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THE MEDIATING ROLE OF LOAN MONITORING IN THE RELATIONSHIP BETWEEN MACROECONOMIC FACTORS AND BANK LENDING BEHAVIOUR AMONG NSE-LISTED COMMERCIAL BANKS IN KENYA

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Abstract

The study investigated the mediating effect of loan monitoring on the relationship between selected macroeconomic factors and bank lending behaviour of commercial banks listed on Nairobi Securities Exchange (NSE), Kenya. It is important to understand the channels through which macroeconomic conditions affect lending, considering that these conditions influence credit demand, borrowers' repayment capacity and banks' risk appetite. The study utilized a quantitative longitudinal design with secondary panel data of 11 NSE-listed commercial banks for the period 2010–2025, based on the Bank Lending Channel Theory. The data was collected from the published financial statements of banks, the Central Bank of Kenya's reports, and the official national statistical sources. The pooled mean group autoregressive distributed lag (PMG-

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ARDL) estimator was used to check the long-run relationships and short-run adjustment, while the mediation was investigated through the direct, indirect and total effects. The results showed that loan monitoring had a positive impact on bank lending behaviour (β = 0.594, p = .036). The indirect effects via loan monitoring were positive for GDP growth (β = 0.547, p <.001) and exchange rates (β = 0.317, p =.033), but negative for interest rates (β = −0.483, p =.001) and inflation (β = −0.485, p =.002). The effects of GDP growth and interest rates were not statistically significant after controlling for loan monitoring, while the effects of exchange rates and inflation were. Thus, loan monitoring fully mediated the relationship between GDP growth and interest rates and partially mediated the relationship between exchange rates and inflation. The study calls for strengthening risk-based loan monitoring and for aligning credit supervision with changing macroeconomic conditions. The results are based on panel associations, not causal effects.

Keywords: Bank lending behaviour, Loan monitoring, GDP growth, Interest rate, Exchange rate, Inflation

INTRODUCTION

Commercial banks are the key players in the financial intermediation process, as they are the ones that mobilize deposits and allocate credit to households, firms and productive sectors. Lending decisions affect investment, working capital, consumption and employment and thus are an important channel between financial conditions and real economic activity (Bernanke & Blinder, 1988; Mishkin, 2019). The lending of banks is affected by external economic conditions, and by internal decisions on credit assessment, risk appetite, pricing and monitoring of outstanding facilities.

Macroeconomic conditions can affect lending through several channels. Higher GDP growth can stimulate demand for credit and enhance borrowers' capacity to repay. Higher interest rates can increase borrowing costs and debt-service burdens. Changes in exchange rates impact import costs, foreign currency liabilities and trade finance, and inflation can increase uncertainty and diminish real purchasing power. The quality of credit appraisal and monitoring practices of banks may influence the direction and magnitude of these relationships (Vo, 2018; Louzis et al., 2012).

Loan monitoring is the ongoing appraisal of borrowers and loan accounts after the credit has been granted. This includes monitoring performance of repayments; identification of early warning signs and taking corrective actions. Monitoring can give banks information about changes in borrower risk and help them decide whether to retain, restructure or restrict credit

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exposure. Agency theory looks at the information asymmetry that may exist between lenders and borrowers. The bank lending channel on the other hand describes the effect of monetary and macroeconomic conditions on banks' ability and willingness to lend (Bernanke & Blinder, 1988). These views suggest that the monitoring of loans may be an intervening mechanism that connects macroeconomic conditions and lending behaviour.

Previous empirical work has examined the macroeconomic determinants of lending, loan quality and non-performing loans, but the transmission mechanism of macroeconomic changes into bank lending decisions remains an important question in the Kenyan context. Studies on macroeconomic and bank-specific determinants of non-performing loans show that GDP growth and interest rates affect loan quality, but internal credit-risk practices are also important (Louzis et al., 2012). Emerging market evidence also points to the role of macro-financial risks and institutional conditions in influencing bank credit supply (Vo, 2018).

This study bridges this gap by examining the mediating effect of loan monitoring on the association between GDP growth, interest rates, exchange rates and inflation and bank lending behaviour among NSE-listed commercial banks in Kenya. It contributes by introducing an internal credit-management mechanism in a dynamic panel set-up and by distinguishing direct effects from indirect effects through loan monitoring.

THEORETICAL FRAMEWORK

This study is based on the bank lending channel put forward by Bernanke and Blinder in 1988 and emphasizes that the effects of monetary policy on economic activity are transmitted through changes in interest rates and the availability of bank loans (Bernanke & Blinder, 1988). According to the theory, when the central bank tightens monetary policy, for example, by raising interest rates or reducing reserves, banks will react by curtailing loan supply, especially to borrowers that depend on bank credit and cannot access capital markets. The panel study by Sichei & Njenga (2012) on the bank-level data from 2001–2008 found that monetary policy tightening, such as central bank rate hikes, resulted in significantly reduced loan supply from banks with lower liquidity and capital adequacy, thus confirming the asymmetric transmission of monetary policy across banks. The theory is applicable for interest rates but also offers a framework to explore the impact of wider economic conditions on lending decisions. The theory is extended for this study with the proposed mediating role of loan monitoring and macroeconomic changes can alter the financial position of borrowers and the risk of default. Thus, banks adjust the lending standards and exposure using the monitoring information. Monitoring is therefore conceptualized as a potential transmission mechanism, rather than merely an outcome of credit risk.

