

Review Article

Analysis Economic Integration Between Indonesia and ASEAN Countries

Devina Octarrum¹, I Wayan Suparta², Arivina Ratih³

Master Program in Economics, Faculty of Economic and Business, University of Lampung

Received Date: 26 April 2021

Revised Date: 02 June 2021

Accepted Date: 06 June 2021

Abstract - This research aims to analyze economic integration between Indonesia and ASEAN countries in terms of Indonesian exports from 2009 to 2019. The testing method used is the economic gravity model, where this model is commonly used to analyze bilateral trade integration between the countries that carry out trade cooperation, as a form of trade freedom. By using the Gross Domestic Product (GDP) ASEAN countries and Indonesia, population ASEAN countries and Indonesia, exchange rate and distance as variables.

The results show that the GDP variable for Indonesia, the GDP of ASEAN countries, the population of Indonesia and the population of ASEAN countries have a positive and significant effects on Indonesia's exports to ASEAN countries. Meanwhile, the exchange rate and economic distance have a negative and significant effect on Indonesia's exports to ASEAN countries.

Keywords - Integration, Gravity economic, Export

I. INTRODUCTION

The current economic has developed rapidly in line with the globalization process. Countries in the world have responded positively to globalization, especially in the economic sector by strengthening trade competitiveness in international markets. Due to the inability of each country to meet domestic needs, as well as competition in the effectiveness and efficiency of production led to the initiation of bilateral, multilateral and regional cooperation. Through cooperation between countries, it can increase the flow of goods and services as well as capital so that an integrated relationship could be formed. Bela Balassa (1967) defines economic integration as a process designed to eliminate discrimination of any kind between the economies of a country.

ASEAN is a form of regional cooperation in Southeast Asia which was established on August 8, 1967 in Bangkok, Thailand. In improving relations in the economic field, ASEAN formed AFTA or ASEAN Free Trade Area which

aims to increase trade in goods and services among member countries. The ASEAN free trade area has created the Common Effective Preferential Tariff (CEPT) scheme which was formed in 1992 as a form of trade policy in the region. In 2009 the ASEAN Trade in Goods Agreement (ATIGA) was a replacement for the CEPT agreement. With the background of preparations for facing economic globalization and facing global competition, the idea arose to accelerate the establishment of the ASEAN Economic Community (AEC), which officially implemented on December 31, 2015.

Indonesia, which from the start has been a member of ASEAN, has participated in various policies that have been made. With the existence of ASEAN through AFTA and the ASEAN Economic Community (AEC) with policies in the economic sector, it is one way to integrate this region as a single market and production base; highly competitive economic area; an area with equitable; and a region integrated with the global economy. For Indonesia, the existence of the ASEAN Economic Community (AEC) is the first step to improve the economy and competitiveness in developing a free market. However, the problem that could be experienced in Indonesian trade with the implementation of the ASEAN Economic Community (AEC) is Indonesia's readiness to compete with countries in the Southeast Asian region which tend to have similar resources.

Figure 1 shows that the value of Indonesia's exports to ASEAN countries in 2018 tends to be small compared to other ASEAN countries like Singapore, Malaysia and Thailand. Indonesia ranks fifth, one rank below Vietnam, which in previous years was ranked below Indonesia. In fact, compared to other Southeast Asian countries, Indonesia's economy and population are much larger. Therefore the factors that could affect Indonesia's exports like economic size, population size, exchange rates, and also tariff policies need to be considered.

