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The Effect of FDI on Total Factor Productivity, Export, and Employment in Ethiopia

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Abstract

Economic growth among other depends on the level of saving. However, in developing countries the level of saving is low. Under such condition foreign direct investment (FDI) is an important engine of economic growth. Accordingly, the objective of this research was to investigate the long run and short run effects of FDI on Total Factor Productivity (TFP), export, and employment creation. To address this objective, Autoregressive Distributed Lag Model was applied. The result of the study clearly showed, in the long run, Foreign Direct Investment (FDI) has a significant positive effect on TFP and employment. The estimated long run coefficients predicted that, as the ratio of FDI to GDP increases by 1%, TFP increases by about 1.245% per year while the ratio of manufacturing employment to total employment increases by approximately 0.28%. The short run effect of FDI on employment is consistent with its long run effect, but contrary to its positive long run impact, FDI has a negative impact on TFP, in the short run. On the other hand, the result showed that FDI do not have any significant effect on the export sector both in the long run and in the short run. Therefore, our findings clearly showed that Ethiopia is benefiting from increased inflows of FDI, at least in terms of productivity and employment creation. Hence, the government has to continue its effort to attract FDI through enhancing conducive business environment and encouraging export-oriented investment.

Keywords: *Foreign Direct Investment, Total Factor Productivity, export, employment, Ethiopia*

1. BACKGROUND

Policy makers strongly believe that foreign direct investment is important to ensure long-run economic growth and development than any other forms of capital (Frankel & Romer, 1999; IMF, 2010). It is argued that FDI would improve host countryôs economic performance including total factor productivity (TFP), export and employment creation. Scholars like Helpman et al. (2004) argued that FDI enhances total factor productivity and income growth in host countries, beyond what domestic investment normally would. First, it serves as a conduit for technology transfer and human capital formation. Second, FDI is direct and debt-free source of capital stock for the host economy, especially in economies where capital is relatively scarce (Bruno et.al. 2018). For instance, in developing countries low domestic savings are resulting in low investment so that low economic growth. Under such condition, the role of FDI to enhance economic growth is indispensable. Third, foreign firms bring not only financial capital but also managerial techniques, entrepreneurial skills and marketing skills that lack in LDCs (Blomström & Kokko, 2003). Some of these firm-specific advantages are expected to spillover to domestic firms in the host country. Fourth, FDI is also helpful to reduce shortage of hard currency and budget deficit problems in developing countries through export earnings and from profit-tax, respectively. Last, FDI can also play an important role by creating employment opportunities and by integrating the host-country economy into the world economy (OECD, 2002). Cognizant of these contributions, many developing countries like Ethiopia make considerable efforts to attract FDI.

Current evidences show that a large amount of FDI is flowing to African countries. Since the last two decades Ethiopia is one of the top African countries in attracting foreign direct investment (Getnet & Hirut, 2009). Realizing the positive spillovers of FDI, the government of Ethiopia has opened several economic sectors to foreign investors. The country took some policy measures pointed at attracting FDI from different parts of the world. Some of the measures taken include economic and political reforms aiming at macroeconomic and political stability, investment in infrastructure and human capital and liberalization of trade (Haile & Assefa, 2006). However, the effect of FDI on different outcomes has not been studied using up-to-date data. Hence, the aim of this study is to investigate the long run and short run effect of FDI on TFP, export and employment creation.

2. OBJECTIVE OF THE STUDY

The general objective of this research was to investigate the long run and short run effect of FDI on Total Factor Productivity, export, and employment creation. Specifically, this research has the objective of evaluating:

i. The effect of FDI on total factor productivity growth in Ethiopia
ii. The effect of FDI on values of Export in Ethiopia
iii. The effect of FDI on employment creation in Ethiopia

3. LITERATURE REVIEW

3.1 Theoretical literature

At macro level, the relationship between FDI and Economic growth is mainly discussed based on the neoclassical and endogenous growth theories (Arisoy, 2012). Both theories argue that FDI positively affects economic growth through capital accumulation, and the incorporation of new inputs and foreign technologies to the host country (Almfraji & Almsafir, 2014).

The neoclassical growth model initiated by Solow (1956) assumes that economic growth of a given economy depends on capital stock, labor force, and technological progress. This theory argues that long run economic growth is determined by technological progress that is exogenously determined. In this framework, FDI increases the per worker capital stock in the host country; and this would, in turn, lead to higher growth rate of per worker output. But the capital widening which stems from FDI would only enhance the growth rate of the economy during the short run due to the existence of diminishing returns to capital (Barro & Sala-i-Martin, 2004).

On the other hand, endogenous growth models argued that FDI includes not only the capital itself, but the transfer of technology and skills, managerial expertise and experience, as well as the introduction of the new processing method across countries. FDI, therefore, is expected to have a positive effect on total factor productivity growth and consequently to stimulate economic growth in the long run (Arisoy, 2012; Grossman & Helpman, 1995).

Among the first wave of endogenous growth models, the product variety model of Romer (1990) argues that productivity growth comes from an expanding variety of specialized intermediate products. Thus, in open economy, FDI is expected to induce productivity and economic growth by expanding and inventing the new variety of intermediate products. The Schumpeterian model of Aghion and Howitt (1992) constitutes the second wave of endogenous growth models. It concentrates on the improvement of the quality of the existing types of capital goods through research and development. Thus, innovative technology and new quality improving mechanisms would transfer with FDI inflows which would give rise to productivity and economic growth.

