

The Role of Foreign Direct Investment on Economic Growth in Tanzania: Empirical Evidence from Emerging Sectors

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Abstract

FDI plays crucial role in stimulating development of various sectors in economy such as provision of skilled labour, employment creation, source of capital, management and technological transfer. Over the past 30 years, the share of FDI in World's economy has been transformed from manufacturing sector to service sector thus creating various emerging sectors. The study employed time series secondary data for 22 years from 1999 to 2020, then used dickey-fuller and Philips perron tests for stationarity, Auto Regressive Distributed Lag (ARDL) bound test for co-integration, ARDL model to estimates long-run relationship lastly, diagnostic tests were applied to check validity and reliability of variables. The study revealed that FDI inflow in transport and storage sector have weak positive impact on economic growth while FDI inflow to other sectors have insignificant impact to economic growth. Thus, to combat such outcomes, the government is advised to attract more foreign investment to sectors with undesirable impacts with productive strategies to improve sectors performance on economic growth through establishment of favourable investment policies such as tax policies to avoid double taxation, capital account liberalization policies and financial institution policies to create conducive investment environment.

Keywords: *Economic growth, Foreign Direct Investment, Emerging sectors, Real GDP, Tanzania.*

1.0 Introduction

The role of FDI in economic growth is observed in stimulating the development of various sectors in economy such as provision of skilled labour, creation of employment, transfer of management skills, acting as source of capital and technological transfer (Bitzer, 2005). In the presence of favourable investment environment, FDI is an important instrument to accelerate economic growth for any country in the world. According to OCED (2002), the main factor that accelerates FDI inflows in Africa is the presence of favourable natural resources for example oil and gases in Nigeria and Angola, different minerals in Congo and Kilimanjaro Mountain in Tanzania. Over the past 30 years the share of FDI in World's economy has been transformed from

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manufacturing sector to service sector, these new emerging sectors of economy include transport, storage, real estates, communication, tourism, insurance, finance, online business and construction activities (IBISWorld, 2023).

Tanzania is one among countries with abundantly natural resources such as land for agriculture, different minerals such as Limestone, Dimension stones, Graphite, Gold, Diamond, Tanzanite, Coal, Ruby and waterbodies such as ocean, lakes, rivers and dams together with natural gas. Despite the availability of abundantly resources together with various policies and efforts made by Government of Tanzania like FDI Act of 1963 and reforms such as privatization and private public partnership (PPP) to attract FDI inflow in order to fill the capital gap and stimulating economic growth, yet the FDI inflows in emerging sectors have not accelerated Tanzania into upper-middle income economy with Gross National Income (GNI) between \$4,046 and \$12,535 or high-income economy with Gross National Income (GNI) of \$13,205 and above (world Bank, 2021).

Several studies on the impacts of FDI in country's economic growth have suggested that there is positive relationship between FDI and economic growth while few others suggested that there is negative relationship. Among the related studies are those by Moshi (2015), Msagati (2021), Haseeb (2014), Okwu (2020), Diyamett (2011), Bomani (2013), Hussain (2020) Sakiru (2015), Latief (2019), Belloumi (2022), Hassan (2005), Wang (2010), Saidi (2020), Mahori (2022), Gholipour (2014), Masron (2012), Boers (2017), Moshi (2015), Utouh (2016), Hussain (2020) and Wijeweera (2010). But most of these studies have been conducted on evaluating impact of a single sector in an economy or on primary sectors of economy such as agriculture, manufacturing and mining whereas none of these studies have conducted analysis on evaluating the impact of emerging sectors to an economy which have recently been highly contributing to world's FDI inflows.

This study investigated the way economic growth is influenced by FDI in emerging sectors of economy. Emerging sectors are sectors within an economy which are at their initial stage of development, and are expected to grow rapidly in coming few years by becoming main contributors to the country's economy OECD (2021). Due to their importance to economic growth of many developed countries the study employed the following emerging sectors of "transport and storage", "Real estate", "information and communication" and "Electricity and gas". The presence of resources from these sectors has led to higher economic growth to various countries in the world such as Nigeria and United Arab Emirates (oil and gas), United Arab Emirates especially Dubai (real estate), South Africa (transport and storage) and South Korea (information and Communication). Tanzania is one among countries with abundantly natural resources in Africa, yet the FDI inflows in emerging

sectors has been dismal and its contribution to the economic growth is not well known.

