

Can internally generated FDI impact export performance? The study on Indonesia in the years 1980-2018

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ABSTRACT

Objective: As part of a developing country, Indonesia is concerned with issues related to investment inflows and trade liberalization. The objective this study is to examine whether or not inward foreign direct investment (FDI) influence to export performance in Indonesia over the time period 1980-2018.

Research Design & Methods: We apply Augmented Dickey-Fuller and Phillip-Perron unit root test to check the stationarity. The autoregressive distributed lag (ARDL)-bound test is applied to check co-integration existence.

Findings: Results present that the variables are stationary at first differences $I(1)$. The ARDL bound testing co-integration approach confirms that there is long-run relationship between considered variables. The findings also indicate the significant positive impacts of FDI on exports in long run and in the short run. The result of the Granger causality test confirms that there is a unidirectional causal relationship existing between the variables where export has a Granger cause to FDI. Results of stability test suggest that there is structural stability in the residuals of the equation of exports.

Contribution & Value Added: FDI does not work uniformly in all sectors, and policymakers should understand the difference and identify their sector-wise policies relating with FDI. The law and order should also be maintained, which is the essential part to attract foreign investors. At this stage, we can also set the direction of future research, that is, the sector-wise study should be done on the relationship between FDI and exports.

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INTRODUCTION

The impact of globalization on increasing foreign direct investment and international trade flows have occurred significantly over the past decade. The value of FDI inward stock has increased from USD 2,081.29 billion in 1990 to USD 24,983.21 billion in 2015 (UNCTAD, 2016). This increase continues, in 2017 the value of inward stock FDI was USD 32,624 billion and in October 2018 the value was USD 32,272 billion (UNCTAD, 2019). Along with this, more than 45 percent of the global FDI flows targeted developing countries and transition economies over 2005-2015 (UNCTAD, 2016). Likewise in the world exports of merchandise trade have increased by 20 percent in value terms since 2008. The value of world merchandise exports was USD 19.48 trillion in 2018, up from USD 17.33 trillion in 2017, partly due to higher oil prices. The value of world commercial services exports grew by 8 percent in 2018, reaching USD 5.77 trillion, up from USD 5.36 trillion in 2017 (WTO, 2019).

Foreign direct investment (FDI) is considered as a major source to promote economic growth, which enhances technology, trade expansion, employment opportunities and incorporation of global market. The importance of foreign direct investment on export for developing countries is an extensively highly research subject in academics. The increased FDI inflows may however influence exports differently across host developing countries, depending on the relative strength of the country-specific factors (Sgard, 2001; Smarzynska, 2003). Some researches argued that the FDI foster exports of host countries by the transfer of technology, facilitating access to wider foreign markets, accumulating domestic capital for exports, providing training for the local work force and upgrading management and technical skills. (Blake & Pain, 1994; Cabral, 1995; Chaisrisawatsuk & Chaisrisawatsuk, 2007; Clausing, 2000; Lall, 2000; Lipsey & Weiss, 1981; Prasanna, 2010; Zhang & Felmingham, 2001). On the other hand, sometimes it is suggested that FDI may transfer technology that is incorporate or low level for the host country's factor proportions, decrease or replace domestic investment and savings, target the host country's domestic market and result not increase exports and the expansion of domestic firms that might become exporters (Barrios *et al.*, 2003; Fukunishi, 2010; Jeon, 1992; Ruane & Julie, 2004; Svensson, 1996).

For developing countries as host country, FDI helps them to improve its export performance. FDI makes a positive impact on the host country's export competitiveness by increasing the efficiency degree and product quality standards. Furthermore, FDI provides the host country with better access to foreign markets. Also, where the foreign investment has been made with the specific intention of sourcing parts/components (or even final products) from the host country to take advantage of low-cost conditions (e.g., low wages), FDI contributes to exports directly (Sethi & Sucharita, 2013).

As a part of developing country, Indonesia was concerned with issues pertaining to foreign investment inflow and trade liberalization. FDI inflow to Indonesia is expected to be able to increase productivity which will ultimately have an impact on the increase in national income in the form of the Gross Domestic Product (GDP) as well as in the form of increased exports. In other words, in order to improve his performance in international trade, investment is absolutely necessary. In addition, it is also necessary to build industrial development and infrastructure construction to boost the competitiveness of national production.

