Original Research Article

Trade Openness and Economic Growth of Tanzania

ABSTRACT

Trade openness is very crucial in the achievement of any rapid economic take off for any country. Realizing that in 1996, Tanzania government initiated economic recovery program to address the economic problem. One among them was Trade liberalization implementation. This paper examines the impact of trade openness on economic growth in Tanzania for the period 1981 to 2017. The study utilized co-integration and Vector Error Correction Mechanism (VECM) Approach to test the relationship between trade openness and economic growth and granger causality test to examine the causal relationship between variable. The unit root tests showed that all variables were integrated after taking first difference, the Johansen co-integration result showed that the variables were co-integrated. The VECM estimate showed that there is positive long run relationship between trade openness and economic growth in Tanzania over the study period, this positive result of trade openness is possibly attributable to the fact that Tanzania unlocked its borders to international trades. In addition, granger causality test revealed that, there is no causal relationship between Trade openness and economic growth in Tanzania. Based on these findings, this study recommended that Government should encourage the production of domestic products for export purpose by developing more domestic industries and attracts more investors in the economy which will lead to increase the per capita income as well as foreign earnings that will promote economic growth of Tanzania.

1. INTRODUCTION

More than a decade, trade openness discussed by different scholars due to its contribution on economic growth of developing countries including Tanzania. The discussion was on whether trade openness is significant in long or short run on the development of respective countries. Following the development of economic policy instruments that was addressed in Washington Consensus, trade liberalization has recognized to be a mechanism for economic growth and poverty reduction in developing countries [1]. From this perspective, it is expected that developing country with high trade openness through the trade liberalization can achieve higher development very fast.

Many studies have been shown the existence of positive and significant effects on economic growth. [2] show that trade openness has positive impacts on economic growth of Cote d'Ivoire in both, short and long run. Furthermore, the same results were indicated by [3] for the economic growth of Tanzania. However, some scholars contradict with others whom their studies show positive impacts and point to the negative effects of trade openness on economic growth. This was supported by [4] in their study which shown that trade openness has a negative

and significant impact on economic growth in the long-run.

In the early 1980s, Tanzania has experienced economy deterioration, among the reason was the imposed restriction in external trade that influence the reduction in its exports and undermined its economic performance [5]. Economic Recovery Program was initiated in 1996 to address the economic problem by starting the implementation of trade liberalization which in turn improved the international trade.

This improvement can be seen from Figure 1; the value of total export in Tanzania has shown to increase consistently from USD 537.5 million in 1990 up to USD 9.3 billion in 2016, however, there was a decline in the year 2009. The trend of import also shown an increase at higher speed compared to export. In 1990 the import value recorded at USD 1.6 billion and experiences the dropping in 2009 and 2013. That decline of export and import was due to the world financial crises which cause the world trade to decline [6]. After that situation to be resolved, the import continued to grow until 2015 with the value of USD 11.3 billion.

However, the trend of external trade has always shown to grow since 1990 to date parallel with the economic growth. The historical trend show an average GDP growth rate of 6.5% for more than two decades and GDP growth rate of 7.1%

in 2017. Though this indicate that Tanzania might fail to attain the expected target of 10% economic growth in 2021 [7]. The situation of economy results a large population falls below the targeted annual per capita income of USD 1500 and deprive the standard of living. Therefore, this paper aims to examine the impact of trade openness (i.e. gross capital formation, labour forces, trade openness and foreign direct investment) on economic growth (i.e. purchasing power parity) of Tanzania for the period 1981 to 2017. In achieving the main objectives of the study, the following specific objectives are going to be tested:

i. To examine the long run relationship between trade openness and economic growth

ii. To determine the causal relationship between the trade openness and economic growth

