

Original Research Article

Impact of Unemployment on Economic Growth in Tanzania

ABSTRACT

This paper examined the impact of unemployment on economic growth in Tanzania. The study utilized co-integration and Dynamic Ordinary Least Square (DOLS) Approach to test the relationship between unemployment and economic growth and granger causality test to examine the causal relationship between variable. The unit root tests showed that the all variables were integrated after taking first difference, the Johansen co-integration result showed that the variables were co-integrated. The DOLS estimate showed that unemployment rate has positive relationship between unemployment and economic growth but insignificant influence on economic growth in Tanzania over the study period. In addition, granger causality test revealed that, there is a unidirectional causal relationship between unemployment and economic growth with direction from economic growth to unemployment. We suggest that there is the need for government to take urgent steps against the rising unemployment rate, because unemployment is a major impediment to social progress and results in waste of trained manpower.

Keywords: Unemployment, Economic Growth, DOLS, Causal Relationship

1. INTRODUCTION

The prevalence of unemployment in Tanzania is regarded as a major national developmental challenge, both economically and socially. Over the past years the rate of job creation in Tanzania has not matched with the growth in the labor force.

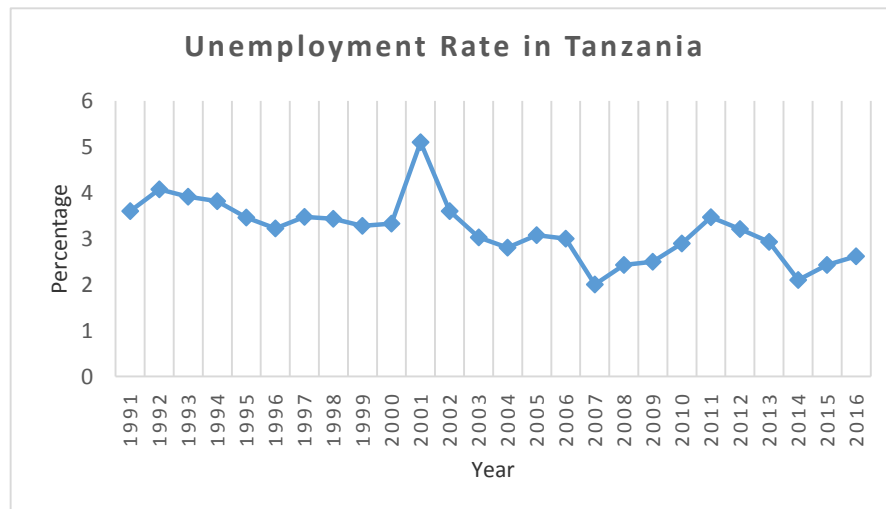


Figure 1: Unemployment Rate

Author compilation from WDI, 2017

The unemployment rate in Tanzania started to rise in the 1970s, when the country experienced an economic crisis, which was reflected by the fall in the annual Gross Domestic Product (GDP) growth rate from 5% to an average of 2.6% in the early 1980s, and fell further to about 1% at the beginning of the 1990s [1]. The figure 2 shows the economic growth trend in Tanzania.

