# Impact of Public External Debt and Trade Openness on the Employment Growth in Tanzania: 1990- 2022, An ARDL Model

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***Abstract***
*Public External Debt and Trade Openness can have significant impact on employment growth.This paper examined the impact of public external debt and trade openness on employment growth, using time series data from 1990 to 2022 obtained from the Bank of Tanzania and the World Bank. Stationarity tests, co-integration bound tests, and the ARDL Error Correction Model were employed for analysis. The results indicated that, in the long run, trade openness (β = -0.002, p = 0.836), external debt (β = -0.024, p = 0.030), and foreign reserves (β = -0.028, p = 0.009) have a negative impact on employment growth. Conversely, GDP growth (β = 0.04, p = 0.026), external debt servicing (β = 0.019, p = 0.032), and foreign direct investment (FDI) (β = 0.003, p = 0.419) contribute positively. The study concludes that both trade openness and external debt can impede employment growth if not managed judiciously. It recommends revising trade tariffs and policies to bolster local participation in international trade, as well as improving borrowing conditions to ensure that external debt is directed towards productive investments in the agriculture and manufacturing sectors. Furthermore, it is advisable to shorten external debt servicing frameworks to facilitate faster debt repayment and create additional employment opportunities.*

***Keywords:*** *Trade Openness, public external debt,employment growth, Tanzania.*

## INTRODUCTION

The National Development Agenda for 2025 has outlined the necessity of maintaining equality in wealth generation and ensuring fair resource allocation to promote a high-quality standard of living across all aspects of education, culture, politics, legislation, and employment (United Republic of Tanzania, URT, 1995). Furthermore, investing in infrastructural projects such as road networks, water supply, telecommunications, and energy is crucial for attracting both foreign and local investment, fostering wealth creation, and generating employment opportunities (URT, 1995). The National Five-

Year Development Plan (2021/22 to 2025/2026) also emphasises the importance of engaging in both regional and global trade activities, which enable local products to be absorbed in terms of exports, thereby increasing employment opportunities (URT, 2021). Tanzania continues to face challenges with unemployment, with the unemployment rate recorded at approximately3.7% in 1995, 3.1% in 2000,3.2% in 2005, 3% in 2010, 2.2% in 2015, 2.8% in 2020, and 2.6% in 2023 (ILO, 2024).

Considering the economic context, many countries implement trade barriers, both tariff and non-tariff, to reach mutual agreements that safeguard local employment and enhance the country's global market share, as well as foreign capital inflow (Martes, 2018). Developing countries like Tanzania regulate imports to protect local infant industries while ensuring the presence of trade competition (Kirema, 2019). Martes (2018) notes that countries typically prefer tariffs to secure domestic jobs while also supporting the growth of international trade. High import costs raise prices for imported goods and services from abroadin comparison with domestic products, prompting local producers to increase production for both local markets and exports, thus generating employment and encouraging foreign capital inflow. Tanzania's export and import profile has fluctuated, with import volumes consistently surpassing exports. In June 2010, exports of goods were recorded at USD 3,754.2 million, while imports amounted to USD 6,570.3 million. By June 2023, goods and services exports had risen substantially to USD 12,767.6 million, compared to USD 11,004.1 million in June 2022. Imports at the end of June 2023 were recorded at USD 17,007.2 million, compared to approximately USD 13,715.7 million in June 2022 (URT, 2010; 2023).

The higher level of imports relative to exports has resulted into significant import bills, especially for petroleum products, fertilisers, freight charges, and machinery, exacerbating current account deficits and leading to a shortage of foreign exchange reserves. This, in turn, diminishes both investment and employment opportunities in the country (URT, 2023). Sanjo et al. (2022) pointed out that trade barriers pose a significant challenge to the economy in maintaining opportunities for openness. Likewise, Kirema (2019) noted that local firms tend to disappear as domestic companies compete with advanced foreign firms, diminishing the employment landscape. However, Ngouhouo and Nchofoung (2021) and Martes (2019) indicated that openness to trade creates job opportunities for both importing and exporting countries by increasing demand for goods and services, thereby enhancing production processes. Sanjo et al. (2022) identified technology diffusion in production as the most significant factor facilitating trade openness.

Furthermore, Tanzania's fiscal policy has progressed towards increasing revenue collections by raising net taxes, expanding the tax base, and enhancing tax administration. In 2009, the business and investment climate improved, resulting in greater accountability among tax collectors and taxpayers. During the financial year 2012/2013, Electronic Fiscal Devices (EFDs) were introduced, alongside the Block Management System and tax audits conducted by the Tanzania Revenue Authority (TRA) (URT, 2013). Despite efforts to improve revenue collections, Tanzania has been experiencing a budget deficit. For example, it was reported that in 2013/2014, the government deficit was 4.5% of Gross Domestic Product (GDP); in 2014/2015, it was 3.3%; in 2015/2016, approximately 3.6%; in 2020/2021, it reached 3.9%; and in 2022/23, the government recorded a budget deficit of 4.2% of GDP (URT, 2010, 2023).