Indonesia has been successful in attracting a significant amount of FDI. In 2018, FDI investment in Indonesia reached USD 21 billion, an increase from 2017 (+6.8%) (UNCTAD,

2019), and based on the data from the Investment Coordinating Board (BKPM), FDI levels grew to USD 13 billion in the second quarter of 2019, mainly in electricity, gas and water, transportation and telecommunication.

FDI plays an essential role that boost the export performance of developing economies (Blake & Pain, 1994; Davaakhuu *et al.*, 2014; Jiang *et al.*, 2013; Ozawa, 1992; Pain & Wakelin, 1998; Shahbaz & Rahman, 2012; Sun & Parikh, 2001). The Greenfield FDI, in particular, can complement local investment and can thus add to the production capacity of the host country.

According to Central Bureau Statistic of Indonesia (2018), Indonesia's total exported goods represent 5.2% of its overall Gross Domestic Product for 2018 (USD 3.495 trillion valued in Purchasing Power Parity). That 5.2% for exports to overall GDP in PPP for 2018 compares to 6.7% for 2014, seeming to indicate a relatively decreasing reliance on products sold on international markets for Indonesia's total economic performance.

Indonesia has generous natural resources, including crude oil, natural gas, tin, copper, and gold. Its key imports include machinery and equipment, chemicals, fuels, and foodstuffs. Major exports include oil and gas, electrical appliances, plywood, rubber, and textiles.

Indonesia shipped USD 180.2 billion worth of goods around the globe in 2018. That dollar amount reflects a 2.4% gain since 2014 and a 6.8% uptick from 2017 to 2018. From a continental perspective, almost three-quarters (72%) of Indonesian exports by value were delivered to fellow Asian countries. Another 11.3% were sold to North American importers closely trailed by European customers at 10.6%. Smaller percentages were shipped to Africa (2.6%), Australia and other Oceania importers (2%), and Latin America (1.5%) excluding Mexico but including the Caribbean.

Based on the aforementioned explain, the aim of this article is to examine whether or not FDI has made any significant contribution to Indonesia's export performance. Indonesia is the fourth largest country in the world and the first largest in South-East Asia in terms of population. Therefore, it is an ideal economy for multinational firms to start their operations in order to supply their products to an economy with such a teeming population. Indonesia has made significant progress in macroeconomic performance with the help of inward FDI. The question is whether FDI is correlated with aggregate exports in Indonesia. This study examines this by using time series annual data of Indonesia over the period from 1980 to 2018 and by applying more rigorous econometric techniques such as Augmented Dickey-Fuller and Phillip-Perron unit root test to check the stationarity and the autoregressive distributed lag (ARDL)-bound test to check co-integration existence. This research will provide some policy implications related to FDI-export relationship for developing economies like Indonesia. The remaining part of this article is organized into five sections including introduction. The second section presents the review of the literature. The third section discusses the methodology: data sources, econometric tools and empirical model of the study. The fourth section presents the empirical analysis and results. The fifth section presents the summary, conclusion and policy implication of the study.

LITERATURE REVIEW

Numerous studies have contributed on the FDI-export interrelationship. Helpman (1984) found that there is a significant impact of foreign direct investment on the export of host countries. His summarize that FDI increases or decreases the export from the host country

when it has vertical investment, that means the foreign firms invest abroad to produce intermediate input that will be used in final production in their home country. Dunning (1970) stated the relationship between FDI by international trade is complementary to each other. This view is also supported by other researchers such as Kojima (1973); Lipsey, Blomstrom and Kulchysky (1988); Pain and Wakelin (1998).

The positive impact of FDI on exports has been observed in several developed countries (Dritsaki *et al.*, 2004; Lipsey *et al.*, 1988; Pfaffermayer, 1994, 1996; Yamawaki, 1991). Among developing countries, Graham (2004) noted that in 1978, China enacted the Law on Chinese-Foreign Joint Ventures with the twin objective of massive technology up-gradation as well as export promotion. In line that Zhang (2005) observed that the export-augmenting effect of FDI in China has been stronger in the case of labor-intensive industries. A similar conclusion has been drawn by several other studies as well (Gu *et al.*, 2008; Liu *et al.*, 2002; Zhang & Song, 2000).

