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Ex Post Analysis of ASEAN-5 Free Trade Area Comparison of the Asian and Global Crisis: The Implementation of the Gravity Model 1998-2018

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Abstract: This research aims to analyze the effects of a free trade agreement on whether it will lead to trade creation or trade diversion as seen from the flow of exports in ASEAN 5 countries including Indonesia, Malaysia, Thailand, Philippines, and Singapore by using the gravity model. This study use quantitative research with secondary data and is estimated with a panel data with the dependent variable is exports of the country origin and destination, while the independent variables are income of the country of origin or GDP, destination country income, a distance between countries, populations of countries of origin, populations of countries of destination, the similarity of languages, and land borders for 21 years from 1998 to 2018, which are divided into two equations of two phenomena that are considered to influence export variables as a dependent, namely post-Asian crisis (1998-2008) and post-global crisis (2009-2018). The results of this study are evidenced by some significant variable values that are considered affect export flows and it can be concluded that the existence of a free trade agreement will create trade creation and a crisis can also affect the rate of trade flows seen in the export curve in 1998 and 2009. The majority of countries in the study experienced a decline when the crisis occurred.

***Keywords**: Free Trade Agreement, Gravity Model, Trade Creation, Trade Diversion, Crisis*

INTRODUCTION

The value of export flows between ASEAN member countries has experienced a high level of fluctuation, this is due partly to phenomena that affect the economy such as crises. It is interesting to examine in this study the effect of the crisis phenomenon which is thought to affect the country's economy seen from the flow of exports between countries which I will associate with the enactment of a free trade agreement which is developing so rapidly, according to Asean Development Bank data in 2019 that recorded 119 free trade agreements materialized in 5 ASEAN countries, Indonesia 22, Malaysia 25, Thailand 24, Philippines 12, and Singapore 36, this shows that the enthusiasm of ASEAN countries is very high to join in this cooperation. Of course, with this it will be an interesting discussion to prove whether the existence of a free trade agreement will have a positive (trade creation) or negative impact (trade diversion), supported by several studies which state that the existence of a free agreement will encourage an increase in trade flows with trade creation such as in Yuniarti's (2008) study examining the determinants of bilateral trade in Indonesia, Baier et al. (2019) examined the 20 years of economic integration in the U.S./E.U FTA which touched on the two effects of trade agreements on trade creation and trade diversion, Aviji et al. (2016) in an ex post analysis of the India-ASEAN Free Trade Agreement or between India and ASEAN countries, Yuqing et al. (2018) analyzed the efficiency of the Free Trade Agreement in Vietnam, Clark & Don P (2011) examined the adjustment factors after the existence of the Free Trade Agreement between the United States and Thailand, Kikuchi et al. (2017) analyzed the effects of the Mega-Regional Trade Agreement in Vietnam.

Meanwhile, some studies deny that the implementation of free trade agreements will have an effect on increasing trade flows with a negative effect on trade diversion, as in research conducted by Chaoying Qi & James Xiaohe Zhang (2018) which states that free trade agreements lead to trade diversion for countries that are included in the rest of the world, Csilla Lakatos & Terrie Walmsley (2012) which states that trade diversion due to free trade agrement occurs in third countries that are not members, Dai et al. (2014) which in its research of 41 trading partners including 40 separate countries and a rest of the world (ROW) aggregate, consisting of 24 additional nations, states that trade diversion occurs more strongly for members who import than for members who export and still stronger for internal trading. Based on the two opinions above, this study wants to prove whether the free trade agreement in ASEAN 5 will create trade creation as a positive effect or trade diversion as a negative effect that will be seen from the export flows that occur between countries. In this study, it is also discussed how the comparison the effects of free trade agreements seen from export flows to the economic crisis, this is an interesting thing to discuss because the crisis can be a trigger factor for the realization of a free trade agreement or an obstacle to the implementation of a free trade agreement.

LITERATURE REVIEW

Economic Integration

Economic integration is the creation of a free international economic structure by removing trade restrictions or trade barriers designed to support free trade by creating all forms of cooperation (Salvatore, 1996). Solvatore (1996) describes economic integration as taking several forms:

a. Preferential Trade Arragements are formed by countries agreeing to lower trade barriers between themselves and differentiate them from non-member countries.
b. The Free Trade Area (Free Trade Area) where all trade barriers, both tariffs and non-tariffs between member countries are completely eliminated, but each member country still has the right to determine for itself whether to maintain or eliminate trade barriers that are applied to non-member countries.
c. The Customs Union requires all member states to not only remove all forms of trade barriers between them, but also uniform their trade policies towards other non-member countries.
d. The common market (Common Market) is a form of integration in which not only trade in goods is freed but the flow of production factors such as labor and capital is also freed from all obstacles.
e. Economic Union (Economic Union), namely by homogenizing the monetary and fiscal policies of each member country in a region or for countries that make an agreement.

