Account and Financial Management Journal e-ISSN: 2456-3374
Volume 11 Issue 02 February 2026, Page No.- 4181-4190
DOI: 10.47191/afmj/v11i2.03, Impact Factor: 8.167

The Effect of Monetary Policy Variables on Tax Revenue Collections in Uganda

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ABSTRACT: This study investigates the extent to which monetary policy instruments influence tax revenue mobilization in Uganda, with particular emphasis on the exchange rate, broad money supply (M2), and interest rates. Using annual time-series data and a Vector Error Correction Model (VECM), the study examines both the short-run dynamics and long-run equilibrium relationships between monetary policy variables and tax revenue performance. The results indicate the existence of a stable long-run relationship among the variables. Empirically, expansions in M2 are found to exert a positive and statistically significant effect on tax revenue, suggesting that increased liquidity stimulates taxable economic activity. Exchange rate depreciation also significantly enhances tax collections, reflecting its impact on trade-related and nominal revenue bases. In contrast, interest rates exhibit a negative but statistically insignificant effect on tax revenue, implying a limited direct transmission channel through revenue mobilization. The study contributes to the empirical literature by providing evidence on the monetary–fiscal transmission mechanism in a low-income, structurally transforming economy, highlighting how monetary policy indirectly supports domestic revenue generation. From a policy perspective, the findings underscore the importance of maintaining adequate liquidity growth while safeguarding macroeconomic stability. A cautiously managed exchange rate regime is recommended to harness revenue gains from moderate depreciation without amplifying volatility. Although interest rates appear weakly linked to tax revenue, prudent adjustments remain essential to avoid crowding out private sector activity. The study further emphasizes the need for stronger coordination between the Bank of Uganda, the Ministry of Finance, and the Uganda Revenue Authority, alongside structural reforms aimed at financial deepening, formalization, and improved tax compliance.

KEYWORDS: Monetary policy, tax revenue, exchange rate, money supply, interest rates, and Uganda.

1.0 INTRODUCTION

Domestic revenue mobilization (DRM) plays a central role in supporting fiscal sustainability and development financing in low-income economies, particularly in Sub-Saharan Africa (World Bank, 2024; Ghura, 1998). In Uganda, tax revenue accounts for about 80% of total domestic revenue and remains the main source of funding for public expenditure and development programmes (MoFPED, 2023). Despite this importance, Uganda's tax performance has remained modest (MoFPED, 2023; UNESCO, 2022). The tax-to-GDP ratio averaged about 13.2% in FY2022/23, below the Sub-Saharan African average of 16.6% and well under the 20% benchmark commonly associated with sustainable development financing (IMF, 2024; Cagé & Gadenne, 2018). This persistent gap raises concerns about the country's capacity to finance public services and maintain fiscal stability without excessive reliance on borrowing.

Macroeconomic conditions, particularly those shaped by monetary policy, are increasingly relevant in understanding tax revenue performance (OECD, 2023). Monetary policy affects tax revenue indirectly through its influence on economic activity, prices, investment, and trade (Aizenman & Jinjarak, 2009). In Uganda, periods of high interest rates have been associated with subdued private investment and employment growth, which can limit income- and profit-based tax collections (World Bank, 2024). Lending rates averaged about 19.5% in 2023, reflecting efforts to contain inflation but with possible implications for the tax base (BoU, 2023). Exchange rate movements also matter. The depreciation of the Ugandan Shilling between 2020 and 2023 affected import values, production costs, and inflation, with mixed effects on trade-related and domestic taxes (BoU, 2023; IMF, 2024). In addition, changes in broad money supply influence liquidity, consumption, and credit conditions (Edwards, 1989). The slowdown in M2 growth in recent years coincided with weaker consumption and investment, key drivers of VAT and PAYE revenues (URA, 2023).

These macroeconomic developments have occurred alongside persistent revenue shortfalls. Between 2019 and 2023, Uganda recorded notable gaps between targeted and

actual tax collections, complicating budget execution and contributing to rising public debt levels (URA, 2023). Although the Government has introduced several reform, including the Domestic Revenue Mobilisation Strategy and digital tax administration tools such as EFRIS, tax revenue performance remains volatile (MoFPED, 2023; URA, 2023). On the monetary side, the Bank of Uganda has pursued inflation targeting, interest rate adjustments, and foreign exchange interventions to stabilise the economy (UNECA, 2021; ATAF, 2020), yet the interaction between these policies and revenue outcomes is not fully understood (BoU, 2023).

