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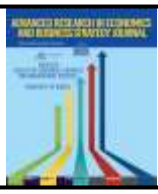

Does Monetary Policy Matter for Economic Growth in Tanzania? A Critical Analysis

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ABSTRACT

This paper examines monetary policy's influence on Tanzania's economic growth by utilizing the Autoregressive Distributed Lag model (ARDL). Analysing yearly time series data from 1970 to 2022, the study offers empirical insights into whether monetary policy impacts economic growth in Tanzania. The empirical findings indicate that in the long run, there is a negative relationship between the growth of monetary aggregates (base money M0 and broad/near money M2) and economic growth. There is also a positive relationship between the expansion of the broader money supply (M3) and the growth of the economy in Tanzania. However, in the short run, the paper discovers a positive relationship between base money (M0) and economic growth and a negative relationship between discount window rate and economic growth. The paper recommends re-assessment of the existing monetary policy frameworks in light of the observed negative relationship, continuing backing for a conducive monetary policy environment to facilitate the positive connection between broader money supply (M3) and economic growth, and considering adjusting the discount window rate to bolster short-time economic growth as well as lowering the discount window rate since it has the potential for incentivizing borrowing and investment thereby stimulating economic activities in the short run.

Keywords: Economic Growth, Monetary Policy, Monetary Aggregates, Discount Rate, ARDL

JEL Codes: E31, O40

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1. INTRODUCTION

Traditionally, it is believed that economic growth is propelled by a diverse set of factors, primarily including the accumulation of capital, increased labor participation rate into the economy, advancement of knowledge, and technological progress (Mankiw and Taylor, 2007; Levine and Renelt 19992; Barro and Sal-i-Martin, 1995; Anyanwu, 2014). Nevertheless, it is also thought that the primary factors can be influenced by various other factors, with the policy environment being one of them (Smith, 2004). Economic growth is primarily attributed to the natural shocks associated with technological progress, which cannot be adequately counteracted by monetary policy (Lucas, 2003). The claim is substantiated by empirical evidence indicating that in the long term, monetary policy plays a vital role in stimulating the growth of the economy (Arestis, 2007; Fontana and Palacio-Vera, 2007; Asongu, 2014). In the realm of literature, the applicability of theoretical and empirical viewpoints concerning the influence of monetary policy and its tools in fostering economic growth varies across contexts. They consistently demonstrate variations and inconsistency, remaining inconclusive to a large extent (White, 2013; Amarasekara, 2009; Balogun, 2009). This has drawn the interest of scholars from around the world to investigate the relationship that exists in this particular economic matter.

Monetary policy refers to the actions and strategies employed by a country's central bank or monetary authority to control and manage the money supply, interest rates, and overall financial conditions to achieve specific economic objectives. The primary objectives of monetary policy typically include price stability, full employment, and, in some cases, sustainable economic growth.

In the framework of the United Republic of Tanzania, monetary policy encompasses the measures and choices implemented by the Bank of Tanzania (BoT) to synchronize the money supply within the economy with the growth and pricing goals set by the government. The Monetary Policy Committee (MPC) is responsible for deciding the trajectory for monetary policy every two months, aligning with the objective delineated in the monetary policy statement. The monetary policy framework of Tanzania's central bank primarily emphasizes maintaining domestic price stability while targeting the growth rate of the money supply. The Bank of Tanzania manages and targets the growth rate of extended broad money supply (M3) as a critical component to control inflation. It is believed to have the closest relationship with the inflation rate and is utilized as an intermediate target variable. The extended broad money supply (M3) primarily comprises currency in circulation outside the banking system and deposits of residents with banks, including foreign currency deposits, among other components.

