

EFFECT OF EXPORT IMPORT AND INVESTMENT ON ECONOMIC GROWTH IN INDONESIA (VECM ANALYSIS METHOD)

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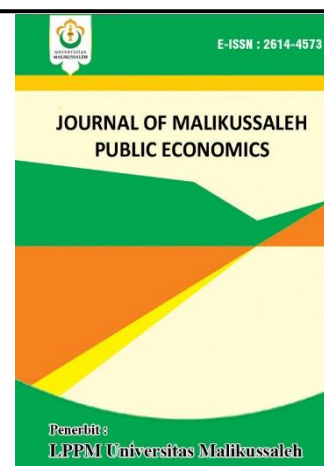
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ARTICLE INFORMATION ABSTRACT

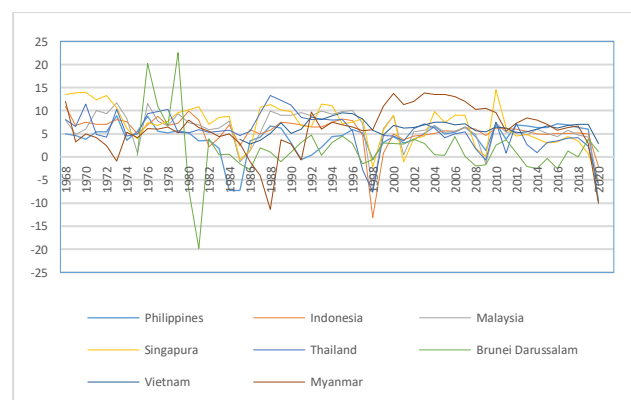
Keyword : Economic Growth, Export, Import, Investment, Vector Error Correction Model

This study aims to know the effect of export, import and investment on economic growth in Indonesia. This study employis secondary data in the period 1967-2020 obtained from the World Bank. The data is analyzed by using Vector Error Correction Method (VECM). All tests used in this study are unit root test, lag length criterion test, cointegration test, Granger causality test and VAR stability test. The results showed that the export and import of Indonesia have a positive and insignificant effect on Indonesia economic growth both in short run and long run. Investment has a negative and insignificant effect on economic growth both in short run and long run in Indonesia

1. Introduction

An Economic growth is defined as an increase in GDP/GNP regardless of whether the increase is greater or less than the rate of population growth, and whether there is a change in the economic structure or not.(Pambudi & Miyasto, 2013). Indicators of growth improve in line with the development of economy. The indicators that are often referred to in evaluating the growth of national income are GNP or GDP, as the simplest indicators (Chendrawan, 2017).

Economic growth is the main indicator in the macro economy. The macroeconomic development of a country can be reflected by growth of the economy. Of a country The economic growth of ASEAN countries can be seen in Figure 1 below.

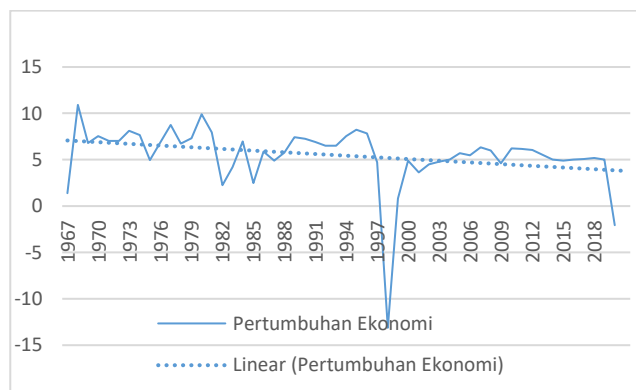


Source : Worldbank (Data Processed), 2021

Figure 1 ASEAN Economic Growth during 1967-2020 (Percent)

If seen from Figure 1 above, Indonesia's economic growth is still much lower than the economic growth rate of countries in ASEAN, where the average economic growth of Indonesia

from 1967-2020 is 5.61%. Meanwhile, Malaysia's average economic growth from 1967-2020 is at 6.27%, Vietnam is at 6.45%, Thailand is 5.77%, the lowest economic growth is Brunei Darussalam at 1.65%. Furthermore, Indonesia's economic growth can be seen in Figure 1.2 below.



