

# The Analysis of the Major Determinants of Foreign Direct Investment: Case of Tanzania

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## Abstract

This paper analyzes the determinants of foreign direct investment in Tanzania. In this paper the Ordinary least square (OLS) estimation technique has been used to analyze the relationship between foreign direct investment and its determinants with the help of the E-views 7.1 software. The result shows that the market size, infrastructure development and natural resources availability are the major determinants of foreign direct investment inflow to Tanzania. Therefore the main recommendations are: firstly Tanzania government need to make more effort in the expansion of the market that will attract more FDI ; secondly investing more on the infrastructure development hence encouraging more FDI to the country: Lastly the results found the natural resources availability to be significant but unexpectedly had negative sign contrary to our hypothesis which may imply that the inadequate of natural resources reduces FDI inflow to the country hence more exploration of natural resources is necessary to ensure its availability for example the new recent massive discovery of gas in the country might have a big impact on attracting FDI in the near future.

**Keywords:** Foreign direct investment (FDI), Ordinary Least Square (OLS), unit root, Natural resources Availability (NRA).

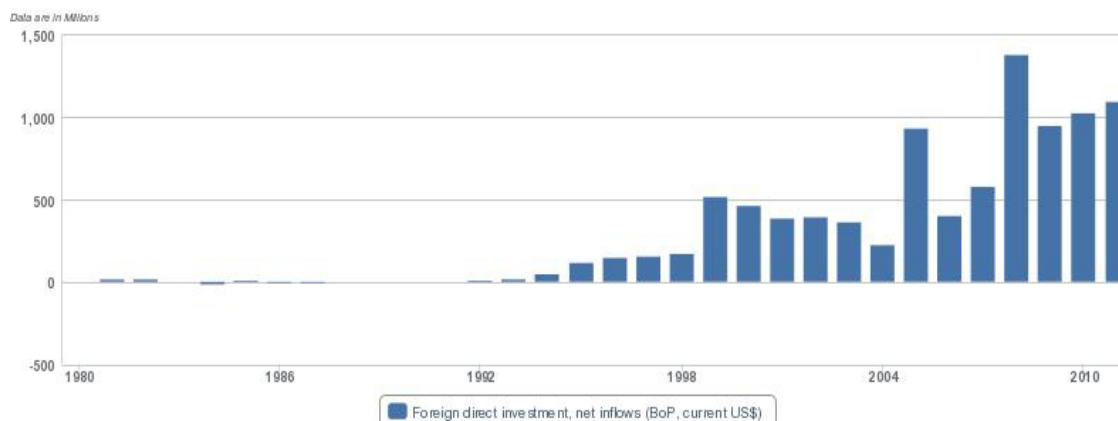
## 1. Introduction

“As a part of the national accounts of a country, FDI refers to the net inflows of investment (inflow minus outflow) to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It usually involves participation in management, joint-venture, transfer of technology and expertise. FDI inflow or outflow is one example of international factor movements. However for the sake of this study only the inflow of FDI has been investigated”.

“Foreign direct investment (FDI) is taken as a way to provide the necessary capital inflow to stimulate growth in a domestic economy. FDI can also result in increased employment levels, management skills and transfer of technology”.

