Trade and Foreign Direct Investment in Tanzania: Do they Matter for Economic Growth?

*Petro Sauti Magai**

Abstract

This paper analyses the effect of trade and foreign direct investments (FDI) on Tanzania's economic growth using time-series data from 1970 to 2019. All the variables are found to be integrated of order one, I (1). The study applies the cointegration test and a VECM accordingly. The Johansen test underscores the presence of two co-integrating equations, which confirms the long-run associations between variables. The VECM demonstrates the presence of a long-run relationship running from FDI, TRD, and EXR to GDP growth. While the Wald test reveals the presence of short-run causality running from FDI and TRD to GPD; however, there is no short-run causality from EXR to GDP. The study concludes that there is a positive relationship between the explanatory variables and economic growth. Therefore, the Tanzanian government should encourage exports to realize the potential effects of trade and FDI on economic growth.

Keywords: trade, FDI, economic growth, time-series, Tanzania

JEL Classification: O4, F1, FE

1. Introduction

Tanzania has enormous investment opportunities in all sectors of the economy, including agriculture, tourism, manufacturing, mining, extraction, ICT, energy, oil and gas. The government of Tanzania continues to improve its business environment for the betterment of promoting economic growth through ensuring the macroeconomic and political stability of the region. As McAuliffe et al. (2012) have argued, the sustainability of the Tanzanian's growth acceleration is possible if macroeconomic stability is maintained, and further progress is made in deepening the financial sectors and improving the business climate, infrastructure, and human capital.

Sub-Saharan Africa in general depends on foreign direct investment (FDI) for catalysing economic growth. FDI is perceived as being able to solve major obstacles to growth in Sub-Saharan African countries, such as shortages of financial resources, technology, and skills (Olatunji and Shahid, 2015). In this regard, several African countries, including Tanzania, have put efforts into improving their business (trade) climate with the aim of attracting FDI, which would increase available capital through a combination of reforms and resource mobilization for trade and FDI (Funke and Nsouli, 2003 & Adams, 2009). FDI is a potent instrument of economic growth, especially for the less developed countries such as Tanzania. It enables the recipient countries to build up physical

---

* University of Dar es Salaam Business School (UDBS): sautimagai@gmail.com

capital, create employment opportunities, develop productive capacity, enhance skills of local labour through the transfer of technology and managerial know-how, and help integrate the domestic economy into the global economy (Jayakumar et al., 2014).

Trade, on the other hand, plays a vital role in shaping up the economic and social performance and prospects of various countries. Dunung (2011) posits that no country has grown economically without trade. The contribution of trade to growth depends on the context in which it works and the objectives it serves. It may be argued that the sheer expansion of trade does not guarantee prosperity of a country and the wellbeing of its people; rather, trade performance should be gauged on its effects on employment levels, growth, and improvement of the human condition, which will accelerate the overall economic growth in the region (Dunung, 2011). Thus, much of Africa's daily consumption as well as jobs depend on exports, imports, or foreign investment, which signifies how investment and trade have become fundamental to people's lives.

FDI and international trade are not only increasingly complementary and mutually supportive but also increasingly inseparable as two sides of the process of economic growth (Chiappini, 2011; Jayakumar et al., 2014). That is, FDI may stimulate trade from domestic sectors through industrial linkage or spill over effects. These effects create a strong demand stimulus for domestic enterprises and promote exports. Thus, FDI is expected to affect trade from the supply side of a host country by enhancing export-oriented productivity that further improves export performance. On the other hand, exports lead to an increase in productivity, which attracts more foreign investors to undertake FDIs (Jayakumar et al., 2014). Hence, in the face of insufficient resources to finance long-term development in Tanzania and to reduce poverty, attracting FDI should be at the centre of the strategies for economic growth (UNCTAD, 2005). The so-called East Asian tigers (Republic of Korea, Hong Kong, Singapore, and Taiwan) are a good example of using the FDI to maintain the high level of economic growth since the 1960s, boosted by exports and rapid industrialization, where FDI contributed significantly to the upgrading and diversification of the industrial structure of those countries (Chen et al., 2015; Søreide, 2001).

Thus, there seems to be great compatibility between FDI and trade in facilitating economic growth, and it is very difficult to separate the two, as some studies have pointed out (Belloumi, 2014; Sunde, 2017; Magai, 2018). However, whereas the importance of FDI or trade as individual variables in economic growth has been studied and widely documented, their possible linkages require the same treatment. The understanding of the technicalities of these interdependent variables harbour the potential of enabling the government of Tanzania to harmonize its FDI and trade policies for growth and development (Miankhel et al., 2009). Therefore, this paper has analysed the extent to which foreign direct investment and trade have supported economic growth in Tanzania in the period1970 to 2019.Thisanalysis has shown that the two variables have a role to play in stirring the trickle-down effects, which boost economic growth.

1.1 Economic Situation in Tanzania

The World Bank report, 2020[1] noted the strong income growth over the past decade, with Tanzania's gross national income (GNI) per capita having increased from $1,020 in 2018 to $1,080 in 2019, exceeding the threshold for lower-middle-income status. The country is on the right track beyond the broad vision of its development goals as it is already in the middle-income group. This is contrary to the expectations of the Tanzania Development Vision 2025 that was expecting this move-in year 2025. This increased GNI per capita is impressive but it is not enough to attain the goals enshrined in Tanzania's Development Vision (TDV) 2025, which include among others the high-quality livelihoods; peace, stability, and unity; good governance; a well-educated and learning society; and a competitive economy capable of sustainable growth and shared benefits. Therefore, investing in both trade and FDI together with other economic variables are necessary initiatives for achieving these broad goals and improving the quality of life for all Tanzanians.

