

# THE INFLUENCE OF FOREIGN DIRECT INVESTMENT (FDI) INFLOWS ON MANUFACTURED EXPORTS IN TANZANIA: AN AUTOREGRESSIVE DISTRIBUTED LAG (ARDL) ASSESSMENT

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# ABSTRACT

The industrialisation and export promotion agenda has recently gained prominence in many African countries as channels towards the path of structural transformation. Following increasing Foreign Direct Investment (FDI) inflows in Tanzania, this article uses an Autoregressive Distributed Lag (ARDL) technique to explore the association between FDI inflows and real manufactured exports for a period of 1980-2018. The findings show a significant association between FDI inflows and manufactured exports in both periods in Tanzania. Similarly, the estimated error correction coefficient is negative and significant at a one percent level. This suggests that all the variables are co-integrated in the long run. However, variables such as trade openness and real effective exchange rate recorded insignificant association with real manufactured exports in the short run. The findings highlight the need to attract more export-oriented FDIs to spur competitiveness and increase exports of manufactured products. This will be possible by increasing trade openness, revisiting investment policies and instituting macroeconomic stability policies.

Keywords: Real Manufactured Exports, FDI inflows, ARDL JEL Classification: C33, F23, O17, O24

# **1.0 INTRODUCTION**

Over the past three decades, many African countries have been emphasizing attracting Foreign Direct Investment (FDI) in their economies as one of the paths to stimulating industrialisation, exports and economic growth (Fintan, 2014; Mbelle, 2016; Gamariel and Hove, 2019; Kaplinsky and Morris, 2019). FDI can play a role in driving industrialisation by facilitating productivity in the manufacturing sector, leading to the creation of more employment opportunities, expanding local incomes and bringing about foreign currency via the export of produced commodities, thus generating government revenue and supporting overall economic development. Therefore, governments attempt to promote FDI inflows to incite industrialisation and promote their businesses to increase exports (Doaei and Hassani, 2010). However, the contents and category of African produced products remain to be of primary commodities and entrenched in low technologies (Mbelle, 2016; Gamariel and Hove, 2019). This situation has lowered the competitiveness of African products in global markets, thereby hindering the transformation that the export sector was expected to bring in African economies.

Nonetheless, FDI can bring about more efficient production systems, help in upgrading of production technologies and improve access to new and more competitive markets (Alfaro, 2003; Moran, 2005; Kulger, 2006; Apergis et al., 2007; Hailu, 2010; Kotrajaras, 2010; Zhang, 2015; Kaplinsky and Morris, 2019). This is because FDI brings along new expertise, capital and technologies that can support industrial development processes, promote the growth of the export sector and the resulting overall economic



development in Africa. Hailu (2010) and Epaphra (2016) show that FDI makes it possible for African countries to get capital for investment, increase employment opportunities, acquire managerial skills, knowledge, and technological upgrading through the transfer of modern technologies and help with the integration of domestic economy into the global economy.

Consequently, many African countries have now established agencies that deal with investment promotion and have adopted economic policies anchored on attracting FDI in their economies by putting in place appropriate macroeconomic stability policies and investment incentive schemes over time. This mission is also reflected in various regional and continental initiatives such as the 2008 Plan of Action for the Accelerated Industrial Development for Africa (AIDA) and, more recently, the agenda 2063 (Chidede, 2017).

Studies show that many African countries have registered increases in FDI inflows over the years (Dupasquier and Osakwe, 2005; Sutton *et al.*, 2016; Ndikumana and Sarr, 2016; Gamariel and Hove, 2019). For instance, the case of Tanzania during the period of 2000-2011 received a total of \$6 billion of FDI compared with less than \$2 million received during 1986-1991. Since then, the annual inflows of FDI have continued to increase year after year. The recent data show that FDI inflows in Tanzania rose by 46.4 percent to USD 1,799.6 million in 2012 from USD 1,229.4 million recorded in 2011, making Tanzania the leading destination in the East African Community in 2012. Moreover, FDI inflows reached USD 1.1 billion in 2018 (Tanzania Investment Report, 2013; World Investment Report, 2019). The activities which attracted more FDI inflows were mining and quarrying, manufacturing, gas and electricity, and finance and insurance over the past ten years.

