The Analysis Export Trend of Indonesia to ASEAN Countries

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Abstract: This research aims to analyze Indonesia's export trend in ASEAN countries. By using time series data from 2004 to 2018, the research method used is trend analysis, cointegration test and causality test between Indonesian GDP, inflation and rupiah exchange rate against US dollars. The results showed that over the next 10 years Thailand and Cambodia are two countries exporting destinations of Indonesia to ASEAN countries that show positive trends and tend to stabilize. There is no long-term balance relationship between Indonesia's exports to Thailand, Indonesian GDP, inflation and the rupiah exchange rate against US dollars. And there is a long-term balance relationship between Indonesia exports to Cambodia, Indonesian GDP, inflation and the rupiah exchange rate against US dollars. So Indonesia's export performance to Thailand and Cambodia has a causality relationship to Indonesian GDP which means that it affects the increase in domestic economic growth.
Keywords: Export, GDP, Inflation, Exchange Rate, Trend


I.   Introduction

Indonesia is one of the countries in the world that embraces an open economy system. The existence of foreign trade activities encourages the economic growth of the country in a better direction. Benefiting from international cooperation supports the development of certain goods in a country. Increased production in a certain period can encourage activities to sell overseas goods called exports.

The more open every country in trading encourages the creation of increasingly rapid globalization. Facing this fact, Indonesia as a country that adheres to an open economic system should be able to anticipate and utilize the situation so as to get maximum benefit. The countries of the world in the open economy rely heavily on exports in terms of economic enhancement. This is because export activities will affect the economic pace in the country, where the higher the export will improve the trade balance of Indonesia and will increase the opportunities for new jobs[1].

Indonesia is one of the countries in the ASEAN region that serves to fulfill the consumption needs of the nation's population in the ASEAN region including Malaysia, Singapore, Thailand, Philippines, Brunei Darussalam, Vietnam, Laos, Myanmar, Cambodia. The following is the rate of Indonesia's export growth to countries in the ASEAN region.