The current economic situation is highly uncertain, challenged by the ongoing pandemic, especially in sectors reliant on global demand. The protracted global health crisis "Covid19" that continues in 2021 could undermine global demand, thereby, jeopardizing growth of the Tanzanian economy. The macroeconomic indicators are not stable at all, for example, in Tanzania, the inflation has been low and stable, but Gross Domestic Product (GDP) growth has declined to the tune of 2.5% in 2020. Domestic credit growth has slowed to 6.9% in January–June 2020 from 8.9% in the first half of 2019. Imports of capital goods, a major component of private investment, declined by about 24% year-over-year in the second quarter of 2020 (World Bank Report, 2020). Business expectations for sales and employment in the near future are pessimistic. Above all, a full recovery requires government attention to reforms to improve the business environment as a key input to bolster the recovery of the private sector. Tanzania outweighs its regional peers in terms of actual reforms. However, the World Bank's Doing Business Report, 2020 ranks Tanzania 141 out of 190 economies in the ease of doing business, trailing Rwanda, Kenya, and Uganda and Sub-Saharan peers like Zambia, Malawi, and Mozambique. With such ranking, reforms for a more favourable and predictable business environment are needed, particularly in terms of business regulation as per the government's "blueprint for regulatory reforms to improve the business environment".

Regarding the exports, imports, and trade balance, Tanzania had a total export of 3,669,212.44 in thousands of US$ and a total import of 8,553,677.02 in thousands of US$, leading to a negative trade balance of -4,884,464.59 in thousands of US$. The Effectively Applied Tariffs (EAT) Weighted Average (customs duty) for Tanzania is 8.55% and the Most Favoured Nation (MFN) Weighted Average tariff is 10.41%. The trade growth is -5.09% compared to a world growth of 3.50%. The GDP of Tanzania is 58,001,200,572 in current US$. Tanzania service export is 4,014,668,613.70 in

---

[1]World Bank Report, 2020. The World Bank supports Tanzania's growth through policy analysis, grants, and credit, with a focus on infrastructure and the private sector. Accessed through https:// www. worldbank.org/en/country/tanzania/overview.

current US$ and service import is 2,131,232,738.50 in current US$. It should be noted that Tanzania's major trading partner countries for exports are Rwanda, Kenya, Congo, Zambia and Uganda, and for imports are China, India, United Arab Emirates, Saudi Arabia, and South Africa, as shown in Table 1.

Table 1: Tanzania Major Trading Partner Countries

Countries	Import	Export	Trade Balance
Partner Countries for Exports (U$ Thousands)			
Rwanda	1,368.71	685,629.22	684,260.51
Kenya	17,376,721.27	6,050,420.68	-11,326,300.59
Congo	--	--	--
Zambia	9,461,739.09	9,052,164.77	-409,574.31
Uganda	6,729,436.50	3,087,363.58	-3.642,072.92
Partner Countries for Import			
China	2,134,982,614.99	2,494,230,194.97	359,247,579.98
India	617,945,603.08	322,291,568.43	-295,654,034.65
UAE	244,645,890.11	387,910,040.56	143,264,150.45
Saudia	135,211,178.07	294,535,553.15	159,324,375.07
South Africa	92,615,924.57	93,597,046.86	981,122.29
Others (126)	3,294,901.03	1,529,183.64	-1,765,717.40

Source: WITS, 2021

2. Literature Review: Trade, FDI and Economic Growth
2.1 Theoretical Literature Review
For several years, scholars have studied the macroeconomic policy and its effect on trade and FDI trade in many economies and its subsequent effect on the society only for achieving economic growth. Theories and empirical literature happen to offer a mixed indication regarding the impact of trade and FDI on economic growth in some country grouping. Several researchers argue that economic growth is positively affected by FDI and trade, while others argue the opposite to be the case. This paper is guided by three theories.

Endogenous growth theory
The endogenous growth theory was developed as a reaction to omissions and deficiencies in the Solow-Swan neoclassical growth model (Solow, 1956). The Solow-Swan growth model focused on three factors that impact economic growth; labour, capital, and technology, or more specifically, technological advancement. The theory states that the output per worker (growth per unit of labour) increases with the output per capita (growth per unit of capital) but at a decreasing rate. This is referred to as diminishing marginal returns. This was the genesis of the endogenous growth theory (Romer, 1986). Different economists, Lucas (1988) and Mankiw et al. (1992), among others, extended the Solow-Swan model by introducing endogenous technical progress in the growth models, which resulted to a new theory, which explains the long-term growth rate of an economy based on endogenous features as opposed to the exogenous features of the neoclassical growth theory. Generally, the model emphasizes the following aspects: first,

increase in both capital and labour productivity. Second, that increasing labour productivity does not have diminishing returns, but rather may have increasing returns. Lastly, that increasing capital does not necessarily lead to diminishing returns as predicted by Solow, but rather that it is more complicated depending on the type of capital investment.

FDI-led growth hypothesis
The FDI-led economic growth hypothesis is based on the endogenous growth model. It addresses that for achieving higher economic growth, FDI has to be associated with other factors such as trade (exports), technology transfer, human capital, and capital (Lim & Maisom, 2000). These are the important stimulant of economic growth. Complementing this proposition, several studies have argued that the flow of FDI might be able to stimulate economic growth via technology transfer and spill over efficiency (Shakar & Aslam, 2015 and (Borensztein et al., 1998).

International trade theories
FDI was developed in the international trade theory framework, pioneered by Ricardo and Heckscher-Ohlin (H-O) model, by exploring the determinants of global production. Ricardo explored the relationship between technology and the production location of multinational firms. The model argues that production location is determined by the differences in labour productivity, which is caused by the gap of production techniques between countries. Each country produces goods with relatively higher productivities and imports other goods. The advanced technology increases productivity; hence, production is concentrated in regions with higher productivities. The H-O model argues that production location is based on the production factor endowments rather than differences in techniques. Thus, each country produces the goods using its abundant factor and exchanges the goods using its scarce factors through international trade. The H-O model discussed the impact of factor endowment on production location decisions, arguing that production is concentrated in regions with abundant resources.

However, it is hard to operationalize the model given its assumptions of two countries, two products, and perfect mobility of factors. It would be very difficult to explain FDI; for example, the theory fails to explain the rising share of FDI. As pointed by Reinert (2008), the Ricardian failure was a result of unrealistic assumptions which always produce the wrong answers. Even the use of portfolio theory failed to explain the FDI, as the theory concentrates on explaining the achievement of foreign investments in a portfolio, but could not explain the direct investments (Denisia, 2010). As Hosseini (2005) argued, FDI cannot be explained by Ricardo's theory.