External debt has been utilised to finance this budget deficit (URT, 2010; 2023).Ijirshar (2016) demonstrated that developing economies often face insufficient capital, leading them to borrow to supplement their investment and savings. External debt rose to USD 21,917 million by June 2019, increased to USD 25,519 million by June 2021, and reached approximately USD 30,125 million by June 2023. This increase has been primarily attributed to infrastructure projects, including the Julius Nyerere hydropower dam and the standard gauge railway. However, the debt burden remains within acceptable thresholds, posing a moderate risk of debt distress (URT, 2023). The high external debt portfolio in the country contributes to balance of payments deficits through increased external debt servicing, further diminishing productive investment, which jeopardises economic growth and employment creation. Alnaa and Matey (2023) indicated that African countries have accumulated unjustified levels of external debt, which are often allocated to consumable projects, thereby failing to create opportunities for employment.

Tanzania's economy has been involved in international trade, where competition is not always free and fair. Its external debt profile has been increasing over the last decade as an alternative to financing the budget deficit. Therefore, this study examined the impacts of trade openness and external debt on employment growth from 1990 to 2022, analysing how changes in both trade openness and external debt affect employment growth in the country.

## LITERATURE REVIEW

### Theoretical Review

This paper draws on Keynesian economics (1936), where Keynes identified effective demand as the foundation of employment theory, asserting that

demand generates its supply. He used the aggregate supply and demand approach to determine full employment equilibrium. Effective demand refers to the income level where total demand and supply balance, comprising consumer and investment spending. Aggregate demand represents the total demand for goods and services in an economy over a year, while aggregate supply (or national income) reflects the monetary value of all goods and services produced. Keynes proposed three equilibrium levels: full employment, less than full employment, and more than full employment. The theory advocates for the effective use of fiscal instruments, such as reducing tax rates and increasing government spending, alongside monetary instruments like lowering bank rates, minimising reserve ratios, and purchasing government assets to remedy deficient demand or enhance export activities. Furthermore, Keynes contended that to address an inflationary gap, society could also implement fiscal policies that include raising tax rates and reducing government spending. Furthermore, it may include monetary policy measures, such as increasing bank rates, adjusting reserve ratios, selling government securities, and promoting imports, as noted by Mhenwa, Ngaruko, and Lyanga (2024), and Ngouhouo and Nchofoung (2021). This theory is pertinent to the study as it employs openness to trade (the sum of exports and importsrelative to GDP) to examine how changes in trade openness impact employment growth in the country.

Additionally, the debt overhang theory, established by Krugman in 1988, highlights how excessive external debt in developing countries diverts funds from new investments to debt servicing. This burden adversely affects both public and private investments, stifling economic growth. To mitigate this issue, measures such as reducing the principal amount, reassessing loan terms, and lowering interest rates are recommended, as noted by Alnaa and Matey (2023). The debt overhang theory is directly linked to Keynesian theory in its pursuit to examine how accumulated debt impacts employment growth.

**Openness to Trade and Employment Growth**

Using empirical evidence,Onifade et al. (2020) revisited the trade and unemployment nexus in Nigeria. The study found a direct relationship between trade openness and unemployment, demonstrating that most developing economies are import-oriented, where local manufacturers face significant competition, leading tounemployment. Asaleye et al. (2017) investigated trade openness and employment using the Vector Error Correction Model. The study demonstrated a long-term indirect relationship between trade openness and employment growth, arguing that the degree of competition is crucial in the context of international trade. Additionally,

Kirema (2019) examined the impact of trade openness on unemployment in Kenya from 1970 to 2017. Using multiple regression analysis, the study revealed an inverse relationship between exports and imports with unemployment, while GDP and openness to trade were positively related to unemployment. It was further argued that many companies in developing economies utilise sophisticated technology from abroad with which local citizens are not familiar; consequently, the manpower employed tends to come from outside, thereby minimising the employment profile.

Conversely, research conducted by Ngouhouo and Nchofoung (2021) in Cameroon examined the impact of trade openness on unemployment. The study confirmed that trade openness positively affects employment, as it increases both demand and supply, leading to higher GDP and greater employment opportunities. Similarly, Alkhateeb et al. (2021) explored the relationship between trade openness and employment in Saudi Arabia. Using the Auto-Regressive Distributed Lag Model (ARDL) for data spanning from1980 to 2015, the study indicated a positive correlation between trade openness and employment growth. It was further argued that Saudi Arabia's economy, as an oil exporter, generates surpluses that facilitate sound employment creation. Martes (2018) investigated both the short-term and long-term effects of trade openness on unemployment. The study established that trade openness reduces unemployment, as it ensures the availability of more goods and services, thereby motivating domestic firms to increase production and hire more labour.

In Tanzania, some reviewed studies focused on the impact of trade openness on economic growth, such as the research conducted by Sanjo et al. (2022), which examined the effects of trade openness and the real exchange rate on economic growth in Tanzania, using time series data from 1970 to 2016. Employing the ARDL model, the study supported the notion that trade openness stimulates economic growth, as, in the long run, it bolsters domestic production, enhances export activities, and promotes economic development. Notably, Miku et al. (2021) studied the causal relationship between trade openness and economic growth from 1970 to 2021, using the Vector Autoregressive Model. The study discovered that trade openness induces greater growth through a multiplier effect. An increase in GDP leads to higher consumption, followed by increased investment spending and employment, which in turn creates further growth. Yusuf and Omar (2019), utilising the Vector Error Correction Model (VECM), examined the relationship between trade openness and economic growth in Tanzania from 1981 to 2017, establishing a direct correlation between trade openness and economic growth. The study further posited that Tanzania, alongside other

countries, recognised the potential of international trade by facilitating its penetration and adopting policies aimed at fostering economic growth during the 1990s.

