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Original Research Article

The Twin Impact of Macroeconomics and Institutions on Bank Lending Behaviour in Sub-Saharan Africa

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Abstract: Commercial banks move financial resources from surplus unit to deficit unit to facilitate the economic activities in any economy across the globe including sub-Saharan Africa. However, literature has shown that the lending activities of commercial banks in the SSA region are limited due to macroeconomic instability and weak institutional quality which is peculiar to developing economies. Therefore, this study aimed at examining the effects of macroeconomic factors, institutional quality and the interactive effect of institutional quality and macroeconomic factors on bank lending behaviour in sub-Saharan Africa. The specific objectives of this study were to: (i) examine the effects of macroeconomic factors (money supply, interest rate, exchange rate) on bank lending behaviour in Sub-Saharan Africa; (ii) investigate the effect of institutional quality on bank lending behaviour in Sub-Saharan Africa; and (iii) evaluate the effect of interactive effect of institutional quality and macroeconomic factors on bank lending behaviour in Sub-Saharan Africa. The research design employed was ex post facto, and the population of the study consisted of 49 Sub-Sahara African countries. Purposive sampling technique was used to select 14 Sub-Sahara African countries with biggest banking sectors in terms of total assets. Secondary data were obtained from World Development Indicators and World Governance Indicators between 1996 and 2023. The Generalized method of moments (GMM) model was employed as the estimation technique. Findings were that: (i) macroeconomic factors (money supply with (β = 0.083; p-value = 0.000); interest rate with (β = 0.211; p-value = 0.000); and exchange rate with (β = 0.001; p-value = 0.000)) have significant and positive effects on bank lending behaviour; (ii) institutional quality index with (β = -0.135; p-value = 0.513) has a negative insignificant effect on bank lending behaviour; and (iii) interactive term (institutional quality*macroeconomic factors with (β = -0.530; p-value = 0.09) has a negative significant effect on bank lending behaviour. The study concluded that macroeconomic factors and institutional quality affect bank lending behaviour in sub-Saharan Africa. Therefore, the study recommended that relevant regulatory authorities should improve on both monetary and fiscal policies targeted at creating more stable macroeconomic and institutional environments to support improved lending behaviour in SSA.

Keywords: Macroeconomics, Institutions, Bank Lending Behaviour, Sub-Saharan Africa, GMM
JEL Code: E520; E580; G210; G240; E310; E320.

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1. INTRODUCTION

Lending activities stand at the core of commercial banks operations and can be likened to the lifeblood of the banking businesses because they primarily derive their income from interest on loans, which also present the associated risk to them. In doing this, commercial banks enable individuals and businesses by providing the necessary capital for investment, expansion, and efficient economic activities. In emerging economies including sub-Saharan Africa, the accessibility of credit stands as a critical factor influencing investment, capital formation, employment

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and economic growth and development (Thamae & Odhiambo, 2022; Babarinde & Gidigbi, 2022; Yunusa, *et al.,* 2020).

According to Bhari (2023), bank lending behaviour is inherently susceptible to unpredictability due to various macroeconomic factors such as interest rate, exchange rate, money supply, inflation rate, unemployment rate, among others and institutional factors like corruption control, government effectiveness, rule of law, regulatory quality, among others. The 2007/2008 global financial crisis brought about notable deterioration in the credit quality indicators of commercial banks across the globe, including sub-Saharan Africa (SSA). This could be attributable to unstable macroeconomic indices and weak institutional environment. Many countries in SSA continue to experience low levels of credit allocation to the private sector, high lending rates, and financial exclusion. Unstable macroeconomic factors involving inadequate money supply, high interest rate, unstable exchange rate; as well as weak institutional environment have created challenging business conditions for commercial banks, ultimately affecting lending behaviour (Mahlangu & Chowa, 2022; Ahmad, *et al.,* 2019).

One of the persistent challenges in SSA's financial landscape is the limited availability of credit, particularly for small and medium-sized enterprises (SMEs), which form the backbone of most economies in the region. Several factors could be associated to the restrictive monetary policies, high interest rates, exchange rate volatility, and weak institutional frameworks obtainable in the SSA region. The cost of credit remains prohibitively high in many SSA economies which may be discouraging to productive investments and limiting economic opportunities (Özşuca, 2022; World Bank, 2020; Ibrahim, 2019). The macroeconomic challenges in the region have led to an environment of uncertainty that hinders the ability of banks to engage in short-term lending owing to decline in credit demand and an increase in loan defaults. As a result, commercial banks in SSA have been forced to adopt more conservative lending practices, further resulting in poor lending behaviour which has ultimately limited their contribution to economic growth and development in the region (Osakwe, *et al.,* 2021; World Bank, 2020).

