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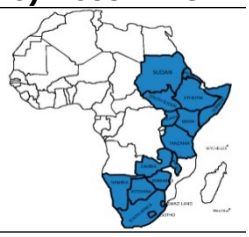

Youth Unemployment and Income Inequality: Exploring the Linkages in Tanzania

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ABSTRACT

This study investigates the intricate relationship between youth unemployment and income inequality in Tanzania, aiming to understand the underlying linkages and evaluate the efficacy of various policy responses. Using a time series analysis, the study models the youth unemployment rate as the dependent variable, with GDP growth rate, inflation rate, income inequality, youth literacy rate, government expenditure on education, and population growth rate as independent variables. Data spanning from 1990 to 2022 are collected from reputable sources, including the World Bank and the Tanzania National Bureau of Statistics. Preliminary findings suggest significant correlations between youth unemployment and key economic indicators, particularly GDP growth and government expenditure on education. The result revealed that income inequality significantly affect youth an employment. This might occur due to the implementation of government policy such as redistributive policy which aims to promote social equity, reduce poverty and ensure fir allocation of resources within the society.

1.0 Introduction

1.1 Background of the Study

Unemployment and income inequality are complex and interconnected issues that have significant impact on individuals, families, and societies. According to OECD. (2023) and World Bank (2023), unemployment refers to the situation where individuals who are willing and able to work are unable to find suitable employment opportunities. It is a multifaceted issue influenced by economic, social, and political factors. High levels of unemployment can have detrimental effects on both individuals and economies, leading to decreased consumer spending, lower tax revenues, and increased government spending on social welfare programs. Policies aimed at reducing unemployment often focus on promoting economic growth, investing in education and skills training programs, supporting entrepreneurship and small businesses, providing unemployment benefits and job retraining programs, and implementing labor market reforms. Amani, J. (2017) discussing possible counter-strategies to employment which include the choice of field of study, job-skills mismatch, ineffective labour market information system and gaps in the employment policy. Factors contributing to unemployment include economic downturns, technological advancements leading to job automation, shifts in global trade patterns, inadequate education and skills mismatch, and structural issues within labor markets. Altiman, M (2020) in the paper 'The State of Employment and Unemployment in South Africa' argued that the main contributors to growing unemployment include expanding labor force due to population growth, increased participation rates due to the end of apartheid, and freedom of movement to urban and no net increase in the number of job opportunities.

Income inequality refers to the unequal distribution of income and resources among individuals and groups within a society, resulting in disparities in access to basic human needs such as food, shelter, clean water, healthcare, and education (UNDP. 2020). According to World Bank. (2023), income inequality measures the extent to which income is distributed unevenly among a population. Income inequality is also linked to unequal participation in civil, social, and cultural life, where marginalized groups often lack a voice of decision-making processes. It is a worldwide issue with serious social and economic consequences. Like poverty, income inequality is both a cause and a consequence of unemployment. Those with lower income levels often face limited access to quality education and healthcare, restricting their job prospects and reinforcing the cycle

of inequality. Meanwhile high unemployment and underemployment can further widen the income gap (ILO. 2020).

Several factors contribute to income inequality. These include structural determinants such as national policies, economic systems, and societal norms that create and maintain unequal access to resources. A lack of investment in education, healthcare, and job creation exacerbates inequality. Systematic determinants such as corruption, discrimination, and political instability also play a role. Unequal treatment based on race, gender, or socioeconomic status results in unfair resource distribution. According to World Bank. (2016). efforts to address income inequality often require a multifaceted approach, including economic reforms, investment in social infrastructure, equitable taxation, inclusive labour markets, social protection programs, access to financial services, and empowerment initiatives targeting marginalized communities. Msigwa, R. and Kipesha, F. E. (2013) factors can be broadly categorized into Structural determinants, which include policies, economic structures, and societal norms, that lead to inequality. Lack of access to education, healthcare, and job opportunities are all structural barriers that hinder individuals and communities from breaking free from the cycle of poverty; Systematic determinants, issues like discrimination, corruption, and political instability

Youth unemployment and income inequality represent pressing social and economic challenges worldwide. With millions of young people entering the job market every year, the inability to secure stable and meaningful employment can have far-reaching consequences, both for individuals and society at large. According to ILO, (2023), youth unemployment refers to the situation where individuals between the ages of 15 and 24 are actively seeking employment but are unable to find suitable jobs. This phenomenon is often exacerbated by factors such as lack of education, skills mismatch, discrimination, and economic downturns. According to the International Labour Organization (2023), youth are three times more likely to be unemployed than adults. This prolonged joblessness among young people deepens income inequality by limiting their ability to earn, accumulate wealth, and access opportunities for social mobility.

