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Commercial Banks' Lending Rates, Capital Reserve Ratio and Monetary Policy in Africa

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Abstract: *An important indicator of monetary policy's ability to control inflation or maintain economic stability is the impact it has on commercial banks' lending rates and cash reserve ratio. This research uses a dynamic system-generalized method of moments (GMM) estimation strategy to analyse the effect of monetary policy on lending rate of commercial banks. The study also incorporated longitudinal data mostly collected from the international monetary fund (IMF), and world development indicators between the years 2002 and 2021. The research found that commercial banks' lending rate are significantly correlated with monetary policy. Additional empirical analysis confirmed a positive relationship between monetary policy and the commercial banking industry's cash reserve ratio. As a means of spurring economic development across the continent, it has been proposed that African central banks use a strategy that combines inflation with measures designed to boost output.*

Keywords: Bank Size, Inflation, Lending Rate, Monetary Policy, Money Supply, Reserve

I. INTRODUCTION

Throughout history, the function and implementation of monetary policy have frequently shifted in response to economic and financial crises. In truth, the world's central banks have always been eager to gain insight from the work of their predecessors and the experiences of other nations(Olamide et al., 2022; Omankhanlen et al., 2021; Seoela, 2022). Obviously, this doesn't imply that every country in the past had the same monetary policy. Different countries obviously have different monetary policy implementations. However, monetary policy making underwent an evolutionary process specifically because of the openness to discussion and learning from each other's experiences over the past century; an evolutionary process that improved the conduct of monetary policy over time and led to a great deal of convergence between nations(Keister, 2012; Yuan et al., 2022).One of the most important things central banks do is to conduct monetary policy in an effort to maintain low price stability and stable inflation, and help with the management of economic turbulence. Monetary policy is directly impacted in a number of ways by globalization, the on-going process of cross-border integration of trade, manufacturing, and financial markets. Significant shifts have occurred in the policy frameworks under which central banks function in recent decades(Chung, 2022; Ingves, 2022; Kumo, 2015; T. T. Nguyen et al., 2022). Inflation targeting has been the standard method of monetary policymaking since the late 1980s. To achieve macroeconomic goals like price stability, full employment, and sustainable economic growth, central banks deploy monetary tools to regulate or control the volume, cost, availability, and direction of money and credit in the economy, Banks are widely recognized as pivotal instruments for carrying out monetary policy(ALHAJJ et al., 2022; Olamide et al., 2022).

Discount rate, open market operation, and reserve requirements are examples of monetary devices that have no direct impact on economic activity. They influence monetary policy through their effects on the banking sector's available resources. The central bank can use contractionary monetary policy, to maintain price stability while the economy is under inflationary pressure(Chishti et al., 2021; Modugu & Dempere, 2022, 2022; Monnet & Vari, 2021). Increasing the reserve requirement ratio and the discount rate will achieve this goal. Because of this, commercial banks will have less money to use as a lending facility, increasing the cost of borrowing, loan rates, and consumer borrowing habits investments and total spending will fall. Furthermore, as a result of rising interest rates, bank deposits become more attractive as they offer greater returns on savings(Chishti et al., 2021; Ehrenbergerova et al., 2022; Impact et al.,

2011; Onoh, 2017). As a consequence, people are more likely to put money aside instead of spending it. However, if increasing GDP growth is less of a priority than boosting aggregate demand, the reserve ratio and discount rate may be reduced. Lower interest rates make loans more accessible, boosting the economy and the job market by encouraging people to spend more than they would otherwise(Borio & Gambacorta, 2017; Eke et al., 2016; Eleam et al., 2022; Heckel, Markus; Waldenberger, 2022).Several countries and regions have set out to control inflation through the use of stated targets. Many developing nations are likewise moving away from focusing on a monetary aggregate, the total amount of currency in circulation and instead setting their monetary policies to control inflation(Boamah, 2009; Eke et al., 2016; Hickel, 2021; Islam et al., 2022, 2022; T. T. Nguyen et al., 2022). As equilibrium interest rates and inflation expectations have fallen in recent years, major central banks have revised their monetary policy frameworks in response to dwindling policy room. Central banks manage monetary policy by altering the money supply, often through open market operations. With a sale and repurchase deal, for instance, the central bank can purchase funds from commercial banks and use them to reduce the money supply. The goal of these types of open market operations is to alter short-term interest rates, which in turn affect longer-term interest rates and the economy as a whole(Paul & Reddy, 2022).

When compared to developed economies, the effectiveness of the monetary transmission mechanism is lower in many developing countries. A framework permitting the central bank to target short-term interest rates should be established before countries switch from monetary to inflation targeting(Kumo, 2015; Naraidoo & Gupta, 2010; Ruch, 2021).After the 2008 financial crisis, developed-world central banks eased monetary policy by cutting interest rates to near zero, which effectively ended further interest rate cuts. Unconventional monetary policies, such as the purchase of long-term bonds especially in the United States, the United Kingdom, the euro area, and Japan, were implemented by central banks as the risk of deflation rose, with the aim of further lowering long-term interest rates and loosening monetary conditions(Gupta & Bonato, 2022). Short-term interest rates have been dropped below zero by some central banks. In light of the global spread of the COVID-19 epidemic, central banks throughout the world have taken unprecedented policy moves to loosen monetary policy, flood core funding markets with liquidity, and keeps credit flowing. Many emerging market central banks have used foreign exchange interventions and, in some cases for the first time, asset purchase programs to ease pressure on their domestic bond and currency markets(Aron & Muellbauer, 2008; Fliers & Colvin, 2022a, 2022b; Paul & Reddy, 2022).

Significant structural changes have occurred in the euro region and global economy since the last assessment of European Central Bank (ECB) strategy (Boakye et al., 2022; De Fiore & Tristani, 2021; Gambacorta, 2003; Monnet & Vari, 2021). The interest rate is at a record low, and there are many more tools at the central bank's disposal with which to implement monetary policy. Concurrently, the challenges to monetary policy have increased due to globalization, digitalization, an aging population, climate change, and developments in the financial system. Because of these worries, the European Central Bank(ECB) has decided to re-evaluate its approach to monetary policy from the start of 2020.The Governing Council of the European Central Bank(ECB) agreed and announced a new monetary policy approach that had been reached through a unanimous vote. Its fundamental goal is to improve the European Central Bank (ECB's) effectiveness in this complex and ever-changing environment so that it can better fulfil its price stability mission in the years to come. In order to complete the present assessment, staff from the European Central Bank and the national central banks of the Euro system have worked closely together over the past eighteen months, splitting up into a total of thirteen different work streams(Boakye et al., 2022; Heckel, Markus; Waldenberger, 2022; Lampe, 2022).

