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DETERMINANTS OF FOREIGN DIRECT INVESTMENT IN TANZANIA: AN AUTOREGRESSIVE DISTRIBUTED LAG APPROACH

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ABSTRACT

Foreign Direct Investment (FDI), as a source of external capital to enhance growth, has become extremely important in light of the decreases in official lending, brings its infusion of a corporate culture that changes the way business is done, brings managerial know-how and best practices, provide access to international markets, transfer technology and innovation, introduce competitive pressures in previously closed markets and becoming the principal driver for the growth of local business. Given those critical issues, it is very crucial to understand the determinants of FDI, which can be used by the country to regulate and be assured of sustainable growth and development. With this regard this study investigated the determinants of FDI in Tanzania, using secondary time series data from 1990 to 2020. In attempting this, the study utilized the Autoregressive Distributed Lag (ARDL) in combination with the Error Correction Model (ECM) and bounds testing procedure. The results indicate that in the long run, the coefficients of gross capital formation, exchange rate, and financial structure are statistically insignificant with the required direction of relationship with the exception of real GDP, trade openness, and inflation rate while in the short-run the results have shown the opposite of the results in the long-run. The results above indicate a great need for a country to emphasize domestic investment as this has shown a positive impact in attracting foreign direct investment in the short-run, with higher real GDP implying a large market thus suitable for market-seeking investments and also does promote export. The country needs to strengthen its monetary policy to ensure a stable exchange rate and price as it has shown a converse relationship with foreign direction investment thus attracting more market-seeking investments.

Keywords: ARDL, error correction model, FDI, Tanzania

INTRODUCTION

1. Foreign Direct Investment

Insufficient national saving is among the major economic problems facing developing countries such as Tanzania. The shortfall in national savings necessitates the need for foreign capital in the forms of both direct and indirect investments. According to the neoclassical growth model increase in savings is essential to take in real economic growth. Nevertheless, Africa's domestic savings and income remain extremely low, as income is channeled directly to subsistence expenditures (Bennett, 2005).

Formerly, developing countries obtained loans from international commercial banks and international financial institutions i.e., World Bank and IMF. During the 1980s the drying-up of commercial bank lending due to debt crises forced various countries to modify their investment policies so as to attract more stable forms of foreign capital, and FDI appeared to be one of the

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easiest ways to get foreign capital without undertaking any risks linked to the debt (Demirhan and Masca**,** 2008).

FDI, as a source of external capital to enhance growth, has become extremely important in light of the decreases in official lending to the developing world as a whole, and Africa specifically (Bennett, 2005).

Within the recent decades, FDI has created an extensive consideration for economic growth as well as development. Among others, FDI forms an important integral part of economic growth in the world of globalization. FDI brings its infusion of a corporate culture that changes the way business is done, brings managerial know-how and best practices, provides access to international markets, transfers technology and innovation, introduces competitive pressures in previously closed markets, and becomes the principal driver for the growth of local business.

FDI is also cited as a more stable type of capital flow and thus is arguably more appropriate and development-friendly for low-income countries than portfolio flows. There is evidence that foreign investment contributes to raising exports. At the microeconomic level, there is also a range of purported benefits, especially higher productivity through new investment in physical and human capital, increased employment, enhanced management, and the transfer of technology. It has important spillover effects on local firms through supply and distribution chains, trading, and outsourcing (Kabelwa, 2006).

It is noteworthy that the complexity of the FDI package also means that there may be trade-offs between different benefits and objectives. For instance, countries may have to choose between investments that offer short as opposed to long-term benefits; the former may lead to static gains but not necessarily to dynamic ones. A large inflow of FDI can add to foreign exchange and investment resources in a host economy, but it may lead to a crowding out of local firms or create exchange rate problems. The desire to generate employment may lead governments to favor labor-intensive, low-technology investments, while that to promote technology development may favor more sophisticated investors.

Similarly, the desire to upgrade technology may call for heavy reliance on technology transfer by foreign firms, while the desire to promote local innovation and deepening may require more emphasis on arm's length transfers to indigenous firms. There can be many such trade-offs, and there is no universal answer to how they should be made. As noted, there is no 'ideal' policy on FDI that applies to all countries at all times (Kabelwa, 2006).

Among the important factors for consideration is the market size of the host country. The market size hypothesis suggests that investment will go primarily to markets large enough to support the scale economies needed for production. This reasoning has been pervasive given that most investment has been market seeking, and it helps to explain why most FDI goes to developed countries rather than to emerging economies (Ajami and BarNiv, 1984). However, evidence from studies comparing FDI flows to different emerging economies has been mixed.