Furthermore, in order for the Bank of Tanzania to exert influence on the growth rate of the broad money supply (M3), it typically manages the expansion of reserve money, also known as the base money or high-powered money (M0). This management is closely tied to the money supply through the money multiplier concept. The Bank of Tanzania employs various market-based instruments to execute monetary policy, including open market operations involving buying and selling debt securities and transactions in the interbank foreign exchange market. Other instruments encompass repurchase agreements (repos), reverse repurchase agreements (reverse repo), the statutory minimum reserve requirement ratio (SMR), discount rate, standby credit facilities, intraday, and Lombard loan facilities. Like numerous other countries in Sub-Saharan Africa, the United Republic of Tanzania has undergone a prolonged period of low inflation and robust economic growth since the mid-1990s. The achievement of this economic success, which starkly contrasts with the stagnation of the preceding decades, is frequently and likely attributed to a prudent monetary policy to maintain stable inflation (Alexianu, 2020)

At the continental level, monetary policy in Sub-Saharan Africa (SSA) has undergone significant evolution since the early post-independence era. Many central banks, including the Bank of Tanzania, have evolved from primary tools for government financing to becoming more independent, transparent, and future-oriented institutions. Equally speaking, Tanzania's monetary landscape has experienced a transformation over the years, shifting from an early era characterized by strong fiscal dominance and restricted capital markets to a period of liberalization and fiscal discipline. The transition was spearheaded by the International Monetary Fund (IMF) adjustment programs initiated in the mid-1990s. The concept that monetary policy enhances economic growth by maintaining price stability has garnered increasing theoretical and empirical agreement, particularly in the short-run period (Mester, 2015; Fontana and Palacio-Vera, 2007)

Conversely, ineffective monetary policy linked to elevated and erratic inflation tends to disrupt the distribution of productive resources, ultimately impeding long-term economic growth. (Hossain, 2014; Barro, 1997; Nyorekwa and Othiambo, 2018). Nevertheless, noteworthy empirical studies have observed that monetary policy measures aimed at maintaining steady and stable inflation often dampen economic growth, giving rise to the phenomenon known as a sacrifice ratio. (Mankiw, 2010; Dornbusch, Fischer and Startz, 2012).

It is crucial to emphasize that uncertainty regarding the impact of monetary policy on economic growth, especially in developing countries, persists and should be noticed (Berg, Charry, Portillo, and Vlcek, 2013). Against this background, this paper aims to empirically explore the extent to which monetary policy can impact economic growth in Tanzania. The paper utilizes two monetary policy variables: money supply, which is in line with Monetarist theory, and interest rate, which is based on Keynesian theory. Additionally, the paper incorporates inflation as a variable in the growth equation to account for the indirect influence of monetary policy on economic growth through maintaining price stability.

2. EMPIRICAL LITERATURE

Considerable empirical research has been conducted to examine the impact of monetary policy on economic growth; however, consensus on its timing still needs to be reached. Several studies have affirmed either limited effects or discernible impact of monetary policy on economic growth. Onyeiwu (2012) assessed the influence of monetary policy on Nigeria’s economy using the Ordinary Least Square (OLS) method. His findings indicated that monetary policy, as represented by money supply, demonstrated a positive and significant relationship with the Gross Domestic Product (GDP) growth rate and the Balance of Payment (BoP). However, the money supply proved to have a significant negative relationship with the inflation rate. This discovery suggests that Nigeria's monetary policy is adept at managing economic liquidity and influencing key macroeconomic variables like national output, employment, and prices.

Furthermore, a study conducted by Adefeso and Mobolaji (2010) investigated the relationship between fiscal-monetary policy and economic growth in central banks. They employed the Johansen Maximum Likelihood Cointegration procedure and revealed that government expenditures and the broad money supply (M2) exhibited a statistically significant long-term relationship with economic growth.

Similarly, Adejare (2014) examined the influence of monetary policy on industrial growth within the West African economy through multiple regression analysis. The study revealed that the proxy variables representing monetary policy significantly impacted industrial growth. Meanwhile, Chaudhry et al. (2012) explored the dynamics of monetary policy, economic growth, and inflation in Pakistan using the cointegration technique and Error Correction Model (ECM). Their findings indicated that the short-run impact of the call money variable was significant, but it displayed positive significance in the long run. Simultaneously, Mugume (2011) utilized a non-recursive Vector Autoregressive model featuring five different variables to assess the monetary transmission mechanism in Uganda. Broad money and the three-month Treasury Bills (T-Bills) representing the lending rate were employed as proxies for monetary policy. Findings indicated that an interest rate shock (91-day T-bill rate) was recognized as a monetary shock, resulting in a contractionary monetary policy that decreased economic growth for up to two quarters. Notably, innovations in broad money (M2) did not display a statistically significant impact.

