Original Article

Impacts of Monetary Factors on Employment Growth in Tanzania: 1990-2022

Rehema Ramadhani Mhenwa[1]*, Deus D. Ngaruko[2] & Timothy Lyanga[2]

[1] Mwalimu Nyerere Memorial Academy, P. O. Box 9193, Dar es Salaam, Tanzania

[2] The Open University of Tanzania, P. O. Box 23409, Dar es Salaam, Tanzania

* Correspondence Email: mhenwaray@gmail.com

ABSTRACT

This study analysed the impact of monetary macroeconomic factors on employment growth in Tanzania, using time series data from 1990 to 2022, sourced from the Bank of Tanzania and the World Bank. Stationarity tests, co-integration bound tests, and ARDL Error Correction Models for both long and short runs were employed. The findings indicated a positive relationship between employment growth and the inflation rate ($\beta = 0.001$, $p = 0.723$), GDP growth ($\beta = 0.023$, $p = 0.049$), and total government expenditure ($\beta = 0.003$, $p = 0.848$). Conversely, lending interest rates ($\beta = -0.008$, $p = 0.499$), total government revenue ($\beta = -0.003$, $p = 0.798$), and foreign reserves ($\beta = -0.033$, $p = 0.048$) did not demonstrate a direct impact on employment growth. Short-run results presented mixed outcomes across variables. The study concludes that maintaining price stability and reducing lending interest rates are essential for enhancing domestic investment and employment. It recommends revising government lending rate policies to support local investors and establishing an exchange rate regime to effectively manage foreign reserves, thereby ensuring foreign creditworthiness, reducing inflation, and stabilising the economy.

INTRODUCTION

The population in Tanzania is growing rapidly, resulting in an increase in the working-age demographic (Haji, 2015). The employment-to-population ratio rose from 69.9% to 76% between 1990 and 2000, attributed to a shift of economically inactive individuals into the labour force over the decade. However, this ratio experienced a decline from 79.2% in 2006 to 77.4% in 2014, with approximately 75.4% recorded in 2020/21, and a drop to 63.9% by June 2022 (URT, 2021/22). The unemployment rate was 10.5% in 2014 but decreased to 9.3% in 2020/21, and rise again to 18.9% in 2022. Consequently, increasing opportunities for decent and well-paying employment for youth has become a government priority. The government has implemented various policies and programmes aimed at fostering both the supply and demand aspects of the labour market to create sustainable employment (Haji, 2015).

Monetary factors play a crucial role in ensuring the creation of decent and well-paying jobs within the country. Since independence, the government, through the Bank of Tanzania, has adopted several roles and functions to maintain economic stability in both domestic and international contexts. Following a command economy in 1960s, the country transitioned to a free-market economy in the mid-1980s. In the early 1990s, significant transformations in financial sector development occurred to accommodate free economic policies, allowing for both local and foreign banks to operate. In 1995, the Bank of Tanzania shifted its focus from multiple obligations to a singular mandate of lowering the inflation rate and enhancing economic conditions through the maintenance of price stability. Currently, the primary obligation of monetary policy, as overseen by the Bank of Tanzania, is to ensure a price stability target of 5%

(URT, 2024). The Bank has been successful in reducing the inflation rate to single digits, with economic growth reaching 7% in 2011.Moreover, the number of banks has increased significantly from 3 to 42 since the 1990s.

Some scholars have argued for the importance of the inflation rate and lending interest rates in increasing employment. Rising price levels indicate that household income has, on average, increased, which reflects the expansion of economic activities and, in turn, increases the demand for labour (Keynes, 1936; Alemu, 2024). Similarly, Arshad and Ali (2016) pointed out that the Phillips curve contends the inverse relationship between the rate of inflation and the unemployment rate. Additionally, Micheni and Muturi (2019) argued that an increasing inflation rate implies a decreasing unemployment rate. Alternatively, high inflation may harm individuals by diminishing their purchasing power, leading to a reduction in spending on goods and services, decreased profits, and diminished production, ultimately resulting in a higher unemployment rate. Alongside the inflation rate, the lending interest rate can also affect employment growth; higher lending rates compel individuals to save more and postpone their consumption of goods and services, which discourages production and may lead to an increase in unemployment. A higher interest rate for investors translates to an increase in production costs and similar can increase savings which guarantee more investment, thereby expanding production and employment (Arshad & Ali, 2016).

In Tanzania, both inflation and interest rates have been escalating due to internal and external factors. The country imports oil and relies on agriculture as the backbone of its economy. Fluctuations in oil prices by producers and climatic changes tend to affect domestic prices. The United Republic of

Tanzania (URT, 2010) reported that real GDP grew, on average, by 6.0% from 1995 to 2010, compared to 2.3% from 1978 to 1994. Average inflation was reported at 27.6% in 1978 and 10.0% in 1994. In 2008, inflation rose to approximately 10.85 due to a domestic oil price surge, which caused food prices to rise, peaking at about 11.8% in June 2009. Correspondingly, lending rates averaged about 15.9% from 1978 to 1994, while in 2010, they decreased to about 8.7% due to reforms in the financial sector, increased competition in the banking sector, and reduced risk premiums. Overall,

lending rates averaged 15.48 % in June 2009 up from 14.76% in June 2008. In 2016/17, inflation was approximately 5.3%, compared to 6.0% in 2015. In 2021/22, an inflation rate of 4.0% was recorded, while in 2022/23, annual inflation raised to 4.6% due to increases in industrial raw material and global commodity prices. Likewise, the banking lending interest rate in 2016/17 was recorded at 16.53%, compared to 16.41% in 2021/22, while in 2022/23, it reached approximately 16.9%.