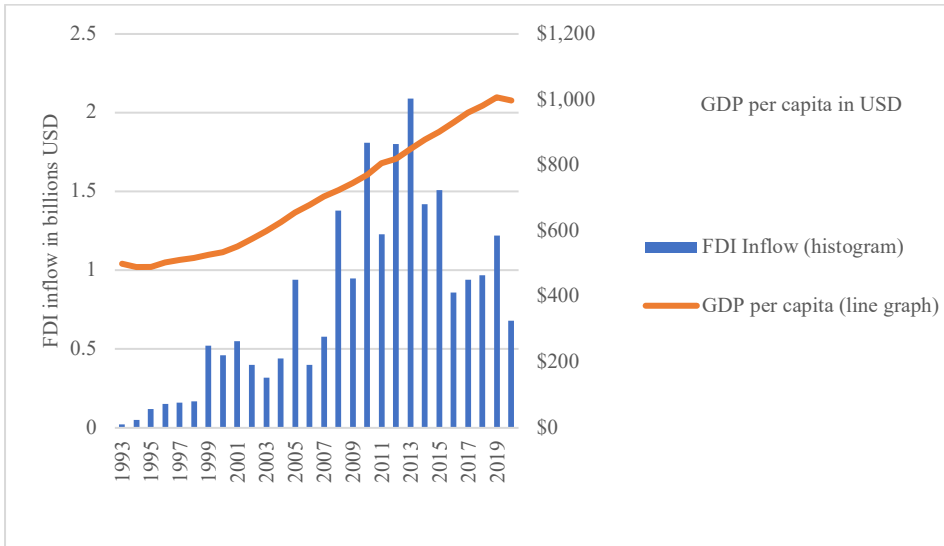


Figure 1. Tanzania FDI inflow and GDP per capital trends over years

Source: World Bank, 2022

There is a need and importance of conducting a study in order to evaluate the impact of these available resources from emerging sectors of economy on economic growth of a country. Considering UAE as an example of a country that did not pass through the hypothetical stages of development rather the availability of “oil and gas” and “infrastructural development” accelerated to fast development by becoming one of industrialized country in the world. Similarly, to Tanzania, where there is presence of abundant oil and natural gas, improvement in transport and storage, real estate’s development and growth in information and communication that is expected to cause high economic growth. This study is important as it provides insights on contribution of FDI from these sectors in economy and also provides suggestions to sectors that various stakeholders should pay attention during investment plans that could have contributed positively to economic growth. The outcome of this study will contribute to government and institutions to formulate policies and future researchers as the starting point for further studies and as a reference for their studies.

2.0 Literature Review

2.1 Theoretical Review

There are various theories regarding FDI inflow into the country and its impacts. The capital market theory also mentioned as currency area theory which is one among oldest theories that explains about foreign direct

investment. The theory explains FDI inflows is resulted by the market imperfection between home country and host countries and home country and host country currencies differences (Aliber,1970). Kindleberger suggested that there are mainly four types of imperfections that causes FDI inflows between countries, which are goods market imperfections, factor market imperfections, government interventions and the last imperfection is economies of scale (Popovici, 2014).

In 1988 Tanzania Government reduced value of its currency from Tanzania shillings 98 to Tanzania shillings 120 to US dollar or about Tanzania shillings 220 to the GB pounds. In response to this the exporters enjoyed highly as their products became less expensive in international market, together with that foreign investment increased as it became cheaper to invest in the country (Carter, 1989). This theory was criticized for not being able to be applied to Less developed Countries (LDCs) that have imperfect markets or non-existent capital markets but with foreign exchange rates that are highly regulated.

Also, Location-based approach to FDI theories, explains the achievement of FDI inflows among nations depend on availability of labours and wealth of a nation such as endowments of natural resources (water bodies, national parks, geographical features, minerals, suitable land for agricultural activities, oil and gases), infrastructure development (luxury accommodations, skyscrapers, adrenaline-pumped adventures, state-of-the-art attractions, fine dining, beautiful beaches and dunes), local market size, availability of labour and government policies established for these resources. (Makoni, 2015). Regardless of the location of a country the behaviour of the firms is highly influencing the FDI flow, as when firms are market seeking, resource seeking and whether they are strategic asset seeking or efficiency seeking.

The theory is suitable and relevant in guiding the undertaken study as in Tanzania there is abundant availability of petroleum, natural gas, tourism activities, mining activities and suitable land for agriculture, in which according to the theory would motivate attraction of foreign direct investment. According to TIR (2013), Mining and Quarrying sector in Tanzania has been contributing to over 34 percent to total FDI inflow in a country being the leading sector for three consecutive years (2009 to 2011). Various studies have criticized the theory as more areas with endowments of abundant natural resources have been the main trigger for conflicts occurrence more likely (Okwu, 2020). For example, occurrence of endless civil wars in Congo DRC and Nigeria due to the availability of abundant resources such as diamond, gold, cobalt, copper, oil and gas.

Nachum (2002) argued that location advantage is not absolute advantage of FDI inflow to a particular country rather contrasts across firms. This is due to characteristics and behaviour of firm that wants to invest on how the area

might affect their capacity to take advantage that includes ability of an area to be reached. Therefore, the location choice is affected by various factors which are not similarly across investing firms. Taking a case of market size which is considered to larger firm as major location advantage by obtaining benefit of its scale advantage, it is not similar to small scale firm that relies with specialized technology as it targets individuals or small group of customers to satisfy their needs.