Source : of Indonesia, 2021

Figure 1 Indonesia Economic Growth during 1967-2020 (Percent)

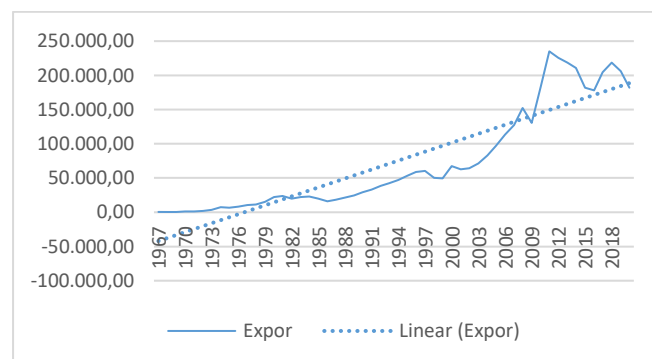
From Figure 2 above, it can be seen that the trend of Indonesia's economic growth is declining in the long term with an average growth of around 5.61%. However, in the short term there is an upward trend of economic growth. The decreasing of Indonesia's economic growth is in the long term due to low productivity and low consumption.(Syahputra, 2019)

One indicator of economic growth is exports. Exports are purchases of goods from other countries done by domestic companies. The most important factor that determines exports is the ability of the country to issue goods that can compete in foreign markets in terms of price and quality of goods(Benny, 2011). Generally, exports in Indonesia are valued by the total number of goods sold multiplied by the price of those goods which are measurea in Rupiah(MoT Statistics, 2020)

Exports have an influence on economic growth in Indonesia. If exports increase, the production of goods and services will also increase because increased exports indicate an increase in demand for domestic products abroad. This increase in the production of goods and services will lead to an increase in economic growth.

The role of exports on economic growth is always discussed in literatures. Some theories also explain that an increase in exports will lead to an increase in economic growth. If the country can increase the number of exports, it will certainly have an impact on increasing the amount of GDP

because exports are one component of GDP (Abdulkadimaltae & Al-jafari, 2018) But there are also researchers of the view that an increase in the value of exports will reduce economic growth. (Ikpesu et al., 2019)



Source : Worldbank (Data Processed), 2021

Figure 2 Indonesian Export Chart 1967-2020 (Million Dollars)

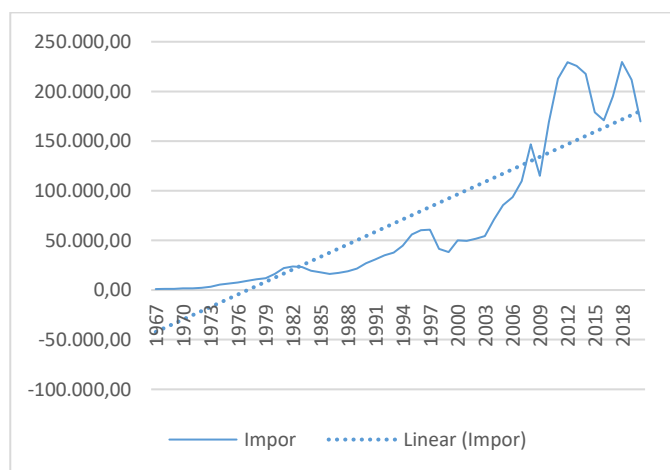
Indonesia's exports as shown in figure 3 tend to increase from the Soeharto presidency to Joko Widodo's presidency. The highest increase in exports occurred in 2009 to 2011. An increase of up to 40% compare to the previous year. The economic growth is turning down from 2011 to 2016 with an average decline of 5.32%.

Indonesia's economic growth continues to increase every year from 2005 to 2013 as shown in Figure 3 above. However, this is different from the value of Indonesia's exports. The value of Indonesia's exports decreases in 2011 to 2013. Where the value of exports and Indonesia's economic growth should go hand in hand. From graph 3 above, Indonesia's economic growth does not have a trend that is in line with export in Indonesia, so there is a gap between theory and facts.

The fundamental problem of the decline in exports is related to the policy of the government to strengthen competitiveness, including the competitiveness of human resources and the competitiveness of national products.