Addressing the intertwined issues of youth unemployment and income inequality is paramount due to their intricate impact on society, the economy, and politics. Socially, both phenomena can lead to social exclusion, alienation, and marginalization, leaving young people disconnected from society and hindering personal and social development (Bell & Blanchflower, 2011). Moreover,

high levels of youth unemployment may escalate crime rates, substance abuse, and mental health issues, posing significant challenges to social cohesion and community well-being (ILO, 2020). Economically, youth unemployment represents a squander of human capital and talent, depriving economies of the innovative contributions young people could offer to growth and prosperity. Persistent youth unemployment can result in lost earnings and decreased lifetime earning potential, fostering increased dependency on social welfare programs and straining government budgets (OECD, 2017). Politically, elevated levels of youth unemployment and income inequality can stoke social unrest, political instability, and disillusionment with political institutions, particularly among marginalized youth. Governments and policymakers may face pressure to implement effective policies and programs to tackle youth unemployment and income inequality, ensuring social order, legitimacy, and political stability. By comprehensively addressing these issues, societies can foster inclusive economic growth, enhance social cohesion, and bolster democratic governance. Moreover, investing in opportunities for young people can yield long-term dividends by unlocking their potential as catalysts for innovation, productivity, and sustainable development. Filmer and Fox (2014) argue that without major reforms in education, governance, and job creation policies, youth unemployment will continue to reinforce economic inequality.

While existing research discusses youth unemployment and income inequality as important development challenges, there is critical gap in integrated, empirical studies that examine how youth unemployment structurally and systematically reinforces income inequality, particularly within developing country contexts. Furthermore, the social and political consequences of this intersection such as social exclusion, unrest, and declining civic trust are underexplored. This necessitates the need for interdisciplinary, youth-centered research that investigates the bidirectional relationship between unemployment and inequality.

1.2 **Overview of unemployment and income inequality in Tanzania**

In Tanzania, unemployment and income inequality represent significant hurdles with far-reaching consequences for individuals, communities, and the nation's developmental trajectory. Youth unemployment stands out as a critical issue, despite efforts to enhance education and vocational training, many young Tanzanians struggle to secure suitable employment. Additionally, underemployment is prevalent, with individuals often working fewer hours or in roles that underutilize their skills (URT, 2021). Moreover, a substantial portion of the workforce operates in

the informal sector, lacking job security and adequate working conditions. Income inequality is particularly acute in rural areas, where limited resources and reliance on rain-fed agriculture perpetuate hardship. Urban centers also grapple with income inequality exacerbated by rapid urbanization, inadequate housing, and income disparities, leading to the proliferation of informal settlements. Tanzanian households face vulnerability to various shocks, including economic downturns and health crises, which further exacerbate poverty and inequality. While the government has implemented income inequality reduction strategies and youth empowerment programs, challenges such as access to finance and market linkages persist (URT, 2022). Social safety net programs provide crucial support, yet significant obstacles remain in addressing the root causes of unemployment and income inequality, particularly in rural and marginalized communities. Sustainable solutions necessitate holistic approaches that foster inclusive economic growth, equitable opportunities, and comprehensive social protection for all Tanzanians.

1.3 Statement of the problem

In Tanzania, youth unemployment and income inequality are pressing challenges that intersect in complex ways, impacting both individuals and the broader society. Despite efforts to address these issues through various policies and programs, significant gaps persist in our understanding of the linkages between youth unemployment and income inequality, as well as the effectiveness of existing policy responses. This research sought to explore the multifaceted relationship between youth unemployment and income inequality in Tanzania, examining how one affected the other. Furthermore, it aimed to critically assess the efficacy of current policy responses in addressing these intertwined challenges. Key questions include: What are the underlying factors driving youth unemployment and poverty in Tanzania? How do these phenomena interact and reinforce each other? What are the existing policy interventions targeting youth unemployment and income inequality, and to what extent have they been successful? By addressing these questions, this research aims to provide insights that can inform the development of more targeted and effective policy measures to alleviate youth unemployment and income inequality in Tanzania. Generally, the study investigates the relationship between youth unemployment and income inequality and explore the linkage in Tanzania and specifically the study examines how income inequality affect youth unemployment in Tanzania.

2.0 Literature Review

2.1 Theoretical Review

The relationship between unemployment and income inequality is most effectively explained through the structuralist theory, which emerged prominently in the 1950s and 1960s, specifically through the work of economists like Lewis, A. (1954) and Prebisch, R. (1950). This theory suggests that in many economies especially developing countries labour markets are divided into informal (traditional) and formal (modern) sector. Structural unemployment arises because the formal sector, which offers higher wages and better working conditions, cannot absorb the surplus labour from the informal sector. As a result, a significant portion of the population remains underemployed or unemployed, leading to persistent income inequality. The Keynesian (1936) complements this by explaining that during economic downturns, unemployment rises, reducing the bargaining power of workers and suppressing wages, which disproportionately affects lower-income groups widens inequality. Marxian theory (1867) also addresses this issue, arguing that capitalism inherently maintains a reserve army of labour (the unemployed) to keep wages low and profits high for the capitalist class, thereby reinforcing income inequality. In modern economics, Piketty's work (2013) has reignited this discussion, showing how wealth concentration increases when the return on capital exceeds economic growth, especially in contexts of high unemployment. Thus, unemployment not only limits income opportunities for the poor but also contributes structurally to widening income gaps, reinforcing long-term inequality.