2.2 Empirical Review

Khatun (2015) analysed on causal relationship between economic growth and Foreign direct investment in power and energy sector in Bangladesh based on statistical data from 1972 to 2010. The study revealed that over time FDI inflow trend was fluctuating. Further, it was found that during a short run period there was positive and unidirectional relationship between FDI in energy sector and economic growth in terms of GDP, similarly, a long run period it was found to be causal relationship between the sectors. Finally, the study suggested that FDI inflow to the sector should be encouraged in order to enjoy targeted economic growth.

Sakiru (2015) conducted study to investigate relationship between economic growth and natural gas consumption by involving foreign direct investment, trade openness and capital in Malaysia from 1971 to 2012. Unit root test for stationarity was applied then cointegration test for long run relationship between variables was applied and then ARDL bound testing method was applied for checking possible long run relationship in case of structural break. The results informed that natural gas consumption, foreign direct investment, trade openness and capital have positive relationship with economic growth in Malaysia.

Belloumi (2022) examined the relationship between economic growth, Foreign Direct Investment (FDI) inflows and information and communication sector by involving 15 Arabic countries from 1995 to 2019 by using panel ADRL approach. The results of the estimations revealed that in the long run period FDI inflow and ICT have positive and significant impact on economic growth, further information and communication sectors indicators have positive impact on foreign direct investment. The study suggested that the findings of the study could be used for future management of information and communication sector in Arab countries as the countries should improve the sector since it is more important infrastructure that could raise foreign investment hence economic growth.

Hassan (2005) conducted study on FDI, Information Technology and Economic Growth in the 95 countries and eight (8) MENA countries from 1980 to 2001 by using pool estimation technique, pooled cross-section regression and fixed effect panel model to analyse data. The results revealed that FDI inflow and economic growth are related to host of macroeconomic, hence the

study recommended to improve FDI inflow by focusing on export processing zones, trade facilitation, investment promotion agencies and WTO rules and incentives

Wang (2010) investigated the economic growth effect of logistics industry FDI Analysis in China from 1997 to 2005 by using fixed effects to analyse the data and extended C-D production function method to estimate FDI contribution to economic growth. The results revealed that the average contribution of FDI to logistic industry in China has much impact on economic growth than average contribution rate of agriculture sector

Mahori (2022) conducted study on the impact of Foreign Direct Investment (FDI) inflow in storage, communication and transport sector on economic growth in South Africa from 1985 to 2018 by employing Ordinary Least Square (OLS) method, bound test to establish long run relationship and lastly, Error Correction Model (ECM) was applied. The results revealed that there is insignificant impact of FDI in transport, storage and communication sector on total factor productivity or economic growth. The study recommended that having higher FDI inflow is not everything as it does not guarantee that spillovers will be absorbed in the economy.

Gholipour (2104) investigated on relationship between FDI inflow in real estate, property prices and economic growth by controlling inflation and interest rate, evidence from OECD countries during the period between 1995 and 2008 by applying panel cointegration technique to analyse the interrelationship between the variables. The results from analysis revealed that during the short run period and long run period the foreign direct investment that goes into real estate sector do not cause appreciation of property prices and also does not affect the economic growth in OECD countries.

Boers (2017) investigated on the impact of foreign direct investment in real estate on economic growth and prices of property by controlling inflation and interest rate on nine (9) OECD countries from 1992 to 2013 where augmented-dickey-fuller (ADF) test was used for checking stationarity, then Johansen test was applied for cointegration, vector auto regression (VAR) was employed and lastly, diagnostics test was used in analysing data for the study. The results revealed that FDI in real estate sector may rise the property prices in some countries and it may have negative impact on economic growth.

The previous studies from stated researchers have been evaluating impact of FDI on a specific sector from developed countries on economic growth but none of these studies have evaluated impact of FDI on emerging sectors in economic growth from Tanzania. Also, the study included four emerging sectors in Tanzania which are “transport and storage”, “Real estate”, “information and communication” and “Electricity and gas”.

Conceptual Framework

This section depicts conceptual framework regarding the role of FDI on emerging sectors of economy on economic growth. The figure below shows that there is one main channel through which FDI inflows on emerging sectors of economy (Transport and Storage”, “Real estate”, “Information and Communication” and “Electricity and Gas) affect economic growth of Tanzania. If the country aims to increase its economic growth it has to change its investment plan on a specific emerging sector of economy, which has the capacity to raise country’s outputs that can be consumed domestically or traded to other countries which in turn increases economic growth. On the other hand, the economic growth is also affected by other variables apart from independent variables, which have been accounted for in the study as controlled variables such as government expenditure, consumption, FDI inflow in manufacturing sector and FDI inflow in Construction sector. Consider the Figure 2.4 below that shows the conceptual framework model for growth analysis from FDI by sectors.