Coupled with the opening of the ASEAN free market, Indonesia must improve and increase competitiveness in order to survive in free market competition with other ASEAN countries. Reported by the World Economic Forum in the Global Competitiveness Report 2014-2015, Indonesia is still ranked 34th out of 144 countries. At the ASEAN level itself, Indonesia's ranking is still inferior to three neighboring countries, namely Singapore which is ranked of 2nd and Malaysia is ranked of 20th.

In addition to exports, economic growth is also influenced by imports. Import is the process of legally transporting goods or commodities from one country to another. The import process in general is the act of entering goods or commodities from other countries into the country. Imports of goods on a large scale require the intervention of customs in both sending and receiving countries. Imports are an important part of international trade. Generally, imports in Indonesia are measured by the rupiah value of the total imported goods.



Source : Worldbank (Data Processed), 2021

Figure 3 Indonesian Import Chart 1967-2020 (Million Dollars)

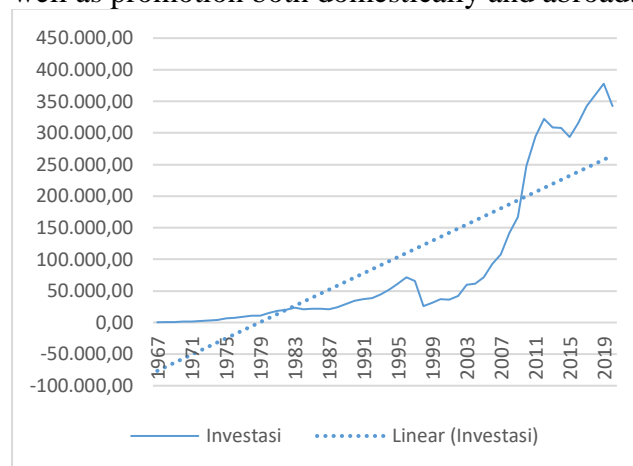
Indonesia's imports in Figure 4 tend to increase from year to year. Indonesia's imports increase sharply in 2009-2013. Indeed, high imports can reduce economic growth (Darman, 2016). imports, of goods from abroad will enter Indonesia, and can threaten domestic products because the competitiveness of domestic products is still inferior to imported products in terms of price and quality.

Indonesia imports a lot of fuel and minerals, mechanical machinery and aircraft, motors and electrical equipment, iron and steel, plastics and plastic goods. (Widiyanto, 2019). Imports tend to be carried out to meet the goods needed by the domestic market.

In addition to exports and imports, economic growth can also be affected by investment. According to Sadono Sukirno, investment is defined as company expenditure or investment expenditure to purchase capital goods and production equipment to increase the ability to produce goods and services. In other words, in economic theory, investment means spending activities to increase production capacity in the economy. In general, investment includes the

addition of goods and services in the community such as the addition of land and so on.

Most researchers conclude that an increase in investment will increase economic growth. such as research conducted by Escu (2018), which states that increased government investment will promote sustainable economic growth. Research conducted by Iamsiraroj (2016) indicates that the effect of foreign direct investment is positively related to future economic growth. Research conducted by Jorgenson & Conrad (2015), states that investment in education is an important key to faster growth. As a result, the entire policy advice is given to increase the amount of investment by doing business and licensing as well as promotion both domestically and abroad.



Source : Worldbank (Data Processed), 2021

Figure 4 Indonesian Investment Year 1967-2020 (Million Dollars)

Indonesia's investment from figure 4 increases rapidly from 2004 to 2012, decreasing until 2015. It increases again from 2016 to 2018. In line with research conducted by Ramayani (2013), High investment can increase economic growth. However, with the number of investments continuing to increase, Indonesia's economic growth actually stagnates in the short term and declines in the long term, and this is something interesting to study. Why is an increase in investment followed by a decrease in economic growth.

The development of provincial investment realization during 2006 to 2010 shows that the islands of Java and Sumatra are still the main choices for investment locations. Investment realization in Java reaches around 62% of the total investment in Indonesia, while in Sumatra it reaches around 20%. (Sulistiawati, 2012). This unequal distribution of investment certainly has an impact on the development gap.

2. Theoretical Review

Economic growth according to Simon Kuznet (2008) is the ability of a country to provide more and more types of economic goods to its population. This ability grows according to economic progress, institutional and ideological adjustments needed.