Previous researches have mostly used economic gravity models to measure integration in trade between countries. They used many economic models to measure integration in



trade between countries. By using variables like GDP of exporter country (origin country) and GDP of the export destination country (Trung Kien 2009, Dinh 2011, Fimalino 2016), the population of the exporter country and the population of the export destination country. (Yang 2014, Purnama 2017), the exchange rate of the REER (Dao 2015, Tri 2015) and the distance (used by researchers using the economic gravity model)

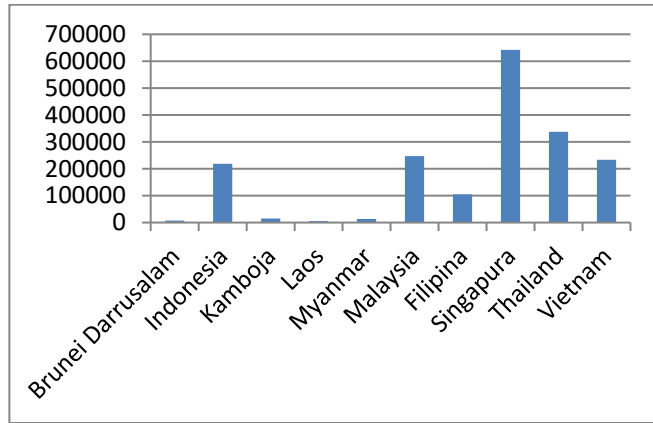


Fig. 1 Exports of ASEAN Countries to ASEAN (million USD)

Previous research has shown that the application of economic gravity in various countries, as done by Lee et al (2006), researches the economic integration of trade in goods and services in 10 OECD member countries using an economic gravity model with trade, GDP, distance, population and language as variables. Another research related to integration, namely Dinh et al (2011) examined the integration of trade activities in Vietnam with the same variables with the addition of other variables like exchange rates, culture and partnerships. Suryanta (2012) in his research found that the distance parameter has a negative estimate and is associated with an increase in trade costs like transportation, communication and administration between Indonesia and trading partners from ASEAN countries. Yang et al (2014) in their research in the ASEAN - China Free Trade Area (ACFTA) said that overall the reduction and elimination of tariff barriers in the ACFTA showed positive and significant results on trade.

In total, the results of previous research on variables that have a negative influence on trade activities between countries. This means that the farther the distance between the countries, the greater the costs incurred to carry out trade. The increase in the GDP of the exporter country and the GDP of the export destination country shows the size of the economy of a country that could have a positive influence on trade between these countries. Similarly, the population variable of the exporter country and of the export destination country has a positive influence on trade between countries. The exchange rate could have a positive or negative effect, this depends on whether the exchange rate appreciates or depreciates (Krugman, 2012).

The gravity model is commonly used to measure the level of economic integration in trade between countries. The model uses frequency to measure population size, number of facilities, number of jobs, total income, building area, etc. to determine the size of the country. Another factor that affects the interaction between two countries is the distance between the two countries. Because the more distance between the two regions, the lower a person's desire to travel (Tarigan, 2005). Therefore income, population and the distance between the two countries are important in this economic gravity model.

This research was conducted to analyze the economic integration of Indonesia's trade with ASEAN countries using the Economic Gravity model. By looking at the effect of Indonesia's GDP, ASEAN's GDP, Indonesia's population, ASEAN's population, Exchange Rate and Distance to Indonesia's exports to ASEAN from 2009-2019.

II. RESEARCH METODHOLOGY

The approached used in this research is the quantitative description approach. By adopting the economic gravity model, the distance variable is considered important in this research. This research uses panel data, a combination of timeseries data for the period 2009-2019 and cross section data consisting of ASEAN countries as Indonesia's export destinations. Indonesia's export destination countries are Malaysia, Singapore, Brunei Darussalam, Thailand, Vietnam, Philippines, Myanmar, Laos and Cambodia. Data were obtained from Worldbank Data, WITS, Badan Pusat Statistik and CEPII.