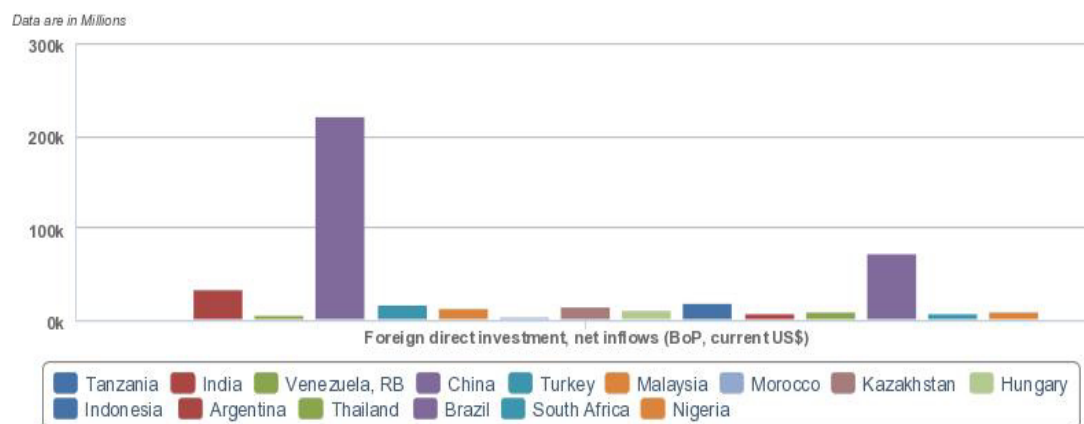
Tanzania in particular as one of the developing country has been experiencing the lowest and high fluctuations in the level of FDI inflow to the country although there have been a lot of effort that have been put through to stabilize the flow. The FDI trends can be seen from the (figure1) below as we can observe that the level of FDI remained very low starting with a value of 4.5 million usd in the year 1980 to reach a value of 119.9 million usd in 1995, where it continued to rise to reach a value of 516.7 million usd in 1999 then it was followed by a series of fluctuations between the year 2000 to the year 2008 which had a the highest peak of 1 383.3 million usd compared to other years, the value then came to a slight decline in the year 2009 with a value of 952.6 million usd finally came to rise again to reach a peak of 1 022.8 million usd and 1 095.4 million in the year 2010 and 2011 respectively.

Figure 1; Foreign direct investment, net inflows (in millions USD) in Tanzania



Source: World Development Indicators (2012).

Figure2: A comparison of foreign direct investment inflows between Tanzania and other selected countries in the year 2012. (Data in millions usd).



Source: World Development Indicators (2012).

This study is important basing on the fact that since 1980 Tanzania have been experiencing the lowest level and high fluctuation of foreign direct investment inflows compared to other developing and other emerging economies especially between the year 2000 until 2008 see (figure 1) for details and (figure 2) for comparison with other countries. *From the figure 2 we can observe that Tanzania is one of the country with the lowest level of FDI inflow compared with other selected countries. These trends shows that probably some factors are more important than the others for the stable inflow of FDI in the country hence the need to re examine these key factors until recently and identify what are they?*

No doubt that many studies have been conducted basing on the same topic but most of them came up with different results due to different period of study, data used, the methodology adopted and the country to be investigated which have different characteristics. To the best of my knowledge only very few studies have been conducted for the case of Tanzania even those conducted so far have not exhausted some of the variables that have been used in this study for estimation and are believed that their inclusion in the regression analysis to be important. Moreover the fact that there have been many studies conducted on the same subject with different conclusions doesn't mean that we should not continue re examining the same factors in questions as we should also be aware that we cannot generalize the results from one case to another.

It is also important to note that, Tanzania as an individual developing country is not capable to provide all the necessary funds that can be used to invest in various sectors of the economy, therefore foreign direct investment seems to be an alternative way to get these funds. In fact due to this insufficient level of FDI the government of Tanzania has been forced to rely on foreign aids to finance its economy that has not been easy to get especially in the most recent years hence FDI remain to be the alternative solution for Tanzania to meet its developments goals.

### 1.1 Objective of the study

The main objective of conducting this study is to continue analyzing and identifying the key determinant of FDI inflow to Tanzania and also make consolidation of the lessons obtained from previous studies. The specific objectives of the study are as follows below:

- Collecting and analyzing the data on FDI for a period of 1980-2012 in order to develop a basis for development of investment promotion strategies and economic growth sustainability.
- Recommending the appropriate investment strategies and policies aimed at improving the Tanzania's investment climate.