ForthehighestexportgrowthtoMalaysiain2010is37.44percentandthelowestin2015isnegative 21.59 percent. To Singapore, the highest export growth in 2011 is 34.40 percent and the lowest in 2015 is negative 24.59 percent. To Thailand, the highest export growth in 2010 is 41.21 percent and the lowest in 2009 is negative 11.67 percent. To Brunei Darussalam, the highest export growth in 2013 is 50.08 percent and the lowest in 2017 is negative 27.19 percent. To the Philippines, the highest export growth in 2016 is 34.40 percent and the lowest in 2006 is negative 0.95 percent. To Vietnam, the highest export growth in 2006 is 55.06 percent and the lowest in 2009 is negative 13.07 percent. To Laos, the highest export growth in 2012 is 176.31 percent and the lowest in 2013 is negative 75.42 percent. To Myanmar, the highest export growth in 2007 is 90.54 percent and the lowest in 2009 is negative 30.31 percent. And to Cambodia, the highest export growth in 2008is 42.82 percent and the lowest in 2016 is negative 0.10 percent.
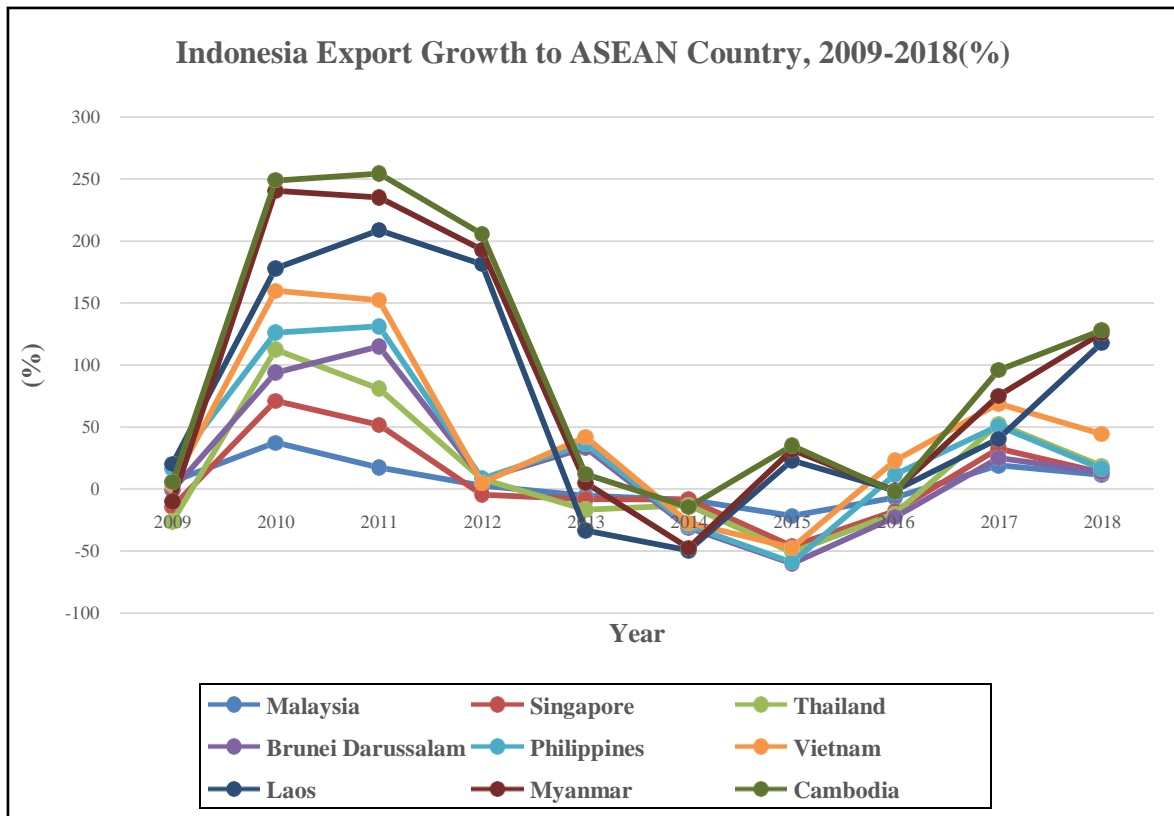
Source: UN Comtrade Data (processed), 2009-2018
Figure 1. Indonesia Export Growth to ASEAN Country, 2009-2018 (%)

A high country's economic growth encourages high public consumption. To meet the consumption needs of people in the country besides producing their own, a country also needs the role of other countries as a form of cooperation in the world. International trade clearly provides benefits for both the producer and the country as the consumer. One of the measuring instruments of a country's economic growth can be seen from the value of Gross Domestic Product/GDP per certainperiod.

In international trade, the rupiah exchange rate against the US dollar and the rupiah exchange rate against the U.S. Dollar greatly influenced the trend of Indonesia's export value in the world market. Benchmark's role in Indonesia's currency success in trading when showing a relatively high number when converted in-world currency, US Dollar. One of the efforts to increase Indonesia's export value in the world market is to maintain the stability of rupiah currency against thedollar.

With the value of Indonesian GDP, inflation and rupiah exchange rate against the US Dollar can be a high determinant of the number of exports of Indonesia to countries in the ASEAN region. It is important to be researched as a matter of how the Indonesian export performance trend to ASEAN countries, causality and balanced relationship in the short and long term between Indonesian GDP, inflation and rupiah exchange rate against the US Dollar To Indonesian exports to ASEAN countries. And this greatly affects the sustainability and export performance of Indonesia not only in the ASEAN region but also in the world market.

II. LiteratureReview

Exports are the simplest form in the international trading system and are a strategy in marketing overseas production. Factors such as the target State's income and population are the basis of consideration in the development ofexports[2].

Export and Economic Growth

Exports can affect economic growth in several ways. First, the direct influence of export is with the improvement of technology for each country that conducts foreign trade activities, second, exports can help overcome currency constraints (exchange rate). It is then a driver for a country to import, including imports of capital goods. Thirdly, based on the research of [3] obtained evidence that the comparison between investments and GDP. There is an indirect link between exports and economic growth (GDP) through investment.

