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Fiscal and Monetary Policy Interaction During Economic Shocks: A Wedge or Bridge for Bank Profitability?

Jared Osoro* and Josea Kiplangat**

Abstract

Persistence of profitability in the Kenyan banking industry masks the limited understanding of the adjustment process of the profit seeking behavior during economic shocks. Whether the adjustment is in response to the adverse outcomes of the shocks, or the inevitable macroeconomic policy response is an open question. This paper seeks to assess the implication of fiscal-monetary interactions on banks' profitability. We deploy both static and dynamic panel models to estimate the influence of the macro policies using bank-level as well as macroeconomic data in Kenya for the period 2003 – 2022. We establish that both monetary policy and fiscal policy matter for bank profitability, their influence revealing the attribute of interconnectivity between the two policies. The banks' profitability is positively influenced by an expansionary fiscal policy, with a similar influence associated with a tightening monetary policy. We contend that for a given set of bankspecific attributes, if monetary and fiscal policies are prominent influencers of profitability, it signals that the banks' reaction function as profit seekers is more a response to policy adjustment to shocks than the underlying economic outcomes. The key inference based on the assessment is that banks' profit seeking attribute while riding on an expansionary fiscal policy and a tightening monetary policy entails risk taking behavior that can potentially push the economy to the boundary of the "region of stability". That puts the spotlight on the attitude of the banks' regulator and that of banks towards profitability and risk-taking and calls for two policy considerations. One is the need for a robust stresstesting framework that takes into account capital adequacy and asset quality optimal thresholds whose breaching we determine to be a possible triggers of market jitters. Two is the necessity of a stable market-based funding mechanism supported by the regulator's liquidity window and complemented by a conservative dividend policy even as profitability may persists. The two policy considerations will potentially obviate a situation where there is a realization that elusive boundaries of "the region of stability" have been breached ex post and the banking system is stable until suddenly it is not.

Keywords: *Bank profitability; dynamic panel threshold model; fiscal policy and monetary policy interaction*

*FSD Africa; ** Kenya Mortgage Refinance Company

1.0 Introduction

The understanding of how economic shocks adversely affect market outcomes and consequently change the landscape for financial sector profit seekers is seldom esoteric. Nor is the acknowledgment that the policy response towards restoring stable financial and macroeconomic environment often comes with short-term tradeoffs (Blanchard, 2014). It is however not obvious whether the adjustment of financial sector players' profit seeking behavior is informed more by the adverse outcomes or by the inevitable macroeconomic policy response. As a contribution towards the understanding of the adjustment to shocks, this paper's objective is to assess the implication of the fiscal policy–monetary policy interaction on the profitability of banks in the context of Kenya.

The insights we proffer in the paper are less about how banks make profit, an area that has attracted considerable interest (Olweny, 2011; Kiganda 2014; Lukorito, Muturi, Nyang'au and Nyamasege (2014). They are instead more about risks masked by the perception of financial stability that does not fully acknowledge the possibility that the interaction between monetary and fiscal policy could be approaching the boundaries of the "region of stability". According to BIS (2023), the consistency of the combination of fiscal policy and monetary policy to macroeconomic and financial stability points to a system operating within the region of stability. Within the region, any tension that may arise between the two policies will remain manageable. When the policies tend towards the boundaries of the region of stability, it implies that they are encroaching on each other in a manner that compromises macro-financial stability.

We contend that even under the best of circumstances, the deployment of macroeconomic policy to address benign market dislocations is a balancing act. When the balance is tested by shocks, the intention of fiscal and monetary policies is ideally to minimize cyclical fluctuations. However, the minimization is often not a neat process, hence the recent plethora of studies calling for a rethink of macroeconomic policy (Sachs, 2009; Blanchard, Dell'Ariccia, and Mauro, 2010; Nayyar, 2011; Akerlof, Blanchard, Romer and Stiglitz, 2014; Gopinath, 2017).

The financial systems, more so banks, are at the center of the rethink. Evident from the 2007 – 2009 global financial, the behavior of financial institutions is core for the stability of the macroeconomic system (Ryoo, 2013). Equally, the state of the macroeconomic system has a bearing on behavior of financial institutions, especially taking into account the latter's inherent active profit seeking attribute. The feedback loop between macroeconomic stability and financial stability motivates a focus on the banks' profitability for two linked reasons.

- One, inspired by Hyman Minsky's financial instability hypothesis, a robust banking system could be endogenously transformed into fragility on account of prolonged periods of stable years motivating enhanced risk-taking behavior in pursuit of profit maximization (Minsky, 1982, 1986).
- Two, when banks are riding the wave of good financial returns on the back of stable periods, it is easy for the boundaries of the region of stability to be elusive to the extent of only being apparent ex post. As BIS (2023) asserts, banks could portray stability, until suddenly they are not.

The Kenyan case embodies an interesting interplay between the fiscal-monetary policy interaction and what it means for banks' profitability in at least three ways that we elaborate in stylized facts underpinned by literature.

- One, while the modernization of the monetary policy framework and operations by the Central Bank of Kenya (CBK, 2021) and the constitutional mandate of The National Treasury point to the independence the conduct of the monetary and fiscal policies, it can be averred that the two are strongly intertwined.
- Two, even though in a general sense fiscal policy is intended to be countercyclical as detailed in Jalles, Kiendrebeago, Lam and Piazza (2023), an inherently predisposition to economic optimism in the case of Kenya is aligned to instances of acyclicality and procyclicality.
- Three, hints of Minsky moments whereby prolonged financial stability and the associated risktaking that underlies the profit agenda of banks is punctuated by sudden bank failures. The recent cases were in the 2015 – 2016 period where three banks collapsed, albeit without systemic implications. Even then, the profit seeking behavior of banks is revealed by the interbank market segmentation whereby the small banks–big banks dichotomy exposes the challenge of liquidity distribution (Osoro and Muriithi, 2017).