FDI can also be helpful to improve export performance in developing countries. There are different theories of international trade that explain the link between FDI and exports. For instance, Flying Geese model coined by Akamatsu in the 1930s argues that the multi-national companies shift their location of production from high labor cost home country to low labor cost host country. The host countryôs abundant factor helps them reduce the cost of production and retain its competitiveness, and thereby increase the export supply capacity of the host country (Lee, 2007). In addition, FDI encourages exports growth of host countries by augmenting domestic capital required for further exports; helping transfer of technology; facilitating access to new and large foreign markets and providing training for the local workforce and upgrading technical and management skills (Abor, Adjasi, & Hayford 2008; Lee, 2007). On the other hand, Heckscher-Ohlin-Samuelson model (H-O-S) model argues that FDI comes only in those sectors in which the host country has comparative disadvantage. Such FDIs come only to supply domestic market of host countries and hence plays no role in increasing exports (Sultan, 2013). Last, FDI can also play an important role in creating employment opportunities by integrating the host-country economy into the world economy (OECD, 2002).

3.2 Empirical Literature

From an empirical point of view, the relationship between FDI and total factor productivity; FDI and export; FDI and employment are often mixed. For instance, Doan, Mare and Iyer (2015) explored the relationship between FDI spillovers and TFP growth for firms in New Zealand during 2000ï 2010. This study identified an insignificant effect of FDI spillovers through horizontal linkages. In contrast, Uttama and Peridy (2010) investigated the productivity spillover effects of FDI inflows on five Asian countries for the year 1970-2005 and found a positive effect from horizontal linkages.

The effect of FDI on host country international trade depends on its motive (whether it is efficiency-seeking, market-seeking, or resource-seeking). FDI can have a great contribution to export growth, if it is efficiency-seeking or resource seeking FDI (Dunning, 1993). When production resulting from efficiency-seeking FDI is typically intended for export, the impact of such FDI is likely to have a positive effect on export performance of the host country. If domestic firms supply inputs to export oriented FDI firms, the local content of value-added exports would be much greater (Amensisa, 2018). Further, the effect of FDI on export performance of the host country depends not only on the amount of FDI but also on its structure (Selimi, Reçi & Sadiku, 2016). Import-substituting FDI generally focuses on the production of goods and services which were previously imported to the host country. These types of firms are not expected to have a significantly direct effect on the export sector. On the other hand, export-promoting FDI is motivated to use the host country as a base to export their products to the rest of the world. This type of FDI increases exports of raw materials and intermediate products to the rest of the world (Tambunlertchai, 2009).

Many researchers have tried to analyze the link between FDI and export. Liu and Shu (2003) have conducted a research in China to identify the determinants of export performance. Kutan and Vuksic (2007) also have done a research to investigate the effect of FDI in 12 European countries. Both research findings found that export performance was positively influenced by FDI. Another research conducted in the same country by Sun (2001) indicated that the impact of FDI on exports differs across regions in China and the effect is stronger in the coastal region than in the inland regions. Similarly, a research conducted by Okechukwu, De Vita and Luo (2018) in Nigeria suggested that FDI has a positive and statistically significant long-run impact on total exports. The positive effect arises because the multinational company may have superior knowledge and technology, better information about export markets, or better contact to the supply chain of the parent firm than do local firms. However, other researchers like Sudershan, Muppani, Khan, and Ali (2012) argued that FDI has no effect on export. The justification behind this unexpected effect is that foreign owned firms export less and focus more on domestic demand and host country specific advantages.

With regard to employment, the empirical results are still controversial. For example, a research conducted in India by Pradhan and Sahoo (2004) confirmed that foreign firms have positive effect on the manufacturing employment as compared to their domestic counterparts. According to the finding of this research foreign owned firms pay relatively higher wages to their workers than domestic firms. Consequently, this study tends to infer that labor in fact had benefited from FDI in India. Estrin (2017) has made a research to investigate the effects of FDI in transition

countries and proved that FDI inflows were associated with lower unemployment for some periods. In contrast, a research conducted in Pakistan, India and China by Rizvi and Nishat (2009) argued that FDI does not have any impact upon the creation of employment. The main reason behind the difference is related to the quality of the data and the choice of the empirical technique.

4. RESEARCH METHODOLOGY

4.1 **Data type and source**

To achieve the stated objectives, the research used quantitative data. Twenty-six years annual time series data from 1992-2017 was used to analyze the effect of foreign direct investment on total factor productivity, export, and employment. The annual data for this study was collected from local and international sources. The national sources include National Bank of Ethiopia (NBE), National Planning Commission (NPC), and Ethiopian Investment Commission (EIC) while the international sources include the World Bank (WB), International Monetary Fund (IMF), UNstat and United Nation Conference on Trade and Development (UNCTAD).