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LITERATURE REVIEW

Effect of loan monitoring on bank lending behaviour and macroeconomic factors

Recent empirical literature has examined the role of loan monitoring on macroeconomic factors, stressing its importance for banking stability and for reducing risk related to NPLs. The main findings of several studies showed a strong relationship between macroeconomic conditions and NPLs. For instance, GDP growth, unemployment rates and inflation are some of the key determinants of the rate of loan defaults. Banks with higher capital adequacy ratios and effective loan loss provisions incur fewer NPLs, thus improving overall banking stability (Boudriga et al., 2020).

Recent developments have seen machine learning techniques being used to predict loan defaults based on macroeconomic variables. These models have improved the classification performance of credit risk assessments. The models indicate that tighter lending conditions in times of economic downturn can reduce the probability of default. This approach emphasizes the necessity of incorporating economic indicators into the decision-making processes of financial institutions. Quality of institutional frames and governance also impacts the stability of the banking system. Low NPL ratios are generally found in countries with strong legal systems, low corruption and effective regulatory oversight. Banks have prudential lending practices and risk management standards, and good governance and regulatory practices are conducive to financial stability (Klomp and de Haan, 2015).

Ben-Naceur (2023) conducted a study to explore the impact of regulatory reforms on bank lending behaviour, focusing particularly on the role of enhanced loan monitoring. The study examined data from European and United States (US) banks and demonstrated that improved monitoring practices contribute to alleviating the negative impact of the economic downturn on lending behaviour The research revealed that banks that have advanced monitoring systems are more capable of evaluating and managing credit risk, which results in better lending decisions and lower default rates. This is particularly so in times of economic downturn, where robust monitoring can help to mitigate adverse effects on lending behaviour by providing timely risk assessments and enabling proactive management strategies (OECD, 2023).

Luu et al. (2023) examined Vietnamese banks under the Basel II Accord and found that effective loan monitoring helps banks better manage loan loss provisions and supports the expansion of lending activities. This study provides evidence that stringent monitoring systems help banks to comply with regulatory requirements while maintaining strong lending practices, thereby emphasising the significance of loan monitoring in fostering stability and growth in lending behaviour in the backdrop of regulatory changes. These results are

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supported by other studies, for example, by Kosak et al. (2015), and emphasise the important influence of capital adequacy and monitoring on bank lending throughout different economic periods. Increased loan monitoring helps banks maintain a better quality loan portfolio and hence reduce the incidence of NPLs, especially in times of financial crises. There is persuasive evidence in studies such as that of Ozili (2019) and Fu et al. (2020) that effective management of credit risk via loan monitoring is an important factor that improves the susceptibility of the financial system to macroeconomic shocks. Ozili (2019) focused on the relationship between loan monitoring practices and credit risk management in banks. The study found that banks with stringent loan monitoring systems could effectively reduce the risk of loans going into default. Effective monitoring can help banks detect early signs of financial distress in borrowers and take timely steps like restructuring loans or demanding additional collateral. These banks demonstrate greater financial stability, especially in times of economic recession, by maintaining low levels of NPLs. This extra stability matters to the financial system as a whole, because it reduces the risk of banking crises triggered by high default rates.

The findings of Fu et al. (2020) revealed that the impact of robust loan monitoring systems was significant on banks' risk profiles, especially when the economy was in turmoil. Predictive analytics and stress testing are sophisticated tools that enable banks to assess and control risk in their loan portfolios, forecast potential macroeconomic shocks, and develop suitable risk mitigation plans. Robust monitoring systems are better positioned to survive economic shocks because they provide early warnings of deteriorating credit conditions, allowing banks to change lending policies and capital buffers in advance. So, stable banking systems support economic growth by ensuring that the flow of credit to productive sectors is constant, especially in times of economic stress. With the support of regulations and powerful predictive models, effective loan monitoring can help to alleviate the negative consequences of economic crises on the banking industry.

Research Gap and Hypothesis Development

Existing literature commonly examined the direct association between macroeconomic indicators and bank lending, or the relationship between macroeconomic conditions and loan quality. The present study focused specifically on whether loan monitoring statistically transmits part of the relationship between four macroeconomic variables and lending behaviour in the NSE-listed commercial-bank panel. This is a context-specific contribution; it does not imply that monitoring is the only channel through which macroeconomic conditions affect lending.

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The study tested the following hypothesis:

H_{01} Loan Monitoring has no significant mediating effect on the relationship between GDP growth and bank lending behaviour among NSE-listed commercial banks in Kenya.

H_{11} Loan Monitoring has a significant mediating effect on the relationship between GDP growth and bank lending behaviour among NSE-listed commercial banks in Kenya.

H_{02} Loan Monitoring has no significant mediating effect on the relationship between Interest rates and bank lending behaviour among NSE-listed commercial banks in Kenya.

H_{12} Loan Monitoring has a significant mediating effect on the relationship between Interest rates and bank lending behaviour among NSE-listed commercial banks in Kenya.

H_{03} Loan Monitoring has no significant mediating effect on the relationship between exchange rates and bank lending behaviour among NSE-listed commercial banks in Kenya.

H_{13} Loan Monitoring has a significant mediating effect on the relationship between exchange rates and bank lending behaviour among NSE-listed commercial banks in Kenya.

H_{04} Loan Monitoring has no significant mediating effect on the relationship between inflation and bank lending behaviour among NSE-listed commercial banks in Kenya.

H_{14} Loan Monitoring has a significant mediating effect on the relationship between inflation and bank lending behaviour among NSE-listed commercial banks in Kenya.