Further empirical backing is provided by Moursi and El Mossallamy (2010), who examined monetary policy in Egypt and its repercussions on inflation and economic growth. They used the Bayesian methodology to conduct estimations with a dynamic stochastic general equilibrium (SDGE) model tailored for a small closed economy. Their findings revealed that adverse shocks in monetary policy had a more pronounced statistically significant impact on economic growth than on inflation. In a parallel study Berg et al. (2013) took a Romer and narrative approach to analyse the contractionary monetary policy implemented by four members of the East African Community (EAC) – Kenya, Tanzania, Uganda and Rwanda in 2011. Their findings highlighted that monetary policy transmission to output was more pronounced in Kenya and Uganda, where more forward-looking monetary policy frameworks were in place. However, in the case of Tanzania, the limited existing literature did not confirm any significant role of monetary policy in stimulating economic growth.

Our empirical investigation and findings indicate that the relationship between monetary policy and economic growth yields mixed results, with some studies proving inconclusive results. Furthermore, there remains to be more clarity regarding the short-term and long-term dynamics; notably, some studies have identified a positive long-term correlation between monetary policy and economic growth, while other studies have presented a contesting result.

3. METHODOLOGY AND MODELLING

3.1. Model Specification

To depict the connection between monetary policy and economic growth in Tanzania, we employed the Autoregressive Distributed Lag model (ARDL). This model is a linear time series representation where the relationship between the dependent and independent variables extends contemporaneously and historical or lagged values. Notably, the ARDL model exhibits flexibility in accommodating variables with varying orders of integration. This adaptability is particularly advantageous when analysing time series data as certain variables may possess integration of order one (I (1)), while others may have integration orders of zero (I (0)). The model is outlined as follows;

If $_{it}$ is the dependent variable, and $x_1, \ldots, x_2$ are k explanatory variables, a general ARDL $(p, q_{1\ldots,} q_k)$ is given by:

$$y_t = a_0 + a_1 t + \sum_{i=1}^{p} \psi_i \, y_{t-1} + \sum_{j=1}^{k} \sum_{l_j}^{qj} \beta_j x_{j,t-l_j} + \epsilon_t \ldots 1$$

Where ϵ_t are the usual innovations, a_0 is a constant term, and a_1, ψ_i , and β_j, l_j are respective coefficients. Alternatively, by letting L denote the usual lag operator and define $\psi(L)$ and $\beta_j(L)$ as lag polynomials;

$$\psi(L) = 1 - \sum_{i=1}^{p} \psi_i \, L^i$$

and

$$\beta_j(L) = \sum_{l_{j=0}}^{qj} \beta_{j,l_j} L^{l_j}$$

Then, equation (1) above can also be written as:

$$\psi(L) y_t = a_0 + a_1 t + \sum_{i=1}^{k} \beta_j(L) x_{j,t} + \epsilon_t$$

4. VARIABLES DEFINITION AND MEASUREMENT.

Table 1. Variable Definition and Measurement

Variable	Description	Scale of Measurement	Type of Variable
$gdpg$	Growth rate of domestic product	Ratio Scale	Dependent variable
$m0g$	The growth rate of base money	Ratio Scale	Independent variable
$m2g$	The growth rate of broad/near money	Ratio Scale	Independent variable
$m3g$	The growth rate of broader money	Ratio Scale	Independent variable
$discr$	The growth rate of the discount window rate	Ratio Scale	Independent variable
$open$	Trade openness index	Ratio Scale	Independent variable

5. RESULTS AND DISCUSSION

5.1. Descriptive Analysis Overview

Table 2. Descriptive Statistics Output

Variable	Obs	Mean	Std. Dev.	Min	Max
$years$	53	1996	15.443	1970	2022
$gdpg$	53	4.408	2.33	-2.4	7.7
$m0g$	42	24.293	74.868	-100	473.169
$m2g$	52	20.743	11.633	-10.6	51.3
$m3g$	53	21.109	12.318	-9.6	54.9
$discr$	53	12.758	11.1	3.7	65.9
$open$	53	15.856	5.339	5.366	28.321

Source: STATA results, 2024.