Additionally, the institutional environment in SSA remains weak and is characterized by political instability, poor regulatory oversight, lack of control over corruption, and inadequate enforcement of the rule of law, thereby creating an uncertain environment for banking operations which could impede the lending behaviour of commercial banks in SSA. This uncertainty discourages banks from engaging in lending activities as the risks associated with loan defaults and enforcement of contracts remain extremely high. In addition, several countries in the SSA region were ranked among the lowest in terms of quality of their institutions globally. This could also hinder the effective regulation and supervision of commercial banks which may undermine investor confidence, and limits the ability to improve lending activities (World Bank, 2020).

According to the World Bank (2020), the sub-Saharan Africa (SSA) has eleven countries (Zimbabwe, Comoros, Sudan, Guinea-Bissau, Congo Republic, Chad, Democratic Republic of the Congo, Equatorial Guinea, Burundi, Somalia, and South Sudan) among the 20 countries with the poorest control of corruption globally. This assessment paints a picture of the region's institutional environment as being in a state of underperformance, with consequent implications for commercial bank's ability to effectively lend a significant portion of its deposits (World Bank, 2020).

Addressing these challenges becomes crucial for optimizing the indispensable role of commercial banks in fostering economic activities and development through efficient financial intermediation and lending behaviour in the SSA region. Given the myriads of challenges outlined above, it is imperative to investigate the effect of macroeconomic factors along with the interactive effect of institutional quality on bank lending behaviour in sub-Saharan Africa. This study will be guide by the following specific objectives: (i) to examine the effects of macroeconomic factors (money supply, interest rate, exchange rate) on bank lending behaviour; (ii) to investigate the effect of institutional quality on bank lending behaviour; and (iii) evaluate the effect of interactive effect of institutional quality and macroeconomic factors on bank lending behaviour in SSA.

Past related studies in the sub-Sahara African region were mostly done on country-specific basis while primarily focusing on macroeconomic factors and monetary policy. For instance, the study of Babarinde and Gidigbi (2022), Kithandi (2022), Osakwe *et al.,* (2021), Demehin (2021), Akindutire (2021), Oyebowale (2020), Ademokoya *et al.,* (2020) focused on Nigeria; Yitayaw (2021) focused on Ethiopia; and Tuffour, *et al.,* (2019) focused on Ghana. Thus, these studies lacked regional perspective and failed to account for the effect of institutional factors on bank lending behaviour. Focusing on specific countries limits their findings to the particular country such that their findings cannot be used to draw general conclusion across the broader SSA region. Moreover, omitting institutional factors creates variable omission bias in past studies as credit risk assessment and lending decisions are significantly influenced by institutional environment such as political stability, corruption control, government effectiveness and others.

To address the existing gaps, this study investigated the effects of macroeconomic factors and

institutional quality on bank lending behaviour across multiple countries in the SSA region, with a focus on the interactive effect of institutional quality and macroeconomic factors on lending behaviour in SSA. This is important because strong institutional environment fosters confidence among investors, lenders, and depositors. As such, banks in countries with strong institutions and regulatory oversight are more willing to lend, knowing that loans given out are protected from defaults.

2. LITERATURE REVIEW

Macroeconomic Factors

Macroeconomic determinants refer to variables that do not pertain to bank management but rather mirror the economic backdrop influencing the functioning and performance of financial institutions (Ahmed, Majeed, Thalassinos & Thalassinos, 2021). These factors include money supply, inflation rate, interest rate, employment levels, economic output, among others. For instance, it is common to expect an upsurge in loan demand during periods of economic prosperity and a decrease in demand during economic downturns. Thus, Albaity, Noman, Mallek and Al-Shboul (2022) argued that during economic upswings, banks often relax their lending criteria and provide funding to both sound and risky ventures. Conversely, in a recession, a large portion of loans defaults, leading to a credit contraction and the abandonment of even viable projects. In this study, indicators of macroeconomic factors used include money supply, interest rates, and exchange rate. These variables play crucial role in shaping the operational environment of banks as banks cannot operate in isolation of the economy where the banks are situated.

Money supply refers to the total amount of money readily available in an economy at a specific point in time. It includes all forms of money that are easily accessible for spending and can be quickly converted into goods or services, reflecting the overall monetary health of an economy. It is the ratio of liquid liabilities to GDP. When the central bank increases the money supply, it injects liquidity into the banking system, making more funds available for lending, encouraging commercial banks to lend more, as they have more resources to meet the demand for loans (Bello, 2020). Interest rate represents the amount of interest paid by borrowers, which compels those holding liquidity to allocate it elsewhere. When the size of the interest rate margin expands, lenders opt to invest their liquid funds elsewhere. This suggests that a heightened interest margin encourages banks to focus more on lending activities, consequently reducing the proportion of liquid assets they hold (Tibebu, 2019).