METHODOLOGY

Research Design and Population

The study utilized a quantitative longitudinal explanatory design, using secondary panel data. The target population consists of 11 commercial banks listed on the NSE and a census method was used for the listed banks. The study was conducted over the period 2010–2025. The period was meant to represent the variation in macroeconomic conditions and lending outcomes over time. The panel structure allows the analysis to exploit variation between banks and variation within banks over time.

Data Sources and Measurement

Bank-level data were drawn from published financial statements and bank reports. Macroeconomic data were obtained from Central Bank of Kenya publications and official national economic statistics. Bank lending behaviour (BLB) was operationalised as loan growth/credit growth. GDP was measured using annual GDP growth, interest rate using the annual interest-rate measure specified in the dissertation, exchange rate using the USD/KES rate, and inflation using the annual inflation rate. Loan monitoring (LM) was represented by the loan loss provision

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Table 1 Operational Definition of Terms

Variable	Role	Operational measure reported in study
Bank lending behaviour (BLB)	Dependent variable	Credit growth
GDP growth	Independent variable	Annual GDP growth rate (%)
Interest rate	Independent variable	Annual Central Bank rate
Exchange rate	Independent variable	USD/KES exchange rate
Inflation	Independent variable	Annual inflation rate (%)
Loan monitoring (LM)	Mediator	Loan Loss Provision

Econometric Strategy

The basic multiple regression model to examine the direct effects of macroeconomic variables on bank lending behaviour (BLB), is expressed as follows:

$$BLB_{it} = \beta_0 + \beta_1 GDP_t + \beta_2 INT_t + \beta_3 EXC_t + \beta_4 INF_t + \varepsilon_{it} \quad (1)$$

Where BLB_{it} Bank Lending Behaviour for bank i at time t

GDP_t is GDP growth rate

INT_t is the Interest rate

EXC_t is the echange rate

INF_t is the Inflation rate

ε_{it} is the error term

The coefficient β_1 to β_4 estimate the strength and direction of the link between each macroeconomic variable and bank lending behaviour and ε_{it} captures unobserved factors.

To incorporate loan monitoring as a mediator, we use a two-equation model of testing the effect of independent Variables on the Mediator and full Model with mediator expressed as;

$$LM_{it} = \alpha_0 + \alpha_1 GDP_t + \alpha_2 INT_t + \alpha_3 EXC_t + \alpha_4 INF_t + v_{it} \quad (2)$$

Where LM_{it} is loan monitoring

Equation (3) models the effect of macroeconomic variables on mediating variable LM**.** If the coefficients α_1 to α_4 are statistically significant, it suggests that changes in macroeconomic conditions influence how banks monitor loans**,** which may in turn affect their lending behaviour. This is the first step in testing for mediation, According to Baron and Kenny (1986)**.**

$$BLB_{it} = \gamma_0 + \gamma_1 GDP_t + \gamma_2 INT_t + \gamma_3 EXC_t + \gamma_4 INF_t + \gamma_5 LM_{it} + \mu_{it} \quad (3)$$

In equation (3), LM is added as an explanatory variable in the bank lending behaviour equation. If $\boldsymbol{\gamma_5}$ is significant, this indicates that loan monitoring significantly influences lending behaviour**,** which supports the presence of mediation**.** When combined with previous equation (2), the model structure allows you to test whether macroeconomic

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variables affect BLB indirectly through mediated effects of LM. The equation estimates how macroeconomic conditions i.e. interest rate, GDP, exchange rate, and inflation, affect loan monitoring practices within banks. If these macroeconomic indicators significantly predict loan monitoring, it suggests that external economic conditions influence how actively banks monitor loans as part of their risk management practices. If α coefficients are significant and γ_5 is significant, it suggests mediation, according to Baron and Kenny (1986) method and Sobel test.

The study employed the pooled mean group autoregressive distributed lag (PMG-ARDL) estimator to distinguish long-run relationships from short-run dynamics. The research reports that variables had mixed orders of integration, I(0) and I(1), with none integrated beyond I(1), and that the Hausman specification test favoured PMG over the mean-group alternative ($\chi^2(6) = 5.83$, $p = .442$). PMG allows short-run coefficients, intercepts and error variances to differ across banks while constraining long-run coefficients to be common when supported by the data (Pesaran et al., 1999).

The mediation analysis followed the path framework: (a) the effect of each macroeconomic variable on loan monitoring; (b) the effect of loan monitoring on bank lending behaviour; (c′) the direct effect of each macroeconomic variable on lending behaviour controlling for loan monitoring; (a × b) the indirect effect; and (c) the total effect. In a linear path representation, the indirect effect is the product of path a and path b.

RESULTS AND DISCUSSION

Mediation Analysis of Loan Monitoring

Mediation analysis was conducted using the causal-steps approach involving the estimation of Path a, Path b, indirect effects, direct effects (c′), and total effects. Loan Monitoring was specified as the mediator between macroeconomic variables and bank lending behaviour. Significant indirect effects supported the existence of mediation. The study examined whether loan monitoring mediates the link between macroeconomic factors and bank lending behaviour among CBs listed on the NSE. Mediation analysis was conducted to determine whether macroeconomic factors influence bank lending behaviour directly or indirectly through loan monitoring. According to Hayes (2022), mediation occurs when an independent variable affects a dependent variable through an intervening variable (mediator). In this study, loan monitoring was specified as the mediating variable because effective monitoring mechanisms are expected to influence how macroeconomic conditions translate into lending outcomes.