2.2 Empirical Review

Galbraith, J. K. (2012) reviews the global relationship between unemployment and income inequality, arguing that the two are structurally linked through labour market institutions and globalization. The study emphasizes how weakened labour protections, outsourcing and financial deregulation have disproportionately harmed low and middle-income workers, increasing unemployment and income disparities. The World Bank (2023) provides a comprehensive analysis of employment patterns and income inequality in Tanzania. The analysis finds that while economic growth has been steady, it has not translated into broad-based employment. High levels of underemployment and informality, particularly among youth and rural populations, sustain poverty and inequality.

According to Msigwa and Kipesha (2013), their study based on Determinants of Youth Unemployment in Developing Countries conducted in Tanzania indicates that various factors such as gender, geographical location, education, skills, and marital status significantly influence youth employment status in Tanzania. The findings suggest several recommendations. Firstly, there's a need for government and policymakers to review job market laws and regulations to facilitate a smoother transition for youth from education to employment. Additionally, specific interventions should be implemented, focusing on creating more formal job opportunities and enhancing job market regulations for young people, ensuring that those with education or skills can effectively contribute to the country's development. Furthermore, it is suggested that laws and regulations concerning gender balance in the job market should be strengthened to provide equal opportunities for youth with similar levels of education or skills.

Banks, N. (2016), Poverty among youth in Arusha is widespread, resulting in limited access to necessities such as education, healthcare, and adequate housing. This lack of resources perpetuates a cycle of poverty, making it difficult for youth to improve their circumstances. Employment opportunities for youth in Arusha are often scarce and precarious. Many young people struggle to find stable jobs with fair wages, leading to high levels of unemployment and underemployment. This situation not only affects individual livelihoods but also contributes to broader economic challenges within the community. Insecurity in livelihoods further compounds the difficulties faced by youth in Arusha. Instability in employment and income sources makes it challenging for young people to plan for the future and invest in their personal and professional development. This insecurity also undermines social cohesion and stability within the community. Addressing the issues of youth poverty, employment, and livelihoods in Arusha requires comprehensive strategies that focus on creating sustainable economic opportunities, improving access to education and skills training, and fostering an enabling environment for youth empowerment and entrepreneurship. By investing in these areas, stakeholders can work towards building a more inclusive and prosperous future for youth in Arusha and beyond.

Odeh, A. M. and Okoye, O. C. (2014) studied poverty reduction policy and youth unemployment in Nigeria, where they examined the dynamic of poverty reduction policy about youth unemployment. Nigeria, with its large youth population, faces a complex economic landscape where poverty disproportionately affects the younger demographic. While various poverty

alleviation initiatives exist, including social welfare programs and economic empowerment schemes, they often fall short of addressing the root causes of youth unemployment. Factors such as inadequate access to quality education, skills mismatch, lack of job opportunities in key sectors, and a burgeoning informal economy contribute to high youth unemployment rates. Effective poverty reduction policies must prioritize targeted interventions tailored to the specific needs of young people, such as skills development programs, entrepreneurship support, and initiatives that promote inclusive economic growth. Additionally, addressing structural issues within the economy, enhancing the business environment, and fostering innovation and technology-driven solutions can create sustainable pathways for youth employment and contribute to long-term poverty reduction in Nigeria.

According to Holmes, P., Chapman, T., & Baghurst, T. (2013)., there is strong empirical evidence that employment creation generally increases incomes and reduces poverty in low-income countries at both micro and macro levels, and a significant body of research decomposes the effect of various factors on poverty, illustrating the critical role of unemployment as a major determinant of poverty in both middle- and low-income countries. On the other hand, the study by Islam (2004) revealed that employment has been viewed as a key mechanism for the transmission of economic growth as well as poverty reduction both directly and indirectly by providing income while also stimulating demand at both the micro and macro levels.

Agenda 2030 explores that youth employment and economic empowerment represent crucial pillars of societal development. The presence of meaningful work not only shapes the trajectory of young individuals' lives but also reverberates throughout local communities, nations, and the global landscape. The current challenge entails simultaneously generating employment opportunities for the burgeoning youth populace while addressing pertinent issues such as skills mismatches, working poverty, and the suboptimal transition from school to work, particularly prevalent in developing nations. The creation of new avenues, skills enhancement programs, microcredit initiatives, SME support, and educational investments are vital for leveling the playing field for disadvantaged youth. These measures equip them with the knowledge and resources necessary to compete effectively in the global labor market.

