The **psc**, **tge**, **tgr**, **npl** and **gdp** are transformed into **logs** as they are nominal amounts. Meanwhile, **crr**, **cbr**, **lr** and **r** are not transformed into logs, as they are percentages. Diagnostic tests were conducted. These tests included descriptive tests for normality of the data, unit root test for stationarity and the granger causality test to test the causal relationship between the variables.

Chart 4: Trend Analysis

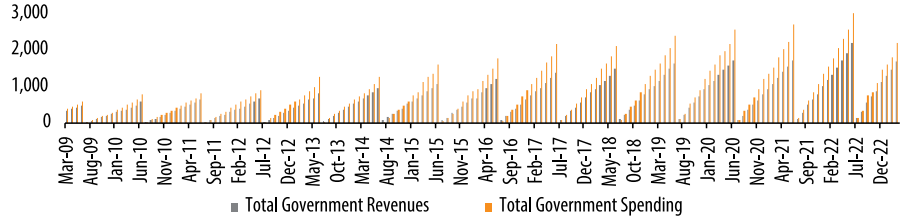
(a) XXXXX xxxxx XXXXXx cxc



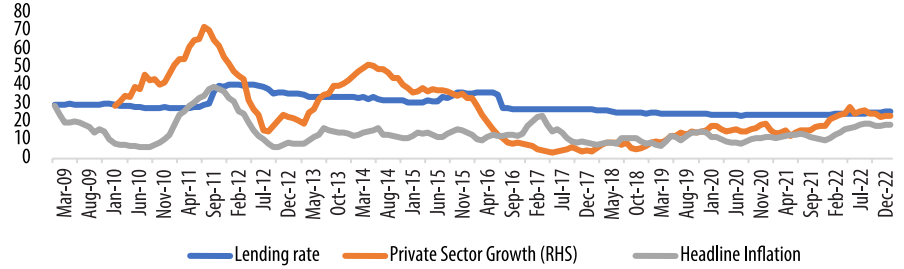
(b) XXXXX xxxxx XXXXXx cxc



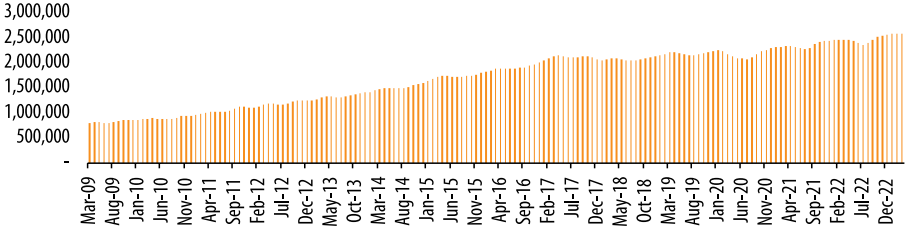
(c) Trends in Total Government Revenues and Expenditure



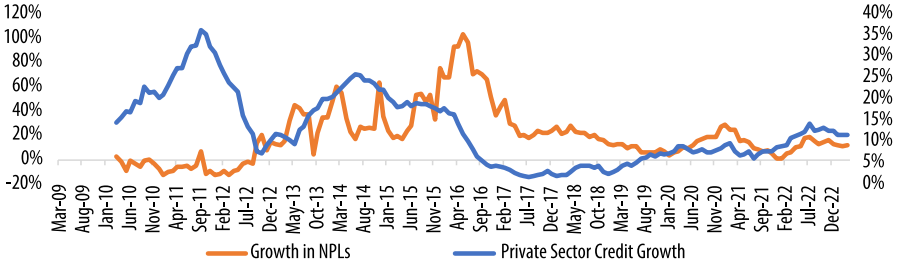
(d) XXXXX xxxxx XXXXXx cxc



(e) Nominal GDP



(f) XXXXX xxxxx XXXXXx cxc



The time trend for each of the variables employed in this study is displayed above.

For private sector credit, its respective chart shows that the stock of private sector credit has consistently grown over the sample period. That said, following the introduction of the interest rate cap in September 2016, its annual growth rate significantly slowed as banks shunned several borrowers. According to the Central Bank of Kenya (CBK), the number of loan accounts declined significantly while the average loan size rose reflecting lower access to small borrowers and larger loans to more established firms (CBK, March 2018).