The Gravity Model is a natural logarithmic form in order that it gets a linear relationship between the logarithm of trade flows and the logarithm of economic size and distance (Shepherd, 2012). The data that has been collected then transformed into the natural logarithm of each variable with the aim of converting the equation into percent units. The general econometric models in the economic model of this research are:

$$\begin{aligned} \ln Ex_{ijt} = & \alpha_0 + \beta_1 \ln Y_{jt} + \beta_2 \ln Y_{it} + \beta_3 \ln Pop_{jt} \\ & + \beta_4 \ln Pop_{it} + \beta_5 \ln ER_{ijt} + \beta_6 \ln Dist_{ij} \\ & + et \end{aligned}$$

Where,

α_0 : Intercept/Constanta

$\beta_{1,2,3,4,5,6}$: The coefficient of each variable

i, j : Indonesia, ASEAN countries

t : Research time period 2009 – 2019

Ex_{ijt} : Indonesia's exports to ASEAN countries in year t

Y_{it} : Gross Domestic Product of Indonesia in year t

Y_{jt} : Gross Domestic Product of ASEAN countries in year t

Pop_{it} : Total Population of Indonesia in year t

Pop_{jt} : Total Population of ASEAN countries in year t

ER_{ijt} : Exchange Rate Between Indonesia and ASEAN countries in year t
 $Dist_{ij}$: The distance between Indonesia and ASEAN countries
 Et : Error term

A. Model Selection Method for Panel Data

a) Chow test

Chow test is used to determine the better approach between Pooled Least Squared/PLS and Fixed Effect Model (FEM). The basis for rejecting the hypothesis above is to compare the F-statistical calculation with the F-table if the result of F-statistic > F-table, the most appropriate model to use is the Fixed Effect Model (Widarjono, 2013).

b) Hausman test

Hausman test plays a role in choosing the Fixed Effect Model (FEM) or Random Effect Model (REM). With the condition that if Chi-Squared statistic < Chi-Squared table, then the correct REM is used.

c) Langrange Multiplier Test

The Langrange Multiplier (LM) test is performed to determine whether the Random Effect or Common Effect model is more appropriate. The LM test is carried out by looking at the LM value of the Breusch-Pagan. If the LM statistical value is greater than the chi square statistical value at a level of significant 5%, the appropriate Random Effect model is used.

B. Classic assumption test

a) Normality test

The data is normally distributed by comparing the Jarque-Bera probability value with a significance level of 0.05. If the Jarque-Bera probability > α 0.05 then it could be said that the residuals are normally distributed (Gujarati, 2013).

b) Multicollinearity Test

One way to check for multicollinearity is to look at the unknown values between the independent variables in the model. If the value of each correlation coefficient is greater than the rule of thumb (0.8), then the model contains multicollinearity (Gujarati, 2013).

c) Heteroscedasticity Test

Heteroscedasticity test aims to test whether in the regression model there is an inequality of variance from one observation to another observation. The model says it contains heteroscedasticity if the White statistic > chi-square table and vice versa (Gujarati, 2013).

d) Autocorrelation Test

One of the tests to detect autocorrelation is the Durbin-Watson test. The Durbin-Watson (DW) statistic value from the calculation using Eviews was then compared

with the DW table value. Determining the area is assisted by DL and DU table values (Gujarati, 2013).

C. Hypothesis testing

a) Coefficient of Determination (R^2)

The value of the coefficient of determination R^2 is used to measure how much the independent variables together could explain the variation of the dependent variable used in the research. The value of R^2 lies between zero and one. The closer to one, the better model.

b) t-statistic test

The t-statistic test was used to determine whether the independent variable partially had a significant effect on the dependent variable at level $\alpha = 0.05$. With the criteria t-statistic > t-table. Then it could be shown that the independent variable, partial, dependent variable and vice versa.

c) F-statistics test

The F-Statistic test is used to prove whether the independent variables used in the research together significantly affect the dependent variable. With Criteria F-statistics > F-table then it could be said that independent variables are together affected the independent variable and vice versa (Widarjono, 2013).

IV. RESULT

Based on the estimation results of the model selection test by comparing the values of the Chow test, Hausman test and LM test that have been carried out, the appropriate panel data model is the Random Effect Model (REM).

A. Classic assumption test

From the classical assumption test that has been done, the panel data regression model in this research is normally distributed, do not have multicollinearity and there is no heteroscedasticity problem or homoscedasticity. The standard OLS estimation model couldnot be a matter of space and time. Thus it is possible that unobservable effects on exports could be correlated to several explanatory variables. REM has the advantage of being able to overcome the problem of this type of explanatory variable, but produces inconsistent estimators because it ignores the display between the unobserved effect in the error and the explanatory variable (Trung Kien, 2009). The following are the results of panel data regression using a random effects model.