Table 1: Some Macroeconomic Indicators in Percentage

Indicator	1978-1994	1995-2010	2010	2015	2020	2023
Real GDP Growth	2.3	5.9	7.0	7.0	4.8	4.7
Overall Lending Rate	33.4	19.9	14.5	16.17	16.60	16.04
Inflation Rate	27.6	10.0	7.2	6.0	3.5	4.6

Source: Bank of Tanzania Various Annual Reports (2010 - 2023).

It has been argued that relative prices are crucial for allocating resources in any nation, as it is assumed that macroeconomic stability should aim for an increase in output and employment, provided that the market mechanism operates freely (ILO, 2015: Islam, 2018). Given both domestic and global economic constraints, Tanzania, in line with other countries, has chosen price stability as its main monetary objective. This paper aims to examine the impact of monetary factors on employment growth in Tanzania from 1990 to 2022, specifically focusing on how volatility in the inflation rate and lending interest rate affects employment growth in the country. In addition, the paper also investigates the impact of other macroeconomic variables such as GDP growth, total government revenue, total government expenditure, and foreign reserves on employment growth.

LITERATURE REVIEW

Theoretical Review

From a theoretical perspective, this paper draws on insights from Keynesian theory, wherein Professor Keynes identified effective demand as the foundation of employment theory in 1936.

According to Keynes, demand generates its own supply. He established the equilibrium of full employment using the aggregate supply and demand approach. Effective demand is defined as the income level at which total demand and total supplies are balanced; or it is the sum of all consumer and investment spending. Aggregate demand represents the overall amount of demand for goods and services in an economy over a year, whereas aggregate supply, or national income, refers to the monetary value of all goods and services produced in a nation within the same timeframe. Keynes proposed three equilibrium levels: equilibrium at full employment, equilibrium at less than full employment, and equilibrium at more than full employment.

The theory suggests that society can effectively utilise fiscal instruments, such as reducing tax rates and increasing government spending, alongside monetary instruments, including lowering bank rates, reducing reserve ratios, and purchasing government assets, to address deficient demand or enhance export activities. Similarly, Keynes asserted that to correct an inflationary gap, society could implement fiscal policies such as increasing

tax rates and decreasing government spending, as well as monetary policy measures like raising bank rates, adjusting reserve ratios, selling government securities, and promoting imports.

Empirical Review

The impact of monetary policy on employment growth, particularly in relation to inflation rates and lending interest rates, has yielded mixed and inconclusive findings. Kruskovic (2020) examined the effects of inflation and exchange rate targeting on employment and economic growth through empirical analysis based on a panel of 18 countries from 1996 to 2013. The findings suggested that nations targeting inflation experienced slower economic growth and higher unemployment rates. Micheni and Muturi (2019) investigated the impact of macroeconomic factors on unemployment in Kenya, utilising annual data from 1984 to 2018. Their study employed 35 quantitative research designs and found that exchange rates, GDP, and inflation rates were directly related to the unemployment rate, while lending rates were inversely related to unemployment in the long run.

Alemu (2024), conducted a study from 1980 to 2022 on the interplay between unemployment, inflation rate, exchange rate, and economic growth in Ethiopia. Using the Granger causality test and Vector Autoregression (VAR) analysis, the study revealed a direct relationship between currency depreciation and economic growth, while an inverse relationship was established between unemployment and both economic growth and inflation. Arshad and Ali (2016) investigated the relationships among the unemployment rate, inflation rate, and interest rate from 1974 to 2013. By employing an Autoregressive Distributed Lag (ARDL) model and a short-run Vector Error Correction model, the study revealed an indirect relationship among interest rates, inflation rates, exchange rates, political instability, and unemployment rates, while a direct relationship was observed between the unemployment rate and external debt.

Adegboye (2020) utilised a panel dataset covering three sub-periods (1991-1999, 2000-2009, and 2010-2016) across 37 countries to analyse the impact of macroeconomic policies on employment yields from output growth in Sub-Saharan Africa. Using the Feasible Generalised Least Squares (FGLS) method, the study established an inverse relationship between government spending and employment, whereas GDP and trade openness had a positive effect on employment yields. Furthermore, it was indicated that regimes targeting inflation experienced greater employment growth compared to those that did not.

Islam and Sahajalal (2019) conducted a study in Bangladesh using quantitative data spanning 29 years to assess the effects of GDP growth rate, inflation rate, real exchange rate, and unemployment rate. Data analysis using SPSS demonstrated that the GDP growth rate and inflation had a non-positive relationship with unemployment, while the exchange rate positively impacted the unemployment rate. Shiferaw (2023) studied the interactions and changes between inflation, GDP, and unemployment rates over time in Ethiopia. The study employed various methods, including the Generalised Autoregressive Score (GAS) model, the Autoregressive Distributed Lag (ARDL) model, Cross-Wavelet Transform (XWT) analysis, and the Toda-Yamamoto causality test. It was revealed that inflation, GDP, and unemployment were indirectly related to one another. Selim and Hassan (2019) investigated interest-free monetary policy and its impact on unemployment rates and inflation across approximately 32 advanced countries, employing a t-test with the misery index. They discovered that countries adopting interest-free monetary policy exhibited both inflation and unemployment rates.

Additionally, Vlad and Haysa (2020) focused on the Western Balkan countries, examining the effects of selected macroeconomic indicators on the unemployment rate from 2000 to 2017 using panel data. Their results indicated that lending interest rates had a positive effect on unemployment, while

inflation rates and GDP were negatively related. Furthermore, foreign direct investment (FDI) significantly influenced the unemployment rates in these nations. Gnahe and Huang (2020), examined the connection between monetary policy and economic growth in the West African Economic and Monetary Union (WAEMU) from 1988 to 2018. Their findings revealed that gross fixed capital formation, money supply, official exchange rates, domestic credit to the private sector, and real interest rates were directly related to economic growth. They further suggested that changes in economic activities could impact gross fixed capital formation, money supply, official exchange rates, domestic credit to the private sector, and real interest rates

Attamah et al. (2015) established that the unemployment rate was positively related to money supply, exchange rates, interest rates, and government expenditure, while government revenue had a negative relationship with the unemployment rate, indicating that increases in government revenue could lower unemployment rates in Nigeria. Some of the literature reviewed presents insufficient arguments concerning the impact of monetary factors on employment growth, as certain studies challenge the appropriate levels of inflation and interest rates required for economic growth and employment (Islam, 2018; Arshad & Ali, 2016). In light of the lack of comparable studies conducted in the Tanzanian context, this paper aims to further investigate this subject, recognising that the macroeconomic environment of a particular country varies and, therefore, findings cannot be generalised across different national contexts.