4.2 **. Method of Estimation**

This study applied Autoregressive Distributed Lag (ARDL) approach to analyze the long run and short run effects of FDI on total factor productivity, export and employment in Ethiopia. The empirical procedure to test co-integration between FDI and other selected macroeconomic variables is described as follows:

Cointegration test

Co-integration portrays the existence of a stationary equilibrium relationship among the variables of interest. The univariate co-integration approaches of Engle and Granger (1987) and Phillips and Hansen (1990), and the multivariate co-integration procedures of Johansen (1988) and Johansen and Juselius (1990), have been used extensively in the literature. Recently, the co-integration approach by Pesaran et al. (2001), known as the ARDL bounds testing, has become popular among researchers. In this research ARDL approach to co-integration was used to prove the existence of long run and short-run relationship among the variables of interest. This approach has several advantages over other co-integration techniques (Pesaran, Shin, & Smith, 2001). First, it is applicable irrespective of whether the underlying repressors are purely I (0), purely I (1). Second, the model uses a sufficient number of lags to capture the data-generating process in general to the specific modeling framework. Third, the error correction model is derivable from the ARDL through a simple linear combination, which integrates both short-run adjustments with long-run information without losing the latterôs information. Fourth, the small samples properties of the ARDL procedure are far superior to those of the multivariate co-integration techniques. Fifth, endogeneity and serial correlation problems are corrected through appropriate lag selection (Umoh & Effiong, 2013).

In this research, three co-integration models were estimated. In the first model, TFP was taken as dependent variable and FDI was taken as explanatory variable. In the second model, export was taken as dependent variable and FDI was taken as independent variable. In the third model,

employment was taken as dependent variable and FDI was taken as independent variable. In addition to FDI other control variables were included in each model.

To test whether there is a long run equilibrium relationship between the variables; bounds test for co-integration was carried out as proposed by Pesaran and Shin (1999) and Pesaran, Shin, and Smith (2001). The detail specification of cointegration mode-1, Model-2 and model-3 are shown as follows.

Model-1: The effect of FDI on TFP

$$\Delta LnTFP_t = \beta_0 + \lambda_1 TFP_{t-1} + \lambda_2 FDI_{t-1} + \lambda_3 OPPN_{t-1} + \lambda_4 INF_{t-1} + \lambda_5 REMIT_{t-1} + \lambda_6 TAXINC_{t-1}$$
$$+\beta_1 \sum_{i=0}^{n} \Delta \ln TFP_{t-i} + \beta_2 \sum_{i=0}^{n} \Delta FDI_{t-i} + \beta_3 \sum_{i=0}^{n} \Delta OPPN_{t-i} + \beta_4 \sum_{i=0}^{n} \Delta INF_{t-i} + \beta_5 \sum_{i=0}^{n} \Delta REMIT_{t-i} + \beta_6 \sum_{i=0}^{n} \Delta TAXINC_{t-i}$$
$$+\beta_7 DROUT + \beta_8 POLINS + \beta_9 T + U_t \quad (1)$$

Where: TFP_t = Total Factor Productivity at time t; FDI_t = Foreign Direct Investment flow at time t; $OPPN_t$ = Sum of real import & export as a percent of real GDP at time t; INF_t = Rate of inflation at time t; $REMIT_t$ = Personal remittance to GDP ratio at time t; $TAXINC_t$ = Tax incentive to total revenue ratio at time t; DROUT = dummy variable for recurrent drought; POLINS = dummy variable for political instability; T = trend and U_t = Random variable at time t.

To calculate TFP growth, this study followed the three-input neoclassical production function (Human capital augmented Solow model) and it is calculated following the *Solow residual approach* specified below:

$$lnY_t = lnA + \alpha lnK_t + \beta lnL_{t+} \delta lnH_t$$

Where, lnY, lnK, lnL and lnH denote, natural logarithm of total output, capital stock, Labor and human capital. To capture lnA (the natural logarithm of TFP), firstly, we estimated the production function, getting the elasticities for each different input and secondly, we used the residual from the estimated production function as being lnTFP (the level of output that was not determined by inputs). Mathematically, we followed the following formula:

$$lnA_t = lnTFP = lnY_t - lnaK_t - \beta lnL_t - \delta lnH_t$$

Model-2: The effect of FDI on export

$$\Delta EXPO_t = \beta_0 + \lambda_1 EXPO_{t-1} + \lambda_2 FDI_{t-1} + \lambda_3 OPPN_{t-1} + \lambda_4 REER_{t-1} + \lambda_5 GDPg_{t-1} + \lambda_6 HELTH_{t-1} + \beta_1 \sum_{i=0}^{n} \Delta EXPO_{t-i} + \beta_2 \sum_{i=0}^{n} \Delta FDI_{t-i} + \beta_3 \sum_{i=0}^{n} \Delta OPPN_{t-i} + \beta_4 \sum_{i=0}^{n} \Delta REER_{t-i} + \beta_5 \sum_{i=0}^{n} \Delta GDPg_{t-i} + \beta_6 \sum_{i=0}^{n} \Delta HELTH_{t-i} + \beta_7 DROUT + \beta_8 T + U_t \quad (2)$$

Where: $EXPO_t$ = Value of Export as a percentage of GDP at time t; FDI_t = Foreign Direct Investment flow at time t; $OPPN_t$ = Sum of real import & export as a percent of real GDP; $REER_t$ = Real Effective Exchange Rate at time t; $GDPg_t$ = Real GDP growth rate at time t; $HELTH_t$ = Health expenditure to GDP ratio at time t; DROUT = dummy variable for recurrent drought; T = trend and U_t = Random variable at time t.