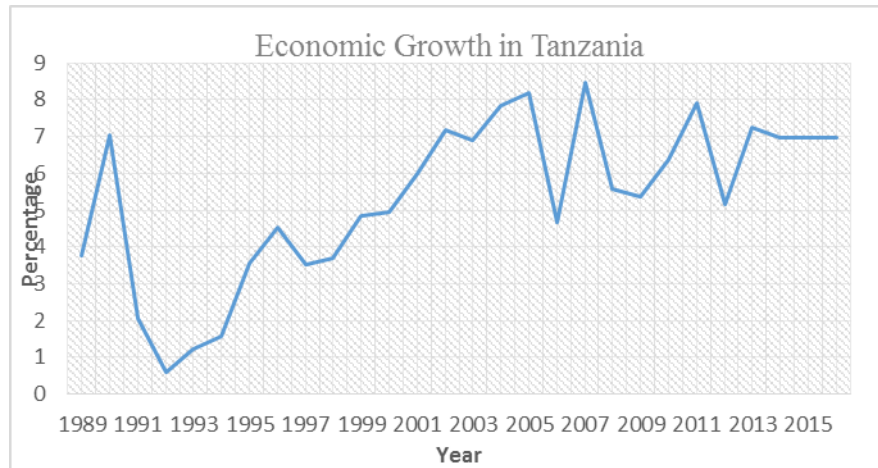


Figure 2: Economic growth
Author compilation from WDI, 2017

According to statistical information, Tanzania has overtime claimed strong real gross domestic product (RGDP) growth rate which measured at 7.1% to 8.4% from 2002 till 2007. However, this claim has appeared to be paradox. This is because, while the country was recording strong economic growth rate of 7.2%, annual unemployment rate was at the same time rising from 2% in 2005 to 2.9% in 2013, despite unemployment rate declined to 2.3 percent in 2016. This situation is so pitiful considering the fact that the country is blessed with a lot of human and natural resources capable of providing employment for the teeming youths in Tanzania. Furthermore, economic growth is yet to reflect to economic development of the country as poverty level and income inequality are still high, technological development is till at stagnant stage, immortal mortality rate and child mortality rate are still high, industries are still in shambles and development index of Tanzania is still very low.

The instability in the economic growth, as well as the increases in the unemployment level of the nation was blamed on the economic depression occasioned global. Consequently, the general price level of goods and services soar, and real wages of labour and purchasing power of the wage earners, and aggregate demand in the economy declined as well. It was against this background that IMF-World Bank supported structural adjustment programme (SAP) and other economic reforms were adopted by Tanzania government in order to promote economic activities in the economy.

Therefore, the current unemployment crisis has revived the academic and policy debate on the economic impact of unemployment on economic development. Despite the government conscious effort in managing the unemployment problem, the issue of unemployment has still been a burden to the Tanzania economy.

In this study, we apply Dynamic Ordinary Least Square (DOLS) on the data covering the period 1991 to 2015 to examine the relationship between unemployment and economic growth in Tanzania; and causal relationship between variables in Tanzania.

Our results indicate that unemployment rate has positive relationship between unemployment and economic growth but insignificant influence on economic growth in Tanzania over the study period. In addition, granger causality test revealed that, there is a unidirectional causal relationship between unemployment and economic growth with direction from economic growth to unemployment.

The rest of the paper is organized as follows: the second section provides a brief review of literature on the linkage between unemployment and economic growth; the third section describes the empirical methodology; and the fourth section discusses the empirical results. Finally, the paper provides concluding remarks of the study.

2. Literature Review

The review clearly shows that, however, there are many studies on the issue of unemployment and economic growth. Similarly, a weak point of these studies is that the methods used cannot capture the dynamic behavior of the data. Meanwhile, only few studies have investigated the impact of unemployment on economic growth in Tanzania. Yet, many studies support that negative relationship between unemployment and economic growth. For example, [2] analyzed the existence of an Okun type relationship between unemployment and output in Malaysia by employing time series data from 1970 to 2004. The study used Okun's first difference method and Granger causality test and found that in Malaysia there is the existence of a negative relationship between output growth and unemployment. The study also showed the presence of two-way causality between output growth and unemployment rate in Malaysia.

[3] investigated a coherent relationship between Economic Growth and Unemployment in Pakistan. They used the time series data since 1972 to 2006. They used the Augmented Dicky Fuller test for Unit Root, all the variable are stationary on first level difference then they used the Johansen Cointegration to find the long run relationship between variables. The results of Co-integration test intimate that GDP Growth, Unemployment, Labor, Capital, Openness of Trade have long run relationship. The overall results intimate that GDP growth has negative relationship with unemployment.

Similarly, [4] examined the impact of unemployment on real gross domestic product in Nigeria for period 2000-2008. The result showed that unemployment has impact on real gross domestic product (RGDP) and that inverse relationship exists between unemployment and real gross domestic product (RGDP) in Nigeria. Study conducted by [5] examine the relationship between unemployment and economic growth in Peru and Lima for the period of 1992 to 2012 using Ordinary Least Square (OLS) techniques. The results confirmed a negative relationship between unemployment and economic growth in both cases.