**External Debt and Employment Growth**

Some reviewed literatureon external debt presents diverse conclusions, as noted by Alnaa and Matey (2023), and Ijirshar et al. (2016). The effect of external debt, the unemployment rate, and inflation on economic growth was studied by Evans (2022). The study employed regression analysis with data from 1991 to 2021, establishing that external debt directly affected economic growth, while unemployment and inflation adversely impacted it. Similarly, Alnaa and Matey (2023) examined the dynamic relationship between unemployment and external debt in Sub-Saharan Africa. Using panel data covering 25 countries, they found that public debt increased unemployment.Tang and Issahaku (2024) conducted a study using panel data from 26 countries and employed the System Generalised Method of Moments (SGMM), indicating that debt accumulation by Sub-Saharan countries increases unemployment growth. Similar findings by Saani et al. (2023) in Ghana, which utilised data from 1992 to 2022 to study public debt, inflation, and unemployment, established a direct relationship between public debt and unemployment. The study further suggested that, to mitigate inflation, the government should favour domestic debt over external debt.

Warsame and Mohamed (2024) studied the role of external debt on the determinants of unemployment in Somalia from 1991 to 2019. Using an ARDL model, their results indicated a direct relationship between public debt and unemployment. Ademola (2023) conducted a study on external debt and economic growth in Nigeria. Using VECM, it was established that there is an inverse relationship between external debt and economic growth, with arguments suggesting that the Nigerian economy has failed to fully utilise the potential of debt to enhance production. Awan and Qasim (2020) studied the impact of external debt on economic growth in Pakistan from 1980 to 2017. The study used the ARDL model and revealed that population growth, imports, external debt servicing, and external debt had diverse effects on Gross Domestic Product (GDP). It was suggested that Pakistan should create more revenue through exports and reduce the amount of borrowing. In contrast, Ijirshar et al. (2016) examined the relationship between external debt and economic growth in Nigeria, using data from 1981 to 2014. They found out that external debt was positively correlated with economic growth in both the short and long run, although external debt servicing had a negative effect.

The presence of diverse findings on trade openness and external debt concerning employment growth motivated this study, given that countries differ in their macroeconomic environments, making generalisation of findings inappropriate. Alkhateeb (2017) and Alnaa and Matey (2023) questioned the degree of openness while participating in international trade, while others indicated that the management of external resources is crucial for job creation. On the other hand, unemployment remains a challenge, and some literature from Tanzania has documented the effects of trade openness and external debt on economic growth, including the work of Yusuf and Omar (2019), Mikuet al. (2021), and Sanjo et al. (2022). Tofulfill this gap this paper examinedthe impact of trade openness and external debt on employment growth, with the following hypotheses:

i. *there was a significant positive relationship between openness to trade and employment growth;*
ii. *there was a significant positive relationship between public external debt and employment growth*; and
iii. *there was a significant positive relationship between other macroeconomic factors (GDP growth, external debt servicing, foreign direct investment (FDI), and foreign reserves) andemployment growth.*

## METHODOLOGY

### Types, Sources and Measurement of Data

The annual secondary data from 1990 to 2022 were sourced from the Bank of Tanzania and the World Bank. This paper utilised this timeframe as it was characterised by significant fiscal and monetary reforms. Employment growth and GDP growth were measured as percentages, while openness to trade was expressed as a percentage of GDP. External debt was reported in millions of TZS, and external debt service was measured as a percentage of Gross National Income. Foreign Direct Investment was quantified in millions of USD, and foreign reserves were measured in current US dollars, including gold. The data were modified from the work of Alkhateeb (2017), Awan and Qasim (2020), and Alnaa and Matey (2023).

### Theoretical Model Specification

According to the Keynesian general theory of employment, interest, and money, national income is equivalent to employment growth, which is influenced by aggregate demand and aggregate supply. When aggregate demand and supply are equal that is effective demand, represents the equilibrium at the full employment level. The objective of this paper is to evaluate the impact of macroeconomic factors, specifically fiscal and

monetary factors, on employment growth, as adopted from Phipps and Sheep (1995).

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

Where $ln$ (RW) is the log of the real wage, $ln$ (E) is the log of the employment number, $ln$ Y is the log of economic growth as measured by gross domestic product, and TFP is total factor productivity. It is widely acknowledged that macroeconomic factors, specifically fiscal and monetary policies, are the primary drivers of a country's economic growth and employment. These factors are, in turn, influenced by both internal and external macroeconomic conditions. Such conditions include external debt, openness to trade, external debt servicing, foreign direct investment (FDI), and foreign reserves, all of which can impact output (Y) at a given point in time, as noted by Phipps and Sheen (1995), thereby leading to the establishment of Equation 2.

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

Therefore FF and MF are vectors comprising fiscal factor and monetary factors indirectly influenced by both internal and external factors like external debt and openness to trade.