METHODOLOGY

Types, Sources and Measurement of Data

The annual time series data from 1990 to 2022 were sourced from the Bank of Tanzania and the World Bank. Employment growth, GDP growth, inflation rate, and lending interest rate were measured in percentages, while total government expenditure and total government revenue were measured in millions of Tanzanian shillings. Additionally, foreign reserves were reported in current US dollars, including gold.

Theoretical Model Specification

According to Keynes's general theory of employment, interest, and money, national income is equivalent to employment growth. The primary objective of this paper was to evaluate the impact of macroeconomic factors on employment growth. Therefore, the analysis commenced by utilising a demand model for labour and employment, as adopted from Kamar et al. (2019).

$$\ln E = f(\ln Y, \ln RW, TFP) \dots\dots\dots\dots\dots\dots\dots\dots 1$$

Where ln (RW) was the natural log of the real wage, ln (E) was the log of the employment number, ln Y was the log of economic growth as measured by gross domestic product, and TFP was total factor productivity. Phipps and Sheen (1995) argued that macroeconomic factors are what drive a country's economic growth, which in turn influenced by both fiscal and monetary factors comprising interest rate and inflation rate, total government revenue, total government expenditure and foreign reserve and determine output ln Y.

$$\ln E = f \ln(RW, FF, MF) \dots\dots\dots\dots\dots\dots\dots\dots 2$$

Where FF and MF are fiscal factor and monetary factors respectively

Model Specification

The study analysed the econometric model presented in Equation 3 alongside other macroeconomic variables, including GDP growth, inflation rate, lending interest rate, total government revenue, total government expenditure, and foreign reserves.

$$Emp = \alpha_0 + \beta_1 GDP + \beta_2 Inf + \beta_3 Int + \beta_2 \text{Re} v + \beta_3 Exp + \beta_4 Fr + \varepsilon_0 \dots\dots\dots\dots\dots 3$$

Where Emp was employment growth, α was constant, GDP growth was Gross Domestic Product, Inf was inflation rate, Int was lending interest rate, Exp was total government expenditure, Rev is total government revenue, Fr was foreign reserve, and ε_0 was stochastic term.

Time Series Data Quality Tests

Under Dickey and Fuller (1979), Onwuka (2021), Micheni and Muturi (2019), all variables in the model were tested for stationary with popular Augmented Dickey-Fuller (ADF) test for methodology adoption.

$$\Delta C_t = \alpha_0 + \alpha_1 c_{t-1} + \Delta_{t-1}\alpha_2 C_{t-1} + \varepsilon_t \dots\dots\dots 4$$

Where C_t= Presence of non-stationary (unit root) at time t, Δt_{-1}= Indicate first difference with lags, ε_i=Adjustment variable of the errors of autocorrelation and α_0, α_1, α_2 indicated the estimates. The decision was under the null hypothesis, $\alpha_2 = 0$ there is a unit root that the series is non stationary while alternative hypothesis, $\alpha_2 <$ 0 for non unit root that the series is stationary.

An ARDL bound test for co-integration was employed to examine the long-run association of the studied variables. Awan and Qasim (2020) and Alkhateeb et al. (2021) indicated that, in order to explore such relationships, the F-statistic was utilised to test the null hypothesis of no long-run relationship against the alternative hypothesis of the existence of a long-run relationship among the studied variables. The decision is to reject the null hypothesis of no co-integration if the F-statistic was smaller than the lower and upper bound critical values, and not reject the null hypothesis if the F-statistic was greater than the lower and upper bound critical values (Pesaran et al., 2001; Onifade et al., 2020; Sanjo et al., 2022).

Subsequently, the Error Correction Model (ECM) was applied to estimate short-run parameters in multiple linear regression models. Mwamkonko (2023) and Onwuka (2021) indicated the existence of a co-integration test, implying an association among the variables. Generally, the ECM with a deterministic trend is represented as shown in Equation 5.

$$\Delta Y_t = \alpha + \theta Y_{t-1} + \pi_t + \sum \tau_i \Delta Y_t + \varepsilon_t \dots\dots\dots 5$$

Where $\alpha = \alpha_1 - y\alpha_2$ and $\pi = \pi_1 - y\pi_2$. Hence equation (5) can further be rewritten as

$$\Delta Y_t = \alpha = \alpha_1 + \pi_1 t + y\left(\beta\wedge' Y_{t-1} - \alpha_2 + \pi_2 t\right) + \sum \tau_t \Delta Y_{t-1} + \varepsilon_t \dots\dots\dots 6$$

The implication of equation (6) arises from the trend point where the summation expression is fundamentally employed to eliminate serial correlation. The compact forms of a Vector Error Correction (VEC) model that connect employment growth with other independent variables are presented in equation (7).

$$\Delta Z_t = \beta_0 + \sum Z_{t-1} + \sum \beta_1 \Delta X_{t-1} + \beta_2 \Delta X_{t-1} + \beta_3 \Delta X_{t-1} + \dots + \sum \beta_n \Delta X_{t-n} + nECT_{t-1} + \varepsilon_t \dots\dots\dots 7$$