A comprehensive overview of descriptive statistics is presented in Table 2, encompassing data spanning the period from 1970 to 2021 comprising 53 observations; however, one variable, namely base money, had forty-two (42) observations while another variable, namely growth rate of broad/near money, had fifty-two observations. The gross domestic product growth rate showcases notable variability, ranging from minus 2.4 to 7.7, with a minimum variation of 2.33 but with an overall mean value of 4.408. Analysing the growth rates of money supply aggregates (including base money, broad/near money, and extended money supply) over the entire period unveils a varied spectrum. The growth rate of base money ranges from a minimum of -100 to 473.169, while the growth rate of broad/near money ranges from minus 10.6 to 51.3, and for broader money aggregates, it ranges from minus 9.6 to 54.9, respectively. The monetary aggregates showed a deviation from the mean of around and between 21.109 and 24.293.

Furthermore, an essential component in the monetary policy used in this analysis was the discount window rate of interest, which ranges from 3.7 to 65.9 with a deviation from a mean of 11.1 and a mean value of 12.75. lastly, a control variable, trade openness, showed a minimum value of 5.366 and a maximum value of 28.321 with a minimum deviation from a mean of 5.339 and a mean of 15.856. These descriptive statistics are vital in this analysis because they serve as the cornerstone for understanding and communicating essential characteristics of our dataset. It also allowed us to grasp the fundamental features of the information at a glance.

5.2. Lag Order Determination.

In our analysis, lag order determination is crucial in time series analysis, particularly when employing autoregressive models such as our ARDL model. The choice of lag order significantly impacts the accuracy of the model's predictions. The goal of lag order determination is to balance capturing the relevant information in the data while avoiding overfitting (Wooldridge, Wadud, and Lye 2016). One common approach is to use diagnostic tools and statistical criteria such as the Akaike Information Criteria (AIC). Table 3 provides information on lag order determination, where the Akaike Information Criteria showed that lag zero (0) was selected as our optimal lag. Note also that in this process, the p-value has been dropped. However, this action has no effect as in the context of model selection by using AIC, the p-value itself is not directly involved; instead, we are comparing models based on their AIC values, and hence, the model with the lowest AIC is considered the most optimal in this context.

Table 3. Lag Order Determination

lag	LL	LR	df	p	AIC
0	-484.038				58.3574*
1	-	-	144	-	-
2	-	-	144	-	-
3	-	-	144	-	-
4	-	-	144	-	-

Source: STATA results, 2024.

5.3. Unit Test

In this particular examination, the unit root test was pivotal in assessing whether a particular time series maintained a consistent statistical property over time. A time series is considered stationary when its statistical characteristics, such as mean, variance, and autocorrelation, remain constant. As the stationary test is essential for meaningful analysis of trends and seasonality, we conducted the Augmented Dickey-Fuller (ADF) test. This step was crucial as distinguishing between underlying patterns in the data and short-term fluctuations proved challenging without subjecting our data to stationary tests. The process of a unit root test involved subjecting the series of our observations to a unit root test to assess the state of stationarity of each variable.

Our examination utilized different lag orders to ascertain the integration order. Additionally, the Augmented Dickey-Fuller test was applied for the unit root test, and the findings are presented in Table 4. The null hypothesis posited that the series of variables used in the model possessed a unit root, while the alternative hypothesis indicated stationarity. However, upon scrutinizing the p-values from the unit root test, we failed to reject the null hypothesis of a unit root for only one variable: trade openness, indicating that it was nonstationary at the level. However, since the p-values are less than the chosen significance level for the remaining five variables, we reject the null hypothesis, suggesting that the time series are considered stationary.

Table 4. Unit Root Test

Var.	Obs.	lag	test-stat	ADF Critical Value			p-value
				1%	5%	10%	
$gdpg$	52	0	-3.713	-3.577	-2.928	-2.599	0.0039
$m0g$	41	0	-7.299	-3.641	-2.955	-2.611	0.0000
$m2g$	51	0	-4.117	-3.579	-2.929	-2.600	0.0009
$m3g$	52	0	-4.109	-3.577	-2.928	-2.599	0.0009
$discr$	52	0	-2.752	-3.577	-2.928	-2.599	0.0655
$open$	52	0	-1.391	-3.577	-2.928	-2.599	0.5864

Source: STATA results, 2024.