Table 1. Regression Results of Random Effect Model

Variable	Coefficient	t-Statistic	Prob.	Conclusion
Constant	-59.83676	-59.83676	0.1552	-
X1_PDBJ	2.715943	2.715943	0.0124*	Significant
X2_PDBI	2.857307	2.857307	0.0003*	Significant
X3_POPJ	0.689423	0.689423	0.0150*	Significant
X4_POPI	5.033996	5.033996	0.0709**	Significant
X5_ER	-0.117430	-0.117430	0.0009*	Significant

X6_DIST	-3.383531	-3.383531	0.0009*	Significant
R-squared	0.541165			
F-statistic	15.33261			

Description: (*) 5% significant, (**) 10% significant.

B. Hypothesis testing

a) Coefficient of Determination (R^2)

The results of this research indicate the R^2 value of 0.541165. This shows that 54% of Indonesia's export value to ASEAN countries is simultant influenced by these variables. Meanwhile, the remaining 46% for other factors outside the model.

b) F-Statistics Test Results

In this research, using a significance level of 5% (0.05), degrees of freedom (df) 1 = k-1 (7-1), df2 = nk (99-7) with the criteria k is the variable and n is the number of observations. . The F-statistic value is 15.33261 > F-table is 2.11 so that the independent variables in this have a significant or overall effect on the variable of Indonesia's exports to ASEAN countries.

c) T-statistics test results

By using a significance level of 5% ($\alpha = 0.05$) and degrees of freedom (n-k-1) = 91, the t-table value is 1.658. So it could be said that each variable has an effect on Indonesia's export variables to ASEAN countries.

V. DISCUSSION

A. Effect of ASEAN GDP on Indonesia's Exports to ASEAN

Based on the estimation results, it could be seen that the GDP of Indonesia's export destination countries, in this case ASEAN countries, has a positive and significant impact on the value of Indonesia's exports to destination countries in the ASEAN region. The results of this research are in line with research conducted by Trung Kien (2009), Dinh (2011) and other researchers who have conducted similar researches. Because an increase in income and demand for output in a country could increase the country's import activities, thereby affecting an increase in exports in the exporting country.

B. Effect of Indonesia's GDP and Indonesia's Exports to ASEAN

Based on the estimation results, it could be seen that Indonesia's GDP has a positive and significant impact on the value of Indonesia's exports to ASEAN member countries. Indonesia's GDP variable as an exporting country is a good proxy for the gravity model in measuring the level of Indonesia's exports to ASEAN. Indonesia's GDP variable represents the size of the economy and the market size of Indonesia's export activities to ASEAN countries. Indonesia's GDP has a positive effect on exports, from the supply side, the increasing income of an exporting country indicates that the level of production in that country is quite

high. Therefore that in this case it could lead to a tendency for ASEAN countries to increase their import activities from Indonesia.

C. Effect of ASEAN Population on Indonesia's Exports to ASEAN

Based on research estimates, it could be seen that the population of ASEAN countries has a positive and significant effect on the value of Indonesia's exports to ASEAN member countries. This study is similar to the research conducted by Dinh (2011) and Trung Kien (2009). This variable could have a positive or negative effect on a country's exports. This depends on the scale of absorption of economic effectiveness. A variable that has a negative value because the country's economic absorption takes place effectively. Therefore if the population of Indonesia's export destination countries or the population of ASEAN countries increases, the domestic market will also increase.

The variable population of export destinations is positive, this is due to an increase in the population of the exporting country which affects Indonesia's exports to that country from the demand side. In accordance with Salvatore's (1997) statement that an increase in the population of a country could increase the demand for commodities in that country, so that the country needs to carry out import activities to meet the needs of its country.

