

The effect of ASEAN-Korea Free Trade Agreement (AKFTA) on Indonesia Trade: A Gravity model approach

Arjun Saka Agung¹, Zulkarnain Ishak², Imam Asngari² and Abdul Bashir^{2*}

¹ Student of Department of Development Economics, Faculty of Economics, Universitas Sriwijaya

² Department of Development Economics, Faculty of Economics, Universitas Sriwijaya

* Correspondence author email: abd.bashir@unsri.ac.id

Abstract: This study investigates the effect of the ASEAN-Korea Free Trade Agreement (AKFTA) on Indonesia Trade with a gravity model approach using panel data. Data collected during 2007-2016 as a result of AKFTA and trading data mostly obtained from UN Comtrade. The test result shows that REM is the best model chosen to analyze the effect from GDP per capita, exchange rate, distance and AKFTA Policy to the import from 14 AKFTA members country to Indonesia. The result from the determination coefficient indicated that the variation of independent variables (GDP per capita, exchange rate, distance, and AKFTA policies) affected the variation of the dependent variable (Import) as 54 percent. Meanwhile, from the gravity theory, the trade among AKFTA economies to Indonesia has brought positive impact as the distance has a positive sign and lead to form trade creation. While the variable of dummy policy has negative and significantly affected the import.

Keywords: Trade; gravity model; AKFTA, ASEAN

JEL Classification: F12, F14, F17

1. INTRODUCTION

Economic integration is an international trade policy undertaken by reducing or eliminating trade barriers discriminatively for the countries involved (Salvatore, 2014). Economic integration through Regional Trade Agreements (RTAs) has continued to grow significantly since the 1990s. Based on the report of the World Trade Organization (WTO), up to April 7, 2015, 612 RTAs have been registered in the form of Free Trade Agreement (FTA) and Customs Union (CU) and 406 of them have been implemented (Bacchetta et al., 2015).

ASEAN Free Trade Area Agreement (AFTA) has a goal to improve the welfares of people in Southeast Asia. The ASEAN economic region is legalized in October 2002 in Cambodia with the aims of establishing a single market and production base by 2020. The three main pillars of ASEAN formation are the ASEAN Economic Community, the ASEAN Socio-Culture Community and the ASEAN Security Community (ASEAN, 2015).

In addition to China, ASEAN conducts economic and trade cooperation with South Korea, the ASEAN-Korea Free Trade Area (AKFTA). AKFTA was established through the Joint Declaration on Comprehensive Cooperation Partnership and endorsed in Vientiane, Laos in 2004. Preferential Treatment of AKFTA in the form of goods, services and investment sectors. The total trade of ASEAN-Korea FTA reached 134.9 million USD. This shows that trade in the ASEAN region with South Korea has a positive impact of increasing the volume of trade and public welfare. In addition to these impacts, AKFTA cooperation will provide positive contribution in the form of increased direct investment (FDI) and improve the quality of domestic products in the ASEAN region as well as national competitiveness.

Table 1. The Competitiveness Ranking ASEAN Trade Partner 2016

Countries	World Rank
Singapore	2
USA	3
Japan	8
Hongkong	9
Malaysia	25
Australia	22
Rep.Korea	26
Thailand	34
Indonesia	41
Philippina	57
Cambodia	89
Laos	93
Vietnam	60

Source: World Economic Forum, 2016-2017.

Table 1 shows that the Indonesia's competitiveness on ranked 41st of 138 countries. While in ASEAN is in the order of 4 after Singapore, Malaysia, and Thailand. The AKFTA agreement aims to increase the volume of trade in goods in Indonesia, ASEAN, and South Korea. The agreement is used to reduce trade barriers and spur productivity. AKFTA goods agreement to increase trading volume divided into Normal Track (NT) and Sensitive Track (ST) categories. Normal Track is a product that accelerated the reduction of import tariffs in order to increase trading volume. Sensitive Track is a product that is considered sensitive and lowered import tariffs with a slower pattern of normal track products such as fisheries, rice, sugar, textiles and so on.