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Effect of Macroeconomic Factors on Loan Monitoring

Table 2 presents the PMG-ARDL estimates for Path a**,** which examines the influence of macroeconomic factors on loan monitoring**.**

Table 2 PMG-ARDL Model Results – Path a (Dependent Variable: Loan Monitoring)

Path	Coefficient	Std. Error	z	p-value
GDP → LM	0.921	0.389	2.37	0.000
IR → LM	-0.816	0.395	-2.07	0.039
EXC → LM	0.534	0.073	7.32	0.018
INF → LM	-0.814	0.083	-9.81	0.043

The results presented in table 2 show that GDP positively and significantly influences loan monitoring (β = 0.921, z = 2.37, p =.000). The finding implies that favourable economic conditions strengthen banks' monitoring activities by improving borrowers' repayment capacity and reducing default risk. As economic activity expands, commercial banks have greater confidence to intensify credit supervision while allocating additional resources toward monitoring outstanding loans. Similar findings were reported by Sangweni and Takawira (2024)**,** who established that favourable macroeconomic conditions significantly enhance banks' credit allocation and monitoring decisions in the long run. Likewise, Nguyen et al. (2022) found that economic growth improves banks' asset quality and strengthens loan administration within emerging economies.

The coefficient for IR is negative and statistically significant (β = –0.816, z = 2.07, p = .039), indicating that higher interest rates reduce loan monitoring activities. Rising lending rates increase repayment burdens and loan default risk, thereby reducing new lending and limiting banks' incentives to expand monitoring activities. Similarly, Owusu et al. (2024) concluded that monetary tightening weakens credit growth by constraining banks' lending and monitoring capacity across Sub-Saharan Africa.

Additionally, the exchange rate positively affects loan monitoring (β = 0.534, z = 7.32, p = .016). The positive coefficient suggests that banks strengthen monitoring practices in response to exchange rate movements to manage foreign currency exposure and safeguard loan quality. This finding corroborates Agung et al. (2025)**,** who reported that exchange rate dynamics significantly influence banks' credit risk management and lending decisions. Comparable findings were also reported by Beck et al. (2022)**,** who found that exchange rate stability enhances banks' capacity to manage foreign currency lending portfolios.

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Conversely, inflation has a negative and statistically significant effect on loan monitoring (β = –0.814, z = -9.81, p = .043). Rising inflation increases macroeconomic uncertainty, erodes borrowers' purchasing power, and raises credit risk, thereby reducing the effectiveness of monitoring activities. This finding is consistent with Sangweni and Takawira (2024) and Ahamed and Mallick (2023)**,** who reported that inflation adversely affects banks' lending decisions and credit quality by increasing loan repayment risk. Therefore, the findings satisfy the first mediation condition (Path a) by demonstrating that macroeconomic factors significantly influence the proposed mediator, loan monitoring (Hayes, 2022).

Effect of Loan Monitoring on Bank Lending Behaviour

Table 3 PMG-ARDL Model Results – Path b
(Dependent Variable: Bank Lending Behaviour)

Path	Coefficient	Std. Error	z	p-value
GDP → BLB	0.983	0.374	2.63	0.009
INT → BLB	-0.842	0.138	-6.10	0.000
EXC → BLB	0.347	0.148	2.34	0.019
INF → BLB	-0.572	0.261	-2.19	0.028
LM → BLB	0.594	0.283	2.10	0.036

Table 3 shows the results of PMG-ARDL estimation for Path b with dependent variable, Bank Lending Behaviour (BLB). The results show that all the explanatory variables have significant effect on bank lending behaviour at 5% level of significance. Gross Domestic Product (GDP) has a positive and significant effect on the behaviour of bank lending (β = 0.983, p = 0.009). Therefore, ceteris paribus, a 1% rise in GDP leads to a 0.983% increase in bank lending behaviour. The coefficient is positive, meaning that economic growth encourages banks to lend more because it increases business activity, demand for credit, and borrowers' capacity to repay. The finding is consistent with Asongu et al. (2017), Liu et al. (2016) and Rashid and Yousaf (2015), who found that stronger economic growth promotes credit expansion through increased investment opportunities, business activity and demand for financial resources.

Interest Rate (INT) has a negative and significant effect on bank lending behaviour (β = -0.842, p < 0.001). The result indicates that a one per cent rise in the interest rate decreases bank lending behaviour by 0.842 units. A negative relationship implies that high borrowing costs curb loan demand and could raise default risk, prompting banks to impose tighter lending terms. The finding supports the Bank Lending Channel Theory and is consistent with the studies of

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Khan et al. (2020), Nderitu and Onyangore (2019), and Ben Naceur et al. (2017), who reported that rising interest rates suppress credit expansion by making borrowing more expensive and increasing credit risk.

The exchange rate (EXC) has a positive and statistically significant influence on the behaviour of bank lending (β = 0.347, p = 0.019). This implies that an increase of one unit in the exchange rate will lead to an increase of 0.347 units in the behaviour of bank lending. The finding implies that exchange rate movements can affect economic activity and credit demand, which in turn influences banks' lending decisions.

Inflation (INF) has a significant and negative effect on bank lending behaviour (β = -0.572, p = 0.028). Thus, an increase in inflation by one unit results in a decrease in bank lending behaviour by 0.572 units. - The negative coefficient shows that inflation generates uncertainty in the economy, erodes purchasing power, and increases the risk of lending, which leads banks to tighten credit conditions. This result is consistent with Darmouni et al. (2015), Gómez et al. (2018) and Agung et al. (2025) who found that inflation has a negative effect on lending activity through the increase in credit risk and the decrease in the effectiveness of financial intermediation.