Monetary policy in countries in Sub-Saharan Africa has substantial challenges, the pandemic impeded economic growth, and even today the recovery is predicted to leave this year's output below the trend preceding the crisis. Several governments in the region have also witnessed a rise in inflation, a concern that is in certain circumstances aggravated by fiscal supremacy coming from high levels of public debt. Capital outflows from a number of these economies are possible in the next years as major central banks in advanced economies are withdrawing policy stimulus and elevating interest rates(Cantú et al., 2021; Canuto, 2020; Mashamba, 2022). The economic impact of the on-going crisis in Ukraine, specifically the substantial spike in energy and food expenses, is likely to compound the hardships. The prolonged violence is having a devastating economic impact, with gasoline and food costs skyrocketing. Allowing currencies to fluctuate while focusing monetary policy on domestic goals is beneficial for countries with managed or free-floating exchange rate regimes. However, many nations in sub-Saharan Africa with floating exchange rate regimes have characteristics and vulnerabilities that restrict the benefits of completely flexible rates. For instance, the beneficial trade adjustments associated with flexible rates might be mitigated by dominant currency pricing and fixed export prices in terms of the US dollar. Additionally, shallow markets with inadequate liquidity can accentuate exchange rate movements, leading to excessive volatility(Cantú et al., 2021; Swanepoel & Fliers, 2021).

Akanbi and Ajagbe, 2012; Bhati et al., 2019; Thinh et al. (2022) examined the effects of monetary policy on commercial banks net profit, liquidity ratio, and savings interest rate and found a robust connection. Each bank's management should present an annual plan detailing how they intend to achieve their anticipated funding requirements. The findings suggest that in order to prevent bank collapses, it is necessary to push for a decrease in lending rates. Based on an analysis of the internal factors that affect the lending rate and commercial banks behaviour, explanatory variables of study had a significant relationship with the interest rate. Banks with considerably deteriorated balance sheets do not adjust loan pricing in response to changes in the policy rate, according to research by Byrne and Kelly, 2008; Onyebueke (2018)on bank asset quality and monetary policy pass-through. The lack of an explicit model of monetary policy through financial institutions is highlighted by a comparison of banks, liquidity management, and monetary policy(Cucic & Gorea, 2021; Gupta & Bonato, 2022).According to the findings of a study conducted by Eke et al., 2016; Nga(2021) the effects of monetary policy on lending practices of commercial banks are substantially influenced by the interest and exchange rates. Similarly, Islam et al., 2022; Modugu and Dempere(2022)found contrasting correlations between lending rate and monetary policy. Similar results were discovered by Osakwe et al. (2022) that neither cash reserve ratio, liquidity ratio nor interest rate significantly affected profit before taxes. Commercial bank earnings were studied byDarlington and Raymond, 2021; Ullah (2022) and found a favourable association between monetary policies and bank profits.

Commercial banks' lending rates, liquidity ratios, and monetary policy in Africa, on the other hand, have been the topic of far less research, thus, none of these studies provided a full empirical examination of the effects of monetary policy on commercial banks' lending rate as well as capital reserve ratio in Africa and consequently, the purpose of this work, is to bridge this gap. The central bank's overarching goal should be to maintain stable prices and create conditions that encourage sustained economic growth. Commercial banks' lending rates and the required amount of liquid reserves are occasionally influenced by these policies. Despite this, synergy is a classic problem in the financial sector, especially in times of economic crisis, yet there is a dearth of written material on the topic. The topic of financial liberalization has been studied extensively, and it centres on the correlation between supply and credit, which in turn promotes expansion and progress. By contrasting the Keynesian and endogenous money supply theories, this study shows how monetary policy affects commercial banks' interest rates and cash reserve ratio levels in Africa.Theoretical issues with commercial bank's lending rates in Africa's central banks are first addressed in the first section of this paper. The results of the study are discussed in Part 2, and analysis and recommendations are wrapped up in the final section.

II. THEORETICAL LITERATURE REVIEW

Endogenous money supply theory is a major tenet of post-Keynesian economics, the theory holds that a nation's monetary supply is set not by the whims of politicians or central bankers but by the demands of its actual economy (Bean et al., 2003; Cesaratto & Febrero, 2022; Jahan et al., 2014). If there is a higher demand for loans at the current interest rate, banks will increase their reserves. Endogeneity of the money supply supports and is essential to the post-Keynesian understanding of the business cycle. By fusing Chintha, 2018; Zeya and Majumder(2022) theory of investment with Balcilar et al., 2022; Onyebueke(2018) theory of speculation, Minsky'sfinancial instability hypothesis was born; it describes irregular, speculatively generated, trade cycles, in which financial developments either amplify or cause swings in the level of production and employment. High interest rates are the root cause of financial innovations, which also lead to a rightward shift in the velocity function, as proposed by Minsky in the 1950s. As indicated above, this is the central argument advanced and suggested that effective money supply is determined internally(Makori et al., 2022; Matemilola et al., 2015).

Keynesian holds the view that aggregate demand can be affected by a wide range of public and private economic actions and can show unpredictable patterns of response. Spending and tax policies, as well as monetary policy, rank among the highest-profile government decisions. Some Keynesians and other monetarists argued that monetary policy is inefficient. Majority of Keynesians and monetarists now agree that government spending and borrowing affect the economy's overall demand for goods and services. However, there is a vocal camp of economists who subscribe to the theory of debt neutrality, which states that replacing government borrowing with taxes has no effect on total demand(Jahan et al., 2014; Modugu & Dempere, 2022).

Alterations in aggregate demand, whether expected or unexpected, have the greatest short-term effect on real output and employment but not on prices, as proposed by Keynesians theory. Keynesians generally agree that the medium term is sufficiently lengthy to make a difference. Some prices must be rigid, such as nominal wages, in order for anticipated monetary policy to have real effects on output and employment(Stockhammer, 2022). If this were not the

case, then the injection of funds would have no discernible effect on prices. That's why most Keynesian models assume or try to explain high prices or wages. Since, according to mainstream microeconomic theory, real supplies and desires do not change when all nominal prices grow or fall proportionately, rationalizing stiff prices is challenging(Garriga et al., 2017).

Important to the study of money and banking is Irving Fisher's idea, known as the Fisher relation, which states that the nominal interest rate, inflation, and the real interest rate are related in some way(Blanchard, 2000; Garriga et al., 2017; Onoh, 2017). As a result, central banks rely heavily on this connection in their micro-founded macroeconomic models for forecasting and policy analysis. It is assumed for the sake of this research that an increase in commodity prices will lead to an increase in investment and commodity prices via a chain reaction that includes an increase in a company's profit, demand, money stock, and deposits. When the historically high interest rate begins to decline, the excess set aside for lending will also go down. In his examination of the propagation of financial impact across time, Fisher replaced interest-investment with Real cash balance. He saw that when money supply rises, people spend more of their newly acquired reserves.

Ito and Tran, 2022; Jefferis et al.(2020)examined the effectiveness of interest rate pass-through from money market rates to retail rates in developing Asian economies. Based on their research, they concluded that the pass-through rate from the money market into deposits is not significantly different from the lending rate, despite the fact that it is greater than the rate at which banks lend money. More so following the Asian financial crisis of 1997, the majority of Asian countries had slower rates of adjustment(Chung, 2022; Jiménez-Sánchez, 2020; Rathnayake et al., 2022). This has been shown using asymmetric error correction modellingEleam et al., 2022; Goshit et al.(2022) find that pass-through is very low and partial for all interest rates in Thailand, with the exception of inter-bank rates, for which pass-through is complete. Furthermore, they discover no large asymmetry adjustment, but short-term deposit and lending rates are more strictly downward.