This paper is organized into six parts; the first part provides theoretical background with the introduction followed by review of the relevant literature in part two. The methodology of the study is covered in section 3, while section 4 covers data analysis, the discussion and interpretation of results. Section 5 concludes the study with the policy recommendation and finally further studies is covered on section 6.

## 2. The Review of Relevant Literature

There have been many studies have cited the determinants of FDI some of these studies are as follows. The studies for example that of Ajayi (2006), Wafure and Nurudeen (2010), Obadan (1982), Masayuki and Ivohasina (2005), Raggazi (1993) and Moore (1993) have shown the importance of the market size as one the determinant of the inflow of foreign direct investment. While there were very few researchers who found the

market size to have a negative effect on attracting FDI such as that of Micah B. M and Thula S. D (2009) on examining the locational determinants of FDI inflows in Swaziland.

The study by Okpara G.C.(2012) employed an Error Correction Model on analyzing the determinant of Foreign Direct Investment, using evidence from Nigeria for a period of about 39 years and found out that the past investment flows could significantly stimulate the current investment inflows. The exchange rate and infrastructure were found to be positive and significant function of FDI in Nigeria other variables such as fiscal incentives, favorable government policy were also significant.

According to Elijah (2006) who did analysis of FDI and included human capital, real exchange rate, annual inflation and openness of the Kenya economy. His results showed that economic openness and human capital influence FDI inflows positively. While he also found that inflation and the real exchange rate impact FDI negatively in the short-run and long-run respectively. His findings was supported by the study of Bajo-Rubia and Sosvilla-Rivero (1994),Yin Yun Yang et al. (2000),Asiedu L.(2006) specifically on finding that inflation has a negative impact on FDI.

Masayuki and Ivohasina (2005) used the exchange rate as one of the FDI variable determinants according to him the exchange rate of a country depreciation usually attracts more FDI while Kathryn et al (1995), in their paper discovered no statistically significant relationship between the exchange rate and FDI.on the Contrary to other studies Benassy-Quere et al. (2001) discovered that the effect of the level of exchange rates on FDI inflows is usually ambiguous.

Asiedu L.(2006) focusing on Foreign direct investment in Africa examined the role of natural resources, market size, Government Policy, institutions and Political instability and found out that Market size, natural resources, infrastructure development, inflation, legal system are the key determinant that attracts FDI.

The study by Rusike (2007) on examining the trends and determinants FDI inflow to South Africa discovers that openness, exchange rate and financial development are important long run determinants of FDI. Increased openness and financial development attract FDI while an increase (depreciation) in the exchange rate deters FDI to South Africa. Market size was found to be a short run determinant of FDI.The emergence of the financial sector may imply that FDI motives may have shifted from the natural resource seeking and market seeking to efficiency seeking FDI in South Africa

Generally speaking there is wide range of variables that can influence a foreign investors to invest in a certain location but the truth is not all of them have equal degree of importance to each foreign investor, therefore it is wise to note that some of these determinant may have more weight to one foreign investor and less to the other at a certain period of time Ajayi (2006) this also means it's always a challenge when it comes to its measurements basing on the quality and quantity.

After checking the related literatures, only few variables that could impact FDI inflows into Tanzania were chosen by considering their availability and their relevance in the country.

### 3. The Methodology of the Study and Data Source

#### 3.1 Model specification

In this study we analyze the relationship between foreign direct investment and its determinants. The model expresses foreign direct investment (FDI) as a function of the Openness of the economy to foreign trade (OPEN), Exchange rate (EXR), Infrastructural development (INFRA), rate of inflation (INF),Natural resources availability (NRA),market size (MKSZ),GDP growth(GR) and Government consumption expenditure (GCONSEXP). Lastly both variables are in natural logarithm (LN) to avoid heteroscedasticity problem in statistics analysis.