Loan monitoring (LM) positively and significantly affects bank lending behaviour (β = 0.594, p = 0.036). This means that a one unit improvement in loan monitoring increases bank lending behaviour by 0.594 units. The positive relationship implies that effective loan monitoring helps banks to track borrower performance, identify potential repayment issues early, and decrease credit risk. Banks are more willing to lend and this has translated into better lending behaviour.

Generally, the findings of PMG-ARDL shows that GDP, Exchange Rate and Loan Monitoring have positive and significant effects on bank lending behaviour, while Interest Rate and Inflation have significant negative effects. Among the variables, Interest Rate has the strongest absolute effect, which indicates the importance of the monetary policy conditions in determining lending decisions. The findings also point to the importance of effective loan monitoring mechanisms in promoting prudent and sustainable bank lending behaviours. These findings are consistent with Berger and Bouwman (2023), who found that robust monitoring systems improve loan portfolio quality and financial stability. Similarly, Nkundabanyanga et al. (2022) established that effective credit monitoring significantly enhances lending performance through improved borrower supervision and risk assessment. According to Hayes (2022), the significance of the mediator confirms the second mediation condition (Path b).

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Indirect Effects (a × b) Mediation Analysis

Table 4 PMG-ARDL Indirect Effects (estat teffects) Mediation Analysis

Variable	Coefficient	Std. Error	z	p-value
GDP	0.547	0.124	4.411	0.000
INT	-0.483	0.122	-3.960	0.001
EXC	0.317	0.086	3.386	0.033
INF	-0.485	0.151	-3.212	0.002

Table 4 shows the indirect effects of macroeconomic factors on bank lending behaviour via loan monitoring. Hayes (2022) emphasizes that the indirect effect is critical as evidence of mediation because it indicates that the independent variable affects the dependent variable through the mediator. The findings suggest that GDP has a positive and statistically significant indirect effect on banks' lending behaviour via loan monitoring (β = 0.547, z = 4.411, p < .001). The findings suggest that positive economic growth results in better loan monitoring practices, which ultimately results in better bank lending behaviour. Improving economic conditions mean borrowers are better able to repay loans, and credit risk falls. This allows banks to monitor loans more effectively and extend more credit. The finding implies that loan monitoring is a significant channel through which economic growth influences commercial banks' lending behaviour.

The result also shows that INT has a negative and statistically significant indirect effect on bank lending behaviour through loan monitoring (β = –0.483, z = –3.960, p = .001). This means that rising interest rates are making loan monitoring less effective, and therefore reducing bank lending behaviour. Higher interest rates raise the costs of borrowing and the burden of repayment, increasing the risk of default and weakening credit demand. This can lead to a decrease in banks' lending and monitoring activities and therefore transmit the adverse effects of the restrictive monetary policy to lending behaviour through the loan monitoring channel. Moreover, the Exchange Rate has a positive and significant indirect effect on bank lending behaviour through loan monitoring (β = 0.317, z = 3.686, p = .033). The positive coefficient reflects that exchange rate movements lead to better loan monitoring practices which in turn improve bank lending behaviour. These results show that banks react to exchange rate volatility by improving their credit supervision and risk management efforts in an effort to protect the quality of loan portfolios. Better monitoring then helps make good lending decisions and supports credit growth. The results also reveal that INF has a negative and statistically significant indirect effect on bank lending behaviour via loan monitoring (β = –0.485, z = –3.212, p =.002). The result suggests that higher inflation decreases the effectiveness of loan

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monitoring and thus lowers bank lending behaviour. The higher the inflation, the greater the economic uncertainty, the lower the purchasing power of borrowers, and the higher the risk of repayment and hence the weaker the ability of banks to effectively monitor credit facilities. Then a decrease in monitoring effectiveness constrains lending.

Finally, the results suggest that loan monitoring plays an important mediating role in the relationship between macroeconomic factors and bank lending behaviour. The positive indirect effects of GDP and Exchange Rate suggest that when these macroeconomic conditions improve, they improve lending behaviour through improving monitoring practices. In contrast, the negative indirect effects of Interest Rate and Inflation imply that bad macroeconomic conditions have a negative effect on lending behaviour by reducing the effectiveness of loan monitoring. The statistically significant indirect effects are in line with the mediation framework proposed by Hayes (2022) and confirm the importance of loan monitoring as a transmission mechanism through which macroeconomic factors influence bank lending behaviour.

Direct Effects (c') Mediation Analysis

Table 5 PMG-ARDL Direct Effects Mediation Analysis

Variable	Coefficient	Std. Error	z	p-value
GDP	0.761	0.574	1.33	0.185
INT	-0.829	0.635	-1.31	0.192
EXC	0.428	0.058	7.38	0.000
INF	-0.633	0.245	-2.58	0.002

Table 5 shows the direct effects (c′) of macroeconomic factors on bank lending behaviour while controlling for the mediating effect of loan monitoring. The direct effect is the effect of the independent variable on the dependent variable controlling for the mediator (Hayes, 2022). The strength of the direct effects is used to distinguish full mediation from partial mediation. The results show that GDP has a positive but statistically insignificant direct effect on bank lending behaviour ($\beta = 0.761$, $z = 1.33$, $p = .185$). While economic growth generally promotes lending by creating more investment opportunities and increasing borrowers' repayment ability, the weak direct impact indicates that GDP affects the behaviour of banks in lending mainly via loan monitoring. This is consistent with Nguyen et al. (2022) who found that economic growth improves banks' asset quality and lending performance through the improved credit administration and monitoring mechanisms. Similarly, Sangweni and Takawira (2024) found that conducive macroeconomic conditions enhance the credit management practices of

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banks which influence lending outcomes. The non-significant direct effect and the significant indirect effect combined suggest full mediation.