**Model Specification**

The paper examined the impact of public external debt and trade openness on employment growth. To test the hypothesis of a significant positive relationship between trade openness, external debt, and employment growth, the paper employed additional control variables, including GDP growth, public external debt servicing, foreign reserves, and foreign direct investment (FDI). All variables were transformed to logarithmic form to ensure the stability of both the mean and variance. Consequently, the study analysed the econometric model presented in Equation 3, as referenced by Warsame and Mohamed (2024), Alnaa and Matey (2023), andAlkhateeb et al. (2017).

$$Emp = \alpha_0 + \beta_1 GDP + \beta_2 Ext + \beta_3 Opp + \beta_3 ExtS + \beta_4 FDI + \beta_5 Fr + \varepsilon_0 \quad \ldots\ldots 3$$

Where Emp stand for employment growth, $\alpha$ was constant, GDP was growth rate,$Ext$ is public external debt,$Opp$ is openness to trade $ExtS$ is public external debt servicing, $FDI$ is foreign direct investment, $Fr$ is foreign reserve and $\varepsilon_0$ is stochastic term.Prior to the results estimation all variables

are expected to positively impact employment growth,therefore there is positive significant relationship between openness to trade and external debt were the hypothesis developend.

**Time Series Data Quality Tests**

Following the methodology established by Dickey and Fuller (1979) and further supported by Micheni and Muturi (2019) and Onwuka (2021), all variables in the model were tested for stationarity using the widely adopted Augmented Dickey-Fuller (ADF) test.

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

Where $C_t$= Presence of non-stationary (unit root) at time t, $\Delta t_{-1}$= indicate first difference with lags, $\varepsilon_i$=adjustment variable of the errors of autocorrelation and $\alpha_0$, $\alpha_1, \alpha_2$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 Autoregressive Distributed Lag (ARDL) bounds test for co-integration was employed to examine the long-run relationship among the variables under investigation. Awan and Qasim (2020) and Alkhateeb et al. (2021) utilised the F-statistic to test the null hypothesis of no long-run relationship against the alternative hypothesis asserting the presence of a long-run relationship among the variables. The null hypothesis of no co-integration is rejected if the F-statistic falls below the lower bound critical value and exceeds the upper bound critical value, while it is not rejected if the F-statistic is greater than both the lower and upper bound critical values (Pesaran et al., 2001; Onifade et al., 2020; Sanjo et al., 2022). The Error Correction Model (ECM) was applied to estimate short-run parameters in multiple linear regression models. Mwamkonko (2023) and Onwuka (2021) indicated the presence of a co-integration relationship, suggesting an association among the variables. Generally, the ECM with a deterministic trend is expressed as shown in Equation 5.

$$\Delta Y_t = \alpha + \theta Y_{t-1} + \pi_t + \sum \tau_t \Delta Y_t + \varepsilon_t \quad \ldots\ldots 5$$

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

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

The implications of equation (6) stem from the trend point at which the summation expression is employed to eliminate serial correlation. The condensed forms of the VEC model, which link employment growth with other independent variables, are delineated in equation (7).

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

Where $Z_t$ was exogenous variable, $\beta_0$ was constant parameter, $\beta_1, \beta_2, \beta_3, \beta_4 \ldots\ldots \beta_n$ 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 $\varepsilon_t$ was a disturbance terms (Onwuka, 2021, Mwamkonko,2023).Now the new employment growth VEC model specification equation was written as equation 8.

$$\Delta Emp_t = \beta_0 + \Delta Emp_{t-1} + \sum \beta_1 GDP_{t-1} + \sum \beta_2 \Delta Ext_{t-1} + \sum \beta_3 \Delta Opp_{t-1} + \sum \beta_4 \Delta ExtS_{t-1} + \sum \beta_5 \Delta FDI_{t-1} + \sum \beta_6 \Delta Fr_{t-1} + nECT_{t-1} + \varepsilon_t \quad \ldots\ldots 8$$

Where t-1 =lag length reduced by 1, $\beta_1 \ldots\ldots \beta_6$ =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, $\varepsilon_t$ was disturbance terms and model variables remained identical as previously defined in equation 3. The Autoregressive Distributed Lag Model (ARDL) was employed to estimate the long-run relationship between the variables. This approach incorporates lags of both the regressors and the regressand, facilitating the analysis of variables with mixed orders of integration, specifically I(1) and I(0). However, it does not account for the effects of variables at order two, I(2). It is particularly suitable for small sample sizes. Additionally, the ARDL captures both long-run and short-run dynamics through the Error Correction Model (ECM), as noted by Alkhateeb et al. (2021) and Sanjo et al. (2022). Equation 9 presents the ARDL.

$$\Delta \log Emp_t = \beta_0 + \Delta \log Emp_{t-1} + \beta_1 GDP_{t-1} + \beta_2 Opp_{t-1} + \beta_3 Ext_{t-1} + \beta_4 ExtS_{t-1} + \beta_5 FDI_{t-1} + \beta_6 Fr_{t-1} + \sum_{y=1}^{r} \beta_9 \Delta Emp + \sum_{y=0}^{r} \beta_{10} \Delta GDP_{t-1} + \sum_{y=0}^{r} \beta_{11} \Delta Opp_{t-1} + \sum_{y=0}^{r} \beta_{12} \Delta ExtS_{t-1} + \sum_{y=0}^{r} \beta_{13} \Delta FDI_{t-1} + \sum_{y=0}^{r} \beta_{14} \Delta Fr_{t-1} + \varepsilon_t \ldots\ldots 9$$