Meanwhile, while there seems to be an inverse relationship between changes in monetary policy rates and trends in private sector credit, the relationship isn't distinctly clear. Over the sample period, the cash reserve requirement (CRR) has been adjusted about four times while the central bank rate (CBR) nearly fifteen times suggesting that it is the most preferred monetary policy tool.

Government spending and revenues have gradually increased over the sample period. Notably, spending continues to outpace reported revenues underlining a sustained budget deficit. Growing revenues has remained a challenge for the nation owing to tax evasion and/or avoidance. This has then informed the government's resolve to continually adjust its spending so as to manage its deficit and emerging debt appetite to which has an impact of private sector credit through its crowding out effects.

Private sector credit doesn't seem to have a direct correlation with lending rates according to its graphical representation. However, of note, private sector credit trends seem to track trends in headline inflation. The above trend is relevant to our study given that periods of high inflation are a source of macroeconomic instability to which central bank rates are adjusted to address through containment of demand (pass-through of demand pressures).

Finally, there is a positive correlation between growth in credit and growth in private sector credit.

Table 3: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
logpsc	169	14.4064	0.4725	13.4057	15.0816
crr	169	0.0490	0.0043	0.0425	0.0525
cbr	169	0.0905	0.0264	0.0575	0.1800
logtge	169	13.2924	1.0029	10.4894	14.9218
logtgr	169	13.0565	0.8998	10.5470	14.6039
lr	169	0.1468	0.0239	0.1175	0.2034
lognpl	169	11.8824	0.8845	10.6487	13.1440
logdp	169	14.3097	0.3545	13.6067	14.7698
r	169	0.0717	0.0334	0.0318	0.1972

Source: Author's Calculations

The descriptive statistics table shows that the sample size is balanced with 169 observations. This is in line with the recommended range of at least 50 observations as larger samples often provide more precise estimates of process parameters such as mean and standard deviation. The standard deviations of the data variables are close to 0 indicating that the variables are not volatile.

Table 4: Correlation Analysis

	logpsc	crr	cbr	logtge	logtgr	lr	lognpl	loggdp	r
logpsc	1.00								
crr	-0.07	1.00							
cbr	-0.04	0.55	1.00						
logtge	0.47	-0.08	-0.04	1.00					
logtgr	0.50	-0.07	-0.06	0.99	1.00				
lr	-0.48	0.55	0.70	-0.28	-0.30	1.00			
lognpl	0.92	-0.27	-0.23	0.46	0.50	-0.71	1.00		
loggdp	0.99	-0.04	-0.05	0.49	0.53	-0.51	0.94	1.00	
r	-0.26	0.00	0.39	-0.15	-0.16	0.27	-0.31	-0.29	1.00

Source: Author's Calculations

The correlation analysis reveals that private sector credit (logpsc) has a strong positive correlation with credit risk (lognpl), economic activity (logdp) and total government revenues (logtgr).

The positive relationship with credit risk may be informed by empirical evidence that suggests that increased credit supply, ceteris paribus, enhances banks' credit risk exposure.

Meanwhile, as the economic performance improves, it may be assumed that demand for credit rises particularly from businesses seeking to enhance their activity to meet higher consumer demand. Alternatively, it can also be assumed that an increase in private sector credit is supportive of economic conditions thus the positive relationship.

When it comes to total government revenues (logtgr), the positive relationship with private sector credit may be associated with a corresponding narrowing of the fiscal deficit to which reduces the sovereign's appetite for debt (more so locally). This helps moderates the crowding out effect.

The positive relationship is however weak when compared with the inflation (r) and total government expenditure (logtge).

Conversely, private sector credit (logpsc) has a negative but weak relationship with the cash reserve ratio (crr) and central bank rate (cbr). This perhaps provides early evidence of a lagged monetary policy transmission linked to changes in the crr and cbr.

The findings of the ADF unit root tests are illustrated in **Table 5**. It depicts that logpsc, logtge, logtgr are stationary at level. Meanwhile, crr, cbr, lr, lognpl, logdp and r are stationary at first difference. The results from the table indicate that the variables are of mixed integration. Given that this study is utilizing the VAR estimation technique, all variables used in the model are converted to first difference.