Agiomirgianakis *et al.* (2003) mentioned that FDI is mostly defined as capital flows resulting from the behavior of multinational companies (MNCs). Thus, the factors to affect the behavior of MNCs may also affect the magnitude and the direction of FDI. MNCs expand their activities to a foreign country for a number of reasons including, among others, the exploitation of economies of

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scale/scope, the use of specific advantages, often owing to a life-cycle pattern of their products, or just because their competitors are engaged in similar activities.

Macroeconomic variables, such as GDP, the inflation rate, and the real exchange rate, exhibit extreme volatility in developing countries (Easterly, Islam, and Stiglitz, 2000). The excess volatility of these variables affects not only the volume and level of international trade but also the level of private investment and the flow of foreign direct investment.

On the other hand, governments have engaged in policy competition by changing key factors of their economic policies, such as domestic labor market conditions, corporate taxes, tariff barriers, subsidies, privatization, and regulatory regime policies so as to improve FDI activity in their countries. The change being made also enhances the stabilization of macroeconomic variables.

2. Foreign Direct Investment Trends in Tanzania

Foreign direct investment is a net inflow of investment 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 is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. Direct investment is a category of cross-border investment associated with a resident in one economy having control or a significant degree of influence on the management of an enterprise that is resident in another economy. Ownership of 10 percent or more of the ordinary shares of voting stock is the criterion for determining the existence of a direct investment relationship.

According to international data classification standards, FDI stocks and transactions are composed of three sub-classifications: (i) equity capital (ii) reinvested earnings, and (iii) other capital (non-equity intercompany transactions). The direct investment income component is obtained from income on equity (dividends and profit payments) and income on debt (non-equity interest payments). In the absence of foreign participation in organized financial markets (e.g. stock exchange), portfolio investment is limited to portfolio equity investment. Other investments include short and long-term debt from unrelated companies to FDI and non-FDI companies (Tanzania Investment Report, 2001).

Among the major problems facing developing countries is scarce financial resources, with the passage of time investment needs to increase along with other things, these needs in the LDCs are fulfilled by the capital inflow from the developed nations either in the form of aid or foreign direct investment (Ellahi and Ahmad, 2011). FDI brings technological spillover in the least developed countries (LDCs) by introducing better production methods, thus it becomes imperative to control any factors that cause interruption of the FDI stability.

Foreign investments also have effects on local firms through supply and distribution chains, trading, and outsourcing (Blomström and Kokko, 1997). For example, with backward linkage, the Tanzania Breweries initiated a comprehensive program of local sourcing and identified a number of inputs to the production of beer that could be sourced locally from the primary inputs (barley) to other intermediate inputs in the packaging process (Kabelwa, 2006).

There is consensus in the literature that net private capital flows to developing countries have been constantly increasing with time, especially in the 1990s. Efforts in this regard include economic liberalization and institutional reforms, including the formulation of a new investment policy and

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investment code in 1990, and its revision in 1997. The formulation or revision of a number of sector-specific policies, including mining and tourism policies further shows the commitment of the Government in creating a conducive environment to attract foreign capital.

Foreign direct investment rose to higher levels, particularly in the second half of the 1990s, from US$150 million in 1995 to US$517.4 million in 1999 due to a combination of various economic reforms adopted by the Tanzanian government. This is evidenced by the increase in Tanzania's share of FDI flows to Africa, from 1.1 percent of GDP in 1997 to 3.5 percent of GDP in 2001. FDI inflows to Tanzania averaged US$330 million between 1997 and 2002 (Muganda, 2004).

About 40 percent of FDI is related to the mining sector, reflecting the low cost of gold production in Tanzania as well as the generous tax incentives offered under the 1998 Mining Act. Total investment in gold mining is now nearly US$ 2 billion. In 2002, gold exports accounted for nearly 40 percent of Tanzania's total exports, making the country one of the leading gold exporters in Africa (Muganda, 2004).

Direct Foreign Investment increased by 74 percent from USD 1330.0 million in 2011 to USD 1806 million in 2012. The increase was due to an increase in investment in gas-deep drilling from three (3) boreholes drilled in 2011 to ten (10) (Economic Survey, 2012). As oil and gas exploration activities continue to attract foreign investments, it is projected that net foreign direct investment (FDI) to Tanzania could increase from about 6.3% of GDP in 2013 to 7.0% of GDP in 2014 (Charle, P et al, 2013).