5.4. Determining Lag Order Through First Order Differencing.

Determining lag order through first-order differencing involves assessing a time series by computing the difference between consecutive observations. The process is commonly known as first differencing or differencing at lag 1. The aim is to transform a unit root time series into a stationary one by removing trend or seasonality. In the previous section of this paper, it was demonstrated that one variable *(open)* did not meet the stationarity condition. Adhering to a general guideline, we perform optimal lag order in the present section through first differencing, which maintains the Akaike Information Criteria.

As outlined in Table 5, the first differenced optimal lag determination with Akaike Information Criteria revealed that the variable *open* – representing the extent to which a country engages in international trade and opens its economy to foreign markets had an optimal lag of one (1). This would mean that this variable exhibits a significant improvement in stationarity or pattern representation when the difference between consecutive observations is calculated

Table 5. Lag Order Determination with First Order Differencing

lag	LL	LR	df	p	AIC
0	-104.01				4.37541
1	-101.086	5.8486*	1	0.016	4.29523*
2	-100.217	1.738	1	0.187	4.30069
3	-99.6585	1.1163	1	0.291	4.3191
4	-99.1947	.92754	1	0.336	4.34145

Source: STATA results, 2024.

5.5. Unit Root Test with Lag Order Through First Order Differencing.

The unit root test operates on the premise that detrending the series of a variable would not necessarily make it stationary. This necessitates further transformation of a series of variables to ensure stationarity conditions. Such transformation necessary to make a series stationary is typically conducted into period-to-period or season-to-season differences. This mechanism is because the statistics of the change in the series between periods or between seasons makes the series stationary (constant) – and this process is technically known as difference stationary. In our previous test for stationarity, we observed that the variable *open* did not become stationary. This section changed the nonstationary variable once to eliminate the unit root bias. It is important to remember that the presence of a unit root in a series of a variable would result in spurious regression results, misleading inferences, violation of assumptions, and unrealistic forecasting.

Table 6 provides a unit root test with the lag order of a variable differenced once. The results indicate that the variable *"open"* has achieved stationarity at a 5% level of significance, leading to the rejection of the null hypothesis of the presence of a unit root.

Table 6. Unit Root Test with Lag Order Through First Order Differencing.

Var.	Obs.	lag	test-stat	ADF Critical Value			p-value
				1%	5%	10%	
$open$	47	4	-3.194	-3.600	-2.938	-2.604	0.0203

Source: STATA results, 2024.

5.6. Autocorrelation Test

The autocorrelation in time series is the correlation between a variable and its lagged (past) values over consecutive periods. Detecting autocorrelation in time series is crucial as autocorrelation may impact reliability, statistical inferences, and predictability. Throughout the execution of this research, we expressed concern regarding the issue of serial correlation due to the time series nature of the variables employed. We would not need our results to be biased due to bias in the variance of the estimated coefficients, which could impact the reliability of hypothesis testing. The Breusch-Godfrey test, detailed in Table 7, examined whether serial correlation is present or absent. The null hypothesis posits no serial correlation. The results suggest a lack of serial correlation, as the p-value surpasses the chosen level of statistical significance. Therefore, we lack adequate evidence to reject the null hypothesis of no serial correlation.

Table 7. The Breusch-Godfrey LM Test for Serial Correlation

Lags(p)	chi2	df	Prob>chi2
1	0.891	1	0.3453

H_0: no serial correlation

Source: STATA results, 2024.

5.7. Homoscedasticity (Constant Variance) Test

Homoscedasticity is the econometrics assumption that the variability or spread of the residuals (the differences between observed and predicted values) is constant across all levels of the independent variables. When this condition is not met, we say the series has heteroscedasticity. The presence of heteroscedasticity (unequal variance) in a series is harmful in the sense that it would result in inflated and or deflated standard errors, hence impacting the precision of the coefficient estimates and leading to wrong hypothesis testing. While conducting this research, we again opted to perform a test on heteroscedasticity by using the White heteroscedasticity test, as depicted in Table 8, with the null hypothesis that the results are homoskedasticity. We found grounds to reject the null hypothesis of equal error variance at a 5% level of significance.