Where r represents the ARDL extreme lag length, Δ denotes the first difference operator, and the model variables remain consistent with those previously defined in Equation 3. Granger causality tests are applied to determine the direction of causality among the variables in the study (Engle and Granger, 1987). Alternatively, the test is employed to assess whether one trend can be used to predict another. Equation (10) continues to capture the directional relationship between employment growth and the other independent variables.

$$\Delta \begin{bmatrix} Emp \\ GDP \\ Opp \\ Ext \end{bmatrix} = \begin{bmatrix} m_1 \\ m_2 \\ m_3 \\ m_4 \end{bmatrix} + \sum_{i=1}^{y} \begin{bmatrix} \omega_{1i}\eta_{1i}\delta_{1i}\rho_{1i} \\ \omega_{2i}\eta_{2i}\delta_{2i}\rho_{2i} \\ \omega_{3i}\eta_{3i}\delta_{3i}\rho_{3i} \\ \omega_{4i}\eta_{4i}\delta_{4i}\rho_{4i} \end{bmatrix} \mathrm{X} \begin{bmatrix} Emp_{t-1} \\ GDP_{t-1} \\ Opp_{t-1} \\ Ext_{t-1} \end{bmatrix} + \begin{bmatrix} m_1 \\ m_2 \\ m_3 \\ m_4 \end{bmatrix} \left(ECT_{t-1}\right) + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \\ \varepsilon_4 \end{bmatrix} \ldots 10$$

Following Sanjo et al.(2022), where by the variables were earlier defined, $ECT_{t-1}$ is error correction lag term from long run, $\Delta$ is an operator lag, y represent number of lags while $\varepsilon_1 \ldots . \varepsilon_4$ are stochastic error term.The null hypotheses tested were as follows: $H_0$: the lagged values of employment do not Granger cause GDP growth, openness to trade, and external debt; $H_0$: the lagged values of GDP growth do not Granger cause employment, openness to trade, and external , debt; $H_0$: the lagged values of openness to trade do not Granger cause employment, GDP growth, and external debt; and $H_0$: the lagged values of external debt do not Granger cause employment, GDP growth, and openness to trade.

## RESULTS AND DISCUSSIONS

### Descriptive Statistics

A statistical summary was conducted to examine the behaviour of the figures throughout the entire study period. The statistical descriptive summary is crucial as it provides a clear representation of the data in terms of magnitude and corresponding trends, as stated by Yusuf and Omar (2019). The objective was to establish a data summary that facilitates the understanding of the distribution, movement, and arrangement of the data (Awan and Qasim, 2020).

**Table 1: Statistical Summary Results 1990 – 2022**

| | Emp | GDP | Opp | Ext | ExtS | FDI | Fr |
|---|---|---|---|---|---|---|---|
| Mean | 86 | 5.54 | 41.52 | 11.82 | 1.90 | 748.26 | 2650.58 |
| Maximum | 90 | 7.9 | 66 | 30.2 | 5.3 | 2087.3 | 6386 |
| Minimum | 84 | 0.4 | 24 | 4.1 | 0.3 | 10 | 192 |
| Median | 87 | 6.2 | 42 | 7.8 | 1.5 | 581.51 | 2307 |
| Standard deviation | 2.2 | 1.96 | 12.01 | 7.48 | 1.58 | 599 | 1981.27 |
| Skewness | -0.21 | -0.97 | 0.42 | 1.18 | 0.89 | 0.463 | 0.22 |
| Kurtosis | 1.46 | 3.09 | 2.27 | 3.01 | 2.44 | 2.15 | 1.67 |
| Observations | 33 | 33 | 33 | 33 | 33 | 33 | 33 |

**Source**: Author Compilation 2024, Data from STATA

The mean value for employment growth, as indicated in Table 1, was approximately 86%, with a standard deviation of 2.2%. The mean value for GDP growth was about 5.54%, accompanied by a standard deviation of 1.19%. The mean value of openness to trade was recorded at 41.52%, with a standard deviation of 12.01%. The mean value of external trade (Ext) was estimated to be 11.82 million Tanzanian shillings, with a standard deviation of approximately 7.48 million. The mean value for external debt servicing (as a percentage of GNI) was estimated at 1.90, while the standard deviation was 1.58. Furthermore, the mean value of foreign direct investment (FDI) was 748.26 million USD, with a standard deviation of 599 million. Additionally, the average value for foreign reserves (Fr) in Tanzania was approximately 2,650.58 million USD, exhibiting high variation of about 1,981.27 million. The kurtosis values for employment growth, GDP growth, openness, external trade, external debt servicing, FDI, and foreign reserves were estimated at 1.46, 3.09, 2.27, 3.01, 2.44, 2.15, and 1.67, respectively. The data indicated normal distributions, as all kurtosis values were close to 3 (Yusuf and Omar, 2019). The skewness for employment growth was recorded at -0.21, for GDP at -0.97, for openness at 0.42, for external trade at 1.18, for external debt servicing at 0.89, for FDI at 0.463, and for foreign reserves at 0.22.

## Openness to Trade and External Debt Root Test

The logs of employment growth, GDP growth, openness to trade, external debt, and external services were not integrated at the first order I(0), with the exception of the log of foreign direct investment, which was stationary at level I(0). The non-stationary data were transformed, resulting in all becoming stationary at the first difference. (For further details, please see Table 2).