Few studies conducted in this area found no significant relationship between unemployment and economic growth. These studies suggested existence of positive relationship between unemployment and economic growth. For instance, [6] investigates the relationship between unemployment and economic growth in Jordan through the implementation of Okun's law , Using annual data covering the period 1970-2008, The empirical results reveal that Okun's law cannot be confirmed for Jordan. Thus, it can be suggested that the lack of economic growth does not explain the unemployment problem in Jordan.

Similarly, [7] investigated the relationship between unemployment and economic growth in Nigeria with the aim of testing the applicability of the theoretical proposition of the Okun's law which postulated that unemployment has negative relationship with economic growth, the study employed error correction model (ECM) and Johansen cointegration techniques to examine both the short run dynamics and long run relationship among the variables. The variables used in the study include real output growth, unemployment rate. The result indicated that both the short and the long run relationship exist between unemployment rate and real output growth in Nigeria.

113 3. Methodology

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115 We adopt the framework of popular neoclassical growth model developed by Robert Solow,
116 which was an extension to the Harrod- Domar model. The Solow's growth model attempts to
117 explain long-run economic growth by estimating capital accumulation or produced capital,
118 labour or population growth, and increase in productivity which is known as technological
119 progress. The model could be expressed as:-

120 $Y_t = f(K_t, L_t, A_t)$

121 Where:-

122 Y_t = the total output at time t

123 K_t = the accumulated or produced capital at time t

124 L_t = the labour at time t

125 A = the labour augmenting technology or knowledge

126

127 Thus, Y_t which is the total output is replaced with Growth Domestic Product (GDP); K_t which
128 is the produced capital is replaced with Capital formation; L_t which is labour is replaced with
129 two variables i.e., unemployment rate and Population (Labour force) and A_t is replaced with
130 other variable like export, FDI, Inflation etc. This result in a model such as:-

131

132 $RGDP = f(K, UEMPL, L)$

133 Where,

134 RGDP represents real gross domestic product as a common measure for economic growth,
135 UEMPL is unemployment rate which represents the total unemployment level in the
136 economy for the period under review, L as labour force measured by number of people living
137 in a given area as Inward and outward flows and stock and K as capital formation. The
138 equation 1 below is further illustrated in linear form as

139

140 $GDP_t = \alpha + \beta_1 LL_t + \beta_2 LK_t + \beta_3 LUEMPL_t + \mu \epsilon_t$

141 RGDP is the dependent variable; UEMPL, LL , and K are the explanatory variables; β_1 , β_2
142 and β_3 are the linear coefficients of the equations, α is the constant term and μ is the
143 stochastic variable.

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145 3.2 Variables Description

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147 Since the aim of this study is to determine the impact of unemployment on economic growth
148 in Tanzania, will use the model which consist relevant an important variables for robust
149 results. Growth Domestic Product (GDP) will be dependent variable and independent
150 variables will be Capital formation; unemployment rate and Population (Labour force). These
151 variables were explained below as follows:-

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Table 1. Variables description

Variable	Measure	Expected sign
Economic Growth	GDP per capita	
Population (PoP)	Measure the number of labor force as a proxy	+

Capital formation (K)	Gross Capital Formation as a proxy for capital formation;	+
Unemployment rate	Measure the total unemployment level in the economy for the period	-

159 **Source:** Author's construction (2017)

160 **3.3 Empirical methodology**

161 **3.3.1 Unit Root Test**

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163 This stage of estimation procedure tests the stationarity of the variables It helps to determine
164 the order of integration of the data serie. We employ Augmented Dickey-Fuller (ADF) unit
165 root test. If the time series are found to be stationary, it means that its variance, mean and
166 covariance are constant overtime.