Krugman & Obstfeld (2000) introduced an assumption that naturally the trading bloc is based on a geographical approach that can provide efficiency and increase the welfare of its members. In this case economic integration has led to trade liberalization between countries. In the context of this research is the ASEAN Free Trade Agreement (AFTA) free trade agreement. AFTA was formed at the 4th ASEAN Summit (Summit) in Singapore in 1992. The formation of AFTA is an effort of several countries in carrying out economic integration in the world of international trade. According to Okabe & Misa (2014), they state several motives behind the formation and implementation of AFTA. First, ASEAN policymakers think that the expansion of intra-ASEAN trade will boost the economic development of ASEAN countries because export expansion will result in output growth and import expansion will increase production efficiency.

In particular, the creation of trade liberalization by ASEAN through AFTA will enable producers in ASEAN to exploit the benefits arising from economies of scale. Second, the trend of increasing regional trade agreements (RTA) in the world, which includes FTAs and other regional cooperation, which results in pressuring ASEAN members to form FTAs, because they see that such a trend will result in discrimination against their products in their export markets. Third, the Asian financial crisis in 1997-1998 increased momentum for regional economic cooperation in the region. The elimination of tariffs under AFTA is accelerated to strengthen economic stability and attract further foreign direct investment from outside the region. Krugman (2012) one of the effects of FTA is a dynamic effect which is an increase in competition and efficiency at economies of scale for intensive business, and closer cooperation between countries in general. Efficiency can be achieved because the losses due to tariffs and distortions on the producer and consumer side can be eliminated. In addition, FTAs are able to induce capital inflows from within and outside the country.

Trade Creation And Trade Diversion Theory

The impact of the formation FTA are trade creation and / or trade diversion experienced by member countries. According to Viner (1950), trade creation occurs when a reduction in import tariffs is carried out by partner countries to replace high domestic production costs, this has an impact on increasing welfare. On the other hand, trade diversion occurs when the elimination of tariffs causes trade to be diverted from a third country to a partner country even though the third country will be a source of low import costs provided they get the same treatment. Deborah et al, (2019) stated that trade diversion in its simplest form occurs when an importer gives a new tariff preference for one of its trading partners while leaving a third country at a disadvantage. Meanwhile, Foster et al. (2011) stated that on the one hand, there is a trade creation effect that comes from eliminating distortions between the relative prices of domestic goods and those of other members. On the other hand, there is a potential trade diversion effect due to the introduction of a distortion between the relative prices of members and non-member goods.

Gravity Model

Nobel laureate Jan Tinbergen (1962) was the first to publish an econometric study using the gravity equation for international trade flows, and basically tried to explain the flow of trade volume between the two countries by considering the size of the two economies as well as the distance between them which included evaluating the effect of the dummy variable FTA on trading. Many previous studies have used this gravity model to analyze the effects of a free trade agreement, such as in the research of Baier et al. (2004, 2007, 2014, 2018) state the same thing about the use of a gravity model to analyze the effects of trade agreements and can better explain the analysis of trade patterns than more theoretical models that only fully predict a country's specialization in producing a commodities and does not directly include the supporting factors. Krugman (2012) In this case, the initial reason for the creation of the gravity model is an analogy with Newton's law of gravity.Just as the gravitational attraction between two objects is proportional to their mass product and decreases with distance, in this context the trade between the two countries is the same. and is proportional to the product of their GDP and decreases with distance.

Empirical Study

In several previous studies on the effects of free trade agreements, such as research conducted by Dai et al (2014) which also uses a gravity model, this study identifies a shift in

securities trading from FTA. The results of this study find that trade diversion is stronger for imports between members than for exports between members and still stronger for internal trade, indicating that internal trade creation increases in the number of FTAs, but diversion of international trade is not. Further research is needed to examine why trade diversion may not be felt uniformly across all non-member trade flows.