Our model is thus presented below:

$$FDI=f(OPEN, EXR, INFRA, INF, NRA, MKSZ, GR, GCONSEXP, \eta) \quad (1)$$

$$LNFDI=LNf(OPEN, EXR, INFRA, INF, NRA, MKSZ, GR, GCONSEXP, \eta) \quad (2)$$

$$LNFDI_t = \theta_0 + \theta_1 LNOPEN_t + \theta_2 LNEXR_t + \theta_3 LNINFRA_t + \theta_4 LNINF_t + \theta_5 LNNRA_t + \theta_6 LNMKSZ_t + \theta_7 GR_t + \theta_8 LNGCONSEXP_t + \eta \quad (3)$$

Where:

$\theta_0, \theta_1, \theta_2, \theta_3, \theta_4, \theta_5, \theta_6, \theta_7, \theta_8$  are coefficients of the variables.

LN stands for the natural logarithm and  $\eta$  is the error term.

We hypothesize the expectation of a positive relationship between FDI and the openness of the economy to foreign trade (OPEN), infrastructural development (INFRA), market size (MKSZ), GDP growth (GR) and natural resources Availability (NRA) however the inflow of FDI to Tanzania is expected to be negatively related to inflation rate (INF), Government consumption expenditure (GCONSEXP) while we expect the sign of

exchange rate (EXR) to be ambiguous (that is can either be positive or negative). The E-view 7.1 software is used to estimate the model above by employing the ordinary least square (OLS) technique.

### **3.2 The Brief Explanations of the Variables**

#### *Market size (MKSZ)*

The larger the market size implies the larger economies of scale hence can attract the inflow of FDI. For example the case of China, India and Nigeria etc with their huge market size have managed to attract the massive inflow of FDI in their economy.

#### *Openness of economy (OPEN)*

The more open the economy becomes in terms of trade and capital flows the easier it become to do business hence tends to attract the inflow of FDI.

#### *Exchange rate (EXR)*

Still no consensus exist on exchange rate since the increase in exchange rate may cause the foreign investors to buy more assets to the host country and in this sense increases the inflow of FDI while the decrease of it may also encourage foreign investors due to the increase in profits or earnings. Rusike (2007) and lim (2001).

#### *Infrastructure development (INFRA)*

The well developed infrastructures such as electricity productions, roads, railways, ports, water supply etc can easily attract the inflow of FDI in the country due to the reduction of cost of doing business in terms of duration and finance involved for transaction.

#### *Inflation (INF)*

The higher the inflation the difficulty it will be to attract foreign investors in the country than the lower inflation.

#### *Government consumption expenditure (Gconsexp)*

Measures the size of the government in the sense that the higher the government spending especially on non developmental projects may have a negative impact on the inflow of FDI. In this context we follow Asiedu (2002) for this study while on the other hand we should recognize that it's possible that high government spending on developmental projects may also attract FDI.

#### *GDP growth (GR)*

The more the country GDP grows the easier it become for the multinational companies to make decision to invest there hence tends attract more inflow of FDI.

#### *Natural resource availability (NRA)*

The more endowed the country with availability of natural resources the easier it will be for it to attract the inflow of FDI. For example the country like Nigeria, Angola and South Africa successfully attracted FDI due to higher availability of natural resources. The inclusion of this variable in this study is important in order to avoid biasness on the results especially for those countries in Africa which are endowed with the natural resources such as Tanzania.

### **3.3 Hypothesis of the study**

This paper is testing impact of independent variables to dependent variable. Therefore it examines if the independent variables have an impact on dependent variable or not. Mathematically can be depicted as follows below:

$$H_0: \pi = 0$$

$$H_1: \pi \neq 0$$

Where;  $H_0$  = Null hypothesis and  $H_1$  = Alternative hypothesis

### **3.4 The Estimation Technique of the model and Data source**

The study used the annual (secondary) time series data covering the period between 1980-2012. This period has been chosen because the data to be used for the foreign direct investment inflow was likely to be available. It should also be noted that the selection of this variables in this study has also been based on the fact that it's possible to include more variables but we should also be aware on the fact that adding more variables does not mean that the model will be the best one as it can lead to difficulties in capturing the dynamic relationships of the most important variables from losing its power. In this study most of these data were collected from the World Bank indicators, International Financial Statistics Year Book, the Central Bank of Tanzania (BOT), National bureau of statistics (NBS), publications and websites.