The existing empirical literature acknowledges the link between macroeconomic conditions and fiscal outcomes but provides limited evidence specific to Uganda. Most studies focus on individual monetary variables or adopt regional approaches that mask country-specific dynamics. This study addresses this gap by examining how several monetary policy variables influence tax revenue collections in Uganda.

Guided by the IS-LM framework and insights from Keynesian and Monetarist theories, the study models tax revenue as a function of interest rates, broad money supply, and exchange rates (Friedman, 1968; Keynes, 1936). Using quarterly time-series data from 2009 to 2024 and a Vector Error Correction Model, the analysis examines both short-run dynamics and long-run relationships, taking into account Uganda's shift to an inflation-targeting framework in 2011 (NPA, 2010; MoFPED, 2023). The Study contributes to the literature on monetary–fiscal interactions and offers insights relevant to policy coordination aimed at strengthening domestic revenue mobilization with country-specific evidence. The remainder of the paper reviews the related literature, outlines the methodology, presents the empirical results, and concludes with policy recommendations and proposes areas for further inquiry.

2.0 LITERATURE REVIEW

Uganda's domestic revenue mobilization (DRM) faces persistent challenges, with the tax-to-GDP ratio remaining around 13% in FY2024/25, below the Sub-Saharan African average of 16% and the 20% benchmark for sustainable development (IMF, 2024). Low and unstable tax revenue constrains the government's capacity to finance essential sectors such as health, education, and infrastructure, while increasing reliance on external borrowing has pushed public debt to 51.4% of GDP (World Bank, 2024). This fiscal fragility underscores the importance of understanding how macroeconomic policies, particularly monetary policy, influence tax revenue performance. In response, the government has implemented reforms, including the Electronic Fiscal Receipting and Invoicing System (EFRIS), digital tax platforms, and macroeconomic interventions like interest rate adjustments and foreign exchange management (URA, 2025). Despite these measures, revenue performance remains volatile, and the influence of key monetary policy instruments on tax mobilisation has received limited empirical attention in Uganda.

The Laffer Curve illustrates the nonlinear relationship between economic activity and revenue, highlighting how factors that suppress investment or output can shrink the tax base, even without changes in statutory tax rates (Laffer, 1974). High interest rates increase borrowing costs and reduce investment, while exchange rate fluctuations affect trade competitiveness and inflation, thereby altering the real value of tax collections (Bleaney & Greenaway, 2001). The Keynesian framework emphasizes that aggregate demand shapes economic performance and, by extension, revenue collection (Keynes, 1936). Changes in liquidity and interest rates influence consumption and investment, affecting output and taxable transactions (Auerbach, 2002). Monetarist theory, in contrast, focuses on the role of money supply in controlling inflation and sustaining economic stability (Friedman, 1968). Excessive monetary expansion can erode real tax revenues, while restrictive monetary conditions suppress economic activity and shrink the tax base (Keynes, 1936; Laffer, 1974; Auerbach, 2002). Together, these frameworks suggest that monetary policy affects tax revenue through multiple, interacting channels involving output, prices, investment, and trade (Keynes, 1936; Laffer, 1974).

Empirical evidence demonstrates the significance of exchange rate dynamics. Exchange rate volatility tends to undermine tax revenue by creating uncertainty that discourages investment and trade. Studies across African countries show that stable exchange rates support predictable revenue flows (Aduhene & Osei-Assibey, 2021). Country-specific evidence from Kenya also highlights a negative relationship between exchange rate fluctuations and tax revenue (Rutto, 2020). In Uganda, depreciation initially increased customs revenue by raising the domestic value of imports (Niringiye, 2020), but over time, inflation eroded household purchasing power (BoU, 2022), reducing VAT and PAYE collections (Kusi, 2020). These notions underscore the importance of exchange rate stability in sustaining revenue mobilisation.

Broad money supply (M2) is another critical determinant. M2 represents liquidity available for consumption and investment, and its expansion is generally associated with higher taxable transactions (BoU, 2022; MoFPED, 2025). Studies like Mugisha & Njoroge (2021) find a positive long-run relationship between M2 and indirect tax revenue in Uganda, particularly VAT and excise duties. Cross-country studies support this link, indicating that increases in M2 relative to GDP enhance revenue, especially in countries with formal financial systems (Khan, 2023). However, excessive liquidity can trigger inflation, which erodes the real value of revenues (Brown & Ahmed, 2022). Evidence from East African economies shows that M2 expansion improves tax revenue in the short run but requires fiscal and inflation

management to sustain long-term gains (Alemu & Abebe, 2021). In Uganda, M2 growth slowed from 13.2% in 2021 to 6.1% in 2023, constraining consumption and trade transactions that underpin VAT and trade taxes (BoU, 2023).