The interrelationship between FDI and export has been observed in other countries as well. FDI flows in Turkey has positively affected its exports (Alici & Ucal, 2003; Vural & Zortuk, 2011). Johnson (2006) has shown that the export-platform FDI has played a significant role in the East Asian economies. Several studies have observed the presence of a similar relationship in various ASEAN countries (Mithani *et al.*, 2008; Tambunlertchai, 2009). Bhatt (2010) noted that FDI inflow in New Zealand in the previous year positively influences exports of the current year. Athukorala (2002) has reported that in Vietnam FDI inflows increasingly targeted export-oriented projects since the late nineties. Xuan and Xing (2008) found that a 1 percent increase in FDI can be expected to give rise to a 0.13 percent increase in exports. De Mello Jr and Fukasaku (2000) revealed in their study the impact of FDI on trade in Southeast Asia and Latin America have a positive impact of FDI on trade is stronger in trade-oriented economies.

Research on other continents also notes a positive interrelationship FDI on exports. The evidence on the positive influence of FDI on export is also been noted in other continents. Using data in 12 Central and Eastern European (CEE) economies, Kutan and Vukšić (2007) found that FDI has contributed significantly to their domestic supply capacity, which in turn has enhanced their export volume. Njong (2008) has a similar conclusion on the spillover effect of FDI in Cameroon. Olayiwola and Okodua (2013) found that FDI positively influences the non-oil exports in Nigeria.

Some of the literature has argued that factors other than FDI (e.g. GDP, resources, human capital) might play a greater role in the determination of export flows in the long run. As a result, the relationship between FDI and exports can be weak. Considering the interrelationship between the two series in several developing countries spread across Asia (India, Malaysia, Pakistan, and Thailand) and Latin America (Chile and Mexico), Miankhel, Thangavelu, and Kalijaran (2009) noted that the interrelationship and causality pattern differ in South and East Asia from the one prevailing in Latin America. In particular, in Latin America long run exports rather affect FDI inflows. The analysis acknowledged the role played by external economies of scale, facilitated by clustering of firms (i.e., SEZ). The analysis by Falk and Hake (2008) on EU countries also revealed that exports influence FDI but the reverse is not true. In a different note, Ancharaz (2003) has noted that while FDI may promote export, the same bear limited influences on export competitiveness.

In other hands, the other of the literature reports that the FDI-export relationship may not necessarily be positive (Jeon, 1992). Svensson (1996) found that the foreign production of Swedish firms generally bears a negative relationship with the home country's exports. The lack of export spillover from MNC operation in Spain and Ireland have also been reported (Barrios *et al*, 2003; Ruane & Sutherland, 2004). A weak FDI-export relationship in Kenya has been reported by Fukunishi (2010), which argues that internal constraints (e.g. credit constraint) prohibit local entities from reaching the efficient scale for exporting abroad. The analysis of Türkan (2006) on US data reveals a marginally negative relationship between FDI flows and trade in final products. Negative relationship between FDI and exports has been detected in India as well (Chakraborty *et al.*, 2016; Mohanty & Sethi, 2019).

By using firm-level data in the Mexico Ramirez (2000); Griffiths and Sapsford (2004) showed the rapid growth of both FDI and trade, the effects of FDI on exports and imports have not been extensively explored.

The interrelationship between FDI and export in Indonesia reveals a mixed picture. A number of empirical studies have noted a positive relationship between FDI on Export (Antoni, 2008; Mahadika *et al.*, 2017; Rahmaddi& Ichihashi, 2013). Some studies also reported causality from export to FDI inflows, but not in the reverse direction (Albahi, 2016).

DATA AND METHODOLOGY

Data

In this study, annual time series data of Indonesia have been used from 1980 to 2018. Data of exports, FDI, exchange rate, gross domestic product (GDP), and gross fixed capital formation are gathered from World Bank (2019), IMF (2019) and Central Bank of Indonesia (2019). We have chosen this time period since the database for the variables taken into account is available. In empirical estimations, all the variables were used in logarithmic form.

Table 1. Description of variables

Variables	Symbol	Measurement	Source
Dependent Variable Export	LEXI	Export Goods and Services (current USD)	World Bank
Independent Variables Foreign Direct Investment	LFDI	FDI Inward Stock (current USD)	IMF
Exchange Rate	LRER	Annual Average (USD to IDR)	Central Bank Indonesia
Physical Capital	LGFCF	Gross Fix Capital Formation (current USD)	World Bank
Gross Domestic Product	LGDP	Gross Domestic Product (current USD)	World Bank

Source: own study.