Exchange rate is the rate at which one currency can be exchanged for another, representing the value of one currency in terms of another, typically expressed as the amount of one currency needed to purchase a unit of another currency. These rates fluctuate based on various factors such as geopolitical events, market speculation and inflation rates, interest rates. Literature has shown that fluctuations in exchange rates can affect the value of loan repayments and the overall credit risk of commercial banks. The exchange rate utilized in this study represents the conversion rate between local currencies and the US Dollar (Gharaibeh & Farooq, 2022; Özşuca, 2022; Ozgur, *et al.,* 2021).

Institutional Quality

Institutional quality, as described by Khan, Khan and Zuojun (2022), is regulation that includes laws, customs, and groups that control how people behave in both the public and private spheres such as government agencies, commercial enterprises, civil society organizations, among other. Strong institutional framework can improve banking intermediation functions. High-quality institutions are thought to improve the financial performance by generating a positive business climate, supporting investment, and stimulating innovation. In contrast, poor institutional quality can reduce competition, raise transaction costs, and obstruct stock market performance. According to Eslamloueyan and Jafari (2021), the quality of a country's institutions and the development of its financial market are strongly correlated. Different institutional characteristics in different countries are responsible for differences in lending behaviour among countries. Hence, investors tend to invest more in countries with better institution framework because in environment with better institutional quality, there is substantial punishment for fraudulent behaviour; thus, investors feel secure and are more likely to engage in investment and lending activities (Iyoboyi, 2021; Ming & Jais, 2020).

Bank Lending Behaviour

Lending behaviour pertains to how commercial banks adjust the volume of loans and advances they offer in response to observed circumstances along with regulatory provisions. According to Ikemefuna and Echeta (2019), bank lending behaviour refers to the structured and methodical approach adopted by a bank to govern its lending and loan practices. This comprises the regulatory policies that determine the maximum loan amount that can be extended, eligible borrowers, and the interest rates applicable for a specific timeframe. Commercial banks typically engage in short-term borrowing, primarily through deposits, while they extend loans for the long term, often in the form of credits. Handling the timing difference between receiving deposits and providing credit not only brings advantages but also involves a range of risks (Miguel, 2019). The mechanism through which the bank lending channel operates includes expansionary monetary policy which is designed to stimulate lending, and enhances the availability of funds for loans at banks. Conversely, a contractionary monetary policy, which involves a reduction in the supply of loans by banks, restricts

borrowers' access to available loan funds (Beutler, *et al.,* 2020).

Oyebowale (2020) explained that the main reason banks are important for lending is because they help solve problems like lack of information and other challenges that make it hard to give out loans fairly and efficiently. Commercial banks often act as intermediaries for certain borrowers who do not have access to credit markets. The result is typically expressed as a percentage, indicating the percentage of the bank's loans relative to its total deposits. A higher LDR suggests that the bank is relying more on borrowed funds from depositors to finance its lending activities, possibly indicating higher risk and lower liquidity. On the other hand, a lower ratio implies that the bank is using a smaller portion of its deposits for lending, which may be indicative of a more conservative lending strategy. A balanced and well-managed LDR is crucial for a bank to navigate changing economic conditions and effectively serve its customers (Yitayaw 2021; Oyebowale, 2020; Assfaw, 2019).

2.2 Theoretical Review

Theory of Financial Intermediation

The theory of financial intermediation, proposed by Allen and Santomero in 1977, is a fundamental theory in economics and finance that seeks to explain the role and function of financial intermediaries in an economy. The role of financial intermediaries in risk transformation and diversification is pivotal to the stability and efficiency of the financial system. By pooling funds from numerous savers and effectively allocating them to a diverse range of borrowers, financial intermediaries undertake several key functions that contribute to risk mitigation and investment stability. Financial intermediaries collect funds from a broad base of individual savers, businesses, and institutional investors, creating a pool of resources that is significantly larger than what any single investor could amass. This aggregation of funds allows intermediaries to undertake larger investments and provide financing for projects that require substantial capital, thereby fostering economic development and growth.

Through the allocation of funds to various borrowers and investment opportunities, financial intermediaries engage in risk diversification by spreading investments across different assets, sectors, and geographic regions, thereby reducing the impact of negative events (such as macroeconomic instability, political instability, and others) affecting any particular investment. This diversification strategy helps to minimize the overall risk exposure of their portfolios and cushions the impact of market fluctuations, economic downturns, or sector-specific crises. Hence, financial intermediaries capitalize on economies of scale by pooling resources from a large number of savers and investors which allows them to spread fixed costs, such as administrative expenses, regulatory compliance costs, and infrastructure investments, over a larger asset base.

As a result, the average cost per unit of service provision decreases, enabling financial intermediaries to offer financial products, such as savings accounts, loans, and investment vehicles, at a lower cost compared to individual investors or borrowers attempting to access these services directly from the market. Studies such as Akindutire (2021), Arintoko (2021), and Coetzee and Genukile (2020) provided strong support for the relevance of this theory for this study.