Interest rates further influence revenue mobilisation. High policy rates raise borrowing costs, discouraging investment and consumption, and shrinking the tax base. Mugisha & Njoroge (2021) demonstrate that increases in Uganda's Central Bank Rate (CBR) reduce GDP growth, VAT and corporate tax collections. Cross-country evidence similarly highlights an inverse relationship between interest rates and revenue, though moderate rates can support tax mobilisation by enabling affordable credit access (Brown & Ahmed, 2022). However, prolonged low rates may fuel inflation, indirectly undermining real revenue (Williams & Zhou, 2021). In Uganda, tightening monetary policy from a 6.5% to 10% CBR between 2022 and 2023 curtailed credit growth and business expansion, illustrating the delicate balance policymakers must strike between inflation control and revenue generation (BoU, 2023; World Bank, 2024).

Despite the insights these studies provide, significant gaps remain. Most research examines monetary variables in isolation or through regional panels, overlooking their combined effects and transmission mechanisms. Empirical studies for Uganda are limited and often fail to integrate exchange rates, money supply, and interest rates within unified theoretical frameworks such as the Laffer Curve, Keynesian taxation theory, or monetarist perspectives. Few studies explore institutional coordination between the Bank of Uganda, the Ministry of Finance, Planning, and Economic Development, and Uganda Revenue Authority, despite its importance for fiscal-monetary alignment. Furthermore, emerging dimensions such as digital finance, informality, and equity considerations remain largely unexplored. These gaps constrain the relevance of existing evidence for policy design in Uganda's rapidly evolving economic environment. This study, therefore, addresses these limitations. By integrating theoretical insights with a longitudinal, time-series approach, it contributes to understanding how monetary policy influences revenue mobilisation through multiple channels. The analysis informs both academic debates and practical policy coordination, providing evidence to guide fiscal and monetary strategies that enhance revenue collection, support economic stability, and reduce reliance on external borrowing.

3.0 RESEARCH METHODOLOGY

3.1 Research Design and Approach

The Study adopts a longitudinal time-series design, employing a quantitative approach to examine the relationship between monetary policy variables and tax revenue collection over time (Gujarati & Porter, 2009). This design is appropriate as it enables the identification of trends, patterns, and potential causal links, which are critical for understanding the relationship (Gujarati & Porter, 2009). The quantitative approach ensures objective measurement of the effects of monetary policy variables and supports replicable, statistically rigorous inference (Gujarati & Porter, 2009).

3.2 Data Sources

Secondary quarterly data from 2009 to 2024 were used to capture long-term dynamics and seasonal effects. Tax revenue data were obtained from the Uganda Revenue Authority (URA, 2025), while monetary variables (exchange rates, broad money supply (M2), and interest rates) were sourced from the Bank of Uganda (BoU, 2023). Data were subjected to cleaning, log transformation, and normalization to improve statistical robustness (Kennedy, 2008).

3.3 Operationalization of Variables

Table 1: Operationalization and Measurement of Study Variables

Variable & Notation	Definition	Unit of Measurement	Data Source
Tax Revenue Collection (tr)	Total tax revenue collected by the government, including direct and indirect taxes (URA, 2025).	Percentage of GDP	Uganda Revenue Authority
Exchange Rate	It is calculated as an annual average based on monthly averages (local currency units relative to the U.S. dollar) (BoU, 2023).	LCU per US$	Bank of Uganda
M2 Money Supply	Includes currency, checking, savings, and time deposits (BoU, 2023).	% of GDP or UGX Billion	Bank of Uganda
Interest Rates	The lending interest rate, adjusted for inflation, affects borrowing costs and investment decisions (BoU, 2022).	Percentage	Bank of Uganda

Source: Compiled by the Author

3.4 Model Specification

In line with the objectives of this study, which seeks to investigate the effect of exchange rate, M2 money supply, and interest rates on tax revenue collection in Uganda, the model was specified to capture the relationship between these key monetary policy variables and tax revenue performance.

