

Do Intra-Trade Export and Foreign Direct Investment Promote Economic Growth in ASEAN? Evidence from Regional Integration

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Abstract. *This study aims to analyze the effect of trade between countries and foreign direct investment on economic growth in the ASEAN integration region. Elements of capital, labor, and education variables are also studied in research studies. The research data is balanced panel data in the form of ASEAN-10 from 1996 to 2021. Data analysis uses the System Generalized Method of Moments. The study's results found that labor capital, education, and intra-trade positively affected ASEAN economic growth. However, foreign direct investment has a negative effect on economic growth. A similar sign is also found in the long term, where labor capital, education, and intra-trade have a positive effect while foreign direct investment has a negative effect. Interestingly the highest effect when compared to others. Meanwhile, the impact of intra-trade trading was the lowest.*

Keywords: *economic growth, FDI, intra-trade, ASEAN-10, regional integration*

1. Introduction

Economic growth is an essential reference in macroeconomics. Economic growth can be defined as the development of activities in the economy that cause goods and services produced in society to increase (Mankiw, 2009). Economic growth describes the strength of the country and also describes prosperity. It is not surprising that every country, both developed and developing countries, is trying to achieve high economic growth from year to year. To get high economic growth, the right formula is needed.

Currently, production no longer comes from the country itself but can be obtained from foreign countries, especially neighboring countries. This effort requires an appropriate agreement between the two parties so that no loss occurs. However, these deals take time to get done. As a result, the country's production stagnates and affects economic growth. Barriers like this will be a problem in the long term and are unprofitable for both countries. One of the ideas that emerged was to carry out economic integration.

Economic integration through the policy of removing tariff barriers can affect a country's economic growth. Economic integration can increase the volume of international trade, investment, and welfare (static effect). It can expand employment opportunities through the dynamic effects of regional economic integration. It can change the economic structure of member countries so that there is an increase in production capacity and resource efficiency.

ASEAN Free Trade Area (AFTA) is one of them. AFTA was the first major step which was enacted in 1992. Through ASEAN, the Southeast Asian region has agreed to establish an AFTA free trade agreement. The ASEAN regional integration process is based on economic and trade integration and focuses on trade liberalization and increasing regional economic growth in obtaining benefits for member countries (Sakyi

& Egyir, 2017). With the formation of free trade areas in several areas, trade liberalization will take place faster than the World Trade Organization (WTO) has scheduled. ASEAN economic integration can encourage and strengthen commitment and free trade cooperation between ASEAN countries (Bong & Premaratne, 2018; Shah, 2021). ASEAN economic integration can provide added value for countries in the region by showing that the ASEAN regional region has a strong influence in every economic and trade cooperation compared to other world regions (Tahir & Khan, 2014).

Each country has the same opportunity to obtain resources, including investment, when economic integration occurs. Investments such as *Foreign Direct Investment* (FDI) are believed to bring efficiency to work due to technology transfer and increased human resources (Alvarado et al., 2017). However, the fact is that investment will go into the country due to specific considerations. Even though they get the same opportunity, the economic conditions when they join are different regarding security and education. However, some literature states that integration does not always have a positive impact on member countries (Sakyi & Egyir, 2017; Alvarado et al., 2017; Anwar & Nguyen, 2010) because investors will choose member countries that have sufficient capacity so that investment will provide benefits to investors in the long term. Based on the background of these problems, the researchers formulated the first problem, does trade between ASEAN countries help increase economic growth? Second, as long as ASEAN integration occurs, what are the impacts of incoming FDI flows and their impact on economic growth?

The systematics of the preparation of the research are as follows. Section 2 is related to the study of literature. Section 3 deals with data and methods. Section 4 is the findings and discussion. Finally, section 5 describes the conclusions and recommendations of the research.

The first context concerns FDI on economic growth. Lee and Chang investigated the effect of FDI on economic growth in 37 countries from the period 1970-2002 (Lee & Chang, 2009). Based on the results of the Dynamic Ordinary Least Square (DOLS) estimation, it was found that the role of FDI did not always have a positive effect but was also found to have a negative effect. Besides, Azman-Saini *et al.* looked at the role of FDI on economic growth in 85 countries (Azman-Saini, et al., 2010). The latest research is to include elements of economic freedom. The findings using the Generalized Method of Moment (GMM) explain that FDI has no significant effect on economic growth except for economic freedom which has a positive impact. Analysis based on country income groups found that FDI had a positive effect on medium and high-income levels, while not on low-income.