Model-3: The effect of FDI on employment

$$\Delta EMPL_t = \beta_0 + \lambda_1 EMPL_{t-1} + \lambda_2 FDI_{t-1} + \lambda_3 OPPN_{t-1} + \lambda_4 GCF_{PL\,t-1} + \lambda_5 GDPg_{t-1} + \lambda_5 GOV_{t-1} + \beta_1 \sum_{i=1}^{n} \Delta EMPL_{t-i} + \beta_2 \sum_{i=0}^{n} \Delta FDI_{t-i} + \beta_3 \sum_{i=0}^{n} \Delta OPPN_{t-i} + \beta_4 \sum_{i=1}^{n} \Delta GCF_{PL\,t-i} + \beta_5 \sum_{i=0}^{n} \Delta GDPg_{t-i} + \beta_6 \sum_{i=0}^{n} \Delta GOV_{t-i} + \beta_8 T + U_t \quad (3)$$

Where: $EMPL_t$ = Total employment in the industry sector to total population ratio at time t; FDI_t = Foreign Direct Investment flow at time t; OPN_t = Sum of real import & export as a percent of real GDP; $GCF_{PL,t}$ = Gross capital formation at time t; $GDPg_t$ = Real GDP growth rate at time t; GOV_t = Total government expenditure to GDP ratio at time t; T = trend and U_t = Random variable at time t.

After estimating the long run and short run models, normality test, serial correlation test, heteroscedasticity test and Ramsey Reset test of model specification were undertaken to check the robustness of the model. In order to estimate the models and to perform the different diagnostic tests, Eviews-*9* statistical package was used.

5. RESULTS AND DISCUSSION

5.1. Unit Root Test and Optimum lag selection

Before running the short-run and long-run regressions to analyze the effect of foreign direct investment, we examined the integrating properties of the variables. To do this, we applied *Augmented Dickey–Fuller* (ADF) and *Phillips–Perron*(PP) unit root tests. Trend and intercepts are included in the tests. The results of the ADF test reported in Table1 confirmed that some of the variables are subject to unit root problem at level with intercept and trend (EXPO, FDI, HELT, OPPN, TXINC, EMPL, REMIT and GCF_{PL}) while some of the variables were stationary at level (lnTFP, REER, INF, GOV and GDPg). This clearly shows that the integrating order of the variables is a mixture of I (1) and I (0).

In order to determine the appropriate lag order, VAR lag order selection criteria was used. We have followed Schwarz information criterion (SIC) for choosing appropriate lag length due to its superior properties (Pesaran, Shin & Smith, 2001; Liew, et.al. 2008). It has considerable high

performance in selecting the true lag order, even if the sample size is small. The result indicated that lag 2 is suitable for the sample size.

Table 1: Unit Root Analysis

	ADF Unit Root Test			PP Unit Root Test		
Variables	T-statistic	Prob.Values	Decision	T-statistic	Prob.Values	Decision
lnTFP	-4.916320	0.0032**	Stationary	-4.916320	0.0032**	Stationary
EXPO	-2.251435	0.4430	Non-stationary	-2.143029	0.4985	Non-stationary
FDI	-2.283763	0.4268	Non-stationary	-2.283763	0.4268	Non-stationary
HELT	-2.577560	0.2923	Non-stationary	-2.157185	0.4912	Non-stationary
OPPN	-0.684199	0.9634	Non-stationary	0.009544	0.9940	Non-stationary
REER	-10.72133	0.0000*	Stationary	-9.122213	0.0000*	Stationary
INF	-3.882035	0.0285**	Stationary	-3.854991	0.0301**	Stationary
TXINC	-2.107534	0.51700	Non-stationary	-2.180817	0.4790	Non-stationary
GOV	-3.495408	0.0617***	Non-stationary	-3.629622	0.0475**	Stationary
GDPg	-5.942571	0.0003*	Stationary	-5.882988	0.0003*	Stationary
EMPL	-2.440023	0.3518	Non-stationary	-2.104789	0.5184	Non-stationary
REMIT	-2.070894	0.2571	Non-stationary	-2.013409	0.2795	Non-stationary
GCF_{PL}	-0.184191	0.9897	Non-stationary	-0.184191	0.9897	Non-stationary
φlnTFP	-8.216319	0.0000*	Stationary	-19.15417	0.0000*	Stationary
φEXPO	-4.663426	0.0059*	Stationary	-7.176246	0.0000*	Stationary
φFDI	-5.776797	0.0005*	Stationary	-5.826355	0.0004*	Stationary
φHELT	-4.257927	0.0134**	Stationary	-4.212148	0.0147**	Stationary
φOPPN	-5.001128	0.0029*	Stationary	-8.183571	0.0000*	Stationary
φREER	-4.109955	0.0189**	Stationary	-25.63583	0.0000*	Stationary
φINF	-6.681170	0.0001*	Stationary	-10.36438	0.0000*	Stationary
φTXINC	-5.023930	0.0025*	Stationary	-5.371485	0.0012*	Stationary
φGOV	-5.083552	0.0022*	Stationary	-5.117178	0.0021*	Stationary
φGDPg	-6.081641	0.0003*	Stationary	-17.80450	0.0000*	Stationary
φEMPL	- 3.380044	0.0778***	Stationary	- 3.380044	0.0778***	Stationary
φREMIT	-5.834699	0.0004*	Stationary	- 5.834699	0.0004*	Stationary
φGCF_{PL}	-4.396735	0.0099*	Stationary	-4.396735	0.0099*	Stationary

Note: Significance at 1%, 5% and 10% is shown by *, **and ***respectively.