Research conducted in India on the effects of the ASEAN free trade agreement on the manufacturing sector states that the results of the ex post analysis of the free trade agreement on the manufacturing sector are influenced by world economic conditions such as the global crisis. In this study, it is stated that choosing to sign an FTA during a period of recession could result in losses or have a negative impact on trade flows, unless the Indian government can liberalize more trade flows for elastic goods against inelastic goods or simultaneously sign the same agreement with the whole world to continue to have wide trade opportunities with this trade creation will still be formed. India has signed or is currently planning to sign FTAs with various countries: Bangladesh, Sri Lanka, Thailand, South Africa, Chile, Argentina, Brazil, Paraguay, Uruguay, European Union, etc. (Aviji et al., 2016)

Previous research also analyzed the same thing regarding the effects of free trade agreements that occurred in Vietnam by Yuqing et al. (2018) who concluded that the factors that affect the efficiency of free trade agreements in triggering exports or the realization of trade creation are bilateral or multilateral trade agreements by eliminating trade barriers, while the Rules of origin limit the effect of trade creation. In addition, in the research of Clark & Don P (2011) the free trade agreement between the US and Thailand has the impact of increasing production and stimulating trade in other words, it can realize trade creation in both countries. The resulting trade flow will have two components: trade between industries and intra-industry.

Research conducted by Kikuchi et al. (2017) entitled "The Effects of Mega-Regional Trade Agreements on Vietnam" analyzes the free trade agreements that Vietnam followed (totaling 12 free trade agreements), one of which is the ASEAN Free Trade Area (AFTA) whether it will have an impact on economic growth seen from the capital accumulation, labor supply and increased production using the Computable General Equilibrium (CGE) method. This study concludes that the reduction in trade barriers results in an increase in exports and imports, making Vietnam a country that is more implementing an open economy, which encourages increased production, resulting in development or increased wages, causing increased labor supply.

Research conducted by Yotov et al. (2014) regarding the results of the existence of a free trade agreement including the first, FTA has a significant positive impact economically and statistically on bilateral trade flows between member countries. Second, there is evidence for the resilience of FTAs with both negative and positive effects from time to time. For example, several mineral sectors have experienced a decline. Conversely, the effect of FTAs has a positive effect on several categories such as chemicals and some machinery and even increases in the metals sector. Third, estimates from one of the variables show that the effect of FTAs for most sectors is still strong nine years after entry into force, in contrast to the aggregate finding of Baier and Bergstrand (2007) that the effects of FTA should dissipate within about ten years of implementation. It can be concluded that in this study free trade agreements have a negative (trade diversion) and positive (trade creation) effect on certain sectors.

Research conducted by Yuniarti (2008) explains that the existence of a free trade agreement in the context of his research affects Indonesia's economic growth. The results obtained in his research found that the existence of a free trade agreement will create trade or trade creation, seen from the results for exporters and importers' GDP, importer population, and equality of economic size have a positive effect, so that it is considered to increase trade

flows through exports between countries. While the distance variable has a negative effect because it will increase transportation costs and is considered to reduce trade flows through exports between countries.

Research conducted by the Ministry of Trade (2016) on "Analysis of Increasing Intra ASEAN Trade in the Context of Increasing Indonesian Exports" in ASEAN 6 countries. In this study using a gravity model, and the results of this study indicate factors that affect the increase in intra ASEAN trade including distance, GDP, population, Logistic Performance Index, and government governance, these factors are considered to play an important role in increasing the flow of exports between countries or can realize trade creation.

Hypothesis

In this study the author's hypothesis is:

a. The GDP variable (GDP of destination and origin countries) is thought to have a positive effect on exports among ASEAN 5 (five) countries.
b. The distance variable is thought to have a negative effect on exports between ASEAN 5 (five) countries.
c. Population variables (population of origin and destination countries) are thought to have a negative or positive effect on exports among ASEAN 5 (five) countries.
d. The language dummy is thought to have a positive effect on exports among ASEAN 5 (five) countries.
e. The land border dummy is thought to have a positive effect on exports between ASEAN 5 (five) countries.

RESEARCH METHODS

The scope of research

The scope of the problem in this study includes 5 ASEAN countries including Indonesia, Malaysia, Thailand, the Philippines, and Singapore which are members of AFTA. The data in this study uses 21 years of secondary data from 1998 to 2018 which will be divided into two major phenomena, namely the post-Asian crisis 1998-2008 and the 2009-2018 global crisis.