2.2 Empirical Literature Review
The international competitiveness of countries has traditionally been assessed based on export and FDI market shares (Magai, 2018). Furthermore, Wastyn & Sleuwaegen (2013) argued that an increasing part of international trade depends on the import of intermediates to be included in the exports of final and further

processed intermediate goods. Hence, a country's export not only reflects the embodied technology and relative endowments which characterize a country's domestic production activities, but also the technology and factor endowments of the partner countries from which a partner country imports intermediate goods (Moussiegt et al., 2012; Wastyn & Sleuwaegen, 2013). There is a great and strong link between FDI, trade, and economic growth as observed by OECD (2002). The report by the OECD commented that the effects must be seen in a broader context than the direct impact of investment on trade as the consequence of FDI on the host country differ significantly across countries and economic sectors. The report further emphasized that trade-related benefit to FDI for developing countries lies in its long-term contribution in integrating the host economy more closely into the world economy in a process likely to include higher trade. Keho (2015) empirically supported the argument while researching the relationships among FDI, exports, and economic growth in 12 selected Sub-Saharan African countries. The results suggested that economic growth has a positive long-run effect on FDI in five countries and exports are positively related to FDI in four countries. Thus, trade and FDI are often seen as important catalysts for growth not only in the developed world but also in the developing countries as well, Tanzania being inclusive.

Makki and Somwaru (2004) argued that, FDI is expected to propel technology from developed countries to developing countries as well as stimulate domestic investment and facilitate improvements in human capital and institutions in the host countries. International trade is regarded as an instrument of economic growth in that trade facilitates more efficient production of goods and services by shifting production to countries that have a comparative advantage in producing them. Zhang and Song (2001) attempted to find out the role of inward FDI in China on promoting exports, using panel data at the provincial level in the period 1986 to 1997. Their findings showed that increased levels of FDI tend to affect export performance positively in China. Soliman (2003) examined the effect of FDI activity on manufacturing exports in four MENA countries (Egypt, Tunisia, Morocco, and Turkey) and found that FDI activity may have a positive effect on the host country's export performance. Additionally, Zhang (2005) concluded that FDI has a positive impact on China's export performance, its export-promoting effect is much greater than that of domestic capital and its effect is larger in labour-intensive industries.

Sunde (2017) investigating the economic growth as a function of FDI and exports in South Africa. Employing the ARDL bounds test, he found that trade and FDI influence economic growth. Fidrmuc and Martin (2011) applied the VECM in their study conducted in Eastern and South-Eastern Europe and found that exports and FDI in the region are positively related to industrial production, which causes economic growth. The study suggested that the region has to attract inward FDI and enhance its export performance. Belloumi (2014) examined the relationship between trade, FDI, and economic growth in Tunisia. The study used the autoregressive distributed lag model (ARDL), whereby the bound tests failed to confirm the positive spill-over externalities generated from FDI. On the other hand, Szkorupová (2014)

employing the co-integration technique and VEC model in Slovakia and confirmed the existence of long-term causal links for all variables used and found a positive impact of FDI and export on economic growth. M. Dritsaki et al. (2004) investigated the relationship between trade, FDI, and economic growth in Greece over the period 1960-2002 and concluded that cointegration analysis indicated the presence of a long-run equilibrium relationship, whereby economic growth, trade, and FDI appeared to be mutually reinforcing each other. Miankhel et al. (2009) obtained similar results for South Asia and selected emerging countries. They thence suggested that the involved governments should attract FDI in sectors that mainly contribute directly or indirectly to making exports competitive in the international market.

3. Methodology and Empirical Analysis
3.1 Data
The economic growth of output applied to this analysis is a function of the four variables as shown in Equation (1). The data, variables, proxies together with the unit of measurements applied in this analysis are presented in Table 2. Thus, the empirical model is given as,

$$\text{GDP}_t = \alpha + \beta_1\text{TRD}_t + \beta_2\text{FDI}_t + \beta_3\text{EXR}_t + \varepsilon_t \qquad (1)$$

Whereas α is the intercept, β_1 to β_3 are the coefficients for the respective variables, whereas ε_t is the random error term.

Table 2: Data and Variables

Variables	Proxy and Unit of Measurements		Data Sources
Dependent Variable:	GDP per capita	+	UNCTAD
Economic growth (GDP)	(US dollar at constant price)		1970–2019
Explanatory Variables:	Inward FDI flows (US dollars at	+	UNCTAD
Foreign direct investment	current price in millions)		1970–2019
Total trade	Export (US dollars at current price	+	UNCTAD
(TRD)	in millions)		1970–2019
Exchange rates	Official exchange rates	-	IMF–IFS
(EXR)	(LCU per US dollars)		1970–2019

Source: Author Compilation (April 2021)

3.2 Descriptive Statistics
The data set for the analysis are the annual observations of the variables from 1970 to 2019. The paper applied the Eview9 software for data analysis. The descriptive statistics are summarised in Table 3. They exhibit the presence of low standard deviation for all variables ranging from 0.25 to 3.04. This implies that the variables are very close to the mean. The variables lnGDP and lnTRD are right-skewed, whereas the remaining variables are negatively skewed. Additionally, the descriptive analysis shows that all the variables are platykurtic (short-tailed) except for lnFDI, which is leptokurtic (long-tailed). A Jarque-Bera test for normality for all variables show that they are normally distributed, except for lnGDP, which is not normally distributed since its respective probability is less than 0.05. With regard to

the correlation analysis, all the variables are positively correlated with each other. However, some are highly correlated (lnGDP and lnTRD) and others are moderately correlated (lnGDP and lnEXR), as shown in Table 3.

Table 3: Statistical Analysis of Selected Variables

	LNGDP	LNFDI	LNTRD	LNEXR
Mean	6.400036	3.841076	6.769777	5.154483
Median	6.263722	4.456338	6.319599	6.293819
Maximum	6.996439	7.643627	8.621054	7.735521
Minimum	6.131612	-4.605170	5.507257	1.948763
Std. Dev.	0.257353	3.041658	1.035409	2.253446
Skewness	0.965173	-0.740443	0.621484	-0.419374
Kurtosis	2.534519	3.219655	1.855313	1.452117
Jarque-Bera	8.214399	4.669314	5.948493	6.457164
Probability	0.016454	0.096844	0.051086	0.059614
Sum	320.0018	192.0538	338.4889	257.7241
Sum Sq. Dev.	3.245301	453.3324	52.53154	248.8229
Correlation				
LNGDP	1.000000			
LNFDI	0.746722	1.000000		
LNTRD	0.962436	0.822755	1.000000	
LNEXR	0.721289	0.725315	0.776446	1.000000
Observations	50	50	50	50

Source: Author's computation, April 2021

3.3 VAR Lag Order Selection Criteria

The lag length has to be determined before conducting the Johansen Cointegration test. Table 4 presents the results of the VAR Lag Order selection criteria for the variables. The lag order is chosen to avoid autocorrelation in the residual. As shown in Table 4, the lag length of four (4) is selected as the best lag length under the sequential modified LR test statistic, Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC), and Hannan-Quinn (HQ) Information Criterion.