5.2. The effect of FDI on Total Factor Productivity

5.2.1. Cointegration results

After confirming the unit root properties and appropriate lag length of the variables, the bounds test for cointegration was conducted. Table 3 presents the calculated F-statistics and critical values for bound test. As can be seen from the table the calculated Wald F-statistic = 4.911 and is greater than the upper bound critical value of 4.67 provided by Pesaran, Shin and Smith (2001) at the 5% level of significance. Accordingly, we reject the null hypothesis of no long-run relationship. Therefore, the conclusion is that there is cointegration or a long-run relationship between TFP, FDI, and the other control variable included in the model.

Table 3: ARDL Bounds Test

Sample: 1994-2017
Included observations: 24

Test Statistic	Value	K
F-statistic	4.911	5
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.75	3.79
5%	3.12	4.25
2.5%	3.49	4.67
1%	3.93	5.23

Source: Authors computation

According to the endogenous growth theorists, through the transfer of technology and skills, managerial expertise and experience, as well as the introduction of the new processing method across countries, FDI is expected to have a positive effect on TFP growth and consequently to stimulate economic growth. Empirically, the findings of Ndiaye and Xu (2016), Arisoy (2012), and Grossman and Helpman (1995) supported this argument and concluded that FDI has a positive and significant effect on TFP and economic growth.

After confirming the existence of a long-run relationship between the six variables included in the TFP model, we proceed to estimate the long-run equation and the coefficients of the model.

Table 4: Long Run Coefficients: *ARDL (1,2,2,0,2,0)*

Sample: 1993- 2017
Included observations: 24

			Dependent Variable: lnTFP	
Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	0.012445	0.004013	3.101026	0.0146
OPPN	-0.012506	0.001801	-6.944570	0.0001
INF	-0.001744	0.000816	-2.136204	0.0652
REMIT	-0.018464	0.014352	-1.286526	0.2342
TAXINC	0.000174	0.000034	5.148955	0.0009
DROUT	-0.140477	0.023928	-5.870876	0.0004
POLINS	-0.043231	0.017656	-2.448477	0.0400
C	0.232855	0.049072	4.745164	0.0015
@TREND	0.023037	0.003246	7.097853	0.0001

Source: Authors computation

Table 4 presents the results of the estimated long-run coefficients of the estimated TFP model. The results displayed that, except for inflation & remittance, all the variables are significant. The coefficient of Foreign Direct Investment (FDI) is about 0.01245, suggesting that as the ratio of FDI to GDP increases by 1percent, TFP increases by about 1.245 percent per year. This finding is consistent with the argument of Endogenous growth theorists and other empirical findings. The positive impact implies that FDI is a means of transferring foreign technology, introducing new processes and managerial skills and know-how diffusion to the domestic market (Olomola & Osinubi, 2017 and Kolawole, 2015).

5.2.2. Short run dynamics and ECM

The coefficient of ECT which measures the speed of adjustment is about ī 0.78012 and is statistically significant, even at 1%. As expected, its magnitude is less than one and has a negative sign. This implies that about 78% of the disequilibrium in the TFP function for the current year will be corrected in the following year. When we see the sort run coefficients of FDI, contrary to its significant positive long run impact, FDI has a negative and significant short run impact on TFP. The negative effect of FDI suggests that FDI is a rival of domestic investment. FDI is crowding out domestic investment of local business enterprise (Güngör & Ringim, 2017). That means when FDI is funded by the banking system of Ethiopia (the host country), it is competing for funds with domestic investment (Bermejo & Werner, 2018). This accompanied with low financial development in Ethiopia may lead to unfavorable effect of FDI on TFP in the short run. The negative impact may also imply that the business environment is not conducive (due to corruption, government instability, war, and so on) to effectively operate in the short run (Kolawole, 2015).

Table 5: Short run coefficients: ARDL (1,2,2,0,2,0)

Sample: 1993-2017
Included observations: 24

Dependent Variable: φlnTFP				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
φFDI	-0.038724	0.005524	-7.010521	0.0001
φ FDI (-1)	-0.013172	0.003445	-3.823893	0.0051
φ OPPN	0.001954	0.000734	2.660733	0.0288
φOPPN (-1)	0.012061	0.000920	13.114980	0.0000
φINF	-0.001361	0.000657	-2.071911	0.0720
φREMIT	-0.001486	0.009349	-0.158899	0.8777
φREMIT (-1)	0.039801	0.006302	6.315937	0.0002
TAXINC	0.000136	0.000025	5.368292	0.0007
DROUT	-0.109588	0.011566	-9.474737	0.0000
POLINS	-0.033725	0.013897	-2.426714	0.0414
@TREND	0.017972	0.001853	9.698455	0.0000
ECT (-1)	-0.780115	0.069553	-11.216144	0.0000

Source: Authors computation

5.3. The effect of FDI on Export

5.3.1. ARDL Bound test for cointegration

In order to empirically test the existence of long-run relationships and short run dynamic interactions among the variables of interest (EXPO, FDI, OPPN, REEF, GDPg and HELTH), we apply the autoregressive distributed lag (ARDL) bound test for cointegration proposed by Pesaran,Shin and Smith (2001). As can be seen from the test result shown in Table 8, the calculated F-statistic = 7.1433 and is greater than the upper bound critical value of 5.23 provided by Pesaran, Shin and Smith (2001) at the 1% level of significance. Accordingly, we reject the null hypothesis of no long-run relationship between the variables. Hence, it is concluded that there is a long-run relationship between EXPO, FDI and the other control variables included in the estimated model.