According to Pandey, 2022; State (2021) the instrument of monetary policy will shift depending on the state of the economy. Selecting an instrument requires clear and unambiguous criteria. Whether it is measurable and can be controlled by the Central Bank and can be used as an indicator of monetary circumstances are the three most prevalent criteria for evaluating the short-term purpose of a monetary instrument(Bianchi et al., 2013; Onoh, 2017; Pandey, 2022).The two most important tools for the Central Bank to implement monetary policy are intervention in the market and portfolio limitations(Nguyen & Dinh, 2022; Omankhanlen et al., 2021; Seoela, 2022). The Author underlined that portfolio limitations limit the ability of a selected number of institutions to purchase assets and liabilities, while market intervention depends on the Central Bank's power as a dealer in the financial markets to influence the availability and rates of return on assets. After dividing monetary policy tools into quantitative and qualitative categories Kimani, 2013; Nwannebuike(2015) noted that the former tend to have a more diffuse and impersonal effect due to their focus on influencing the price, supply, and demand for bank reserves and, by extension, credit.

Using monthly data, Engel-Granger co-integration, and an autoregressive distributed lag (ARDL) technique Borio and Gambacorta, 2017; Matemilola et al. (2015) examined the interest rate pass-through from money market rates to bank lending rates in the Euro area and the United States. They check other countries and find that the United States has a quicker interest rate pass-through than European countries. Gregor et al., 2018; Lampe, 2022; Loate and Viegi (2021)further employ the asymmetric co-integration test in their study and argue that, the United States and nine Asian countries have different levels of interest rate pass-through between deposits and bank lending rates. There is evidence of a lack of uniformity in the adjustment of lending rates in three out of ten countries. Gregor et al., 2018; Ito and Tran, 2022; Li and Liu(2019)empirical research shows that there is full pass-through in the US deposit rate and that there is a stiff downward bias in the lending rates in Hong Kong, the Philippines, and Taiwan.

According to Gu et al., 2022; Oyadeyi and Akinbobola, 2022; Suriani et al (2021) the direct interest rate channel predominates in countries of the Euro Area, and monetary policy predominantly affects real activity through its effect on corporate investment. It follows that differences in interest rate pass-through between countries in the Eurozone could be a major cause of asymmetric monetary transmission, and that the pass-through of policy rates to business lending rates is a crucial link in the process of monetary transmission. The availability of bank loans to businesses through the credit channel is affected by monetary policy shifts. Tightening monetary policy causes banks to reorganize their loan portfolio and reduce lending to firms due to information asymmetries between banks and firms and the weakening balance sheets of enterprises. As a result, businesses that rely on bank loans are harmed when credit availability decreases. Conflicting empirical studies lend credence to the credit channel. ALHAJJ et al., 2022; Balcilar et

al., 2022; Islam et al (2022) use a swath of macro-level data to conclude that a shift in monetary policy significantly affects the way businesses raise money from outside sources. In particular, they demonstrate that the availability of bank loans decreases and the availability of commercial papers increases in response to tighter monetary policy views, and that this decrease in loan availability appears to affect investment after accounting for interest rates.

2.1 Concept of Monetary Policy

In response to a forecast of the need for cash, the Central Bank releases fiduciary currency, also known as paper currency. To achieve its goals of low inflation, full employment, and wage growth, the Central Bank manipulates the money supply in accordance with its monetary policy. Because of its role as a means of exchange, the value of money must be adjusted whenever there is a disparity between its demand and supply(Islam et al., 2022; Modugu & Dempere, 2022; Ozili, 2022). A monetary aggregate, interest rate, or exchange rates are all examples of Central Bank-controlled monetary variables that can be adjusted in order to affect non-Central Bank goals as part of monetary policy. The Central Bank's ability to implement monetary policy is reliant on the maturity of the economy and the financial system in particular. Deposit Money Banks may be required by the Central Bank to keep a certain percentage of their reserves in the form of vault cash and deposits with the Central Bank. The quantity of loans banks can provide to the domestic economy and, by extension, the money supply, is capped by the fractional reserve system. Deposit Money Banks are believed to keep a steady correlation between their reserve levels and the amount of consumer credit they issue(Onoh, 2017; Rakhrour, 2022).

To help finance government operations, the Central Bank buys and sells Treasury securities on the open market and to financial institutions and the general public. The money supply can be influenced by the Central Bank's actions of selling securities and repurchasing assets from Deposit Money Banks, respectively(Ito & Tran, 2022; Paul & Reddy, 2022). The quantity of reserves and, by extension, the monetary base can be affected by the Central Bank's occasional credit extensions to Deposit Money Banks. The Central Bank's minimum rediscount rate is the interest rate at which it lends to solvent Deposit Money Banks. The minimum rediscount rate (MRR) sets the nominal anchor rate, the floor for the interest rate regime on the money market, and affects the availability of credit, savings, reserves, the monetary aggregate, investment, employment, and gross domestic product (Eleam et al., 2022; Onoh, 2017). The Central Bank has the authority to issue directives to Deposit Money Banks about the maximum allowed loan percentage or amount, credit limits for specific economic sectors or activities, interest rate ceilings, liquid asset ratio, and credit guarantee for preferred loans. Consequently, the available funds are distributed, and the investments are directed, toward designated goals.

The Central Bank is in charge of the banking system and issues licenses to Deposit Money Banks to allow them to function. This advantage can be exploited to persuade banks to engage in activities that they otherwise might not due to their risk return assessment. These activities include, but are not limited to, restricting or expanding credit, increasing savings mobilization, and providing financial support to promote exports. It is possible for the Central Bank to issue written instructions to Deposit Money Banks requiring them to exercise heightened caution in conducting their operations in order to achieve predetermined outcomes. Some crucial parts of prudential standards enact rules rather than giving bank management flexibility in making decisions. The monetary base and, by extension, the money supply, are affected in opposite ways by whether the balance of payments is in deficit or surplus. The Central Bank monitors the balance of payments and the prevailing exchange rate to prevent any unanticipated changes to the domestic money supply brought about by fluctuations in the exchange rate(Omankhanlen et al., 2021; Ozili, 2022). The external competitiveness of a country is impacted by the real exchange rate and, in turn, the current account balance. Direct supervision or qualitative tools include moral suasion and prudential rules. All other instruments are quantitative since they are measured against objective numerical criteria.

III. METHODOLOGY

The research utilized data spanning 2002 to 2021 extracted from some commercial banks reports in Africa, international monetary fund economic outlook (IMF), and world development indicators (WDI) using convenience sampling technique. The estimation is carried out simultaneously by employing the dynamic system-GMM estimator(Hassan Bazhair & Naif Alshareef, 2022; Sare et al., 2022), which is asymptotically efficient, robust to heteroskedasticity, and able to resolve the difficulties of omission variables bias and reverse causality. The issues of endogeneity, omitted variables, and unobserved effects in estimating the dependent variable are not adequately addressed by static panel estimators, whether fixed or random effect(Burr et al., 2012). According to available

data(Blundell & Bond, 1998) the system-GMM is well-suited for cross-country and cross-time analysis because it allows for the specification of a unique model to capture period- and country-specific effects that are usually not observable and may result in potential endogeneity. Further, the system-GMM estimator outperforms the first-differenced-GMM estimator in terms of accuracy and bias because it incorporates the moment requirements for the first difference equations and employs properly lagged variables as instruments(Blundell & Bond, 1998).