3.0 Methodology

3.0 Introduction

This section details the methodology for data collection, preprocessing, model selection, estimation, evaluation, and forecasting. The objective of this time series analysis is to explore the linkages between the youth unemployment rate (dependent variable) and various economic and social factors (independent variables) and to evaluate the effectiveness of policy responses in Tanzania. The independent variables include GDP growth rate, inflation rate, income inequality, youth literacy rate, government expenditure on education, and population growth rate.

3.1 Data Collection

Data for the youth unemployment rate and the independent variables collected from reliable sources such as the World Bank, International Monetary Fund (IMF), Tanzania National Bureau of Statistics, and other relevant agencies. The data will cover a period from 1990 to 2022 with annual observations.

3.2 Multicollinearity test

A multicollinearity test conducted by using the Variance Inflation Factor (VIF) to detect if there is an inter-correlation among the independent variables. Kutner, M. H. (2004), multicollinearity is a phenomenon that occurs when two or more predictor variables in a regression model are highly correlated with each other. This can cause problems in the estimation of regression coefficients and can lead to unstable and unrealistic results. Fox, J. (2019) and Belsley, D. A. et al (1982) revealed that VIF measures the degree to which the variance of an estimated regression coefficient is increased due to multicollinearity, where VIF values greater than 5 or 10 are often used as a cutoff to indicate the presence of multicollinearity.

3.3 Lag Length Selection

Considering the effect of lag length in time series data analysis, the number of lags to include in the model was determined using Akaike Information Criteria (AIC) among other different criteria. This approach uses statistical measures such as the Akaike Information Criterion (AIC), Bayesian

Information Criterion (BIC), and Schwarz Information Criterion (SIC) to compare the fit of different lag lengths. The lag lengths that yield the lowest value of the information criterion are typically selected as the optimal lag length (Burnhan & Anderson, 200 4 Claeskens & Hjort, 2008).

3.4 Test for Stationarity

Unit root tests conducted to provide information about the stationarity of the time series variables to avoid superior results and Augmented Dickey fuller tests will be applied to determine whether or not the data is stationary. According to Enders, W. (2015), ADF tests are most appropriate for medium – long time series data (between 25 – 100) and they produce the same result. The test has the null hypothesis that there is a unit root in a time series sample while alternatively there is no unit root in time series data. The study will use a 5% level of significance and the decision rule will be to reject the null hypothesis if the ADF statistic is less than the critical value (0.05). The ADF will be estimated as the following equation:

$$\Delta Y_t = \beta + \delta Y_{t-1} + \sum_{i=1}^{m} \alpha_i \Delta Y_{t-1} + \varepsilon_t$$

Where; Δ is the difference operator, ε_t is a pure white noise error term, and m is the maximum number of lags.

If the results obtained from ADF indicate that the data is stationary, it means that the time series variables are not affected by the trends, seasonal effects, or other non – stationary characteristics.

3.5 Estimation Technique

The study used Autoregressive Distributed Lag Model (ARDL-ECM) to estimate the results. On the other hand, if the test revealed that the data are non – stationary then taking the first or second difference will help to remove the trend or seasonality that might be present, or applying seasonal adjustment if the data exhibits a seasonal pattern will help to remove seasonal effects and achieve stationarity. The equation is specified as follows:

$$\lambda_{3i} \Delta II_{t-i} + \sum_{i=0}^{1} \lambda_{4i} \Delta YLR_{t-i} + \sum_{i=0}^{1} \lambda_{5i} \Delta GEE_{t-i} + \sum_{i=0}^{1} \lambda_{6i} \Delta PGR_{t-i} + \sum_{j-1}^{1} \delta_j \Delta \mathrm{YUR}_{t-j} + \beta_{ECM} (YUR_{t-1} - \gamma_0 - \gamma_1 GDPgr_{t-1} - \gamma_2 IR_{t-1}$$

$$\varepsilon_t$$

Table 1: Variable Descriptions

Variable	Descriptions
YUR	*Youth Unemployment Rate* Percentage of unemployed youth in the labor force
GDPgr	*GDP growth rate* Overall economic growth, which can influence youth employment opportunities
IR	*Inflation Rate* This is inflation which will impact the cost of living and purchasing power of households.
II	*Income Inequality* Will be measured by Gini coefficients ranging from 0 (perfect equality) to 1 (maximum inequality)
YLR	*Youth Literacy Rate* Percentage of youth who are literate.
GEE	*Government Expenditure on Education* Investment in education and skill development initiatives for youth
PGR	*Population Growth Rate*