Drawing on empirical studies such as Ofori et al. (2018) on exchange rate volatility and tax revenue in Ghana, Rutto (2020) on exchange rates and tax revenue in Kenya, and Adusei &d Osei-Assibey (2021) on monetary factors influencing tax collections, the functional relationship was expressed as:

$$tr_t = f(e_t, M2_t, r_t) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (a)$$

Where: tr_t denotes tax revenue collection, e represents the exchange rate, M2 is the broad money supply, and r is the interest rate. To empirically estimate this relationship, the study adopted a linear log-log model of the form:

$$Intr_t = \beta_0 + \beta_1 Ine_t + \beta_2 InM2_t + \beta_3 Inr_t + e_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (b)$$

The log transformation ensures interpretability, comparability across variables, and statistical robustness, while guiding policy insights on the responsiveness of tax revenue to key monetary policy variables in Uganda (Gujarati & Porter, 2009).

3.5 Diagnostic Tests

Estimation began with pre-model diagnostic tests to ensure the validity of the econometric analysis. The stationarity property of the time-series variables was examined using the Augmented Dickey–Fuller (ADF) test to avoid spurious regression results (Nelson & Plosser, 1982). Variables that were non-stationary at levels were differenced until stationarity at first difference, I(1), was achieved (Said & Dickey, 1984). Multicollinearity among the explanatory variables was assessed using Variance Inflation Factors (VIF), with all values remaining below the critical threshold of 10, indicating no serious multicollinearity concerns (Kennedy, 2008). The optimal lag length for the model was selected using the Schwarz Bayesian Information Criterion (SBIC), supported by the Akaike (AIC) and Hannan–Quinn (HQIC) criteria, which jointly indicated an optimal lag length of four (4) (Kennedy, 2008). Following confirmation that all variables were integrated of order one, the Johansen cointegration procedure was applied to test for the existence of long-run equilibrium relationships using both trace and maximum eigenvalue statistics (Johansen, 1988, 1991). The presence of cointegration justified the estimation of a Vector Error Correction Model (VECM), which captures both short-run dynamics and long-run adjustments. Model adequacy was further evaluated using post-estimation diagnostic tests, including the Lagrange Multiplier test for serial correlation (Breusch, 1978), the Breusch–Pagan test for heteroscedasticity, and residual normality checks (Brooks, 2019). Robustness was assessed through alternative lag specifications, variable transformations, and heteroscedasticity-robust standard errors, while sensitivity to structural breaks in monetary policy regimes was examined to account for global and domestic shocks (Brooks, 2019; Kennedy, 2008). All estimations and diagnostics were conducted using STATA version 17, ensuring transparency and replicability of the results (Jolliffe, 2002).

3.6 Study Limitations

Potential limitations included gaps or inconsistencies in secondary data, volatility in monetary indicators, and model sensitivity to structural breaks. These were mitigated through rigorous diagnostics, robust estimators, and sensitivity analysis.

3.7 Ethical Considerations

The study relied exclusively on publicly available secondary data from reputable institutions. No human subjects were involved, minimizing privacy risks. Ethical standards of citation, integrity, and responsible reporting were strictly followed (Resnik, 2020).

4.0 RESULTS AND DISCUSSION

4.1 Descriptive analysis of the Study variables

Table 2: Descriptive analysis of the study variables

Variable	n	Mean	Std. Dev.	Min	Max
Tax Revenue Collection	64	11.26323	2.683057	5.9	16
Interest rate	64	20.87449	2.39694	17.0177	27.2411
M2 Money Supply	64	15594.39	8028.182	4615.106	31916.94
Exchange rate	64	3162.894	628.5843	1889.929	3856.621

Source: Author's compilation

The descriptive statistics in Table 2 summarise the key variables in the Study based on 64 observations for each. Tax Revenue Collection exhibits amean of 11.26323 with a standard deviation of 2.683057, indicating moderate variability around the mean, and ranges from 5.9 to 16. Interest rate has a higher mean of 20.87449 and a lower standard deviation of 2.39694, suggesting relatively stable values across observations, with a range from 17.0177 to 27.2411. Money Supply displays the highest variability, with a mean of 15594.39 and a substantial standard deviation of 8028.182, reflecting wide disparities in values, which span from 4615.106 to 31916.94. Lastly, the exchange rate has a mean of 3162.894 and a standard deviation of 628.5843, with values ranging from 1889.929 to 3856.621, indicating considerable fluctuation.

4.2 Test for Multicollinearity using the Variance Inflation Factor

Table 3: Multicollinearity test using Variance Inflation Factor

Variable	VIF
Natural Logarithm of M2 Money Supply (m2ms)	8.97
Natural Logarithm of the exchange rate	6.93
Interest rate	1.86
Mean VIF	**5.92**

Source: Author's compilation

The Variance Inflation Factor (VIF) values for all explanatory variables range between 1.86 and 8.97, with a mean VIF of 5.92. Since all VIF values are well below the common threshold of 10 (Brooks, 2019; Kennedy, 2008), this indicates that multicollinearity is not a concern in the model, ensuring the reliability of the estimated coefficients (Gujarati & Porter, 2009).