**Table 2: Unit Root at Level and 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) |
| lnOpp | -1.398 | -2.980 | -1.429 | -3.572 | -3.596 | -2.983 | -3.539 | -3.576 | I(1) |
| InExt | 0.234 | -2.980 | -1.358 | -3.572 | -5.116 | -2.983 | -5.292 | -3.576 | I(1) |
| InExtS | -1.246 | -2.980 | -0.331 | -3.572 | -4.107 | -2.983 | -4.625 | -3.576 | I(1) |
| lnFDI | -2.589 | -2.980 | -2.173 | -3.572 | -7.520 | -2.983 | -8.427 | -3.576 | I(0) |
| lnFr | -1.859 | -2.980 | -1.258 | -3.572 | -8.936 | -2.983 | -10.276 | -3.576 | I(1) |

**Source**: Authors compilation with data from STATA (2024),

## Openness to Trade and External Debt ARDL Bound Test Results

The F-statistic was estimated at 5.627, surpassing both the lower and upper bounds at the 5% significance level, indicating that all studied variables were co-integrated. The variables exhibited a significant long-run relationship, and the data estimation was more appropriately conducted using an error correction model.

**Table 3: Openness to Trade and External Debt ARDL Bound Test Results**

| Test Statistic | Value | Lower bound | Upper bound | Significant level | Decision |
|---|---|---|---|---|---|
| | | 3.15 | 4.43 | 0.01 | Co integration |
| F-Statistics | 5.627 | 2.45 | 3.61 | 0.05 | Co integration |
| | | 2.12 | 3.23 | 0.1 | Co integration |

**Source**: Author compilation, (2024)

**ARDL Long run and Short run Relationship Estimates**

## Impact of Trade Openness on Employment Growth

In Table 4, the long-run coefficient of trade openness (Opp) demonstrated an inverse relationship with employment growth (Emp) of 0.88%; however, this finding was statistically insignificant at the 5% level. The results suggest that as trade openness increases in the long run, employment growth decreases. In the short run, a direct relationship between trade openness and employment was established, with the coefficient being statistically significant at the 5% level at lag one. It was hypothesised that openness to trade has an undesirable relationship with employment growth in the long run during the studied period.

The inverse relationship between employment and trade openness in the long run can be attributed to the fact that developing economies like Tanzania heavily rely on the importation of goods and services. The local manufacturing sector does not generate significant employment, as most goods and services are produced abroad (URT 2010; 2023). Additionally, the country primarily exports raw materials rather than high-quality finished goods, yielding less value to the economy and limiting further investment and employment opportunities. Like other developing economies, Tanzania utilises sophisticated technology in production from developed countries, which is often unfamiliar to local job seekers (Kirema, 2019). These findings align with Keynesian theory, which posits that to rectify unemployment rates, countries must ensure that the export sector grows relative to the import sector. Tanzania continues to experience a high volume of imports, and the costs of these imports in terms of foreign currency are substantial, thereby limiting the generation of further employment opportunities.

These results are supported by Onifade et al. (2020), Asaleye et al. (2017), Kamar et al. (2019), Kirema (2019), and Edo and Oigiangbe (2024), who contended that the presence of openness to trade exposes more African countries to external shocks, which endanger job creation. However, the findings diverge from those of Martes (2018), Ngouhouo and Nchofoung (2021), and Alkhateeb et al. (2021), where it was argued that trade typically generates demand for goods and services, which in turn stimulates production and increases demand for labour. Similarly, openness to trade increases competition among local producers, leading to domestic surplus and greater exportation, which facilitates the expansion of economic activities and employment growth.

**Table 4: Openness to Trade and External Debt ARDL Long run and Short run Relationship Estimates**

| Variables | Co-efficient | Std Error | T-Statistic | Probability |
|---|---|---|---|---|
| InGDP | 0.040393 | 0.0163017 | 2.48 | 0.026** |
| InOpp | -0.0018485 | 0.0087951 | -0.21 | 0.836 |
| InExt | -0.0236457 | 0.0098441 | -2.40 | 0.030** |
| InExtS | 0.0189846 | 0.008004 | 2.37 | 0.032** |
| InFDI | 0.003379 | 0.004066 | 0.83 | 0.419 |
| InFr | -0.0278302 | 0.009298 | -2.99 | 0.009* |
| Constant | 2.226136 | 0.657155 | 3.39 | 0.004* |
| $DlnGDP_1$ | -0.0084489 | 0.0032342 | -2.61 | 0.020** |
| $DlnGDP_2$ | -0.0096259 | 0.0029109 | -3.31 | 0.005** |
| $DlnOpp_1$ | 0.0190136 | 0.0051354 | 3.70 | 0.002** |
| $DlnExt_1$ | 0.0187432 | 0.0052539 | 3.57 | 0.003** |
| $DlnExt_2$ | 0.0095298 | 0.0052984 | 1.80 | 0.092*** |
| $DlnExtS_1$ | -0.0065094 | 0.0029534 | -2.20 | 0.044** |
| $DlnExtS_2$ | -0.0038647 | 0.0026171 | -1.48 | 0.160 |
| ECT | -0.4796879 | 0.1405054 | -3.41 | 0.004** |

Sample: 1993 - 2022 ARDL(1,2,1,2,2,0,0) regression , Number of obs = 30, R-squared = 0.7447 , Adj R-squared = 0.5064, (*), (**) and (***) indicate 1 %, 5% and 10% level of significant, respectively, Durbin-Watson d-statistic= (2.255395), Heteroskedasticity Test (White's Test) = 0.4140, ARCH Test = 0.7862

Source: Authors Compilation with data from STATA (2024)

## Impact of Public External Debt on Employment Growth

The long-run coefficient of external debt (Ext) was found to have a negative relationship with employment growth (Emp) and was statistically significant at the 5% level. In contrast, the short-run analysis revealed a direct relationship between external debt and employment growth, with results being statistically significant at the 5% level for lag one, while results for lag two were not significant at the 5% level.

