

THE EFFECT OF ADDITIONAL INDUSTRIAL VALUE AND MACRO ECONOMIC VARIABLES ON INDONESIA TRADE

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ABSTRACT

This study aims to analyze the influence of industrial value added and macroeconomic variables on Indonesia's trade in the face of World Free Trade. Data was taken from the Central Statistics Agency, Bank Indonesia and the Ministry of Finance of the Republic of Indonesia from 1986 to 2016. The model used in the study was the Vector Error Correction Model (VECM) model. The VECM model is used because it can predict short-term and long-term conditions.

The results of the study show that in the short term and long term trade has a significant effect on trade itself, then there are four independent variables that have a significant effect on trade. The four independent variables, namely last year's gross domestic income, Gross Fixed Capital Formation last year, the exchange rate and industrial value added last year.

Keywords: International Trade, Dynamic Models and Value Added Industry

A. Background

International trade has played a very important role, although it cannot stand alone, almost throughout the history of development in developing countries. In all regions of third world countries, both in Africa, Asia, the Middle East and Latin America, exports of primary products have traditionally been a significant and large part of the total gross national product in each country (Todaro, 2000).

Table 1: Exports and Imports of Several ASEAN Countries (Annual Change Percentage)

No	Country	2010	2011	2012	2013	2014	2015Q1
1	Indonesia	44.3	30.7	-6.0	-1.4	-4.5	-5.0
2	Malaysia	32.9	13.9	-0.3	4.9	1.5	-8.7
3	Filipina	27.6	8.8	7.6	-1.2	3.7	-2.0
4	Singapura	26.5	17.7	-0.3	-1.8	-1.8	-21.5
5	Thailand	37.4	23.6	0.8	-0.6	-8.6	-6.1

Source: - IFS (International Financial Statistics)

Based on Table 1. it can be seen the growth of exports and imports of 5 ASEAN countries, namely Indonesia, Malaysia, Philippines, Singapore and Thailand. The highest average growth in exports and imports in 2010-2014 was the highest in Indonesia (12.62%), Malaysia (10.58%) and Thailand (10.52%). While the negative export and import growth in 2014 was Thailand (-8.6%), Indonesia (-4.5%) and Singapore (-1.8). While in the first quarter of 2015, almost all countries in the ASEAN region experienced negative export and import growth, especially those experiencing the biggest negative growth were Singapore (-21.5%)

In macroeconomic studies, exports and imports play an important role in driving economic growth. Economists make decisions not only concerned with the total output of goods and services (Mankiw, 2003), but also the allocation of these outputs among various alternatives. National income posts divide GDP into 4 groups, namely: consumption (C), investment (I), government expenditure (G) and net exports. This last group, this net export (export minus import) takes into account trade with other countries.

Some third world countries (such as Indonesia) rely on the smooth flow of foreign exchange earnings and overall economic vitality to the export of non-oil primary products. Because the prices of non-oil primary commodity goods are uncertain, the export dependence on these primary products is subject to enormous uncertainty (Todaro, 2000).

In addition to the problem of dependence on the problem of exports of primary goods, many countries also depend on imported goods, especially on various machinery and modern equipment, capital goods, intermediate goods, and consumer products ready to move the process of industrialization to meet the consumption of the population.

International trade and finance must be understood in a broad perspective, far more broadly than the flow of resources and finance. By opening up the economy and society to commercial relations and world trade, and by establishing interactions with other nations, developing countries not only invite new financial transfers, services and financial resources, but also all

good influences that support development (technology transfer). the productive) as well as those that hinder development (high consumption patterns for imported goods). Regardless of what is taken, each country must realize the present and future conditions in order to achieve economic and short-term economic development goals.

The purpose of this study is to determine the effect of gross domestic product, industry value added, the dollar exchange rate against the rupiah and gross fixed capital formation on international trade in Indonesia both short and long term.