Types and Sources of Data

This research is a quantitative study using secondary data including time series data and cross section or panel data. Data sources for research materials include: Export variables (US $) sourced from the Trade Map, GDP Origin (US $) and Destination GDP (US $) variables sourced from the World Bank, the Population Origin and Destination Population variables were sourced from the World Bank, the Distance variable sourced from CEPII, the language similarity variable (dummy) and land border (dummy) comes from the author's calculations.

Data Analysis Techniques

The analytical method used in the study used panel data analysis with a gravity model. Econometric analysis with gravity panel data regression is used to see the relationship between trade flows and the country's economy. Panel data is a combination of cross section data which is the same observed according to time or time series (Gujarati 2004). If each cross section unit has the same number of time series observations, it is called a balanced panel. Conversely, if the number of observations is different for each cross section unit, it is called an unbalanced panel.

According to Baltagi (2005), there are several advantages of panel data, namely being able to control individual heterogeneity, providing more information and variation, reducing

collinearity between variables, increasing the degree of freedom so that it is more efficient, better for the study of dynamic adjustments, being able to identify and measure effects that simply cannot be obtained from pure cross section and time series data, and can test and build more complex behavioral models. However, panel data analysis has several limitations, namely the design of the panel survey, data collection and management, interference in measurement errors due to inappropriate responses, selectivity which includes self-selectivity. In a study conducted by Baier et al. (2014) several years ago that panel techniques in conjunction with a precisely determined gravity model were essential for finding unbiased and precise EIA estimates. This panel data analysis uses the help of STATA 14 software.

Research Model

This research uses quantitative methods. Quantitative methods are used to analyze the impact of the ASEAN Free Trade Area treatment, whether it results in trade creation or results in trade diversion. The model used was adopted from previous research by Baier and Bergstrand (2007) on the basis of the gravity model, namely:

$$Xit = f(Yit;\beta)exp^{(\varepsilon_{it} - u_{it})}$$

Xit is a bilateral trade relationship between two countries, f (Yit; B) are the factors determining potential trade with natural resistance, and β is a vector of unknown parameters, to be estimated. εit and uit are error terms. This research was conducted on two periods of the phenomenon, namely post-Asian crisis and post-global crisis, the following model can be written:

The post-Asian crisis period (1998-2008)

LnEKijt = β0 + β1lnGDPit + β2lnGDPjt + β3lnPOPit + β4lnPOPjt + β5lnjarakijt + εijt

The post-global crisis period (2009-2018)

LnEKijt = β0 + β1lnGDPit + β2lnGDPjt + β3lnPOPit + β4lnPOPjt + β5lnjarakijt + εijt

Model Specifications

To assist in the determination of the Indicator Gravity Model, which shows the flow of bilateral trade through variables supporting or inhibiting the flow of trade between countries of origin or destination countries, in this study, a dummy variable is added, namely language similarity, which describes whether or not the use of language between countries is present research is also considered a triggering factor for trade cooperation between countries. The second dummy variable, namely the existence of land borders, which describes whether or not there are land borders between countries in this study is also considered to be the driving force for the increased interaction of trade flows between countries. These two variables will have an influence on the ongoing free trade agreement. With the dummy variable in the model, the equation to be used is as follows:

The post-Asian crisis period (1998-2008)

LnEKijt = β0 + β1lnGDPit + β2lnGDPjt + β3lnPOPit + β4lnPOPjt + β5lnjarakijt + β6lnbahasaijt + β7lnperbatasanijt + εijt (3.4)

The post-global crisis period (2009-2018)

LnEKijt = β0 + β1lnGDPit + β2lnGDPjt + β3lnPOPit + β4lnPOPjt + β5lnjarakijt + β6lnbahasaijt + β7lnperbatasanijt + εijt (3.5)

Keterangan:

Ekij : Export country I ke j

Gdpit : Country GDP I time t

Gdpjt : Country GDP j time t
Popit : State population I
Popjt : State population j
Jarakijt : The distance from country I to country j
Bahasa (dummy) : There is similarity in language (1) on the contrary (0)
Perbatasan (dummy) : The existence of land borders (1) otherwise (0)

RESULTS AND DISCUSSION

Model Selection in Panel Data Processing

Model selection is used to select the best model in the study, the test used is the Chow Test, Multiple Lagrange Test, and Hausman Test. The Chow test or F test is used to select the Pooled Least Square model with Fixed Effect, the Lagrange Multiple test is used to choose between Pooled Least Square and Random Effect, and the Hausman test to select a model between the fix effect and the random effect. After doing the selection test, the authors used the probability value to determine the model selection compared to alpha 5%. The results include the chow test between the PLS model and the Fix effect model with the F test yielding prob 0.000 (F test) for the first post-Asian crisis equation, prob 0.000 (F test) for the second post-Global crisis equation.