D. Effect of Indonesia's population on Indonesia's exports to ASEAN

Based on research estimates, it could be seen that the total population of Indonesia has a positive and significant effect on the value of Indonesia's exports to ASEAN member countries. The results of this study are in line with Lee's (2006) research that the population of the exporting country has a positive effect on the export activities of a country. The variable population of Indonesia as an exporting country is positive and significant with level of significance 10%. This is because from the supply side, with the increase in population in Indonesia there is also an increase in the labor force to carry out export commodity production activities.

E. Effect of Exchange Rate on Indonesia's Exports to ASEAN

Based on the results of the research, it could be seen that the exchange rate has a negative and significant influence on the value of Indonesia's exports to ASEAN member countries. The results of this research strengthen the results of previous researches which state that the exchange rate has a negative effect on exports in line with the results of Firmalino's research (2016). This is because the changes in the exchange rate could change the price of a product. When there is an appreciation of the Indonesian currency against ASEAN countries, it causes the price of Indonesian export products to become more expensive, thus that the exchange rate variable is negative.

F. Effect of Distance on Indonesia's Exports to ASEAN

Based on the research results, it could be seen that the Distance between countries have negative and significant influence on the value of Indonesia's exports to ASEAN member countries. This result is similar to the research of Lee (2006), Dinh (2011), Suryanta (2012) and Firmalino (2016) that distance will have a negative effect on exports or trade activities of a country. The Distance variable is shown as negative because the farther the distance from a country to the exporting country, the higher the transportation costs incurred to carry out trade activities between countries.

VI. CONCLUSION

The results of data analysis that has been carried out, it could be concluded that Indonesia's exports to ASEAN are influenced by the GDP of ASEAN countries, Indonesia's GDP, the population of ASEAN countries, Indonesia's population, exchange rates and the distance between countries. The estimation results show that the increase in the GDP of ASEAN countries, Indonesia's GDP, the population of ASEAN countries and the population of Indonesia have a positive and significant effect on increasing Indonesian exports to ASEAN. Meanwhile, the exchange rate and distance between Indonesia and export destination countries in ASEAN have a negative and significant impact on Indonesia's exports to ASEAN.

VII. SUGGESTION

The implementation of the ASEAN Economic Community (AEC) is expected to be able to open up opportunities to increase Indonesia's welfare through Indonesia's exports to intra-ASEAN. Therefore, it is necessary to increase the quality, quantity and facilities from the bottom to the top. It is important for Indonesia to utilize its natural resources wisely and improve technical skills and foreign language skills in human resources, in order to be able to compete with other ASEAN member countries. Because it could be proven in this research that increasing income size and population size could increase Indonesia's exports to ASEAN countries.