B. Previous research

Research on the relationship between gross domestic product to international trade has been carried out by Shihab, Soufan and Abdul-Khaliq (2014). The research results conclude that gross domestic income affects international trade.

Research analyzing the relationship between exchange rates against international trade was conducted by Genc and Artar (2014). This study concludes that there is a relationship between the exchange rate of exports and imports. While the research of Nyead, Atiga, and Atogenzoya (2014) concluded that exchange rates have no influence on exports and imports

Research on the relationship between industrial value added to international trade was carried out by Benedetto (2012). This study concludes that there is a relationship between Industrial Value Added Products to exports. And research that discusses the relationship between investment in international trade is done by Feriyanto (2010) and Adhikary (2012). The research conducted by Feriyanto (2010) concludes that domestic and foreign direct investment significantly and positively affects Indonesia's non-oil and gas exports and Adhikary's (2012) study concluded that foreign investment affects both short and long-term exports.

C. Regression Model

Before performing VECM estimation and descriptive analysis, several steps must be carried out such as data stationarity test, determining lag length, cointegration degree test and Granger causality test (Widarjono, 2009). After the data is estimated using VECM, the analysis can be continued with the IRF method and variance decomposition. The steps in formulating the VECM model are as follows:

Conduct expected relationship specifications in the model under study.

$$\text{TRADE}_t = f(\text{GDP}, \text{KURS}, \text{GFCF}, \text{IVA}_t)$$

$$\text{TRADE}_t = \alpha_0 + \alpha_1 \text{GDP}_t + \alpha_2 \text{KURS}_t + \alpha_3 \text{GFCF}_t + \alpha_4 \text{IVA}_t$$

Keterangan:

TRADE_t : Total Trade Value in period t

GDP_t : Gross Domestic Product in period t

Kurst : Exchange Rate of Rupiah against US dollar period t

GFCF_t : Gross Fixed Capital Formation in period t

IVAt : Industry Value Added (constant LCU) in period t

$\alpha_0, \alpha_1, \dots, \alpha_4$: Long-term coefficient

VECM must be stationary at first differentiation and all variables must have the same stationary, which is differentiated in the first derivative.

D. Analysis and Discussion

Steps that must be fulfilled in determining VECM, namely:

1. Stationary Test

Levin, Lin & Chu t, Im, Pesaran and Shin W-stat tests, ADF and PP (Mohan, Kemegue and Sjuib, 2007) were used to detect stationary or not data from each variable used in the study using the intercept model. The following table shows the Levin stationary test, Lin & Chu t, Im, Pesaran and Shin W-stat, ADF and PP of each variable:

Table 6: Stationary Test on the data level

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	2.29313	0.9891	5	140
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	3.60736	0.9998	5	140
ADF - Fisher Chi-square	1.50978	0.9989	5	140
PP - Fisher Chi-square	1.88202	0.9972	5	140

Source: data processed

Based on Table 6. above, the probability of the Levin Test, Lin & Chu t, Im, Pesaran and Shin W-stat values, ADF and PP is greater than 0.05, so the data used in this study is not stationary so stationary testing for data is needed first derivative (first difference).

Based on Table 7 above, the probability of the Levin Test, Lin & Chu t, Im, Pesaran and Shin W-stat values, ADF and PP is smaller than 0.05, so the data used in this research is stationary in the first derivative (first difference).

Table 7: Stationary Test on first difference data

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-6.27058	0.0000	5	135
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-6.28797	0.0000	5	135
ADF - Fisher Chi-square	56.9042	0.0000	5	135
PP - Fisher Chi-square	80.6418	0.0000	5	135

Source: data processed

2. Optimum Lag Determination

Determination of the optimal lag length will be searched using the existing information criteria. The selected lag candidates are length lag according to criteria such as Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Crition (AIC), Schwarz Information Crition (SC), and Hannan-Quin Crition (HQ). The lag length used in this study is from 0 to 4. The following in table 5.3 shows the optimal lag length:

Table 8: Optimal lag length

Lag	LogL	LR	FPE	AIC	SC	HQ
0	199.1366	NA	3.91e-13	-14.38049	-14.14052	-14.30914
1	240.3354	64.08701*	1.22e-13	-15.58040	-14.14058*	-15.15227
2	270.6474	35.92528	1.02e-13*	-15.97388*	-13.33421	-15.18897*

* indicates lag order selected by the criterion

Source: data processed

From Table 8 above, it can be seen that the optimal lag length lies in lag 2, that is, there are more indicative lag orders selected by the criterion (*). Therefore, the optimal lag length used in this study is lag 2. Furthermore, because the optimal lag length has been found, it can be done to the next test, namely the VAR stability testing.

3. VAR Stability Testing

VAR stability needs to be tested before doing further analysis, because if the VAR estimation results will be combined with an unstable error correction model, then Impulse Response Function and Variance Decomposition become invalid (Hill, Griffiths, Lim and Lim, 2008).

Table 9. Showing all modulus values under one, then the VAR estimation results that will be combined with a stable error correction model, the Impulse Response Function and Variance Decomposition become valid.

Table 9: Stability Test

Root	Modulus
0.778170 - 0.132084i	0.789300
0.778170 + 0.132084i	0.789300
0.112239 - 0.776071i	0.784145
0.112239 + 0.776071i	0.784145
-0.315865 - 0.576424i	0.657294
-0.315865 + 0.576424i	0.657294
-0.656430	0.656430
-0.540988	0.540988
-0.138471 - 0.306302i	0.336148
-0.138471 + 0.306302i	0.336148

No root lies outside the unit circle.
 VAR satisfies the stability condition.
 Source: data processed

4. Cointegration Test

The fourth stage that must be passed in the VECM estimation is cointegration testing. This cointegration test aims to determine the long-term relationship of each variable.

Table 10: Cointegration Test

Unrestricted Cointegration Rank Test (Trace)

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.809674	109.7091	69.81889	0.0000
At most 1 *	0.680716	66.57473	47.85613	0.0004
At most 2 *	0.597783	36.89118	29.79707	0.0064
At most 3	0.285521	13.21131	15.49471	0.1073
At most 4 *	0.157958	4.470070	3.841466	0.0345

Trace test indicates 3 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: data processed

The variables used in this study have a long-term relationship (cointegration) between one another, or in other words H0 is rejected and H1 is accepted. Therefore the VECM estimation in this study can be used, and proceed to the next stage, namely the granger causality test (Granger, 1980).

5. Granger Causality Test

To find out the causal relationship of each independent variable on the dependent variable, it is necessary to do a granger causality test (Granger, 1980).

In Table 11. it can be explained that those who have causality are variables with probability values smaller than $\alpha = 0.05$. Based on Table 11. it is known that GDP significantly affects TRADE with a probability value of $0.0350 < 0.05$, so that in this case H0 is rejected and H1 is accepted, or in other words the causal relationship between GDP and TRADE. The significant effect of the GDP variable on TRADE shows that GDP can be a leading indicator for TRADE. It is known statistically that the TRADE variable does not significantly influence GDP, with a probability value of $0.8416 > 0.05$ which means accepting H0 and rejecting H1, or it can be said that there is no causal relationship between the TRADE and GDP variables. Thus it can be concluded that there is only a one-way relationship, which is between the GDP variable which affects the TRADE variable, and does not apply otherwise.