To be able to empirically capture the link between commercial Banks' lending rates, capital reserve ratio and monetary policy in Africa, a model is presented as follows:

$$MP_{it} = f\,(Lrate_{it},\ CRR_{it},\ X_{it}) \text{ ---------- (1)}$$

Monetary Policy (MP_{it}) is the regressand variable proxy by changes in monetary policy rate and money supply, $Lrate_{it}$ is the independent variable and the total volume of loans granted by banks to the GDP_{it} percentage; Capital reserve ratio (CRR_{it}) is the total regulatory capital divided by the risk-weighted assets and the size of the bank. The economic factors that affect the monetary policy rate are denoted by X_{it}. Commercial banks that have enough capitalization in relation to their risk exposure and liquidity can provide more loans advances than those that do not. Monetary policy, the lending rate (Lrate), and the capital reserve ratio (*CRR*) are all impacted by the money supply, GDP growth (*GDPg*), exchange rate (*Ech*), inflation (*Inf*), and unemployment (*Unemp*). The addition of bank capital and size (BS), as well as economic variables, permits the impact of monetary policy transmission to vary with bank capital and size. This is how the enlarged model is expressed:

$$MP_{it} = f\,(L_{it},\ MS_{it},\ GDPg_{it},\ Exch_{it},\ Inf_{it},\ CRR_{it},\ Unemp_{it},\ BS_{it}) \text{ ---------- (2)}$$

Model specification:

$$MP_{it} = \beta_1 MP_{it-1} + \beta_2 Lrate_{it} + \beta_3 MS_{it} + \beta_4 GDPg_{it} + \beta_5 Exch_{it} + \beta_6 Inf_{it} + \beta_7 CRR_{it} + \beta_8 Unemp_{it} + \beta_9 BS_{it} + \lambda_t + \nu i + \mathcal{E}_{it} \text{------ (3)}$$

Where, MP_{it} is central bank's monetary policy of country*i* at time *t*,*Lrate* is commercial banks' lending rate, *MS* is the broad money supply to GDP percentage, *GDPg*is growth rate of gross domestic product, *Exch* is exchange rate per dollar, *Inf* denotes annual inflation rate, *CRR* also denotes capital reserve ratio. Unemployment rate is denoted by Unemp, bank size is represented by *BS*, and λ_t, ν_i *and* $\mathcal{E}_{it}$denote the unobserved time specific effect, unobserved individual bank specific effect and the stochastic term respectively.

Table 3.1 Description of variables

Variable	Measurement	sources
Monetary policy	Central bank's monetary policy rate from the period of 2002 to 2021	International monetary fund (IMF) database
Lending rates	Commercial banks and other lending	World development indicators (WDI)
Money supply	Total money supply to GDP percentage	International monetary fund (world economic outlook, IMF)
Gross Domestic Product growth	Gross Domestic Growth (annual %)	World bank, world development indicators (WDI)
Exchange rate	Real effective exchange rate index (2010 = 100)	World Bank, world development indicators (WDI)
Inflation rate	Growth rate and consumer price index	World bank, world development indicators (WDI)
Capital reserve ratio	Banks liquid reserves to bank assets ratio	World development indicators (WDI)
Unemployment rate	Unemployment, total (% of total labour force) (national estimates)	World development indicators (WDI)
Bank size	Bank capital to assets ratio (%)	World development indicators (WDI)

Authors' compilation, 2022

IV. RESULTS AND DISCUSSION

Table 4.1 Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
MP	400	41.22	29.313	11.31	133.93
LRATE	400	49.642	28.027	22.25	180
MS	400	2.025	.517	1.34	3.16
GDPg	400	3.48	2.169	1.19	13.52
EXCH	400	4.39	2.67	1.87	15.93
INFL	400	5.231	2.557	2.72	16.55
CRR	400	1.801	.702	.86	4.36
UNEMP	400	2.605	1.095	1.01	7
BS	400	1.972	1.08	.5	6.88

Author's computations, 2022

There are 400 observations for all variables with no missing values; the average mean value for monetary policy is 41.22, which is less than the median value of 61.31(133.93-11.31/2), showing that the data for monetary policy is skewed toward low values. The mean value for loan rate (Lrate) is 49.642, which is smaller than the median value of 78.86(180-22.25/2). This indicates that the data for lending rate is likewise skewed toward lower values. Nonetheless, the money supply has a mean value of 2.025, which is greater than the median value of 0.91(3.16-1.34/2) and indicates slightly higher values. GDPg has a mean value of 3.48, exchange rate is 4.39, inflation is 5.231, capital reserve ratio is 1.801, unemployment is 2.605, and size of the Bank is 1.90. All variables have mean values that are lower than their median values, indicating that the data set is skewed toward lower values. The monetary policy standard deviation is 29.3%, loan rate is 28.027%, money supply is 0.5%, GDPg is 2.17%, exchange rate is 2.7%, inflation is 2.55%, capital reserve ratio is 0.7%, unemployment is 1.1%, and the size of the bank is 1.1%. This shows that the data are dispersed widely around the mean(Jarque & Bera, 1887). The table also reveals that the standard deviation numbers are rather high, indicating that the data is more dispersed around the mean.

Table 4.2 Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) mp	1.000								
(2) lrate	0.756*	1.000							
(3) ms	0.746*	0.706*	1.000						
(4) gdpg	0.370*	0.431*	0.137*	1.000					
(5) exch	0.729*	0.615*	0.740*	0.041	1.000				
(6) infl	0.663*	0.468*	0.641*	-0.023	0.938*	1.000			
(7) crr	-0.277*	-0.268*	-0.272*	-0.418*	0.043	0.147*	1.000		
(8) unemp	-0.326*	-0.106	-0.323*	-0.006	-0.301*	-0.234*	0.082	1.000	
(9) bs	-0.526*	-0.365*	-0.480*	-0.228*	-0.402*	-0.327*	0.302*	0.870*	1.000

** shows significance at p<0.01*
Author's computations, 2022

The linearity of each set of data points is determined in table 3.1 of the correlation matrix above, variables that tend to increase and decrease are positively correlation (between +1 and -1). The stronger the relationship between two variables, the closer the correlation coefficient is to 1(Pearson, 1901). If the coefficient is positive, then there is a direct correlation between the variables; as the value of one variable rises, so does the value of the other. If the coefficient is negative, the variables are connected in an inverse way; when one variable's value rises, the other's value tends to fall. From the table above, monetary policy has a highly positive correlation of 0.756 with lending rate, meaning that the two variables move in the same direction. As monetary policy increases, lending rate also increases. Also apart from money supply, exchange rate, inflation, and Bank size which have higher correlation values, all the variables have moderate and low correlation values. This explains the strength, and direction between the variables in the matrix.