This success is linked to the reforms in the business environment that Tanzania has put in place over the years. However, there are concerns that despite the relatively massive size of FDI inflows in the manufacturing sector in Tanzania, there is little evidence in terms of its trickle-down effects in areas like better local economic integration, enhanced manufactured exports and overall economic development (Dominician, 2008; Page, 2015; Mbelle, 2016). These views contest the widely held ideas in the literature, which claim that the manufacturing sector can expand production, enhance exports and boost economic growth when productivity levels are enhanced and stimulated in the industry. However, Dinh and Monga (2013), UNIDO (2013), and UNIDO (2014) maintain that there is more significant potential to increase FDI inflows as well as maximising its effects among various sectors in the local economy. Nevertheless, for this to happen in Tanzania, Moyo *et al.*, (2012) indicated that the manufacturing sector as a whole ought to grow two more times as quickly over the next 15 years if the country was to transition to the middle-income status by 2025.

One of the preconditions to attracting FDI is having a favorable business environment. Tanzania has continued to implement vigorous measures to position Tanzania as a striking investment hub through legal and regulatory reforms for small and large-scale enterprises (World Investment Report, 2019). The FDIs that come to Tanzania are undertaken in different forms and motives. There are FDIs driven by market and export target FDIs. In terms of the market, Tanzania is a member of several regional blocs such as the East African Community (EAC) and Southern Africa Development Community (SADC). These forms huge markets for products produced in Tanzania. Export target FDIs mainly seek lower production costs sites. They aim to enhance competitiveness by locating in areas where cheap but skilled labor can easily access raw materials and infrastructure support like what is found in export processing zones and economic zones. Countries like South Africa, Canada and the United Kingdom are the leading sources of FDIs in Tanzania.



The research evidence on the relationship between FDI and manufactured export performance is mixed. For example, the successes of the East and Southeast Asian countries suggest that FDI was an essential factor in export promotion (Nayyar, 1983; Lall and Mohammed, 1983; Will, 1992; Haddad *et al.*, 1996; Zhang, 2006 and Gamariel and Hove, 2019). However, some studies did not find any significant impact of FDI on manufactured export performance, for instance, Jeon (1992), Sharma (2000), and Sharma (2003).

Few studies have explored the link between FDI and exports in Tanzania. This includes studies of Fintan (2014) and Mbelle (2016). Fintan (2014) investigated the long-run relationship between FDI and export performance using co-integration analysis. His findings show that there is long-run bi-directional causality between FDI and export. On the other hand, Mbelle (2016) examined the manufacturing and transformation in a developing country context. He explored the role of Tanzania's Manufacturing sector in delivering change in the context of evolving global development paradigms and how national policy has influenced its performance. The findings show a positive relationship between FDI and the value of manufacturing exports.

The current study differs from the previous one in four ways. Firstly, it focused on the FDI inflows in the manufacturing sector and manufactured export linkages. Secondly, it takes stock of the recent policy shifts favoring the manufacturing industry and assesses if it has had any significant impact on manufactured exports. Thirdly, it examines FDI inflows and manufactured exports and other factors necessary for enhancing export competitiveness, such as real effective exchange rate and trade liberalisation. Fourthly, unlike the previous studies, this paper uses Autoregressive Distributed Lag (ARDL). ARDL examines the long-run relationship of the variables irrespective of their level of cointegration and it helps to identify the cointegrating vectors, i.e., each of the underlying variables stands as a single long-run equation. This gives realistic and efficient estimates (Nkoro and Uko, 2016).

# 2.0 METHODOLOGY

# 2.1 Data Description

This study covers the period between 1980–2018. We use data from Tanzania Investment Centre (TIC), Bank of Tanzania (BOT), United Nations Conference on Trade and Development (UNCTAD), World Investment reports, and World Bank. FDI data was sourced from Tanzania Investment Centre (TIC) and United Nations Conference on Trade and Development (UNCTAD). Manufactured exports and real effective exchange rate data were sourced from the Bank of Tanzania (BOT).

# 2.2 Regression Model Specification

The regression model is given as follows:  $\ln EXPM_t = \alpha + \alpha_2 \ln FDIM_t + \alpha_3 \ln REER_t + \alpha_4 \ln OPENNESS_t + \varepsilon_t.....(1)$ 

# Where:

InEXPM = Real Manufactured Export; Captures Tanzania's manufactured exports performance.

InFDIM = Foreign Direct Investment in the Manufacturing sector; Foreign Direct Investment (FDI) in the manufacturing sector. FDI is a channel of transferring capital, technology, information, and relevant skills and knowledge from one country into another country. It represents an intention to manage and influence foreign firms' operations. The existing comparative advantages in a country, such as cheap but skilled labour, raw materials, etc., are then exploited through trade (Virman, 2004).



lnREER = Real Effective Exchange Rate; A real effective exchange rate captures appreciation or depreciation of exchange rate. This represents price competitiveness in international markets and is included to ascertain its influence on manufactured exports.