Table 11: Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
GDP does not Granger Cause TRADE	28	3.89221	0.0350
TRADE does not Granger Cause GDP		0.17378	0.8416
GFCF does not Granger Cause TRADE	28	5.07370	0.0150
TRADE does not Granger Cause GFCF		1.33889	0.2818
KURS does not Granger Cause TRADE	28	7.09451	0.0040
TRADE does not Granger Cause KURS		4.24942	0.0269
IVA does not Granger Cause TRADE	28	5.86727	0.0087
TRADE does not Granger Cause IVA		0.30911	0.7371
GFCF does not Granger Cause GDP	28	3.92963	0.0340
GDP does not Granger Cause GFCF		8.75359	0.0015
KURS does not Granger Cause GDP	28	0.75274	0.4823
GDP does not Granger Cause KURS		2.23936	0.1292
IVA does not Granger Cause GDP	28	1.33661	0.2824
GDP does not Granger Cause IVA		3.04691	0.0670
KURS does not Granger Cause GFCF	28	2.22353	0.1310
GFCF does not Granger Cause KURS		2.74748	0.0851
IVA does not Granger Cause GFCF	28	1.67376	0.2096
GFCF does not Granger Cause IVA		0.14416	0.8665
IVA does not Granger Cause KURS	28	3.19668	0.0596
KURS does not Granger Cause IVA		0.44855	0.6440

Source: data processed

Based on Table 11. it is known that GFCF significantly affects TRADE with a probability value of $0.0150 < 0.05$, so that in this case H_0 is rejected and H_1 is accepted, or in other words the causal relationship between GFCF and TRADE. The significant effect of the GFCF variable on TRADE shows that GFCF is able to become a leading indicator for TRADE. Statistically the TRADE variable does not significantly influence GFCF, with a probability value of $0.2818 > 0.05$ which means accepting H_0 and rejecting H_1 , or it can be said that there is no causal relationship between the variables TRADE and GFCF. Thus it can be concluded that there is only a one-way relationship, which is between the GFCF variables that affect the TRADE variable, and does not apply otherwise.

Based on Table 11. it is known that KURS significantly affects TRADE with a probability value of $0.040 < 0.05$, so that in this case H_0 is rejected and H_1 is accepted, or in other words the causal relationship between KURS and TRADE. The significant effect of the KURS variable on TRADE shows that KURS is capable of being a leading indicator for TRADE. TRADE variables

statistically have a significant effect on KURS, with a probability value of $0.0269 < 0.05$ which means rejecting H_0 and accepting H_1 , or it can be said that there is a causal relationship between the variables TRADE and KURS. Thus it can be concluded that there is a two-way relationship, namely between the KURS variable that affects the TRADE variable, and vice versa.

Based on Table 11. it is known that IVA significantly affects TRADE with a probability value of $0.00870 < 0.05$, so that in this case H_0 is rejected and H_1 is accepted, or in other words there is a causal relationship between IVA and TRADE. The significant effect of the IVA variable on TRADE shows that IVA is able to become a leading indicator for TRADE. Statistically the TRADE variable does not significantly influence IVA, with a probability value of $0.7371 > 0.05$ which means accepting H_0 and rejecting H_1 , or it can be said that there is no causal relationship between the variables TRADE and IVA. Thus it can be concluded that there is only a one-way relationship, namely between the IVA variables that affect the TRADE variable, and do not apply otherwise.

Based on Table 11. it is known that the GFCF significantly affects GDP with a probability value of $0.0340 < 0.05$, so that in this case H_0 is rejected and H_1 is accepted, or in other words the causal relationship between GFCF and GDP. The significant effect of the GFCF variable on GDP shows that the GFCF is able to become a leading indicator for GDP. Statistically the GFCF variable has a significant effect on GDP, with a probability value of $0.0015 < 0.05$ which means rejecting H_0 and accepting H_1 , or it can be said that there is a causal relationship between the GFCF and GDP variables. Thus it can be concluded that there is a two-way relationship, namely between the GFCF variables that affect the GDP variable, and vice versa.

6. Results of the Short Term VECM (Vector Error Correction Model) Estimation

Based on the data in Table 12. it can be explained that in the short term (one year, according to the type of data used, ie annual edition data from 1986 to 2016), TRADE has a significant effect on the first lag (1), then there are four influential independent variables significant to TRADE. The four independent variables are GDP (-1), GFCF (-1), KURS (-2) and IVA (-1).