Anwar and Nguyen conducted a similar study in Vietnam with the GMM model (Anwar & Nguyen, 2010). The results informed that FDI, exports, labor growth, and capital had a significant positive effect. Meanwhile, the exchange rate was found to be significantly negative. Ahmed reported a study in Malaysia where FDI has a positive impact on economic growth (Ahmed, 2012). Mehic and coworkers tested FDI in Southeastern Europe from the period 1998-2007 through the Fixed Effect Model (FEM) where, FDI, domestic investment, and economic openness have a positive effect on economic growth (Mehic et al., 2013). While inflation was found to have a negative effect. Similar findings also occurred in Africa with the GMM approach (Gui-Diby, 2014). The findings explain that FDI and domestic investment have a positive impact.

Furthermore, Hong conducted a different test of the FDI model and economic growth (Hong, 2014). He incorporates FDI moderation with elements of infrastructure,

market size, and wages. The research data were 284 cities from 1994-2010. Based on the GMM model, the results explain that FDI has a positive effect. Moderation of FDI with infrastructure and wages was found to have a significant negative effect on economic growth. Silajdzic and Mehic found that FDI had a positive effect and had an effect on surrounding countries in 10 central and eastern European countries (Silajdzic & Mehic, 2015). Pegkas did something similar in European zone countries and found something similar previous study by Silajdzic and Mehic (Pegkas, 2015). However, different findings were found by Iamsiraroj where Asian, Latin, and African regions were found to have a negative effect (Iamsiraroj, 2016). While North America and Western Europe were found to have a positive effect. Negative findings in Africa were also obtained by Sakyi and Egyir (Sakyi & Egyir, 2017). Meanwhile, in Latin America, FDI was also found to have a negative effect in lower-middle-income countries by the GMM approach (Alvarado, et al., 2017).

Research by (Alvarado, et al., 2017), suggests that FDI has a positive impact on economic growth in high-income countries. Not only from the inflow side but also from the outflow from the investing country. Adedoyin *et al.* developed the FDI-economic growth model by adding elements of energy, transportation, and the role of technology and communication in the United States (Adedoyin, *et al.*, 2020). The findings reveal that, based on FMOLS, DOLS, and CCR estimates, FDI has a significant negative effect on economic growth. However, the results of the interaction between technology and communication variables and FDI found a significant positive impact on economic growth. Besides, the factors that influence economic growth in large-scale economies (Rahman & Alam, 2021). The research data used is 20 countries from 1980-2018 using the Pooled Mean Group (PMG) method as an update. The results of his research explain that FDI has different impacts (negative and positive) in 20 countries, especially in the short term. The term results explain that FDI has a positive effect on economic growth. Education was found to have a consistently significant positive effect in the short and long term.

The second context is trade on economic growth. The discussion of trade has many research approaches. Generally carried out with an export and import approach by a country or trading activities such as open trade. In theory, trade can drive a country's economic growth. Several studies have confirmed this, such as Lee (2011), who found that exports encourage economic growth when countries specialize. Meanwhile, Keho found that open trading has a positive effect in the short and long term on the Cote d'Ivoire (Keho, 2017). This finding is based on the ARDL method. The sample approach with the integration area was carried out by Ejones et al. (Ejones et al., 2021), in East African Communities and by Zaman et al. at BRI (Zaman et al., 2021). Both used the Fixed Effect Model (FEM) model. The results show that open trade has a positive and significant effect. According to Ejones et al, trade cooperation between regions has a significant effect compared to outside countries (Ejones et al., 2021).

Based on the literature that has been discussed, many inconsistent results were found between studies, especially from the FDI side. Furthermore, there are still few studies on the impact of regional trade, especially regarding trade between ASEAN countries. Therefore, our review aimed to investigate the impact of inter-country trade and FDI in ASEAN countries) filling the research gap.