Pursuant to this paper's objective, we deploy both static and dynamic panel models to estimate the influence of the macro policies using bank-level as well as macroeconomic data in Kenya for the period 2003 – 2022. The time frame covers fully the broad economic shocks associated with the 2007 – 2009 global financial crisis (GFC) and the confluence of shocks seen in the 2000 – 2022 period. We establish that both monetary policy and fiscal policy matter for bank profitability, their influence revealing the attribute of interconnectivity between the two policies. The banks' profitability is positively influenced by an expansionary fiscal policy, with a similar

influence associated with a tightening monetary policy. We contend that for a given set of banks specific attributes, if monetary and fiscal policies are prominent influencers of profitability, it signals that the banks' reaction function as profit seekers is more a response to policy adjustment to shocks than to the underlying economic outcomes.

It is inferred that that banks' profit seeking attribute while riding on an expansionary fiscal policy and a tightening monetary policy entails risk taking behavior that can potentially push the economy to the boundary of the "region of stability". With that, the spotlight is on the attitude of bank regulator and that of banks towards profitability and risk-taking and calls for policy considerations around robust stress testing framework and stable market-based funding mechanism supported by the regulator's liquidity window and complemented by a conservative dividend policy even as profitability may persists. The rest of the paper is organized as follows. **Section 2.0** provides stylized facts, followed in **Section 3.0** which summarizes the review of related literature, while the empirical assessment is provided in **Section 4.0** **Section 5.0** concludes.

2.0 Stylized facts

The foundation of the stylized facts that anchor the analysis of the fiscal and monetary policies interaction in the Kenyan context is the consolidated government and central bank budget constraint identity as specified in BIS (2023) whereby:

$$\Delta DD_t + \Delta FD_t E_t = r_t DD_{t-1} + r_t^* FD_{t-1} - PB_t - \Delta M_t \quad \text{..... (1)}$$

Where DD is the government's aggregated domestic currency debt that include debt from the central bank; FD is aggregated foreign currency net debt that nets out foreign currency reserves and converted to local currency using E, the nominal exchange rate; r and r^* are, respectively, domestic and external interest rates; PB is the primary balance, and M is the non-interest liabilities in the form of noninterest-bearing reserves and cash.

The evolution of the changes in debt-to-GDP ratio based on the combined domestic and foreign debt (d) and divining all the other variables in **equation 1** by nominal GDP is expressed as follows:

$$\Delta d_t = (r_t^{wa} - g_t) d_{t-1} - pb_t - m_t \quad \text{..... (2)}$$

where r^{wa} is the weighted average of the interest paid both domestic and foreign debt; g is the nominal GDP growth rate; pb and m are, respectively, primary balance and seigniorage as a share of GDP. From **equation 2**, the two variables that are given keen attention are the primary balance as a share of GDP and the difference between the debt yield and GDP, so-called growth-adjusted interest rate. The variable r^{wa} is a key connector of monetary policy and fiscal policy that is expressed as follows:

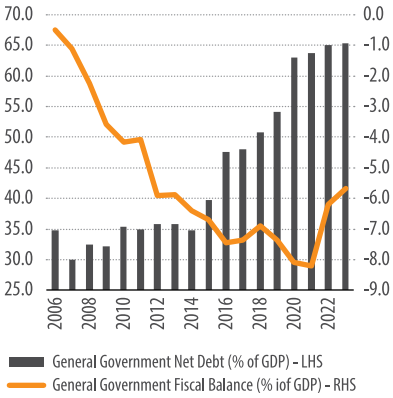
$$r_t^{wa} = \emptyset_t r_t + (1-\emptyset_t)(r_t^* + e_t) \quad \text{..... (3)}$$

The valuation effect of the weighted interest rate is through e, the depreciation of the nominal exchange rate; $\emptyset$ is the share of domestic currency debt in net debt. The outlined simple but illustratively intuitive depiction of the inextricable link between fiscal policy and monetary policy underpins four key stylized facts as they relate to Kenya.

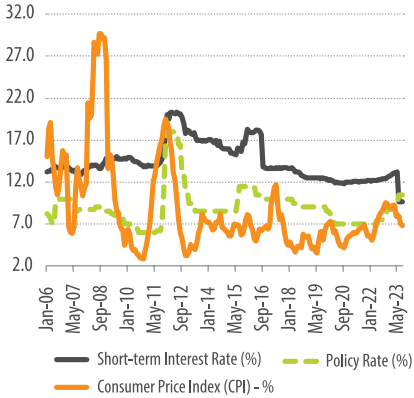
One, fiscal policy has been on a steady expansionary path with the widening negative fiscal balance revealing itself in public debt accumulation **(Figure 1)**. With the short-term interest rate being at double digit levels even as the policy rate is at upper single digit levels on the back of a generally stable consumer price movements, the fiscal and monetary policies depict a general disposition towards optimism. That makes the examination of the ramifications of fast debt accumulation on stability, risk taking and profitability of banks compelling.

Figure 1: Fiscal and monetary policies' stance

A: Fiscal Balance and Government Debt



B: Policy Rate, Short Term Rate and CPI

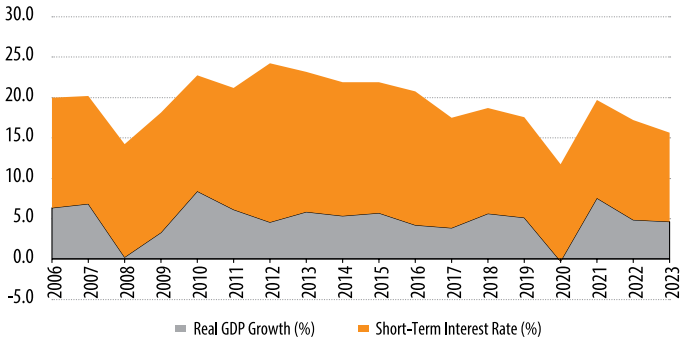


Source: National Treasury; CBK.