Table 4.3 Lending rate, capital reserve ratio, and monetary policy in Africa

	(1) MP	(2) CRR	(3) LRATE
L.MP	0.944***		
	(6.19)		
MP		0.00861***	0.252***
		(0.24)	(0.58)
LRATE	0.0204***	0.0405***	
	(0.28)	(0.48)	
MS	0.424***	0.733***	0.117***
	(0.43)	(0.57)	(0.07)
GDPg	0.508***	0.0521***	5.721***
	(0.36)	(-0.13)	(1.33)
INFL	0.500***	0.139***	0.608***
	(0.87)	(0.57)	(0.36)
CRR	0.668***		0.524***
	(0.72)		(0.23)
UNEMP	0.0164***	0.529***	4.019***
	(0.02)	(0.34)	(0.36)
BS	0.0708***	0.246***	10.15
	(0.08)	(0.13)	(0.57)
L.CRR		1.025***	
		(3.91)	
L.LRATE			1.036***
			(7.69)
_cons	1.272***	2.833***	5.917***
	(0.33)	(0.61)	(0.68)
AR	0.861	0.684	0.65
SARGAN	0.401	0.203	0.53
HANSEN	0.344	0.209	0.75
No. of Instruments	11	11	11
No of groups	42	42	42
Prob>Ch2	0.000	0.000	0.000
N	378	378	378

Author's computation, 2022

The lagged value of the dependent variable of monetary policy is significant, showing that the present value of monetary policy is dependent on its past value as shown in Table 4 (Sare et al., 2022; Wahyuningrum & Mafruhah, 2022). There is also a significant relationship between monetary policy and capital reserve ratio. When the central bank increases money supply in the economy, it lowers policy rate, which affects the cash reserve ratio of banks. As a result, commercial banks have more funds to disburse as loans, and this increases the amount of money circulating in the

economy(Kimani, 2013; Onoh, 2017). In contrast, the central bank can also boost its policy rate for commercial banks, andmay alter their reserve ratio to lead to a rise in the lending rate for borrowers. The capital reserve ratio or minimum cash reserves of depository institutions are specified by the central bank. There is also a significant relationship between monetary policy and lending rate; as the central bank raises its policy rate, commercial banks increase their lending rates, making it difficult for investors to borrow money due to high interest rates(ALHAJJ et al., 2022; Eleam et al., 2022). This is because monetary policy determines the money supply, interest rates, and inflation in an economy. There is also a positive and statistically significant association between gross domestic product growth(GDPg) and monetary policy, as central banks pursue both contractionary and expansionary monetary policies to boost GDPg. By reducing interest rates, savings become less appealing and consumers spending including borrowing are increased, ultimately boosting the economy's gross domestic product growth. This finding was also reached by (Islam et al., 2022; Pandey, 2022) who conducted similar study and found that monetary policy decisions by central banks have a favorable impact on Africa's gross domestic product. Islam et al., 2022; Viitanen (2022) also believed that central banks can increase interest rates to limit outstanding money supply in order to halt growth and reduce inflation when the prices of goods and services increase, thereby diminishing the buying power of money.

From the table inflation has a positive and significant association with monetary policy; as inflation rises, the central bank raises the policy rate to pursue a contractionary monetary policy that aims to increase interest rates to impede economic development and diminish liquidity in the economy. According to Eizaguirre et al., 2022; Makori et al (2022) most contemporary central banks use inflation as their major monetary policy measure. Cash reserve ratio also has a significant relationship with monetary policy, which means that when central banks want to eliminate excess liquidity in the economy and reduce money supply, it increases the cash reserve ratio for commercial banks, thereby reducing the ease with which banks can issue loans and increasing interest rates in the process. Banke & Yitayaw, 2022; Farooq et al., 2021; Loate and Viegi (2021)have shown that banks' internal business models can also impact the monetary policies of central banks. The relationship between unemployment and monetary policy is also significant. When the central bank pursues expansionary monetary policies, unemployment decreases as a result of increased money supply and attractive interest rates;this stimulates business activity and creates employment opportunities. The relationship between bank size and the central bank's monetary policy is also significant. When banks have a relaxing monetary policy on their balance sheet, bank reserves increase, leading to an increase in deposits, and as a result, extra funds will be available to lend to customers. According to Bala, 2022; Onoh, 2017; Osakwe et al. (2022) since small banks have less access to the capital market to lend money, they rely heavily on deposits; hence, central bank monetary policy decisions have a greater impact on small banks than on larger banks.

V. CONCLUSION

The study explores the effect of monetary policy on lending rate and capital reserve ratio of commercial banks in Africa. The empirical evidence suggests that there is a positive relationship between the monetary policies of central banks and lending rates of commercial banks. As governments pursue expansionary monetary policies, such as an increase in the money supply, it spurs the lending rates of commercial banks. A contractionary policy of central banks, on the other hand, leads to the economic decline of financial institutions. In addition, contractionary policies are adopted, resulting in a decline in company consumption spending, which reduces the overall demand for products and services in the economy (Aghabalayev & Ahmad, 2022; Muindi & Mukorera, 2022). The data also indicate a considerable link between the monetary policy of central banks and the cash reserve ratio of commercial banks. The central bank uses this notion to govern the money supply, inflation, and liquidity of the economy. According to the findings, an increase in the cash reserve ratio affects the liquidity of banks, consequently reducing the amount of loans that may be extended to customers for investment opportunities. The data also revealed a substantial association between monetary policy, money supply, and increase in gross domestic product, inflation, unemployment, and bank size. It is proposed that African central banks construct robust political institutions as a prerequisite for formulating the continent's finest economic policies geared toward its growth and development. Monetary policies are theoretical laws that must be operationalized by institutions; if these institutions are inadequate, the policies will not be fully implemented. In addition, majority of industrialized economies limit the purpose of monetary policy to price stability, which is difficult for developing nations with low inflation whose policies are not tailored to economic growth. It will also be acceptable for African central banks to implement a combination of inflation-fighting, exchange rate stability, and growth initiatives. The study is limited by the fact that monetary policy alone cannot solve all economic problems because it has only one instrument; and the bank cannot employ interest rates to target many variables. Keeping inflation low in Africa may potentially lead to a disastrous accumulation of debt. Therefore, additional research on the effect of monetary policy on Africa's sustainable growth and poverty reduction is strongly urged.

Reference

[1] Akanbi, T. A., & Ajagbe, F. A. (2012). Analysis of monetary policy on commercial banks in Nigeria. *African Journal of Business Management*, *6*(51), 12038–12042. https://doi.org/10.5897/ajbm11.1843

[2] Alhajj, S. S., Md. Taib, F., & Abdul Mohsin, A. M. (2022). Effects of increased money supply on the economic stability of southeast Asian Countries Post-Bretton Woods System. *Journal of Business and Social Development*, *10*(1), 75–84. https://doi.org/10.46754/jbsd.2022.03.006

[3] Aron, J., & Muellbauer, J. (2008). *"Monetary Policy and Inflation Modeling in a more Open Economy in South Africa."*

[4] Bala, U. (2022). *The Effect of Monetary Policy on the Performance of Deposit Money Banks in Nigeria Rabiu Maijama ' a Journal of Business Management and Economic Research The Effect of Monetary Policy on the Performance of Deposit Money Banks in Nigeria*. *January*. https://doi.org/10.29226/TR1001.2022.292

[5] Balcilar, M., Ozdemir, Z. A., Ozdemir, H., Aygun, G., & Wohar, M. E. (2022). Effectiveness of monetary policy under the high and low economic uncertainty states: evidence from the major Asian economies. *Empirical Economics*, *63*(4), 1741–1769. https://doi.org/10.1007/s00181-021-02198-x

[6] Banke, N. K., & Yitayaw, M. K. (2022). Deposit mobilization and its determinants: evidence from commercial banks in Ethiopia. *Future Business Journal*, *8*(1). https://doi.org/10.1186/s43093-022-00144-6

[7] Bean, C., Larsen, J., & Nikolov, K. (2003). Financial frictions and the monetary transmission mechanism: Theory, evidence and policy implications. *Monetary Policy Transmission in the Euro Area: A Study by the Eurosystem Monetary Transmission Network*, *113*, 107–130. https://doi.org/10.1017/CBO9780511492372.008

[8] Bhati, S., De Zoysa, A., & Jitaree, W. (2019). Factors affecting the liquidity of commercial banks in India: A longitudinal analysis. *Banks and Bank Systems*, *14*(4), 78–88. https://doi.org/10.21511/bbs.14(4).2019.08

[9] Bianchi, J., Bigio, S., Cochrane, J., Kashyap, A., Kiyotaki, N., Krishnamurthy, A., Lagos, R., Sims, C., Piskorski, T., Philippon, T., Woodford, M., & Uhlig, H. (2013). *Banks, Liquidity Management and Monetary Policy* *.