The layout of the rest of the paper is as follows: Section 2 provides a brief review of the existing literature on the linkage between trade openness and economic growth. Section 3 introduces the methodology and estimation techniques employed in this paper. Section 4 presents the findings and its discussions and finally in section 5 the authors present the conclusion and recommendations with respect to findings.
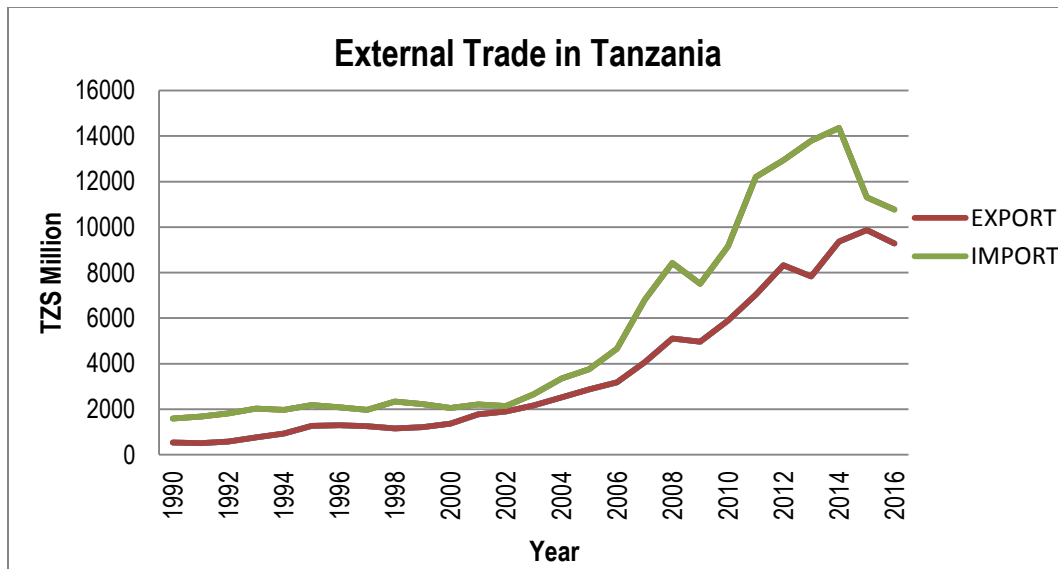
Fig. 1. External Trade Trends in Tanzania
Source: World Bank Data, 2018

2. LITERATURE REVIEW

Trade openness is very crucial in the achievement of any rapid economic take off for any country. For this reason, many researchers have attempted to examine the nature of the relationship between trade openness and economic growth. However, the results on how trade openness influences economic growth, lack consensus in countries world-wide.

Empirical evidence tends to vary across countries and over time and the results are sensitive to the underlying theoretical framework. According to DBIS report of 2015 among other things trade exposes firms and products to international competition (boosting productivity and innovation), in which economies are encouraged to focus more on areas of comparative advantage hence it ensure that scarce skills and resources are deployed where they are most productive. [9] identified the presence of a long run relationship between trade openness and economic growth and the existence of bi-directional causality between trade openness and economic growth in the BRICS countries. He applied Autoregressive Distributed Lag (ARDL) bounds test to co-

integration and the Granger causality tests to analyze his data for the period from 1990 to 2017. He advised BRICS countries to fully utilise the myriad of import and export opportunities that are presented by the collaborative efforts of these economies as it contributes to economic growth.

Also [10] obtained a positive bi-directional causal relationship between trade and economic growth. They used a sample of 115 developing economies, employed the ARDL methodology. Same results were found by [11] when empirically analyze the causality relationship between economic growth and international trade using new advancements in the econometric methodology for heterogeneous panel data applied to Latin American countries. They found bidirectional causality in Mexico and Honduras.