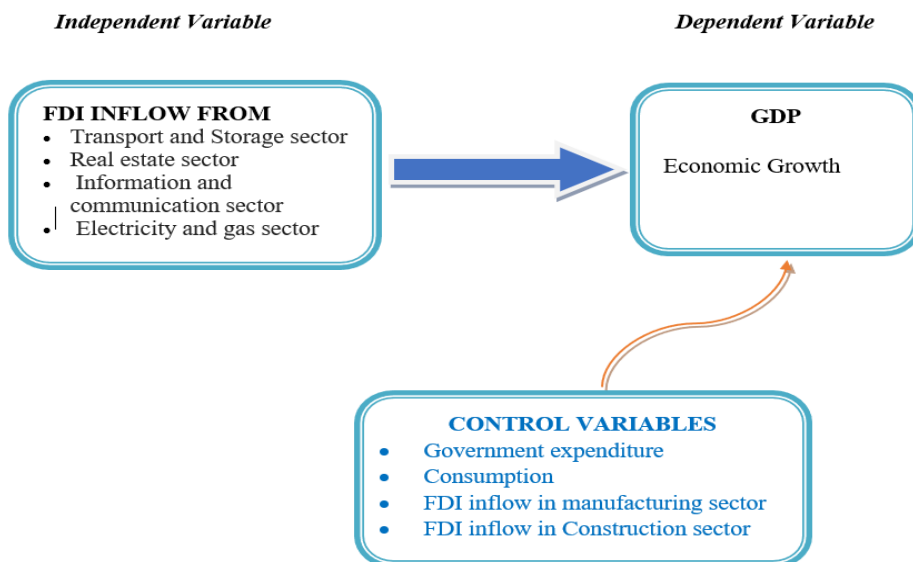


Figure 2: Conceptual Framework Model for Growth analysis from FDI by sectors

Source: Developed by Author from Reviewed Empirical and Theoretical Evidences

Description of Variable

The study used real Growth Domestic Product (GDP) as the measure for economic growth. Real GDP is the ratio of nominal GDP to GDP deflator. GDP is the best measure of country’s economic growth as GDP measures the rise in country capacity to produce goods and services in the economy that takes

place over a certain period of time. The real GDP was used in the study in order to adjust data for changes in prices or inflation.

The study also, used foreign direct investment (FDI) inflow as independent variables to the study as FDI were disaggregated into four sectors namely: transport and storage (TS); Real estate (RE); information and communication (IC); and Electricity and gas (EG). The four sectors were considered as emerging sectors to economy as recently, the sectors have high contribution to the world economy.

However, the study used FDI inflow in Manufacturing sector, FDI inflow in construction sector, Government expenditure and Consumption as control variables. The study controlled for the FDI inflow from two primary sectors of economy (manufacturing and construction) as these sectors have higher influence on economic growth. The government expenditure and consumption as separate variables from FDI inflow are two variables whose impact on economic growth is immerse.

S/N	Variable	Description	Operationalization of variables	Sources
1	GDP	real GDP	Growth rate of real GDP per capita	WB
2	TS	FDI on Transport and storage sector	Foreign Direct Investment share to Transport and storage sector	BoT
3	RE	FDI to Real Estate sector	Foreign Direct Investment share to Real Estate sector	BoT
4	IC	FDI to Information and Communication sector	Foreign Direct Investment share to Information and Communication sector	BoT
5	EG	FDI to Electricity and Gas sector	Foreign Direct Investment share to	BoT
6	MANF	FDI inflow in Manufacturing sector	Foreign Direct Investment share to Manufacturing sector	BoT
7	CONSTR	FDI inflow in construction sector	Foreign Direct Investment share to construction sector	BoT
8	GOVT	Government expenditure	Government expenditure	BoT
9	CONS	Consumption	Consumption	BoT

3.0 Methodology

3.1 Data

The study used annual time series data for the period ranging from 1999 to 2020 collected from different economic bulletin of Bank of Tanzania (BOT) and World Bank Website to conduct the study. The data that were used were in dollar terms for consistence of information and reporting. After data

compilation statistical software STATA was used to process and analyse data to come up with study findings.