In a general view among researchers that export growth has contributed greatly to countries where the economic-oriented economy is exported. Research on the validity of the export-led growth (ELG) and growth-

driven export (GDE) hypothesis in Taiwan using the Granger Causality test tool through the vector error correction model (VECM) test and using the bound testing methodology Developed by Pesaran et al, (PSS, 2001). Empirical results prove that in the long term there is a link between the level of equilibrium among exports, outputs, trade conditions and the productivity of workers/employees in the model and a reciprocal relationship between real exports and the real output [4]. Thus, the results of the test by SHYH-Wei Chen for the benefit of the export-led growth strategy to remain enhanced in Taiwan.

Export and Inflation

In the short term, rising inflation rates show economic growth, but the long-term high rate of inflation can give a bad impact. The high rate of inflation causes domestic goods to be more expensive than the price of imported goods.

If in the country there is inflation means the price of domestic products becomes more expensive. And if the price of domestic products is more expensive compared to products from overseas then this will cause the product to be more difficult to compete with imported products. This will result in the export value will be smaller than the import value so that the trade balance is experiencing a deficit and the deficit condition will spend the state foreign exchange reserves [5].

Export and Exchange Rate

Currency exchange rates play a central role in international trade relations, as the exchange rate allows you to compare the prices of goods and services produced by a country. It is also explained by Salvatore (2007) that in conducting trade transactions between countries, they use foreign currency instead of the country's currency. They need a standard currency such as US $ to transact. When the domestic currency appreciates the foreign currency, the import price for domestic residents is cheaper, but if the value of the domestic currency is depreciation, the value of the foreign currency becomes more expensive which results in exports for Overseas to be cheaper.

Various studies on the influence of the volatility of exchange rates on the performance of exports of a country have been carried out many different outcomes (Rahmatsyah, 2001). However, most of these studies state that volatility in currency exchange rates has an influence, both in the form of positive and negative influences on the export and import performance of a country. While a small part of the other provides no significant correlation results.

III. Methodology

This research has time series datum from the website of worldbank and the period was 2004 until 2018, and analyze for trend then cointegration relation of equilibrium for long term then to know causality betweenthe variables. The step of a method for this research asfollows:

1. TrendAnalysis

To know the Indonesia export trend to ASEAN countries (US$) used trend equation with *Least Square* method with the equation as follow:

$$Y = a + bX \qquad (1)$$

where:

Y	=	export of Indonesia to ASEAN countries (US$)
a	=	intercept
b	=	coefficient regression of time
X	=	trend

2. Unit RootTest

In this step, the Unit Root test uses the Augmented Dickey-Fuller (ADF) method, to know stationarity or not for every variable of estimates. The Formula of the ADF test as follows:

$$DY_t = a_0 + \gamma Y_{t-1} + \sum_{i=1}^{\rho} \beta \, DY_{t-1+1} + \varepsilon_t \qquad (2)$$

Hypothesis null in this test was H_0: $\gamma=0$. Datum has said stationary with comparison statistics of MacKinnon. The criteria were if the number of $|ADF_{stat}|$ > critical number of MacKinnon or Prob.*t-statistics < 0.05 then the datum was stationary and the other way then the datum was not stationary.

3.   CointegrationTest
In this step, the cointegration test for analyzing cointegration or relation of equilibrium for long term between the variables. The method is the Johansen test. This method had required to do with two statistic tests. That is, the trace (λ_{trace}) test for Hypothesis Null test had required an amount of cointegration direction is $\leq \rho$. The formula as follows:

$$\lambda_{trace} \ r = -T^{\rho} \quad {}_{i=r+i} \ in(1-\lambda i) \qquad (3)$$

The amount $\lambda_{r+1}, \dots \lambda_n$ is the least of *eigenvectors* (ρ - r). Hypothesis null has used that is the sum of the same cointegration direction with r. And the result of cointegration vector $\leq$ r, where r = 0, 1, 2 and beyond.