[2] examined the impact of trade openness on economic growth for Cote d'Ivoire over the period 1965–2014 in a multivariate framework including capital stock, labour and trade openness as regressors. The results from the Autoregressive Distributed Lag bounds test to co-integration and the Toda and Yamamoto Granger causality tests showed that trade openness has positive effects

on economic growth both in the short and long run. Furthermore, they reveal a positive and strong complementary relationship between trade openness and capital formation in promoting economic growth. However, [12] when examined the empirical relationship between trade openness and economic growth of India for the time period 1970-2010 using Vector Auto regression method found out that growth in trade volumes accelerates economic growth of India since 1980-81 onwards.

However [13] found a non-linear pattern between the export ratio and the quality of the export basket, suggesting that openness to trade may impact growth negatively for countries which are specialised in low-quality products. Same results obtained by [14] when examined the relationship and impact of openness of trade on the economic growth of Pakistan for a period from 1980-2010. The VECM and Johanson multivariate approach were adopted to find out the short and long-run estimates. The long-run results state a negative impact of trade liberalization on the economic growth of Pakistan. They argued that these results might be triggered by the weak conflict management institutions and lack of quality institutions in the country. Also the negative impact may be due to the raw material exports instead of final goods. The results of the study showed a short-run positive relationship between trade openness and GDP growth of the country.

Moreover, [15] used panel co-integration tests and panel error-correction models (ECM) to explore the causal relationship between trade openness and economic growth for 120 countries over the period 2000-2013. They segmented the data set into four subpanels according to per capita income classification that namely low-income, lower-middle income, upper-middle income and high-income economies. The results suggest that the long-run causality between trade openness and growth runs in four panel groups. The result indicated the bidirectional causalities between real GDP growth and trade openness in all panels except low income groups, where

unidirectional causation from trade openness to economic growth was obtained.

[16] argued that openness to trade has been one of the primary drivers stimulating growth. To prove that they used 87 selected countries from Organizations for Economic Co-operation and Development (OECD) and developing countries for 1977–2011 periods. Two measures of trade openness i.e. the ratio of trade openness (TO) typically spoke by exports plus imports in nominal value divided by GDP (nominal) which is commonly used in the literature, and trade openness in real (RO) which is defined as the sum of imports and exports in US$ relative to GDP in purchasing power parity US$ (real GDP). The results from dynamic panel data estimation method i.e. the general method of moments (GMM) reveal a bidirectional causal relationship for both developing and OECD countries. These findings were consistent with the endogenous theory that increased openness leads to higher growth, which thus prompts expanded openness.

From the above literature, it can be seen that the literature on the relationship between trade openness and economic growth, although with mixed empirical results, is richly documented. Nevertheless, the above literature failed to show the impact of trade openness on purchasing power parity of a particular country. Therefore this study bridge the gap by identifying how trade openness-growth nexus behave in Tanzania economy using VECM to analyze the following hypothesis;

Ho: There is no long run relationship between trade openness and economic growth.

H1: There is long run relationship between trade openness and economic growth.

Ho: There is no causal relationship between trade openness and economic growth.

H1: There is causal relationship between trade openness and economic growth.

3. METHODOLOGY

3.1 Model Specification

The model for estimation was developed by using the simple production function of Cobb-Douglas as follows:

$$Y_t = A_t K_t^{\beta_1} L_t^{\beta_2} \quad\text{...1}$$

By applying the logarithm in the equation 1, then we get the following:

$$logY_t = logA_t + \beta_1 logK_t + \beta_2 logL_t \quad\text{.....................2}$$

While $logA_t$ are the other factors that promote economic growth and assumed to have a linear relationship with growth.

$$logA_t = \beta_0 + \beta_3 logTOP_t + \beta_4 logFDI_t + \varepsilon_t \quad\text{...........3}$$

Therefore, the general model used in this study is:

$$logY_t = \beta_0 + \beta_1 logK_t + \beta_2 logL_t + \beta_3 logTOP_t + \beta_4 logFDI_t + \varepsilon_t \quad\text{...............4}$$

Whereby the parameter $\beta_1, \beta_2, \beta_3$ and β_4 explain the coefficient values of independent variables, β_0 shows the constant term, ε_t is the stochastic error term which explain other factors that influence the economy but are not included in the model and t = 1, 2... is the time index for the years from 1981 to 2017. Y represents economic growth, K represents gross capital formation, L represents labour forces in an economy, TOP represents trade openness, and FDI represents foreign direct investment inflow.