Like the previous studies the variables were measured as follows:

Foreign direct investment in this study is measured by the total inflows of FDI into Tanzania (FDI). The ratio of exports plus imports to GDP captures the country's openness to foreign trade and it is denoted as (OPEN). Exchange rate (EXR) refers to the rate at which the Tanzanian shillings is converted to the US dollar, infrastructural development (INFRA) is a measure of the number of telephone line per 100 as used by other empirical studies for measurements of infrastructure, The rate of inflation (INF) refers to the changes in the general price level annually, the gross domestic product growth (GR) is an annual percentage change in GDP, Natural resources Availability (NRA) measured by Ores and metals exports (% of merchandise exports) and Government consumption expenditure (GCONSEXP) is a measure of the size of the government.

The equation above is estimated using ordinary least square (OLS) method. The choice of using this technique is due to its simplicity, convenience and the fact that it has been successfully used by other studies and gives out meaningful results. The parameters estimated using this procedure are both unbiased and valid and give the best results. Ordinary Least Squares (OLS) is one of the simplest methods of linear regression to use. The goal of OLS is about fitting the function with the data. It does so by minimizing the sum of squared errors from the data.

### 3.5 Time Series Properties of the Economic variables

One problem with time series data is that independent variables can appear to be more significant than they actually are if they have the same underlying trend as the dependent variables. For example in a country with high inflation, then using a nominal variable in this case will appear to be highly correlated with all other nominal variables because nominal variables are not adjusted for inflation so every nominal variable will have a powerful inflationary component. This inflationary component will always outweigh any causal relationship and causing nominal variable to appear to be correlated even if they are not correlated. The explained above problem is an example of a spurious correlation or a strong relationship between two or more variables that is not caused by a real underlying causal relationship.

Working with non stationary series always leads to a spurious regression. Since the non stationary series has one or more basic properties that do change overtime. So it's always advised to use the stationery series to run the regression because the stationery series mean and its variance do not change over time hence the spurious regression results can be avoided. In order to tackle the above problem it will be necessary to conduct a unit root test to check for the stationarity of the variables used for this study.

This test shows the number of times the variable has to be differenced to come at a stationary state. Classical econometric theory states that variables which are stationary are called I (0) series and those which are to be differenced once in order to achieve a stationary value are called I (1).

## 4. The Data Analysis, Empirical Results and Interpretation

### 4.1 Data Analysis

#### 4.1.1 ADF (Augmented Dickey-Fuller) test

First of all we conduct the augmented Dickey-Fuller (ADF) unit root tests for all the individual variable that has been selected for this study hence we use the method done by Dickey and Fuller (1979) in order to test the significance of the independent variables. The results of the test after first difference only are shown in Table 1. The general results of the test shows that all variables have a unit root at levels but they were all found to be stationary after the first difference implying that they follow the I (1) series .

Table 1: Stationary (unit root) test for variables

Variables	ADF Statistics	Critical Values	Decision
D(LN FDI,1)	-9.431086 * (0.0000)	1%=- 3.661661 5%=-2.960411 10%=-2.619160	Stationery at 1st difference
D(LNOPEN,1)	-3.567461** (0.0126)	1%=- 3.661661 5%=-2.960411 10%=-2.619160	Stationery at 1st difference
D(LN EXR,1)	-3.902493 * (0.0057)	1%=-3.670170 5%=-2.963972 10%=-2.621007	Stationery at 1st difference
D(LNINFRA,1)	-5.570014 * (0.0001)	1%=-3.661661 5%=-2.960411 10%=-2.619160	Stationery at 1st difference
D(LNINF,1)	-7.781468 * (0.0000)	1%=- 3.661661 5%=-2.960411 10%=-2.619160	Stationery at 1st difference
D(LNNRA,1)	-4.510062 * (0.0012)	1%=-3.661661 5%=-2.960411 10%=-2.619160	Stationery at 1st difference
D(LNMKSZ,1)	-8.108405* (0.0000)	1%=- 3.661661 5%=-2.960411 10%=-2.619160	Stationery at 1st difference
D(LNGR,1)	7.366380* ( 0.0000)	1%=- 3.661661 5%=-2.960411 10%=-2.619160	Stationery at 1st difference
D(LNGCONSEXP,1)	-5.144016* ( 0.0002)	1%=- 3.661661 5%=-2.960411 10%=-2.619160	Stationery at 1st difference