Table 5: Unit Root Testing

Variable	I(0)	I(1)
logpsc	*,**,***	
crr		*,**,***
cbr		*,**,***
logtge	*,**,***	
logtgr	*,**,***	
lr		*,**,***
lognpl		*,**,***
logdp		*,**,***
r		*,**,***

*,**,*** variable is stationary at the 1%, 5% and 10% significance level

Table 6: Optimal Lag Selection

VAR models use the same lags so to which, according to the AIC, the optimal lag selection of 4.

Equation	Dependent Variable	Independent Variable	Lag	Coefficient	Standard Error
1	Private Sector Credit	Private Sector Credit	L1.	0.215	0.077
			L2.	0.353	0.077
		Cash Reserve Ratio	L4.	-1.683	0.577
		Central Bank Rate	L1.	-0.299	0.107
		Non-Performing Loans	L2.	-0.026	0.010
2	Cash Reserve Ratio	GDP	L1.	0.036	0.014
			L2.	-0.053	0.023
			L3.	0.047	0.022

Equation	Dependent Variable	Independent Variable	Lag	Coefficient	Standard Error
3	**Central Bank Rate**	Private Sector Credit	L2.	0.142	0.061
		Central Bank Rate	L1.	0.419	0.085
			L2.	0.267	0.093
			L3.	-0.309	0.090
			L4.	0.246	0.092
		Inflation	L1.	0.108	0.057
			L3.	0.194	0.064
4	**Total Government Expenditure**	Private Sector Credit	L1.	-26.620	8.349
		Cash Reserve Ratio	L1.	-177.453	68.373
			L2.	-140.269	62.379
			L4.	197.325	62.611
		Central Bank Rate	L1.	-30.184	11.665
			L3.	25.216	12.316
		Non-Performing Loans	L3.	-2.547	1.137
		GDP	L2.	39.814	19.943
			L4.	-22.620	11.057
5	**Total Government Revenues**	Private Sector Credit	L1.	-20.371	7.148
		Cash Reserve Ratio	L1.	-160.891	58.537
			L2.	-115.886	53.406
			L4.	159.215	53.604
		Central Bank Rate	L1.	-24.203	9.987
			L3.	20.636	10.544
		Non-Performing Loans	L3.	-2.056	0.974
		GDP	L2.	33.664	17.074

Equation	Dependent Variable	Independent Variable	Lag	Coefficient	Standard Error
6	**Lending Rate**	Central Bank Rate	L1.	0.319	0.063
			L4.	0.148	0.068
		Total Government Expenditure	L1.	0.007	0.003
			L2.	0.009	0.004
		Total Government Revenues	L2.	-0.009	0.004
7	**Non-Performing Loans**	Total Government Expenditure	L2.	0.101	0.043
			L3.	-0.108	0.044
			L4.	-0.133	0.040
		Total Government Revenues	L2.	-0.119	0.051
			L3.	0.141	0.052
			L4.	0.150	0.048
		Lending Rate	L2.	2.409	0.969
		Inflation	L2.	-1.711	0.561
8	**GDP**	Private Sector Credit	L1.	-0.108	0.050
			L3.	0.133	0.052
		Cash Reserve Ratio	L2.	1.094	0.375
		Central Bank Rate	L1.	-0.168	0.070
			L4.	0.159	0.076
		Total Government Expenditure	L1.	0.014	0.004
			L4.	0.012	0.004
		Total Government Revenues	L1.	-0.020	0.004
			L4.	-0.014	0.004
		GDP	L1.	1.510	0.073
			L2.	-1.325	0.120
			L3.	0.671	0.116
			L4.	-0.164	0.066

Equation	Dependent Variable	Independent Variable	Lag	Coefficient	Standard Error
9	**Inflation Rate**	Private Sector Credit	L1.	0.161	0.080
		Lending Rate	L4.	-0.373	0.134
		Non-Performing Loans	L4.	0.025	0.011
		Inflation Rate	L1.	0.480	0.075
			L3.	0.188	0.084

The summary table below only features variables that are statistically significant at the 5% level.