Table 4: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-174.2129	NA	0.027239	7.748388	7.907400	7.807955
1	96.76662	483.0505	4.19e-07	-3.337679	-2.542618	-3.039844
2	127.5687	49.55121	2.24e-07	-3.981249	-2.550138*	-3.445146
3	143.7071	23.15502	2.32e-07	-3.987264	-1.920104	-3.212893
4	178.3625	43.69599*	1.12e-07*	-4.798370*	-2.095161	-3.785732*

Note: * indicates lag order selected by the criterion. Each test at 5% level

3.4 Unit Root Test

The Augmented Dickey-Fuller (ADF) was employed as the first step to examine the presence of the unit-roots or non-stationarity (Dickey & Fuller, 1979). The ADF

test relies on rejecting a null hypothesis of the unit root (the series are non-stationary) in favour of the alternative hypothesis of stationarity. The general form of the ADF is estimated by the following regression.

$$\Delta Y_t = \alpha + \beta K_{t-1} + \sum_{j=1}^{n} \delta_i \, \Delta K_{t-i} + \varepsilon_t \qquad (2)$$

$$\Delta Y_t = \alpha + \beta K_{t-1} + \sum_{j=1}^{n} \delta_i \, \Delta K_{t-i} + \mu_t + \varepsilon_t \qquad (3)$$

The standard Dickey-Fuller model has been augmented by ΔK_{t-i}, where Y_t represent a time series (a linear time trend), Δ is the first difference operator, a is a constant, and ε_t is the random error term while β, δ, and μ are parameters to be estimated. Equation 2 tests the unit root of the random walk with the intercept, while Equation 3 tests for a random walk with the intercept and time trend.

Results for ADF unit root
The ADF results are presented in Table 5. The results show that all the variables become stationary at first difference. Since the ADF test gives a real way for further econometric tests, we therefore undertook a co-integration test as its requirement was satisfied. This condition requires that all the variables in the model be stationary at first difference (Johansen & Juselius, 1990).

Table 5: Results for Unit Root Tests

| Variables | Augmented Dickey-Fuller (ADF) test | | | |
| | At levels | | At first difference | |
	Intercept (t)	*Trend and intercept (t)*	*Intercept (t)*	*Trend and intercept (t)*
lnGDP	2.059246	-0.408589	-1.298874	-4.829073***
lnFDI	-0.918130	-3.291393	-8.326506***	-8.242105***
lnTRD	0.116534	-1.281533	-5.91819***	-5.929747***
lnEXR	-1.265440	-1.476203	-8.157026***	-8.121266***

Note: MacKinnon's (1996) critical values used in the rejection of the null hypothesis of the unit root, whereas * shows $p < 0.1$; ** shows $p < 0.05$; *** shows $p < 0.001$.

3.5 Co-integration Test
As proposed by Johansen and Juselius (1990) and recently employed by Dwyer (2014), Abbes et al. (2015) and Pegkas (2015), we used the maximum likelihood for testing the presence or otherwise of long-run equilibrium between the series of the same order of integration through forming a co-integration equation. The advantage of the co-integration approach is to allow one to integrate the long run and short-run relationships between variables within a unified framework. Johansen (1998) and Johansen and Juselius (1990) suggest two statistical tests for determining the number of co-integration vectors. The first one is the trace test (λ

trace), which tests the null hypothesis that the number of a distinct co-integrating vector is less than or equal to *n* against a general unrestricted alternative *n = r,* as shown below.

$$\lambda trace(r) = -T \sum_{i=r+1}^{n} ln(1 - \lambda_i) \qquad (4)$$

Where T is the number of usable observations, and λ1's are the estimated eigenvalue from the matrix. The second statistical test is the maximum eigenvalue test (λ max) that is calculated according to the following formula.

$$\lambda \ max \ (r, \ r+1) = -T \ln (1 - \lambda_{r+1}) \qquad (5)$$

The maximum eigenvalue test (λ max) checks the concerns of the null hypothesis that there are *r* co-integrating vectors against the alternative of *r* + 1 co-integrating vectors.

Results of the Johansen Co-integration test
The Johansen co-integration test results are presented in Table 6. The results indicate that all variables under study have a long-run relationship, meaning that all variables move together in the long run. Thus, the co-integration test results show that both trace and a max-eigenvalue test show the presence of two co-integrating equations at 0.05 significant level, indicating that if individual variables are non-stationary, the linear combination of these variables may be stationary. Therefore, we reject the null hypothesis at none* and at most 1* as the P-value is less than 5%, rather at most 2. We accept the null hypothesis because the P-value is greater than 5%. The co-integrating equation is shown in Equation 6 with its respective normalized co-integrating coefficients.

$$\ln GDP_t = -5.455 + 0.900\ln FDI_t + 0.5317 TRD_t - 0.0297\ln EXR_t \qquad (6)$$

Since the co-integrating equation exists, we invoke VECM only to examine the short-run and/or long-run equilibrium relationships among the selected variables.