The next for the second statistics test, with the formula as follows to know the number of *eigenvalues* (λ_{max}) maximum:

$$\lambda_{max} = r, r+1 = -T \ in(1-\lambda_{r+1}) \qquad (4)$$

To know there or not cointegration relation between the variables, that is seen from the ratio of Trace Statistics and Max-Eigen Statistics value with the critical value of $\alpha=0.05$.

4.   Causality Test
In this step, to know there or no relation of one way, two way between the variables used the formula as follows:

$$I_t = {}^{m}_{i=1} a_i I_{t-i} + {}^{n}_{j=} b_j Y_{t-j} - \mu_t \qquad (5)$$
$$Y_t = {}^{r}_{i=1} c_i I_{t-i} + {}^{s}_{j=1} d_j Y_{t-j} - v_t \qquad (6)$$

Where μ_t and V_t showed error terms assume there is no serial correlation, and m = n = r = s. By the result of estimation from the equation model (5), (6) shows 4 related possibilities of coefficient regression value from that equations as follows:

$$1 if \ {}^{n}_{j=1} b_j \neq 0 \ and \ {}^{s}_{j=1} d_j = 0,$$

There the causality one way between the variables Y to X.

$$2 if \ {}^{n}_{j=1} b_j = 0 \ and \ {}^{s}_{j=1} d_j \neq 0,$$

There the causality one way between the variables X to Y.

$$3 if \ {}^{n}_{j=1} b_j = 0 \ and \ {}^{s}_{j=1} d_j = 0,$$

There does not the causality between the variable X and Y (variable X and Y has exogen each other).

$$4 if \ {}^{n}_{j=1} b_j \neq 0 \ and \ {}^{s}_{j=1} d_j \neq 0,$$

There the causality two way between the variables Y and X.

The next with strengthening indications causality form, have to do F_{test} for every regression model.

IV. Result andDiscussion

As a country known for its wealth of natural resources, Indonesia can contribute to the countries of the ASEAN region to meet the needs of their countries thereby increasing domestic exports and revenues. This form of international trade cooperation can benefit one another in the ASEAN region as well as the ASEAN Economic Community (AEC) in December 2015.
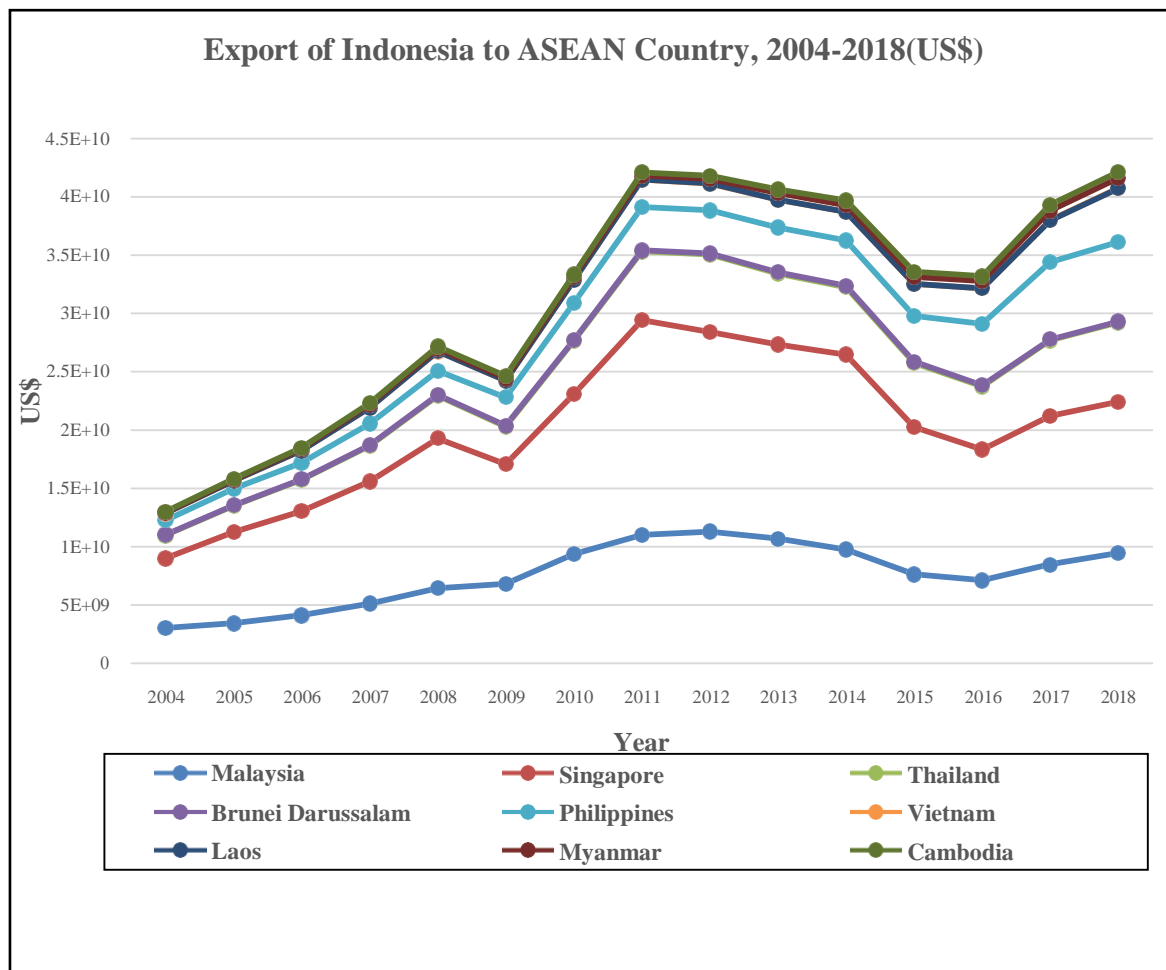