[10] Blanchard, O. (2000). *What Do We Know about Macro that Wicksell and Fisher Did Not?October 1999*.

[11] Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, *87*(1), 115–143. https://doi.org/10.1016/S0304-4076(98)00009-8

[12] Boakye, E. A., Hongjiang, Z., Ahia, B. N. K., & Damoah, M. A. (2022). Covid-19 Pandemic: Exploring the Fiscal and Monetary Policies for Mitigating the Socio-economic Impact on Ghana's Economy. *New Innovations in Economics, Business and Management Vol. 9*, 22–39. https://doi.org/10.9734/bpi/niebm/v9/2035b

[13] Boamah, M. I. (2009). *The Monetary Policy Transmission Mechanism and Inflation Control in Ghana . Mustapha Ibn Boamah A thesis submitted in partial fulfilment of the requirements of Nottingham Trent University for the degree of Doctor of Philosophy August 2009*. *August*.

[14] Borio, C., & Gambacorta, L. (2017). Monetary policy and bank diminishing effectiveness? *BIS: Monetary and Economic Department*, *612*.

[15] Burr, G. W., Virwani, K., Shenoy, R. S., Padilla, A., BrightSky, M., Joseph, E. A., Lofaro, M., Kellock, A. J., King, R. S., Nguyen, K., Bowers, A. N., Jurich, M., Rettner, C. T., Jackson, B., Bethune, D. S., Shelby, R. M., Topuria, T., Arellano, N., Rice, P. M., … Gopalakrishnan, K. (2012). Large-scale (512kbit) integration of multilayer-ready access-devices based on Mixed-Ionic-Electronic-Conduction (MIEC) at 100% yield. *Digest of Technical Papers - Symposium on VLSI Technology*, *June*, 41–42. https://doi.org/10.1109/VLSIT.2012.6242451

[16] Byrne, D., & Kelly, R. (2008). *Working Paper Series Bank asset quality and monetary policy pass-through*. https://doi.org/10.2849/390956

[17] Cantú, C., Cavallino, P., De Fiore, F., & Yetman, J. (2021). A global database on central banks' monetary responses to Covid-19. *BIS Working Papers*, *934*(934). https://www.bis.org/publ/work934.pdf

[18] Canuto, O. (2020). THE IMPACT OF ON THE GLOBAL Crisis and Recovery in the Economies Impacted by Coronavirus. *Policy Center for the New South*, *1*(June), 20–58. https://www.policycenter.ma/publications/impact-coronavirus-global-economy

[19] Cesaratto, S., & Febrero, E. (2022). *Private and Central Bank Digital Currencies: a storm in a teacup? A Post-Keynesian appraisal*. *May*. https://www.uclm.es/departamentos/daef/

[20] Chintha, S. S. (2018). Impact of Bank Specific and Macroeconomic Determinants on the Profitability of Commercial Banks : An Evidence from MSM Listed Banks in Sultanate of Oman. *International Journal of Accounting Research*, *3*(4), 13–22. https://doi.org/10.12816/0044415

[21] Chishti, M. Z., Ahmad, M., Rehman, A., & Khan, M. K. (2021). Mitigations pathways towards sustainable development: Assessing the influence of fiscal and monetary policies on carbon emissions in BRICS economies. *Journal of Cleaner Production*, *292*. https://doi.org/10.1016/j.jclepro.2021.126035

[22] Chung, N. H. (2022). The Nexus Between Monetary Policy and Economic Growth: Evidence from Vietnam. *Journal of Asian Finance*, *9*(1), 153–0166. https://doi.org/10.13106/jafeb.2022.vol9.no1.0153

[23] Cucic, D., & Gorea, D. (2021). Nonbank Lending and the Transmission of Monetary Policy. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3974863

[24] D, C. O. P. (2021). *Monetary Policy Instruments and Manufacturing Sector Output in Nigeria*. *9*(2), 85–100.

[25] Darlington, I., & Raymond, A. (2021). *Corporate tax shield and earnings management : an empirical analysis of*

commercial banks in Nigeria. *1*(12), 1–12.

[26] De Fiore, F., & Tristani, O. (2021). Optimal Monetary Policy in a Model of the Credit Channel. *SSRN Electronic Journal*, *1043*. https://doi.org/10.2139/ssrn.1383502

[27] E.A., U., & P.O., U. (2021). Effect of Monetary Policy on Industrial Growth in Nigeria. *International Journal of Entrepreneurship and Business Innovation*, *4*(1), 47–60. https://doi.org/10.52589/ijebi-1z4iybye

[28] Ehrenbergerova, D., Bajzik, J., & Havranek, T. (2022). When Does Monetary Policy Sway House Prices? A Meta-Analysis. *IMF Economic Review*. https://doi.org/10.1057/s41308-022-00185-5

[29] Eizaguirre, C., Gabauer, O. P., & Gabauer, D. (2022). *On the propagation mechanism of international real interest rate spillovers : evidence from more than 200 years of data On the Propagation Mechanism of International Real Interest Rate Spillovers : Evidence from More than 200 Years of Data Department of E*.

[30] Eke, F. A., Eke, I. C., & Inyang, O. G. (2016). Interest rate and commercial banks' lending operations in Nigeria: A structural break analysis using chow test. *Global Journal of Social Sciences*, *14*(1), 9. https://doi.org/10.4314/gjss.v14i1.2

[31] Eleam, V. E., Ekwom, C. G., Ariolu, C. C., Umebali, C. J., & Balogun, A. T. (2022). Monetary Policy Transmission and Bank Interest Rates in Nigeria. *Central Bank of Nigeria Journal of Applied Statistics*, *12*(2), 59–85. https://doi.org/10.33429/cjas.12221.3/5

[32] Farooq, M., Khan, S., Atique Siddiqui, A., Tariq Khan, M., & Kamran Khan, M. (2021). Determinants of Profitability: a Case of Commercial Banks in Pakistan. *Humanities & Social Sciences Reviews*, *9*(2), 01–13. https://doi.org/10.18510/hssr.2021.921

[33] Fliers, P. T., & Colvin, C. L. (2022a). Going Dutch: monetary policy in the Netherlands during the interwar gold standard, 1925–1936. *Financial History Review*, *29*, 1–31. https://doi.org/10.1017/s096856502200004x

[34] Fliers, P. T., & Colvin, C. L. (2022b). Going Dutch: monetary policy in the Netherlands during the interwar gold standard, 1925–1936. *Financial History Review*, 1–31. https://doi.org/10.1017/s096856502200004x

[35] Gambacorta, L. (2003). Asymmetric bank lending channels and ECB monetary policy. *Economic Modelling*, *20*(1), 25–46. https://doi.org/10.1016/S0264-9993(01)00084-0

[36] Garriga, C., Kydland, F. E., & Šustek, R. (2017). Mortgages and Monetary Policy. *Review of Financial Studies*, *30*(10), 3337–3375. https://doi.org/10.1093/rfs/hhx043

[37] Goshit, G. G., Jelilov, G., Iorember, P. T., Celik, B., & Davd-Wayas, O. M. (2022). Asymmetric effects of monetary policy shocks on output growth in Nigeria: Evidence from nonlinear ARDL and Hatemi-J causality tests. *Journal of Public Affairs*, *22*(2). https://doi.org/10.1002/pa.2449

[38] Gregor, Melecky, J., & Martin. (2018). *The Pass-Through of Monetary Policy Rate to Lending Rates: The Role of Macro-financial Factors*.