Table 6: Results for Johansen Co-integration Test

H₀ No. of CE	Unrestricted Cointegration Rank Test (Trace)			Unrestricted Cointegration Rank Test (Maximum Eigenvalue)			Observed No. of CE
	Trace Statistics	*0.05 Critical value*	*Prob.***	*Max-Eigenvalue test*	*0.05 Critical value*	*Prob.***	
None*	774.9680	47.85613	0.0001	521.3712	27.58434	0.0001	Trace: 2
At most 1*	253.5968	29.79707	0.0001	242.8757	21.13162	0.0001	
At most 2	10.72109	15.49471	0.2292	9.101445	14.26460	0.2778	Max-Eigen: 2

Note: * Denotes rejection of the hypothesis at the 0.05 level.
　　　　**MacKinnon-Haug-Michelis (1999) p-values

3.6 Vector Error Correction Model (VECM)

When the variables are co-integrated, it means that there is a long-run association between variables. Therefore, we run an error correction model (ECM) that describes the short-run dynamics of the co-integrated variables towards their long-run equilibrium values. The error correction model for the selected variables takes the following form:

$$\Delta \ln(GDP_t) = \alpha_0 \sum_{i=1}^{q_1} \beta_{1i} \Delta \ln(GDP_{t-1}) + \sum_{i=0}^{q_2} \beta_{2i} \Delta \ln(TRD_{t-i}) + \sum_{i=0}^{q_3} \beta_{3i} \Delta \ln(FDI_{t-i})$$

$$+ \sum_{i=0}^{q_4} \beta_{4i} \Delta \ln(EXR_{t-i}) + \lambda ECT_{t-1} + \varepsilon_t \qquad (7)$$

Where q_1 to q_4 represents optimal lag length, β_1 to β_4 represent short-run dynamics of the model, Δ is the first difference operator, λ is the speed of adjustment parameter, because it measures the speed at which the dependent variable (GDP) returns to equilibrium after a change in the independent variables. ECT_{t-1} is a lagged error correction term and is the residual from the co-integrating regression equation that measures the speed of adjustment to long-run equilibrium. The sign of the coefficient of the error correction term (λ) should be negative and significant, while the coefficients of the first differenced lagged variables measure the short-run effect of the variables.

3.6.1 Results for Vector Error Correction Model (VECM)

The VECM results through the system equations show that the error correction term *(ECT$_{t-1}$)* has a negative sign and is significant. That means the disequilibrium created in the previous time will be corrected in successive times, which means that there is a long-run causality running from independent variables (lnFDI, lnTRD, and lnEXR) to the dependent variable (lnGDP).

Table 7: Results for the System Equations

Dependent	D(lnGDP), Least Squares Method			
Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
C(1)	-0.106108	0.031867	-3.329673	0.0020
C(2)	0.002520	0.001885	1.336880	0.1896
C(3)	0.026410	0.160106	0.164956	0.8699
C(4)	-0.262654	0.168664	-1.557262	0.1282
C(5)	-0.004550	0.001669	-2.725872	0.0098
C(6)	-0.003519	0.001706	-2.062837	0.0464
C(7)	0.050220	0.018624	2.696524	0.0106
C(8)	0.004077	0.016496	0.247178	0.8062
C(9)	0.025842	0.021486	1.202715	0.2369
C(10)	-0.021799	0.022070	-0.987720	0.3299
C(11)	0.016860	0.004574	3.685688	0.0007

R-squared	0.677602	Mean dependent var	0.015970
Adjusted R-squared	0.588047	S.D. dependent var	0.023268
S.E. of regression	0.014934	Akaike info criterion	-5.368830
Sum squared resid	0.008029	Schwarz criterion	-4.935817
Log likelihood	137.1675	Hannan-Quinn criter.	-5.205884
F-statistic	7.566328	Durbin-Watson stat	1.928026
Prob(F-statistic)	0.000002		

The study used the Wald coefficients restriction test to check for the short-run causality of the explanatory variables. The Wald statistics indicate not to reject the null hypothesis for both lnFDI, and lnTRD, which is $C(5)=C(6)=0$ and $C(7)=C(8)=0$ respectively, indicating that there is a short-run causality running from lnFDI and lnTRD to lnGPD. However, the Wald statistics indicates the rejection of the null hypothesis $C(9)=C(10)=0$ for the lnEXR, which indicates that there is no short-run causality from lnEXR to lnGDP, as shown in Table 8.

Table 8: VECM Short-run Representations–Wald Test

	Test Statistic	Value	Probability	Decisions
FDI	F-statistic	4.445829	0.0188	Accept H_0
	Chi-square	8.891659	0.0117	
TRD	F-statistic	3.644312	0.0362	Accept H_0
	Chi-square	7.288624	0.0261	
EXR	F-statistic	0.762101	0.4741	Reject H_0
	Chi-square	1.524203	0.4667	

3.7 Robustness Check of the Model
The robustness check was performed during the post-estimation method of the model. The R^2 (0.6776) and adjusted R^2 (0.5880) of the OLS model throughout the VECM bound of this study are relatively high. Observing the R^2, which is more than 60%, indicates that the model is the best fit. The F-statistic (7.5663) of the model is as well as positive and large enough with a corresponding probability value (0.0000), which is significant at 1% level, demonstrates that all the independent variables influenced the dependent variable. The Durbin-Watson statistic is 1.9280, which lies in the range of 1.5–2.5, implying that the model is not suffering any autocorrelation problem and the series is stationary, which allows for the diagnostic stability test.

3.8 Diagnostic Stability Test
The diagnostic check performed in this analysis shows that the model is not suffering any serial correlation and heteroscedasticity problem, as confirmed by

Breusch-Godfrey LM test (Breusch, 1978; Godfrey, 1978) and Breusch and Pagan heteroscedasticity tests (Breusch & Pagan, 1979). Besides, the Jarque-Bera test authenticates that the residuals are normally distributed as their respective probability is more than 0.05 (Hendry and Juselius, 2001), as shown in Table 9.