Table 8: ARDL Bounds Test

Sample: 1993-2017
Included observations: 25

Test Statistic	Value	K
F-statistic	7.1433	5

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.75	3.79
5%	3.12	4.25
2.5%	3.49	4.67
1%	3.93	5.23

Source: Authors computation

The effect of FDI on export performance of the host country depends not only on the amount of FDI but also on its structure and type (Selimi, Reçi & Sadiku, 2016). Import-substituting FDI generally focuses on the production of goods and services which were previously imported to the host country. These types of firms are not expected to have a significantly direct effect on the export sector. On the other hands, export-promoting FDI is motivated to use the host country as a base to export their products to the rest of the world. This type of FDI is export-increasing in the sense that the host country's exports of raw materials and intermediate products to the rest of the world (Tambunlertchai, 2009).

Table 9 shows the results of the estimated long-run coefficients of the estimated export model. The coefficients of all of the variables included in the model (except foreign direct investment, real GDP growth and Drought) are statistically significant. The coefficient of our variable of interest (Foreign direct investment) shows that FDI has a positive effect on export-to-GDP ratio in the long run, but the coefficient is statistically insignificant.

Table 9: Long Run Coefficients: *ARDL (1,0,0,1,0,1)*

Sample: 1992-2017
Included observations: 25

Dependent Variable: EXPO

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	0.184300	0.174038	1.058964	0.3075
OPPN	0.108916	0.031052	3.507544	0.0035
REER	-0.062765	0.014623	-4.292258	0.0007
GDP_g	0.006676	0.069555	0.095978	0.9249
HELTH	0.593788	0.195801	3.032604	0.0090
DROUT	-0.206951	0.572792	-0.361303	0.7233
C	12.413844	2.386435	5.201836	0.0001
@TREND	-0.340142	0.142792	-2.382074	0.0319

Source: Authors computation

Most of the FDI firms coming to Ethiopia are manufacturing industries. On the other hands, most of the export commodities of Ethiopia are primary products (agricultural products). Therefore, it is not surprising to have insignificant effect of FDI on the export sector of Ethiopia. In addition, the foreign owned firms flooding to Ethiopia may be those largely directed towards import-substitution which focuses on the production of goods for the domestic market while little has gone toward export-oriented industries. Another reason could be due to the fact that the foreign direct

investments into Ethiopia are not creating a higher level of competitive advantage in the international market.

5.3.2. Short run dynamics and ECM

The results of the short-run dynamic coefficients obtained from the ECM are given in Table 10. The equilibrium correction coefficient is estimated to be about -0.9464 and is highly significant, has the correct sign. This implies a high speed of adjustment to equilibrium after a shock. Approximately 94.64% of disequilibrium of the current yearôs shock converges back to the long-run equilibrium in the next year. When we see the sign of the short-run coefficient of FDI, like the long run model FDI has no effect on Export in Ethiopia. This seems logical as firms usually need time until they build capacity to penetrate in to the international market.

Table 10: Short run coefficients: ARDL (1,0,0,1,0,1)

Sample: 1992-2017
Included observations: 25

Dependent Variable: ϕEXPO				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
ϕFDI	0.174429	0.172131	1.013351	0.3281
ϕOPPN	0.103083	0.030798	3.347086	0.0048
ϕREER	-0.044078	0.017289	-2.549490	0.0231
ϕGDP_g	0.006318	0.066087	0.095605	0.9252
ϕHELTH	0.145789	0.222022	0.656641	0.5221
DROUT	-0.195867	0.561041	-0.349114	0.7322
@TREND	-0.321924	0.131294	-2.451941	0.0279
ECT (-1)	-0.946441	0.182407	-5.188622	0.0001

Source: Authors computation

5.4. The effect of FDI on Employment

5.4.1. ARDL Bound test for cointegration

Table 13 portrays the results of the bounds test. The appropriate lag length was selected on the basis of Schwarz Bayesian Criterion (SBC) for the conditional ARDL model. The Table result reveals that the calculated Wald F-statistic (8.565) is much greater than the upper bound critical value (5.23) at the 1% level of significance. Thus, the null hypothesis of no cointegration is rejected, signifying there is a stable long-run equilibrium relationship among EML (employment in the industry sector), FDI and the other four control variables.

Table 13: ARDL Bounds Test

Test Statistic	Value	K
F-statistic	8.5648	5
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.75	3.79
5%	3.12	4.25
2.5%	3.49	4.67
1%	3.93	5.23

Source: Authors computation

Once the presence of co-integration among the variables was confirmed, the long-run coefficients of the selected ARDL (2, 1, 1, 0, 1, 1,) model was estimated and its results are presented in Table 14. The results show that the estimated coefficient of FDI is positive and significant at 1% level of significance. It shows that in the long run, a 1% increase in the ratio of FDI to GDP ratio leads to approximately 0.28% increase in the ratio of manufacturing employment to total employment all things being equal. This empirical evidence confirms that the FDI has a positive impact on employment in the manufacturing sector of Ethiopia. That means the foreign owned firms are investing in labor intensive production activities.