2. Method

Data and Source

We used panel data from 10 ASEAN countries (Brunei Darussalam, Cambodia,

Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam) from 1996-2021. The scope of the research data was the period of applied economic integration. The research data used was economic growth measured by constant 2015 US dollars, the capital was measured by the gross fixed capital formation in constant 2015 dollars, the total labor force measures labor, education was measured by average year of schooling, trade was measured by intra-export share in percent, and a net inflow of % GDP measures foreign direct investment. Economic growth, capital, labor, and foreign direct investment data were sourced from the World Development Indicator. Education came from the United Nations Development Program (UNDP). Meanwhile, trade originated from the International Monetary Fund (IMF) processed by researchers.

The Variables

In this research study, we used the basic formulation of economic growth by Cobb-Douglas, assuming constant technology. The form of the equation is as follows:

$$Y = (K, L) \quad (1)$$

Where Y is the output, K is capital; and L is labor. In equation (1), an economic growth model can be developed by adding factors that may impact economic growth. Therefore, the economic growth model developed (augmented) as an empirical research investigation is:

$$GDRP = (CAP, LAB, EDU, TRADE, FDI) \quad (2)$$

Where GDRP is a proxy for economic growth, CAP is capital, LAB is labor, EDU is education as a proxy for human capital, TRADE is intra-trade during economic integration, and FDI is foreign direct investment. We use education as a controlling variable (Ahmed, 2012; Rahman & Alam, 2021). The econometric specifications of equation (2) are formed linearly to become equation (3), namely:

$$GDRP_{it} = \gamma_0 + \gamma_1 CAP_{it} + \gamma_2 LAB_{it} + \gamma_3 EDU_{it} + \gamma_4 TRADE_{it} + \gamma_5 FDI_{it} + e_{it} \quad (3)$$

We transformed equation (3) with natural logarithms to make it easier to interpret to minimize problems of normality, autocorrelation, and heteroscedasticity (Ikhsan, *et al.*, 2022; Fachrurrozi, *et al.*, 2022; Nurjannah, *et al.*, 2023). Then the form of equation (4) is as follows:

$$LnGDRP_{it} = \gamma_0 + \gamma_1 LnCAP_{it} + \gamma_2 LnLAB_{it} + \gamma_3 LnEDU_{it} + \gamma_4 LnTRADE_{it} + \gamma_5 LnFDI_{it} + e_{it} \quad (4)$$

Where Ln is the natural logarithm. γ_1 - γ_5 is the coefficient of each variable from capital, labor, education, trade, and foreign direct investment. Trade and foreign direct investment are not transformed into natural logarithms because they are already in percent form. The expected capital, labor, education, and trade expectations are positive. For FDI, the sign is expected to be positive or negative.

In order to analyze equation (4), we used the dynamic panel method, Generalized Method of Moments (GMM). This method incorporates the dependent lag element as an independent variable. Then the form of equation (5) is as follows:

$$LnRGDP_{it} = \gamma_0 + \gamma_1 LnRGDP_{it-1} + \gamma_2 LnCAP_{it} + \gamma_3 LnLAB_{it} + \gamma_4 LnEDU_{it} + \gamma_5 LnTRADE_{it} + \gamma_6 LnFDI_{it} + e_{it} \quad (5)$$

The GMM method was formally introduced by Hansen (1982). GMM works to estimate parameters that have endogenous problems in panel data. In addition, it solves the problem of heteroscedasticity and autocorrelation. This often cannot be solved in static models such as fixed effect models or random effect models (Muhammad & Khan, 2019). GMM is more widely applied in micro-panel data where $N > T$ (Yao et al., 2021).

The current GMM model is divided into two forms, Difference GMM (Arellano & Bond, 1991) and System GMM (Arellano, 1995). Both models are very reliable in solving endogeneity problems, but the GMM differences are more similar to the fixed model, so bias can still occur. Therefore, we used System GMM as the best approach. As with other models, GMM must meet assumptions such as a valid model free of autocorrelation. The model's validity was assessed using the Sargan test (Nathaniel & Adeleye, 2021). The auto-correlation test was carried out using the lag two auto-correlation approach, where the statistics must accept the null hypothesis (Yao *et al.*, 2021).