Where Z_t was exogenous variable, β_0 was constant parameter, $\beta_1, \beta_2, \beta_3, \beta_4 \dots\dots \beta_n$ are equilibrium convergence short-run dynamic coefficients, t was time trend, Xt selected explanatory variables and n was the speed of adjustment, ECT_{t-1} was the lagged error correction term and ε_t was a disturbance terms (Onwuka, 2021, Mwamkonko, 2023). Now the new employment growth VEC model specification equation was written as equation 8.

$$\Delta Emp_t = \beta_0 + \Delta Emp_{t-1} + \sum \beta_1 GDP_{t-1} + \sum \beta_2 Inf_{t-1} + \sum \beta_3 \Delta Int_{t-1} + \sum \beta_4 \Delta Rev_{t-1}$$
$$+ \sum \beta_5 \Delta Exp_{t-1} + \sum \beta_6 \Delta Fr_{t-1} + nECT_{t-1} + \varepsilon_t \dots\dots\dots\dots\dots 8$$

Where t-1 =lag length reduced by 1, $\beta_1 \dots \beta_7$ =short-run dynamic coefficients of the model' adjustment long-run equilibrium, n= speed of adjustment parameters with a negative sign, ECT_{t-1}= the error correction term was the lagged value of the residuals obtained from co integrating regression of the employment growth on the regressors. Contains long-run information derived from the long-run co integrating relation, ε_t was disturbance terms or residuals or stochastic error term and variables have previously defined in equation 3. Alkhateeb et al. (2021) and Sanjo et al. (2022) argued that the Autoregressive Distributed

Lag Model (ARDL) was employed to estimate the long-run relationship among the variables. This model integrates lags of both the regressors and the regressand, allowing for the inclusion of variables with various orders of integration, specifically order one, I(1), and order zero, I(0), while not capturing the effects of variables at order two, I(2). It is particularly suitable for small sample sizes. Furthermore, the ARDL facilitates the analysis of both long-run and short-run dynamics through the Error Correction Model (ECM). Consequently, the ARDL was utilised to establish the long-run relationship, as demonstrated in equation 9.

$$\Delta \log Emp_t = \beta_0 + \Delta \log Emp_{t-1} + \beta_1 GDP_{t-1} + \beta_2 Inf_{t-1} + \beta_3 Int_{t-1} + \beta_4 Rev_{t-1} + \beta_5 Exp_{t-1}$$
$$+ \beta_6 Fr_{t-1} + \sum_{y=1}^{r} \beta_9 \Delta Emp + \sum_{y=0}^{r} \beta_{10} \Delta GDP_{t-1} + \sum_{y=0}^{r} \beta_{11} \Delta Inf_{t-1} + \sum_{y=0}^{r} \beta_{12} \Delta Int_{t-1} + \sum_{y=0}^{r} \beta_{13} \Delta Rev_{t-1} +$$
$$\sum_{y=0}^{r} \beta_{14} \Delta Exp_{t-1} + \sum_{y=0}^{r} \beta_{15} \Delta Fr_{t-1} + \varepsilon_t \dots\dots 9$$

Where r denotes the ARDL extreme lag length, Δ represents the first difference operator, and model variables remained identical as previously defined in equation 3. A Granger causality test was implemented to ascertain the direction of causality among the study's variables (Engle & Granger,

1987). This test is utilised to determine whether one time series can be used to predict another. Following the work of Sanjo et al. (2022), Equation (10) continues to capture the directional relationship between employment growth and the other independent variables.

$$\Delta \begin{bmatrix} Emp \\ GDP \\ Inf \\ Int \end{bmatrix} = \begin{bmatrix} v_1 \\ v_2 \\ v_3 \\ v_4 \end{bmatrix} + \sum_{i=1}^{y} \begin{bmatrix} \chi_{1i}\mu_{1i}\phi_{1i}\tau_{1i} \\ \chi_{2i}\mu_{2i}\phi_{2i}\tau_{2i} \\ \chi_{3i}\mu_{3i}\phi_{3i}\tau_{3i} \\ \chi_{4i}\mu_{4i}\phi_{4i}\tau_{4i} \end{bmatrix} X \begin{bmatrix} Emp_{t-1} \\ GDP_{t-1} \\ Inf_{t-1} \\ Int_{t-1} \end{bmatrix} + \begin{bmatrix} v_1 \\ v_2 \\ v_3 \\ v_4 \end{bmatrix} (ECT_{t-1}) + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \\ \varepsilon_4 \end{bmatrix} \dots 10$$

Where, ECT_{t-1} is error correction lag term from long run, Δ is an operator lag, y represent number of lags, $\varepsilon_1 \dots \varepsilon_4$ are stochastic error term and the

variables were earlier defined. The tested null hypotheses factors were, H_0: the lagged values of employment growth do not granger caused GDP growth, inflation rate, interest rate, total revenue and total expenditure, H_0: the lagged values of GDP

growth do not granger caused employment rate, inflation rate, interest rate, total revenue and total expenditure,: H_0: the lagged values of inflation rate do not granger caused employment growth, GDP growth, interest rate, total revenue Rev and total expenditure and H_0 the lagged values of interest rate do not granger caused employment rate, GDP growth , inflation rate, total revenue and total expenditure.

FINDINGS AND DISCUSSION

Descriptive Statistics

The statistical descriptive summaries are crucial as they provide an overview of the data in terms of their magnitude and associated characteristics. The objective was to establish a data summary that aids in presenting the distribution, variability, and organisation of the data (Yusuf & Omar, 2019).