The definition above has three components of understanding: First, the economic growth of a nation can be seen from the continuous increase in the supply of goods. Second, advanced technology is a major factor in economic growth that determines the degree of growth in the supply of various goods to the population. Third, the widespread and efficient use of technology requires adjustments in the fields of institutions and ideologies. The innovations produced by human science can be used appropriately. So, economic growth is an increase in the prosperity of a country from an increase in overall income.

Export is an effort to sell commodities that our country has to other countries or foreign nations in accordance with government regulations by expecting payment in foreign currencies, as well as communicating in foreign languages (Amir, 2001). Exports are very influential on the economic growth of a country, as has been explained in the Hecksher-Ohlin theory. This activity will be beneficial for the country, because will increase national income and accelerate the process of development and economic growth.

According to Apridar (2009) Export is one of the supporting factors in stimulating the growth of a region, export activities are carried out to get at increasing the regional income. Thus, exports play an important role in the selection of economic development strategies and therefore any changes in the number of exports will affect domestic products. According to Monireh Dizaji and Arash Ketabforoush (2014) state that increasing export capacity will increase domestic product. This is because export activities are one component of aggregate expenditure. Exports can affect the level of national income to be achieved. Exports can be said to be the process of legally transporting goods or commodities from one country to another countries, generally in the trade process. When exports increase, Aggregate spending increases and will further stimulate the economic growth of a country. This is supported by research conducted by Sanika Sulochani and Keun Lee (2015) that economic growth cannot be

separated from export activities. So it can be concluded that export is an activity of selling goods to other countries to gain profits in the form of foreign exchange reserves which are reused to buy imported goods.

Import is the purchase or entry of goods from abroad into a domestic economy (Sukirno, 2006). Imports are very influential on the economic growth of a country, as explained in the Hecksher-Ohlin theory which states that a country will import products/goods that use for production factors that are not or rarely owned by that country in domestic markets. This activity will be profitable for the country compared to doing its own production but not efficiently.

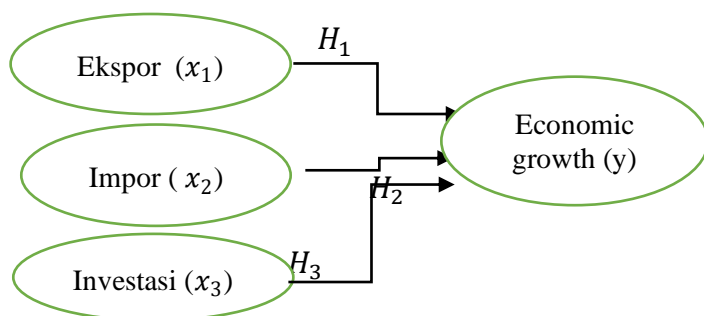
According to (Imam, 2013) import activity is an activity of public consumption of goods from abroad. The higher Indonesia's imports must be supported by a high GDP. Imports are highly dependent on GDP, because GDP is one of the sources of import financing. Imports have a negative relationship to GDP, which means that if imports are high, GDP will decrease (Saputra, 2015). A country's imports are influenced by the level of people's income, the higher the income level of the community, the more imports will be carried out (Sedyaningrum, 2016). Import activities will lead to a flow of money abroad and the reward is that foreign goods and services enter the country. It have the potential to threaten domestic companies because of entering of large number of similar goods and services that reduce national income and will reduce economic growth in the long run (Andiarto, 2019). So imports are buying goods from other countries to meet domestic consumption and production needs.

Investment can be interpreted as expenditure or investment to buy capital goods and production equipment to increase the ability to produce goods and services to be available in the economy (Sukirno, 2010). This increase in the amount of capital goods allows the economy to produce more goods and services in the future.

Investment is an effort either directly or indirectly with the hope that in time the owner of the capital will get the benefits of the investment. According to Boediono, investment is expenditure for the purchase of goods or services to increase stock used or for factory expansion. While Dornbusch and Fischer in Pramono Iswardono state that investment is the demand for goods and

services to create or increase production capacity or income in the future. From the above understanding it can be stated that investment is an investment in the form of assets owned in a period with the aim of getting a profit on the investment. (Sutawijaya & Zulfahmi, 2012). So, investment is the activity of using capital, both money and goods to produce or add goods or services to meet the needs of the community for profit.