South Africa, the United Kingdom, and Canada continued to be the dominant sources of foreign private investments for Tanzania as they accounted for an average of 71.5 percent of the total FDI inflows between 2008 and 2011 (BOT, 2013).

3. Literature Review

This part of the study covers theories and studies done by other economists on the same study or related studies. It involves reviewing the findings of other studies on the subject; some of the theories that are meaningful in modeling the current study are also reviewed.

Dixit and Pindyck (1994) argue that investment adjustment costs are asymmetric, they are larger for downward than for upward adjustment. Under such conditions, due to the risk of getting stuck with too much capital if events turn unfavorable, an investment decision is made only when the difference between the expected profitability and the cost of capital exceeds a certain threshold (Serven, 2003).

Bernanke (1983), however, suggests that even if uncertainty may raise the profitability of all investment projects, it makes their relative ranking uncertain. Under such a situation, the investors try to avoid their irreversible investment mistakes in wrong projects which may depress aggregate investment. If it is assumed that investors are risk averse as opposed to risk neutral then the overall effect of uncertainty on investment may be negative (Zeira, 1990). Lee and Shin (2000) argue that investment uncertainty may raise the level of investment only when the output share of the variable input is larger.

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Cushman (1985) found a positive relationship between the flow of investment and the degree of exchange rate volatility using time series data from the US. In explaining the reason behind the result, he argued that "exchange rate uncertainty introduces risk to the operation of the multinational company. Similarly, Osinubi et al (2009) in their investigation of the possibility of the role of exchange rate volatility on FDI inflow found a positive relationship between exchange rate and FDI in Nigeria.

Froot and Stein (1991) used industry-level data on US inward FDI for the 1970s and 1980s and claimed that the level of exchange rate may influence FDI. This is because depreciation of the host country's currency against the home currency increases the relative wealth of foreigners thereby increasing the attractiveness of the host country for FDI as firms are able to acquire assets in the host country relatively cheaply. Thus, a depreciation of the host currency should increase FDI into the host country, and conversely, an appreciation of the host currency should decrease FDI. The argument relies on the situation when capital markets are subject to information imperfections, exchange rate movements do influence foreign investment.

Goldberg (1993) studies the impact of the exchange rate and its uncertainty on industry-level investment in the United States and finds that in the 1980s the real dollar depreciation (appreciation) was likely associated with investment contraction (expansion).

Cushman, (1985, 1988) in his studies of exchange rate risk (due to exchange rate volatility) finds a negative relationship between FDI flows from the United States and exchange rate risk. Similarly, Serven (2003) finds a strong negative effect of real exchange rate uncertainty on private investment. He finds the effect particularly large in relatively open economies.

Goldberg and Kolstad (1995), however, argue that if both the real demand and exchange rate shocks are assumed, exchange rate volatility tends to increase the FDI share even with identical costs of production across countries. In their empirical work using quarterly U. S. bilateral FDI flows to four countries from 1978-1991, they show that exchange rate volatility and the share of FDI in total investment are positively related. This finding supports their theoretical prediction that investors are risk averse. They also find that a depreciation of the source country currency leads to a reduction in FDI outflows but this effect is not very large. Others who find similar results are Cushman (2001), Stokman and Vlaar (1996) and Dewenter (1995) for US-related flows, and De Ménil (1999) for a broader sample of OECD countries in a gravity model of bilateral FDI flows.

Loree and Guisinger (1995), Cassou (1997), and Kemsley (1998) find that host country corporate income taxes have a significant negative effect on attracting FDI flows. However, Lim (1983), Wheeler and Mody (1992), and Porcano and Price (1996) conclude that taxes do not have a significant effect on FDI.

Darby et al (1999) use a threshold model and find a negative long-run relationship between exchange rate volatility and investment in France, Germany, and the US; and a negative short-run relationship with investment in the UK and Italy. Likewise, Bryne and Davis (2003) find that a sustained 10% increase in the monthly volatility of the real effective exchange rate lowers the total volume of investment by 1.5%.

Morisset (1999) uses both a panel and cross-sectional analysis of FDI in Africa, employing two separate dependent variables: FDI inflows and FDI inflows normalized by GDP and the total value

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of natural resources for each country. Morisset finds that economic growth and trade openness have a large impact on the level of FDI inflows a given country receives.