Likewise, the direct effect of INT on bank lending behaviour is negative but statistically insignificant (β = −0.829, z = −1.31, p = .192). The negative coefficient suggests that as the interest rate increases, credit activity decreases. This reflects the higher borrowing costs and the subsequent reduction in credit demand. However, the non-significance indicates that the effect of interest rates on lending behaviour is mostly indirect, through loan monitoring, rather than through a direct channel. The finding is consistent with the findings of Ibrahim and Law (2022), who found that restrictive monetary policy reduces bank lending through its effect on credit conditions and risk management practices. Also, Owusu et al. (2024) show that higher interest rates inhibit banks from increasing lending due to their reduced capacity to monitor credit and assess risk. The negligible direct effect, along with a significant indirect effect, suggests full mediation through loan monitoring.

In contrast, the Exchange Rate has a positive and significant direct effect on bank lending behaviour (β = 0.428, z = 7.38, p <.001). This result implies that banks' lending decisions are directly influenced by exchange rate movements even after controlling for loan monitoring. The finding suggests that the exchange rate fluctuations influence business profitability, trade financing and foreign currency borrowing, which in turn has a direct effect on credit demand and lending behaviour. This is consistent with Agung et al. (2025) who reported that banks' lending activities and risk exposure are significantly impacted by exchange rate movements. Likewise, Beck et al. (2022) found that exchange rate volatility improves the efficiency of credit allocation and improves lending performance. Loan monitoring is a partial mediator between exchange rate and bank lending behaviour, as both direct and indirect effects are significant.

The results also reveal that Inflation has a negative and statistically significant direct effect on bank lending behaviour (β = −0.633, z = −2.58, p = .002). This finding implies that rising inflation reduces bank lending behaviour directly controlling for loan monitoring. High inflation reduces macroeconomic uncertainty, erodes the purchasing power of borrowers and increases the risk of default, thus discouraging lending. This result is consistent with Ahamed and Mallick (2023) who find that inflation has negative implications for credit growth through the increased risk of loan repayment and a decline in financial stability. Similarly, Sangweni and Takawira (2024) concluded that inflation has a negative impact on banks' lending decisions through the erosion of credit quality and the increase of uncertainty in the financial sector. The significance of direct and indirect effects indicates partial mediation.

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Therefore, the results of the direct effect show that the exchange rate and Inflation have a significant direct effect on bank lending behaviour after controlling for loan monitoring, while GDP and Interest Rate are statistically insignificant. These findings indicate that loan monitoring fully mediates the effects of GDP and Interest Rate on bank lending behaviour but partially mediates the effects of Exchange Rate and Inflation. Full mediation is when the indirect effect is significant and the direct effect is not (Hayes, 2022). Partial mediation is when both the direct and indirect effects are significant (Hayes, 2022). The results therefore confirm that loan monitoring is an important transmission channel through which macroeconomic factors affect bank lending behaviour among commercial banks.

Total Effects (c) Mediation Analysis

The results in Table 6 present total effects of macroeconomic variables on bank lending behaviour. The total effect is the sum of the direct effect (c′) and the indirect effect (a × b) mediated by loan monitoring. The total effect, as described by Hayes (2022), offers a general assessment of the degree to which an independent variable affects the dependent variable, irrespective of the path through which the effect is conveyed.

Table 6 Total Effects Mediation Analysis

Variable	Direct Effect (c′)	Indirect Effect (a × b)	Total Effect (c = c′ + a × b)	Mediation Type
GDP	0.761	0.547	**1.308**	Full Mediation
INT	-0.829	-0.483	**-1.312**	Full Mediation
EXC	0.428	0.317	**0.745**	Partial Mediation
INF	-0.633	-0.485	**-1.118**	Partial Mediation

The results suggest that GDP has a positive overall effect on bank lending behaviour (β = 1.308). It demonstrates that economic growth influences bank lending behaviour through both direct and indirect channels. This finding implies that good economic conditions improve business activity, the ability of borrowers to service their loans and improve loan monitoring procedures all of which lead to an increase in lending activity. This confirms previous research by Asongu et al. (2017), Nguyen et al. (2022) and Sangweni and Takawira (2024) that established that economic growth stimulates credit expansion by improving lending opportunities and credit management efficiency.

The results further show that the interest rate has a negative total effect on bank lending behaviour (β = −1.312). It implies that the impact of a rise in interest rates on lending is large

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and operates through both direct and indirect channels. Higher interest rates increase borrowing costs, reduce demand for credit, and impair banks' ability to monitor loans and manage risk. The size of the total effect suggests that changes in interest rates are among the most powerful macro-economic determinants of lending behaviour. This is consistent with the findings of Ibrahim and Law (2022), Khan et al. (2020) and Owusu et al. (2024) who reported that restrictive monetary policy significantly curtails commercial bank lending.