4.0 Presentation of Results and Discussion

4.1 Descriptive Analysis

Table 2 below presents a summary of descriptive statistics for the variables used in this study covering from 1990 to 2022, with a total of 33 observations. The youth unemployment rate ranges from 3.463 to 6.912 with a mean value of 5.336424 and standard deviation of 1.15901. The amount spends on education which is proportion to GDP varies from 7.457 to 24.3965, which provide a mean of 15.26235 and deviate from the mean by 3.951002. The GDP growth rate varies from

0.5843 to 7.6722 with mean of 5.158573 and standard deviation of 1.972121. The Gini coefficient has a minimum value of 4.520401 and maximum value of 75.9381 with average of 27.66987 and a high relative standard deviation from the mean of 21.83594. The inflation rate recorded the average of 11.58615 with relatively standard deviation from the mean of about 9.457319 and ranges from 3.2903 to 35.8268. In addition, literacy rate which in most cases help to provide the qualification and understanding for employee varies from 66.5 percent to 88.4 percent with mean of 78.0747 and standard deviation of 6.351183. The population growth rate on the other hand helps to provide how labour market changes ranges from 1.9 to 3.97 with mean value of 2.898182 and standard deviation of 0.3971182.

Table 2: Descriptive Statistics Analysis

Variable	Obs	Mean	Std. Dev.	Min	Max
$YUrate_t$	33	5.336424	1.15901	3.463	6.912
$ESGDP_t$	33	15.26235	3.951002	7.457	24.3965
$GDPGr_t$	33	5.158573	1.972121	0.5843	7.6722
$GCoe_t$	33	27.66987	21.83594	4.520401	75.9381
$InfRate_t$	33	11.58615	9.457319	3.2903	35.8268
$Lrate_t$	33	78.0747	6.351183	66.55	88.4
$PGrate_t$	33	2.898182	0.3971182	1.9	3.97

4.2 Test for Stationarity (Unit Root Test)

The study considered unit root test based on the series of observations for each variable. The test aimed at indicating if the variables have a unit root or not. With the purpose of this study the Augmented Dickey Fuller test employed to determine if the variables are stationary or not stationary. The null hypothesis for unit root test states that the unit root is present in the series.

Table 3. Unit Root Test Before Differencing

	No. Of	No. of	Test	Dickey-Fuller Critical Value			
Variable	Obs	Lags	Statistics	1%	5%	10%	P-Value
$YUrate_t$	32	0	-0.890	-3.702	-2.980	-2.622	0.7911
$d.ESGDP_t$	31	0	-2.045	-3.702	-2.980	-2.622	0.2670
$d.GDPGr_t$	31	0	-2.555	-3.702	-2.980	-2.622	0.1027
$dd.GCoe_t$	31	0	-0.048	-4.316	-3.572	-3.223	0.9937
$InfRate_t$	32	0	-2.716	-3.702	-2.980	-2.622	0.0713
$Lrate_t$	32	0	-1.107	-3.702	-2.980	-2.622	0.7122
$PGrate_t$	32	0	-2.793	-3.702	-2.980	-2.622	0.0593

The results of the Augmented Dickey-Fuller (ADF) unit root tests on Table 3 above indicate that two variables which are inflation rate and population growth rate are stationarity at level, since the test statistics are less than the corresponding 10% critical values. This implies that the null hypothesis of a unit root rejected for these two variables at 10% level of significance. The rest of the variables have p-values which are greater than 10% critical values, implies that the null hypothesis of a unit root (non-stationarity) cannot be rejected for any of the variables even at the 10% level of significance. It is then necessary to difference them to determine if they become stationary.

Table 4. Unit Root Test After First and Second Differencing

Variable	No. Of Obs	No. of Lags	Test Statistics	Dickey-Fuller Critical Value			
				1%	5%	10%	P-Value
$YUrate_t$	32	0	-4.596	-3.702	-2.980	-2.622	0.0001
$d.ESGDP_t$	31	0	-5.704	-3.309	-2.983	-2.623	0.0000
$d.GDPGr_t$	31	0	-7.443	-4.325	-3.576	-3.226	0.0000
$dd.GCoe_t$	31	0	-5.683	-3.716	-2.986	-2.624	0.0000
$InfRate_t$	32	0	-2.716	-3.702	-2.980	-2.622	0.0713
$Lrate_t$	32	0	-5.832	-3.702	-2.980	-2.622	0.0000
$PGrate_t$	32	0	-2.793	-3.702	-2.980	-2.622	0.0593