Table 9: Results of the Diagnostic Test

	Observed R^2	Prob	Remarks
Breusch-Godfrey serial correlation LM test	5.14336	0.0764	Do not reject H_0
Heteroskedasticity test: Breusch-Pagan-Godfrey	10.06700	0.6101	Do not reject H_0
Normality (Jarque-Bera test)	1.03920	0.5947	Do not reject H_0

Finally, the stability of the model for the long-run parameters together with the short-run dynamics for the equations was examined. The test relied on the cumulative sum (CUSUM) and cumulative sum square (CUSUMSQ) tests proposed by Borensztein et al. (1998) and Mohsen and Raymond (2002). These tests were applied to the residuals of the ECM model (Brown et al., 1975).
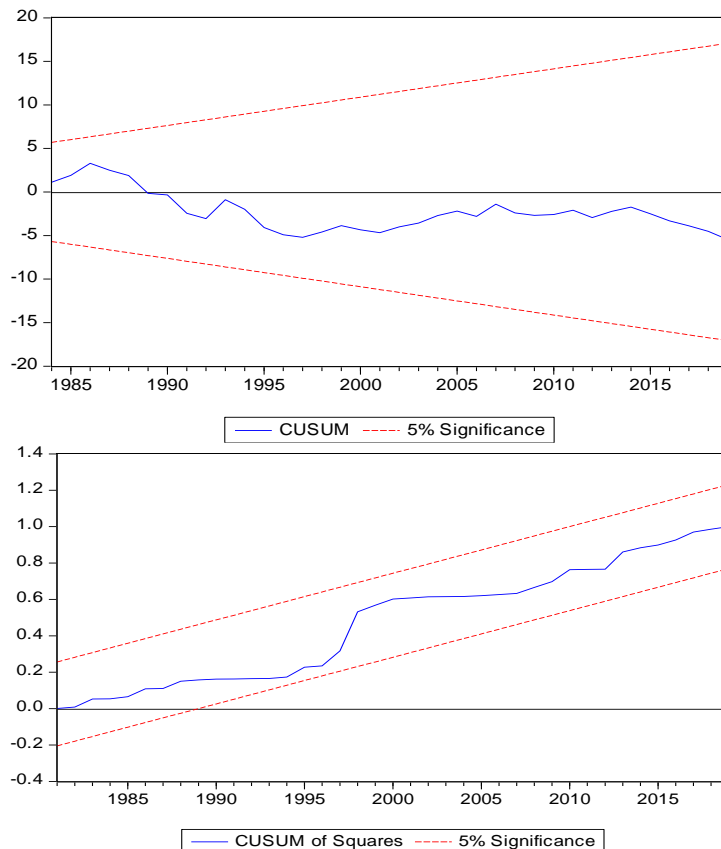

Figure 1: *Plot of Cumulative Sum and Squares of Recursive Residuals*

Figure 1 shows the plot of CUSUM and CUSUM of squares within the critical 5% bounds. This confirms the long-run relationships among variables and thus shows the stability of the model. Afterward, the inverse roots of the characteristic polynomial are all inside the unit circle, this also implies the stability of the model. Thus, the entire diagnostic results show the model to be robust and good fit for examining the effects on economic growth.

4. Discussion of Findings

The main objective of this study was to investigate whether trade and FDI matter for economic growth in Tanzania. The study found the presence of a long-run relationship between the variables, which indicates that all the variables move together in the long run. Consistent with the economic intuition, this study found that a 1% increase in lnFDI would increase lnGDP by 9% in the long run. This finding is consistent with the findings by Gui-Diby (2014) and Hong (2014). The former study investigated the impact of FDI on economic growth in Africa, and found that the low level of skilled human resources did not limit the flow of FDI to the African countries. The latter examined how FDI promotes economic growth in China, and found that factors that influence economic growth in China include the level of infrastructure, economies of scale, human capital development and regional divergences. Both studies found that FDI has a positive impact on economic growth in the countries studied.

Furthermore, this study found that a 1% increase in lnTRD increases lnGDP by 35% in the long run. This finding is consistent with findings of several studies that found trade to have a positive effect on economic growth (Were, 2015 and Magai, 2018). The former examined the differential impacts using cross-sectional data for the least developing countries, whereas the latter used the time series data to investigate the relationship between trade and economic growth in Tanzania. Both concluded that trade has a robust and significant influence on economic growth. However, other studies found trade to have a negative impact on economic growth in Kenya (Musila & Yiheyis, 2015), Asia (Trejos & Barboza, 2015) and Sub-Saharan Africa (Zahonogo, 2016). The study found real exchange rate to have a negative impact on economic growth in Tanzania in the long run, in that 1% increase in the real exchange rate will decrease the real lnGDP growth by 2%. This result is consistent with Brahim et al. (2017); Magai (2019), and Vargas-Silva (2009), who found that the exchange rate is likely to negatively impact economic growth. However, MacDonald (2000) and Korkmaz (2013), found the exchange rate to likely stir up economic growth in European countries, thereby emphasizing on the role played by the exchange rate policy in economic growth.

The results for VECM underscored the presence of long-run causality, running from independent variables (lnFDI, lnTRD, and lnEXR) to the dependent variable (lnGDP). This result was shown by the negative sign of the error correction term, whose probability is significant at 1% level, which implies that the disequilibrium created in the preceding time will be corrected in the successive time. Through the Wald coefficients restriction test, the study could not reject the null hypothesis,

thereby confirming the presence of short-run causality running from lnFDI and lnTRD to lnGPD. The test rejected the null hypothesis for the exchange rate, thereby indicating that there is no short-run causality from lnEXR to lnGDP. This finding is similar to findings of various studies on the causal relationship between trade, FDI, and economic growth. For example, Liu et al. (2002) found bidirectional causality between economic growth, trade and FDI inflows in China and Dritsaki et al. (2004) found bidirectional causality between economic growth and trade, and found unidirectional causalities from FDI to trade, and FDI to economic growth, for Greece. As well, Dritsaki and Stiakakis (2014) found a bidirectional long run and short-run causal relationship between exports and growth. The implication of the findings of this study is that the causal link between trade, FDI, and economic growth is sensitive to the growth effects; hence it should not be ignored.

5. Conclusion and Recommendations
This study has examined the relevance of trade (TRD) and foreign direct investment (FDI) to economic growth (GDP) in Tanzania from 1970 to 2019 by employing the Johansen co-integration test and Vector Error Correction Model (VECM) approaches. The study found that there is a relationship between foreign direct investments, trade, and the growth rate of per capita GDP in Tanzania. For better outcome, the study included the real exchange rate (EXR) as an explanatory variable. The trade and foreign investment variables were found to have a significant impact on the growth rate of GDP per capita. To check the validity of the VECM model, a few post-estimation diagnostic tests were conducted. It was found that the residuals of the regressions have a normal distribution and did not show any auto-correlation.