Conceptual Framework



Picture 2.1 Research Framework

From the theoretical framework, it can be concluded that economic growth is influenced by exports, imports and investment. In examining the effect of each independent variable on economic growth, there are still differences in the results of research regarding the effect of exports, imports and investment on economic growth. Further details can be seen in the following sub-chapters.

The Effect of Exports on Economic Growth

Exports have a significant effect on economic growth, because export activities provide very large foreign exchange. Exports widely to various countries allow an increase in the amount of production that drives economic growth. Through exports, the state receives payments in the form of foreign currencies, thereby increasing the amount of foreign exchange reserves and increasing the country's purchasing power for foreign goods, both for productive goods and for consumptive goods.

The Effect of Imports on Economic Growth

As far as the authors have read, the researchers are still debating how the impact of imports on economic growth will be. Do imports have a positive or negative effect on economic growth.

growth in Sub-Saharan African countries in an article entitled "Growth effect of trade and investment in Sub-Saharan Africa countries. Experience the operational variables of the study is as follows a positive effect on economic growth in each research area.

Economic growth measures the potential of an economic development. From one period to another period in the form of a country's ability to increase goods and services. (Bawinti et al., 2018). The increase is caused by the addition of production factors both in quantity and quality. Investment will increase the capital goods and technology used so that it will increase the capacity of goods that can be produced by the company, and increase the company's income. This, of course will lead to the increasing of National income will develop. And finally increase social welfare by absorbing labor, assessed from the increase in economic growth.

Hypothesis

Based on the theoretical framework and literature review for each variable, the following hypotheses can be formulated:

H₁: Exports have a positive and significant impact on economic growth in Indonesia in the short and long term.

H₂: Imports have a negative and significant impact on economic growth in Indonesia in the short and long term.

H₃: Investment has a positive and significant impact on economic growth in Indonesia in the short and long term.

3. Research methods

Data Types and Sources

The type of data in the study is secondary data or data that has been processed by other parties. In strengthening the aim of finding the relationship between the independent and dependent variables, this study employs data from the World Bank database (data.worldbank.org). The data used in this study are for 53 years, the data is in the form of a time series of economic growth, exports, imports and investment from 1967-2020.

Definition Of Operational Variable

A. Dependent Variable

The dependent variable is the variable that is affected of the independent variable (Sugiono, 2017). In this study, economic growth (Y) is used as an independent variable with a measure of growth in the value of GDP of Indonesia per year expressed in percent from 1967-2020.

B. Independent Variable

The independent variable is a variable that affects the emergence of the dependent variable (Sugiyono, 2017). This study has three independent variables, namely:

1. Exports (X_1), is the value of all exports in Indonesia from 1967-2020, which is measured in units of million United States dollars (\$)
2. Import (X_2), is the value of all imports in Indonesia from 1967-2020. measured in million United States dollars (\$)
3. Investment (X_3), is the total gross fixed capital formation in Indonesia from 1967-2020. Gross fixed capital formation here includes both domestic investment and foreign investment. measured in million United States dollars (\$)

Data Analysis Model

The data analysis method is an activity of grouping data and tabulating data based on variables, presenting data from each variable studied, performing calculations to answer the problem formulation and performing calculations to test the hypotheses that have been proposed (Sugiyono, 2016). The data in this study are grouped in a table with each row of variables contains 54 year time series data. Then, it is analyzed and processed using Microsoft Excel and E-views 10 applications, with the VECM (Vector Error Correction Model) dynamic analysis model.

The Vector Error Correction Model (VECM) method is first popularized by Engle and Granger in 1987 to correct short-run versus long-run imbalances. Vector Error Correction Model (VECM) is a Vector Autoregressive (VAR) designed to be used on non-stationary data which is known to have a cointegration relationship. The existence of cointegration in the VECM model makes the VECM model called an restricted VAR. The first step in using the VECM analysis method is to perform a stationarity test.

Stationarity Test (Unit Root Test)

This stationarity test is important in time series data analysis because if there is a non-stationary data condition, and an estimate is made using non-

stationary data, it will give a false regression result or called spurious regression (Gujarati, 2004) it will produce estimation results that get very high results of R^2 (greater than 0.9) but the relationship between these variables do not in fact exist. And this causes the regression results do not match the facts or the regression results are false.