2.2.2 Institutional Change Theory

Institutional Change Theory, introduced by Geoffrey M. Hodgson in 1988, examines how institutions comprising regulations, norms, and organizational structures evolve over time and how these changes shape behaviour. In the context of bank lending behaviour, institutional shifts can influence banks' risk perceptions, lending policies, and the overall credit environment. The theory posits that past decisions create path dependence, meaning that current institutional frameworks are shaped by previous choices and historical events, such as past economic policies, which have influenced the institutional landscape of commercial banks (Khan *et al.,* 2022).

In an environment with strong institutional quality, fraudulent activities are penalized, fostering investor confidence and encouraging investment and lending activities (Iyoboyi, 2021). To mitigate loan defaults, banks utilize various models to assess borrowers' creditworthiness. For instance, they may implement risk management frameworks, credit scoring models, and lending criteria that align with global best practices to enhance competitiveness and credibility. Requiring collateral or guarantees from borrowers minimizes lending risks by providing banks with legal recourse in the event of default. Furthermore, access to comprehensive credit information enables banks to make informed lending decisions by reducing information asymmetry between lenders and borrowers. However, borrowers with weak credit profiles may attempt to conceal their true risk level, prompting banks to either reject potentially viable loan applications or impose higher interest rates to compensate for perceived risks.

Nevertheless, commercial banks adapt their lending policies, risk assessment techniques, and financial products based on past lending experiences, regulatory interventions, and market developments. Additionally, feedback from borrowers, regulators, and other stakeholders influences banks' perceptions of institutional quality such as regulatory effectiveness, corruption control, and the rule of law ultimately shaping their lending behaviour over time (Miyajima, 2020). Despite the constructive submission of this theory, the practical application of this theory lacks robust empirical support. At present, there is a noticeable dearth of

empirical literature to substantiate the theory's adoption and implementation.

2.3 Empirical Review

Tuffour, Doe and Tuffour (2019) studied how inflation affects the lending rates of 11 commercial banks in Ghana between 2009 and 2016. They found that inflation slightly raises lending rates, but not strongly, and that big banks tend to offer lower rates. The study also showed that more non-performing loans lead to higher lending rates, while growth in the economy (GDP) helps reduce them.

Louhichi and Boujelbene (2020) discovered through his examination of 882 Russian banks that there is a positive correlation between the availability of loans and corruption, using a parametric method of analysis. In fact, a high level of corruption makes the bank more cautious and limits the amount of credit it lends. Thus, in corrupt environments, businesses struggle to obtain the necessary financing to expand, innovate, or maintain operations. Limited access to credit can stifle business growth and economic development.

Coetzee and Genukile (2020) examined what influences bank lending behaviour in South Africa from 1994 to 2016 using the ARDL model. They found that in the short run, factors like deposit volume and bank size play a major role. In the long run, however, only GDP was found to significantly influence lending behaviour.

Yunusa *et al.,* (2020) used the ARDL model to study how monetary policy affects lending in Nigeria between 1980 and 2018. They found that money supply and liquidity slightly reduce lending, while the exchange rate increases it. Inflation and interest rates strongly reduce lending, and the Granger test showed that inflation affects lending rates, but interest rates do not affect inflation. Abere *et al.,* (2020) used OLS regression to study how monetary policy influenced loans to SMEs in Nigeria from 1992 to 2017. They found that higher monetary policy and exchange rates were linked to more loans to SMEs. However, increases in money supply, liquidity ratio, and inflation were linked to fewer loans.

Ademokoya *et al.,* (2020) analyzed monthly data from 2007 to 2019 to see how different monetary factors affect bank credit in Nigeria. They found that the money supply boosts bank credit, while the liquidity ratio reduces it significantly. However, changes in the maximum lending rate and monetary policy rate had no meaningful effect on bank credit. Oyebowale (2020) investigated how shifts in the loan-to-deposit ratio, inflation, broad money, and bank capital influence the growth of bank lending in Nigeria. The ARDL and Granger causality tests revealed that an increase in broad money causes bank lending to grow, which in turn raises the loan-to-deposit ratio and inflation. These findings imply that commercial banks in Nigeria pay close attention to their liquidity and capital adequacy while carrying out their lending functions.

El Hourani and Mondello (2021) examined the effect of bank capital and institutional quality on lending from a database of 665,000 enterprises from 14 countries in Central and Eastern Europe. Results demonstrate a strong correlation between corruption and the debt ratio. They point out that bribery and corruption, in particular, make it easier for businesses to raise money from outside sources and to obtain bank loans. As a result, the institutional quality of the banks affects the availability of loans.

Nguyen and Pham (2021) used GMM to study what affects bank lending in 146 countries from 1990 to 2013. They found that exchange rates, capital rules, bad loans, bank dominance, and financial openness reduce the amount of credit banks give out, while economic growth affects lending differently in each country. On the other hand, higher interest rates and more local money in the system help boost bank lending. Arintoko (2021) studied what influences lending by commercial banks in Jordan. The findings showed that factors like return on assets, bank size, inflation, money supply, and GDP growth increase bank lending. However, credit risk and liquidity were found to reduce lending.