The prob value of the two equations is smaller than alpha 0.05 which means that the fix effect is more feasible to use for the two equations, after that a multiple lagrange test is carried out to see the feasibility between the random effect model and the PLS model, resulting in prob 0.000 (Prob> chibar2) for the first equation. post Asian crisis, 0.000 (Prob> chibar2) for the second equation after the Global Crisis. The prob value of the two equations is smaller than alpha 0.05, which means that the results of the random effect model are more suitable for both equations and for testing the final model selection between the fix effect model and the random effect model using the Hausman test, a prob with a value of 0.000 (Prob> chi2) is produced for the first equation after the Asian crisis, 0.001 (Prob> chi2) for the second equation after the global crisis. The prob value of the two equations is smaller than alpha 0.05, which means that the fix effect model is more suitable for use in research for both equations.

Comparison of statistical test results between PLS, REM, and FEM which shows the coefficient, probability level with star simoles, and standard errors can be seen in the following table:

Table of Statistical Test Results for the Post-Asian Crisis Equation

VARIABLES	(1) OLS Model	(2) Fix Effect Model	(3) Random Effect Model
GDP Origin	1.315669**	3.401018**	1.784573**
	(0.0809369)	(0.5917895)	(0.1649884)
GDP Destination	0.764708**	-.0611318	1.034935**
	(0.0800243)	(0.5917895)	(0.163183)
Distance	-0.3868642**		-0.9618562**
	(0.1248898)		(0.4417415)
Similarity in Language	-0.2297442		-0.9044848**
	(0.1352264)		(0.4484034)
Existence of Land Borders	0.1732083**		-0.1913467
	(0.0855181)		(0.2213871)
Population Origin	-0.8075617**	-2.055068**	-.8849784**
	(0.0370188)	(0.8953504)	(0.1031767)
Population Destination	-0.5760209**	-1.015054	-0.6225676**

VARIABLES	(1) OLS Model	(2) Fix Effect Model	(3) Random Effect Model
	(0.038926)	(0.8953504)	(0.1023545)
Constant	-5.32683	-11.51967	-17.87225**
	(2.785445)	(13.0956)	(3.473493)
Observations	220	220	220
Adj. R-squared	0.8649	0.7543	0.7452

Source: Data Processing Results, STATA Output (2020)
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table of Statistical Test Results of Post-Global Crisis Equations

VARIABLES	(1) OLS Model	(2) Fix Effect Model	(3) Random Effect Model
GDP Origin	1.315428**	1.585348**	1.413554**
	(0.0975741)	(0.1072763)	(0.0993725)
GDP Destination	0.4450013**	0.7308752**	0.5446132**
	(0.0977451)	(0.1090048)	(0.0996867)
Distance	-0.8239278**	-1.102445**	-0.849862**
	(0.1911409)	(0.1624714)	(0.1840972)
Similarity in Language	-0.4790555**	-.8342901**	-0.572899**
	(0.189975)	(0.1868646)	(0.1853942)
Existence of Land Borders	0.2251556**	0.0697658	0.2333854
	(0.1017344)	(0.0796006)	(0.0979223)
Populasi Origin	-0.26299**	-0.297258**	-0.286040**
	(0.0449884)	(0.0422899)	(0.0439644)
Populasi Destination	-0.6252276**	-0.6581709**	-0.648154**
	(0.0454845)	(0.042535)	(0.0444275)
Constant	-2.33702	-13.74918**	-6.573705
	(3.503134)	(3.989006)	(3.652223)
Observations	200	200	200
R-squared	0.7936	0.8350	0.8359

Source: Data Processing Results, STATA Output (2020)
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Model Assumption Testing or Classical Assumption Test

After the model selection test used in this study is the fix effect model for the two equations in the study, then a classic assumption test is carried out to see whether the model used can provide results that are considered good and unbiased because one of the classical assumption test functions describes an unsatisfactory result. bias and kind. The results of this test will be assessed through the probability number, the first is the autocorrelation test which functions to test whether in the multiple linear regression model there is a correlation between the confounding error in period t with the confounding error in period t-1 (previous). If there is a correlation, it is called an autocorrelation problem. and a value of 0.000 (Prob> F) for both

equations, resulting in Autocorrelation problems because the second value (Prob> Chi2) <Alpha (0.05) is multicollinearity which serves to see a strong linear relationship between independent variables in the regression equation multiple and the value is 3.87 for the first equation 4.33 for the second equation with this result it can be stated that there is no multicollinearity because the value obtained is less than 10 or the VIF value.