4.3 Augmented Dickey-Fuller (ADF) unit root test results for the series in levels

One of the initial steps in the regression analysis was testing the study variables for stationarity in order to establish their respective orders of integration (Brooks, 2019). Identifying the order of integration is essential for selecting an appropriate modeling framework. This study employed the Augmented Dickey-Fuller (ADF) test developed by Said & Dickey (1984), which enhances the original Dickey-Fuller procedure by incorporating lagged differences of the dependent variable to correct for autocorrelation. Optimal lag length selection criteria used in the model, including the Akaike Information Criterion (AIC), Hannan-Quinn Information Criterion (HQIC), and Schwarz Bayesian Information Criterion (SBIC), before running the ADF (Gujarati & Porter, 2009).

Table 4: Augmented Dickey-Fuller unit root test results for the series in levels

Variable	Optimal Lag length (SBIC, HQIC, AIC and FPE)	ADF statistic (*at 5% significance level*)	Probability	Order of integration
Tax Revenue Collection	4	-2.924	0.3842	Non stationary
Natural Logarithm of M2 Money Supply	4	-2.923	0.7648	Non stationary
Interest rate	1	-2.920	0.4095	Non stationary
Natural Logarithm of Exchange Rate	1	-2.920	0.5560	Non stationary

Source: Author's compilation

Table 5: Augmented Dickey-Fuller unit root test for the series in first difference

Variable	Optimal Lag length (SBIC, HQIC, AIC and FPE)	ADF statistic (*at 5% significance level*)	Probability	Order of integration
Tax Revenue Collection	4	-2.925	0.0000	I(1)
Natural Logarithm of M2 Money Supply	4	-2.924	0.0006	I(1)
Interest rate	1	-2.921	0.0001	I(1)
Natural Logarithm of Exchange Rate	1	-2.921	0.0000	I(1)

Source: Author's compilation

The ADF test results are presented in Tables 4 and 5. As shown in Table 4, all variables were found to be non-stationary in levels. After first differencing, all of them became stationary, as detailed in Table 5. Therefore, since all variables are integrated of order one 1(1) after first differencing**,** there is a need to test for cointegration, and a Johansen cointegration is more suitable in this case (Gujarati & Porter, 2009).

4.4 Optimal lag length determination

Table 6 presents the lag length selection criteria used in the model, including the Akaike Information Criterion (AIC), Hannan-Quinn Information Criterion (HQIC), and Schwarz Bayesian Information Criterion (SBIC) (Kennedy, 2008). According to the results, the study adopts the lag length of four (4) recommended by the Schwarz Bayesian Information Criterion (SBIC), which agrees with the AIC and HQIC as indicated by the asterisk sign (*) (Kennedy, 2008).

Table 6: Optimal lag length determination

Lag	AIC	HQIC	SBIC
0	3.99514	4.05049	4.13723
1	4.02949	4.09867	4.20711
2	4.05995	4.14297	4.2731
3	3.84869	3.94556	4.09737
4	3.79025*	3.90095*	4.07445*

indicates lag order selected by the criterion (each test at 5% level)

Source: Author's compilation

4.5 Johansen Test for cointegration

Results in Table 7 indicate that the ARDL bounds test produced an F-statistic of 14.176 with four (4) regressors. This value exceeds the upper bound critical values (I(1)) at all conventional significance levels: 3.847 (10%), 4.545 (5%), and 6.170 (1%). Since the F-statistic is greater than these upper bounds, we reject the null hypothesis of no cointegration. This indicates the existence of a significant long-run equilibrium relationship among the variables in the model (Brooks, 2019).

Table 7: Johansen test for cointegration

Maximum rank	Eigenvalue	Trace statistic
0	-	73.7514
1	0.51445	31.8484
2	0.34482	7.3237*
3	0.06979	3.1279
4	0.05250	

Source: Author's compilation. * selected rank

As indicated in Table 7, the trace statistic indicates an asterisk sign (*) on rank 2. In this case, we reject Ho and conclude that there is cointegration in the model (Said & Dickey, 1984).

4.6 Regression estimates for study objectives

Based on the unit root test results, (1(1)) for all variables after differencing and cointegrating relationships in the empirical model, this study utilised the Vector Error Correction Model (VECM) model.