Table 2. Indonesian - South Korea Trade Balance Year 2013-2016 (Thousand US\$)

Component trade	2013	2014	2015	2016
Total trade	23.015.109,6	22.468.592,00	16.091.652,2	13.682.201
Export	11.422.476,2	10.621.193,30	7.664.446,245	7.007.623,660
Import	11.592.633,4	11.847.398,70	8.427.205,940	6.674.577,343
Trade Balance	-170.157,20	-1.226.205,50	-762.759,695	333.046,317

Source: UNCOMTRADE, 2016

Indonesia's total trade growth rate with South Korea in 2013 was 44.93 percent while in 2014 the growth rate of total Indonesian trade with South Korea decreased. The decline reached 8.06 percent. The highest decrease in total trade growth in 2015 reached 14.82 percent. In general, total trade between Indonesia and South Korea has decreased.

The empirical results of Ritaningsih (2014) shows that overall the trade sector of Indonesia suffered losses due to trade diversion and there's no trade creation. Indonesia's import trade flows with non-member countries ASEAN-Korea is 68 percent less than the level of trade which has been done. The government needs to lower the real exchange rate, negotiating the price of free trade offer to non-member countries to lower and approach the offer price of free trade member countries in anticipating the occurrence of trade diversion, and opening up market access to new products in order to trade creation with the country member.

The Heckscher-Ohlin model is a theory in economics explaining that countries export what can be most efficiently and plentifully produced. This model is used to evaluate trade and, more specifically, the equilibrium of trade between two countries that have varying specialties. Emphasis is placed on the exportation of goods requiring factors of production that a country has in abundance and the importation of goods that the country cannot produce as effectively.

2. LITERATURE REVIEW

The Heckscher-Ohlin model is a theory in economics explaining that countries export what can be most efficiently and plentifully produced. This model is used to evaluate trade and, more specifically, the equilibrium of trade between two countries that have varying specialties. Emphasis is placed on the exportation of goods requiring factors of production that a country has in abundance and the importation of goods that the country cannot produce as effectively (Silitonga et al., 2017).

The Modern International Trade Theory begins when the Swedish economist is Eli Heckscher and Bertil Ohlin put forward an explanation of International trade that has not been able to be explained in the theory of Absolute comparative. Before entering into the discussion of H-O theory, this little writing will poses the weakness of the classical theory that led to the emergence of H-O theory. The Classical Comparative advantage theory explains that international trade can Occurs because of differences in the productivity of labor explicitly stated) interstate (Salvatore, 2014). But this theory is not Provide an explanation of the causes of the difference in productivity. Economic integration in general is the removal (obliteration) of economic barriers between two or more economies (countries). Operationally, defined as the deprivation of discrimination and political unite (wisdom) such as norms, rules, procedures. The instruments include import duties, taxes, currencies, laws, institutions, standardization, and economic policy

According to Salvatore (2014), there are also several stages or sequences before the influence that occurs, are: (1) Free Trade Area, (2) customs union, (3) general market, and (4) monetary union. FTA is one form of response from the presence of globalization, the failure of the multilateral trading system and the liberalization that it implies Reduction and elimination of various barriers to good trade barriers Tariff or non-tariff barriers. In other words, "internal tariff" between countries Members become 0 percent, while each country has an "external Tariff "is different. For example AFTA (ASEAN Free Trade Area) that begins With CEPT (Common Effective Preferential Tariff) which came into force Since January 1, 1993 and the ASEAN-China Free Trade Area (ACFTA) has been in effect January 1, 2010.

Following the specification of Newton's universal law of gravitation in physics, the gravity model utilizes the gravitational force concept as a research instrument to address various investigation purposes in economics and political sciences (Yang & Martínez-Zarzoso, 2013). It has been applied to study the determinants of bilateral trade volumes and performs well in assessing other bilateral flows, namely capital flows, aid flows or migration flows. It has been used to assess the effects of market access, trade resistance and the impacts of regional trade agreements on bilateral trade. In a basic gravity model, trade between country i and country j is proportional to the size of the economies and inversely relates to the distance, a proxy for transportation costs, between them.