Drawing from **equation 2** above, it is clear that so long as is consistently positive, the debt-to-GDP ratio will continue rising in a manner that even a positive primary surplus may not have sufficient offsetting effect of containing the rise. The emerging literature on growth adjusted interest rate is substantially on advanced economies and has common thread of the rate being historically negative on the back of debt accumulation (Blanchard, 2019; Rogoff,2020; Mauro and Zhou, 2021; Mehrotra and Sergeyev, 2021). These studies argue that even with prolonged the benefits of debt accumulation are not limitless, for its costs may be hidden until they are exposed by the next economic crisis. By implication, the case of debt accumulation in Kenya where a conservative estimate of the growth adjusted interest rate is consistently positive **(Figure 2)** calls for abundance of caution.

Two, the sustained public debt accumulation over the past two decades has been characterized by a shift in the debt mix from the obvious swings between domestic debt and external debt that portent

Figure 2: Kenya's r-g>0

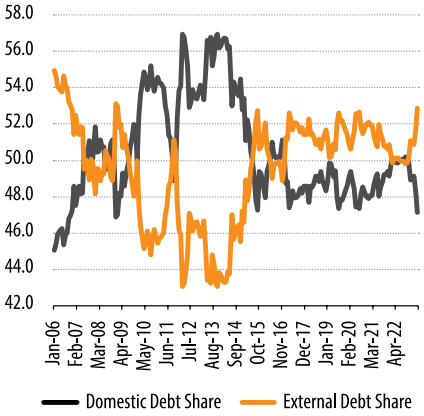


Source: CBK.

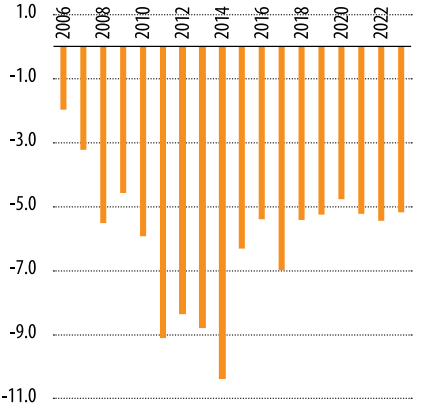
some substitution effect to a more stable balance of proportionality **(Figure 3)**. The period prior to the almost equiproportional mix of public debt was characterized by an interesting phenomenon of the declining share external debt being accompanied by a deterioration of the external position and the subsequent reversal of the external debt position corresponding to an improvement of the external position. This may superficiary seem paradoxical given that the external balance signals the extent to

Figure 3: Public Debt Mix and External Balance

A: Public Debt (%)



B: Current Account Balance (% of GDP)

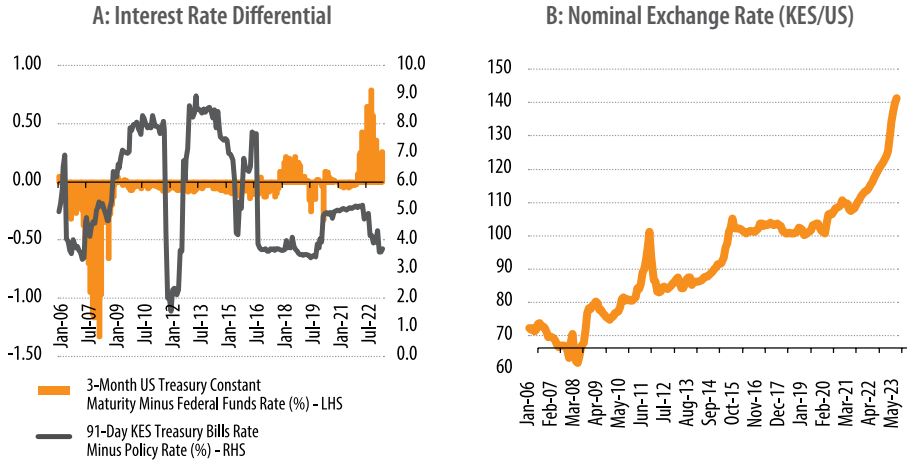


Source: CBK; KNBS.

which the domestic savings gap is filled by external savings. We however argued that any ascription of a causal relationship between the share of external debt and the current account balance is tenuous. The trend of the share of external debt relative to the total debt is influenced more by the extent to which domestic circumstances, including liquidity conditions, determine debt uptake and less on the extent to which the economy is reliant on foreign savings. It also partly reflects the increasing prominence of private inflows flows from external financial markets.

Three, the extent to which global shocks have played into both money markets and foreign exchange markets in Kenya is a stark contrast to that of advanced markets such as the US. The consistently positive and sufficiently wide spread between the short-term interest rate and policy rate in Kenya compare to a largely negative spread in the US (**Figure 4**) points to the aggressive monetary easing in the latter market during the 2007 – 2009 GFC and the limited exposure of the former to the GFC that did not compel an ultra-accommodative monetary policy.

Figure 4: Interest Rate Differential and Exchange Rate



Source: Federal Reserve Economic Data (FRED); CBK.