Table 8. White Test for Heteroscedasticity

Source	chi2	df	P
Heteroskedasticity	37.00	36	0.4226
Skewness	8.34	14	0.8710
Kurtosis	1.36	1	0.2439
Total	46.70	51	0.6451

H_0: Homoskedasticity, H_a: Unrestricted heteroskedasticity

Source: STATA results, 2024.

5.8. ARDL Model Estimation and Discussion of Results

This paper employed the Auto Regression Distributive Lag Model (ARDL) to analyse the impact of monetary policy on the Tanzanian economy. The model used was appealing and deemed optimal, as the variables demonstrated stationarity at either level I (0) or order I (1) integration. Furthermore, the model applied captured both the short-run and long-run dynamics of monetary policy variables. The findings of the ARDL model estimation are detailed in Table 9.

Table 9. ARDL Estimation Results

D. $gdpg$	Coeff.	Std. err	t	P>|t|	[95% conf. interval]	
ADJ						
$gdpg$						
L1.	-.757025	.1982205	-3.82	0.001	-1.168109	-.3459407
LR						
$m0g$	-.0916804	.0196523	-4.67	0.000	-.1324367	-.050924
$m2g$	-.2108983	.0980175	-2.15	0.043	-.414174	-.0076225
$m3g$	.2929295	.1146225	2.56	0.018	.055217	.5306421
$discr$	.0484603	.0478385	1.01	0.322	-.0507507	.1476712
$open$	.2101492	.0504768	4.16	0.000	.1054668	.3148315
SR						
$gdpg$						
LD.	-.0942809	.1466233	-0.64	0.527	-.398359	.2097972
L2D.	-.1384865	.139449	-0.99	0.331	-.4276861	.1507131
L3D.	.2719587	.1173238	2.32	0.030	.0286441	.5152734
$m0g$						
D1.	.0597716	.0184938	3.23	0.004	.0214179	.0981253
LD.	.0436288	.0157834	2.76	0.011	.010896	.0763617
L2D.	.0264191	.0121291	2.18	0.040	.0012649	.0515733
L3D.	.0098176	.0050781	1.93	0.066	-.0007138	.020349
$discr$						
D1	-.0618306	.0342827	-1.80	0.085	-.1329285	.0092674
$\_cons$	.9106914	.9460166	0.96	0.346	-1.051227	2.87261

Source: STATA results, 2024.

The ARDL results show that in the long run, the growth rate of all the monetary aggregates used in the analysis was statistically significant and impacted economic growth in diverse ways. Notably, the growth rate of base money ($m0g$) has a negative and statistically significant effect on economic growth. In contrast, the broad/near money ($m2g$) growth rate shows a statistically significant and negative relationship with economic growth. In contrast, the broader money supply ($m3g$) growth rate shows a positive and statistically significant relationship with economic growth in the long run. Equally speaking, trade openness, which measures the extent to which a country trades with the rest of the world and enters the model as a control variable, was statistically significant and positively related to long-term economic growth. However, the variable discount rate representing the rate at which commercial banks borrow at the Bank of Tanzania was positively related to the country's economic growth, but the relationship was insignificant.

The negative relationship between base money (M0) and the economic growth rate could be attributed to the interest rate distortions. Central Banks often use the monetary base to influence interest rates. When the interest rate is kept artificially low for an extended period, it may discourage savings and distort investment decisions. In the long run, this can result in a lack of capital accumulation and hinder productive capacity growth. Equally speaking, in the long run, a negative relationship between broad money and economic growth may be influenced by inflationary pressure, whereby when the growth of broad money outpaces the growth in actual output, it can contribute to inflationary pressure. In the long run, persistent inflation erodes the purchasing power of money, reduces real incomes, and creates uncertainty in the economy. This could negatively impact economic growth by discouraging investment and savings. The results obtained between growth rate monetary aggregates, specifically the antagonistic relationship of the broad money supply and economic growth, were consistent with the finding by Ihsam and Anjun (2013) where they examined the impact of money supply (M2) on the GDP of Pakistan and found that excessive supply of money supply (M2) adversely affected the economy of Pakistan.

Furthermore, a positive and statistically significant relationship between broader money supply growth and economic growth can be explained by supporting consumption. A steady growth in the broader money supply allows for the availability of credit, which can support consumer spending. When consumers have access to credit, they are more likely to make large purchases, such as homes or durable goods, stimulating economic activities and contributing to overall growth.