[39] Gu, G., Zhu, W., & Wang, C. (2022). Time-varying influence of interest rates on stock returns: evidence from China. *Economic Research-Ekonomska Istrazivanja* , *35*(1), 2510–2529. https://doi.org/10.1080/1331677X.2021.1966639

[40] Gupta, O. P., & Bonato, M. (2022). *The effects of conventional and unconventional monetary policy shocks on US REITs moments : evidence from VARs with functional shocks The Effects of Conventional and Unconventional Monetary Policy Shocks on US REITs Moments : Evidence from VARs with Funct*.

[41] Hassan Bazhair, A., & Naif Alshareef, M. (2022). Dynamic relationship between ownership structure and financial performance: a Saudi experience. *Cogent Business and Management*, *9*(1). https://doi.org/10.1080/23311975.2022.2098636

[42] Heckel, Markus; Waldenberger, F. (2022). The Future of Financial Systems in the Digital Age. In *Perspectives in Law, Business and Innovation*.

[43] Hickel, J. (2021). The (anti) politics of central banking: Monetary policy, class conflict and the limits of sovereignty in South Africa. *Economy and Society*, *50*(1), 57–77. https://doi.org/10.1080/03085147.2021.1841931

[44] Impact, T. H. E., Bank, O. F., Rate, P., Commercial, O. N., Lending, B., The, R., Of, S., Bank, B., Cobbinah, B., Ekow, N., Studies, M., & Learning, D. (2011). *the Impact of Bank of Ghana Policy Rate on Commercial Bank Lending Rate . the Study of Commonwealth Executive Master of Business*. *June*.

[45] Ingves, G. S. (2022). *Inflation targeting for nearly 30 years – a robust framework for all times ? 1 From copper standard to inflation targeting*. *May*, 1–33.

[46] Islam, M. S., Hossain, M. E., Chakrobortty, S., & Ema, N. S. (2022). Does the monetary policy have any short-run and long-run effect on economic growth? A developing and a developed country perspective. *Asian Journal of Economics and Banking*, *6*(1), 26–49. https://doi.org/10.1108/ajeb-02-2021-0014

[47] Ito, H., & Tran, P. (2022). Emerging Market Economies' Challenge: Managing the Yield Curve in a Financially Globalized World. *Open Economies Review*, *0123456789*. https://doi.org/10.1007/s11079-021-09661-3

[48] Jahan, S., Mahmud, A. S., & Papageorgiou, C. (2014). What is Keynesian economics? *Finance and Development*, *51*(3), 53–54.

[49] Jarque, C. M., & Bera, A. K. (1887). International Statistical Institute. *Science*, *ns-9*(225), 507–507. https://doi.org/10.1126/science.ns-9.225.507

[50] Jefferis, K., Kasekende, E., Rubatsimbira, D. K., & Ntungire, N. (2020). *Exploring the determinants of interest rate spreads in the Uganda banking system*.

[51] Jiménez-Sánchez, C. (2020). Impact of the SARS-CoV2 pandemic on education. *Revista Electronica Educare*, *24*(May), 1–3.

[52] Keister, T. (2012). On the liquidity coverage ratio and monetary policy implementation. In *BIS Quarterly Review*. www.bis.org/press/p120108.htm.
[53] Kimani, J. (2013). *Assessment of effects of monetary policies on lending behaviour of commercial banks in kenya a research project submitted to school of business kenyatta university in partial fulfillment of the requirement for the award of masters degree in business administration*.
[54] Kumo, W. L. (2015). "Inflation Targeting Monetary Policy , Inflation Volatility and Economic Growth in South Africa." *Working Paper Series*, *216*(01), 1–34. http:/www.afdb.org/
[55] Lampe, F. (2022). *Interest Rate Policy of the Banque Centrale des Etats de l'Afrique de l'Ouest: International Currency Hierarchy, Monetary Base Coverage, and Bank Lending in the*. https://www.econstor.eu/handle/10419/251184
[56] Li, J., & Liu, M. H. (2019). Interest rate liberalization and pass-through of monetary policy rate to bank lending rates in China. *Frontiers of Business Research in China*, *13*(1). https://doi.org/10.1186/s11782-019-0056-z
[57] Loate, T., & Viegi, N. (2021). *The Transmission of Monetary Policy via the Banks' Balance Sheet-Does Bank Size Matter?* 1–27.
[58] Makori, E., Matundura, E., & Mose, N. (2022). Effect of Fiscal and Monetary Policy on Gross Domestic Savings in Kenya. *Journal of Economics and Sustainable Development*, *February*. https://doi.org/10.7176/jesd/13-2-05
[59] Margaritis, D. (2005). *Monetary Policy Transparency and Pass-Through of Retail Interest Rates Alireza Tourani-Rad Paper 23-2005 AND P ASS -T HROUGH OF R ETAIL I NTEREST R ATES Ming-Hua Liu , Dimitri Margaritis and Alireza Tourani-Rad*.
[60] Mashamba, T. (2022). Liquidity Dynamics of Banks in Emerging Market Economies. *Journal of Central Banking Theory and Practice*, *11*(1), 179–206. https://doi.org/10.2478/jcbtp-2022-0008
[61] Matemilola, B. T., Bany-Ariffin, A. N., & Muhtar, F. E. (2015). The impact of monetary policy on bank lending rate in South Africa. *Borsa Istanbul Review*, *15*(1), 53–59. https://doi.org/10.1016/j.bir.2014.09.003
[62] Matundura, E., Kiano, E., & Serem, A. (n.d.). *Journal of Economics, Finance and Management Studies Macroeconomic Drivers of Economic Growth*. https://doi.org/10.47191/jefms/v5-i2-19
[63] Modugu, K. P., & Dempere, J. (2022). Monetary policies and bank lending in developing countries: evidence from Sub-Sahara Africa. *Journal of Economics and Development*, *24*(3), 217–229. https://doi.org/10.1108/jed-09-2021-0144
[64] Monnet, E., & Vari, M. (2021). Liquidity Ratios as Monetary Policy Tools: Some Historical Lessons for Macroprudential Policy. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3444151
[65] Naraidoo, R., & Gupta, R. (2010). Modeling Monetary Policy In South Africa: Focus On Inflation Targeting Era Using A Simple Learning Rule. *International Business & Economics Research Journal (IBER)*, *9*(12), 89–98. https://doi.org/10.19030/iber.v9i12.349
[66] Nga, N. T. V. (2021). Monetary policy, exchange rate, renewable energy and economic growth: An empirical analysis of vietnam. *Accounting*, *7*(6), 1315–1324. https://doi.org/10.5267/j.ac.2021.4.007
[67] Nguyen, T. P., & Dinh, T. T. H. (2022). The role of bank capital on the bank lending channel of monetary policy transmission: An application of marginal analysis approach. *Cogent Economics and Finance*, *10*(1). https://doi.org/10.1080/23322039.2022.2035044
[68] Nguyen, T. T., Phan, T. D., & Tran, N. A. (2022). Impact of fiscal and monetary policy on inflation in Vietnam. *Investment Management and Financial Innovations*, *19*(1), 201–209. https://doi.org/10.21511/imfi.19(1).2022.15
[69] Nwannebuike, S. (2015). Impact of Monetary Policy Instruments on Profitability of Commercial Banks in Nigeria: Zenith Bank Experience. In *Research Journal of Finance and Accounting www.iiste.org ISSN* (Vol. 6, Issue 10). Online. www.iiste.org
[70] Olamide, E., Maredza, A., & Ogujiuba, K. (2022). Monetary Policy, External Shocks and Economic Growth Dynamics in East Africa: An S-VAR Model. *Sustainability (Switzerland)*, *14*(6). https://doi.org/10.3390/su14063490
[71] Omankhanlen, A. E., Ilori, N., Isibor, A., & Okoye, L. U. (2021). Monetary policies and the achievement of bank profit objective. *Journal of Central Banking Theory and Practice*, *10*(2), 201–220. https://doi.org/10.2478/jcbtp-2021-0020
[72] Onoh, U. A. (2017). Monetary Policy Instruments and Their Effects on Turnover Ratio of Commercial Banks in Nigeria. *Journal of Business and African Economy*, *3*(1), 61–95. https://www.iiardjournals.org/get/JBAE/VOL. 3 NO. 1 2017/Monetary policy instruments.pdf
[73] Onyebueke, C. (2018). *Bank Asset Quality Performance among Nigerian Banks - The Role of Monetary Policy*. *4*(1), 1–31.
[74] Osakwe, C. I., Nwakaego Udoye, O., & Akunna, R. C. (2022). The Effect of Central Bank of Nigeria Regulation on the Performance of Deposit Money Banks. *International Journal of Multidisciplinary and Current Educational Research*, *4*(1), 92–103. www.ijmcer.com%7C92%7C
[75] Oyadeyi, O. O., & Akinbobola, T. (2022). Further insights on monetary transmission mechanism in Nigeria. *Journal of Economics and International Finance*, *14*(2), 11–22. https://doi.org/10.5897/jeif2020.1037
[76] Ozili, P. K. (2022). Central bank digital currency research around the world: a review of literature. *Journal of Money Laundering Control*, *111389*. https://doi.org/10.1108/JMLC-11-2021-0126
[77] Pandey, B. (2022). *Impact of monetary policy instruments on profitability : a case of nepalese commercial banks*.
[78] Paul, M., & Reddy, K. S. (2022). US QE and the Indian Bond Market. *Journal of Quantitative Economics*, *20*(1), 137–157. https://doi.org/10.1007/s40953-021-00257-9