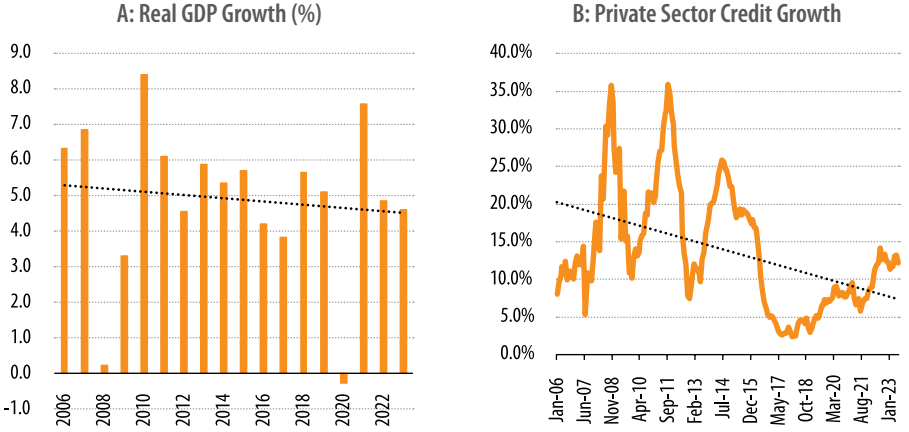
The spillover effect from the international markets to the Kenyan market as revealed in the foreign exchange market has been two phased. First, during the sustained zero interest rates in advanced economies, the portfolio flows to markets such as Kenya in pursuit of yields partly contributed to the relative stability of the exchange rate market. The prolonged low interest rate regime has motivated literature grounded on the "lowforlong" notion that the regime will likely be persistent (Bean, Broda, Ito and Kroszner,2015; Borio, Disyatat, Juselius, and Rungcharoenkitkul, 2017; Claessens, Coleman and Donnelly, 2018; IMF,

2019; Tobias, 2020). Part of the relative stability in the Kenyan foreign exchange market is attributed to the CBK's intervention through the deployment of foreign currency reserves, its apparent tool of choice given CBK's inclination towards an accommodative monetary policy stance based on the alluded disposition towards optimism.

Second, the inflationary pressure associated with the COVID19 pandemic was initially assessed as transitory but subsequently confirmed to be entrenched, leading to aggressive monetary policy tightening. The positive spread between the 3-Month US Constant Maturity less the Fed Fund Rate seen post-2020 is associated with the sharp depreciation of the Kenyan currency. The pre-2000 foreign exchange market stability was as much the pursuit of macroeconomic stability in line with the primary objective of the CBK as it was a measure to support fiscal sustainability as illustrated by in **(3)**. In line with the characterization of Brunnermier (2023), if the implication is that the CBK is deploying its monetary policy tools pursuant to its instrument independence while at the same time seeking to assure fiscal sustainability, then the possibility fiscal dominance arising from public debt buildup cannot be ruled out.

Four, the Kenyan economy's real output growth has over the past two decades held steady, with the real GDP growing by an average of 4.9 percent over 2006 – 2023 period. The notable exceptions were in 2008 and 2020 when short growth downturns were respectively occasioned by domestic political tension and exogenous shocks associated with the COVID19 pandemic and the Russia-Ukraine war (**Figure 5**). An expansionary fiscal policy was a key growth driver economic growth during the period of sluggish private sector growth, especially during the 2016 – 2019 period of interest rates caps**.**

Figure 5: Real GDP and Private Sector Credit Growth

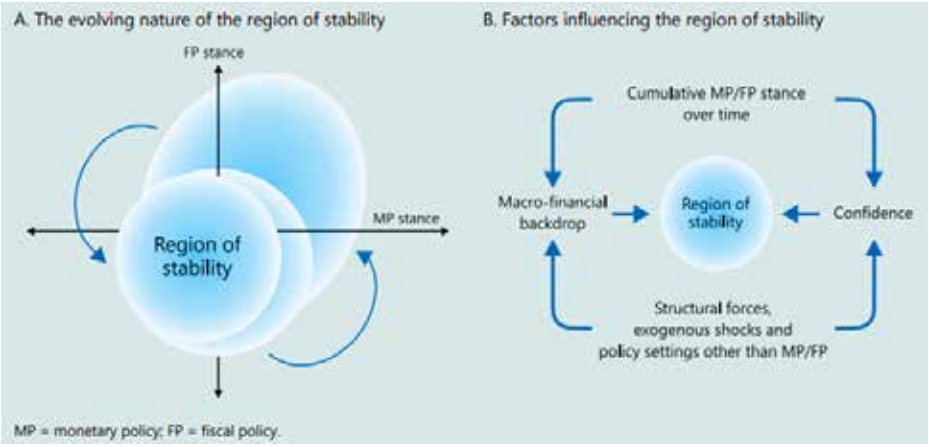


Source: KNBS; CBK; IMF

Going by the empirical determination (e.g., Kiriga, Chacha and Omanyo, 2020) that there is a strong positive causal effect of private sector credit and economic growth, the inference of public sector driven growth points to the possibility of an underlying cost on the form of crowding out effect. The dominance of the "quantity channel" where crowding out effect reveals itself more in the lessening of loanable funds than on the influence of public debt on interest rates, "the price channel" as argued by Chebet and Kiemo (2017) signals that banks navigate the profit-seeking agenda on the back of a positive and rising .