Third, heteroscedasticity which functions to test whether the regression model does not have the same variance from the residuals from one observation to another and the value is 0.000 (Prob> chi2). This heterocedasticity test is carried out using the Breusch-Pagan method. Judging from the value Prob> Chi2 is smaller than 0.05, with this result it can be stated that there is a heteroscedasticity problem, the fourth is normality which functions to see whether the residual value is normally distributed, which is tested by Skewness / Kurtosis tests for Normality and the value is 0.7835 for the value. Export of the first equation, 0.0715 for the export value of the second equation, with this result it can be stated that the assumption of normality will be fulfilled if the p-value is greater than the value of α 5%. Because the p-value is greater than alpha, only exports and other variables are smaller than alpha 5%, then the residual data is normally distributed only for the export variable. With the results of these 4 classical assumption tests on two equations, it can be concluded that in this study there are three the test that does not pass and only one classic assumption test that passes is multicollinearity.

Goodness of Fit Test

After the classical assumption test is carried out to test the hypothesis using the goodness of fit test, which consists of the t test, f test, and adjusted r square test.

Table of Statistical Test Results of the Post-Asian Crisis 1998 Equation

Variable	Uji t			Uji F		R2	Coefficient	Konstanta
	p>|z|	z	t/z tabel	Prob	F			
GDP ORIGIN	0.000	10.82	1.971217013	0.0000	697.40	0.7452	1.784573	-17.87225
GDP DESTINATION	0.000	6.34					1.034935	
DISTANCE	0.029	-2.18					-0.9618562	
DUMMY LANGUAGE	0.044	-2.02					-0.9044848	
DUMMY BORDERS	0.387	-0.86					-0.1913467	
POPULATION ORIGIN	0.000	-8.58					-0.8849784	
POPULATION DESTINATION	0.000	-6.08					-0.6225676	

Source: Data Processing Results, STATA Output (2020)

Table of Statistical Test Results of the Post-Global Crisis 2008 Equation

Variable	Uji t			Uji F		R2	Coefficient	Konstanta
	p>|t|	t	t tabel	Prob	F			
GDP ORIGIN	0.000	14.78	1.972396491	0.0000	132.26	0.8350	1.585348	-13.74918
GDP DESTINATION	0.000	6.70					0.7308752	
DISTANCE	0.000	-6.79					-1.102445	
DUMMY LANGUAGE	0.000	-4.46					-.8342901	
DUMMY BORDERS	0.382	0.88					0.0697658	
POPULASI ORIGIN	0.000	-7.03					-0.297258	
POPULASI DESTINATION	0.000	-15.47					-0.6581709	

Source: Data Processing Results, STATA Output (2020)T test

The function of the t test is to determine the effect of the independent variable on the dependent individually per variable which is determined based on the probability level of the variable compared to alpha, in this study it is 5% (0.05) and the statistical t value contained in the regression results if the t statistical value is more greater than the t value or t table sta> t table, then the variable is considered significant to affect the dependent variable and if the probability value is less than alpha 5% it is considered to have a significant effect, for the first variable, GDP origin and destination, it has a probability of 0.000 and the t statistical value. which is greater than t table of 10.82, 14.78 for the two equations respectively so that it can be concluded that these two variables are GDP origin and destination for both equations have a significant effect on export flows.