From the VAR results, private sector credit can be explained by its own lagged values as well as past values of the cash reserve ratio (CRR), central bank rate (CBR) and the gross non-performing loans. The relationship is positive when compared to its own lags and negative when compared with the cash reserve ratio (CRR), central bank rate (CBR) and gross non-performing loans (NPLs).

Changes in the cash reserves ratio seem to have a more significant influence on private sector albeit after four (4) months. From the results, a 1.00% rise in the cash reserve ratio results in a 1.68% decline in the stock of private sector credit.

Changes in the central bank ratio seem small but have a more immediate impact on the stock of private sector credit. From the model, a 1.00% increase in the central bank rate results in 0.30% decline in the private sector credit after one (1) month.

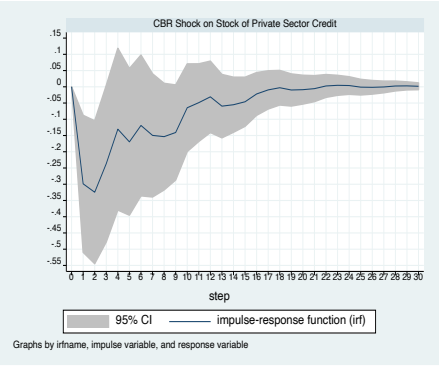
Changes in gross non-performing loans- are reflected in private sector credit after two (2) months. From the model, a 1.00% increase in gross non-performing loans decreases the stock of private sector credit 0.03%.

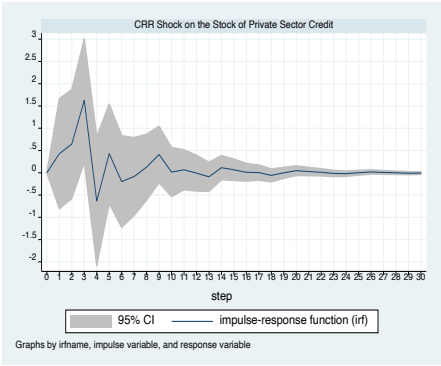
Table 7: Summary of Granger Causality Test:

Dependent Variable	Excluded	Prob > chi2	Direction
Private Sector Credit	dcrr	0.01	crr → logpsc
	dcbr	0.01	cbr → logpsc
	dlogtge	0.04	logtge → logpsc
	dlogtgr	0.05	logtgr → logpsc

Dependent Variable	Excluded	Prob > chi2	Direction
Central Bank Rate	dlogpsc	0.03	logpsc → cbr
	dlogtge	0.04	logtge → cbr
	dlogtgr	0.04	logtgr → cbr
	dr	0.01	logr → cbr
Total Government Expenditure	dlogpsc	0.02	logpsc → logtge
	dcrr	0.00	crr → logtge
	dcbr	0.01	cbr → logtge
	dloggdp	0.00	loggdp → logtge
Total Government Revenues	dlogpsc	0.05	logpsc → logtgr
	dcrr	0.00	crr → logtgr
	dcbr	0.02	cbr → logtgr
	dloggdp	0.00	loggdp → logtgr
Lending Rate	dlogpsc	0.04	logpsc → lr
	dcbr	0.00	cbr → lr
Non-performing loans	dlogtge	0.00	logtge → lognpl
	dlogtgr	0.00	logtgr → lognpl
	dr	0.01	r → lognpl
GDP	dlogpsc	0.00	logpsc → loggdp
	dcrr	0.01	crr → loggdp
	dcbr	0.01	cbr → loggdp
	dlogtge	0.00	logtge → loggdp
	dlogtgr	0.00	logtgr → loggdp
Inflation Rate	dlogpsc	0.04	logpsc → r