The above stylized facts motivate the postulation that the strong connection between monetary and fiscal policy in the case of Kenya underpins the profitseeking behavior by banks more that is often examined. The analytical void of this connection, especially when the economy is subject to shocks, disguises the underlying risks arising from the risk-taking attitude as shaped by the prevailing macroeconomic policy stances. On the fiscal side, the difficult trade-off between economic support and fiscal sustainability as, for instance, flagged by Aligishiev, Gabriela, Duval, Furceri, Jalles, MacDonald, Melina, Narita, Papageorgiou, and Pizzinelli (2023), rarely features in bank profitability analyses. Nor does the appreciation that the effects of monetary policy on stability that is suggested to exist through the risktaking channel whereby monetary expansions induce more risk (Angeloni, Faia and Lo Duca, (2015). The blind spot on the implication of these interactions incapacitates the embedding of the "region of stability" as illustrated in **Figure 6** in the strategic view on banks' profitability.

Figure 6: Region of Stability



Source: BIS (2023)

3.0 Literature Review

A vast body of research on the determinants of bank profitability in developed and developing countries, hardly interrogate the influence of the fiscal policy interaction.

A number of these studies examine a panel of countries (Dietrich & Wanzenried, 2014; Petria, Capraru, & Ihnatov, 2015), while other studies focus single country cases (Abid, Ouertani, & Zouari-Ghorbel, 2014; EL-Maude, Abdul-Rahman, & Ibrahim, 2017; Alandejani & Asutay, 2017). While the approaches of these studies differ depending on whether these studies are undertaken based on either bank-level or industrylevel data, they share the attribute of including macroeconomic variables as controls (Bolarinwa et al., 2019). From the literature, the drivers of profitability at the bank-level include bank size, capitalization, asset quality, growth of deposits, and a measure of bank efficiency (Adelopo, Lloydking, & Tauringana, 2018; Bolarinwa et al., 2019; Petria, et al., 2015; Dietrich & Wanzenried, 2014; Garcia & Guerreiro, 2016; Salike & Ao, 2017).

While there is consensus on the bank-specific attributes to consider in the analysis of bank profitability, the findings are mixed insofar as the direction of influence. For instance, some studies examining the relationship between bank size and profitability conclude that there is a positive relationship between the two variables (Bolarinwa et al., 2019; Chowdhury & Rasid, 2015; Dietrich & Wanzenried, 2011; Garcia & Guerreiro, 2016; Sufian, 2012). These studies contend that the size of banks enables them to benefit from economies of scale, resulting in enhanced profitability. However, other studies argue that that larger banks may experience negative effects due to diseconomies of scale manifesting themselves in the form of rigidity, inertia, and bureaucratic tendencies commonly associated with large organizations (Athanasoglou et al., 2008; Jakubík & Reininger, 2014; John, 2018; Khemraj & Pasha, 2016; Kjosevski & Petkovski, 2017; Olaniyi, Simon-Oke, Obembe, & Bolorinwa, 2017; Petria et al., 2015).

The role of bank capitalization in influencing profitability has drawn vast research interest (Kjosevski et al., 2019; Klein, 2013; Kumar & Kishore, 2019). So has efficiency as measured by various metrices such as cost-income ratio, operating expenses, funding ratio, and expenses management (Louzis et al., 2012; Căpraru & Ihnatov, 2015; Ugoani, 2016; Mazreku et al., 2018; Bolarinwa & Adegboye, 2020;). These

two variables have a positive influence on profitability. It follows that with enhanced capitalization supporting the capacity to increase deposits that consequently boosting profitability (Le, Tzeremes, & Ngo, 2020; Panta, 2018). The interrogation of how asset quality as for instance measured by nonperforming loans to gross loans ratio and loan loss provision to gross loans ratio overwhelmingly confirms the obvious negative relationship between the two variables (Adelopo et al., 2018; Azad, Azmat, & Hayat, 2020; Bakoush, Abouarab, & Wolfe, 2019; Campmas, 2020; Dietrich & Wanzenried, 2014; Martins, Serra, & Stevenson, 2019; Pessarossi, Thevenon, & Weill, 2020; Petria et al., 2015; Salike & Ao, 2017; Le, Tzeremes, & Ngo, 2020; Ünvan & Yakubu, 2020).

The standard macroeconomic variables whose effect on bank profitability are considered in the literature include inflation, output, monetary policy, fiscal policy, and exchange rate (Borio, Gambacorta and Hofmann (2017). Such consideration has led to inclusive findings when it comes to the influence of inflation on profitability, with some determining a positive relationship (Tab and Floros, 2012 and Guru et al., 2002 for Malaysia and Jiang et al. (2003) for Hong Kong) and others a negative one (Abreu and Mendes, 2001 in the European Union. The inconclusive findings point towards the importance of country specific circumstances, the need to appreciate the interconnectedness of the bank specific variables and the macroeconomic variables. The case of Demirguc-Kunt and Huizinga (1999) illustrates the connection by determining that banks operating in developing nations exhibit lower levels of profitability in the presence of inflation, especially when they possess higher capital ratio. Even then, the way role that macroeconomic policy is embedded in the analysis in such a way that the focus is on the independent effect of monetary policy and fiscal policy yet the two are executed concomitantly.

From the outlined literature overview, we identify a dearth of analysis at two levels. The first is the failure to appreciate the intertwined nature of fiscal and monetary policy, much as the two deploy different instruments. The second is the limitation of assessing profitability without embedding the possibility of its pursuit compromising stability in the banking system during economic shocks whose epicentre is not the financial sector. This paper's contribution is the positioning of the fiscal-monetary policy interactions as framed in Section 2 at the centre of analysis. It further progresses the profitability analysis from the conventional static assessment to a dynamic framework. By estimating a dynamic panel threshold estimator, we enable the determination of the threshold effects in the relationship between bank profitability dynamics and the two bank characteristics with a bearing on stability namely asset quality and capital adequacy.