Table 14: Long Run Coefficients: *ARDL (2,1,1,0,1,1)*

Sample: 1992- 2017

Included observations: 24

			Dependent Variable: EMPL	
Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	0.282026	0.036736	7.677209	0.0000
OPPN	0.075064	0.016808	4.465911	0.0010
GCF_{PL}	0.000670	0.000148	4.533821	0.0009
GDP_g	0.050363	0.010486	4.802798	0.0006
GOV	0.167356	0.033698	4.966320	0.0004
C	-4.492181	1.180211	-3.806251	0.0029
@TREND	0.087747	0.040108	2.187767	0.0512

Source: Authors computation

5.4.2. Short run dynamics and ECM

The results of short-run dynamic coefficients associated with the long-run relationships obtained from the conditional ARDL model are presented in Table 15. The reported result indicates that the estimated error correction coefficient is negative and significant at 1% level of significance showing that the adjustment process from the short-run deviation is medium. More specifically, it indicates that 53.40 % of the disequilibrium in employment from the previous periodôs shock converges back to the long-run equilibrium in the current period. The estimated coefficient of FDI is positive and significant at 1% level of significance. This shows that there is a statistically significant short-run positive impact of FDI on manufacturing employment in Ethiopia.

Table 15: Short run coefficients: ARDL (2,1,1,0,1,1)

Sample: 1992-2017

Included observations: 24

		Dependent Variable: ϕEMPL		
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
ϕEMPL	-0.445674	0.182609	-2.440586	0.0328
ϕFDI	0.078676	0.015398	5.109564	0.0003
ϕOPPN	0.030103	0.008860	3.397834	0.0060
ϕ GCF_{PL}	0.000358	0.000048	7.443976	0.0000
ϕGDP_g	-0.002596	0.004202	-0.617678	0.5494
ϕGOV	0.035493	0.006778	5.236569	0.0003
@TREND	0.046854	0.026377	1.776309	0.1033
ECT (-1)	-0.533962	0.065202	-8.189380	0.0000

Source: Authors computation

6. DIAGNOSTIC AND STABILITY TESTS

The soundness of the results is dependent on the fit and stability of the model. Therefore, Annex Table A-C summarizes the results of the various diagnostic and stability tests of the TFP, export and employment model. Based on the Breusch-Godfrey serial correlation LM Test, there is no serial correlation in the model. AS proved by the Jarqueï Bera normality test, the residuals are normally distributed in the model. The model also appears not be heteroscedastic as it passes the Breusch-Pagan-Godfrey heteroskedasticity tests. The Ramsey RESET test results also confirm that the models are correctly specified and stable.

7. SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

The objective of this research was to empirically investigate the long run and short run effect of FDI on TFP, export and employment creation. To address the objective of this study an Autoregressive Distributed Lag approach was applied. The result of the study clearly shows that, in the long run, Foreign Direct Investment (FDI) has a positive and significant effect on TFP and employment. The estimated long run coefficients predict that as the ratio of FDI to GDP increases by 1%, TFP will increase by about 1.245 % per year while the ratio of manufacturing employment to total employment will increase by approximately 0.28%. This finding is consistent with the argument of Endogenous growth theorists and other empirical findings. The short run effect of FDI on employment is consistent with its long run effect, but contrary to its significant positive long run impact, FDI has a negative and significant short run impact on TFP. The negative effect of FDI suggests that FDI is a rival of domestic investment. On the other hands, the result shows that FDI do not have any significant effect on the export sector both in the long run and in the short run. This could be due to the foreign owned firms flooding to Ethiopia are those largely directed towards import-substitution which focus on the production of goods for the domestic market while little has gone toward export-oriented industries.

To sum up, our findings clearly shows that Ethiopia will benefit from increased inflows of FDI, at least in terms of productivity and employment creation. Therefore, it is important to implement policies that encourage such inflows. Government bodies such as Ethiopian investment commission should focus on improving the overall business climate as a way to encourage foreign firms to locate in Ethiopia. The government has to focus on basic policy measures that help to attract and retain FDI: ensuring economic and political stability, keeping laws and order, providing different incentives, developing infrastructures and minimizing corruption and unnecessary bureaucracies. Ethiopia is relatively doing better when it comes to infrastructure development and fiscal incentives but substantially worse when it comes to political and macroeconomic stability and keeping laws and order. Above and beyond, improvement in the law & order situation, settling political instability, & reduction in corruption will improve Ethiopiaôs image in the world which results in increment in FDI inflow. Further, the government needs to revise its priorities while making policies in favor of FDI. In these regards, the flows of FDI need to be directed towards the sectors in which Ethiopia has a comparative advantage so that it can contribute to export growth.

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ANNEX

A. Diagnostic and stability test (TFP model)

Table 1. Diagnostic test

F-statistics and P-values	Types of Tests			
	χ^2SC	χ^2H	χ^2N	Ramsey Test
Calculated F-statistics	1.1255	0.7919	1.2196	1.9145
P-values	0.3845	0.6686	0.5435	0.2275

Note: $\chi^2SC = Breusch - Godfrey\ Serial\ Correlation\ LM\ Test$, χ^2H = Breusch-Pagan-Godfrey test for heteroscedasticity, χ^2N = Jarque-Bera normality Test. Ramsey Reset test was performed based on the squared fitted values.