3.2 Variables Description and their measures

The choice of these variables was based on the previous studies that were conducted by different scholars including [14] in their study they use the gross fixed capital formation on private and public sector; and trade openness as the determinants of economic growth of Pakistan. [9] also includes FDI and active population when he examines the relationship between trade openness and economic growth.

All variables in table 1 obtained from World Bank Database. According to [17] growth theory, long-term economic growth is determined by growth of labour force and saving rates which in turn increases capital accumulation. In addition to that, the Cobb Douglas production function also emphasized the changes in technological relationship between capital and labour on increasing the production. In this regards, all dependent variables (K, L, TOP and FDI) are expected to have positive signs implying the positive influence of these variables on economic growth

Table 1. Summary of Variables

Variables	Description	Measurement
Y	Economic Growth	Purchasing Power Parity
K	Gross Capital Formation	K/GDP
L	Labour forces in an economy	Labour forces Growth rate
TOP	Trade Openness	Total Trade/GDP
FDI	Foreign Direct Investment Inflow	FDI/GDP

Source: Constructed by authors (2018)

3.3 Estimation Techniques

The descriptive study with the time series data for the period 1981 to 2017 were used to examine the impact of trade openness on

economic growth of Tanzania.

3.3.1 <u>Unit Root Test</u>

Due to macroeconomic data to have the feature of random walk [18], the unit root problem for each individual series was checked to avoid the spurious results. The ADF test developed by [19] and PP test of [20] were used with the assumption (null hypothesis) that each individual series has unit root problem. Although the ADF test is simple compared to PP test and both have the similar procedure for testing the hypothesis but the PP test corrects the statistics to consider the autocorrelation and heteroskedasticity issues [21].

For which the time series data happen to have trend, then these tests were performed in two scenarios with and without trend at level and first differences. Therefore, if the test rejects the null hypothesis means the series are stationary. If all series are stationary then the model can be estimated by using the Ordinary Least Square method and if all series are non-stationary or some are stationary then the co-integration test has to be done to check the existence of long run relationship between variables used.

3.3.2 <u>Co-integration test</u>

Many econometricians realized that, Johansen and Juselius maximum likelihood method has little possibility of making errors since it involve only one step in its process unlike two steps in the Engle Granger method. Considering our regression model Y_t with four variables, the co-integration test will be done by using the null hypothesis as follow;

$$Y_t = \theta + \sum_{i=1}^{T-1} w_i Y_{t-i} + \pi Y_{T-t} + \varepsilon_t$$

Whereby, θ is a constant, w as coefficient matrix and π is the number of independent co-integrating vectors, if ($\pi = 0$) means no co-integration between series of variables used. According to [22], if one series co-integrates this means that error in the regression model is stationary although the dependent and independents variables are non-stationary it is concluded the existence of long run relationship.

3.3.3 <u>Vector Error Correction Mechanism</u>

If the long run relationship will be realised, the model can be estimated by using vector error correction mechanism (VECM) which allow for the separation out of long run and short run impacts as well as the ECT which show the speed of adjustment of the variables used to return to the equilibrium position as shown in the below equations:

$$\Delta Y_t = \eta_1 \sum_{i=1}^{T-1} u_{1,i}\Delta Y_{t-i} + \sum_{i=1}^{T-1} \varphi_{1,i}\Delta L_{t-i} + \sum_{I=1}^{T-1} w_{1,i}\Delta K_{t-i} + \sum_{t=1}^{T-1} \delta_{1,i}\Delta TOP_{t-i} + \sum_{t=1}^{T-1} \gamma_{1,i}\Delta FDI_{t-i} + \alpha_{1,i}ECT_{t-i} + \varepsilon_t$$