To check the stationarity of the data, unit root test can be used, with the test statistic used is Augmented Dickey-Fuller (ADF), as follows : $\Delta Y_t = \gamma + \delta t + \rho Y_{t-1} + \sum_{j=1}^k \phi_j \Delta Y_{t-j} + e_t$

With $\Delta Y_t = Y_t - Y_{t-1}$ dan $\rho = \alpha - 1$.

Hypothesis $H_0 : \rho = 0$ (there is a unit root). At the level of significance $(1-\alpha)100\%$, H_0 rejected if the ADF statistic is less than the critical value at the time α , p value smaller than the significance value α . If H_0 rejected then the data is stationary. Next, the study will determine The leught of leg by using information createrion.

Information Criteria

Selection of order lag can use the following information criteria:

- Akaike Information Criterion (AIC)

$$AIC(p) = \log \det (\sum_u^{\wedge}(p)) + \frac{2p k^2}{T}$$

- Schwarz Information Criterion (SC)

$$SC(p) = \log \det (\sum_u^{\wedge}(p)) + \frac{\log(T)pk^2}{T}$$

With $(\sum_u^{\wedge}(p) = T^{-1} \sum_{t=1}^T \hat{u}_t \hat{u}_t'$, T is the sample size and k is the number of endogenous variables. The value of lag p selected as value P^* which minimizes the information criteria in the interval of 1, ..., p_{max} observed. The optimum lag is based on the smallest values of AIC and SC. Next, the optimum lag will be selected through information criteria.

Johansen Cointegration Test

The modeling of the Johansen cointegration test is as follows:

Known model $V(p)$ is

$$Y_t = A_t \gamma_{t-1} + \dots + A_p \gamma_{t-p} + Bx_t + e_t$$

With γ_t is a vector with k non-stationary variable $I(1)$, x_t is a vector with d variabel deterministik, e_t is the error vector. Equation $V(p)$ can also be written as:

$$\gamma_t = \Pi \gamma_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \gamma_{t-i} + Bx_t + e_t$$

Which :

$$\Pi = \sum_{i=1}^{p-1} A_i - I, \Gamma_i = \sum_{j=i+1}^p A_j$$

For hypothesis testing, trace test statistics can be used:

$$LR_{tr}(r|k) = -T \sum_{i=r+1}^k \log(1 - \lambda_i)$$

and the maximum Eigen value test statistic:

$$LR_{max}(r|r+1) = -T \log(1 - \lambda_{\gamma+1})$$

$$= LR_{tr}(r|k) - LR_{tr}(r+1|k)$$

for $r = 0, 1, \dots, k-1$, with the hypothesis used is H_0 : there is r cointegration equation. At the level of significance $(1-\alpha)100\%$, H_0 is accepted if the trace test statistic and the maximum Eigen value are less than the critical value when α , p value greater than the significance value α . Next, the Granger causality test is carried out.

Granger Causality Test

Causality analysis aims to see long-run causality and short-run causality. The analysis of the long-run causality relationship between the independent variable and the dependent variable in VECM modeling can be seen in the coefficients of the error correction term (ECT), which is based on the sign and the results of the coefficient significance test using the test statistic on the Ordinary Least Square (OLS) method. . Meanwhile, for short-run causality analysis for each variable, Granger causality test can be used. Granger causality test is based on the Wald test statistic with chi square distribution or test as an alternative. The hypotheses used are:
 H_0 : There is no Granger causality relationship.
 Then, the VAR stability test is carried out.

VAR Stability Test

The VAR stability test is carried out by calculating the roots of the polynomial function, or better known as the root of characteristic polynomial with the following equation:

$$\text{Det}(1 - A_1Z - A_2Z^2 - A_3Z^3 - \dots - A_pZ^p)$$

Where I is the identity matrix of size $M \times M$. If all the roots of the polynomial function are in *unit circle* or if the absolute value is less than 1, as stated in Gereen (2003) "dynamic stability is achieved if the characteristic root of has modulus less than one" then the VAR model is stable so that impulse response and variance decomposition analyzes can be carried out .