4.0 Empirical Analysis

4.1 Static and dynamic panel model specification

The empirical model deployed in this paper is based on the usual measures of profitability, with the parameters of the fiscal policy and monetary policy appropriately drawing from equations 1 to 3. The model is specified as follows:

$$\pi_{it}=\alpha_0+\beta_1 y\pi_{it-1}+\beta_2 MP_{it}+\beta_3 FP_{it}+\beta_4 E_{it}+ \gamma_i \sum_{j=1}^{j=6} z_{it} +\emptyset_i \sum_{k=1}^{k=2} w_{it} +\mu_{it}+v_{it} \quad \text{.....(4)}$$

where π_{it} is the dependent variable which captures the bank profitability indicator represented by the return on assets (ROA) and return on equity (ROE). π_{it-1} is the lagged dependent variable and is included in the specification to capture the profit persistence, a regularity that has so far been established in the literature. MP_{it} is the monetary policy variable which is proxied by the central bank rate. β_1 gives the marginal impact of monetary policy on bank profitability. FP_{it} is a fiscal policy indicator, and in this study is proxied by the net lending or borrowing – the overall balance - as a proportion of GDP, an appropriate variant of pb_t in **equation 2**; β_2 gives the marginal impact of fiscal policy on bank profitability.

The other variable of interest is the is foreign exchange which, drawing from **Equation 4**, is captured by E_{it}, with the annual nominal exchange rate of the dollar against the shilling is used as a proxy, β_3 and gives the marginal impact of foreign exchange on bank profitability. z_{it} captures the vector of seven bank-level control variables included in the model and this include bank size, equity-to-asset ratio, efficiency as represented by the cost-to-income ratio, asset quality as indicated by the NPL ratio, diversification, market share, and loan growth. Other macroeconomic control variables captured by a $kx2$ vector w_{it} are also included in the model, and they are represented by inflation and real GDP growth.

4.1.1 Data sources and descriptive analysis

We use annual data for a sample of 39 commercial banks over the period spanning from 2003 to 2022. This is a balanced panel whereby the empirical investigation deploys data for banks whose availability is the entire period is considered. This

period fully covers the broad economic shocks associated with the GFC and the confluence of shocks seen in the 2000 – 2022 period. The data is collected from the banks' annual audited financial statements. The macroeconomic data is obtained from the Economic Surveys published by the Kenya National Bureau of Statistics (KNBS), World Bank's World Development Indicators database, and the International Monetary Fund's International Financial Statistics database.

4.2 The static panel model estimates

The estimation results are presented in **Table 1**. Columns (1) and (2) report the estimated parameters with ROA as the dependent variable while Column (3) and (4) report the estimates with ROE as the dependent variable. The results presented in column (1) and (3) are based on noninteraction terms while column (2) and column (4) are those based on interaction terms between the central bank rate as monetary policy indicator variable and the bank-level characteristics that affect bank profitability. The estimates presented in column (5) and column (6) are based on interaction terms between fiscal policy and bank level characteristics that affect bank profitability.

Table 1: Fiscal - Monetary policy and exchange rate implications on bank profitability dynamics

	ROA		ROE		ROA	ROE
	(1)	(2)	(3)	(4)	(5)	(6)
Y_{it-1} (Lagged dependent variable)	0.1671	0.3352***	0.213***	0.335***	0.209**	0.304***
	(0.107)	(0.000)	(0.003)	(0.000)	(0.082)	(0.063)
Bank Size	0.9996***	1.3786***	4.86***	-8.938***	0.331	0.397
	(0.000)	(0.000)	(0.000)	(0.000)	(0.213)	(1.824)
Capital Adequacy (TRWA-to-capital ratio)	0.0405***	0.0108	0.014	-0.157**	0.015	-0.162**
	(0.000)	(0.149)	(0.852)	(0.021)	(0.009)	(0.079)
Bank efficiency	-5.521***	3.158***	-39.87***	20.387***	0.140	6.156
	(0.000)	(0.000)	(0.000)	(0.000)	(1.078)	(6.594)
Asset quality	-0.0073	-0.0031	-0.041	0.056	-0.011	-0.027
	(0.348)	(0.645)	(0.521)	(0.358)	(0.008)	(0.066)

	ROA		ROE		ROA	ROE
	(1)	(2)	(3)	(4)	(5)	(6)
Loan-to-asset ratio	0.0053	-0.0052	0.004	-0.070	-0.024***	-0.200***
	(0.391)	(0.335)	(0.929)	(0.149)	(0.007)	(0.060)
Diversification	0.0525***	0.0022	0.401***	-0.052	0.018	0.068
	(0.002)	(0.825)	(0.006)	(0.573)	(0.014)	(0.120)
Monetary Policy (CBR)	0.7108**	3.6478***	2.504	-0.166	-0.037	-0.369
	(0.039)	(0.000)	(0.384)	(0.381)	(0.030)	(0.256)
Fiscal Policy	1.5979**	0.3460	10.979**	-0.718	-0.204	-3.301***
	(0.017)	(0.356)	(0.050)	(0.264)	(0.133)	(1.139)
Foreign Exchange Rate	0.3614**	0.3273***	2.163*	-0.181	0.027	-0.075
	(0.019)	(0.000)	(0.092)	(0.143)	(0.017)	(0.145)
Inflation rate	0.1458	1.2922***	-1.290	0.227	0.032	0.245
	(0.603)	(0.000)	(0.582)	(0.352)	(0.028)	(0.238)
Gross domestic product (GDP)	0.7205	3.8648***	-0.518	0.286	-0.023	-0.069
	(0.219)	(0.000)	(0.916)	(0.552)	(0.057)	(0.486)
(Monetary policy) x (Asset quality)		0.0001		-0.021***		
		(0.892)		(0.001)		
(Monetary policy) x (Bank size)		-0.107***		1.069***		
		(0.001)		(0.000)		
(Monetary policy) x (Capital adequacy)		0.0006		0.011		
		(0.454)		(0.110)		
(Monetary policy) x (Bank efficiency)		-1.006***		-7.086***		
		(0.000)		(0.000)		