Table 2: Monetary Factors, Summary Statistics

	Emp	GDP	If	Int	Rev	Exp	Fr
Mean	86	5.54	11.68788	20.08	6178946	8072071	2650.58
Maximum	85.43	7.9	35.9	36	2.44e+07	3.11e+07	6386
Minimum	90	0.4	3.3	14.1	94655	98429	192
median	87	6.2	7.6	16.65	224843	3873254	2307
Standard deviation	2.2	1.96	9.55	6.58	7498892	9131165	1981.27
Skewness	-0.21	-0.97	1.24	1.2	1.11	1.00	0.22
Kutorsis	1.46	3.09	3.40	3.20	2.83	2.78	1.67
Observations	33	33	33	33	33	33	33

Source: Author compilation 2024, Data from STATA

The mean value for Employment growth was 86%, with a standard deviation of 2.2%. The mean value for GDP growth was approximately 5.54%, accompanied by a standard deviation of 1.96%. The mean for inflation was estimated to be 11.69%, with a standard deviation of 9.55 %. The Lending rate had a mean of 20.08%, while its standard deviation was estimated to be 6.58%. The mean value for total revenue was 6,178,946 million Tanzanian shillings, with a standard deviation estimated at 7,498,892 million Tanzanian shillings. The mean value for total expenditure was 8,072,071 million Tanzanian shillings, with a standard deviation of 9,131,165 million Tanzanian shillings. The mean value for foreign reserve was estimated at 2,650.58 million USD, with a standard deviation of approximately 1,981.27 million USD. The kurtosis for employment was estimated at 1.46, for GDP growth at 3.09, for inflation at 3.40, for interest rate at 3.20,

and for foreign rreserve at 1.67. The studied variables exhibited normal distribution, as the estimated kurtosis values were approximately equal to 3; (Yusuf & Omar, 2019). The skewness for employment was -0.21, for GDP growth was --0.97, for inflation was +1.24, for Lending Rate was +1.2, for total revenue was +1.11, for expenditure was +1.00, and for foreign reserves was +0.22 (Awan & Qasim, 2020).

Unit Root Test

The logs of employment growth, GDP, inflation rate, interest rates, and total revenue were all found to be non-stationary at level. However, the log of total expenditure was stationary at level without a trend. Consequently, the non-stationary data were differenced, resulting in all variables being stationary at the first difference (see Table 3 for further details).

Table 3: Unit Root at Level and at First Difference

| Variables | At Level | | | | At First Difference | | | | |
| | With no trend | | With trend | | With no Trend | | With Trend | | |
	ADF Calculated	ADF Critical at 5%	ADF Calculated	ADF Critical at 5%	ADF Calculated	ADF Critical at 5%	ADF Calculated	ADF Critical at 5%	Conclusion
lnEmp	-0.627	-2.980	-1.902	-3.572	-6.878	-2.983	-6.770	-3.576	I(1)
lnGDP	-2.186	-2.980	-2.827	-3.572	-5.518	-2.983	-5.426	-3.576	I(1)
lnIf	-1.886	-2.980	-2.119	-3.572	-5.678	-2.983	-5.642	-3.576	I(1)
lnInt	-1.336	-2.980	-1.292	-3.572	-5.353	-2.983	-5.342	-3.576	I(1)
InFr	-1.859	-2.980	-1.258	-3.572	-8.936	-2.983	-10.276	-3.576	I(1)
InRev	-2.497	-2.980	-1.489	-3.572	-5.116	-2.983	-5.569	-3.576	I(1)
InExp	-3.421	-2.980	-1.097	-3.572	-4.100	-2.983	-5.179	-3.576	I(0)

Source: Authors compilation 2024, Data from STATA

ARDL Bound Test Results

The ARDL approach initially aims to assess the presence of co-integration among the examined variables. Pesaran et al. (2001) and Onifade et al. (2020) have indicated that the presence of co-integration signifies a long-run relationship between the variables.

Table 4 : ARDL Bound Test Results

Test Statistic	Value	Lower bound	Upper bound	Significant level	Decision
F-Statistics	5.801	3.15	4.43	0.01	Co integration
		2.45	3.61	0.05	Co integration
		2.12	3.23	0.1	Co integration

Source: Author compilation 2024, Data from STATA

F-statistics was about 5.801which was greater than lower and upper bound at 1%, 5% and 10% suggesting that all the studied variable were co-integrated meaning the variables have significant long-run relationship.

ARDL Long Run and Short Run Relationship Estimates

Impact of Inflation Rate on Employment Growth

A positive relationship between inflation and employment was observed, although the estimated coefficient was statistically insignificant. Similarly, in the short run, inflation rate was found to be directly related to employment growth at all three lags, with the coefficients being significant at the 5% level at lag one and two.

The findings in Tanzania indicated a positive relationship between the inflation rate and employmentgrowth. The overall increase in prices of goods and services in the country results to higher profits for firms, with increased profits, firms can further expand both public and private investments by employing more workers. Consequently, firms may also incur loans from lending commercial

banks, which provide greater capacity for production expansion, allowing for the hiring of additional labour to facilitate the production, thereby enhancing local employment opportunities. Furthermore, inflation rate can cause the value of loans to depreciate, leading firms to borrow more since repayment becomes relatively easier, thus increasing employment opportunities.

Keynes suggested that countries suffering from high unemployment rates should focus on increasing overall demand. Labour is considered a derived demand; therefore, an increase in the demand for goods and services encourages firms to employ more workers to produce additional goods and services to meet the higher market demand. These results align with the findings of Adegboye (2020), Vladi and Hysa (2018), Islam and Sahajalal (2019), Onifade et al. (2019), Alemu (2024), Shiferaw (2023), and Arshad and Ali (2016). However, the findings contradict with those of Micheni and Muturi (2019) and Krušković (2020), who argued that the Phillips Curve did not hold in their countries, where targeting inflation has been associated with higher unemployment rates.

Impact of Lending Interest Rate on Employment Growth

The findings indicated in Table 5 reveal an adverse relationship between interest rates and employment but the results were statistically insignificant. The rise in lending interest rates implies an increase in the cost of production, as employment growth is a function of investment. When companies borrow at higher interest rates, they must eventually repay both the principal and the interest, which accelerates production costs. In many cases, companies may postpone production, leading to a decline in investments and a higher unemployment rate. An increase in lending interest rates by commercial banks indicates that fewer loans will be available for investment, thereby decreasing the employment profile in the country, as noted by Vladi and Hysa (2018).