The results presented in Table 4 above show that two variables which are inflation rate and population growth rate are stationary at level while Youth unemployment rate, spending on education, GDP growth rate and Literate rate are stationary after first difference and Gini coefficient is stationary after second difference. This step is essential before applying the ARDL model, which requires that all included variables be either I(0) or I(1), but not I(2). The ARDL model is only applicable when the variables are integrated of order zero I(0) or order one I(1), or a combination of both. It became invalid if any variable is integrated of order two I(2) and above (Nkoro, E., & Uko, A. K., 2016)

4.3 Optimal Lag Selection for the Model

The optimal lag is selected using the Vector Autoregressive (VAR) lag order selection criteria to determine the number of lags to be used in the model. The lag chosen is the one with stars, where Akaike Information Criteria (AIC) have the lowest value compared to other criteria. The AIC is superior to the Likelihood Ratio test (LR) in the case of a small sample of sixty observations and below, in the sense that they minimize the chance of under-estimation while maximizing the

chance of recovering the true lag length (Liew, 2004). In this study, lag selections will be considered by cautiously using the access number of lags to avoid the risk of multicollinearity, which may impact the accuracy of the study findings and lead to less precise coefficient estimates. The results of Table 5 below.

Table 5. Lag order selection criteria results (AIC)

Variable	Lag	LL	LR	df	p-value	FPE	AIC
Yurate	0	-44.4169				1.34226	3.1322
	1	-21.2749	46.284*	1	0.000	0.291564	1.60516
	2	-19.4714	3.6069	1	0.058	0.275993	1.54975
	3	-19.2667	0.40937	1	0.522	0.291853	1.6046
	4	-17.4118	3.7099	1	0.054	0.275613*	1.54564*
PGrate	0	-14.7492				0.173479	1.08615
	1	-7.87342	13.752	1	0.000	0.115703	0.680926
	2	-2.29239	11.162	1	0.001	0.084404	0.364992
	3	1.60802	7.8008*	1	0.005	0.069173	0.164964
	4	2.79709	2.3781	1	0.123	0.068394*	0.151925*
Lrate	0	-89.1288				29.3099	6.21578
	1	-60.9612	56.335*	1	0.000	4.50187*	4.34215*
	2	-60.9278	0.06673	1	0.796	4.81473	4.40881
	3	-60.9167	0.02214	1	0.882	5.15986	4.47702
	4	-60.8708	0.0919	1	0.762	5.5202	4.54281
InfRate	0	-98.7654				56.97	6.88037
	1	-76.8668	43.797*	1	0.000	13.4831	5.43909
	2	-76.3347	1.0642	1	0.302	13.9325	5.47136
	3	-74.6355	3.3985	1	0.065	13.2902*	5.42314*
	4	-74.2276	0.81584	1	0.366	13.8678	5.46397
GCoe	0	-129.519				475.081	9.00133
	1	-48.502	162.03	1	0.000	1.90644	3.48289
	2	-46.7275	3.5489	1	0.060	1.80823	3.42948
	3	-44.475	4.5601*	1	0.033	1.65715*	3.34121*
	4	-44.2717	0.35159	1	0.553	1.75707	3.39805
ESGDP	0	-75.6746				11.589	5.2879
	1	-63.9627	23.424*	1	0.000	5.53723*	4.54915*
	2	-63.9613	0.00279	1	0.958	5.93512	4.61802
	3	-63.0971	1.7283	1	0.189	5.99713	4.62739

	4	-63.0926	0.00911	1	0.924	6.43429	4.69604
GDPGr	0	-54.2461				2.64382	3.81007
	1	-45.8139	16.864*	1	0.000	1.58384	3.29751
	2	-44.6422	2.3433	1	0.126	1.56602*	3.28567*
	3	-44.5706	0.14333	1	0.705	1.67127	3.34969
	4	-43.1912	2.7587	1	0.097	1.6309	3.32353

4.4 Model Estimation

4.4.1 Discussion of the Long-Run and Short-Run Relationship Results of the Youth unemployment and Income Inequality

The negative and significant coefficient shows that about 54 percent of any deviation from the long-run equilibrium corrected each year. This suggests that there is an average of adjustment backs to its long-run equilibrium after an expected or external forces such as economic crises, policy shocks, and demand and supply shocks. The long-run coefficient for population growth rate (PGrate) has a statistically significant (at a 90 percent confident) negative effect on youth unemployment. This negative and significant relationship indicates that a one percent increase in population growth is associated with a 4.033543 percentage point decrease in youth unemployment. Literate rate shows negative and significant long-run relationship with youth unemployment, that a one percent increase in literate rate is associated with an average 0.2706819 decrease in youth unemployment. The long-run coefficient for Gini coefficient (GCoe) has a statistically significant (at a 90 percent confident) positive effect on youth unemployment. The relationship indicates that a one percent increase in Gini coefficient is associated with a 0.1110243 percentage point increase in youth unemployment. Furthermore, the results show the short- run relationship between explanatory and youth unemployment rate. Starting with autoregressive terms, the second lag of the differenced youth unemployment rate is statistically significant with p – values = 0.004, suggesting that past increases in youth unemployment exert a strong and positive influence on current youth unemployment. A positive coefficient indicates that a one percent increases in past youth unemployment is associated with an average 0.3833 increase in current youth unemployment rate. The population growth rate has three lagged differences and all are highly significant. The first difference has a large and positive coefficient of 2.8146 (p – value = 0.000), indicating that a one percent point increase in population growth in the current year is associated with an average 2.8146 increases in youth unemployment. The first lag and second lag