	ROA		ROE		ROA	ROE
	(1)	(2)	(3)	(4)	(5)	(6)
(Monetary policy) x (Bank diversification)		0.0002		-0.021**		
		(0.848)		(0.011)		
(Monetary policy) x (Loan-to-asset ratio)		0.001**		0.011**		
		(0.033)		(0.029)		
(Fiscal policy) x (Asset quality)					-0.001	0.018
					(0.001)	(0.012)
(Fiscal policy) x (Bank size)					-0.032	-0.176
					(0.029)	(0.247)
(Fiscal policy) x (Capital adequacy)					-0.002	-0.021
					(0.002)	(0.016)
(Fiscal policy) x (Bank efficiency)					1.279***	9.253***
					(0.070)	(0.604)
(Fiscal policy) x (Bank diversification)					0.002	0.041***
					(0.001)	(0.013)
(Fiscal policy) x (Loan-to-asset ratio)					-0.006***	-0.043***
					(0.001)	(0.011)
Constant	-36.28**	-88.91***	-138.059	52.261***	0.919	32.263**
	(0.014)	(0.000)	(0.260)	(0.000)	(1.640)	(13.470)
N	479	469	479	469		
Hausman test	***		***		***	***

Note: The dependent variable in column (1) is the return on assets (ROA) while in Column (2), it is the return on equity (ROE): * p<.1, ** p<.05, *** p<.01. Standard errors in parentheses: * p<0.10, ** p<0.05, *** p<0.01 * p<.1, ** p<.05, *** p<.01.

Our preferred estimation method is random effects model arising from the Specification testing based on Hausman test where by the null hypothesis is that the individual effects are not correlated with the $X_{it}s$.

Based on these results the following can be inferred:

- First, both monetary policy and fiscal policy matter for bank profitability, their influence revealing the attribute interconnectivity between the two policies. The interplay between the two policies is characterized by the influence on profitability stemming from their contrasting stances. Banks' profitability is positively influenced by an expansionary fiscal policy, with a similar influence associated with a tightening monetary policy. The nuanced perspective depending on which policy is under consideration can be underpinned by the differences between the two. Both polies have an influence on aggregate demand but fiscal policy exerting that influence with a funding requirement and the monetary policy simply influencing the price of money. For banks, the government's funding gap arising from the expansionary fiscal policy stance presents an opportunity for portfolio optimization strategies. Tight monetary policy is associated with higher interest margins, translating into higher profitability.
- Second, exchange rate being the connecting variable between fiscal policy that has a strong nexus external markets through borrowing and monetary policy are positively associated with bank profitability. This reinforces aforementioned monetary-fiscal policy nexus to banks' profitability. Similarly, the macroeconomic variables – albeit featuring in the analysis as control variables – positively influence banks' profitability. This is intuitively consistent with the logic that as inflation increases, so does interest rates as that comes with the necessity to tighten monetary policy. At the same time, as highlighted in the stylized facts, Kenya's expansionary fiscal policy has been a key driver economic growth, hence the connection of the variable to bank's profitability. The fact that the influence of real GDP on bank profitability is not prominent is a pointer to the banks' profit seeking behavior is more a response to policy adjustment than to the underlying economic outcomes.
- Third, considering that monetary policy's disposition to frequent finetuning, its interaction with bank specific variables leads to the following insights. The coefficient on the interaction between monetary policy and bank size has a negative influence on ROA and a positive one on ROE. The mixed influence is counterbalanced with the characteristics of efficiency, ability to diversify and capacity to leverage, all pointing to a positive influence of a tighter monetary policy on profitability
- Fourth, the positive influence of an expansionary monetary policy on bank profitability hinges on banks' efficiency. This can be inferred from the fiscal policy and bank specific attributes, with the profitability of banks being negatively influenced by fiscal policy if they have a high loan to assets ratio.

4.3 Dynamic panel threshold model estimates

We reinforce the estimates above findings by estimating estimates panel model using the two-step system generalized method of moments (GMM) estimator created by Arellano and Bover (1995)[1]. The extended analysis takes the first difference of all the variables to ensures that unobserved bank-specific heterogeneity is eliminated. It incorporates the profit persistence considetation through the inclusion of a lagged dependent variable, and account for the potential endogeneity of the explanatory variables by using lagged dependent variables as instrumental variables.

Through the extended analysis, we are able to relax the assumption that no threshold effects exist in the relationship between bank profitability dynamics and bank characteristics with regard to capital adequacy, and asset quality. In line with Seo and Shin (2016) and Seo et al. (2019), we undertake the empirical analysis of the threshold effect on the nonperforming loans and capital adequacy–profitability nexus in the Kenyan banking industry. These two variables with a strong connection with market stability have been frequently adopted as threshold variables in various empirical banking studies (e.g., Djebali and Zaghdoudi, 2020; Pop et al., 2018).

The results of implementing the System GMM estimator are presented in the **Table 2**. They show that the model passes the Arellano-Bond AR (1) and AR (2) tests at the 5% level, indicating that the disturbance term has first-order autocorrelation, and no second-order autocorrelation, and are qualitatively similar to those obtained under the static framework.

1 In this paper with use the xtbond2 Stata command that implements the two-step system GMM estimator with the Windmeijer (2005) correction to the reported standard errors in the one-step system GMM.