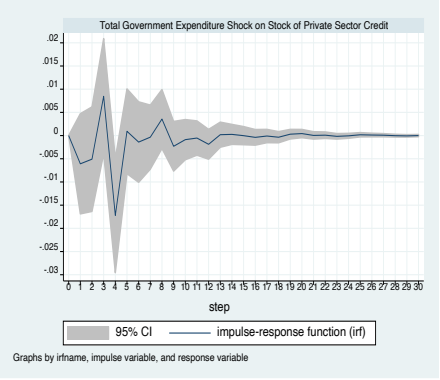
Chart 5: Impulse Response Functions

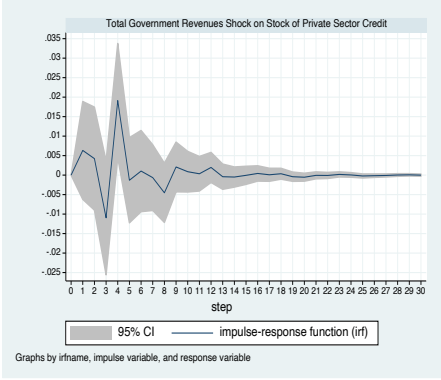




A 1.00% increase in the CBR reduces the stock of private sector credit after one (1) month with a peak reduction of 0.53% after two (2) months. The impact lasts up to 16-months. This suggests that there is a lagged transmission on the credit channel emanating from a change in monetary policy via the manipulation of the key policy rate, CBR– confirming both theoretical and empirical evidence.

Meanwhile, a 1.00% increase in CRR reduces the stock of private sector credit after four (4) months with a peak reduction of 2.00% with the impact lasting 6-months. This suggests that changes in CRR have a more significant impact on the quantum of private sector credit and may be more useful in influencing private sector credit trends.

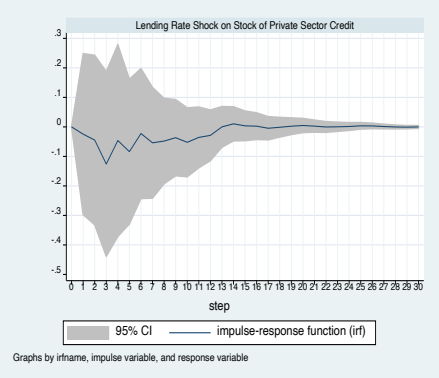


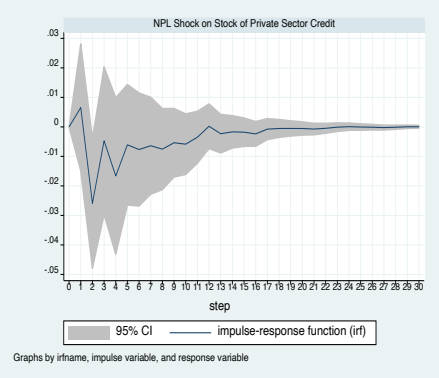


A 1.00% increase in total government expenditure reduces the stock of private sector credit after one (1) month with a peak reduction of 0.03% after four (4) months. The impact dissipates after one (1) month. Meanwhile, a 1.00% increase in total government revenues raises the stock of private sector credit after one (1) month with a peak increase of 0.02% after four (4) months. The impact fades within a month.

Both findings are in line with empirical evidence that show that the composition of government expenditure and the efficient mobilization of government revenues affects private investments by crowding them in or out (Chua, 1998).

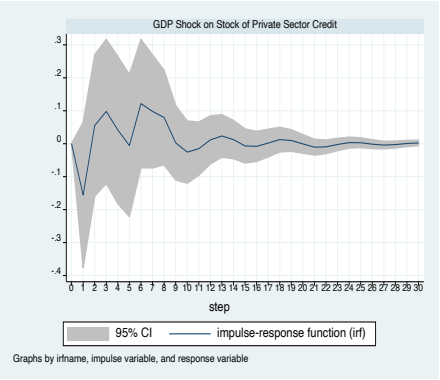
In Kenya, financing the government's budget deficit tends to lean towards the local debt market thus resulting in a crowding out effect on the private sector. This is as banks, increase their holdings of government securities. Enhancing revenue collections thus crowds in private sector credit.

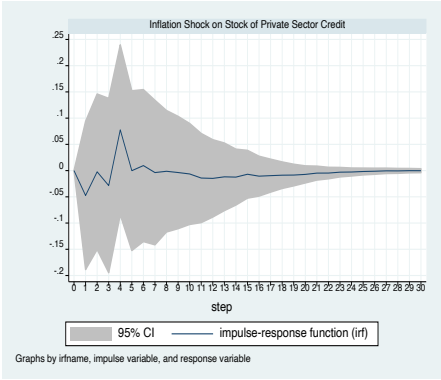




A 1.00% increase in the lending rate reduces the stock of private sector credit on impact with a peak reduction of 0.42% after three (3) months. The impact lasts for nine (9) months. Meanwhile, a 1.00% increase in gross non-performing loans reduces the stock of private sector credit after two (2) months with a peak reduction of 0.05%. The impact lasts about 10-months.