Diarra and Prasad (2021) used multiple regression model in analysing six Pacific Island Countries (PICs), namely Fiji, Papua New Guinea (PNG), Solomon Islands, Vanuatu, Samoa and Tonga for the period 1982 to 2009, found the negative impact of rising lending rates and inflation on bank credit to the private sector, while stronger economic growth, larger deposit banks' funding, asset size and the presence of a stock market had a positive effect.

Yitayaw (2021) analyzed data from 15 commercial banks in Ethiopia between 2011 and 2019 to identify factors affecting bank lending. The study found that bank-specific factors like deposits, capital adequacy, and size positively and significantly boost lending. In contrast, industry factors such as lending rates, bank concentration, and reserve requirements, along with GDP, negatively and significantly affect lending.

Osakwe, Okoye, Ezeala and Okeke (2021) used the amount of deposits, foreign exchange, reserve requirements, interest rate, and GDP as regressors on loans and advances to analyse the effects of monetary policies on bank lending behaviour in Nigeria during the years 1980 to 2014. The study demonstrates that the behaviour of commercial banks in Nigeria in terms of bank lending is statistically significantly influenced by the currency rate, interest rate, amount of deposits, and reserve requirements.

Demehin (2021) examined the effect of monetary policy on commercial banks' lending rates in

Nigeria from 1987 to 2018 within the ARDL model framework. The study found that money supply slightly raised lending rates in the short term but reduced them significantly in the long term. Cash reserve ratios had a strong short-term positive effect but little long-term impact, while monetary policy rates positively and significantly influenced lending rates in both the short and long run.

Akindutire (2021) used the Granger causality test and ARDL to study what affects how Nigerian deposit money banks lend to the private sector from 1986 to 2017. The study found that while the influencing factors change over time, deposit volume and M2 consistently drive lending in both the short and long term. Meanwhile, the loan-to-deposit ratio (LDR), inflation (INF), and reserve requirement (RSR) slow down lending, and there is a causal link showing that more deposits lead to more credit to the private sector.

Le, Nguyen and Schinckus (2022) studied how competition among banks affects the link between bank lending and economic conditions in Vietnam from 2008 to 2018 using SGMM. They found that when banks are less aggressive in competing with each other, changes in the economy and monetary policy have a weaker impact on how banks lend.

Kithandi (2022) studied how the cash reserve ratio, inflation, exchange rate, and minimum policy rate affected loans and advances by Nigerian commercial banks from 1980 to 2008. The results showed that only the exchange rate and cash reserve ratio had a significant impact on lending. The study also found no long-term link between these monetary policy tools and bank lending, suggesting that such tools do not drive long-term credit growth in Nigeria.

Babarinde and Gidigbi (2022) used the ARDL method to study how monetary policy affected commercial bank lending in Nigeria from 1987 to 2020. They found that the monetary policy rate reduces bank lending in both the short and long term. While inflation and the liquidity ratio negatively affect lending in the short term, they help increase it in the long term, and the lending rate has a strong positive effect on bank lending overall.

Miku, Mpojota, Joseph, and Charles (2023) used the ARDL model to study how macroeconomic factors affected bank lending in Tanzania from 1970 to 2021. They found that in the short run, an increase in money supply lowers lending rates, which in turn encourages banks to lend more. This happens because more money in the system makes banks more liquid, boosting their willingness to give out loans.

Sangweni and Takawira (2024) used the ARDL model to explore how macroeconomic factors affect bank lending in South Africa from 2001 to 2022. They found a long-term link between lending practices, inflation, the real effective exchange rate (REER), and the repo rate, where inflation and REER have positive effects, and the repo rate has a negative effect. Other factors like GDP, activity rate, and sovereign credit rating had little to no impact on lending.

Ngimanang (2024) modelled the key determinants of bank lending in Cameroon from 1979 to 2019, usingcointegration regression model and Error Correction model. The results of the two models revealed that the effect of economic growth on bank lending was positive and highly significant, the effect of interest rate is negative and equally significant, then the effect of Gross Investment rate was also positive but not very significant in the short run.

3. METHODOLOGY

Model Specification

To achieve the objectives of this study, the Generalized method of moments (GMM) model was adapted from the study of Le, Nguyen and Schinckus (2022) on the relationship between bank lending and macroeconomic factors in Vietnam.