Table 12: Short-term VECM (Vector Error Correction Model) Estimates

Error Correction:	D(LOG(TRADE))	T hitung	Probabilitas
CointEq1	-2.175041	[-5.58988]***	0.0000
D(LOG(TRADE(-1)))	0.895704	[2.76896]***	0.0071
D(LOG(TRADE(-2)))	0.361297	[1.34284]	0.1834
D(LOG(GDP(-1)))	9.054389	[2.68881]***	0.0088
D(LOG(GDP(-2)))	-2.227871	[-1.01577]	0.3130
D(LOG(GFCF(-1)))	-1.755319	[-2.42879]***	0.0175
D(LOG(GFCF(-2)))	-0.883591	[-1.65425]	0.1023
D(LOG(KURS(-1)))	0.122226	[0.42090]	0.6750
D(LOG(KURS(-2)))	-0.397903	[-1.69156]*	0.0949
D(LOG(IVA(-1)))	-2.633233	[-2.99046]***	0.0038
D(LOG(IVA(-2)))	-1.103859	[-1.50448]	0.1367
C	0.008974	[0.09509]	0.9245

Source: data processed

Short-term estimation results show that the TRADE variable in lag 1 has a positive and significant effect on TRADE itself, which is equal to 0.8957. That is, if there is a TRADE increase of one percent in the previous year, it will increase TRADE in the current year by 0.895 percent.

Short-term estimation results show that the GDP variable in lag 1 has a positive and significant effect on TRADE, which is equal to 9,054. That is, if there is an increase in GDP of one percent in the previous year, it will increase TRADE in the current year by 9.054 percent. The increase in GDP is very effective in encouraging trade between countries.

The short-term estimation results show that the GFCF variable in lag 1 has a negative and significant effect on TRADE itself, which is -1.755319. That is, if there is an increase in the GFCF of one percent in the previous year, it will reduce TRADE in the current year by 1.755 percent.

The short-term estimation results show that the KURS variable in lag 2 has a negative and significant effect on TRADE itself, which is -0.397903. That is, if there is an increase in KURS of one percent in the previous two years, it will reduce TRADE in the current year by 0.398 percent.

Short-term estimation results show that the IVA variable in lag 1 has a negative and significant effect on TRADE itself, which is -2.633233. That is, if there was an increase in IVA of one percent in the previous year, it would reduce TRADE in the current year by 2,633 percent.

7. Results of Long-Term VECM Estimation

Based on Table 13. GDP variables in lag 1 have a positive and significant effect on TRADE, which is equal to 2.63. That is, if there is an increase in GDP of one percent in the previous year, it will increase TRADE by 2.63 percent. The results of the analysis show that the partial t-statistic of the GDP variable in lag 1 is -6.186 (probability t count <0.05) which means, H0 is rejected and H1 is accepted or in other words, the GDP variable has a significant effect on TRADE in the long run.

Table 13: Long-term estimation results

Cointegrating Eq:	CointEq1	T hitung	Probabilitas
LOG(GDP(-1))	2.630340	[6.18609]	0.00
LOG(GFCF(-1))	-1.321147	[-3.83383]	0.00
LOG(KURS(-1))	-0.315915	[-4.22486]	0.00
LOG(IVA(-1))	-1.554005	[-8.99739]	0.00

Source: data processed

The long-term estimation of VECM shows that the GFCF variable in lag 1 has a negative and significant effect on TRADE, which is equal to -1,321. That is, if there is an increase in the GFCF of one percent in the previous year, it will reduce the trade by -1,321 percent. The results of the analysis show that the t-statistic of GFCF variables in lag 1 is -3,833 greater than 2.07 (probability of t count <0,05) which means that H0 is rejected and H1 is accepted or in other words, the GFCF variable has a significant negative effect towards TRADE in the long term. The results of the analysis are not in accordance with the hypothesis which states that GFCF has a significant positive effect on TRADE.