The distance variable has a probability of 0.029, 0.000 for the two equations consecutively and a statistical t value that is smaller than the t table of -2.18, -6.79, for the two equations in sequence with a negative coefficient it means that the distance variable has a significant negative effect on the dependent variable. export, the dummy variable for language similarity and land borders has a probability of 0.044, 0.000 (language similarity variable) 0.387, 0.382 (land border variable) for the two equations respectively and a statistical t value that is greater than the table of -2.02, -4.46 (variable language similarity), -0.86, 0.88 (land border variable) for the two equations respectively. It can be concluded that this variable significantly affects the dependent variable for the language similarity variable, while the land border variable does not significantly affect the dependent variable. The origin and destination population variables have a probability of 0.000, 0.000 (population variable origin) 0.000, 0.000 (destination population variable) for both equations respectively and a statistical t value that is smaller than the table of -8.58, -7.03 (population variable origin) 6.08, -15.47 (destination population variable) for the two equations respectively It can be interpreted that this variable has a significant effect on the dependent variable with a negative coefficient.

F Test

The function of the f test is to see the effect of the independent variable on the dependent variable together as seen from the pro f value compared to alpha 5% and the f test value is compared to the f table value if f test> f table can be interpreted that together the independent variable affects the dependent variable. In the results of the test above, the prob> F value of 0.0000 is obtained, this number is smaller than the α value of 0.05 and the Ftest (Wald chi2) value of 697.40 for the first equation and 132.26 for the second equation. While the Ftable value with α of 0.05 and a df value of 212 (n-k value of 220-8) obtained a figure of 2.052966159. So that the value of Ftest> F table for the first equation and the value of Ftable with α of 0.05 and a df value of 192 (n-k value is 200-8) obtained a number of 2.057530808. So that the value of Ftest> Ftable for the second equation. So together the two equations of GDP origin, destination GDP, distance, language as dummy, border as dummy, origin population and destination population have a significant effect on exports of country i-j.

Adjusted R Square

The function of this test is the determinant coefficient (R2) which shows how much the percentage of variation in the independent variables used in the model is able to explain the variation in the dependent variable. The value of the determinant coefficient (R2) from the regression results above shows that the value of R-sq within is 0.7452 for the first equation and 0.8350 for the second equation or 74.52% for the first equation and 83.50% for the second equation, which means the ability of the variable GDP origin, destination GDP , distance, language similarity as a dummy, the existence of land borders as a dummy, population of origin and population of destinations in explaining the export variable between origin and destination countries is 74.52% for the first equation and 83.50% for the second equation, while the remaining 25.48% for the first equation and 16.50 % for the second equation is explained by another variable outside of the model.

Discussion

Discussion on the goodness of fit test which explains the level of influence of the independent variable on the dependent with the t test, f test, and adjusted R squared test. The results of several significant variables affect the dependent variable including GDP origin, destination GDP, distance, dummy variable language similarity, population origin and the destination population seen from the probability, t test, prob f, f test, and adjusted r square, while for the dummy variable the land border has insignificant results. The results of the research on the analysis of the effects of the ASEAN free trade agreement which are divided into two equations into the first two phenomena after the Asian crisis and the second after the global crisis have the results of the coefficient relationship on each variable and the same research results. The results of this study are supported by several previous studies such as research by Yuniarti (2008), Baier et al (2019), Aviji et al (2016), Yuqing et al (2018), Clark & Don P (2011), and Kikuchi et al (2017).)

Other studies which consider the existence of a free trade agreement will lead to trade creation. A brief explanation recognizing the results of his research includes, Yuniarti (2008) which states that the increase in GDP of the country of origin or destination country shows the greater production capacity of the country so that the urge to export is higher, on the other hand it can also be interpreted that an increase in GDP causes an increase in absorption capacity, so that imports will increase or the realization of a trade creation. Yuniarti (2008) also states that the distance variable which is a proxy for transportation costs has a negative effect on bilateral trade. This is because distance will increase transportation costs so that it will

reduce trade flows. In the context of this study, the flow of exports between countries. However, this effect can actually be reduced, since distance is not the only cost that must be borne, other costs such as shipping and time. So that the development of the shipping sector can reduce costs borne by exporters or importers.

In research from Okabe & Misa (2014) regarding the results of their research entitled "The impact of AFTA on intra-AFTA trade" which examines the impact seen from various export sectors, states that regarding the distance coefficient, significant and negative values are found in most products in the case of export and manufacturing materials, while machinery and transportation equipment in the case of imports. This would imply that transportation costs are still an important factor for ASEAN countries' imports and exports.

The results of negative population variables are supported by research by Veeramacheneni et al (2010). A negative population sign that implies that there is an increase in population occurring in a partner country, the demand for imported goods in that country has decreased so that exports from the country of origin also decrease. One explanation for this result is that as the population of partner countries increases, there is an increase in the workforce. As a result, there is an increase in the total domestic product produced, so that the demand for imported goods is reduced.