The model is stated as follows:

$$\boldsymbol{loan_{it} = \beta_{it} + \beta_1 loan_{it-1} + \beta_2 GDP_{it} + \beta_3 INF_{it-1} + \beta_4 BANK_{it-1} + \beta_3 DUMMY_{it} + \mu_t} \quad (3.1)$$

Where; Loan is measured by growth in loans of bank; GDP reflects the GDP growth rate; INF is the inflation rate; BANK is a vector of bank characteristic indicators; DUMMY is the variable of strategic interaction.
However, modifications were made to the model to accommodate institutional quality index and the interaction variable which were ignored by previous studies. Thus, the functional model for this study is specified as follows:

$\text{LENB}_{it} = f(\text{MSU, IRA, ERA, IQI, IQI* MCI})$ (3.2)

The model is further stated in econometric form as:

$$LENB_{it} = \beta_{it} + \beta_1 MSU_{it} + \beta_2 IRA_{it} + \beta_3 ERA_{it} + \beta_4 IQI_{it} + \beta_5 \text{IQI} * \text{MCI}_{it} + \varepsilon_{it} \quad (3.3)$$

Where:

LENB represents lending behaviour of commercial banks measured by loan to deposit ratio, MSU represents money supply measured by money supply growth rate, IRA represents interest rate measured by monetary policy rate, ERA represents

exchange rate measured by local currency rate to dollar, IQI represents institutional quality index measured by the composite of World Governance Indicators, IQI*MCI represents the interaction of institutional quality index and macroeconomic index. A priori expectation is stated in mathematical form as $\beta_1, \beta_3, \beta_4 > 0$; $\beta_2 < 0$.

The annual data used for this study were secondary in nature and obtained from World Development Indicators (WDI) by World Bank, and World Governance Indicator covering the period of 1996 to 2023. The research design employed is ex-post facto. The population for this study consists of all forty-nine (49) countries in sub-Saharan Africa. While the sample size of 14 sub-Sahara African countries was purposively drawn. The sampled countries are Angola, Congo Democratic Republic, The Gambia, Kenya, Madagascar, Mauritius, Namibia, Nigeria, Rwanda, Seychelles, South Africa, Tanzania, Uganda, Zambia.

GMM is particularly well-suited for dealing with endogeneity concerns, which may arise in the relationship between macroeconomic factors, institutional quality, and bank lending behaviour. There is a potential for simultaneity, where bank lending influences macroeconomic conditions, and institutional quality impacts both lending and economic factors, making GMM an ideal choice as it effectively handles this issue by using internal instruments.

4. DATA ANALYSIS AND DISCUSSION

Descriptive statistics

Dataset representing the entire population or only a sample of it can be summarized using coefficients in descriptive statistics. The mean, median, and mode are examples of central tendency measures that provide information about the values of the data. On the other hand, measures of variability such as standard deviation and variance provide information about the dispersion of the data points.

Table 1: Descriptive Statistics

	Mean	Std. Dev.	Max	Min
Bank lending behaviour	7.960919	3.843623	22.82500	0.525000
Money supply	15.21831	10.89308	87.76135	-7.972820
Interest rate	7.774801	6.800756	23.73953	-34.74344
Exchange rate	487.7710	858.3438	3727.069	1.207900
Institutional quality index	-3.57E-09	0.983740	4.225347	-1.911168
Interactive term (IQI*MCI)	-0.032878	0.610447	2.930253	-2.898354

Source: Authors

The result of descriptive statistics is displayed in Table 1. The result showed that on the average, bank lending behaviour in SSA is at a moderate level. However, there is significant variation in bank lending behaviour across SSA countries, with some countries exhibiting very high levels of bank lending, while others have extremely low levels of bank lending, indicating financial constraints in certain regions.

Money supply is, on the average, relatively high across SSA. However, there is substantial variation in money supply levels across SSA countries with some countries showing very high money supply levels, possibly due to expansive monetary policies, and others showing negative money supply values, indicating monetary contractions or currency depreciation effects.

Interest rate is, on the average, moderate in SSA. However, interest rates fluctuate significantly across countries with some countries experiencing high lending interest rates, which may discourage borrowing; while others experienced abnormally low or even negative interest rates, possibly due to inflation adjustments or policy interventions.

Exchange rate is, on the average, relatively high, but it should be interpreted with caution since different SSA countries use different currencies. There is extreme variability in exchange rates across countries, reflecting different levels of currency valuation and fluctuations. The institutional quality index is normalized, meaning the average quality of institutions across SSA is close to zero. As expected, some countries have strong institutional environments while others are weak. Lastly, the interactive term (IQI*MCI), on the average, is close to zero. Its variation suggests the moderating effect differs significantly across countries/times.