3. Results and Discussions

Descriptive Statistics

The first stage before analyzing the data was to analyze the data in the form of descriptive statistics. This analysis describes the research data as a whole. Table 1 displays research data on economic growth, capital, labor, education, trade, and FDI. Only trade and FDI are not converted in percent (%). Table 1 explains that the average economic growth was 22.10, capital was 23.77, labor was 16.19, education was 2.45, trade was 10, and FDI was 5.54. Data fluctuations were seen from the standard deviation. The higher the standard deviation, the greater the data fluctuation. Trade and FDI variables had higher standard deviations than the other four variables. The trade standard deviation was 12.18 and FDI was 5.84.

Table 1. Descriptive Statistics

Variable	Mean	Std.Dev	Min	Max
Rgdp	22.10	1.55	22.09	27.69
Cap	23.77	1.59	19.97	26.57
Lab	16.19	1.78	11.82	18.75
Edu	2.45	0.19	1.99	2.80
Trade	10	12.18	0.04	45.91
FDI	5.54	5.84	-2.75	29.69

Source: Author Calculation

Diagnose Model

The next stage was to test the accuracy of using the GMM model in research. The GMM model was a dynamic panel model, so it was necessary to test it in a static form with an Ordinary Least Square (OLS) estimator as a benchmark (Yang, *et al.*, 2020). Some of the tests include serial correlation, heteroscedasticity, and endogeneity. The test results in Table 2 explain the serial correlation test results found at 22.763 with a significance level of 1%. It explained the linear model has problems in serial correlation. Next, the results of the heteroscedasticity test found a statistical number of 1494.13 with a significance level of 1%. This means that the static model has a heteroscedasticity problem. Furthermore, endogeneity was the heaviest violation test in the linear model finding a statistical lift of 37.554 with a significance level of 1%. This indicates that there is a violation of endogeneity in the linear model. Therefore, the use of the GMM model in this study is feasible.

Table 2. Linear Model Diagnostics

Test	Chi-Squared	P-value
Serial correlation	22.763	0.000***
Heteroskedastitas	1494.13	0.000***
Endogeneity	37.554	0.000***

Source: author calculation. *** mean significance at 1%.

System GMM Estimation

Table 3 displays the estimation results based on the GMM system. It can be seen that capital, labor, education, and trade have a significant positive effect on economic growth. This influence is at a significance level of 1%. The interpretation of capital explained that if capital increases by 1%, economic growth will increase by 0.027 percent with the *ceteris paribus* assumption. Next, a 1 percent increase in the labor force causes economic growth to increase by 0.031% assuming *ceteris paribus*.

Next is the education variable found to have a positive effect on economic growth with a significance level of 1 percent. If education increases by 1% economic growth will increase by 0.107% assuming *ceteris paribus*. This finding is in line with research conducted by Ejones and Rahman (Ejones *et al.*, 2021; Rahman & Alam, 2021), but different from Ahmed (Ahmed, 2012). Education plays a role as a form of productivity at work. Furthermore, education functions to understand the workforce in using technology so that they work more efficiently and effectively (Rahman & Alam, 2021). If a country has higher education, there will be an increase in productivity and impact on output.

Table 3. SYS-GMM Estimation

	Coefficient	t-stat	p-value
Rgdp (-1)	0.911	118.24	0.000***
Cap	0.027	4.58	0.000***
Lab	0.031	9.34	0.000***
Edu	0.107	3.85	0.000***
Trade	0.002	18.28	0.000***
FDI	-0.012	-3.55	0.000***
Constant	0.543	14.81	0.000***
AR (1)	2.50**		
AR (2)	-1.60		
Sargan test	229.44		

Source: author calculation. Dependent: Economic Growth. *** mean significance at 1%.

Next is the trade variable between countries where the coefficient has a positive sign of 0.002 and has a significant effect at the 1% level. If trade between countries, in exporting, increases by 1% then economic growth. Trade has an impact on economic growth because countries produce goods and export goods to destination countries. With economic integration, economic cooperation occurs because countries open up opportunities to obtain needed resources. However, the increase in economic growth among countries is very slow when compared to cooperation with other countries such as BRI (Zaman, 2021), and the East African Community (Ejones, 2021). One reason for the low impact is the potential for exported commodities. ASEAN member countries are more dominated by countries with low-income status so the added value of commodities does not increase. As a result, the exported commodities are the same in the destination country.