According to Anderson (2011) Taking a step toward structure, an intuitively appealing starting point is the description of a completely smooth homogeneous world in which all frictions disappear. Developing the implications of this structure yields a number of useful insights about the pattern of world trade. A frictionless world implies that each good has the same price everywhere. In a homogeneous world, economic agents everywhere might be predicted to purchase goods in the same proportions when faced with the same prices. In the next section the assumptions on preferences and/or technology that justify this plausible prediction are the focus, but here the focus is on the implications for trade patterns. In a completely frictionless and homogeneous world, the natural benchmark prediction is that $X_{ij}/E_j = Y_i/Y$, the proportion of spending by j on goods from i is equal to the global proportion of spending on goods from i , where Y denotes world spending.

3. MATERIALS AND METHODS

This study there are 5 main variables; Import, Distance, Tariff, Exchange rate and GDP per capita. There are one dependent variable is Import and 4 independent variables for the result of AKFTA effect done with approach of gravity model. This research employs the secondary data type

for the quantitative method. Data has been downloaded and collected from legal authorities such as UN Comtrade, WTO, and ASEAN.

Data collected in 10 years range from 2007-2016 as a result of AKFTA. Trading data mostly downloaded from UN Comtrade and will be analyzed by panel data regression. The data collected for this problem is through documentation methods which means collecting data in categories and written clarified data related to problem research rather than legal documents, whether newspapers or other media and etc.

Quantitative analysis refers to economic, business or financial analysis that aims to understand or predict behavior or events through the use of mathematical measurements and calculations, statistical modeling and research. Quantitative analysts aim to represent a given reality in terms of a numerical value. Quantitative analysis is employed for a number of reasons, including measurement, performance evaluation or valuation of a financial instrument, and predicting real world events such as changes in a country's gross domestic product (GDP) growth rate. The model can be showed:

$$M_{it} = a_0 + a_1GDPC_{it} + a_2DITS_{it} + a_3EXC_{it} + a_4DuPol_{it} + e_{i,t}$$

where: M is import country i and y in Million US\$; GDPC is GDP per capita country i and y in million US\$; DITS is Economic distance country i to y; t is year 2007-2016; EXC is exchange rate in US\$; DuPol is AKFTA policy tariff reduction (dummy), AKFTA economies and Top 4 trade partners; a_0 is constant; a_1, a_2, a_3, a_4 is parameters coefficient and e is error term.

4. RESULTS AND DISCUSSION

Import from AKFTA economies to Indonesia increasing from 2009 to 2014. Indonesia's import trade from ASEAN-Korea is dominated by Singapore, South Korea, and Malaysia. The value of imports from Singapore continues to increase from year by year. Because, Singapore is a center of trade and finance as well as a transit point of entry of goods circulating for Southeast Asia. This indicates that the establishment and enforcement of the ASEAN-Korea FTA affects the increase in the value of Indonesian imports.

4.1. AKFTA Policy in Tariff

The inclusion of dummy variable is to determine the effect of the AKFTA Policy. Dummy variables represent qualitative value in 1 and 0. In this case, dummy variables represent AKFTA policies on tariff reduction scheduled from 2007-2016. Value determine for this dummy is 1 if the policies applied, and 0 otherwise. The test uses Gretl application to regress the panel data. Chow test and Hausman test is done to choose the best model. Whether the fixed effect model or random effect model are chosen.