These findings support the Keynesian theory, which suggests that to address high unemployment rates, national policy should involve reducing interest rates set by lending commercial banks. Interest represents a cost to investors; minimising these costs paves the way for increased investment, which in turn creates more jobs. Similar results were reported by Vladi and Hysa (2018), Attamah et al. (2015), and Selim and Hassan (2019), who explained that rising interest rates increase production costs, thereby diminishing both production and employment profiles. However, these findings are incompatible with those of Onwuka (2021), Micheni and Mutuni (2019), and Arshad and Ali (2016).

Table 5: ARDL Long run and Short run Relationship Estimated Monetary Factors

Variables	Co-efficient	Std Error	T-Statistic	Probability
InGDP	0.0226525	0.0097658	2.32	0.049**
InIf	0.0013099	0.0035683	0.37	0.723
InInt	-0.0078234	0.0110395	-0.71	0.499
InRev	-0.0027385	0.0103461	-0.26	0.798
InExp	0.0033338	0.0168532	0.20	0.848
lnFr	-0.0333049	0.0143178	-2.33	0.048**
Constant	4.31696	0.8543846	5.05	0.001*
$DlnGDP_1$	-0.0108172	0.008103	-1.33	0.219
$DlnGDP_2$	-0.0034127	0.0057692	-0.59	0.570
$DlnGDP_3$	0.008196	0.0038251	2.14	0.065***
$DlnInf_1$	0.0091768	0.0039709	2.31	0.050**
$DlnInf_2$	0.0083328	0.0027999	2.98	0.018**
$DlnInf_3$	0.0107394	0.0028482	3.77	0.005**
$DlnRev_1$	-0.0280896	0.0145493	-1.93	0.090***

Variables	Co-efficient	Std Error	T-Statistic	Probability
$DlnRev_2$	-0.0387813	0.0134259	-2.89	0.020**
$DlnRev_3$	-0.019808	0.0145397	-1.36	0.210
$DlnExp_1$	0.008355	0.0138238	0.60	0.562
$DlnExp_2$	0.0400757	0.0138327	2.90	0.020**
$DlnFr_1$	0.019944	0.013108	1.52	0.167
$DlnFr_2$	0.0248803	0.0108792	2.29	0.052***
$DlnFr_3$	0.0029482	0.0082747	0.36	0.731
ECT	-0.9202563	0.1815259	-5.07	0.001*

Dependent Variable. Emp ARDL (1,3,3,0,3,2,3) regression, Observation: 1993 - 2022 (*), (**) and (***) indicate 1 %, 5% and 10% level of significant, respectively, Durbin-Watson d-statistic= (2.076649), Heteroskedasticity Test (White's Test) = 0.4140, ARCH Test = 0.4628

Source: Author compilation 2024, Data from STATA

Impact of Other Macroeconomic Factors on Employment Growth

The estimated coefficient of GDP growth was found to be directly related to employment, with results statistically significant at the 5% level. Conversely, in the short run, the coefficient of GDP growth was found to be inversely related to employment at both two lags, while at three lags, the coefficient was positively related to employment growth. Islam and Sahajalal (2019), Adegboye (2020), Alem (2024), Islam (2018), Vladi and Hysa (2018 and Attamah, et al. (2015), supported that GDP growth was the engine for employment growth.

Similarly, total government expenditure was directly related to employment in the long run, although it was statistically insignificant. In the short run, total expenditure was also directly related to employment growth at both two lags, with results statistically significant at the 5% level at lag two, while at lag one, the results were statistically insignificant. Increases in government expenditures indicate greater economic activity, which naturally leads to increased labour hiring, thereby fostering employment growth in the country, Onwuka (2021), Alkhateeb et al. (2017).

In contrast, the long-run coefficient of total revenue in Tanzania was found to negatively impact the growth of employment opportunities, although the results were statistically insignificant in the long run. Similarly, in the short run, totalrevenue was inversely related to employment growth across all

three lags, with results at lag one statistically significant at the 10% level, at lag two significant at the 5% level, and at lag three was statistically insignificant. High government revenue implies higher production costs in terms of taxes to producers, which may discourage further investment, as proposed by Adegboye (2020) and Islam (2018).

Additionally, the estimated coefficient of foreign reserves was negatively associated with employment and was statistically significant at the 5% level in the long run. In the short run, the coefficient of foreign reserves was directly related to employment across all three lags, with results statistically significant at the 10% level at lag two, while results at lag one and three were statistically insignificant. Furthermore, Tanzania has a higher volume of imports compared to exports, which further hinders the accumulation of foreign reserves necessary for expanding economic activities, URT (2023).

Table 5 illustrates that the estimated coefficient of the error correction term (ECT) was recorded at 92%, negative and statistically significant at the 5% level. The error correction mechanism term indicates how quickly equilibrium can be restored following any disturbances. The negative coefficient, statistically significant at the 5% level, indicates that in the event of a disequilibrium shock of 1% in the previous period, approximately 92% of the shock can be corrected to adjust for employment

growth. In the long run, the system will adjust by 92% to any long-run distortions that occur.

Granger Causality

It has been validated that employment growth does Granger-cause GDP growth, inflation rate, interest rates, total revenue, total expenditure and foreign reserves during the studied period. However, generally, it was not accepted that employment Granger-caused all the factors studied within the Tanzanian context. Furthermore, a unidirectional causality was noted between GDP growth and employment growth, with causation running from employment to GDP growth.