Source: UN Comtrade Data, 2004-2018

Figure 2. Export of Indonesia to ASEAN Country, 2004-2018 (US$)

Over the last 15 years from 2004 to 2018 total Indonesia export data to each ASEAN country fluctuated with US $ value. To Malaysia, the value highest total export in 2012 and the lowest in 2004. To Singapore, the value highest total export in 2011 and the lowest in 2004 too. To Thailand, the value highest total export in 2018 and the lowest in 2004. To Brunei Darussalam, the value highest total export in 2013 and the lowest in 2004. To the Philippines, the value highest total export in 2018 and the lowest in 2004. To Vietnam, the value highest total export in 2018 and the lowest in 2004. To Laos, the value highest total export in 2012 and the lowest in 2004. To Myanmar, the value highest total export in 2018 and the lowest in 2004. And to Cambodia, the value highest total export in 2018 and the lowest in 2004.

1. TrendAnalysis

By the estimate of the trend, shows at the figure as follows. An estimate of the trend starts from 2019 until 2028. The trends are positive for the export to ASEAN countries 10 years later. As detail in Table 1. Malaysia, Singapore, Brunei Darussalam, and Laos are having a positive and negative trend. The Philippines, Vietnam, and Myanmar are having dominant a positive trend. Whereas Thailand and Cambodia are having a positive trend in 10 next year later.
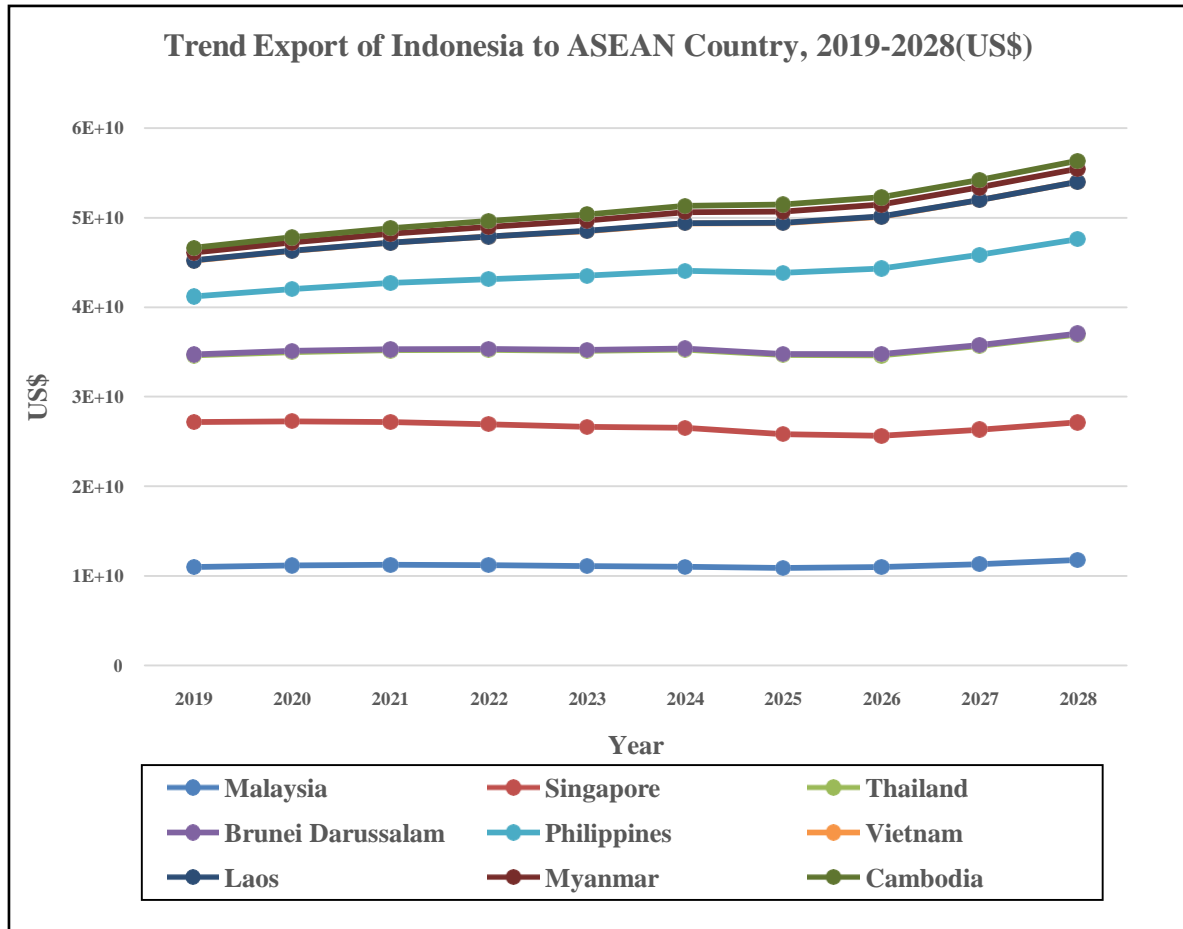
Source: Estimate of Trend, 2019-2028

Figure 3. Trend Export of Indonesia to ASEAN Country, 2019-2028 (US$)

Table 1. Trend Export of Indonesia to ASEAN Country, 2019-2028

Year	Malaysia	Singapore	Thailand	Brunei Darussalam	Philippines	Vietnam	Laos	Myanmar	Cambodia
2019	↑	↑	↑	↑	↓	↓	↑	↓	↑
2020	↑	↑	↑	↑	↑	↑	↑	↑	↑
2021	↑	↓	↑	↑	↑	↑	↓	↑	↑
2022	↓	↓	↑	↑	↑	↑	↓	↑	↑
2023	↓	↓	↑	↓	↑	↑	↓	↑	↑
2024	↓	↓	↑	↓	↑	↑	↓	↑	↑
2025	↓	↓	↑	↓	↑	↑	↓	↑	↑
2026	↓	↓	↑	↓	↑	↑	↓	↑	↑
2027	↑	↑	↑	↓	↑	↑	↓	↑	↑
2028	↑	↑	↑	↓	↑	↑	↑	↑	↑

Note: ↑ = increasing ; ↓ =decreasing

From the analysis of the trend, it is known that Thailand and Cambodia are Indonesian export destinations that have positive trends over the next 10 years. So for both the export data of the destination country will be conducted test cointegration and causality to see the long-term balance relationship and causal relationship betweenvariables.