are also statistically significant with positive coefficients of 0.9105 (p-value = 0.003) and 1.0625 (p – value = 0.001) respectively, reinforcing the ideas that rising population pressure contributes significantly to short-term increases in youth unemployment. The literacy rate in its first difference is positive and statistically significant with a coefficient of 0.1172 (p - value = 0.015). This result is somewhat counterintuitive, as it suggests that in the short run, an increase in literacy is associated with a slight increase in youth unemployment. This could reflect a lag in labour market absorption of more educated youth or a mismatch between skills and job opportunities. For the inflation rate, the first difference has a negative coefficient of -0.0328, with a p-value of 0.088, indicating a weakly significant effect. This suggests that higher inflation might slightly reduce youth unemployment in the short term, perhaps due to inflation-linked economic activity. However, the second lag indicates a stronger positive effect (coefficient = 0.0899, p-value = 0.004), implying that inflationary pressures tend to push unemployment upward after a delay. Income inequality, as measured by the Gini coefficient, have a strong and statistically significant impact on youth unemployment. The first different has negative coefficient with a p – value of 0.000, indicating a highly significant relationship. This means that a short – term decrease in income inequality (such that a reduction in the Gini coefficient) is associated with a 0.4273 percentage point reduction in the youth unemployment rate. And the lagged difference has a negative coefficient (-0.978) with p – value of 0.096, suggesting a marginally significant delayed effect – previous reductions in inequality may continue to slightly reduce youth unemployment in subsequent periods. GDP growth also plays a significant short-run role in the model. The first difference has a positive coefficient and statistically significant with p – value = 0.028, indicating that a one percent increase in GDP growth rate is associated with an average 0.2428 increase in youth unemployment. The first and second lags are both statistically significant with coefficients of 0.1627 (p – value = 0.014) and 0.1711 (p – value = 0.001) respectively. The results are very interesting, the positive signs indicate that GDP growth might temporarily raise youth unemployment, due to structural shifts or labour market adjustments. The education spending (ESGDP)—measured as the share of GDP allocated to education—has a statistically significant negative effect on the youth unemployment rate. The first difference has a coefficient of -0.1103 and a p-value of 0.011, indicating that a 1 percentage point increase in the share of GDP spent on education is associated with a 0.11 percentage point decrease in youth unemployment, all else equal.

Table 6. Long-Run and Short-Run Relationship Results

D.YUrate	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
ADJ						
YUrate						
L1	-0.5428878	0.1462669	-3.71	0.008	-0.8887541	-0.1970215
LR						
PGrate	-4.033543	1.372404	-2.94	0.022	-7.278762	-0.7883239
Lrate	-0.2706819	0.1048658	-2.58	0.036	-0.51865	-0.0227137
InfRate	0.0108181	0.0396791	0.27	0.793	-0.0830081	0.1046442
GCoe	0.1110243	0.0502364	0.21	0.063	-0.0077658	0.2298145
GDPGr	-0.3845262	0.3010672	-1.28	0.242	-1.096437	0.3273845
ESGDP	0.1322927	0.0990791	1.34	0.224	-0.1019922	0.3665776
SR						
YUrate						
LD	0.0331125	0.1130171	0.29	0.778	-0.2341304	0.3003554
L2D	0.3832633	0.0897756	4.27	0.004	0.1709776	0.5955489
PGrate						
D1	2.814646	0.3228139	8.72	0.000	2.051313	3.57798
LD	0.9104656	0.2036921	4.47	0.003	0.4288105	1.392121
L2D	1.06251	0.1893719	5.61	0.001	0.6147168	1.510304
Lrate						
D1	0.1171809	0.0363506	3.22	0.015	0.0312254	0.2031364
InfRate						
D1	-0.0327938	0.0165257	-1.98	0.088	-0.071871	0.0062834
LD	-0.0047731	0.0122168	-0.39	0.708	-0.0336611	0.0241149
L2D	0.0898638	0.0208267	4.31	0.004	0.0406164	0.1391112
GCoe						
D1	-0.427322	0.0649314	-6.58	0.000	-0.5808603	-0.2737836
LD	-0.0977904	0.0508377	-1.92	0.096	-0.2180024	0.0224217
GDPGr						
D1	0.2427715	0.0879753	2.76	0.028	0.034743	0.4508
LD	0.1626993	0.0497918	3.27	0.014	0.0449603	0.2804383
L2D	0.1710889	0.0323607	5.29	0.001	0.0945679	0.2476099
ESGDP						
D1	-0.1102609	0.0319888	-3.45	0.011	-0.1859024	-0.0346194
_cons	20.14422	1.748033	11.52	0.000	16.01078	24.27766