3.3 Model

Consider the Cobb-Douglas value-added production function to describe the relationship between production variables in the economy.

$$Q_{it} = A_{it}K_{it}^{\alpha}L_{it}^{\beta} \dots \dots \dots (1)$$

- Where Q denote physical output
- L denotes employment (labour)
- K denotes physical capital stock

Note: $A_{it} = e^{\pi_0 + \varepsilon_{it}}$ denotes technology or host economy institutional quality which is assumed to not be observable directly, the subscript “t” means time, subscript “i” indicates a firm or sector, π_0 indicates firms’ efficient level over time and ε_{it}

Introducing $A_{it} = e^{\pi_0 + \varepsilon_{it}}$ into the equation, the equation changes to

$$Q_{it} = e^{\pi_0 + \varepsilon_{it}}K_{it}^{\alpha}L_{it}^{\beta} \dots \dots \dots (2)$$

Then, applying natural logarithmic form in both sides of the equation

$$\begin{aligned} \ln Q_{it} &= \ln(e^{\pi_0 + \varepsilon_{it}}K_{it}^{\alpha}L_{it}^{\beta}) \\ \ln Q_{it} &= \ln e^{\pi_0 + \varepsilon_{it}} + \alpha \ln K_{it}^{\alpha} + \beta \ln L_{it} \\ \ln Q_{it} &= \pi_0 + \varepsilon_{it} + \alpha \ln K_{it} + \beta \ln L_{it} \\ \ln Q_{it} &= \pi_0 + \alpha \ln K_{it} + \beta \ln L_{it} + \varepsilon_{it} \dots \dots \dots (3) \end{aligned}$$

The equation represents individual firm productivity by transforming it into national level productivity (the national income equation) by using expenditure approach with national output (GDP), investment I, consumption C, government spending G and net exports X-M the equation becomes

$$\ln Y_t = \beta_0 + \beta_1 \ln C_t + \beta_2 \ln I_t + \beta_3 \ln G_t + \beta_4 \ln X - M_t + \varepsilon_{it} \dots \dots \dots (4)$$

Where: Y denotes the total output representing economic growth (GDP); C denotes the consumption function (autonomous consumption and marginal propensity to consume); I denotes total investment (autonomous investment and marginal propensity to invest); G denotes total government expenditure; X-M denotes net exports which is calculated as aggregate export minus aggregate import; ε denotes error terms that accounts for unobserved factors that may have impact on GDP.

With the regard to the model above, the study investigated the relationship between investment in terms of FDI inflow and Output (GDP). The multiple linear regression model was used to describe the relationship between variables in this study. The model equated dependent variable GDP with independent variables (FDI in real estate, FDI in transport and storage, FDI

in Information and communication and FDI in electricity and gas, represented as follows:

$$\ln GDP_t = \beta_0 + \beta_1 \ln TS_t + \beta_2 \ln RE_t + \beta_3 \ln IC_t + \beta_4 \ln EG_t + \beta_5 \ln MANF + \beta_6 \ln CONSTR + \beta_7 GOVT + \beta_8 CONS + \varepsilon_{it} \dots \dots \dots (5)$$

Where: GDP is Economic growth measured in terms of Gross Domestic Product; TS is FDI inflow in Transport and storage sector; RE is FDI inflow in Real Estate sector; IC is FDI inflow in Information and Communication sector; EG is FDI inflow in Electricity and Gas sector; MANF is FDI inflow in manufacturing sector; CONSTR is FDI inflow in construction sector; GOVT is Government expenditure; CONS is Consumption; and ε is error term that accounts for unobserved factors that may have impact on GDP

Hypothesis

- i) Ho: There is positive effect of FDI inflow in Electricity and Gas sectors on economic growth
H1: There is positive effect of FDI inflow in Electricity and Gas sectors on economic growth
- ii) Ho: FDI inflow in Information and Communication sector leads to high economic growth
H1: FDI inflow in Information and Communication sector leads to high economic growth
- iii) Ho: FDI inflow in Transport and Storage sector affect positively the economic growth
H1: FDI inflow in Transport and Storage sector affect positively the economic growth
- iv) Ho: There is positive relationship between FDI inflow in real estate sector and economic growth
H1: There is positive relationship between FDI inflow in real estate sector and economic growth.

3.4 Estimations

3.4.1 Unit Root Test

The Dickey fuller test for stationarity was applied to examine the presence of unit root to variables used in the model. In relation to this test and in order to minimize Type I error, Philips Perron P-P non parametric test was applied in order to reduce chance of falsely rejecting true null hypothesis or not rejecting false null hypothesis. In order to stabilize mean and variance of the variables under the study the variables were transformed into logarithm and then differenced according to statistical analysis. According to CFA Institute (2022).

3.4.2 Cointegration Test

Checking for long run relationship between GDP and FDI in the model is of crucial important in order to determine if the variables in the long run they move together or they drift apart from each other. ARDL bound test approach was used to test the long run relationship of variables under the study. The bound test is more superior to other models such as Johansen co-integration test because it can be used to test the relationship when variables are integrated to different orders but the order of integration should not be higher than a unit and also it is more efficient in small sample size (Aslam, 2016).