This result is also supported by the research of Inmaculada et al (2014) in which the population is considered to be likely to be negatively correlated with trade flows, because a larger population implies a larger domestic market, richer resources and more diverse results, and more. little reliance on international specialties. In this study it was also considered that population size may have a negative impact on exports if countries export less, when their population becomes larger (because they depend more on internal trade) or a positive effect if they export more when they become bigger because they are able to achieve economies of scale. The size of the population will have the same effect on imports.

The border dummy has insignificant results. Try to explain this from a book (Krugman 2012) which states There is clearly some truth to this statement: the Internet allows instant and almost free communication between people thousands of miles apart, while jet transport allows fast physical access. to all parts of the world. This is the reason why borders between countries are not very important in today's era because land transportation is less efficient than sea and air transportation which is advanced in the present era and is certainly more efficient.

The language dummy has a negative relationship and the probability is significant, this means that official language similarity has an already non-vital influence in influencing the flow of trade, because the common language that is currently often used is the international language that is predominantly controlled in every country. Language similarity as a dummy variable is used in this study as one of the variables which is the standard variable in the gravity model. This result is supported by research from the Ministry of Trade (2016), this study uses the comlang_off dummy variable in the criteria showing at least 20 percent of the population of both countries uses the same language.The results of the analysis of this study both show the comlang_off variable or language similarity has a negative and significant effect on export performance. commodity BEC-21 ASEAN6 member countries, 20 percent language similarity between countries does not increase the flow of exports of ASEAN6 countries, on the contrary, it causes a decrease in the export performance of ASEAN6 countries.

CONCLUSION AND SUGGESTIONS

Conclusion

1. The impact of AFTA implementation on trade creation on exports of ASEAN 5 countries can be proven through the results of each variable affecting exports of each country consisting

of GDP of the country of origin, GDP of destination countries, distance between capital cities or economic centers, two dummy variables (similarity in language and land borders), the population of the country of origin, and the population of the country of destination which are simultaneously proven through the t test, f test and the adjusted R square test to be significant for both equations, except for the dummy variable for the presence of land borders between countries whose probability is not significant, Exports are considered not to affect trade flows in the context of this study. The ASEAN Free Trade Agreement will create a trade creation or trade creation that can be seen by the significance of the results of the analysis of several variables that are positively related to export flows and trigger an increase in exports which is also an indicator of free trade agreements. For example, the GDP variable (origin and destination) with a positive coefficient and significant probability according to the above results is stated to have a significant effect on exports as the dependent variable, so that an increase in a country's GDP will increase exports between countries or will create trade creation.

2. The impact of AFTA implementation on trade diversion on exports of ASEAN 5 countries can be proven by the results of the analysis above which show that trade diversion arises when a member country experiences a decrease in trade flows due to several factors such as in the research variable, when the Population variable has increased , export flows from other countries tend to decline because an increase in production factors can meet internal demand. Trade diversion is suffered by partner countries whose export flows are reduced and the distance variable which symbolizes transportation costs that must be borne has a negative relationship, which means that the farther the distance the lower the opportunities for export interactions between countries.
3. Comparison of the impact of the Asian crisis phenomenon and the global crisis on the sustainability of the free trade agreement. The results of the analysis of the crisis phenomenon that disrupts the country's economy, especially the decline in trade flows, obtained a comparison between the two post-Asian and global crisis equations which can be concluded to have the same results statistically, but for export flows shown in the graph for 22 years from 1996 to 2018, it is shown that the dominant export flows fell during the global crisis compared to the Asian crisis.

Suggestions

From this research, we can see that free trade agreements have a significant effect on trade flows between countries, but the data obtained shows that the role of the state is not maximal in taking advantage of existing opportunities so that the effects received are not evenly distributed among all member countries. This encourages the author to provide suggestions in the form of:

1. Improving the quality of the product so that it can compete with countries outside the member countries so that trade diversion does not occur and improvement of the system or internal regulations of the country in encouraging the process of export flows or encouraging trade creation.
2. Maximizing cooperation regulations in this research ASEAN free trade area that can benefit member countries.
3. This research will be more interesting to write by future researchers if it uses more significant data such as quarterly or monthly which will produce stronger and unbiased results, as well as modification of variables that better explain the effect and use stronger methods.Daftar Pustaka

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