Table 6: Granger Causality Wald Tests Results

Dependent variable: *ln-employment growth*			
Excluded	**Chi-sq**	**Prob Value**	**Decision**
GDP	26.815	0.000	Reject H_0
Inflation rate	23.81	0.000	
Lending Interest rate	7.7199	0.052	
Total Government Revenue	9.2876	0.026	
Total Government Expenditure	18.672	0.000	
Foreign Reserve	12.952	0.005	
ALL	105.63	0.000	
Dependent variable: *ln-**GDP***			
Employment growth	3.5485	0.315	Do not reject H_0
Inflation rate	2.8634	0.413	
Lending Interest rate	4.9988	0.172	
Total Government Revenue	3.9019	0.272	
Total Government Expenditure	10.462	0.015	
Foreign Reserve	1.2282	0.746	
ALL	68.193	0.000	
Dependent variable: *ln-* Inflation rate			
Employment growth	18.674	0.000	Reject H_0
GDP	28.728	0.000	
Lending Interest rate	6.9064	0.075	
Total Government Revenue	27.548	0.000	
Total Government Expenditure	19.122	0.000	
Foreign Reserve	5.9445	0.114	
ALL	80.581	0.000	
Dependent variable: *ln-* Lending Interest rate			
Employment growth	15.043	0.002	Reject H_0
GDP	4.7356	0.192	
Inflation rate	15.866	0.001	
Total Government Revenue	6.3942	0.094	
Total Government Expenditure	2.1954	0.533	
Foreign Reserve	4.9042	0.179	
ALL	151.3	0.000	

Source: Author's Compilation, 2024

The results also showed that GDP growth does not Granger-cause inflation rate, interest rate, total revenue and foreign revenuer, but it does Granger cause total expenditure. These findings are consistent with Alemu (2024) and Vlad and Hysa (2019), but not with Gnahe and Huang (2020), who found that the growth rate and the real interest rate were directly correlated.

The results concluded the existence of a bi-directional causal relationship between inflation rate and employment growth, as well as a unidirectional relationship between inflation rate and GDP growth, running from inflation rate to GDP growth. The inflation rate was found to be a cause of interest rate, total revenue, and total expenditure, but not foreign reserve Alemu (2024) established that the inflation rate caused GDP growth, while it was not Granger-caused employment growth. Vlad and Hysa pointed that the inflation rate Granger-caused interest rates and GDP growth, but it did not Granger-cause unemployment growth.

Similarly, there was a bi-directional causal relationship between interest rate and employment growth, as well as between interest rate and inflation rate in Tanzania. Interest rates did not elucidate the growth of GDP, total expenditure, and foreign reserve. However, it was indicated that interest rate was a Granger-cause of total revenue. Overall, interest rate was the factor that Granger-caused all the studied factors during the studied period within the Tanzanian environment, as noted by Vlad and Hysa (2019).

CONCLUSION AND RECOMMENDATIONS

Conclusion

This paper has examined the impact of monetary macroeconomic factors on employment growth in Tanzania. The results show that both the inflation rate and the lending interest rate had asymmetric impacts on employment growth. Specifically, the inflation rate was associated with increased employment growth, while the lending interest rate was correlated with a decline in employment growth over the long term. Additionally, GDP growth and total government expenditure were directly related to employment growth, whereas total government revenue, interest rates, and foreign reserves were inversely related to employment growth. The paper concluded that these findings are consistent with the theory, which suggests that countries should minimise bank rates and maintain price stability.

Recommendations

The paper recommends revisiting lending interest rate policies to favour local investors, allowing them to borrow at a lower minimum cost. This reduction in borrowing costs would encourage increased investment, leading to greater output for exports and additional employment opportunities. Furthermore, it is essential to control the exchange rate regime and imports to enhance the inflow of foreign reserves, thereby improving foreign creditworthiness, curbing inflation, and ensuring economic stability within the country.

ACKNOWLEDGEMENT

REFERENCES

Adegboye, A. C. (2020). Macroeconomic policies and sustainable employment yields in sub-Saharan Africa. *Africa Development Review*, *32*(4), 515–527. https://doi.org/10.1111/1467-8268.12457.

Alemu, F. M. (2024). An Empirical Analysis of the Nexus Between Inflation, Exchange Rate, Unemployment and Economic Growth in Ethiopia: A granger Causality Approach. *Sage Journals*, https://doi.org/10.1177/097508782412342.

Alkhateeb, T. T. Y., Mahmood, H., Sultan, Z. A., & Ahmad, N. (2021). Trade Openness and Employment Nexus in Saudi Arabia. *Munich Personal RePEc Archive*, *7*(6) 27-31 https://mpra.ub.uni-muenchen.de/109451/.

Alkhateeb, T. T., Sultan, Z. A., & Mahmood, H. (2017). Oil revenue, public spending, gross domestic product and employment in Saudi

Arabia. *International Journal of Energy Economics and Policy (IJEEP)*, 7(6), 27 - 31.available at http: www.econjournals.com.

Arshad, S., & Ali, A. (2016). Trade-off between Inflation, Interest andUnemployment Rate of Pakistan: Revisited. *Bulletin of Business and Economics*, 5(4), 193-209. https://doi.org/10.61506/.

Attamah, N., Igwe, A., & Ukpere, W. I. (2015). The impact of fiscal and monetary policies on unemployment problem in Nigeria (Managerial economic Perspective). *Risk governance & control: financial markets & institutions*, 5(2), 101– 109. https://doi.org/10.22495/rgcv5i2c1art4.

Awan, A. G., & Qasim, H. (2020). Impact of External Debt on Economic Growth of Pakistan. *Global Journal of Management, Social Sciences and Humanities*, 6(1) 30-61.DOI: https://orcid.org/0000-0001-5767-6229.

Dickey, D., & Fuller, W. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association*, 74: 427–431.

Engle, R.F, and Granger, C.W.J. (1987). Co-integration and Error Correction: Representation, Estimation and Testing. *Econometrica*, 55 (2): 251 – 279.