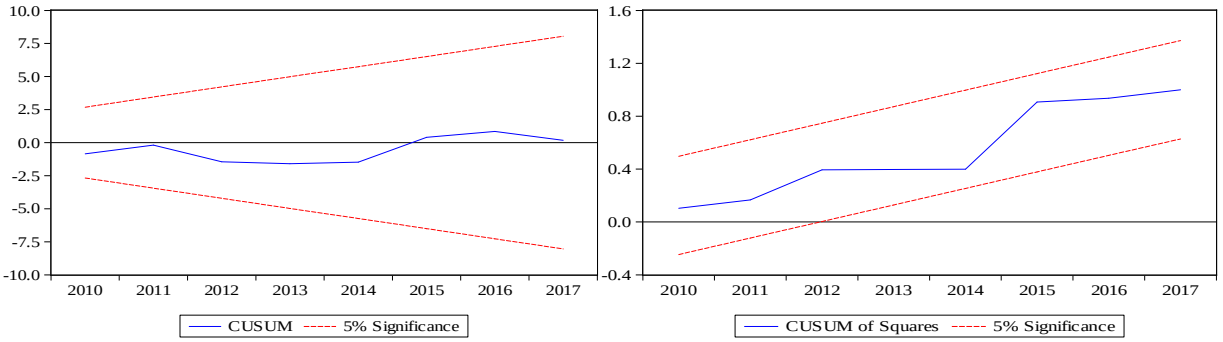

Fig-1: stability test (TFP model)

B. Diagnostic and stability test (Export model)

Table 2**:** Diagnostic test

F-statistics and P-values	Types of Tests			
	χ^2SC	χ^2H	χ^2N	Ramsey Test
Calculated F-statistics	1.3092	1.2209	1.0791	0.22864
P-values	0.3060	0.3563	0.9421	0.7990

Note: $\chi^2SC = Breusch - Godfrey\ Serial\ Correlation\ LM\ Test$, χ^2H=Breusch-Pagan-Godfrey test for heteroscedasticity, χ^2N = Jarque-Bera normality Test. Ramsey Reset test was performed based on the squared fitted values.

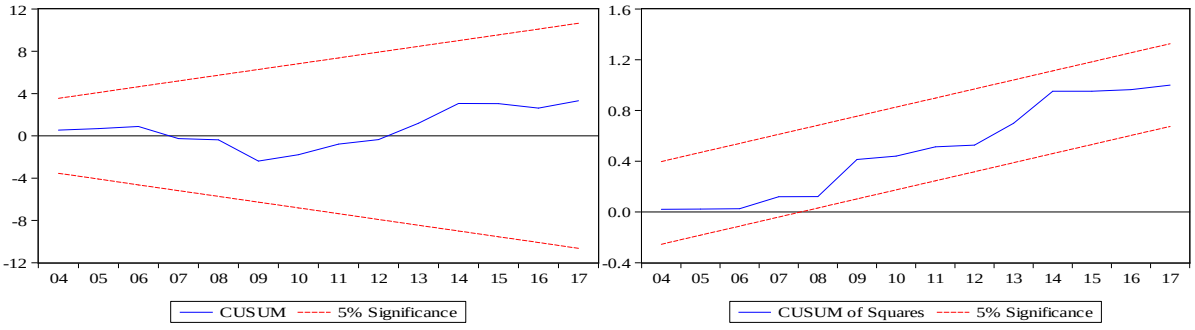

Fig-2: stability test (Export model)

C. Diagnostic and stability test (Employment model)

Table 3**:** Diagnostic test

F-statistics and P-values	Types of Tests			
	χ^2SC	χ^2H	χ^2N	Ramsey Reset Test
Calculated F-statistics	2.7576	2.04514	0.8047	0.0033
P-values	0.1164	0.1231	0.6687	0.9967

Note:χ^2SC = Breusch – Godfrey Serial Correlation LM Test ,χ^2H=Breusch-Pagan-Godfrey test for heteroscedasticity, χ^2N = Jarque-Bera normality Test. Ramsey Reset test was performed based on the squared fitted values.

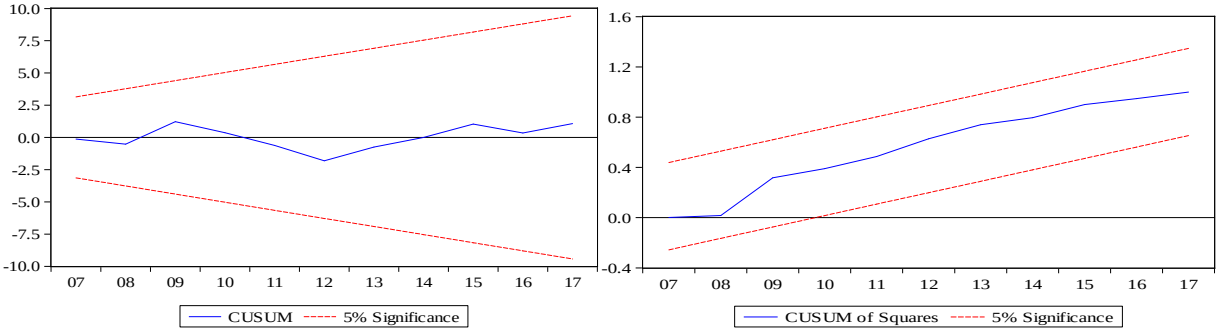

Fig-3: stability test (Employment model)