URT (2023) reported that the increase in external debt was due to infrastructural projects, such as the standard gauge railway and the Julius Nyerere hydropower dam. It is evident that in the short run, temporary contracts tend to create jobs due to ongoing construction activities. However, in the long run, as these short-term contracts expire, the unemployment rate increases. It has been demonstrated that as the country continues to accumulate external funds, employment opportunities deteriorate in the long run (Alnaa and Matey, 2023). The considerable accumulation of external debt suggests that the funds are not being allocated to projects that create employment; rather, they are primarily used for consumable projects. The effectiveness of directing external borrowing into productive sectors, such as manufacturing, is crucial, as these sectors tend to add value and subsequently increase local production. Moreover, servicing external debt will increase, necessitating payment through exports, remittances, donations, or further borrowing to repay previous loans. These actions typically hamper the balance of payments status and ultimately lead to a crowding-out effect for both the public and private sectors, further deteriorating employment creation (Ademola, 2023; Awan and Qasim, 2020).

Overall, the findings align with the debt overhang theory, which posits that external debt can create a burden when repaying it through foreign earnings, rather than utilising such funds to generate new investments. This is corroborated by the works of Edo and Oigiangbe (2024), Evans (2022), Alnaa and Matey (2023), Tang and Issahaku (2024), Wasarme et al. (2024), Saani et al. (2023), Ademola (2023), and Awan and Qasim (2020). It was noted that debt creditors typically impose several restrictions on loans that do not initiate employment creation, thereby increasing unemployment in the long run. Similarly, this inverse relationship indicates that the economy is not effectively directing external funds to the most productive resources. Nevertheless, servicing external debt tends to increase economic burden and consequently diminish employment. The findings defer to Nwannebuike et al. (2016) andIjirshar et al. (2016), which indicated that countries with a higher export profile can service their debt while creating employment opportunities. In line with openness to trade, this paper hypothesised that there is a negative significant relationship between external debt and employment growth in the long run over the observed period.

**Impact of Other Macroeconomic Factors on Employment Growth**

In the long run, the coefficient of GDP growth was positive and statistically significant at the 5% precision level during the studied period. Conversely, in the short run, GDP growth was inversely related to employment growth across both lags, with results being statistically significant at the 5% level.

An increase in GDP growth in the long run indicates an expansion of economic activities, leading to heightened demand for labour. This is due to labour being a "derived" demand, meaning that as the demand for goods and services rises, so too does the demand for labour, thereby creating additional job opportunities. Warsame and Mohamed (2024), along with Evans (2022), found an inverse relationship between GDP growth and unemployment. Kamar (2019) argued that GDP is inversely related to employment growth because African countries are characterised by uneven employment due to large informal sectors.

Additionally, a positive relationship between foreign direct investment (FDI) and employment growth has been established, although the results were found to be insignificant. This influx of investment typically results in greater production and demand for labour. Adegboye (2020), Warsame and Mohamed (2024), and Sanjo et al. (2022) found that both FDI and economic growth contribute to increased employment. It was pointed out that a favourable environment ensures investments that stimulate economic growth. Kamar et al. (2019) established that FDI is positively related to employment growth in advanced economies but not in Africa due to institutional management challenges. Furthermore, it was noted that FDI in Egypt was inversely related to employment because the large inflow was concentrated in agriculture, services, and privatisation, where there has been a transformation towards capital-intensive production techniques, ultimately minimizing job creation.

The coefficient of external debt servicing (ExtS) exhibited a positive and significant relationship with employment growth in the long run, and it was statistically significant at the 5% level. These results contrast with those for external debt (Ext) during the same study period, indicating that while external debt servicing directly increases employment growth, external debt has a detrimental effect. The positive nature of external debt servicing suggests that the burden of repaying loans remains moderate, particularly given the cancellation of external debt by multilateral donors to heavily indebted countries (URT, 2010). Notably, Nwannebuike et al. (2016), Ademola (2023), and Ijishar (2016) indicated an indirect relationship between debt stock services and economic growth, contending that servicing the debt increases the loss of foreign exchange, which could alternatively be allocated to expanding further investment and creating more employment.

Furthermore, the estimated coefficient of foreign reserves was negative and statistically significant concerning employment in Tanzania in the long run, although it was statistically insignificant at the 5% level. Foreign reserves

were found to diminish the employment profile in Tanzania, likely due to lower export volumes relative to imports, resulting in higher importation costs (URT, 2023). Moreover, Ademola (2023) established that foreign reserves are used to settle balance of payments instability and ensure stability of the currency in the exchange rate market during economic downturns.