REFERENCES

- [1] A. Sebayang, K. Dianta, 'Dampak Integrasi Ekonom ASEAN Terhadap Perdagangan Indonesia Pada Sektor Kendaraan Roda Empat', *Econosains Jurnal Online Ekonomi Dan Pendidikan*, 9.2 (2011), 119–31 <<https://doi.org/10.21009/econosains.0092.03>>
- [2] Aprilia, G. T., & Handoyo, R. D., (2019), Impact of Trade Creation and Trade Diversion in ASEAN-Japan Comprehensive Economic Partnership (AJCEP). *JDE (Journal of Developing Economies)*, 4(02), 99-108
- [3] Amin, Ruzita Mohd, *Economic Integration Among ASEAN Countries: Evidence from Gravity Model International Islamic University Malaysia*, 40.40 (2009)
- [4] Balassa, Bela, *The Theory of Economic Integration: An Introduction, The European Union*, (1994), 125–37 <https://doi.org/10.1007/978-1-349-23984-9_15>
- [5] Chaney, Thomas, *The Gravity Equation in International Trade: An Explanation*, *Journal of Political Economy*, 126.1 (2018), 150–77 <<https://doi.org/10.1086/694292>>
- [6] Dao, Ngoc Tien, Van Nho Pham, and Quang Hung Doan, *Analyzing the Determinants of Services Trade Flow between Vietnam and European Union: Gravity Model Approach*, *MPRA Paper*, 63982.5 (2015), 1–25 <https://mpra.ub.uni-muenchen.de/63982/1/MPRA_paper_63982.pdf>
- [7] Dinh, Thi Thanh Binh, Viet Duong Nguyen, and Manh Cuong Hoang, *Applying Gravity Model To Analyze*, *Forum for Research in International Trade*, (2011), 1–24
- [8] Firmalino, Anna Floresca F., and Jefferson A. Arapoc, *Development Gaps in the ASEAN: A Comparison of the ASEAN6 and CLMN Using Gravity Models of Trade*, *International Academy of Global Business and Trade*, 12.2 (2016), 43–51 <<https://doi.org/10.20294/jgbt.2016.12.2.43>>
- [9] Gujarati, Damodar N. *Dasar-dasar Ekonometrika*. Penerbit Salemba Empat. Jakarta, (2013)
- [10] Krugman, Paul R. Obstfeld, M. dan Melitz, Marc J. *International Trade : Theory and Policy 11th Edition*. Global Edition. Pearson Education, (2012)
- [11] Lee, Fukunari Kimura and Hyun-Hoon, *The Gravity Equation in International Trade in Services* Author (s): Fukunari Kimura and Hyun-Hoon Lee Stable URL :<http://www.jstor.org/stable/40441082> The Gravity Equation in International Trade in Services', *Springer*, 142.1 (2006) 92–121
- [12] Martin, Ali, and Sugiarto Pramono, *FAKTOR-FAKTOR PENDORONG INTEGRASI REGIONAL : Studi Perbandingan Uni Eropa Dan ASEAN*, *Spektrum*, 8.1 (2011) 25–43
- [13] Purnama, Florentin Anggraini, Aufa Numan Fadhillah Rudiawan, Ahmad Rizqita Raharja, and Sparisoma Viridi, *Menerapkan Gravity Model Untuk Menganalisa Aktivitas Dagang Indonesia*, *Prosiding SKF*, (2017) 205–11
- [14] R. M. Amin, *Economic Integration Among ASEAN Countries : Evidence from Gravity Model International Islamic University Malaysia*, 40(40) (2009).
- [15] Suryanta, Barli, *Aplikasi Regim Persamaan Model Gravitasi Yang Telah Dirubah Pada Kasus Dinamika Arus Perdagangan Indonesia Dengan Mitra Dagang Dari Asean*, *Buletin Ekonomi Moneter Dan Perbankan*, 15.2 (2012), 57–76 <<https://doi.org/10.21098/bemp.v15i2.62>>
- [16] Shepherd, Ben. *The Gravity Model of International Trade : A User Guide*. Economic and Social Commission for the Asia and the Pacific. United Nation, (2013).
- [17] Tarigan, Robinson. *Ekonomi Regional. Teori dan Aplikasi*. Jakarta. Bumi Aksara, (2005).
- [18] Tri wahyudi, setyo, and Riyandi Saras Anggita, 'The Gravity Model of Indonesian Bilateral Trade', *International Journal of Social and Local Economic Governance*, 1.2 (2015), 153–56 <<https://doi.org/10.21776/ub.ijleg.2015.001.02.9>>
- [19] Trung Kien, Nguyen, 'Gravity Model by Panel Data Approach: An Empirical Application with Implications for the ASEAN Free Trade Area', *Asean Economic Bulletin*, 26.3 (2009), 266–77 <<https://doi.org/10.1355/ae26-3c>>
- [20] Widarjono, Agus. *Ekonometrika Pengantar dan Aplikasinya* Eviews. UPP STIM YKPN: Yogyakarta, (2013).
- [21] Yang, Shanping, and Inmaculada Martinez-Zarzoso, *A Panel Data Analysis of Trade Creation and Trade Diversion Effects: The Case of ASEAN-China Free Trade Area*, *China Economic Review*, 29 (2014), 138–51 <<https://doi.org/10.1016/j.chieco.2014.04.002>>