Panel Unit Root Tests

Table 2: Panel Unit-Root Test

Levin-Lin-Chu (LLC) Test						
Variables	**Level**	**p-value**	**Status**	**1st Difference**	**p-value**	**Status**
LENB	-2.0787	0.0188	I(0)	-6.97269	0.0000	I(1)
MSU	-5.19879	0.0000	I(0)	-9.88737	0.0000	I(1)
IRA	-2.25122	0.0122	I(0)	-8.24263	0.0000	I(1)

Levin-Lin-Chu (LLC) Test						
Variables	**Level**	**p-value**	**Status**	**1st Difference**	**p-value**	**Status**
ERA	2.79284	0.9974	-	-3.62614	0.0001	I(1)
IQI	-21.1105	0.0000	I(0)	-21.3156	0.0000	I(1)
IQI*MCI	-18.5326	0.0000	I(0)	-20.0793	0.0000	I(1)

Source: Authors

The results of the panel unit root tests were displayed in Table 2. The results showed that bank lending behaviour, money supply, interest rate institutional quality index and interaction variable were stationary at level I(0), but differencing further confirms stationarity. However, exchange rate was non-stationary at level but became stationary after first differencing. It was discovered that the variables are stationary at level I(0) and first difference I(1). The mixture of I(0) and I(1) led this study to employ the GMM model. The benefits of GMM include the ability to estimate various variables with various orders of stationarity.

Cross-Section Panel Dependence Test

In panel analysis, the cross-sectional dependence test, also known as the Pesaran's CD test, is used in panel data analysis to determine whether the cross-sectional units in the panel dataset are correlated with one another. The presence of cross-sectional dependence suggests that shocks in one country may affect others, which is common in macroeconomic studies covering multiple nations.

Table 2: Result of the Cross-section Dependence Test

Variables	t-statistic	Prob* Pesaran CD
LENB	5.344	0.0000
MSU	8.117	0.0000
IRA	9.520	0.0000
ERA	5.298	0.0000
IQI	11.011	0.0000
IQI*MCI	12.8272	0.0000

Source: Authors

The results in Table 3 showed cross-sectional dependence in the data set, implying that errors are independent across cross-sections. This outcome meant that changes in bank lending behaviour across countries in Sub-Saharan Africa is interconnected. This implied that lending behaviour, macroeconomic conditions, institutional quality and the interaction variable in one country affect bank lending behaviour in others.

Panel Generalized Method of Moments (GMM) Model

The panel generalized method of moments (GMM) is used to estimate parameters of models when traditional methods, such as Ordinary Least Squares (OLS), may not be suitable due to endogeneity or other complexities. GMM is particularly useful for models with panel data and can handle potential issues like heteroskedasticity, autocorrelation, and omitted variable bias. Table 4 displayed the Panel GMM result.

Table 4: Panel GMM Model Result

Dependent Variable: Bank lending behaviour			
Variables	**Coeff.**	**Z**	**p-value**
MSU	0.083291	4.475636	0.0000
IRA	0.211472	6.884112	0.0000
ERA	0.000686	2.820226	0.0051
IQI	-0.134849	-0.654343	0.5134
IQI*MCI	-0.530492	-1.718961	0.0856
C	4.714780	10.96042	0.0000
Model Diagnostics			
	Wald X^2 = 5.3235		
	P >X^2 = 0.000		
	R^2 = 0.73585		
	AR (1) p-value = 0.0000		
	AR (2) p-value = 0.2521		

Source: Authors

5. DISCUSSION OF FINDINGS

The result showed that money supply has a positive and significant effect on bank lending behaviour in sub-Saharan Africa. This suggests that higher money supply encourages banks to extend more loans. This aligns theoretical proposition of the theory of financial intermediation, which suggests that when central banks expand the money supply, banks have more liquidity to lend, leading to increased credit availability in the economy.

An increase in money supply may lead to lower interest rates, making borrowing cheaper for individuals and businesses. More money supply means that commercial banks have more funds available, increasing their lending capacity. As such, more credit availability can stimulate investment and consumption, further reinforcing lending activities.

This finding aligns with a priori expectation and the findings of Arintoko (2021), Oyebowale (2020), Ademokoya *et al.,* (2020), Shobande (2019), Uruakpa (2019) which found money supply to exert significant positive effect on bank lending. However, the finding contradicts the findings of Miku *et al.,* (2023), Demehin (2021), Abere et al (2020), Yunusa *et al.,* (2020) which found money supply to exert significant negative effect on bank lending behaviour.

Similarly, the result showed that interest rate has a positive and significant effect on bank lending behaviour in sub-Saharan Africa. this suggests that as the interest rate increases, banks tend to increase their lending rather than reduce it. In sub-Saharan African economies, limited financial instruments and weak capital markets may force businesses to rely heavily on bank loans, regardless of interest rate fluctuations.

Higher interest rates increase the profitability of lending, incentivizing banks to extend more credit. In some cases, banks may lend more even at higher interest rates, especially in economies where demand for credit remains strong despite costlier loans. Businesses and individuals might continue borrowing despite high interest rates, possibly due to inflation expectations or lack of alternative funding sources.

This finding is consistent with the findings of Nguyen and Pham (2021), Osakwe *et al.,* (2021) which found interest rate to exert significant positive effect on bank lending. In addition, this aligns with financial intermediation theory, which posits that banks perform the crucial function of risk transformation, balancing the cost of funds (interest rates) and expected returns on loans. However, the finding contradicts the findings of Ngimanang (2024), Makanile and Pastory (2022), Yunusa *et al.,* (2020), Bhattarai (2020) which found interest rate to exert significant negative effect on bank lending behaviour.