Source: Calculated from data used for Analysis



The table 1 above shows unit root tests. The notation (LnFDI), (LnOPEN), (LnEXR), (LnINFRA), (LnINF), (LnNRA),(LnMKSZ),(LnGR) and (LnGCONSEXP) indicate respectively the foreign direct investment, Openness, Real exchange rate, Infrastructure development, Inflation, Government consumption expenditure, GDP growth, market size. The Letter “D “denotes difference derivation. The asterisks \*, \*\*, and \*\*\* denote statistical significance at 1%, 5%, and 10% levels, respectively. McKinnon (1980) critical values are used for rejection of the null unit root.

#### 4.1.2 Ordinary Least Squares (OLS)

Second we performed the ordinary least squares (OLS) estimation technique and the results were presented as follows below;

Table 2: Regression Results

Dependent Variable: LNFDI

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNOPEN	0.018253	0.040763	0.447774	0.6583
LNEXR	0.003214	0.002403	1.337691	0.1935
<b>LNINFRA</b>	13.36238	4.702827	2.841351	<b>0.0086*</b>
LNINF	-0.010341	0.040289	-0.256666	0.7996
<b>LNNRA</b>	-0.124961	0.066156	-1.888892	<b>0.0710***</b>
<b>LN MKSZ</b>	0.006862	0.003675	1.867205	<b>0.0741***</b>
LN GR	0.031447	0.150237	0.209319	0.8360
LNGCONSEXP	-0.021910	0.072484	-0.302272	0.7650
C	-3.908726	3.475723	-1.124579	0.2719

Source: Calculated from data used for Analysis.

Adjusted R-squared=0.76, D-W=2.46, F-statistic=13.88, Prob (F-statistic) = 0.000000, N=33.

The symbol \*, \*\* and \*\*\* indicates the statistical significance at 1%, 5% and at 10 % level respectively

#### 4.2 The Empirical results and Interpretation of the regression

From the results of regression (table no.2) it was found that the adjusted R-squared is (0.76) which is significant to explain the good fitness of the model, the overall significance of the model at 1 percent is shown by F-test result with a prob (0.000000) and finally the value of Durbin Watson DW (2.46) is significant to indicate that the model is not serially correlated. The test also shows that all the variables were stationery after the first differences and that they follow the I (1) series.

The results identified that only three variables were found to be significant and with a correct sign as hypothesized above; these variables are the market size (MKSZ), infrastructure development (INFRA) and natural resources availability (NRA) except that it had a negative sign contrary to our hypothesis.

The market size (MKSZ) had positive coefficient elasticity of 0.007 implying that an increase of the market size by 1 percent would lead to an increase of foreign direct investment by 0.007 percent this results is consistent with the results found by other studies done by Wafure and Nurudean (2010), Ragazi (1973), Obadan (1982) and Ajayi (2006) who discovered that market size had a significant impact on the inflow of FDI.