Moreover, Hubert and Pain (1999) and Udomkerdmongkolm et al. (2006), for instance, obtain a negative relationship between nominal bilateral exchange rate volatility for FDI in developing countries and emerging markets, which is explained by Bénassy-Quéré et al (2001) with the argument that transfer pricing is particularly sensitive to exchange rate fluctuations. Reinhart and Rogoff (2004) note that exchange rate volatility is often only an indication of deeper institutional and policy problems and therefore only indirectly causes the negative effects on FDI.

Benassy-Quere et al (2001) find a negative impact of exchange rate volatility on flows of FDI to developing countries. Another study looking at the flow of FDI to developing countries is Hubert and Pain (1999), who find that currency risk, reduces flows of FDI from Germany to developing countries. It may be the case that in these studies, a volatile exchange rate is just a symptom of deeper institutional and structural problems in developing countries. However, other studies have noted this negative relationship for developed countries.

Gorg and Wakelin (2001) the study investigated empirically both direct investment from the US to 12 countries and investment from these 12 countries to the US. The empirical estimations yielded different results for US outward and inward FDI, which appear contradictory. They found a positive relationship between US outward investment and appreciation in the host country currency while there is a negative relationship between US inward investment and appreciation in the dollar.

Charkrabarti (2001) states that the market-size hypothesis supports the idea that a large market is required for the efficient utilization of resources and exploitation of economies of scale: as the market size grows to some critical value, FDI will start to increase thereafter with its further expansion. This hypothesis has been quite popular and a variable representing the size of the host country market has come out as an explanatory variable in nearly all empirical studies on the determinants of FDI.

Serven (2003) based on cross-country sample data and a GARCH measure of exchange rate uncertainty finds a highly significant and negative relationship between exchange rate volatility and FDI. Also, Kelinde (2009) using observations for the years 1975-2005 analyzed the two-way causality relationship from FDI to exchange rate volatility and exchange rate volatility to FDI in the two African nations. The results showed an increasingly negative role played by exchange rate volatility in Nigeria.

Jordaan (2004) claims that the impact of openness on FDI depends on the type of investment. Multinational firms engaged in export-oriented investments may prefer to invest in a more open economy since increased imperfections that accompany trade protection generally imply higher transaction costs associated with exporting. Wheeler and Mody (1992) observe a strong positive support for the hypothesis in the manufacturing sector, but a weak negative link in the electronics sector. Culem (1988), and Edwards (1990) find a strong positive effect of openness on FDI.

Artige and Nicolini (2005) state that market size as measured by GDP or GDP *per capita* seems to be the most robust FDI determinant in econometric studies. This is the main determinant for horizontal FDI. It is irrelevant for vertical FDI. Jordaan (2004) mentions that FDI will move to

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countries with larger and expanding markets and greater purchasing power, where firms can potentially receive a higher return on their capital and by implication receive higher profit from their investments.

Asiedu (2006) analyses the relative influence of natural resources and market size *vis-à-vis* government policy, host country's institutions, and political instability in attracting FDI to SSA. The main result is that countries that are endowed with natural resources or have large markets will attract more FDI. However, good infrastructure, an educated labor force, macroeconomic stability, openness to FDI, an efficient legal system, less corruption, and political stability have also been shown to promote FDI.

Furceri and Borelli (2008**)** analyzed the role of exchange rate volatility in explaining the evolution of FDI inflows in EMU neighborhood countries. The results of the paper suggest that the effect of exchange rate volatility on FDI crucially depends on a country's degree of openness. In fact, while exchange rate volatility has a positive or null effect for relatively closed economies, it has a negative impact on economies with a high level of openness.

Osinubi and Amagheionyeodiwe (2009) investigated the empirical evidence on the effect of exchange rate volatility on foreign direct investment (FDI) in Nigeria, using secondary time series data from 1970 to 2004. The results suggest, among others, that exchange rate volatility need not be a source of worry for foreign investors. Also, the study further reveals a significant positive relationship between real inward FDI and exchange rate. This implies that the depreciation of the Naira increases really inward FDI.

Wafure, O. G. and N. Abu (2010) investigated the determinants of foreign direct investment in Nigeria. The error correction technique was employed to analyze the relationship between foreign direct investment and its determinants. The results reveal that the market size of the host country, deregulation, political instability, and exchange rate depreciation are the main determinants of foreign direct investment in Nigeria.

Anyanwu (2012) analyses factors that influence FDI inflows in Africa. The study uses cross-country data from 53 countries for the period 1996-2008. The study finds that market size, openness to trade, rule of law, foreign aid, natural resources, and past FDI inflows have a positive effect on FDI inflows. However, higher financial development has a negative effect on FDI inflows. The paper also finds that East and Southern African sub-regions appear positively disposed to obtain higher levels of inward FDI.