2. Unit RootTest

For the Unit Root Test used the Augmented Dickey-Fuller (ADF) test type for the stationary data. The result of unit root test as follows:

Table 2. Unit Root Test with ADF Test Type

ADF Test	Level		1st difference		2nd difference	
	t-statistic	Prob.	t-statistic	Prob.	t-statistic	Prob.
EXP_TO_THAI	-1.066478	0.6974	-2.753239	0.0919	-4.184642	0.0090
EXP_TO_CAMB	1.258257	0.9661	-4.850205	0.0031	-8.669588	0.0000
GDP	-1.217903	0.6349	-2.378221	0.1653	-3.734626	0.0189

INFL	-1.178860	0.6421	-1.549145	0.4732	-12.16820	0.0000
EXCH_RATE	-0.402426	0.8838	-3.624443	0.0211	-3.407424	0.0406

Source: Unit Root test with Eviews v. 10; 2019

The result of the unit root test known the export to Thailand is stationary at 2nd difference. Export to Cambodia is stationary at 2nd difference. GDP is stationary at 2nd difference. Inflation is stationary at 2nd difference. And the exchange rate is stationary at 1st difference.

3. CointegrationTest

For the cointegration test used the Johansen method. This test to known relation equilibrium for long term between the variables. The result of the cointegration test for Thailand as follows:

Table 3. Cointegration test Johansen Method for Thailand

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.991686	86.22561	47.85613	0.0000
At most 1	0.659501	23.95816	29.79707	0.2022
At most 2	0.463105	9.952710	15.49471	0.2844
At most 3	0..133800	1.867314	3.841466	0.1718
Trace test indicates 2 cointegrating eqn(s) at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values				

Source: Cointegration test Johansen Method with Eviews v. 10; 2019

And the result of the cointegration test for Cambodia as follows:

Table 4. Cointegration test Johansen Method for Cambodia

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.962231	81.59980	47.85613	0.0000
At most 1 *	0.886120	39.00834	29.79707	0.0033
At most 2	0.379442	10.76439	15.49471	0.2264
At most 3 *	0.295942	4.561623	3.841466	0.0327
Trace test indicates 2 cointegrating eqn(s) at the 0.05 level *denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values				

Source: Cointegration test Johansen Method with Eviews v. 10; 2019

Had known for cointegration test for Thailand no relation equilibrium for the long term and for Cambodia had a relation equilibrium for the long term in theperiod.

4. Granger Causality Test

For the causality test used the Granger Causality test. This test to known the causality one and or two way between the variables for Thailand and Cambodia. The result of the causality test asfollows:

Table 5. Granger Causality Test for Thailand

Pairwise Granger Causality Tests Sample: 2004 2018 Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
GDP does not Granger Cause EXP_TO_THAI	13	12.8671	0.0032
EXP_TO_THAI does not Granger Cause GDP		4.67770	0.0451
INFL does not Granger Cause EXP_TO_THAI	13	5.18256	0.0360
EXP_TO_THAI does not Granger Cause INFL		0.42679	0.6666
EXCH_RATE does not Granger Cause EXP_TO_THAI	13	3.64735	0.0749
EXP_TO_THAI does not Granger Cause EXCH_RATE		3.23984	0.0932
INFL does not Granger Cause GDP	13	2.57865	0.1367
GDP does not Granger Cause INFL		1.76303	0.2321
EXCH_RATE does not Granger Cause GDP	13	2.51417	0.1422
GDP does not Granger Cause EXCH_RATE		3.53453	0.0794
EXCH_RATE does not Granger Cause INFL	13	1.39605	0.3020
INFL does not Granger Cause EXCH_RATE		1.73217	0.2371

Source: Granger Causality test with Eviews v. 10; 2019

The results are GDP Indonesia and export to Thailand had the causality one way. It means GDP Indonesia not cause the export to Thailand but export to Thailand cause GDP Indonesia. Inflation and export to Thailand had the causality one way too. It means inflation not cause the export to Thailand but export to Thailand cause inflation. Exchange rate and export had the causality two way. It means the exchange rate cause export to Thailand and export to Thailand cause the exchange rate. Inflation and GDP Indonesia had the causality two way. It means inflation causes GDP Indonesia and GDP Indonesia to cause inflation. Exchange rate and GDP Indonesia had the causality two way. It means the exchange rate causes GDP Indonesia and GDP Indonesia causes the exchange rate. Exchange rate and inflation had the causality two way. It means the exchange rate cause inflation and inflation causes the exchange rate.