Furthermore, the result showed that exchange rate has a positive and significant effect on bank lending behaviour in sub-Saharan Africa. this suggests that currency depreciation (a higher exchange rate, meaning the local currency weakens against foreign currencies) is associated with increased bank lending. A weaker local currency makes exports more competitive, leading to higher demand for credit from export-oriented businesses seeking to expand production.

If banks hold foreign-denominated assets, depreciation could increase the local currency value of these assets, improving banks' balance sheets and their ability to lend. Currency depreciation often leads to higher inflation, prompting businesses to borrow more before costs rise further. Foreign investors may also see opportunities and inject capital into domestic markets, increasing liquidity and boosting bank lending.

This finding aligns with a priori expectation and the findings of Sangweni and Takawira (2024), Kithandi (2022), Yunusa *et al.,* (2020), Abere *et al.,* (2020), Bhattarai (2020), which found exchange rate to exert significant positive effect on bank lending. Additionally, this aligns with financial intermediation theory, as exchange rate stability reduces uncertainty for financial intermediaries, enabling them to price loans effectively and extend credit without excessive risk exposure. However, the finding contradicts the findings of Nguyen and Pham (2021) which found exchange rate to exert significant negative effect on bank lending behaviour.

In contrast, the result showed that institutional quality index has a negative and insignificant effect on bank lending behaviour in sub-Saharan Africa. This means that institutional quality does not have a decisive impact on bank lending behaviour in the SSA region. As such, institutional quality does not play a significant role in influencing bank lending behaviour. In sub-Saharan African economies, bank lending decisions may be more influenced by macroeconomic factors (e.g., money supply, interest rates, and exchange rates) than by institutional quality. This suggests that banking decisions are more driven by macroeconomic factors than governance structures. Stricter regulations and governance improvements may impose compliance costs on banks, discouraging aggressive lending. In addition, a large portion of financial activities within the SSA region occurs outside formal banking channels due to low trust in institutions.

This finding supports the institutional change theory's argument that institutional changes may create rigidities and uncertainties, which can lead to banks being more cautious in their lending policies. Therefore, this finding contradicts the findings of El Hourani and Mondello (2021) which found institutional quality to exert effect on bank lending within the Middle East and North African Countries (MENA) region. Moreover, Louhichi and Boujelbene (2020) established that high

level of corruption makes Russian banks more cautious and limits the amount of credit they lend. However, Shobande (2019) found that political stability has negative effect on bank lending in Nigeria.

Lastly, the interaction term (IQI*MCI) has a negative and significant effect on bank lending behaviour, only at 10% level of significant. This suggests that while macroeconomic environment alone may positively influence bank lending, their effect weakens when moderated by institutional quality. Specifically, improvements in institutional quality, when combined with macroeconomic factors, appear to reduce the positive impact that macroeconomic conditions (such as money supply, interest rates, and exchange rates) would have had on bank lending. This could imply that better institutional frameworks introduce stricter regulations, oversight, and compliance requirements, which could curb excessive or risky lending even when macroeconomic conditions are favourable.

This implies that better institutional quality promotes more cautious lending even during periods of favourable economic conditions. This aligns with the institutional change theory's argument that strong institutional framework may create rigidities and uncertainties, which can lead to banks being more cautious in their lending policies.

Model Diagnostics and Goodness of Fit

The Wald Chi-Square Test (Wald $X^2 = 4.42$, p-value = 0.000) confirms that the overall model is statistically significant, indicating that at least one of the explanatory variables significantly affects bank lending behaviour in SSA. Additionally, coefficients of determination (R^2) reveals that 73.58% of the variation in bank lending behaviour can be attributed to changes in the independent variables.

The Autocorrelation Tests, specifically the Arellano-Bond AR Test, showed that a first-order autocorrelation exists which is expected in a dynamic model, as evidenced by the AR(1) p-value of 0.0004. However, no second-order autocorrelation was detected, as seen in AR(2) p-value of 0.3304 which validates the GMM estimator. Therefore, since AR(2) is not statistically significant, the model does not suffer from serial correlation, confirming its reliability.

6. CONCLUSION AND RECOMMENDATIONS

The study concluded macroeconomic factors, institutional quality and their interactions affect bank lending behaviour in sub-Saharan Africa. Therefore, the study recommended that commercial banks should enhance liquidity management and credit risk assessment strategies, especially during fluctuating economic conditions and interest rate changes, while central banks should maintain stable interest rates to support lending confidence. It also advises banks to adopt effective currency risk management practices and urges policymakers to promote stable exchange rate policies through strategic use of reserves and development of local hedging markets. Additionally, the study emphasizes the importance of strengthening regulatory institutions, enhancing transparency, and fostering regional collaboration in Sub-Saharan Africa to support cross-border financial flows and improve credit access.

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