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168 **3.3.2 Cointegration test**

169 The nest stage after confirm our variable ere stationary at first difference, we apply the
170 Johansen cointegration test to test long run relationship between variables. This test is
171 more appropriate than the Engle and Granger test since it allows more than one long-run
172 association and, it which is based on the ADF test which considers one long-run association.

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174 **3.3.3 Dynamic Ordinary Least Square (DOLS)**

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176 We apply Dynamic Ordinary Least Square (DOLS) approach proposed by [8] and [9] and
177 extended to panel analysis [10]. By incorporating leads and lags of the first differences of the
178 regressors endogenous feedback effects from the dependent variable to the regressors are
179 absorbed. In contrast to OLS, the DOLS estimator is therefore consistent, even if regressors
180 are endogenous. This method favored compared to Static OLS and Johansen and Juselius
181 approach due to the following reasons. Firstly, it is more robust and appropriate for small
182 sample size which implies more efficient and unbiased estimates [11] Secondly, the method
183 is more appropriate in case there endogenous relationship among the variables as in our
184 case. The DOLS Model is restructured as following:-

$$185 \quad LGDP_t = \alpha + \beta_1 LK_t + \beta_2 LUEMPL_t + \beta_3 LL_t + \sum_{j=-q}^p \phi_{ij} \Delta K_i + \sum_{j=-q}^p \partial_{ij} \Delta UEMPL_t + \sum_{j=-q}^p \omega_{ij} \Delta L_{it} + \varepsilon_{it}$$

186

187 In this case, the use of lag and lead is to capture serial correlation and endogeneity of the
188 regresses that could result in unbiased estimation. Therefore, p and q are the number of lags
189 and leads respectively.

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193 **3.3.3 The Granger Causality Test**

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195 The final stage of the estimation procedure examines the causality between unemployment
196 and economic growth through the application of the Granger causality test propounded [12].
197 It focused on determining whether the direction of the relationship is bi-directional,
198 unidirectional, feedback or no causation between the two variables.

4. Results and Discussion

4.2 Unit Root Test

The results of unit root test (ADF) in Table 2 and 3 indicate that cannot reject the null hypothesis of unit root at level. However, after taking first difference are able to reject the null hypothesis of unit root. It was observed from the ADF test estimate that all the variables were integrated of order one.

Table 2. Unit root results (level)

Variables	Constant	
	ADF TEST	
	Statistics	P-Value
LGDP	4.400425	1.0000
LUEMPL	-2.027883	0.2738
LKK	0.440156	0.9807
LL	-0.906293	0.7633

Source: Author computation from collected Data (2017)

Table 3. Unit root results (First difference)

Variables	Constant	
	ADF TEST	
	Statistics	P-Value
D(LGDP)	-2.740998	0.0820
D(LUEMPL)	-5.801226	0.0001
D(LKK)	-3.740503	0.0103
D(LL)	-5.956338	0.0001

Source: Author computation from collected Data (2017)

4.3 Johansen Co integration test

The co-integration estimate was carried out using the Johansen co-integration technique and this is a powerful co-integration test, particularly when a multivariate model is used. Johansen test usually involves two test namely "Trace statistics" and "Maximum Eigen value". From the results of co integration, it was observed that trace statistics and the maximum Eigen-value statistics were greater than their critical values. Therefore, it reject null hypothesis of no co-integration relationship among unemployment, labour force and capital formation were rejected. In Table 3. We present the results of Johansen Cointegration Test.

Table 3. Johansen Test for Co integration

Hypothesized	Trace			Maximum Eigen		
No. of CE(s)	Statistic	Critical Value	Prob.**	Statistic	Critical Value	Prob.**
None *	59.01787	47.85613	0.0032*	37.84405	27.58434	0.0017*

At most 1	21.17382	29.79707	0.3469	12.04433	21.13162	0.5433
At most 2	9.129490	15.49471	0.3535	8.607300	14.26460	0.3203
At most 3	0.522190	3.841466	0.4699	0.522190	3.841466	0.4699

Source: Author computation from collected Data (2017)

Note: Max-Eigen value test and Trace test t indicates 1 co integrating eqn(s) at the 0.05 level.