Infrastructure development (INFRA) had a positive coefficient sign and significant at 1 percent level with a high elasticity of 13.36 implying that an increase of infrastructure development by 1 percent would lead to an increase of foreign direct investment by 13.36 percent this results is in line with that found by Okpara G. C. (2012) in their study of the determinant of FDI in Nigeria. Natural resources availability (NRA) had a negative but significant sign only at 10 percent level implying that the inadequate of natural resources by 1 percent reduces FDI by 0.12 percent which collaborates with the findings of Okpara G.C. (2012), Asiedu (2006) on the impact of natural resources. This results seems to contradict with the real situation since Tanzania is full endowed with natural resources like land and minerals like gold,diamond,tanzanite e.t.c so this should be sufficient to attract foreign investors in the country and not otherwise. In this sense it may also imply that probably the negative sign from the results might have been caused by the proxy used to estimate the variable that may have influenced the signs but since the variable was found to be significant it may also imply that the variable is still important for Tanzania and probably with the recent new discovery of gas things might change in the coming future.

All the remaining variables like openness was insignificant with a correct sign, This result was consistent from what had been found out by Okpara G.C. (2012) on his study of the determinant of FDI in Nigeria and concluded that the government need to intensify the trade openness so as to be more significant but contrary to our results Elijah (2006) did research of FDI in Kenya and found out that openness of economy had a positive impact on the inflow of FDI.

Real exchange rate and inflation were also insignificant and had a correct sign as hypothesized which support the findings of the study by Elijah (2006) who found the negative sign of inflation although his results was significant and that of Okpara G.C.(2012) on exchange rates who also found a positive sign which was

significant. Other variables like GDP growth (GR), Government consumption expenditure (GCONSEXP) a measure of government size were also found to be insignificant with a correct sign as hypothesized. Therefore since these variables had insignificant statistical value they will not be included among the key determinant to attract FDI in Tanzania.

The general prob (F-statistics) found to be significant at 1 percent level which imply that the independent variables jointly can influence dependent variables and the F-statistics value which is also significant with the value of 13.88 implying that the model was well specified.

## 5. Conclusion and Policy Recommendation

The lowest and high fluctuation level of Foreign Direct investment (FDI) in Tanzania, the highest and significance level of FDI in other developing and emerging economy such as Nigeria, China, South Africa etc ( see figure 2) are the main reason for conducting this study. Therefore after estimating between FDI and its determinants using the Ordinary least square technique, the results showed that the key determinants of FDI are the Market size (MKSZ), infrastructure development (INFRA), natural resources availability (NRA) which was found to be significant at 10 percent level but it had a negative sign contrary to our expectation which implies that the inadequate of natural resources reduces the inflow of FDI in the country. However the study did not find any significant impact of openness of the economy to trade although it was found to be positively related to FDI which implies that trade liberalization did not played a very significant role for the inflow of FDI to Tanzania other policy measures might have impacted the FDI, this findings corroborated with that discovered by Wafure, O.G. and Nurudeen, A. (2010) based on their study of FDI in Nigeria.

This paper contributes to the existing literature by using more variables in the analysis with the most recent data especially for Tanzania.

*The main recommending policies are as follows:* First, since we have seen from the results that market size had the positive impact on the FDI inflow to Tanzania then Tanzania government need to make more effort in the expansion of the market for the attraction of the FDI inflow to the economy of Tanzania;

Secondly, the government need to invest more on the infrastructure development so as to improve accessibility and hence attract more investors in the country in different sectors for example the construction of the new and improvement of the existing roads, railway, ports and electricity production etc will be necessary for attracting more FDI. The project initiated by USA in Africa called “power Africa” to ensure sufficient power production in Africa might be so useful for Africa and Tanzania in particular.

## 6. Further Research

This study is limited to Tanzania and used a simple ordinary technique (OLS) as an estimation method for about 33 years of sample period of study. Therefore further studies on the determinants of FDI is needed especially using other econometric measuring techniques with broader sample period of study and more variables to be included in order to ensure maximum exploration and exhaustion of the variables that can give the robust results, for example in this study important variables like labor cost, taxation, political stability, education level to mention a few were not included due to the availability, reliability of the data and the sample size used for this study hence this presents the limitation of the study and therefore the results in this study should be cautiously be interpreted.

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