Table 8: The VECM regression estimates (Long run)

Total Revenue Collection	Coef.	P-value	Sig
Log(M2 Money Supply)	0.211	0.007	***
Interest rate	-0.005	0.601	*
Log(Exchange rate)	0.315	0.019	**

Source: Author's compilation *** *p<.01,* ** *p<.05,* * *p<.1*

The VECM results in Table 8 reveal that M2 money supply has a positive and statistically significant effect on tax revenue (coefficient = 0.211, P = 0.007), suggesting that increased liquidity in the economy enhances taxable economic activity, therefore increasing tax revenue collections. Similarly, exchange rate depreciation significantly boosts tax collections (coefficient = 0.315, P = 0.019). However, while interest rates exhibit a negative coefficient (-0.005), aligning with theoretical expectations that higher rates suppress economic activity and tax revenue, notably, the effect is statistically insignificant (P = 0.601).

Table 9: The VECM regression estimates (Short Run)

Total Revenue Collection	Coef.	P-value	Sig	
Log(M2 Money Supply)	0.089	0.045	**	
Interest rate	-0.012	0.134		
Log(Exchange rate)	0.187	0.041	**	
ECT(-1)	**-0.452**	0.128	0.001	***

Source: Author's compilation

The short-run VECM results reveal the immediate drivers of changes in Total Revenue Collection, with the statistical significance of each variable clearly determined by its P-value. The analysis shows that the Log of M2 Money Supply has a statistically significant positive effect, with a coefficient of 0.089 and a P-value of 0.045, indicating that a 1% increase in the money supply leads to a 0.089% rise in revenue growth in the short term. Similarly, the Log of the Exchange Rate also exerts a significant positive influence, with a larger coefficient of 0.187 and a P-value of 0.041, meaning a 1% currency depreciation is associated with a 0.187% increase in revenue growth. In contrast, Interest Rate, with a coefficient of -0.012 and an insignificant P-value of 0.134, demonstrates no statistically meaningful short-run relationship with revenue collection. Therefore, in the short run, expansionary monetary conditions through increased money supply and a weaker currency are key to boosting revenue, while interest rate changes are an ineffective policy tool for this objective (Friedman, 1968).

The highly significant ECT (-1) coefficient of -0.452 reveals a powerful self-correcting mechanism in the revenue collection system, indicating that approximately 45.2% of any deviation from the long-run equilibrium is corrected within a single period. This statistically significant negative relationship (P-value = 0.001) confirms that when revenue collection is above its sustainable long-run level, it will decrease in the subsequent period to restore balance, and conversely, when below equilibrium, it will increase. The error correction term (-0.452, P = 0.001) indicates that when total revenue collection deviates from its long-run equilibrium, about 45% of the deviation is corrected in the following period. This significant negative coefficient confirms that total revenue collection adjusts towards its long-run equilibrium whenever short-term shocks occur. This robust error correction process demonstrates that shocks to revenue are temporary rather than permanent, as the system consistently and rapidly reverts to its fundamental equilibrium path.

4.8 Post Diagnostic Tests

4.8.1 Test for Heteroscedasticity using Breusch-Pagan Test

As indicated in Table 10, the Chi-squared test statistic of 0.03 with one (1) degree of freedom yielded a P-value of 0.5371, indicating that the null hypothesis of constant variance cannot be rejected (Breusch, 1978). This suggests that there is no evidence of heteroscedasticity in the model. Therefore, the assumption of constant variance in the error terms holds (Breusch, 1978), supporting the reliability of the regression results as indicated in Table 9.

Table 10: Breusch–Pagan test for heteroscedasticity

Chi2(1)	P-value
0.03	0.5371

Source: Author Compilation

4.8.2 Test for Autocorrelation using the Lagrange-Multiplier

As highlighted in Table 11, the Lagrange multiplier test shows that the P-values for both lag 1 and 2 are greater than the conventional significance level of 0.05%, indicating no evidence of autocorrelation in the regression residuals (Breusch, 1978; Brooks, 2019; Kennedy, 2008), and thus supporting the reliability of the regression results as indicated in Table 9.