3.4.3 Autoregressive Distributed Lag (ARDL) Model

Autoregressive Distributed Lag (ARDL) Model was used to determine the long run and short run relationship between FDI by sectors and GDP. It is used to describe dynamic behaviour of economic and financial time series and for forecasting. The method was valid to be used as there was cointegration (long run relation between variables). The study used ARDL and not VECM or VAR because there was single equation for a single dependent variable and variables were integrated of different orders which are order one and order zero (Welani, 2023).

3.4.4 Diagnostic Test

Diagnostic tests were used to validate the results that were obtained from the research that was conducted. The Jarque-Bera test as a diagnostic tool for testing goodness of fit of data was applied to test whether the data were normally distributed or not, then heteroskedasticity test was used to test whether the variance of residuals is constant to all observations, The Breusch-Godfrey LM test as applied to test whether the model was correctly specified or there is miss specification problem and lastly Variance Inflation Factor (VIF) was applied to test for multicollinearity between variables.

4.0 Results and Discussion

4.1 Unit Root Test

Dickey fuller test together with Philips perron (P-Perron) tests in table 1 below showed that at 5% significance level the variables EG, TS, IC, GOVT, CONS and MANF were stationary at their levels while the variable RE and CONSTR were not stationary. But after taking first difference all variables became stationary. The variables that were stationary at their levels were integrated at order zero I (0), the one that was stationary after first difference was integrated at order one I (1).

Table 1: Results Stationarity test by Dickey-fuller test and Philips Perron tests

D-Fuller Test					
Levels	First Difference		Order of Integration		
	Test Statistics	Critical Value	Test Statistics	Critical Value	
Variables					
GDP	3.334	-3.000	-3.076 **	-3.000	I (0)
TS	-3.281**	-3.000	-8.135**	-3.000	I (0)
RE	-2.547	-3.000	-6.046**	-3.000	I (1)
IC	-3.883**	-3.000	-6.417**	-3.000	I (0)
EG	-3.839**	-3.000	-6.019**	-3.000	I (0)
GOVT	-4.545 **	-3.000	-6.952 **	-3.000	I (0)
CONS	-7.646**	-3.000	-51.818**	-3.000	I (0)
MANF	-3.761**	-3.000	-7.230**	-3.000	I (0)
CONSTR	-2.609	-3.000	-3.356**	-3.000	I (1)
Phillips – Perron					
GDP	2.494	-3.000	-3.156**	-3.000	I (0)
TS	-3.347**	-3.000	-8.659**	-3.000	I (0)
RE	-2.528	-3.000	-5.929**	-3.000	I (1)
IC	-3.893**	-3.000	-6.955**	-3.000	I (0)
EG	-3.790**	-3.000	-7.019**	-3.000	I (0)
GOVT	-5.341**	-3.000	-6.410 **	-3.000	I (0)
CONS	-6.041**	-3.000	-43.192**	-3.000	I (0)
MANF	-3.741**	-3.000	-10.477**	-3.000	I (0)
CONSTR	-2.637	-3.000	-3.008 **	-3.000	I (1)

NOTE: GDP: Natural log of real Gross Domestic Product per capita; TS: natural log of FDI in transport and storage sector; RE: natural log of FDI inflow in Real Estate sector; IC: natural log of FDI inflow in Information and Communication sector; EG: natural log of FDI inflow in Electricity and Gas sector; MANF: natural log of FDI inflow in manufacturing sector; CONSTR: natural log of FDI inflow in construction sector; GOVT: natural log of government expenditure; and CONS: natural log of construction; and ** rejects null hypothesis of non-stationarity at 5% significance level

4.2. Optimal Lag length

The FPE criteria was selected to be used in the study to determine optimal lag length due to the fact that there are 22 observations from 1999 to 2020. The results from table 2 below shows that optimal lag length is lag one (1) order, the selected lag preserved degree of freedom for estimation, increases number of observations, decreases multicollinearity of results and was used in Autoregressive Distributed Lag (ARDL) Model. According to Liew (2004)

when the study uses small sample (under 30 observations) the superior criteria to be used for optimal lags selection are Akaike's Information Criterion (AIC) and Final Prediction Error (FPE) criteria than other criteria such as Schwarz Bayesian Information Criteria (SBIC) and Hannan - Quin Information Criteria (HQIC). The table 4.4 results suggests that FPE should be used instead of AIC as it suggests that lag one is superior and optimal.

Table 2: Lag Selection Results

Lag Order	FPE	AIC	HQIC	SBIC
0	4.60E+07	10.9468	11.0082	11.392
1	1.9e26*	-34.9461	-34.3322	-30.4942
2		-520.916	-519.811	-512.902
3		-567.038	-565.933	-559.025
4		-577.88*	-576.775*	-569.866*

NOTE:

* Indicates optimal lag length selected at 5% significance level

4.3 Co-integration Test

The results from table 3 below shows that there is co-integration among variables as F - statistics value is above higher bound values and the t – Statistic value is below the upper bound values, hence exists long run relationship among variables in the model. From the stationarity test results it was found that some variables were integrated at order one while others were integrated at order zero, therefore bound test was used in order to determine the co-integration of the variables. In a case where the data are integrated in difference order such that integrated of order one I (1) and integrated of order zero I (0) but no variable should be integrated of order two I (2) the ARDL bound testing approach should be applied (Afzal, 2010).