Methodology: Unit Root Test

In this study, annual time series data of Indonesia have been used from 1980 to 2018. Data of exports, FDI, exchange rate, gross domestic product (GDP), and gross fixed capital formation are gathered from World Bank (2019), IMF (2019) and Central Bank of Indonesia (2019). We have chosen this time period since the database for the variables

taken into account is available. In empirical estimations, all the variables were used in logarithmic form.

$$\Delta y = \delta y_{t-1} + \sum_{i=1}^p \beta_1 \Delta y_{t-1} + \mu_t \quad (1)$$

$$\Delta y_t = \alpha_0 + \delta y_{t-1} + \sum_{i=1}^p \beta_1 \Delta y_{t-1} + \mu_t \quad (2)$$

$$\Delta y_t = \alpha_0 + \delta y_{t-1} + \alpha_2 t + \sum_{i=1}^p \beta_1 \Delta y_{t-1} + \mu_t \quad (3)$$

The MacKinnon (1991) tabulated appropriate critical values for each of the three models. If the ADF statistic value is greater than the critical value in absolute terms then the null hypothesis of a unit root will be rejected and it is concluded that y_t is a stationary process.

Philip and Perron (1988) developed a generalization of the ADF test procedure that allows for fairly mild assumptions concerning the distribution of errors. The test regression for the PP test is the AR(1) process which is expressed as follows;

$$\Delta y_{t-1} = \alpha_0 + \delta y_{t-1} + \varepsilon_t \quad (4)$$

The PP test corrects for the t-statistic of the coefficient δ from the AR(1) regression to account for the serial correlation in ε_t . Therefore, the Phillips-Perron (PP) test is a modification of the ADF test where it takes into account the less restrictive nature of the error process. The MacKinnon (1991) critical values are applicable for the PP test. The PP test is robust to general forms of heteroskedasticity in the error term and it can be used without specifying a lag length for the regression.

Cointegration Test

Next, the cointegration test based on bounds testing procedure is used to test empirically the long-run relationship between the variables of interest. This test is fairly simple to use as compared with other cointegration methods because it allows the cointegration relationship to be estimated by OLS after determining the lag order in the model. The ARDL cointegration approach has numerous advantages in comparison with other cointegration methods such as Engle and Granger (1987), Johansen (1988), and Johansen and Juselius (1990) procedures. Besides, ARDL bounds testing approach is considered to be more robust and appropriate when dealing with small sample data. The ARDL (p,q) model can be expressed as follows:

$$\Delta y_t = \alpha_0 + \alpha_1 y_{t-1} + \beta_1 x_{t-1} + \sum_{i=1}^p \delta \Delta y_{t-i} + \sum_{i=1}^q \theta \Delta x_{t-j} + \varepsilon_t \quad (5)$$

Alternatively, the equation (5) can be specified as (6):

$$\begin{aligned} \Delta LEXP_t = & \beta_0 + \beta_1 \sum_{i=1}^p \Delta LEXP_{t-1} + \beta_2 \sum_{i=1}^p \Delta LFDI_{t-1} + \beta_3 \sum_{i=1}^p \Delta LRER_{t-1} + \\ & \beta_4 \sum_{i=1}^p \Delta LGFCF_{t-1} + \beta_5 \sum_{i=1}^p \Delta LGDP_{t-1} + \gamma_1 LEXP_{t-1} + \gamma_2 LFDI_{t-1} + \\ & \gamma_3 LRER_{t-1} + \gamma_4 LGFCF_{t-1} + \gamma_5 LGDP_{t-1} + \mu_t \end{aligned} \quad (6)$$

where β_0 is constant and μ_t is a white noise error term, the error correction dynamics is denoted by summation sign, while the second part of the equation corresponds to the long-run relationship. The null hypothesis of the cointegration is ($H_0 = \gamma_1 = \gamma_2 = \gamma_3 = \gamma_4 = \gamma_5 = 0$). The null hypothesis of no cointegration is rejected, if the calculated F-test statistics exceeds the upper critical bound value. If the long-run relationship between FDI and export performance is found, then we estimate the long-run coefficients. The following model is used to estimate the long-run coefficients:

$$\Delta LEXP_t = \tau_0 + \tau_1 \sum_{i=1}^p LEXP_{t-1} + \tau_2 \sum_{i=1}^p LFDI_{t-1} + \tau_3 \sum_{i=1}^p LRER_{t-1} + \tau_4 \sum_{i=1}^p LGFCF_{t-1} + \tau_5 \sum_{i=1}^p LGDP_{t-1} + \mu_t \quad (7)$$