To ascertain the ARDL results, the ARDL bound test, as suggested by Pesaran, Shin, and Smith (2001), was conducted to assess the potential existence of a long-run relationship among the variables in our time series model. This specific test examines whether cointegration is present between the variables in the model. The null hypothesis is such that there is no cointegration among the variables. Looking at Table 10, the results are such that the p-values are less than the desired level for I (1) variables at a 10% level of significance. This means that there is ample evidence to reject the null hypothesis of no level relationship amongst variables suggesting the presence of a long-run relationship or cointegration.

On the other hand, the short-run results show that the monetary base ($m0g$) lagged up to three periods was statistically significant and positively related to economic growth, while the discount window rate ($discr$) was seen to have a negative significant relationship with the country's economic growth. The positive relationship between the growth of the monetary base and economic growth in the short run can be attributed to the interest rate effect whereby an expansionary monetary policy, reflected in an increased monetary base, often leads to lower interest rates. Lower interest rates encourage borrowing for investment and consumption. Additionally, a tight monetary policy may influence the reported negative and significant relationship between the discount window rate and economic growth. Since the discount window rate is the interest rate at which banks can borrow funds directly from the central bank, a high or rising discount window rate is often associated with a tight monetary policy stance. If the central bank raises the discount window rate to curb inflation or addresses financial imbalances, it can lead to higher borrowing cost for commercial banks and businesses. This, in turn, may result in reduced investment, lending, and overall economic activity contributing to negative economic growth.

Table 10. TRDL Bound Test

	10%		5%		1%		p-value	
	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)	I (0)	I (1)
F	2.473	3.893	3.021	4.657	4.374	6.529	0.005	0.036
t	-2.463	-3.772	-2.844	-4.233	-3.631	-5.186	0.007	0.093

H_0: No level relationship

Source: STATA results, 2024.

The results of a positive relationship between monetary policy aggregates, specifically base money, and economic growth, are consistent with the findings by Nouri and Samimi (2011) and Ogunmuyiwa and Ekone (2010). These researchers used the Ordinary Least Square regression methodology, respectively, they found a positive impact of money supply on economic growth in Nigeria and Iran. Similar results were gauged by Jawaid, Quadri, and Ali (2011) and Senbet (2011) for Pakistan and the United States of America. Equally speaking, the reported negative relationship between the discount window rate and economic growth in Tanzania was consistent with the study conducted by Amarasekara (2009), where he applied a recursive Vector Autoregressive Model and semi-structural VAR methodology to monthly data for Sri Lanka for the period from 1978 to 2005 and found that a positive shock on interest rate reduced economic growth. Similar findings were reported by Vinayagathasan (2013), who used a structural VAR model and monthly data for Sri Lanka covering the period 1978 to 2011.

6. CONCLUSION

The paper concludes that a negative relationship exists between the growth of monetary aggregates (base money M0 and broad/near money M2) and economic growth in Tanzania in the long run. This suggests a complex dynamic that warrants careful consideration. It is evidence that the conventional impact of monetary aggregates on fostering economic growth may be complex. This calls for a nuanced understanding of the relationship between monetary aggregates and long-term economic growth. The paper recommends re-evaluating the current monetary policy framework in light of the observed negative relationship, considering adjustment to policy objectives to better align with the long-term goals of economic growth. Additionally, the paper discovers a positive relationship between broader money supply (M3) growth and long-term economic growth, suggesting a potential avenue for leveraging monetary policy to stimulate sustained economic expansion. The paper recommends continual support to a conducive monetary policy environment that facilitates the positive relationship between broader money supply (M3) and long-term economic growth.

Again, the paper discovers a positive relationship between base money and economic growth in the short run. This suggests that adjustment to the monetary base can play a role in influencing economic expansion over the short run. The paper recommends leveraging the positive relationship between the monetary base and short-term economic growth by optimizing traditional monetary policy tools, especially by adjusting interest rates and money supply measures to maintain a supportive environment for short-term economic growth. Lastly, the findings reveal a negative relationship between discount rates and short-term economic growth. Therefore, we recommend adjusting the discount window rate to support short-term economic growth. Lowering the discount window rate may encourage borrowing and investment, stimulating short-term economic activities.

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