METHOD

The study investigates whether there is a co-existence bilateral relationship between foreign direct investment and exchange rate volatility in the Tanzanian economy. This study examines to what extent and the direction of exchange rate given the fluctuations in FDI and vice versa, their impact on the macroeconomic performance of Tanzania.

1. Description of the Variables

In determining the factors that affect FDI, it is practically important to make a distinction between three types of FDI. Dunning (1993) describes three main types of FDI as follows; *market-seeking*

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FDI, whose aim is to serve local and regional markets. Secondly, *resource-seeking:* when firms invest abroad to obtain resources not available in the home country. Thirdly, *efficiency-seeking* takes place when the firm can gain from the common governance of geographically dispersed activities in the presence of economies of scale and scope.

The literature review has examined various variables that have been set forth to explain FDI. Some of these variables are included in the formal hypotheses or theories of FDI, whereas others are suggested because they make sense intuitively. Most of the variables used in empirical studies appear in the UNCTAD's (1998) classification of the determinants of inward FDI.

The determinants of foreign direct investment explained in the light of earlier studies include the following: lag of FDI, market size of the host country (GDP) symbolized as RGDP, Gross fixed capital formation (proxy for infrastructure) designated as GFCF, inflation rate designated as INFL, openness to trade (export plus import to GDP ratio) symbolized as (X+M/GDP), availability and efficiency of financial infrastructure (ratio of M2 to GDP) denoted as (M2/GDP), and exchange rate (Tanzania currency against US dollar) represented as EX.

Lag of FDI: the results should indicate a positive relationship between the lag of FDI and FDI inflows for the current period (Bennett, 2005). Real exchange rate: the depreciation or appreciation has an important impact on FDI inflows (Abala, 2014). Coleman and Tettey (2008) conclude that the real exchange rate volatility has a negative influence on FDI inflows. The market size of the host country: is positively related to the FDI inflow (Bennett, 2005; Charkrabarti, 2001; Masayuki and Ivohasina, 2005). Gross fixed capital formation (proxy for infrastructure): has a positive relationship with the FDI.

Economic stability and instability (inflation levels): Ceteris paribus, multinational corporations should find a country with higher inflation less attractive, thus investing less within the host country (Bennet, 2005; Asiedu (2006). Openness to trade: a host country's openness to trade will facilitate this export-oriented FDI (Bennet, 2005). When FDI is market-seeking, trade restrictions (less openness) lead to a positive impact on FDI (Jordaan, 2004).

Availability and efficiency of financial infrastructure (traditionally measured by the ratio of M2 to GDP): its inefficiency or unavailability discourages investors (Bhinda *et al*., 1999). Return to investment (inverse of the natural logarithm of real GDP per capita is used as a proxy): the return to investment has a positive effect on FDI inflows (Asiedu, 2002; Jaspersen *et al*., 2000).

According to Moosa (2005) due to the absence of a consensus on a theoretical framework to guide empirical work on FDI, there is no widely accepted set of explanatory variables that can be regarded as the *"true*" determinants of FDI. Therefore, the determinant of FDI to be used depends entirely on the interest/decision of the researcher.

2. Data Sources, Types, and Measurement

The time period 1990-2020 has been chosen on the basis that during this period foreign capital became more mobile due to the fact that most developing economies progressively dismantled barriers to foreign capital inflow at a time when the major donor western market economies had eliminated their restrictions by the early 1980s. However, the starting date of 1985 has been chosen due to the availability of data on the variables used in the analysis. The sources include the National

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Bureau of Statistics, Tanzania Investment Centre reports, Bank of Tanzania annual reports, Economic Bulletin review, Economic Survey, and the World Bank-statistics department.

3. Model Specification and Estimation Techniques

Unit root test

The study involves testing the nature of the data to avoid spurious regression, time series data usually presents unit root behavior (Hendry and Juselius, 2000). It uses the augmented Dickey-Fuller (ADF) test and Phillip-Perron (PP) test as means to investigate the order of integration of the individual series under consideration. Mallik and Choudhry (2001) pointed out that the Phillip-Perron test can properly distinguish between stationary and non-stationary time series with a high degree of autocorrelation and the presence of structural break.