We can estimate the short-run coefficients by employing the following model:

$$\Delta LEXP_t = \varphi_0 + \varphi_1 \sum_{i=1}^p \Delta LEXP_{t-1} + \varphi_2 \sum_{i=1}^p \Delta LFDI_{t-1} + \varphi_3 \sum_{i=1}^p \Delta LRER_{t-1} + \varphi_4 \sum_{i=1}^p \Delta LGFCF_{t-1} + \varphi_5 \sum_{i=1}^p \Delta LGDP_{t-1} + nECM + \mu_t \quad (8)$$

The error correction model (ECM) shows the speed of adjustment needed to restore the long-run equilibrium following a short-run shock. The n is the coefficient of error correction term in the model that indicates the speed of adjustment.

Causality Analysis

The direction of causality between dependent variable and independent variables is analyzed by Granger (1969) causality test. We determine the causality analysis of our export performance model selected lag. Jones (1989) favors the ad hoc selection method for lag length in Granger causality test over some of other statistical methods to determine optimal lag. The equation of Granger causality model is given as follows:

$$Y = \sum_{i=1}^t \alpha_i X_{t-1} + \sum_{i=1}^t \beta_i Y_{t-1} + \varepsilon \quad (9)$$

$$Y = \sum_{i=1}^t \lambda_i X_{t-1} + \sum_{i=1}^t \delta_i Y_{t-1} + \varepsilon \quad (10)$$

It is assumed that ε and ε are uncorrelated.

RESULT ANALYSIS

Unit Root Test Results

This study uses the ADF and Phillips-Peron tests to check the stationary existences of the time-series variables. The result of unit root test is presented in Table 2.

Table 2. The list of estimated models

Variable	ADF Test				PP Test			
	Constant		Constant and Trend		Constant		Constant and Trend	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
LEXP	-0.150017 (0.9363)	-2.478086 (0.3365)	-5.255704 (0.0001)***	-5.204617 (0.0008)***	-0.195927 (0.9304)	2.600761 (0.2822)	-5.255704 (0.0001)***	-5.214394 (0.0007)***
LFDI	-0.884854 (0.7819)	-2.907224 (0.1719)	-3.668113 (0.0089)***	-3.608816 (0.0427)**	-0.278497 (0.9188)	-2.059198 (0.5511)	-3.368192 (0.0187)**	-3.288548 (0.0839)*
LRER	-3.521424 (0.0127)**	-5.648969 (0.0002)***	-10.20120 (0.0000)***	-10.09008 (0.0000)***	-3.367968 (0.0186)**	-5.644041 (0.0002)***	-22.31684 (0.0001)***	-26.87558 (0.0000)***
LGFCF	-0.165347 (0.9344)	-2.107865 (0.5246)	-4.759225 (0.0004)***	-4.738476 (0.0027)***	-0.298742 (0.9158)	-1.818109 (0.6761)	-4.767206 (0.0004)***	-4.745275 (0.0026)***
LGDP	-0.263212 (0.9211)	-2.118378 (0.5194)	-6.28670 (0.0000)***	-6.290653 (0.0000)***	-0.241992 (0.9241)	-2.135100 (0.5105)	-6.292862 (0.0000)***	-6.29204 (0.0000)**

Significant codes: ***significant at level 0.001, ** significant at level 0.05, * significant level at 0.1

Source: own calculations in Eviews 10.

Table 2 shows the unit root test results. The unit root tests reported are for both level and first differenced series of LEXP, LFDI, LGFCF and LGDP for hypothesis of non-stationarity, but for exchange rate, is stationary at level I(0). At levels when LEXP, LFDI, LGFCF and LGDP

variables are used at first difference, it becomes stationary at $I(1)$. Consequently, as time-series data are stationary at first difference, the series follow stochastic trends and therefore can be co-integrated as well. Therefore, it can be concluded that the variables are integrated of order one $I(1)$, indicating a possible long-run co-integrating relation among them.