Also, the exchange rate shows a positive total effect on bank lending behaviour (β = 0.745). The positive coefficient suggests that exchange rate movements have a positive effect on lending decisions both directly and indirectly through improvements in loan monitoring. Exchange rate dynamics can affect trade financing, foreign currency lending, and business investment activities, stimulating credit demand and lending activity. The result is in line with the studies of Beck et al. (2022) and Agung et al. (2025), who revealed that exchange rate conditions affect the risk management strategies and lending performance of banks.

The results also show that Inflation has a total negative effect on bank lending behaviour (β = −1.118). Thus, higher inflation has a negative impact on lending behaviour, both directly and indirectly. High inflation causes high macroeconomic uncertainty, erosion of borrowers' purchasing power, high credit risk and low effectiveness of loan monitoring. Thus, banks become more cautious in extending credit facilities. This finding is consistent with Ahamed and Mallick (2023), Darmouni et al. (2015) and Sangweni and Takawira (2024), who found that inflation negatively affects credit allocation and lending performance.

Therefore, the total effects analysis reveals that GDP and Exchange Rate have positive effects on bank lending behaviour, while Interest Rate and Inflation have negative effects. The variable Interest Rate (β = −1.312) has the largest total effect in absolute terms of all variables. This implies that monetary policy conditions are of great importance in the determination of commercial banks' lending behaviour. Moreover, the results show that the effect of the macroeconomic variables is larger after the introduction of the loan monitoring, which confirms its importance as a transmission mechanism in the mediation framework. In line with the mediation approach suggested by Hayes (2022), the total effects suggest that macroeconomic factors impact bank lending behaviour through direct and indirect pathways, the latter operating through loan monitoring. These results further support the conclusion that macroeconomic conditions are a key mechanism in the relationship between loan monitoring and lending decisions.

Mediating Effects of Loan Monitoring

Loan monitoring has been introduced as mediating variable in Equations (2) and (3). The first step (Equation 2) tested the influence of macroeconomic variables on LM. The second step

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(Equation 3) included LM in the BLB equation. The results revealed that the R-squared was 0.798 which shows that macroeconomic conditions indirectly affect lending behaviour through loan monitoring practices. Equation (2) shows that significant α coefficients show that GDP, interest rate, exchange rate and inflation affect loan monitoring by banks. These results confirm the mediating role of loan monitoring, with risk management being a significant channel through which macroeconomic shocks are transmitted into lending behaviour (Baron and Kenny, 1986, and the Sobel test).

The first mediation model is expressed as;

$$LM_{it} = 0.921\ GDP_{it} - 0.816\ INT_{it} + 0.534 EXC_{it} - 0.814 INF_{it} + v_{it} \quad (2)$$

Equation (3) shows that macroeconomic conditions have a strong impact on loan monitoring. An increase of 1 unit in GDP growth causes an increase of 0.921 units in the loan monitoring. This implies that good economic performance enhances the banks' supervision of the credit portfolios by enhancing the borrowers' ability to repay and decreasing the risk of default. In contrast, a unit increase in interest rate decreases loan monitoring by 0.816 unit, showing the contractionary effect of higher borrowing costs, which limit new lending and weaken banks' incentives to intensify monitoring. The results show that exchange rate movements have a positive effect in which a unit increase in the exchange rate increases loan monitoring by 0.534 units. Thus, banks increase loan monitoring to reduce foreign currency exposure and maintain loan quality. However, inflation negatively affects it. A unit increase in inflation decreases the loan monitoring by 0.814 units. This finding indicates that an increase in prices reduces borrowers' purchasing power and increases the risk of repayment, which decreases the effectiveness of monitoring. Taken together, these findings establish that macroeconomic shocks have a direct impact on the intensity of loan monitoring, fulfilling the first mediation condition in demonstrating that the proposed mediator is significantly predicted by GDP, interest rate, exchange rate, and inflation.

The second mediation model is expressed as;

$$BLB_{it} = 0.983\ GDP_{it} - 0.842\ INT_{it} + 0.347\ EXC_{it} - 0.572\ INF_{it} + 0.594\ LM_{it} + \mu_{it} \quad (3)$$

Equation (4) confirms that bank lending behaviour is simultaneously determined by both macroeconomic conditions and loan monitoring. A unit increase in GDP growth leads to a 0.983 unit increase in lending behaviour, implying that economic growth increases the demand for credit and improves the credit quality of borrowers. In contrast, a unit increase in the interest rate decreases lending behaviour by 0.842 units, showing the contractionary effect of higher borrowing costs. Exchange rate movements have a positive effect, where a unit increase in the exchange rate increases lending behaviour by 0.347 units, while inflation reduces lending by 0.572 units, pointing to the ill effect of price instability on credit expansion. Most prominently, loan monitoring

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has a significant positive impact, with a unit increase improving lending behaviour by 0.594 units. The finding indicates that proper supervision enhances the quality of the loan portfolio, reduces information asymmetry and boosts the confidence of banks in granting credit. Collectively, these results fulfil the second mediation condition, which implies that the mediator (loan monitoring) is an important predictor of bank lending behaviour and thereby validates its role in transmitting the macroeconomic shocks in the form of prudent lending practices.

DISCUSSION

The study tested the mediating effect of Loan Monitoring on the relationship between macroeconomic factors and BLB. The mediation analysis showed that LM and Loan Monitoring significantly impact bank lending behaviour ($\beta = 0.594$ and p-value < 0.001). GDP, IR, EXC and INF significantly affect LM. The indirect effects confirmed full mediation for GDP and Interest rate, whereas exchange rate and inflation showed partial mediation across all macroeconomic variables. These results imply that macroeconomic conditions affect credit demand not only directly but also indirectly through banks' credit monitoring behaviour. Good loan monitoring translates into better risk assessment, better quality of the loan portfolio and more confidence on the part of the banks to lend.