$$\Delta L_t = \eta_2 \sum_{i=1}^{T-1} u_{2,i}\Delta Y_{t-i} + \sum_{i=1}^{T-1} \varphi_{2,i}\Delta L_{t-i} + \sum_{I=1}^{T-1} w_{2,i}\Delta K_{t-i} + \sum_{t=1}^{T-1} \delta_{2,i}\Delta TOP_{t-i} + \sum_{t=1}^{T-1} \gamma_{2,i}\Delta FDI_{t-i} + \alpha_{2,i}ECT_{t-i} + \varepsilon_t$$

$$\Delta K_t = \eta_3 \sum_{i=1}^{T-1} u_{3,i}\Delta Y_{t-i} + \sum_{i=1}^{T-1} \varphi_{3,i}\Delta L_{t-i} + \sum_{I=1}^{T-1} w_{3,i}\Delta K_{t-i} + \sum_{t=1}^{T-1} \delta_{3,i}\Delta TOP_{t-i} + \sum_{t=1}^{T-1} \gamma_{3,i}\Delta FDI_{t-i} + \alpha_{3,i}ECT_{t-i} + \varepsilon_t$$

$$\Delta TOP_t = \eta_4 \sum_{i=1}^{T-1} u_{4,i}\Delta Y_{t-i} + \sum_{i=1}^{T-1} \varphi_{4,i}\Delta L_{t-i} + \sum_{I=1}^{T-1} w_{4,i}\Delta K_{t-i} + \sum_{t=1}^{T-1} \delta_{4,i}\Delta TOP_{t-i} + \sum_{t=1}^{T-1} \gamma_{4,i}\Delta FDI_{t-i} + \alpha_{4,i}ECT_{t-i} + \varepsilon_t$$

$$\Delta FDI_t = \eta_5 \sum_{i=1}^{T-1} u_{5,i}\Delta Y_{t-i} + \sum_{i=1}^{T-1} \varphi_{5,i}\Delta L_{t-i} + \sum_{I=1}^{T-1} w_{5,i}\Delta K_{t-i} + \sum_{t=1}^{T-1} \delta_{5,i}\Delta TOP_{t-i} + \sum_{t=1}^{T-1} \gamma_{5,i}\Delta FDI_{t-i} + \alpha_{5,i}ECT_{t-i} + \varepsilon_t$$

The parameter $\eta, u, \varphi, w, \delta, \gamma$ show the coefficient values, αECT_{t-i} shows the causality between variables and ε_t has to explain the speed of adjustment from dis-equilibrium to equilibrium in the long run.

4. FINDINGS AND DISCUSSIONS

4.1 Descriptive Statistics

Usually, before estimating any regression model, it has to check whether the series of variables used has followed the normal distribution curve. Therefore, the traditional way to confirm the normality is to conduct the descriptive analysis for variables used. The Table 2 provides the estimation of mean, median, skewness, kurtosis and probability values. The mean over median ratio for each series is seen to be approximately one, which represents normality of distribution, which agreed the series had the feature of normal distribution. Addition to that, the Jarque-Bera test statistics fails to reject the null hypothesis of normal distribution of each variable (P> 0.05), which confirms that the series are normally distributed. Also, the numeric of kurtosis for each variable is found to be close to 3, which indicates the normality of distribution. Therefore, the study has been confirmed the normality of distribution.

Then, correlation analysis between the variables used were done which show the strong and positive relationship between economic growth and TOP, FDI and capital as well as between capital and TOP while weak negative correlation shown between economic growth and L.