4.4.2 Cointegration Test (ARDL Bounds Test)

The ARDL Bounds Test by Pesaran, Shin, and Smith (2001) is used to determine the existence of long-run relationship between variables. The table below categorize into two, the F– statistic and t – statistic. The computed F-statistic is 36.406, which is significantly higher than the upper bound critical value for the 1% significance level (4.43). Therefore, the null hypothesis of "no level relationship" is rejected, indicating strong evidence of a long-run cointegrating relationship among the variables. Moreover, the t-statistic for the lagged level term is -3.712, which is also below the lower bound of -3.43 at the 1% significance level, further supporting the rejection of the null hypothesis. Therefore, the results strongly suggest a stable long-run relationship among the variables.

Table 7. Pesaran/Shin/Smith (2001) ARDL Bounds Test

H_0: no levels relationship F = 36.406

t = -3.712

Critical Values (0.1-0.01), F-statistic, Case 3

	[I_0] L_1	[I_1] L_1	[I_0] L_05	[I_1] L_05	[I_0] L_025	[I_1] L_025	[I_0] L_01	[I_1] L_01
k_6	2.12	3.23	2.45	3.61	2.75	3.99	3.15	4.43

Critical Values (0.1-0.01), t-statistic, Case 3

	[I_0] L_1	[I_1] L_1	[I_0] L_05	[I_1] L_05	[I_0] L_025	[I_1] L_025	[I_0] L_01	[I_1] L_01
k_6	-2.57	-4.04	-2.86	-4.38	-3.13	-4.66	-3.43	-4.99

4.4.3 Serial Correlation Test

A serial correlation test assesses whether residuals in a time series analysis are correlated over time or by order. Serial correlation arises when variables are linked to their own past (lagged) values. To address this issue, the Breusch–Godfrey LM test for autocorrelation is applied, with results presented in Table 8. The test evaluates the null hypothesis that no serial correlation is present. Since the p-value exceeds 0.05, the null hypothesis cannot be rejected, indicating that the residuals do not exhibit significant serial correlation.

Table 8. Serial Correlation Test Breusch–Godfrey LM test for autocorrelation

Lags(p)	Chi2	df	Prob>c2
3	**4.046**	**3**	**0.2566**

4.4.4 Heteroskedasticity test

Detecting heteroskedasticity is important because its presence can affect the efficiency of the estimators and the validity of the statistical tests. The study considered the White test (i.e., Cameron & Trivedi's decomposition of IM-test) to check whether the variance of the errors (residuals) is constant or not. The result in Table 9 below shows that the p-value of the White test is 0.4140; this indicates that there is no statistically significant indication of heteroskedasticity at a 0.05 significant level. In other words, we fail to reject the null hypothesis of homoscedasticity, suggesting that the error variances are constant across observations.

Table 9. Cameron & Trivedi's decomposition of the IM-test

Source	Chi2	df	p-value
Heteroskedasticity	30.00	29	0.4140
Skewness	15.76	22	0.8274
Kurtosis	0.86	1	0.3573
Total	46.62	52	0.6850

5.0 Conclusion and Recommendations

The findings of the study reveal a strong long-run relationship between youth unemployment and income inequality in Tanzania. Income inequality significantly increases youth unemployment over time, highlighting how unequal access to opportunities limits younger people's chances of securing jobs. Conversely, in the short-run reductions in inequality lead to notable decreases in youth unemployment, suggesting that policies aimed at improving equity can have immediate positive effects. Other observations show that while population growth and literacy improvements eventually reduce youth unemployment, they initially cause upward pressure in the short term due to labour market absorption challenges. Moreover, short-run GDP growth surprisingly correlates

with increased youth unemployment indicating that growth is not automatically inclusive or job-generating for young people.

Based on these results, policies should prioritize reducing income inequality through targeted social programs, equitable education access, and progressive economic reforms. Investment in education, particularly in job-relevant skills and vocational training, is critical to addressing the mismatch between youth qualifications and labour market demands. Government efforts should also focus on making economic growth more inclusive, supporting labor-intensive industries and small enterprises that can absorb youth labor. Managing short-term population and inflationary pressures, while building a responsive and data-driven labour market, will be essential to create sustainable and equitable employment opportunities for Tanzania's growing youth population.

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