A 1.00% increase in the nominal GDP raises the stock of private sector credit on after two (2) months with a peak increase of 0.30% after three (3) months. The impact lasts for seven (7) months. Meanwhile, a 1.00% increase in the inflation rate reduces the stock of private sector credit on impact with a peak reduction of 0.18% after three (3) months. The impact lasts up to six (6) months.


GDP Shock on Stock of Private Sector Credit
.3
.2
.1
0
-.1
-.2
-.3
-.4
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
step
95% CI
impulse-response function (irf)
Graphs by irfname, impulse variable, and response variable


Inflation Shock on Stock of Private Sector Credit
.25
.2
.15
.1
.05
0
-.05
-.1
-.15
-.2
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
step
95% CI
impulse-response function (irf)
Graphs by irfname, impulse variable, and response variable

6.0 Conclusion

The study's conquest to answer the research questions of the strength and significance of changes in monetary and fiscal policy on private sector credit has been achieved.

The model results indicate that changes in monetary policy through the manipulation of the CRR and CBR have a longer lasting impact on private sector credit compared to changes in fiscal policy.

That said, the transmission of this impact is lagged, confirming both theoretical and empirical evidence.

An increase in the CBR is intended to directly mitigate price pressures (inflation) by curtailing demand through increments in the price of credit. In Kenya, Banks are required to provide one (1) month notice when they intend to raise their base lending rates – to which will impact the price of credit (lending rates). This explains why the IRF and VAR results reveal that the impact of the shock occurs after one month.

Meanwhile, from the model changes in CRR have a more significant impact on the quantum of private sector credit compared to changes in CBR given its direct impact on bank liquidity. This indicates that adjusting the CRR may be more useful in influencing private sector credit particularly when there is an urgent need to tame inflation or positively impact economic growth during by availing more bank funds for lending.

Fiscal policy as illustrated through total government spending and revenues, tends to impact the stock of private sector credit instantaneously. However, the impact is short-lived given the evolving nature of the sovereign's wallet.

The results clearly show that prudent fiscal consolidation (raising government revenues or reducing government spending or a combination of both) support lending to the private sector.

Kenya's local issues around revenue mobilization suggest that a rationalization of the government's budget, specifically on managing its expenditure is supportive

of bank credit extension activities to the private sector. However, the VAR results suggests that the significance of fiscal policy on influencing private sector credit remains weak.

Meanwhile, as high credit risks, as proxied by gross non-performing loans, remain an obstacle for bank credit extension to the private sector, banks should pay attention to reducing the levels of NPLs. The study recommends that commercial banks must give more emphasis to credit risk because it weakens banks loan disbursement.

Further, sound financial sector policies remain supportive of financial intermediation. This affirms the need for banks to maintain a healthy liquidity ratio which would prevent abrupt deleveraging which might improve credit supply to the private sector.

All in all, private sector credit remains a key driver of private investment and consequent driver of economic growth in Kenya. The study therefore achieves its task of investigating the impact of macroeconomic stability policies on bank credit to the private sector.

7.0 Recommendations

The study finds that the raising CRR may act as a kind of tax on the financial sector and may lead to financial disintermediation if it is calibrated excessively. Further its quantitative impact is questionable.

The study recommends the use of CRR more so during times of monetary policy accommodation and pursued concurrently with CBR to strengthen monetary policy transmission.

Government spending in Kenya is primarily recurrent in nature thus (potentially) resulting in direct crowding out of the private sector. However, the extent of crowding out depends on the financing of the spending either through government revenues or debt.

The study finds that the impact of government spending on private sector credit requires further investigation given concurrent changes with respect to interest rates, the exchange rate, credit risk (just to mention a few) that may impact the extent of crowding out.

On gross NPLs the study found a passthrough of both fiscal and monetary policy to NPLs through several channels with changes in fiscal policy being most significant. The study recommends a phased approach to changes in fiscal policy as a result.

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