Table 2. Descriptive and Correlation Analysis

Description	Y	K	L	TOP	FDI
Mean	1486.81	0.19	3.06	0.34	0.02
Median	1173.77	0.18	3.00	0.32	0.02
Maximum	3247.27	0.34	3.67	0.56	0.06
Minimum	632.75	0.07	2.61	0.12	0.00
Std. Dev.	746.81	0.08	0.27	0.12	0.02
Skewness	0.17	0.43	0.50	-0.08	0.38
Kurtosis	2.67	3.01	2.41	3.12	2.90
Jarque-Bera Probability	5.17	2.66	2.11	1.24	2.75
Observations	37	37	37	37	37

Correlation:					
Y	1				
K	0.80	1			
L	-0.45	-0.37	1		
TOP	0.70	0.86	-0.32	1	
FDI	0.68	0.66	-0.70	0.66	1

4.2 Unit Root Test

Both tests, ADF and PP were done by comparing the t-statistics calculated and Mackinnon critical values at the 1% and 5% level of significance. With the 3 lag interval, the results in Table 3 show that all series were non-stationary at level except FDI but become stationary at 1% level of significant when the first difference is taken.

Table 3. Unit Root Analysis

Variables	ADF Test			
	Level		First Difference	
	Intercept	Intercept & trend	Intercept	Intercept & trend
Y	11.699	3.699	-4.264*	-4.940*
K	-1.449	-2.437	-6.268*	-6.175*
L	-1.637	-1.828	-4.742*	-4.685*
TOP	-1.530	-1.299	-4.503*	-4.625*
FDI	-1.456	-3.772**	-9.783*	-6.421*
	Phillip Perron Test			
Y	9.077	2.722	-4.286*	-4.911*
K	-1.392	-2.585	-6.273*	-6.180*
L	-1.787	-2.196	-4.742*	-4.685*
TOP	-1.632	-1.689	-4.458*	-4.613*
FDI	-1.984	-3.928**	-10.813*	-11.025*

*Note: * and ** denote series are stationary at 1% and 5% level of significant respectively.*

4.3 Co-integration test

The Johansen and Juselius maximum likelihood method was used to check the co-integration between the variables used. Table 4 shows that both Max- Eigen and Trace statistic rejects the null hypothesis that series are non-co-integrated at 5% significance level. For that results, it is

concluding the existence of long run relationship among the variables.

Table 4. Co-integration Analysis

Hypothesis	Eigen value	Trace statistic	Intercept Max-Eigen statistic
r = 0	0.77	98.137**	48.538**
r ≤ 1	0.478	49.598**	21.460**
r ≤ 2	0.425	28.138	18.253
r ≤ 3	0.258	9.885	9.833
r ≤ 4	0.002	0.052	0.052
			Intercept & trend
r = 0	0.843	135.321**	61.056**
r ≤ 1	0.657	74.265**	35.319
r ≤ 2	0.467	38.946	20.772
r ≤ 3	0.327	18.174	13.052
r ≤ 4	0.144	5.123	5.123

4.4 Vector Error Correction Mechanism

According to Ljung-Box Q statistic results, there was no autocorrelation problem because the p-values of Q-statistic are greater than 0.05.Therefore, our model is accuracy for estimating the results. The generation of results shown in the estimated regression model below based on Schwarz Info Criterion of 3 optimum lag selection.

VECM Estimated Regression Model:

$$logY_t = 4.72 - 0.06logK_t + 1.59logL_t + 0.21logTOP_t - 4.61logFDI_t$$
$$Std.Error \quad -0.09 \quad\quad -0.39 \quad\quad -0.09 \quad\quad -3.13$$
$$t-Statistics \quad [2.60] \quad\quad [-5.33] \quad\quad [6.58] \quad\quad [-5.01]$$

The empirical results show in both short and long run trade openness has positive significant effect on economic growth. This implies that, an increase of trade openness for one percentage point is associated with an increase of economic growth by 0.21 percent, thus indicating that trade openness is favourable to achieve the intended goal of promoting higher rates of economic growth in Tanzania. The positive sign of trade openness is possibly attributable to the fact that Tanzania was unlocked its borders to International trades since 1996 when the country established the Economic Recovery Program and efficient polices relating to trade implemented by the government such that its impact is promoting the economic growth. Same results was found by [23] who found that trade openness has positively associated with the higher economic growth of Ghana in both short and long term.