Table 3. The result of model estimation (Fixed Effect)

Variable	Description	Coefficient
C	Constants	4.04786*
Ln GDPC	GDP per capita	1.90134***
Ln EXC	Exchange rate	0.00599
DuPol	AKFTA policy tariff reduction	-0.41209**
LSDV R ²		0,963076
LSDV F		200.5115
Chow Test		1.16342

Source: Processed, 2018

Note: * = 10%; ** = 5%; *** = 1%

To choose between common effect and fixed effect model is through Chow test. If the probability value is significant toward alpha (α), it can be conclude that to choose fixed effect for

the model. The result showed from chow test probability value 1.16342.

Table 4. The result of model estimation (Random Effect)

Variable	Description	Coefficient	t-test
Constant	Constants	4.01062	0,630
Ln GDPC	GDP per capita	1.72069***	8,405
Ln EXC	Exchange rate	-0.01420	-1,566
Ln DITS	Distance country	0.20002	0,928
DuPol	AKFTA policy tariff reduction	-0.34605**	-2,142
R ²		0,548653	
f-test		41,02611	
Schwarz criterion		657,0063	
HQ		648,2751	
Hausman test		0.07212	

Source: Processed, 2018

Note: * = 10%; ** = 5%; *** = 1%

To choose between fixed effect and Random effect model can be resulted through Hausman test. If the probability value significant toward alpha (α), so the option is Random effect model. The hypothesis, H_0 is Random Effect Model; H_1 is Fixed Effect Model. The result estimation showed that cross section probability value from Hausman test as 0.0721225. The result of the test is to choose the best model from both test Chow test and Hausman test. Based on Chow test result as the hypothesis, H_0 rejected if p-value < 0.05 or α otherwise. The result is probability value $1.16342e-030 < 0.05$ H_0 is rejected, and the chosen model is Fixed Effect. Based on Hausman test result H_0 rejected if p-value < 0.05. The result probability value is $0.0721225 > 0.05$ so H_0 is accepted. The best model which use for this research is Random Effect Model.

4.2. Statistics test

4.2.1. Determinant Coefficient

The goodness of fit for the model is showed by the determinant coefficient of R^2 . Where the R-squared result from regression is 0,548653. This is describe that the variation of independent variables (GDP per capita, Exchange rate, distance and AKFTA Policies) affected the variation of dependent variable (Import) as 54 percent. Thus other 46 percent are explaining by other variables in term of error (e).

4.2.2. Statistics of F-test

Based on the result of test F-statistic is 41.02611 is greater than f-table in $\alpha = 5\%$ which is 2,289851. Probability value of f-statistic is significant. Therefore It is shows that the independent variables GDP per capita, Exchange rate, distance and AKFTA Policy affect significantly toward Indonesia Import from AKFTA.

4.2.3. Statistics of t-test

The hypothesis for t-test for the result if p-value of the t-statistic smaller than t table of alpha (α) 0,05 the variable is significantly effect on dependent variable, and vice versa. Minimum 1 dependent variable significantly affect to independent variable. Where p-value of the t-statistic result from each variables:

- (1) GDP per Capita: the effect of GDP per capita variable is can be determine from T-test result value. P-value of GDP Per capita is 0,000; this result is smaller than alpha significance level $\alpha = 0.05$. Therefore the GDP per capita is affect significantly towards Indonesia Import from AKFTA.
- (2) Exchange rate: whether the Exchange rate is affected Indonesia import or not, it is can be find from T-test result. P-value of Exchange rate is 0.8364; this result is higher than alpha significance level $\alpha = 0.05$. Thus the exchange rate is not affect significantly towards Indonesia

Import from AKFTA.

- (3) Distance: the effect of distance as independent variable from Indonesia to AKFTA economies can be found from the P-value of it. Then the P-value of Distance is 0.8015; this result is higher than alpha significance level $\alpha = 0.05$. However, the conclusion is the variable of distance has not affect significantly towards Indonesia Import from AKFTA. How far or near the distance is Indonesia still can become the good partner on trade in AKFTA member.
- (4) Policy (AKFTA): the t-test is to find the effect of AKFTA policy as dummy variable to Indonesia import. P-value of Policy is 0.0386; this result is smaller than alpha significance level $\alpha = 0.05$. Therefore the AKFTA policy is affect significantly towards Indonesia import from AKFTA.