Table 11: Lagrange-Multiplier test for autocorrelation

Lag	Prob > chi2
1	0.44394
2	0.10608

Source: Author Compilation

4.8.3 Normality Test for Residuals

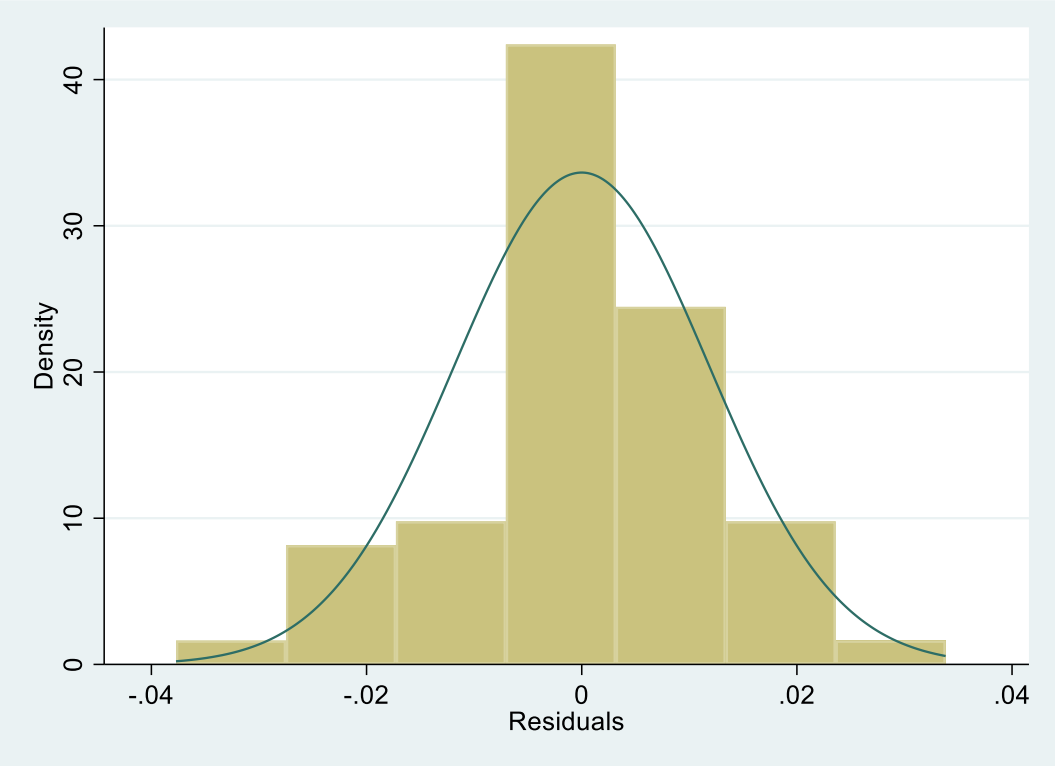

Figure 1: Normality Test for Residuals

The histogram reveals an approximately symmetric, bell-shaped distribution that closely follows the theoretical normal curve, suggesting no severe deviations from normality (Gujarati & Porter, 2009). The results suggest that the model residuals satisfy the normality assumption, which is crucial for the validity of our hypothesis tests and confidence intervals (Gujarati & Porter, 2009). This finding is particularly important for our policy inferences, as it indicates that our statistical conclusions about the relationships between monetary policy variables and tax revenue performance are not compromised by non-normal error distributions (Kennedy, 2008).

4.9 Discussion of Findings

The findings of this study align with Keynesian theory, which posits that monetary policy variables influence economic activity and, consequently, tax revenue. The positive and significant effect of M2 money supply supports the Keynesian transmission mechanism; an increase in money supply enhances liquidity in the economy, leading to higher aggregate demand, increased consumption, and expansion in business activity (Keynes, 1936; Tanzi, 1992). This stimulates production, trade, and investment, which broadens the tax base and boosts collections from consumption taxes (MoFPED, 2025; Tanzi, 1992). In Uganda, growth in money supply, often driven by accommodative monetary policy and expansion in credit to the private sector, has been associated with increased spending power and business turnover (BoU, 2022). This, in turn, positively influences tax revenue performance as economic agents engage more in taxable transactions. Therefore, money supply serves as a key macroeconomic driver that supports revenue mobilization through its impact on economic activity and the tax base (BoU, 2023). This finding is consistent with Mugisha & Njoroge (2021), who found that M2 growth enhances VAT and excise collections in Uganda, as well as Khan (2023), who reported similar effects across Sub-Saharan Africa. However, in an inflation-targeting regime, such expansion must be carefully calibrated to avoid fueling inflation, the World Bank (2024) warns that excessive M2 expansion risks inflation, which could erode real tax revenues, a concern echoed in Brown & Ahmed (2022).