The long-term estimate of VECM shows that the KURS variable in lag 1 has a negative and significant effect on TRADE, which is -0.315. That is, if there is an increase in KURS of one percent in the previous year, it will reduce TRADE by -0.315 percent. The results of the analysis show that the value of the KURS variable t-statistic in lag 1 is -4.22 greater than 2.07 (probability of t count <0.05) which means, H0 is rejected and H1 is accepted or in other words, the KURS variable has a negative effect significantly towards TRADE in the long run. The results of the analysis are not in accordance with the hypothesis that KURS has a significant positive effect on TRADE.

The long-term estimation of VECM shows that the IVA variable in lag 1 has a negative and significant effect on TRADE, which is -1.554. That is, if there is an increase in IVA of one percent in the previous year, it will reduce the trade by -1,554 points. The results of the analysis

show that the value of t-variable IVA in lag 1 is -8.997 greater than 2.07 (probability t count <0.05) which means, H0 is rejected and H1 is accepted or in other words, variable IVA has a significant negative effect towards TRADE in the long term.

8. IRF (Impulse Response Function) Analysis Results

IRF analysis is used to explain the impact of shock that occurs in one variable against other variables, both in the short and long term. In this analysis can see the long-term response if the variable experiences shock. Impulse Response Function analysis also functions to see how long the effect occurs. A long enough period is expected to describe the response of the dependent variable to its independent variable. In this study, the IRF analysis was used to show the response of changes in the variables GDP, GFCF, CURS and IVA to the shock determinant.

The first IRF analysis will explain the response received by the TRADE to the shock given by GDP. GDP is one of the most important indicators in a country's economic development. This is because GDP is considered capable of describing the economic development of a country. Respon GDP terhadap *shock* TRADE

In Figure 5.1 it can be explained that the GDP response to the TRADE shock in the 1st period is negative (-) indicated by the IRF line below the horizontal line. Entering the second period the GDP response to the TRADE shock is positive (+). In the 2nd to 20th period the IRF line shows a stable position (+), because it is above the horizontal line. Based on the explanation above, it can be concluded that the GDP response to the TRADE shock is positive (+), ie from the second period to the 20th period, even though it is negative in the 1st period.

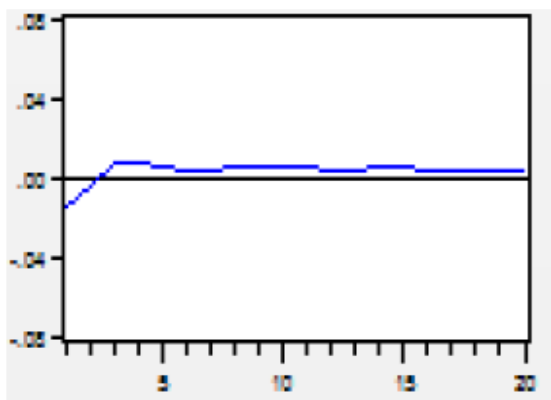


Figure 5.1.
Response of LOG(GDP) to LOG(TRADE)

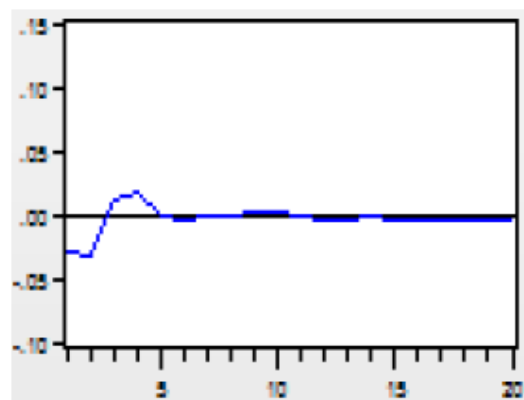


Figure 5.2.
Response of LOG(GFCF) to LOG(TRADE)

The second IRF analysis explained the response received by TRADE to the shock given by GFCF. GFCF is one of the most important indicators in a country's economic development. This is because Gross Fixed Capital Formation is considered capable of boosting a country's economy through international trade.