Table 2: Dynamic panel threshold model specification of bank profitability dynamics

	(1)	(2)	(3)	(4)
	ROA	ROE	ROA	ROE
	Capital Adequacy (TRWA-to-capital ratio) as threshold variable		Asset quality as threshold variable	
Y_{it-1} (Lagged dependent variable)	0.003	0.083	0.049	0.096
	(0.214)	(0.174)	(0.216)	(0.170)
Below the Threshold:	-0.090***	-0.437	0.084***	0.209
	(0.027)	(0.297)	(0.032)	(0.194)
Above the Threshold:	-0.029**	-0.155	-0.050***	-0.053
	(0.013)	(0.127)	(0.019)	(0.135)

	(1)	(2)	(3)	(4)
	ROA	ROE	ROA	ROE
	Capital Adequacy (TRWA-to-capital ratio) as threshold variable		Asset quality as threshold variable	
Threshold variable	0.035**	-0.128	-0.021*	-0.109
	(0.015)	(0.139)	(0.012)	(0.104)
Bank efficiency (cost-to-income ratio)	-4.482	-35.775	-3.968	-36.705
	(3.862)	(24.737)	(3.999)	(24.654)
Loan-to-asset ratio	-0.002	-0.048	0.001	-0.024
	(0.008)	(0.076)	(0.008)	(0.072)
Bank diversification	0.037**	0.323*	0.040**	0.328
	(0.017)	(0.194)	(0.018)	(0.209)
Monetary policy rate	0.045*	0.301	0.036	0.319
	(0.026)	(0.252)	(0.026)	(0.258)
Fiscal policy	0.112	-0.314	0.057	-0.528
	(0.094)	(0.678)	(0.085)	(0.576)
Exchange rate	-0.009	-0.353**	-0.020	-0.376***
	(0.018)	(0.153)	(0.017)	(0.139)
Inflation rate	-0.037	-0.274	-0.017	-0.267
	(0.043)	(0.394)	(0.043)	(0.376)
GDP growth rate	-0.063	-0.398	-0.017	-0.360
	(0.075)	(0.669)	(0.076)	(0.621)
Constant	7.482*	81.854***	5.959	77.008**
	(3.928)	(31.691)	(4.111)	(30.910)
Optimal Threshold level	20.02	20.02	25.85	15.56
Upper threshold level	19.12	2.17	17.69	14.16

	(1)	(2)	(3)	(4)
	ROA	ROE	ROA	ROE
	Capital Adequacy (TRWA-to-capital ratio) as threshold variable		Asset quality as threshold variable	
Lower threshold level	22.32	28.51	32.05	36.03
Observations	479	479	479	479

Standard errors in parentheses; * p<0.10, ** p<0.05, *** p<0.01

The results in Table 2 indicates the following:

- One, the optimal capital adequacy threshold, measured as the ratio of total capital to total risk weighted assets, is 20.02 with its lower level at 19.12 and the upper level at 22.32. This points to the possibility of the capital adequacy increasing over time to its optimal level as banks take risks in pursuance of profitability. However, the degrees of maneuver above the optimal threshold are narrow.
- Two, the optimal asset quality thresholds level as measured by the share of non-performing loans to gross loans is 25.85%, with its upper level at 32.05% and the lower level at 17.69%. The negative relationship between asset quality and profitability points to the risk of approaching even the lower threshold.

These estimates, however, are averages and relate to the entire study period. The threshold levels could be heterogenous across different bank sizes and in sub-periods. Therefore, these estimates should be considered as global averages over the sample period. The implication the thresholds on market stability is linked to the potential risks emanating from the increased exposure of banks to government securities on the bank of the fiscal policy stance and accumulating debt, and compounded by the implications of monetary policy stance on the back of shocks. They should not necessarily be seen as an allure to excessive risk taking.

5.0 Conclusion and policy implications

This paper's empirical inferences are a pointer to Kenyan banks' profit seeking attributes entail risk behavior that can potentially push the economy to the boundary of the "region of stability" as they ride on an expansionary fiscal policy and a tightening monetary policy. We argued that the same risk-taking behavior that has engendered persistence of profitability is observable even under a different policy mix where fiscal policy is conservative and monetary policy is accommodative. In the case of monetary policy for instance, studies in advanced and emerging economies identify a risk-taking channel policy by distinguishing responses to monetary policy shocks across different types of banks and different loan risk categories, concluding that falling interest rates might induce investment into risky activities (Claudia, Eickmeier and Prieto. (2014).

Ultimately, perspectives on banks' profitability when persistent even during periods of shocks need to go beyond business imperatives that are dictated by investor motivations. For a given set of banksspecific attributes, if monetary and fiscal policies are prominent influencers of profitability, it signals that banks' reaction function as profit seekers is more a response to policy adjustment to shocks than the underlying economic outcomes. In that case, the spotlight is on the attitude of bank regulator and that of banks towards profitability and risk-taking and calls for policy considerations at two levels.

First, once evidence of economic shocks is unambiguous, then the capitalization requirement, especially the building up of sufficient buffers is key. The case of a safety corridor beyond required capital buffers that allows for countercyclicality even under a generally profitable regime can be made so long as the economy has not fully got out of a shock. The finetuning of stress-testing frameworks that takes into account capital adequacy and asset quality optimal thresholds is essential.

Second, the need for a stable funding mechanism that is market based but supported by the CBK is crucial. Even as profitability may persists, a conservative dividend

policy by banks is a reasonable complementary measure to support the regulatory measures around capital adequacy and interbank funding sources.

These two policy considerations will help obviate a situation where there is a realization that elusive boundaries of "the region of stability" have been breached ex post and the banking system is stable until suddenly it is not. This inference resonates with the conclusion of IMF (2023) where the adjustment from "low for long" interest rates to a high interest rate regime has been accompanied by market jitters and drawn new intellectual attention to banking stability or lack thereof.

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