The empirical analysis was in three steps. The first step was to test the stationary of the variables studied. By employing the Augmented Dickey-Fuller (ADF) test, all variables become stationary at first difference. Results for ADF test allowed for the co-integration test as a second step. The Johansen co-integration test underscored a long-run relationship among the variables, with two co-integrating equations. This finding led to a conclusion that there is a positive relationship between explanatory variables and the dependent variable in Tanzania. The third step was the analysis of the vector error correction model (VECM), which entailed the modelling of adjustments to long-run and short-run equilibria. The examination of the VECM revealed that there is a long-run relationship running from FDI, TRD, and EXR to GDP growth. While, Wald test demonstrates the presence of short-run causality running from FDI and TRD to GPD, and no short-run causality from EXR to GDP. Since a long-term relationship exists from the VECM model, we suggest that Tanzania should promote trade and foreign investment-friendly policies to attract more investors and maintain political and economic stability. In addition, it should emphasize export-led growth, which tends to lead to the realization of the full potential of trade on economic growth in the country. These policies are indicated to lead to the long-term economic growth for the country. Furthermore, living standards of the people (as indicated by the annual growth rate of GDP per capita) depend on trade and foreign investment as well. One of the measures for an aggressive policy of promoting the trade sector would be a tariff-free access to the markets of both developing and developed countries.

References

Abbes, S. M., Mostéfa, B., Seghir, G. M. & Zakarya, G. Y. (2015). Causal interactions between FDI, and economic growth: Evidence from dynamic panel co-integration. *Procedia Economics and Finance*, 23: 276–290.

Adams, S. (2009). Foreign direct investment, domestic investment, and economic growth in Sub-Saharan Africa. *Journal of Policy Modeling*, 31(6): 939–949. https://doi.org/ 10. 1016/j.jpolmod.2009.03.003.

Belloumi, M. (2014). The relationship between trade, FDI and economic growth in Tunisia: An application of the autoregressive distributed lag model. *Economic Systems*, 38(2): 269–287. https://doi.org/10.1016/j.ecosys.2013.09.002.

Borensztein, E., De Gregorio, J. & Lee, J.-W. (1998). How does foreign direct investment affect economic growth? *Journal of International Economics*, 45: 115–135.

Brahim, M., Nefzi, N. & Sambo, H. (2017). *Remittances and the real effective exchange rates in MENA countries, What is the long run impact?*

Breusch, T. & Pagan, A. (1979). A simple test for Heteroscedasticity and Random Coefficient Variation. *Econometrica*, 47(5): 1287–1294.

Breusch, T. S. (1978). Testing for autocorrelation in dynamic linear models. *Australian Economic Papers*, 17(31): 334–355. https://doi.org/10.1111/j.1467-8454.1978.tb00635.x.

Brown, R. L., Durbin, J. & Evans, J. M. (1975). Techniques for testing the constancy of regression relationship over time. *Journal of the Royal Statistical Society*, 37(2): 149–192.

Chen, G. Geiger, M. & Fu, M. (2015). *Manufacturing FDI in Sub-saharan Africa : Trends, determinants, and impacts.* World Bank Group, Washington. https://openknowledge. worldbank.org/handle/10986/22352 License: CC BY 3.0 IGO.

Chiappini, R. (2011). FDI and trade: A Granger causality analysis in a heterogeneous panel. *Economics Bulletin, Economics Bulletin*, 31(4): 2975–2985.

Denisia, V. (2010). Foreign direct investment theories: An overview of the main FDI theories. *European Journal of Interdisciplinary Studies*, 2(2): 104–110.

Dickey, D. A. & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association*, 76(366a): 427–431.

Dritsaki, C. & Stiakakis, E. (2014). Foreign direct investments, exports, and economic growth in Croatia: A time series analysis. *Procedia Economics and Finance*, 14: 181–190. https://doi.org/10.1016/S2212-5671(14)00701-1.

Dritsaki, M., Dritsaki, C. & Adamopoulos, A. (2004). A causal relationship between trade, foreign direct investment and economic growth for Greece. *American Journal of Applied Sciences*, 1(3): 230–235.

Dunung, S. (2011). International trade and foreign direct investment. In *The Nature of International Business*. Flat World Knowledge.

Dwyer, G. (2014). *The Johansen tests for cointegration*. http://jerrydwyer. com/pdf/ Clemson/ Cointegration.pdf.

Fidrmuc, J. & Martin, R. (2011). FDI, trade and growth in CESEE countries. *Focus on European Economic Integration Q.*, 1: 70–113.

Funke, N. & Nsouli, S. M. (2003). The new partnership for Africa's Development (NEPAD)-opportunities and challenges. *IMF Working Paper No. 03/69*.

Godfrey, L. G. (1978). Testing for higher order serial correlation in regression equations when the regressors include lagged dependent variables. *Econometrica*, 46(6): 1303-1310.

Gui-Diby, S. L. (2014). Impact of foreign direct investments on economic growth in Africa: Evidence from three decades of panel data analyses. *Research in Economics*, 68(3): 248–256. https://doi.org/10.1016/j.rie.2014.04.003.

Hendry, D. F. & Juselius, K. (2001). Explaining cointegration analysis: Part II. *The Energy Journal*, 22(1): 75–120.

Hong, L. (2014). Does and How does FDI promote the economic growth? Evidence from dynamic panel data of Prefecture City in China. *IERI Procedia*, 6: 57–62. https://doi.org/10.1016/j.ieri.2014.03.010.

Hosseini, H. (2005). An economic theory of FDI: A behavioral economics and historical approach. *The Journal of Socio-Economics*, 34: 528–541.

Jayakumar, A., Kannan, L. & Anbalagan, G. (2014). Impact of foreign direct investment, imports and exports. *International Review of Research in Emerging Markets and the Global Economy (IRREM),* 1(1).

Johansen, S. (1998). Statistical analysis of cointegration vectors. *J. Econ. Dynamics and Control*, 12(6): 231-254.

Johansen, S. & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration with applications to the demand for money. *Oxford Bulletin of Economics and Statistics*, 52(2): 169–210.

Keho, Y. (2015). Foreign direct investment, exports and economic growth: Some African evidence. *Journal of Applied Economics & Business Research*, 5(4). http://search.ebscohost.com/login.aspx?direct=true&profile=ehost&scope=site&authtype=crawler&jrnl=1927033X&AN=111920217&h=hj75rgzo1gzfwxg7slnoejfjotz4ocwvgu1432kava2i4i1spzoksfpabkg747btybtucezbkdzlwicrkbyklq%3d%3d&crl=c.