[79] Pearson, K. (1901). LIII. On lines and planes of closest fit to systems of points in space . *The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science*, *2*(11), 559–572. https://doi.org/10.1080/14786440109462720

[80] Rathnayake, D. N., Bai, Y., Louembé, P. A., & Qi, L. (2022). Interest Rate Liberalization and Commercial Bank Performance: New Evidence From Chinese A-Share Banks. *SAGE Open*, *12*(2). https://doi.org/10.1177/21582440221096648

[81] Ruch, F. U. (2021). Neutral Real Interest Rates in Inflation Targeting Emerging and Developing Economies. *World Bank Group Prospects Group*, *June*. http://www.worldbank.org/prwp.

[82] S.H., S., & A.T., M. (2022). Money Supply Behavior in Egypt (2004-2019). *African Journal of Economics and Sustainable Development*, *5*(1), 59–74. https://doi.org/10.52589/ajesd-4veyypje

[83] Sare, Y. A., Davies, E., & Nyeadi, J. D. (2022). Effects of financial development on mortgage development in Africa: an application of GMM dynamic pooled estimator. *Journal of Financial Economic Policy*, *14*(5), 633–650. https://doi.org/10.1108/JFEP-08-2021-0206

[84] Seoela, B. N. (2022). Efficacy of monetary policy in a currency union? Evidence from Southern Africa's Common Monetary Area. *Quantitative Finance and Economics*, *6*(1), 35–53. https://doi.org/10.3934/qfe.2022002

[85] State, R. (2021). *Money market instruments and liquidity of commercial banks : a time variant study from*. *1*(1), 66–84.

[86] Stockhammer, E. (2022). Post-Keynesian Macroeconomic Foundations for Comparative Political Economy. *Politics and Society*, *50*(1), 156–187. https://doi.org/10.1177/00323292211006562

[87] Suriani, S., Abd. Majid, M. S., Masbar, R., A. Wahid, N., & Ismail, A. G. (2021). Sukuk and monetary policy transmission in Indonesia: the role of asset price and exchange rate channels. *Journal of Islamic Accounting and Business Research*, *12*(7), 1015–1035. https://doi.org/10.1108/JIABR-09-2019-0177

[88] Swanepoel, C., & Fliers, P. T. (2021). The fuel of unparalleled recovery: Monetary policy in South Africa between 1925 and 1936. *Economic History of Developing Regions*, *36*(2), 213–244. https://doi.org/10.1080/20780389.2021.1945436

[89] Thinh, T. Q., Thuy, L. X., & Tuan, D. A. (2022). The impact of liquidity on profitability - evidence of Vietnamese listed commercial banks. *Banks and Bank Systems*, *17*(1), 94–103. https://doi.org/10.21511/bbs.17(1).2022.08

[90] Ullah, M. R. (2022). An Economic Analysis of Interest Rate Spread in the Commercial Bank of Bangladesh. *Canadian Journal of Business and Information Studies*, *4*(October 2021), 1–11. https://doi.org/10.34104/cjbis.022.01011

[91] Viitanen, T. (2022). *The inflationary consequences of the broad money supply surge in 2020 : a monetarist approach*.

[92] Wahyuningrum, D., & Mafruhah, I. (2022). *International Journal of Multicultural and Multireligious Understanding Implementation of Decentralization Policy on Economic Growth in Central Java Province (GMM Arellano-Bond Approach)*. 136–143.

[93] Weth, M. A. (2005). The Pass-Through from Market Interest Rates to Bank Lending Rates in Germany. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.320112

[94] Yuan, B., Leiling, W., Saydaliev, H. B., Dagar, V., & Acevedo-Duque, Á. (2022). Testing the impact of fiscal policies for economic recovery: does monetary policy act as catalytic tool for economic Survival. *Economic Change and Restructuring*, *55*(4), 2215–2235. https://doi.org/10.1007/s10644-022-09383-7

[95] Zeya, F., & Majumder, S. C. (2022). Perception on Cryptocurrency Trade in Bangladesh: Fintech Innovation or Dilemma. In *An Approach Towards Central Bank Digital Currency* (Issue April). https://www.researchgate.net/publication/360166472