The Autoregressive Distributed Lag (ARDL) or "Bounds" Testing Approach

The *ARDL* procedure involves two stages. In the *first stage*, the existence of the long-run relation between the variables under investigation is tested by computing the F-statistic for testing the significance of the lagged levels of the variables in the error correction of the underlying *ARDL* model. The *second stage* of the analysis is to estimate the coefficients of the long-run relations and make inferences about their values. ARDL is advantageous in that it allows estimation of variables in different order of integration i.e. $I(0)$ and $I(1)$. A bounds testing procedure is available to draw conclusive inferences without knowing whether the variables are integrated of order zero or one, $I(0)$ or $I(1)$, respectively (Kripfganz and Schneider 2016).

The ARDL approach shows estimates that are much more reliable unlike their counterparts even if the dynamic structure is over-specified, and also provides the size of the t-tests from an estimator that is much more reliable. However, Banerjee et al. (1993) show that the ARDL approach to cointegration is especially attractive when carrying out cointegration in small samples and that it is also more efficient than other VAR methods. This is also confirmed by Pesaran and Shin (1999) and Pesaran, Shin, and Smith (2001) who show that the ARDL model outperforms other approaches.

Pesaran and Shin (1999) indicate that appropriately modifying the orders of the ARDL model is adequate to simultaneously correct for residual serial correlation and the problem of endogenous regressors, thus giving ARDL an advantage over other approaches to cointegration. Harris and Sollis (2003), and Constant and Yue (2010) support the superiority of the ARDL over other approaches. The inclusion of dynamics is shown by Inder (1993) and Pesaran and Pesaran (1997) to help correct for endogeneity bias.

The modified approach by Pesaran and Shin (1999) uses the error correction version of the ARDL model and takes the following form:

$$\Delta FDI_t = \beta_o + \beta_1 \ln LFDI_{t-i} + \beta_2 \ln RGDP_{t-i} + \beta_3 \ln GFC_{t-i} - \beta_4 \ln INFL_{t-i}$$
$$+ \beta_5 \ln \left[\frac{(X+M)}{GDP}\right]_{t-i} + \beta_6 \ln \left[\frac{M2}{GDP}\right]_{t-i} + \beta_7 \ln \left[\frac{1}{RGDP}\right]_{t-i} - \beta_8 \ln EX_{t-i}$$

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$$+\sum_{i=1}^{q}\gamma_i\,\Delta\ln LFDI_{t-i}+\sum_{i=1}^{n}\delta_i\,\Delta\ln RGDP_{t-i}+\sum_{i=1}^{n}\vartheta_i\,\Delta\ln GFC_{t-i}-\sum_{i=1}^{n}\theta_i\,\Delta\ln INFL_{t-i}+\sum_{i=1}^{n}\varphi_i\,\Delta\ln\left[\frac{(X+M)}{GDP}\right]_{t-i}+\sum_{i=1}^{n}\rho_i\,\Delta\ln\left[\frac{M2}{GDP}\right]_{t-i}+\sum_{i=1}^{n}\sigma_i\,\Delta\ln\left[\frac{1}{RGDP}\right]_{t-i}-\sum_{i=1}^{n}\emptyset_i\,\Delta\ln EX_{t-i}+v_t$$

where β_i are the long-run multipliers, β_0 is the drift and v_t are white noise errors. n and q are the appropriate ARDL model orders. Δ represents the first difference operator. The *F* test is then used to determine the long-run relationship between the variables by testing the significance of the lagged levels of the variables (Klasra, 2011).

The null hypothesis derived according to Pesaran and Shin (1999) can be shown as:

$$H_0 : \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = \beta_8 = 0$$

Which is tested against the alternative hypothesis

$$H_0 : \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq \beta_7 \neq \beta_8 \neq 0$$

RESULTS AND DISCUSSION

1. Unit root test

In hypothesis testing, if (P-value < 0.05) null hypothesis is rejected and conclude that the variable is stationary otherwise the null hypothesis is accepted. Also, when the absolute value of the test statistic is greater than the 5% critical value, we can reject the null hypothesis that the variable has unit root otherwise we fail to reject the null hypothesis.

The unit root test results indicate that all variables are nonstationary at levels as shown in Table 1. The presence of nonstationarity on the variables under consideration necessitates the process of differencing the variables. The results indicated that all variables are stationary at all levels of significance after differencing once as presented in Table 4.1. The results also implies that our variables are integrated of order one *I*(1**)**. With the confirmation that all variables are integrated of order one then their long-run equilibrium relationship can be investigated.