Korkmaz, S. (2013). *The effect of exchange rate on economic growth*. 2nd International M-Sphere Conference.

Lim, C. C. & Maisom, A. (2000). Contribution of private foreign investments in the Malaysian manufacturing sector 1977–1995. *Faculty of Economics and Management*.

Liu, X., Burridge, P. & Sinclair, P. J. N. (2002). Relationships between economic growth, foreign direct investment and trade: Evidence from China. *Applied Economics*, 34(11): 1433–1440. https://doi.org/10.1080/00036840110100835.

Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22(1): 3–42.

MacDonald, R. (2000). *The role of the exchange rate in economic growth: A Euro-Zone Perspective: National Bank of Belgium Working Paper No. 9*.

Magai, P. S. (2018). An econometric analysis of trade and economic growth in Tanzania: Evidence from Time Series Data. *Business Management Review*, 22(1), pp.74-84.

Magai, P. S. (2019). The relevance of remittances on economic growth in Tanzania. *ORSEA Journal*, 9: 16–31.

Makki, S. S. & Somwaru, A. (2004). Impact of foreign direct investment and trade on economic growth: Evidence from developing countries. *American Journal of Agricultural Economics*, 86(3): 795–801.

Mankiw, G., Romer, D. & Weil, D. N. (1992). A contribution to the empirics of economic growth. *The Quarterly Journal of Economics*, 107(2): 407–437.

McAuliffe, C., Saxena, S. C. & Yabara, M. (2012). The East African Community: Prospects for sustained growth. *IMF Working Paper*.

Miankhel, A. K., Thangavelu, S. M. & Kalirajan, K. (2009). *Foreign direct investment, exports and economic growth in South Asia and Selected Emerging Countries: A Multivariate VAR Analysis*. CCAS Working Paper No. 23 August 2009

Mohsen, B.-O. & Raymond, C. W. N. (2002). Long-run demand for money in Hong Kong: An Application of the ARDL Model. *International Journal of Business and Economics*, 1(2).

Moussiegt, L., Beltramello, A. & De Backer, K. (2012). *The export performance of countries within global value chains (GVCs)* (OECD Science, Technology and Industry Working Papers No. (2012/02). https://doi.org/10.1787/5k9bh3gv6647-en.

Musila, J. W. & Yiheyis, Z. (2015). The impact of trade openness on growth: The case of Kenya. *Journal of Policy Modeling*, 37(2): 342–354. https://doi.org/10.1016/ j.jpolmod. 2014.12.001.

Organisation for Economic Co-operation and Development (OECD). (2002). *Foreign direct investment for development maximizing benefits and minimizing costs*.

Olatunji, L. & Shahid, M. S. (2015). FDI and economic growth in Nigeria: A co-integration analysis. *Business and Economic Research*, 4(1).

Pegkas, P. (2015). The impact of FDI on economic growth in Eurozone countries. *The Journal of Economic Asymmetries*, 12(2): 124–132. https://doi.org/10.1016/j.jeca.2015.05.001.

Reinert, E. S. (2008). *How rich countries got rich and why poor countries stay poor*. Public Affairs.

Romer, P. M. (1986). Increasing returns and long-run growth. *The Journal of Political Economy*, 94(5): 1002–1037.

Shakar, S. A. & Aslam, M. (2015). Foreign direct investment, human capital and economic growth in Malaysia. *Journal of Economic Cooperation and Development*, 36(1): 103–132.

Sharma, R. & Kaur, M. (2013). Causal links between foreign direct investments and trade: A comparative study of India and China. *Eurasian Journal of Business and Economics*, 6(11): 75–91.

Soliman, M. (2003). Foreign direct investment and LDC Exports: Evidence from the MENA Region. *Emerging Markets Finance and Trade*, 44(2): 4–14. https://doi.org/ 10.2753/ REE1540-496X440201.

Solow, R. M. (1956). A contribution to the theory of economic growth. *The Quarterly Journal of Economics*, 70(1): 65–94.

Søreide, T. (2001). FDI and industrialisation: Why technology transfer and new industrial structures may accelerate economic development. CMI.

Sunde, T. (2017). Foreign direct investment, exports and economic growth: ADRL and causality analysis for South Africa. *Research in International Business and Finance*, 41: 434–444. https://doi.org/10.1016/j.ribaf.2017.04.035.

Szkorupová, Z. (2014). A causal relationship between foreign direct investment, economic growth and export for Slovakia. *Procedia Economics and Finance*, 15: 123–128. https://doi.org/10.1016/S2212-5671(14)00458-4.

Trejos, S. & Barboza, G. (2015). Dynamic estimation of the relationship between trade openness and output growth in Asia. *Journal of Asian Economics*, 36: 110–125. https://doi.org/10.1016/j.asieco.2014.10.001.

UNCTAD. (2005). *Economic development in Africa: Rethinking the role of foreign direct investment*.

Vargas-Silva, C. (2009). The tale of three amigos: Remittances, exchange rates, and money demand in Mexico. *Review of Development Economics*, 13(1): 1–14.

Wastyn, A. & Sleuwaegen, L. (2013). *Study on the export and FDI potential of Belgian companies*. http://statbel.fgov.be/fr/binaries/study_export_fdi-potential_belgian_ companies_ tcm326-246940.pdf.

Were, M. (2015). Differential effects of trade on economic growth and investment: A cross-country empirical investigation. *Journal of African Trade*, 2(1–2): 71–85. https://doi.org/ 10.1016/j.joat.2015.08.002.

Zahonogo, P. (2016). Trade and economic growth in developing countries: Evidence from sub-Saharan Africa. *Journal of African Trade*, 3(1–2): 41–56. https://doi.org/ 10.1016/j.joat. 2017.02.001.

Zhang, K. H. (2005). How does FDI affect a host country's export performance? The case of China. *International Conference of WTO, China and the Asian Economies*, 25–26. http://faculty.washington.edu/karyiu/confer/xian05/papers/zhang.pdf.

Zhang, K. H. & Song, S. (2001). Promoting exports: The role of inward FDI in China. *China Economic Review*, 11(4): 385–396. https://doi.org/10.1016/S1043-951X(01)00033-5.