In Figure 5.2 it can be explained that the GFCF response to TRADE shock in the 1st and 2nd periods is negative (-) indicated by the IRF line below the horizontal line. Entering the 3rd to 5th period the GDP response to the TRADE shock is positive (+). In the 5th to 20th period the IRF line shows the position below the horizontal line (-), because it is below the horizontal line. Based on the explanation above, it can be concluded that the GFCF response to TRADE shock is negative (-), namely from the 5th period to the 20th period.

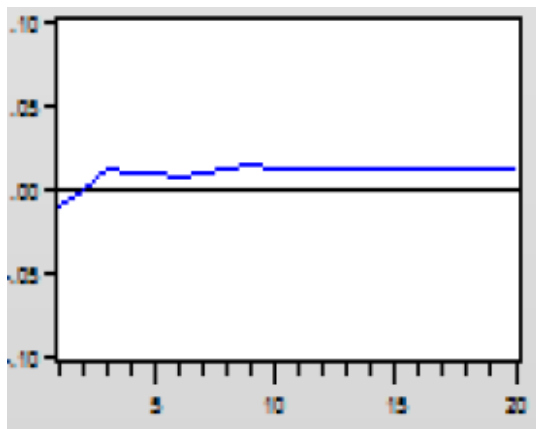
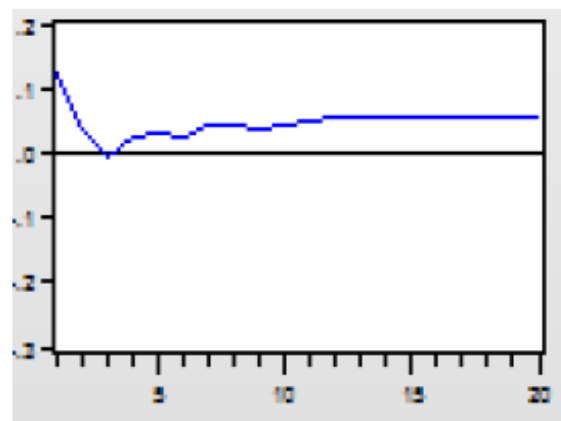


Figure 5.3.
Response of LOG(IVA) to LOG(TRADE)



Gambar 5.4
Response of LOG(KURS) to LOG(TRADE)

In figure 5.3 it can be explained that the IVA response to the TRADE shock in the 1st period is negative (-) indicated by the IRF line below the horizontal line. Entering the 2nd to 20th period the IVA response to the TRADE shock is positive (+), because it is above the horizontal line. Based on the explanation above, it can be concluded that the IVA response to TRADE shock is positive (+), namely from the second period to the 20th period.

In figure 5.4, it can be explained that the KURS response to the TRADE shock in the 1st period, is decreasing until enol is indicated by the IRF line which is close to the horizontal line. Entering the second period of the KURS response to the TRADE shock is positive (+), because it is above the horizontal line. Based on the explanation above, it can be concluded that the KURS response to TRADE shock is positive (+), ie from the second period to the 20th period.

9. Variant Decomposition

Variant Decomposition Analysis aims to measure the size of the composition or contribution of the influence of independent variables on the dependent variable. In this study VDC analysis was focused on looking at the effect of independent variables (GDP, GFCF, CURS and IVA) on the dependent variable (TRADE).

Table 14: Variance Decomposition of LOG(TRADE)