Table 1: ADF and Phillip-Perron unit root test results

Variables	At levels		At first difference	
	ADF	PP	ADF	PP
FDI	0.5780(-1.409)	0.7075(-1.119)	0.0000(-8.751)	0.0000(-9.349)
RGDP	0.9987(2.030)	0.9988(2.086)	0.0008(-4.144)	0.0008(-4.164)
GFCF	1.0000(7.290)	1.0000(10.350)	0.0000 (-6.753)	0.0000(-9.005)
INFL	0.1417(-2.400)	0.1400(-2.406)	0.0001(-4.612)	0.0001(-4.639)
(X+M)/GDP	0.6328(-1.292)	0.4978(-1.572)	0.0010(-4.082)	0.0007(-4.194)
M2/GDP	0.6012(-1.360)	0.4147(-1.728)	0.0121(-3.367)	0.0104(-3.416)
EX	0.9904(0.731)	0.9955(1.132)	0.0000(-5.378)	0.0000(-5.418)

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Critical values at levels are; -3.743at 1%, -2.997at 5% and -2.629 at 10%. Critical values at first difference are; -3.750 at 1%, -3.000 at 5% and -2.630 at 10%. The bracket indicates their respective test statistics.

2. The ARDL or "Bounds" Testing Approach to Cointegration

Given the unit root test results that all variables are integrated of order one, then the ARDL technique is employed for investigating the long run relationship that exists among the variables under consideration. The study has employed the combination of ARDL and error correction form in which yields the adjustment coefficient that gives the speed of adjustment to the long-run equilibrium. The adjustment coefficient separates long-run coefficients and short-run coefficients from long-run equilibrium as the results shown in Table 4.2.

The coefficient of determination (R square) is 99.7% implying that variation in dependent variable is explained by the explanatory variables and the rest of the variation is due to factors other than the independent variables. The probability of the F-Statistic suggests that the model has a very good fit as reported in Table 4.2. The adjustment coefficient has expected negative sign and significant at 1 percent level of significance. Its magnitude reports the speed for adjustment of around 66.0 percent, which is relatively high. This implies that, about 66.0 percent of the deviations from the long-run equilibrium are corrected in one period.

In the long-run the results depict a positive relationship between gross fixed capital formation and foreign direct investment, a unit increase in gross fixed capital formation leads to an increase in foreign direct investment by 3.4585 hence accords with the literatures. There also exist a negative relationship between exchange rate and foreign direct investment, a unit increase in exchange rate will lead to a fall in foreign direct investment by 3.4460 thus agreeing to the literatures (Coleman and Tettey, 2008). An improvement in financial infrastructure proxied by (M2/GDP) will lead to an increase in foreign direct investment by 3.334 implying a positive relationship (Asiedu, 2002).

An increase in inflation rate will also lead to an increase in foreign direct investment by 1.3673 indicating a positive relationship as supported from various literatures. However, an increase in trade openness proxied by (X+M/GDP) indicates a negative relationship with foreign direct investment contrary to the revised literature, a unit increase in trade openness will lead to a fall in foreign direct investment by 4.9857. Moreover, units increase in real GDP leads to a decrease in foreign direct investment by 2.6973 implying a converse relationship.

The coefficients generated from the regressors are all statistically insignificant as P-value is higher than the significance level at 5 percent. The short-run coefficients are converse to the long-run in terms of direction of their relationship although they also do differ in their magnitude. The only unique result has been shown on trade openness which is statistically significant at 10 percent with P-value of 0.064.

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Table 2 ARDL with Error correction model results

ARDL(2,2,2,2,2,2,2) regression Sample: 1992 - 2016 Log likelihood = 29.348089	Number of obs = 25 R-squared = 0.9973 Adj R-squared = 0.9837 Root MSE = 0.1870

Series	Coef.	Std. Err.	t-statistics	Prob
ADJ				
L1.logfdi	-.6601245	.1367255	-4.83	0.008
Long-run coefficients				
loggfcf	3.458533	2.5286	1.37	0.243
logex	-3.446006	5.406329	-0.64	0.559
logm2gdp	3.334	3.116556	1.07	0.345
loginfl	1.367343	1.453367	0.94	0.400
logxgdp	-4.985758	3.103903	-1.61	0.183
logrgdp	-2.697395	3.0633	-0.88	0.428
Short-run coefficients				
logfdi LD.	-.151338	.077749	-1.95	0.123
loggfcf D1.	-2.006814	1.287816	-1.56	0.194
LD.	-1.072903	.6814143	-1.57	0.190
logex D1.	1.842234	1.711833	1.08	0.342
LD.	-1.584065	1.831237	-0.87	0.436
logm2gdp D1.	-1.558416	1.679052	-0.93	0.406
LD.	-2.28919	1.463774	-1.56	0.193
Ioginfl D1.	-.781084	.8485935	-0.92	0.409
LD.	-.0267318	.3711567	-0.07	0.946
logxgdp D1.	4.547236	1.793799	2.53	0.064
LD.	2.536236	2.398893	1.06	0.350
logrgdp D1.	2.922489	1.594709	1.83	0.141
LD.	1.024105	1.073274	0.95	0.394
Constant	22.4358	30.06155	0.75	0.497