Lag Length Selection

ARDL method for co-integration is used to estimate the long-run relationship between FDI and export performance. The first step is to determine the optimal lag length of the model. ARDL method for co-integration is used to estimate the long-run relationship between FDI and export performance. The first step is to determine the optimal lag length of the model. Figure 1. shows the result of the optimal lag length of the model using Akaike Criterion (AIC). The optimal lag length selected are 1,3,2,0,2. These results are obtained by looking at the Akaike Information Criterion (AIC) criteria which show the lag length that produces the best model.

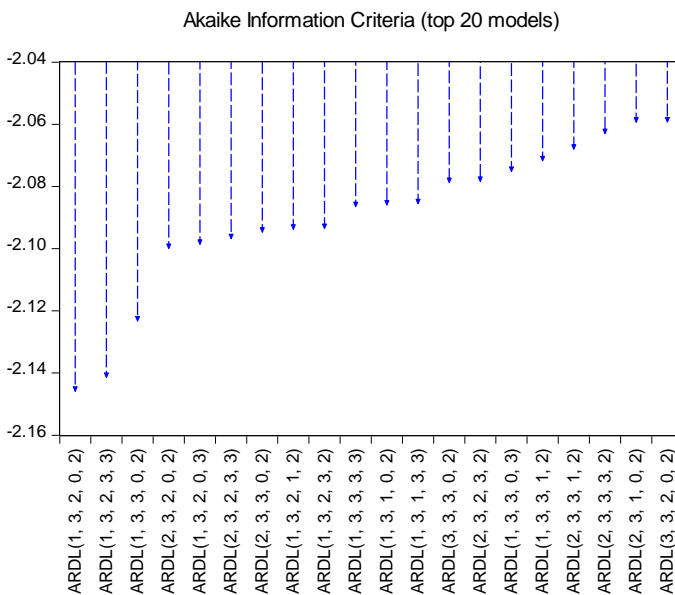


Figure 1. Lag Length Selection

Source: own study from Eviews 10.

Cointegration Test

The next stage is cointegration testing on the model. Pesaran and Shin (1999) suggest that the cointegration test aims to determine whether the variables are not stationary cointegrated or not. The cointegration test used in this study uses the Bound Test approach. In this approach, cointegration can be seen from the F-statistic value with the critical value that has been compiled by Pesaran and Pesaran (1997). There are two asymptotic critical boundary values to test cointegration when the independent variable is integrated at $I(d)$ where $(0 \leq d \leq 1)$. The lowest value (lower bound) assumes an integrated regressor at $I(0)$ while the highest value (upper bound) assumes an integrated regressor at $I(1)$.

If the F-statistic value is below the lower bound value, it can be concluded that cointegration does not exist. If the F-statistic value is above the upper bound value, it can be concluded that cointegration exists. However, if the F-statistic is between the lower bound and upper bound values, then the result is inconclusive. Cointegration test results using the bound test approach can be seen in Table 3. Below.

Table 3. Bound Test for Cointegration

Test Statistic	Value	K
F Statistic	3.953558	4
Significance	Critical Value Bonds	
	I(0) Bound	I(1) Bound
10%	2.45	3.05
5%	2.86	3.28
2.5%	3.25	3.41
1%	3.74	3.92

Source: own computation in Eviews 10.

Cointegration test results based on the bound test approach in Table 4 above shows the F-statistic value of 3.953558. This F statistic value is greater than the highest value (upper bound) at 99% confidence interval, which means there is cointegration of the variables in the model being tested so that there is a short-term to long-term balance in these variables. If the F-statistic value is greater than the highest value (upper bound), then there is cointegration of the variables in the model being tested, which means there is a short-term to long-term balance in these variables.

ARDL Model Estimation Results

After having the valid evidence of long-run relationship between FDI and export performance, we applied the ARDL method to estimate the long-run and short-run coefficients. Table 4. shows the results long-run estimations. The estimated coefficients of the long-run relationship are significant for all variables. We can see that in the long-run term equation LFDI has involved a new boost in LEXP, meaning this variable has a positive significant impact on export at 5% and 10%. With the coefficient 0.17, a 1% increase in FDI will cause export to increase by 0.17 in the long run. Likewise for GDP, coefficient 0.99 means a 1% increase GDP will cause export to increase by 0.99 in the long run. In addition, the coefficient of exchange rate and capital (GFCF) implies that a 1% decrease in exchange rate and capital will raise the export to 0.06 and 0.78 in the long-run. The following model is used to check the short-run relationship among the considered variables with the different lag length:

The results of the short-run dynamic coefficients associated with the long-run relationship obtained from equation (11) are given in Table 5. In the short-run, FDI, exchange rate, capital and GDP are significant at the 5% and 10% level and has an important impact of export. The error correction coefficient is negative (-0.30), as required, and is significant at 1% confidence level, so indicates that any deviation from the long-run equilibrium between variables is corrected about 30% for each year. Finally, the diagnostics tests do not shown any problem.