Table 3: ARDL Bound test Co-integration Results

H0: no levels relationship

F = 16.311

t = -5.236

	[I_0]	[I_1]	[I_0]	[I_1]	[I_0]	[I_1]	[I_0]	[I_1]
	L_1	L_1	L_05	L_05	L_025	L_025	L_01	L_01
k_8	1.95	3.06	2.22	3.39	2.48	3.7	2.79	4.1

NOTE: K – represent number of non-deterministic regressors in long-run relationship

4.4 Autoregressive Distributed Lag (ARDL) Model

The results of ARDL model from Table 5 below showed that the FDI inflow compositions from the emerging economic sectors (Transport and Storage”, “Real estate”, “Information and Communication” and “Electricity and Gas) under the investigation matters for long run economic growth in Tanzania. The results showed that about 0.2418 percent disequilibrium from last period is corrected in the following period, this means towards long-run equilibrium, economic growth adjusts in response to changes in FDI from emerging economic sectors.

The results from table 5 reveals that, FDI inflow in real estate sector has negative and insignificant impact on economic growth during long run and short run period which is supported by negative and statistically insignificant coefficient of FDI inflow in real estate. The results implies that real estate sector in Tanzania is not well developed that is against some literatures that suggests that in short run it should have positive impact on economic growth with negative impact in long run. According to Hong (2014) revealed that real estate investment has positive impact on economic growth in short run while it has negative impact in long run period, hence it is important for Government to control the size and growth of real estate investment.

Moreover, the results reveal that FDI inflow in electricity and gas has negative and insignificant impact on economic growth during short run and long run period, which is supported by negative and insignificant coefficient of FDI inflow in electricity and gas sector. The obtained outcome for this analysis suggests that FDI inflow that goes to electricity in the country have not been able to impact the economic growth, hence this suggests for underdevelopment of the sector from which various literatures suggests that it should have positive impact on economic growth of the country. Considering the studies by Cerdeira (2012) and Lefen (2019) revealed positive and bi-directional short-run relationship between economic growth with FDI in power and energy sector.

The results from table 5 reveal that in short run period FDI inflow in information and communication sector has positive and insignificant impact on economic growth which is supported by positive and insignificant coefficient of FDI inflow in information and communication. However, the results reveal that in long run period FDI inflow in information and communication sector has negative and insignificant impacts on economic growth that is supported by positive and insignificant coefficient of FDI in information and communication sector. The results from analysis implies that the sector needs massive investment and analysis on determining the reasons as to why it has undesirable impact to economic growth. The outcome for this analysis might have been caused by underdevelopment of infrastructural

system to support information and communication sector in Tanzania. According to study by Niebel (2018), developed countries are highly benefiting from investment in information and communication (ICT) than benefits received by emerging and developing countries.

Table 5: The results for long run and short run relationship

	GDP	Coef.	P>t
ADJ	GDP	-0.2418	0.014
	EG	-0.0266	0.265
LR	IC	-0.0012	0.867
	RE	-0.0293	0.536
	TS	0.0678	0.042
	GOVT	0.1197	0.356
	CONS	0.5757	0.009
	MANF	-0.0244	0.376
	CONSTR	0.0486	0.289
	EG	-0.0001	0.929
SR	IC	0.0002	0.823
	RE	-0.0082	0.264
	TS	0.01002	0.046
	GOVT	0.0701	0.036
	CONS	0.1116	0.021
	MANF	-0.0059	0.08
	CONSTR	-0.0012	0.639
	_constant	0.8597	0.016

NOTE: GDP is natural logarithm of Real Gross domestic product; TS is natural logarithm of FDI inflow in Transport and storage sector; RE is natural logarithm of FDI inflow in Real Estate sector; IC is natural logarithm of FDI inflow in Information and Communication sector; EG is natural logarithm of FDI inflow in Electricity and Gas sector; MANF is natural log of FDI inflow in manufacturing sector; CONSTR is natural log of FDI inflow in construction sector; GOVT is natural log of government expenditure; CONS is natural log of construction; P>t is P-Value for rejection or fail to reject the null hypothesis at 5% or 10% level of significance; ADJ is coefficient of error correction, the adjustment speed toward equilibrium; LR is long-run period; SR is short-run period; and *** & ** means significant at 10% & 5% levels, respectively.