Table 6. Granger Causality Test for Cambodia

Pairwise Granger Causality Tests Sample: 2004 2018 Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
GDP does not Granger Cause EXP_TO_CAMB	13	0.86982	0.4552
EXP_TO_ CAMB does not Granger Cause GDP		1.68763	0.2446
INFL does not Granger Cause EXP_TO_ CAMB	13	0.68904	0.5295
EXP_TO_ CAMB does not Granger Cause INFL		1.62991	0.2548
EXCH_RATE does not Granger Cause EXP_TO_ CAMB	13	0.45708	0.6487
EXP_TO_ CAMB does not Granger Cause EXCH_RATE		2.59272	0.1355
INFL does not Granger Cause GDP	13	2.57865	0.1367
GDP does not Granger Cause INFL		1.76303	0.2321
EXCH_RATE does not Granger Cause GDP	13	2.51417	0.1422
GDP does not Granger Cause EXCH_RATE		3.53453	0.0794
EXCH_RATE does not Granger Cause INFL	13	1.39605	0.3020
INFL does not Granger Cause EXCH_RATE		1.73217	0.2371

Source: Granger Causality test with Eviews v. 10; 2019

The results are GDP Indonesia and export to Cambodia had the causality two ways. It means GDP Indonesia cause the export to Cambodia and export to Cambodia cause GDP Indonesia. Inflation and export to Cambodia had the causality two way. It means inflation cause export to Cambodia and export to Cambodia cause inflation. Exchange rate and export to Cambodia had the causality two way. It means the exchange rate causes the export to Cambodia and export to Cambodia to cause the exchange rate. Inflation and GDP Indonesia had the causality two way. It means inflation causes GDP Indonesia and GDP Indonesia causes inflation. Exchange rate and GDP Indonesia had the causality two way. It means the exchange rate causes GDP Indonesia and GDP Indonesia causes the exchange rate. Exchange rate and inflation had the causality two way. It means the exchange rate cause inflation and inflation causes the exchangerate.

Indonesia's export performance to ASEAN countries shows a number that continues to increase year by year. This form of cooperation between countries in the ASEAN region in international trade. Meeting the needs of the people in each country can increase the economic growth between countries too. Malaysia and Singapore are Indonesia's trading partner countries that show maximum export figures among other countries in the ASEAN region. In the next 10 years, Thailand and Cambodia were Indonesia's export destinations with positive trends and showed a steady increase in the rate of growth. Other countries tend to fluctuate.

Indonesia exports to Thailand against GDP, inflation, and exchange rates have no long-term balanced relationship. While Indonesia exports to Cambodia against GDP, inflation and exchange rate there is a long term balance relationship. Export to Thailand affects Indonesia's GDP and exports to Cambodia also affect Indonesia's GDP. Indonesia's GDP and inflation are mutually affecting. The rupiah exchange rate against US dollars and Indonesian GDP is influencing each other. And the rupiah exchange rate against US dollars and inflation is the mutual influence. This is demonstrated by both causalities in the country of Thailand and Cambodia.

V. Conclusion

Thailand and Cambodia are the two countries of Indonesia's exports of ASEAN region that have positive trends and show numbers that tend to increase and stabilize. It is noted that the rupiah exchange rate against US dollars and Indonesia's export performance is mutually affecting. Indonesia's inflation and GDP are affecting each other. The rupiah exchange rate against US dollars and Indonesian GDP is influencing each other. And the rupiah exchange rate against US dollars and Indonesian inflation is affecting each other. So this research is important for the Government of Indonesia in maintaining the stability of the rupiah exchange rate against US dollars to improve Indonesia's export performance to high economicgrowth.

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