InOPENNESS = Represents the trade liberalisation index; Trade Openness (Openness). Trade openness captures the level of trade liberalisation in a country. "Is the sum of imports and exports normalized by GDP" It measures the degree to which a country is engaged in a global trading system by promoting the efficient allocation of resources through comparative advantage and enhanced competition in domestic and international markets. This implies that openness is expected to have a positive impact on manufactured exports

# 2.3 Testing Hypothesis

 $H_1$ : There is a significant positive relationship between manufactured exports and FDI inflows in the manufacturing sector

 $H_2$ : There is a significant positive relationship between manufactured exports and real effective exchange rate

H<sub>3</sub>: There is a significant positive relationship between manufactured exports and trade openness

# 2.4. Bound Testing Approach

The paper uses the bounds technique, which was developed by Pesaran *et al.*, (2001), which allows a mixture of I(1) and I(0) variables as regressors. Using this technique, the order of integration variables may not necessarily be the same.

# 2.5 ARDL Model Specifications

The study uses the bounds testing approach to analyse the influence of FDI inflows on manufactured exports in Tanzania. The study uses this approach because it does not require pre-testing for the order of integration of each variable of interest, and yet, it can be used to examine the long-run influence of FDI inflows on EXPM irrespective of whether the underlying regressors are I (0) or I (1). Another usefulness of the bounds testing approach is that it is robust in capturing long-run relationships with small sample sizes, so it is relevant to this study since it covers 40 observations. According to Pesaran *et al.*, (2001), in an ARDL (p,q) model of the equation of unrestricted error correction, we develop the vector autoregression (VAR) of order p, denoted VAR (p) as follows:

Where  $z_t$  is the vector of both  $x_t$  and  $y_t$ , where  $y_t$  is the dependent variable defined as real manufactured exports  $x_t$  is the vector-matrix which represents a set of explanatory variables, i.e., Foreign Direct Investment (FDI), Real Effective Exchange Rate (REER), Trade Openness (OPENNESS) and *t* is a time or trend variable. According to Pesaran et al. (2001),  $y_t$  it must be I(1) variable, but the regressor  $x_t$  can be either I(0) or I(1). We further develop a vector error correction model (VECM) as follows:



$$\Delta z_{t} = \mu + \alpha t + \lambda z_{t-1} + \sum_{i=1}^{p-i} \gamma_{t} \Delta y_{t-i} + \sum_{i=1}^{p-1} \gamma_{t} \Delta x_{t-i} + \varepsilon_{t}$$
(3)

Where  $\Delta$  is the first-difference operator. The long-run multiplier matrix  $\lambda$  is as follows:

$$\lambda = \begin{bmatrix} \lambda_{YY} \lambda_{YX} \\ \lambda_{XY} \lambda_{XX} \end{bmatrix}$$

The diagonal elements of the matrix are unrestricted, so the selected series can be either I(0) or I(1). If  $\lambda_{YY} = 0$ , then *Y* is I(1). In contrast, if  $\lambda_{YY} < 0$ , then *Y* is I(0). The co-integration test model is specified as follows:

Where: *ln*EXPM=Real Manufactured Export *ln*FDIM= Foreign Direct Investment in the Manufacturing sector *ln*REER= Real Effective Exchange Rate *ln*OPENNESS= Represents the trade liberalisation index

After regression of equation (4), the Wald test (*F*-statistic) was computed to differentiate the long-run relationship between the concerned variables. The Wald test was carried out by imposing restrictions on the estimated long-run coefficients of *lnEXPM*, *lnFDIM*, *lnREER* and *lnOPENNESS*. The null and alternative hypotheses are as follows:

 $H_0 = \beta_1 = \beta_2 = \beta_3 = 0$  (no long-run relationship)

Against the alternative hypothesis  $H_1 \neq \beta_1 \neq \beta_2 \neq \beta_3 \neq 0$  (a long-run relationship exists)