Table 5 reveals that in the short run period FDI inflow in transport and storage sector has weak positive impact on economic growth evidenced by positive and statistically significant coefficient of FDI inflow in transport and storage sector, everything held constant a percentage increase on FDI inflow in real estate is associated with 0.01002 percentage increase in economic growth. However, in long run period the results revealed that FDI inflow in transport and storage sector has weak positive impacts on the economic growth which is supported by positive and statistically significant coefficient of FDI inflow in transport and storage sector, other things remain constant, a percentage increase in FDI Inflow in Transport and Storage Sector is associated with 0.06776 percentage decrease in economic growth. The positive impact of FDI Inflow in Transport and Storage Sector on economic growth in short run and long run period might have been resulted by improvement in quality and standard of transport and storage infrastructure that stimulate production of other economic activities such as agriculture, tourism, trade and manufacturing hence increase economic growth. The study by Wang (2010) revealed that logistic FDI in China has positive correlation with economic growth hence logistic FDI is the major driving force of economic development.

4.2.5 Diagnostic test

This test is conducted in order to identify whether the study outcome or findings are valid and reliable or not. After the estimation of Autoregressive Distributed Lag (ARDL) Model, various post estimations tests were conducted such as normality assumption test, heteroskedasticity test, serial correlation test and multicollinearity test were applied to check validity and reliability of the results.

i. Test of the Normality Assumption

The results of Jarque-Bera test from table 6 below suggested that there is a failure to reject null hypotheses (residuals are normally distributed), as p-value of Jarque-Bera test is above 5 percent significant level. Therefore, this suggests that the model's error term follows normal distribution properties.

$$JB = n \left(\frac{s^2}{6} + \frac{k-3^2}{24} \right) \dots \dots \dots (6)$$

Where n = the sample size

S = skewness coefficient

k = kurtosis coefficient

Table 6: Jarque-Bera normality test

JB Test	
chi2	Prob > chi2
1.787	0.4092

1 is respective lag; JB: Jarque - Bera Test for Normal Distribution

ii. Serial Correlation test

The results from the table 8 below shows that there is no serial correlation at lag order, as p-value for the serial correlation test is greater than 5 percent significant level hence null hypotheses (no serial correlation) is failed to be rejected. This suggests that the model is correctly specified that is model do not suffer from serial correlation problem.

$$LM = \sum_{t=1}^k x\beta_t + \sum_{i=1}^p \varepsilon_{t-tp} - np \dots\dots\dots (7)$$

Table 8: Breusch-Godfrey LM test for autocorrelation

LM test			
Lag	chi2	Df	Prob > chi2
1	1.189	1	0.2756

Note: 1 is respective lag; LM: Lagrange - Multiplier Test for Autocorrelation

iii. Multicollinearity Test

The results from table 9 below suggest that there is no multicollinearity between variables as VIF value is below 10. It is important to check for multicollinearity in the study as its presence in the model can cause unreliable and unstable estimates that hinders validity and robustness of model.

$$VIF_i = \frac{1}{1 - R_i^2}$$

Where, R_i^2 The unadjusted coefficient of determination for regressing the ith independent variable on the remaining one

Table 9: Variance Inflation Factor Test

Variable	VIF	1/VIF
TS	1.72	0.58253
EG	1.56	0.64247
IC	1.38	0.72513
RE	2.24	0.44589
CONSTR	2.1	0.47666
MANF	1.74	0.57567
GOVT	9.96	0.10042
CONSUMP	6.71	0.149
Mean VIF	3.42	

5.0 Conclusion

The study investigated the role of Foreign Direct Investment on emerging sectors of economy to economic growth of Tanzania. The study filled the gap

left out by previous literatures in evaluating impact of four FDI on emerging sectors of economy (“electricity and gas”, “information and communication”, “real estate” and “transport and storage”) to country’s economic growth. The study used time series data ranging from 1999 to 2020 to estimate the results where pre-estimation tests such as DF test and P-P test for unit root were applied followed by Johansen test for cointegration and diagnostic test for to ensure consistent with results. Then Autoregressive Distributed Lag (ARDL) Model was applied to estimate results for the study. The study revealed that FDI on transport and storage sector in Tanzania have weak positive and significant impact on economic growth during short run and long run periods. The outcome implies that with more investment on the current state of the sector higher outcome hence higher economic growth which is supported by several previous studies. This has not been similar to the remaining independent variables (FDI inflow to the remaining three sectors “electricity and gas”, “information and communication”, “real estate”), which have no significant impact on economic growth of the country. This is not desired outcome for the country as most of the previous studies suggests that FDI into these sector results to strong positive outcome to economic growth, as evidenced to most of developed countries

In order to overcome the undesirable impact of some sectors to economic growth, the government is advised to attract more foreign investment to the sectors with undesirable impacts with productive strategies in order to improve sectors performance on economic growth through establishment of favourable investment policies such as tax policies to avoid double taxation/tax evasion/tax avoidance, capital account liberalization policies and financial institution policies to create conducive investment environment.

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