As expected, the log of labour forces have positive coefficient and statistically significant, meaning it tend to increase the level of economic growth. This is might be due to the increases of

the trade competition which boot the production and hence required more skilled labour forces.

While the results of gross fixed capital formation and foreign direct investment contrary to the [17] growth theory that assume saving leads capital formation that enhance economic growth; and technological transfer through FDI inwards also generate higher growth rate of economy to the host country. These results probably due to Tanzania to invest funds for capital formation in non-productive areas and FDI are operated by foreigner and there are insufficient transfers in term of technology and capital from foreigners. Moreover, these negative results were supported by different scholars including [24]; [25] & [26].

4.5 Granger Causality Results

Although the co-integration indicates the presence of Granger causality, at least in one direction, but it does not indicate the direction of causality between variables. The results in Table 5 shows that there is no causality running between economic growth and trade

openness.The one way causality found from labour forces to economic growth and FDI also from gross fixed capital formation to trade openness and from economic growth to gross fixed capital formation. As a whole, there is no strong presence of Granger bidirectional causality between the variables used in this study.

Table 5. VAR Granger Causality Test

Variables	D(LY)	D(LK)	D(LL)	D(LTOP)	D(LFDI)
D(LY)		1.96	6.88**	1.16	5.05
D(LK)	8.83*		3.04	0.42	2.21
D(LL)	2.12	1.82		2.44	0.06
D(LTOP)	2.06	6.7**	1.97		0.16
D(LFDI)	0.89	0.09	8.83*	0.63	

Note: and **denote series have causal relationship at 1% and 5% level of significant respectively*

4.6 Error Correction Term

The results in Table 6 show that, Y and labour forces have long term unidirectional causality to the economic growth of Tanzania. The results suggest that the sizable speed of adjustment by 6.1% and 29.5% of disequilibrium correction yearly for Y and L respectively reaching long run equilibrium steady state position. This accordingly implies that our model is correct and also proves the presence of long term relationship between the variable used in this study. According to the ECT and the causality tests show that, the trade openness has no causal relationship with economic growth in Tanzania.

Table 6. Error Correction Terms

ECT	Coefficient	Std.Error	t-statistics
D(LY)	0.061	-0.030	[2.995]
D(LK)	-0.356	-0.472	[-0.754]
D(LL)	0.295	-0.078	[3.804]
D(LTOP)	0.278	-0.343	[0.811]
D(LFDI)	0.015	-0.022	[0.681]

5. CONCLUSION AND RECOMMENDATIONS

This paper examines the impact of trade openness on economic growth of Tanzania for the period 1981 to 2017. The empirical results from VECM suggest that in a long run trade openness has a positive impact on Tanzania economic growth and the two are statistically significant. which proves that trade openness is good for growth. On the other hand, the granger causality results reveal no causal relationship between trade openness and economic growth. FDI and gross fixed capital formation appeared to have a negative impact with economic growth; this might be caused by investing funds to non-profitable areas. The empirical results of the study concluded the trade openness is good for the economic growth of Tanzania. However the reliable national sources have not sufficient secondary macroeconomic data concerning this study.

The Government should do an assessment on what kind of profitable investment is needed and where to locate within Tanzania in order to generate more employment and increase production. Moreover, the fixed capital formation should be invested in the areas mainly used for productive investment for instance constructing roads to agricultural and industrial zones. The encouragement on the production of domestic products for export purpose should be done by Government, this will lead to increase the per capita income as well as foreign earnings that will promote economic growth of Tanzania. Moreover, further studies may also shift attention to sectors through which FDI could impact the growth of Tanzania.

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