The computed *F*-statistic value will be evaluated with the critical values tabulated in Table CI (iii) of Pesaran et al. (2001). The lower bound critical values assumed that the explanatory variables  $x_t$  are integrated of order zero, or I (0). In contrast, the upper bound critical values assumed that  $x_t$  are integrated of order one, or I (1). Therefore, if the computed *F*-statistic is smaller than the lower bound value, then the null hypothesis is not rejected. We conclude that there is no long-run relationship between the variables. Conversely, if the computed *F*-statistic is greater than the upper bound value, then there is a long-run level relationship among the variables. On the other hand, if the computed *F*-statistic falls between the lower and upper bound values, the results are inconclusive. Once the long-run relationship has been identified, then the long-run and short-run estimates of the ARDL model can be obtained from



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equation (4). Then we select the optimum lag in the ARDL modeling using Akaike Information Criterion (AIC). The model is specified as follows:

$$\ln EXPM = Const + \sum_{i=1}^{p} \beta_{1,t} \ln FDI_{t-i} + \sum_{i=1}^{q} \beta_{2,t} \ln REER_{t-i}$$

$$+\sum_{i=1}^{r}\beta_{2,t}\ln OPENNESS_{t-i} + \varepsilon_{t}......(5)$$

Where: p,q,r = Optimal lag length used in the model

 $\varepsilon$  = Residual

We identify a long-run steady point for the model, a residual from a long-run co-integration model. The long-run co-integration model is as follows:

### **3.0 FINDINGS AND DISCUSSIONS**

### **3.1 Unit Roots Tests**

The stationarity status of all variables was tested as a prior step before proceeding with the ARDL bounds test. This was an important test to determine the order of integration. During this process, the augmented Dicky-Fuller and Phillips Perron unit root tests were applied.

Variable	1%	5%	10%	ADF	Status	1st Difference
lnEXPM	-3.682	-2.972	-2.618	-1.880	I(1)	-3.526
<i>ln</i> FDIM	-3.682	-2.972	-2.618	-1.191	I(1)	-3.772
<i>ln</i> REER	-3.682	-2.972	-2.618	-5.444	I(0)	-
<i>ln</i> OPENNESS	-3.682	-2.972	-2.618	1.100	I(1)	-3.794
Phillips Perron U	nit Root test					
Variable	1%	5%	10%	Z(t)	Status	1st Difference
<i>ln</i> EXPM	-3.682	-2.972	-2.618	-2.062	I(1)	-6.270
<i>ln</i> FDIM	-3.682	-2.972	-2.618	-1.260	I(1)	-4.465
<i>ln</i> REER	-3.682	-2.972	-2.618	-5.401	I(0)	-
<i>ln</i> OPENNESS	-3.682	-2.972	-2.618	0.790	I(1)	-4.353

 Table 1: ADF Unit Root Test and Phillips Perron Unit Root Test

The findings in Table 1 show that under the ADF unit root test, REER is stationary at a level while lnFDIM, lnREER, and lnOPENNESS became stationary after the first difference. Similarly, when the Phillips Perron unit root test was applied, lnREER was stationary at a level while lnFDIM, lnREER, and lnOPENNESS became stationary after taking their first difference.



# **3.2 Bounds F-Test for Co-integration**

Table 2 provides the results of the ARDL Bounds F-statistics for the co-integration relationship. The results show that the computed F-statistics are greater than the upper bound critical values. Thus, the null hypothesis of no co-integration is rejected, suggesting a long-run relationship between *lnEXPM*, *lnFDI*, *lnREER*, and *lnOPENNESS*.

### Table 2: Results of Bound Test

Computed F-statistics:		Critical Values		
6.641*, **, ***	Lower Bound	Upper Bound		
1% Significance level	2.96	4.26		
5% Significance level	2.32	3.50		
10% Significance level	2.03	3.13		

Notes: \*, \*\*, \*\*\* Indicates that computed statistic falls above the upper bound values at 1, 5, and 10 percent significance levels. The bond's critical values were obtained from Perasan et al. (2001, p 300), table: CI (iii) case III: Unrestricted intercept and no trend.

# 3.3 Long-run Estimates of ARDL Process

Since the co-integration relationship among the variables has been detected, equation four was estimated for the long-run coefficients using the optimum lags based on Akaike Information Criterion (AIC). The ARDL (1, 1, 1, 1) model is presented in Table 3. The results show the short-run and long-run positive and significant relationship between manufactured export and Foreign Direct Investment (FDI) at lag 1. Trade openness has a positive and significant long-run relationship with manufactured export, signifying that trade liberalisation is essential to enhance manufactured exports in Tanzania. Trade openness might have promoted manufactured export growth through efficient resource allocation and competition from local and international markets. On the other hand, the lagged real effective exchange rate coefficient recorded a positive but insignificant relationship with manufactured exports in the long run.