Variance Decomposition of LOG(TRADE): Period	S.E.	LOG(TRADE)	LOG(GDP)	LOG(GFCF)	LOG(KURS)	LOG(IVA)
1	0.081384	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.139194	35.25366	46.46927	12.61136	3.939568	1.726145
3	0.163267	26.24110	53.92106	10.21159	2.907609	6.718638
4	0.186459	20.54234	61.63169	8.137108	3.422115	6.266739
5	0.226235	13.97621	70.75119	6.960288	2.815884	5.496433
6	0.265504	10.25380	78.15632	5.116994	2.319897	4.152986
7	0.297530	8.839619	81.02712	4.851359	1.881538	3.400360
8	0.328205	7.620562	83.57150	4.331425	1.678823	2.797691
9	0.359455	6.444684	85.88360	3.815722	1.454308	2.401690
10	0.391262	5.580721	87.46674	3.643262	1.273024	2.036254
11	0.421267	5.057106	88.43179	3.637353	1.115269	1.758478
12	0.450303	4.638612	89.12684	3.697296	0.995221	1.542036
13	0.477166	4.305708	89.62174	3.805214	0.893867	1.373470
14	0.502549	4.032317	90.02864	3.883276	0.815986	1.239779
15	0.526767	3.797409	90.41798	3.906137	0.749891	1.128587
16	0.550350	3.598611	90.73041	3.941665	0.694045	1.035268
17	0.572767	3.446998	90.94971	4.001233	0.645042	0.957016
18	0.594153	3.319993	91.12979	4.054439	0.604220	0.891554
19	0.614563	3.204213	91.30506	4.087615	0.568829	0.834279
20	0.634294	3.099060	91.46822	4.110245	0.538362	0.784108

Source: data processed

Based on Table 14. it can be explained that in the first period TRADE was strongly influenced by the TRADE shock itself by 100 percent. Meanwhile in the first period the variables GDP, GFCF, KURS and IVA have not had an effect on TRADE. Furthermore, in the second period the GDP variable gave a shock contribution of 46.46 percent, and always increased until the 10th period which was to be 87.46 percent, and in the 20 period to 91.46. A significant increase in the GDP variable is seen from each period.

In the second period the shock given from the GFCF variable is 12.61 percent, and continues to decline until the period of 20 by 0.538 percent. With a significant decline occurred in the 3rd period, which amounted to 10.21 percent to 4.331 percent in the 8th period. Compared with other variables (KURS and IVA), GFCF provides a considerable shock with the highest shock occurring in the second period of 12.61 percent.

The second period of shock given by the KURS variable was 3.939 percent, and decreased to the 7th period by 1.88 percent. And continues to decline until the period of 20 amounting to 0.538 percent

The second period of shock given by the IVA variable is 1.726 percent, and has increased until the 4th period which is equal to 6.266739 percent. However, it experienced a decline in the 5th period of 5.496433 percent. And has decreased until the 20th period, which is equal to 0.784108 percent.

E. Conclusion

Based on the results of calculations using the VECM model Indonesia's international trade is strongly influenced:

The increase in GDP will encourage an increase in the value of trade both in the short term and in the long term, but in the long run the increase in GDP causes an increase in trade that is declining. This shows that in the long run Indonesia can overcome economic dependence by increasing imported substitution production domestically.

The increase in GFCF will encourage an increase in trade value both in the short term and in the long term, but in the case of Indonesia both in the short and long term an increase in GFCF causes a decrease in the value of trade. This is due to the fact that investments in export and import commodities are dominated by foreign companies. Economists consider foreign direct investment as one of the drivers of economic growth because it contributes to national economic measures such as Gross Fixed Capital Formation and balance of payments.

Increasing the value of the rupiah exchange rate against the dollar both in the long term and in the short term will boost the value of international trade. The increase in the dollar exchange rate encouraged an increase in Indonesian exports, while an increase in the rupiah exchange rate encouraged an increase in imported goods from abroad.

Increasing the value added of the domestic industry both in the long term and in the short term will encourage the value of international trade. But in this case the increase in added value of domestic industries both in the long term and in the short term will reduce the value of

international trade. This is because the increase in added value of the domestic industry is not offset by an increase in competitiveness. Indonesia's competitiveness has declined from 2016 compared to 2015. The decline in competitiveness is due to the main problems that have never been resolved: Corruption problems, Inefficient Government Bureaucracy, Inadequate Infrastructure, Access to Financing, and Inflation which are still quite high.

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