The following finding is that FDI has a negative effect on economic growth. If FDI

increases by 1%, economic growth will decrease by 0.012%. According to Alvarado the negative impact can be justified because developing countries have a relatively low capacity to use FDI to increase economic growth (Alvarado, *et al.*, 2017). FDI often offers new technology so skills are needed to use it. Developing countries with low education tend to be unable to optimize technology. As a result, FDI will move to countries with higher human resources. According to the World Bank data in Figure 1, Singapore is a country with high human resources. FDI flows into the country average 19.12% per year. It is different from the surrounding countries where only 1-3% per year of incoming FDI flows

Table 4. Long-run Estimation

Variable	Coefficient	t-stat	P-value
Cap	0.354	6.54	0.000***
Lab	0.408	10.51	0.000***
Edu	1.376	4.90	0.000***
Trade	0.037	9.19	0.000***
FDI	-0.016	-3.28	0.001***

Source: author calculation. *** mean significance at 1%.

From equation (5), we can derive this equation to get long-term estimation results. It can be seen from the estimation results in Table 4. The long-term effect of capital that a coefficient of 0.354 is found with a significance level of 1%. If the additional capital is 1%, economic growth will increase by 0.354%. Furthermore, the impact of labor was found to be 0.408% in driving economic growth if there was an increase in labor by 1% assuming *ceteris paribus*. Statistically, the influence of labor has a significant effect. Interestingly, education was found to have the most elastic effect compared to the others with a coefficient of 1.376. The education variable has a significant effect at 1% level so an increase in education by 1% means economic growth will increase by 1,376%. The focus of research on trade and FDI which is the object of research found that trade has a significantly positive impact on economic growth by 0.037% if there is an increase of 1%. While reducing economic growth by 0.016%. Overall, the validity tests such as Sargan and auto-correlation were found to have accepted the null hypothesis.

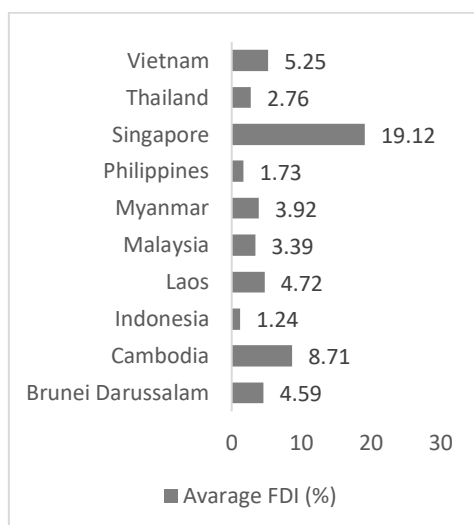


Figure 1. Average FDI percentage on ASEAN-10

4. Conclusions

This review aimed to examine the impact of inter-country trade and FDI on economic growth in 10 ASEAN countries. We used data from 1996-2020 with a sample size of 260 observations. The method used was the GMM system. To take this method, we tested several linear tests such as auto-correlation, heteroscedasticity, and endogeneity. Based on these tests the GMM system was found to be feasible to use. The first finding was that capital and labor had a positive effect on economic growth. Next, education was found to have a significantly positive effect both in the short and long terms. The effect of education was greater in driving economic growth than other variables. The trade variable was found to have a positive effect at 1% of significance level. The influence of trade between countries was the lowest at 0.002%. Meanwhile, FDI was found a negative effect on economic growth. Economic integration provides new opportunities for member countries to be able to grow higher economies. Thus, the welfare of the country will also increase. However, if a country only relies on labor and capital, economic growth will not grow optimally. In addition, trading among members is not too big to help the economy jump to a high. However, education can boost the economy. So, policymakers need to improve human resources, such as training the workforce in technology. The need to follow the pattern of Singapore where human resources are the main focus and today is the highest in ASEAN. The resulting impact is a large influx of FDI because technology and human resources are aligned. In addition, the added value from exports will change from raw goods to finished goods to get high economic growth. Subsequent research can develop a research model by adding technology variables. Besides that, the economic integration of this research is only limited by the impact of FDI on economic growth. For further research, it is necessary to carry out a gravity model to study the attractiveness of countries when economic integration is implemented.

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