Gnahe, F. E., & Huang, F.-M. (2020). The Effect of MonetCountries.ary Policy on Economy Growth of WAEMU. *Open Journal of Business and Management*, 8, 2504-2523. https://doi.org/:10.4236/ojbm.2020.86156.

Haji, M. (2015). *Youth Employment in Tanzania: Taking stock of the Evidence and Knowledge Gap.* Canada. https://idl- bnc- idrc.dspacedirect .org/items/86d2f699-123b-461b-ba9e-68ecb8b33d9f: International Development Research Centre.

ILO. (2015). *How do macroeconomic and sectoral policies affect employment?* Retrived fromhttps://www.google.com/How+do+macro economic+and+sectoral+policies+affect+empl oyment%3F+: International Labour Office.

ILO. (2024). *Unemployment, Total (% of Total Labour Force)(Modeld ILO Estimate)-Tanzania.*Geneva.https://data.worldbank.org/in dicator/SL.UEM.TOTL.ZS?locations=TZ: ILO.

Islam, R. (2018). Macroeconomic Policy and Employment: A Development Pespective. *The Indian Journal of Labour Economics*, 61(3), 427–451. https://doi.org/10.1007/s41027-018-0139-y.

Islam, S., & Sahajalal, M. (2019). An empirical study of GDP, exchange rate, inflation and unemployment in Bangladesh. *International Journal of Multidisciplinary Research and Development*, 6(6), 51- 53, www.allsubjectjour nal.com.

Kamar, B., Bakardzhieva, D., & Goaied, M. (2019). Effects of pro-growth policies on employment: Evidence of regional disparities. *Applied Economic*, 1(40), 4337– 4367. https://doi.org/1 0.1080/00036846.2019.1591596.

Keynes, J. M. (1936). *The General Theory of Employment, Interest and Money.* Havard UniversityPalgraveMacmillan.http://books.goo gle.ie/books?id=Su1lDwAAQBAJ&printsec=f rontcover&dq=The+General+Theory+of+Emp loyment,+Interest+and+Money&hl=&cd=1&s ource=gbs_api.

Krušković, B. (2020). Exchange Rate Targeting Versus Inflation Targeting: Empirical Analysis of the Impact on Employment and Economic Growth. Journal of Central Banking Theory and Practice, 9(2), 67– 85. https://doi.org/10.2478/j cbtp-2020-0014.

Menon,K. (2023, January 12). The Complete Guide to Skewness and Kurtosis. *Data science and business analytics*, pp. https://www.simplilearn.com/tutorials/statistics-tutorial/skewness-and-kurtosis.

Micheni, P. N., & Muturi, W. (2019). Effect of macroeconomic variables on unemployment in Kenya. *The Strategic Journal of Business & Change Management*, *6*(2), 1578 –5961, https://doi.org/10.61426/sjbcm.v6i2.1205.

Mwamkonko, M. A. (2023). Macroeconomic Stabilization Effects of Public Expenditures: Empirical Evidence from Tanzania. *Journal of African Economic Perspectives*, *1*(1), 1–18. https://doi.org/10.58548/2023jaep11.0118.

Onifade, S. T., Ay, A., Asongu, S., & Bekun, F. V. (2020). Revisiting the trade and unemployment nexus: Empirical evidence from the Nigerian economy. *Journal of Public Affairs*, *20*(3). https: //doi.org/10.1002/pa.2053.

Onwuka, C. E. (2021). The impact of fiscal and monetary policy on unemployment rate in Nigeria. *SSRN Electronic Journal.*, https://doi.org/10.2139/ssrn.3959996.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of applied econometrics*, *16*(3):289-326. https://doi.org/10.1002/jae.616.

Phipps, A. J., & Sheen, J. R. (1995). Macroeconomic Policy and Employment Growth in Australia. *The Australian Economic Review*, *28*(1), 86– 104. https://doi.org/10.1111/j.1467-8462.1995.tb00877.x.

Sanjo, G. J., Sende, N. B., & Mpeta, I. F. (2022). Effect of Trade Openness and Real Exchange Rate on Economic Growth in Tanzania. *Journal of Economics, Management and Trade*, *28*(7) 47-64. https: //www.sdiarticle5.com/review-history/87121.

Selim, M., & Hassan, K. (2019). Interest-free monetary policy and its impact on inflation and unemployment rates. *ISRA International Journal of Islamic Finance*, *11*(1), 46-61. DOI 10.1108/IJIF-06-2018-0065.

Shiferaw, Y. A. (2023). An Understanding of How GDP, Unemployment and Inflation Interact and Change across Time and Frequency. *Economies*, *11*(5), 131; https://doi.org/10.3390/economies11050131.

URT. (2010). *TheTanzania Mainland's 50 Years of Independence:A Review of the Role and Functions of the Bank of Tanzania (1961-2011).* Dar Es Salaam: Bank Of Tanzania.

URT. (2021). *Intergrated labour force survey 2020/21 analytical report.* https://www.nbs.go.tz/index.php/en/census-surveys/labour-statistics/688-integrated-labour-force-survey-2020-21.

URT. (2024). *Monetary Policy Framework.* Dar es Salaam. https://www.bot.go.tz/MPS: Bank of Tanzania.

Vladi, E., & Hysa, E. (2020). The Impact of Macroeconomic Indicators on Unemployment Rate. *ResearchGate*, 158- 181.https://doi.org/10.4018/978-1-5225-7561-0.ch009.

World Bank. (2023). *World development indicators database.* Washington, DC https://databank.worldbank.org/source/world-development-indicators: World Bank.

Yusuf, S., & Omar, M. R. (2019). Trade openness and economic growth of Tanzania. *Resaerch Gate*, *12(*3) 1-10.DOI: 10.9734/ajeba/2019/v12i330154.