The positive and significant impact of exchange rate depreciation, aligning with short-term gains in trade-related taxes under Inflation Targeting Monetary Policy, corroborates Niringiye (2020) observation that a weaker Ugandan shilling initially boosts trade taxes by increasing the local currency value of imports. However, as Adusei & Osei-Assibey (2021) noted, prolonged depreciation may later hurt VAT and PAYE collections due to inflationary pressures contradicting the inflation targeting objective, a dynamic reflected in the Bank of Uganda's (2022) post-COVID-19 analysis. The effect of the exchange rate on tax revenue operates through several transmission channels. Exchange rate movements influence the prices of imports and exports, which directly affect trade tax collections (Agbeyegbe, Stotsky, & WoldeMariam, 2006). A depreciation of the domestic currency tends to make imports more expensive, which may reduce import volumes but increase the domestic

currency value of import-based taxes (Adam, Bevan, & Chambas, 2001). Conversely, an appreciation of the currency makes imports cheaper, potentially boosting import volumes and associated tax revenues (Baunsgaard & Keen, 2010).

While interest rates showed a statistically insignificant effect, the negative coefficient aligns with theory and empirical studies such as Mugisha & Njoroge (2021), who found that higher rates reduce investment and VAT revenue in Uganda. The lack of significance may stem from Uganda's underdeveloped financial sector as per Khan (2023) or the informal economy's insulation from monetary policy (Williams & Zhou, 2021). Nevertheless, the direction of the relationship warrants caution, as aggressive tightening, like Uganda's 2023 rate hikes (BoU, 2023), could eventually constrain tax revenue by stifling private sector growth.

5.0 CONCLUSION AND SUMMARY OF FINDINGS

Findings demonstrate that M2 money supply has a statistically significant positive effect on tax revenue collections in Uganda. However, as noted, excessive money supply growth risks inflation, which could eventually erode real tax collections (Keen & Mansour, 2010). The study also confirms that exchange rate depreciation has a significant positive impact on tax revenue. A weaker shilling initially boosts import-based taxes by increasing the local currency value of traded goods. However, prolonged depreciation may lead to inflationary pressures, which could later suppress consumption-based taxes like VAT, as observed by Adusei & Osei-Assibey (2021). This underscores the need for exchange rate stability to ensure sustainable revenue growth, particularly in an import-dependent economy like Uganda. The study also found that interest rates have a statistically insignificant but theoretically consistent negative relationship with tax revenue. While the coefficient was small and not robust, the direction aligns with Mugisha & Njoroge's (2021) argument that higher interest rates constrain private sector investment and consumption, reducing taxable economic activity. Nevertheless, the negative sign suggests that aggressive monetary tightening could still pose risks to revenue collection, reinforcing the need for cautious interest rate adjustments.

5.1 Policy Recommendations

The findings indicate that Uganda's existing monetary and fiscal policy frameworks remain appropriate but require stronger coordination and clearer alignment with domestic revenue objectives to enhance effectiveness.

In the short run, exchange rate movements significantly influence revenue performance. Moderate depreciation supports tax collections, particularly through trade-related channels. Policymakers should therefore avoid sustained exchange rate overvaluation and focus on limiting excessive volatility to stabilize revenues during fiscal stress.

Money supply management also matters in the short term. Abrupt monetary tightening can undermine economic activity and revenue flows. The Bank of Uganda should pursue a predictable and stable liquidity path consistent with inflation control to reduce short-run revenue volatility.

Interest rate changes show no significant short-run effect on revenue, suggesting that fiscal projections should not be closely linked to interest rate decisions. Monetary policy should remain focused on price and financial stability.

In the long run, revenue growth depends on expanding the formal tax base. Coordinated and controlled monetary expansion can support private sector growth, especially among SMEs, improving VAT, PAYE, and corporate tax collections without raising tax rates. Exchange rate flexibility that supports export competitiveness and import substitution further strengthens the tax base. Interest rate policy should remain cautious and growth-supportive, complemented by targeted financing mechanisms to sustain investment and employment.

5.2 Areas for Further Inquiry

Building upon the findings of this study, several avenues for further research emerge; firstly, future studies can conduct a comparative analysis with other East African Community (EAC) nations, which would help determine if the identified relationships are unique to Uganda or part of a broader regional pattern. Additionally, disaggregating total tax revenue to investigate the distinct effects of M2, interest rates, and exchange rates on specific tax heads like VAT, income tax, and trade taxes would enable more targeted and effective fiscal and monetary policy formulation. Future studies could also explore the role of structural factors such as financial sector development and institutional quality.

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