4.2.4. Dummy of Policy

The policy dummy variables in this study are used to capture the difference between the years before and after the ASEAN-Korea FTA are applied for each year. The estimation results show that the policy dummy has a significant and negative effect on the Indonesia Import with the value of coefficient 0.34. The elimination of tariff from AKFTA agreement will increase Indonesia Import as 34 percent. According to integration economic theory AKFTA is the first level of the integration. The Agreement on trade in goods provides the reduction or elimination of tariffs and other barriers of AKFTA. All tariff Lines under the agreement are categorized as Normal Track and Sensitive Track. Korea has progressively eliminate tariff by 2010 for ASEAN-6, Vietnam by 2018, Cambodia, Lao PDR, and Myanmar by 2020.

5. CONCLUSION

Indonesia's import trade flows have increased when the trade agreement of goods in ASEAN-Korea FTA is applied as an impact of regional integration. The Import significantly increasing from 2010-2014 and fall down on 2015. Then back to normal on 2016. GDP per capita positively significant affect to import. The GDP per capita is increasing in stable condition each year. GDP per capita shows the country's ability in trading with countries trading partner. Thus the impact is increasing income per capita and the purchasing power that lead to the consumption.

The exchange rate of national currency to US Dollar from AKFTA and other 4 partners is show negative effect. It means the depreciation in the real exchange rate lead to increase domestic import prices in order to reduce domestic demand for imports. On the other hand the variable of distance has positive value and significantly affected the import. However not become the best consideration because the extra-ASEAN partner also joining the same FTA as same as Indonesia. The AKFTA Policy for progressively eliminate tariff level is still ongoing and its effect is negatively significant. ASEAN 6 have experienced the zero level started on 2010. However, other member Vietnam by 2018, Myanmar, Lao PDR and Cambodia by 2020. The liberalization on trade will happen on 2020.

REFERENCES

- Anderson, James E. (2011). The Gravity Model. *Annual Review of Economics*, 3: 133-160.
- ASEAN. (2013). *ASEAN Community in Figures 2012 (ACIF 2012)*. Jakarta: ASEAN.
- ASEAN statistics. (2015). *ASEAN Statistical Publication*. www.asean.org/aseanstats. [Accessed on 20 September 2017].
- Bacchetta, Marc., C, Beverelli., O, Cadot., M, Fugazza., J-M, Grether., M, Helble., A, Nicita., & R, Piermartini. (2015a). *A Practical Guide to Trade Policy Analysis*. Jenewa, Swiss: World Trade Organization.
- Ritaningsih, T., D. B. Hakim., & Sahara. (2014). Trade Creation dan Trade Diversion antara Indonesia dan Negara-negara ASEAN-Korea, *Jurnal Ekonomi dan Kebijakan Pembangunan*, 3(1), 64-81.

- Salvatore, Dominick. (2014). *International Economics*, Eight Edition, John Wiley & Sons Inc., United States of America.
- Silitonga, Ribka BR, Z, Ishak, & Mukhlis. (2017). Pengaruh ekspor, impor, dan inflasi terhadap nilai tukar rupiah di Indonesia. *Jurnal Ekonomi Pembangunan*, 15(1), 53-59.
- United Nations Comtrade Database. (2016). Import and Export Data. Indonesia. Accessed on 23 September 2017.
- World Trade Organization. (2015b). *World Trade Report 2015-2016*. Jenewa, Swiss: World Trade Organization. Available from: http://www.wto.org/english/res_e/booksp_e/anrep_e/world_trade_report11_e.pdf. [Accessed at 18 July, 2017].
- Yang, S; Martínez-Zarzoso, I. (2013). A panel data analysis of trade creation and trade diversion effects: The case of ASEAN-China Free Trade Area (ACFTA), *Discussion Papers, Ibero America Institute for Economic Research*, No. 224, Ibero-Amerika-Inst.