* denotes rejection of the hypothesis at the 0.05 level

4.4 Relationship between unemployment and economic growth

The application of DOLS was necessary because of the existence of co-integration among the variables. The estimation of DOLS requires the inclusion of leads and lags in order to robust result and to avoid the autocorrelation problem and to capture the endogeneity of the independent variables. Hence, the estimation used set of the lags and leads, by using one year lags and one year lead.

Based on DOLS estimator, as can be observed from Table 4, the results reveal that there is a positive relationship between unemployment and economic growth for the Tanzania. This result is contrary to a priori expectation. Additionally, it is observed from the estimate results that unemployment rate had an insignificant effect on economic growth in Tanzania.

Yet, the result is not shocking in the case of Tanzania since its economy experienced increase in unemployment rate which unfortunately has being go along with an increase in the economic growth of the economy in recent time. The implication of this is that the economic growth of Tanzania is indifferent to the unemployment condition in the economy. This result is agreed with previous studies found that unemployment does not have a significant impact on the economic growth. ([13], [14] and [15]).

Table 4: DOLS estimates of the long run effect of unemployment on economic growth for Tanzania

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LKK	0.303552	0.066094	4.592709	0.0010*
LLL	1.380798	0.257729	5.357562	0.0003*
LUEMPL	0.064825	0.098701	0.656786	0.5261
C	-6.030967	3.377344	-1.785713	0.1045

Source: Author computation

Note * Significant at the 0.05 level

Additionally, our result indicate that there is positive relationship between stock capital formation and economic growth and statistical significant at 5%. This reveals that a unit increase in capital stock will result in an increase of 0.304 percent in economic growth. This finding is supported by a study of [16] which highlighted that economic growth will increase if there is an increase in the capital stock.

With respect to other explanatory variables, it was observed that labour force had a significant-positive on economic growth with coefficient values of 1.38 per cent. The implication of this is that a one per cent increase in labour force would positively stimulate economic growth in the long run.

4.5 Granger causality

The Granger causality method is used to test the direction of causality among the variables. In Table 5 below report the results of granger causality, that there is a unidirectional causal relationship between unemployment and economic growth with direction from economic growth to unemployment. This result consistent with the study of [17]. However, the result is statistical significant at 10%.

Table 5. Granger Causality results

Null Hypothesis:	Obs	F-Statistic	Prob.
LKK does not Granger Cause LGDP	24	4.02714	0.0348*
LGDP does not Granger Cause LKK		7.53301	0.0039*
LLL does not Granger Cause LGDP	24	5.06867	0.0172*
LGDP does not Granger Cause LLL		2.14568	0.1445
LUEMPL does not Granger Cause LGDP	24	0.39809	0.6771
LGDP does not Granger Cause LUEMPL		2.86473	0.0818**

Note: * and** represent statistical significance at 5% and 10% respectively.

Source: Author computation

Meanwhile, the result shows that there is bidirectional causality between capital stock and economic growth, hence both capital stock and growth were caused each other. In addition, the result shows unidirectional causality between labour and economic growth in Tanzania. The factor labour is an essential determinant of economic growth, both mental and physical efforts needed to ensure steady performance of the economy.

5. Conclusion

Our paper investigated the impact of unemployment on economic growth in Tanzania. Annual data from World Bank online database 2017 for the period 1991 to 2015 were used. We examine the existence of a significant relationship between unemployment and economic growth in Tanzania and the causal relationship between variables by testing granger causality.

We apply DOLS estimate to test the null hypothesis of no significant long run relationship between unemployment and economic growth in Tanzania during period of the study. Our result reject the null hypothesis, and confirm that unemployment rate has positive impact but insignificant influence on economic growth in Tanzania over the study period. Similarly, the granger causality test reveal that there is no causal relationship between unemployment and economic growth in Tanzania. We suggest that there is the need for government to take

urgent steps against the rising unemployment rate, because unemployment is a major impediment to social progress and results in waste of trained manpower.

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