Source: Own computation

3. Bounds Testing Procedure

The study uses bound testing procedure to check whether a long-run relationship can be statistically confirmed among the variables under the study, the study makes use of the postestimation command estat btest. The results displayed in Table 4.3 and 4.4 confirm the rejection of the null hypothesis using both F-statistic and t-statistic.

The empirical results of the bounds testing procedure reveal that the null hypothesis of no existence of long run is rejected at 1% level of significance. The rejection is based on the fact that the *F*-statistic value (6.1358) is greater than the lower critical bound value of 4.43. Therefore, the

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existence of a steady state long run relationship exists between LogFDI and its determinants (regressors). Similarly, using the t-statistic from the bounds testing procedure the results indicate the rejection of the null hypothesis since t-statistic value (-4.84) is greater than the bounds critical value of (-4.66) at 2.5% level of significance.

Table 3: Bounds testing procedures for F-statistic

Test statistic	Value	k
F-statistic	6.1358	6
Critical value bounds		
Significance	IO bound	I1 bound
10%	2.12	3.23
5%	2.45	3.61
2.5%	2.75	3.99
1%	3.15	4.43

Source: Own computation

Table 4.4: Bounds testing procedures for t-statistic

Test statistic	Value	k
t-statistic	-4.828	6
Critical value bounds		
Significance	IO bound	I1 bound
10%	-2.57	-4.04
5%	-2.86	-4.38
2.5%	-3.13	-4.66
1%	-3.43	-4.99

Source: Own computation

CONCLUSION

This study investigated the empirical evidence on the determinants of foreign direct investment (FDI) in Tanzania, using secondary time series data from 1990 to 2016. In attempting this, the study utilized the Autoregressive Distributed Lag in combination with Error Correction Model and the bounds testing procedure.

The results suggest, among others, that exchange rate volatility need not be a source of worry by foreign investors. Also, the study further reveals a significant positive relationship between real inward FDI and exchange rate. This implies that, depreciation of the Shilling increases real inward FDI. Also, the study further reveals a significant positive relationship between real inward FDI and exchange rate. This implies that, depreciation of the Shilling increases real inward FDI.

The study aimed to explore the determinant of foreign direct investment (FDI) in Tanzania. The study has employed time series data which were collected from secondary sources for the period from 1990 – 2016 with the view to achieve the stated objectives. The results indicate that, in the long-run the coefficients are statistically insignificant with required direction of relationship with exception of real GDP, trade openness and inflation rate while in the short-run the results have shown the opposite of the results in the long-run.

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Financial infrastructure has shown a positive impact on FDI in the long-run, thus a country needs to further deepen financial competitiveness with abolition of policies of financial repression so as to attract more financial intermediaries as well institutions. Improved financial infrastructure attracts non- market seeking investments as creates stable sources of funds. Also, the country needs to strengthen its monetary policy as to ensure stable exchange rate as it has shown a converse relationship with foreign direction investment, by way of stabilizing monetary policy will also ensure stable prices thus attracting more market seeking investments. In the meanwhile, an increase in prices has shown a positive relationship with foreign direct investment this is particularly for non-market seeking investments.

There is a great need for a country to emphasize on domestic investment as this has shown a positive impact in attracting foreign direct investment in the short-run, with higher real GDP implies large market thus suitable for market-seeking investments. The higher the level of real GDP may imply the level of export with less import thus improving the degree of trade of openness hence the economy becomes competitive hence more foreign direct investment.

However, there is a need to look at how FDI could positively contribute to economic growth in

Tanzania. There is a need for policy makers to emphasize on a win - win situation in contracts signing. The foreign investors have to work in joint ventures with local investors for easy transfer of technology. The government should also coin monetary policy and conducive environment for investments that will attract foreign investors retains their profits within the country.

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