Table 4. Estimation of long run Coefficient

Variables	Coefficient	Std.Error	t-Statistic	Prob
C	13.37401	4.212988	3.174471	0.0042***
LEXP(-1)	-0.301801	0.134549	-2.243061	0.0348**
LFDI (-1)	0.175898	0.054785	3.210707	0.0039***
LRER(-1)	-0.060006	0.026961	-2.225640	0.0361**
LGFCF	-0.783295	0.265850	-2.946382	0.0072***
LGDP(-1)	0.9888875	0.428242	2.309150	0.0303**

Significant codes: *** significant at level 0.01. ** significant at level 0.05, * significant level at 0.1

Source: own calculation in Eviews 10.

Table 5 Estimation of short run Coefficient

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	13.37401	2.769992	4.828177	0.0001***
D(LFDI)	0.140944	0.056262	2.505147	0.0198**
D(LFDI(-1))	0.121305	0.051090	2.374349	0.0263**
D(LFDI(-2))	-0.150513	0.047565	-3.164363	0.0043***
D(LRER)	-0.042553	0.013018	-3.268773	0.0034***
D(LRER(-1))	-0.024784	0.012622	-1.963571	0.0618*
D(LGDP)	1.192632	0.186657	6.389435	0.0000***
D(LGDP(-1))	0.355306	0.069719	5.096232	0.0000***
ECM(-1)*	-0.301801	0.062650	-4.817226	0.0001***

Significant codes: *** significant at level 0.01. ** significant at level 0.05, * significant level at 0.1

Source: own calculation in Eviews 10.

Diagnostic Test and Stability Test

Various diagnostic tests were conducted to confirm the efficiency of the model, as shown in Table 6. The results show that the model is free from serial correlation, functional form, heteroskedasticity problems and is normally distributed (All p_values are greater than critical values of 0.05).

Table 6 Estimation of short run Coefficient

Statistic		Prob Value
Serial Correlation Test (LM Test)	F_Statistic: 0.639589	0.5984
Normality Test	JarqueBera: 1.469180	0.479702
Heteroskedasticity(Breuch-Pagan-Godfrey)	F Statistic: 0.444003	0.9271

Source: own calculation in Eviews 10.

In addition, based on cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUM of squares). The cumulative sum of recursive residuals (CUSUM) and the CUSUM of square (CUSUMQ) test are applied to assess parameter stability (Pesaran&Pesaran, 1997). Figures 3 and 4 plot the results for both tests. The results indicate the absence of any instability of the coefficients because the plot of CUSUM and CUSUMQ statistic fall inside the critical bands of the 5% confidence interval of parameter stability.

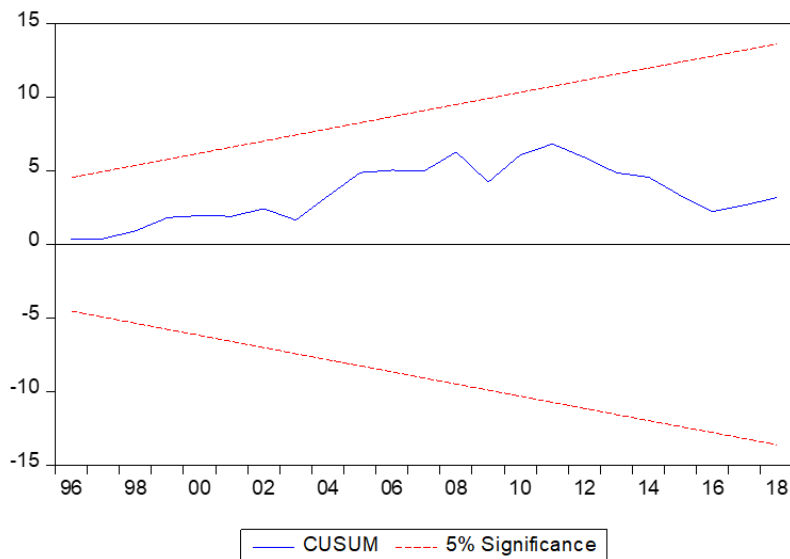


Figure 2. CUSUM Test
Source: own study from Eviews 10.