The mediation analysis (Tables 2 to 6) revealed that macroeconomic factors significantly affect loan monitoring (Path a coefficient was 0.198 and p-value < 0.05) and loan monitoring significantly affects lending behaviour (Path b coefficient was 0.276, $p < 0.01$). The indirect effect ($a \times b$) was 0.055 ($p < 0.05$), confirming the partial mediation. While Naili and Lahrichi (2022) argued that the impact of loan monitoring is limited, the regulatory focus on credit risk frameworks in Kenya after 2016 improved monitoring practices, reinforcing the mediating role. The results are consistent with Financial Intermediation Theory, which states that one of the main tasks of financial intermediaries is to monitor borrowers. The findings are consistent with Ozili (2023) who argued that effective loan monitoring has a significant positive effect on lending efficiency. Alsharif et al. (2024) found similar results and demonstrated that strong credit monitoring systems enhance the lending performance of banks and reduce credit risk.

The findings reveal that loan monitoring significantly mediates the relationship between macroeconomic factors and the lending behaviour of commercial banks listed on NSE in Kenya. The results of mediation analysis supported the idea that GDP growth and exchange rates have positive indirect effects on bank lending behaviour through loan monitoring, while interest rates and inflation have negative indirect effects. Loan monitoring fully mediates the relationship between GDP growth and bank lending behaviour and between interest rates and bank lending behaviour, while Exchange rates and inflation are partially mediated.

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The study finds that macroeconomic conditions affect bank lending behaviour through internal credit-management processes as well as through other direct channels. In the estimated model, GDP growth and exchange rates have positive total effects, i.e., they are associated with positive lending behaviour. The total effects of interest rates and inflation are negative, indicating that higher borrowing costs and inflation are associated with lower lending. Interest rates have the largest total effect in absolute value among the four macroeconomic variables, which indicates the importance of monetary conditions in banks' lending decisions.

The paper contributes to the literature by providing evidence that loan monitoring is an important channel through which macroeconomic conditions affect bank lending behaviour. The findings underscore the importance of sound credit-risk management, adequate loan monitoring practices and macroeconomic stability in promoting sustainable lending. However, the interpretation of the mediation pathways should be made with care when considering the operational measure of loan monitoring, particularly if loan-loss provisions or a provisioning ratio is used as a proxy for loan monitoring. The results should also be interpreted in the light of the model assumptions and the characteristics of the banks in the sample.

CONCLUSION AND IMPLICATIONS

This study examined the mediating role of loan monitoring in the relationship between GDP growth, interest rates, exchange rates, inflation and bank lending behaviour among NSE-listed commercial banks in Kenya. The reported results show a positive and significant association between loan monitoring and lending behaviour. Indirect effects through monitoring were positive for GDP growth and exchange rate and negative for interest rate and inflation. Based on the direct and indirect effects reported in the dissertation, loan monitoring fully mediated the GDP-growth and interest-rate relationships and partially mediated the exchange-rate and inflation relationships.

Policy and Managerial Implications

The results of this study provide useful insights on the role of loan monitoring in explaining the relationship between macroeconomic factors and bank lending behaviour in the Kenyan banking sector. The evidence that loan monitoring mediates the relationship between GDP growth, interest rates, exchange rates, inflation and bank lending behaviour points out the importance of internal credit-risk management mechanisms in shaping bank lending decisions. The results show that the effects of macroeconomic conditions on lending are not transmitted in isolation directly, but also through the effectiveness of monitoring borrowers and managing credit risk.

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From a managerial perspective, the results indicate that commercial banks are able to improve lending performance and portfolio quality through the improvement of loan-monitoring practices. Effective monitoring enables banks to detect new repayment risks, enhance borrower compliance, and implement corrective actions before credit problems become serious. Therefore, loan monitoring should be seen as a strategic component of credit-risk management that enables sustainable lending rather than merely a compliance function.

From a policy standpoint, the findings emphasize the need for regulatory structures that foster strong credit-risk management practices in the banking sector. Regulators could improve guidelines on borrower assessment, loan monitoring, and early-warning systems to increase banks' resilience to macroeconomic volatility. Better monitoring practices can help to promote greater financial stability by reducing the probability of loan defaults in times of economic uncertainty.

The study also adds to theory by showing that loan monitoring is an important transmission channel through which macroeconomic conditions affect bank lending behaviour. The results add to the existing literature by showing the important role of internal bank processes in translating macroeconomic development into lending outcomes. This provides additional empirical support for perspectives that stress the importance of credit-risk management in the lending process.

In general, the study suggests that improvement in loan-monitoring systems can help the banks to respond effectively to changing macroeconomic conditions, while promoting sound lending practices and long-term stability in the financial sector.

Limitations and Further Research

The study was limited to commercial banks listed on the NSE and therefore may not generalise to unlisted banks, microfinance institutions or SACCOs. It relied on secondary reports and on the operational proxy used to represent loan monitoring. Future studies should define and validate monitoring measures more explicitly, compare listed and unlisted banks, and test robustness using alternative dynamic-panel estimators and alternative loan-growth measures. Further research could also examine whether the mediation pathway differs by bank size, ownership, capital adequacy or borrower segment.

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