The Error Correction Mechanism Term (ECT) was estimated to be -48% and statistically significant at the 5% level. The negative coefficient, statistically significant at the 5% level, indicates that in the event of a 1% shock from the previous period, approximately 48% of the shock can be corrected to adjust employment growth. In the long run, the system will adjust by 48% to any occurrence of long-run distortion (for details, see Table 4).

**Granger Causality**

The established direction of causality validated that employment growth Granger-caused the growth rate(GDP) and trade openness during the studied period; however, employment growth did not Granger-cause external debtwithin the Tanzanian context during the same timeframe. In summary, employment Granger-caused all the factors studied in the Tanzanian case (appendix 1). Furthermore, a bi-directional causality was identified between trade openness and employment growth. A uni-directional causality was established between trade openness and GDP growth, running from GDP growth to trade openness. The results also indicated that trade openness did not Granger-cause external debt in Tanzania. Overall, it was demonstrated that trade openness effectively acted as a causal factor for all the studied variables within the Tanzanian environment, as noted by Sanjo et al. (2022), who also found a uni-directional relationship between trade openness and GDP growth, while Yusuf and Omar (2019) reported no existence of a relationship between trade openness and the GDP growth rate.

Additionally, a uni-directional relationship was observed between external debt and employment growth in Tanzania, running from external debt to employment growth. It was also shown that external debt did not Granger-cause GDP growth, while a uni-directional relationship existed between external debt and trade openness, running from external debt to trade openness. Overall, it was suggested that external debt Granger-caused all the factors studied during the specified period in the Tanzanian environment, as Ademola (2023) identified a uni-directional causality between trade openness to trade and external debt.

## CONCLUSION, RECOMMENDATIONS AND FURTHER STUDY

The paper examined the impact of trade openness and external debt on employment growth using time series data from 1990 to 2022, sourced from

the Bank of Tanzania and World Bank indicators. Due to the presence of lagged variables, the ARDL bounds test of cointegration was employed to assess both short- and long-run effects using STATA software. The findings indicated that, in the long run, trade openness, external debt, and foreign reserves hinder employment growth in Tanzania, despite the expectation that trade liberalisation and debt accumulation would enhance job creation. Conversely, GDP growth, external debt servicing, and foreign direct investment (FDI) emerged as effective macroeconomic tools for employment generation. In the short run, GDP growth and external debt servicing negatively impacted employment, whereas trade openness and external debt contributed positively. The study concludes that these factors function as a double-edged sword, significantly impairing employment growth.

The inverse relationship between external debt and employment growth suggests that increased debt leads to higher debt servicing, which crowds out public investment and limits job creation. Redirecting external resources towards domestic sectors such as agriculture, manufacturing, and vocational training could enhance production, create surpluses, and improve the trade balance. Increased domestic production would reduce reliance on imports, boost local trade, and strengthen government revenue, thus aiding in budget deficit management (Yusuph & Omar, 2019; Sanjo et al., 2022). The paper recommends revising trade policies to eliminate barriers and enhance local participation in international trade. Additionally, borrowing should be restricted to productive investments rather than consumable projects, and debt servicing frameworks should prioritise short-term repayment strategies. Further research can examine the institutional manangement which hold the external resources and how they channel them in realizing their targeted goals. The studied variables can be altered by adopting export and import, the same applied to other variables to study how they affect employment growth in the country.

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## APPENDIX

### Appendix 1: Granger Causality Wald Tests Results

| Excluded | Chi-sq | Prob Value | Decision |
|---|---|---|---|
| Dependent variable*: ln-**employment growth*** | | | |
| GDP | 23.869 | 0.000 | Reject $H_0$ |
| Openness to trade | 17.309 | 0.001 | |
| Public external debt | 3.476 | 0.324 | |
| External debt servicing | 4.9801 | 0.173 | |
| FDI | 18.579 | 0.000 | |
| Foreign reserve | 12.549 | 0.006 | |
| ALL | 86.492 | 0.000 | |
| Dependent variable: *ln-**GDP*** | | | |
| Employment growth | 7.0469 | 0.070 | Reject $H_0$ |
| Openness to trade | 47.895 | 0.000 | |
| Public external debt | 20.502 | 0.000 | |
| External debt servicing | 11.555 | 0.009 | |
| FDI | 22.197 | 0.000 | |
| Foreign reserve | 9.7617 | 0.021 | |
| ALL | 305.41 | 0.000 | |
| Dependent variable: *ln-* Openness to trade | | | |
| Employment growth | 8.3223 | 0.040 | Reject $H_0$ |
| GDP | 5.3177 | 0.150 | |
| Public external debt | 1.0352 | 0.793 | |
| External debt servicing | 5.5422 | 0.136 | |
| FDI | 13.008 | 0.005 | |
| Foreign reserve | 10.363 | 0.016 | |
| ALL | 65.467 | 0.000 | |
| Dependent variable: *ln-* Public external debt | | | |
| Employment growth | 21.216 | 0.000 | Reject $H_0$ |
| GDP | 5.9508 | 0.114 | |
| Openness to trade | 10.503 | 0.015 | |
| External debt servicing | 32.499 | 0.000 | |
| FDI | 17.067 | 0.001 | |
| Foreign reserve | 2.4313 | 0.488 | |
| ALL | 116.88 | 0.000 | |

**Source**: Author's Compilation, 2024

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