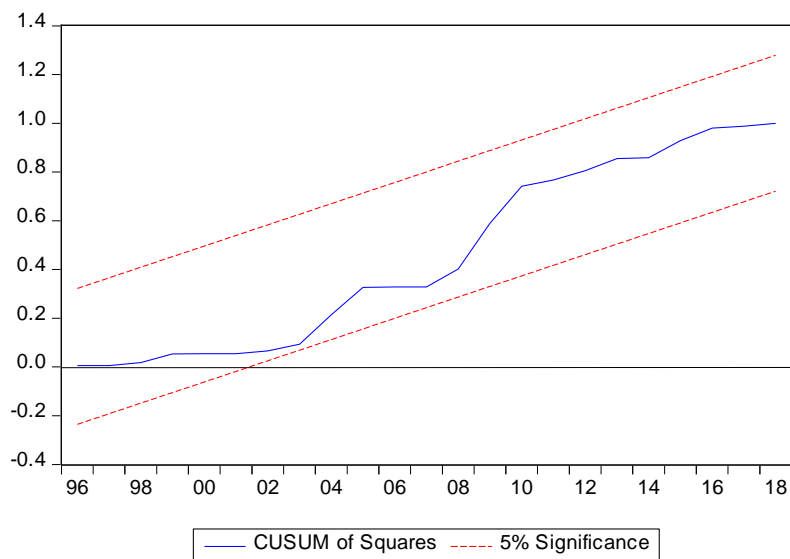


Figure 3. CUSUM Square Test
Source: on study from Eviews 10.

Causality Result

The results of the short-run Granger causality test are shown in Table 10. We see that there is a unidirectional causality relation between export and foreign direct investment with direction from exports and FDI.

Table 7 Granger Causality Results

Null Hypothesis	Direction of Causality	F-Statistic	P-Value
LEXP does not Granger Cause LFDI	LEXP → LFDI	4.37940	0.0116
LGFCF does not Granger Cause LFDI	LGFCF → LFDI	8.82055	0.0003***

Significant codes: *** significant at level 0.01. ** significant at level 0.05, * significant level at 0.1.

Source: own calculation in Eviews 10.

CONCLUSIONS AND POLICY IMPLICATIONS

This study contributes to the recent empirical literature of inward FDI-export nexus. This study finds that ARDL-bound testing co-integration approach confirms that there is long-run relationship between considered variables. Results indicate that there is a positive and significant impact of FDI on exports in long run and the short run. From the Granger causality test, it is found that there is a unidirectional relationship exists between export and FDI. This implies that inflow of FDI in Indonesia is growing market size determined by high population and economic growth (horizontal FDI).

The result findings presented in this paper have policy implications for Indonesia. For policy-makers who aim to achieve economic growth through export upgrading, policies attracting FDI flows will be effective since the presence and activities of MNCs in host economies potentially lead to capabilities transfer to local firms (Balasubramanyam & Salisu (2001). Moreover, adopting a policy that fosters an environment to promote capabilities transfer and developing will strengthen the positive impacts of FDI on export increasing. Mandating worker training, requiring joint ventures, and local content requirements are examples of policies that can adopt in Indonesia. However, policymakers should keep in mind that FDI may bring a negative consequence on the diversification level of the export sector as the entrance and activity of MNCs might negatively influence domestic producers of lower-productive goods. If policymakers would like to avoid a temporary increase in unemployment rate, they should incorporate policies that encourage MNCs and other domestic firms to hire laid off workers in low-productive domestic industries.

LIMITATION AND SUGGESTED AREA FOR FUTURE RESEARCH

There are some limitations to this paper and we suggest directions of future research. First, this paper uses the data of export-based on World Bank Data in all goods and services. Therefore, it would be important to recheck the relationship between FDI and export diversification by using different data in each sector.

Secondly, this study makes no reference to how the effects of FDI might differ according to the use and source. Considering the source and destination of FDI can be important as previous studies show that FDI from different sources will have different impacts (Banga, 2006), and that FDI has different impacts in different industries (Lall, 2000). Therefore, the use of more disaggregated data on FDI, if it were available, would improve this study.

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