Table	3:	Long	run	Estimates	of	ARDL
Lanc	<b>.</b> .	LUILE	I UII	Louinacos	UI.	INDL

Variable	Coefficient	Std. Error	t-Statistic	Prob.
С	0.434810	1.110494	0.391547	0.6992
D(lnEXPM(-1))	-0.059943	0.197622	-0.303322	0.7645
D(lnFDI)	0.003048	0.157376	0.019367	0.9847
D(lnFDI(-1))	0.507125	0.178678	2.838209	0.0096*
D(lnREER)	0.145934	0.211399	0.690328	0.4972
D(lnREER(-1))	-0.046709	0.204796	-0.228075	0.8217
D(InOPENNESS)	-0.148188	0.461834	-0.320869	0.7513
D(lnOPENNESS(-1))	-0.440162	0.364344	-1.208092	0.2398
lnEXPM(-1)	0.693351	0.215731	3.213966	0.0040*
lnFDI(-1)	0.346253	0.080354	4.309074	0.0003*
lnREER(-1)	0.398593	0.255844	1.557954	0.1335
InOPENNESS(-1)	0.314165	0.081130	3.872348	0.0008*

(\*, \*\*) Significance at 1%, 5%

# 3.4. Short-run Dynamics of ADRL Process

Table 4 presents short-run dynamics coefficients associated with the long-run relationships from the ARDL equation (ARDL-ECM). The optimal lag length for the selected error correction is ADRL (3,1,1,1) by the Akaike Information Criterion (AIC). The short-run diagnostic tests were performed using the Breusch Godfrey Serial correlation test, heteroscedasticity test, Cusum test, and Jarque bera. The results show the validity and reliability of the ARDL- ECM Short-run model. The model has passed all the diagnostic tests.



**Table 4: Short-run estimates of ARDL** Dependent Variable: DlnEXPM Variable Coefficient Std. Error t-Statistic Prob. C -0.025584 -0.487561 0.052473 0.6303 DlnOPENNESS -0.458769 0.395958 -1.158632 0.2580 DlnFDI 0.443885 0.180146 2.464036 0.0213\*\* DlnREER -0.081491 0.133437 -0.610709 0.5471 -0.785498 0.213399 -3.680886 0.0011\* ETC(-1) Serial Correlation LM Test (  $X^2$  ) R-squared 0.498329 0.656 (0.5884) Heteroscedasticity Test (  $X^2$  ) Adjusted R-squared 0.352008 1.123 (0.3815) 3.405730 Durbin-Watson stat F-statistic 2.067689 0.011386 0.673 (0.7143) Prob(F-statistic) Jarque Bera

Note: \*, \*\*, \*\*\* indicates significance levels at 1%, 5% and 10%

The findings in Table 4 show that the estimated error correction coefficient is negative and significant at one percent level. This confirms that all the variables are co-integrated, and the speed of adjustment towards the long-run equilibrium is at 78% annually. The variables such as trade openness and real effective exchange rate recorded insignificant values in the short run. However, there exists a short-run relationship between manufactured export and lagged FDI inflows and manufactured exports. This suggests that there exists an association between FDI inflows and manufactured exports in Tanzania.

# **4.0 CONCLUSION**

This paper explored the link between Foreign Direct Investment (FDI) inflows and manufactured exports in Tanzania using An Autoregressive Distributed Lag (ARDL) from 1980 to 2018. The outcome shows a positive short-run and long-run association between FDI inflows in the manufacturing sector and manufactured exports in Tanzania. Furthermore, the estimated error correction coefficient is negative and significant at a one percent level. This suggests that all the variables examined, including real manufactured exports, trade openness, FDI inflows in the manufacturing sector, and real effective exchange rate, are co-integrated and have a long-run association. The speed of adjustment towards the long-run equilibrium is estimated to be 78% annually.

# **5.0 POLICY IMPLICATIONS**

The study findings reported indicating that there is an association between FDI and manufactured exports in Tanzania. The results suggest that to stimulate increased manufactured exports, attracting FDIs that target the export sector will be essential. The findings highlight the need to formulate policies that aim to encourage more export-oriented FDIs inflow in Tanzania. This must go along with increasing trade openness, revisiting investment policies to direct more investments in the manufacturing sector by putting in place friendly legal and regulatory reforms and instituting macroeconomic stability policies. These measures will help to build a more sustainable value-added manufacturing sector in Tanzania that can withstand local, regional and global market competition.

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