Model Fit Test

Model fit test to see the serial correlation on the residuals uses the Portmanteau test statistic as follows:

$$Q_h = T \sum_{j=1}^h tr(\hat{C}_j^r \hat{C}_0^{-1} \hat{C}_j \hat{C}_0^{-1})$$

or

$$Q_h^* = T^2 \sum_{j=1}^h \frac{1}{T-j} tr(\hat{C}_j^r \hat{C}_0^{-1} \hat{C}_j \hat{C}_0^{-1})$$

with $\hat{C}_i = \sum_{t=i+1}^T \hat{u}_t \hat{u}'_{t-i}$. This test statistic is distributed $\chi^2_{(k^2(h-n^*))}$, with n^* stating the

number of coefficients other than constants in the estimated $V(p)$ model*

Hypothesis H_0 : there is no serial correlation.

At the significance level $(1-\alpha)100\%$, H_0 is accepted if p value statistic Q for each lag is greater than the significance value α . Thus, there is no serial correlation. Finally, forecasting and structural analysis are carried out to see the results of the study.

Forecasting and Structural Analysis

Theoretically, the forecasting and structural analysis of the VECM has similarities with the forecasting analysis and structural analysis of the VAR model. In the VAR modeling, the analysis can use impulse response analysis and variance decomposition. Impulse Response Analysis aims to see the effect of each variable (endogenous) if a shock is given. Meanwhile, the analysis of variance decomposition aims to predict the contribution of each variable caused by changes in certain variables in a system.

As with forecasting analysis in general, to determine the accuracy of the forecast results from a model, we can use the Mean Absolute Percentage Error (MAPE):

$$MAPE = \frac{\sum_{t=1}^n \frac{|\hat{Y}_t - Y_t|}{Y_t}}{n} \times 100\%$$

and Mean Square Error (MSE) : $MSE = \frac{1}{n} \sum_{i=1}^n (Y_t - \hat{Y}_t)^2$ where n represents the amount of data. The smaller the MSE and MAPE values, the more accurate the forecast results obtained.

4. Research Results and Discussion
Stationarity Test Results

Data is stationarity when a time series data has a value that tends to approach the average. To know the existence of stationarity, we can see the stationarity test results can be seen in the following table

Table 1 Dickey Fuller Augmented Root Test Results

Variable	Unit Root	ADF T-Statistic	Critical Value (5%)	Probability AD F	Information
Economic growth	Level	-5.670438	-3.496960	0.0001	Stationary
	1st Differ	-7.560	-3.500	0.0000	Stationary

	ence	433	495		
	2nd Differ ence	6.664 996	3.506 374	0.00 00	Statio nary
Export	Level	1.884 929	3.496 960	0.64 83	Not Statio nary
	1st Differ ence	5.504 625	3.498 692	0.00 02	Statio nary
	2nd Differ ence	4.555 625	3.520 787	0.00 38	Statio nary
Import	Level	1.945 359	3.496 960	0.61 69	Not Statio nary
	1st Differ ence	5.273 789	3.498 692	0.00 04	Statio nary
	2nd Differ ence	6.810 752	3.508 508	0.00 00	Statio nary
Investme nt	Level	1.780 672	3.498 692	0.69 98	Not Statio nary
	1st Differ ence	3.776 634	3.498 692	0.02 58	Statio nary
	2nd Differ ence	8.340 248	3.500 495	0.00 00	Statio nary

Source: Processed Data, 2021

Based on table 1 above, it can be concluded that the variable economic growth is stationary at the level, first different, and second different because the t statistic value is greater than the critical value of 5% or it can be seen from the probability value below 0.05. The export, import and investment variables are not stationary at the level, but are stationary at the first difference, seen from the statistical t value which is greater than the critical value or probability below 0.05. It can be concluded that the data in this study are stationary at the first and second different levels. In this study, the first difference stationary level is used for further data processing.

Optimum Lag Determination Results

By knowing the lag in the study, it will provide an overview of the time interval required by the dependent variable in responding to changes in the independent variable, it will be used as the basis for seeing the right time interval

to determine the effect between variables. In determining the appropriate optimum lag level, each of the smallest values of the 5 available criteria is seen, namely LR: sequential modified LR test statistic (each test at 5% level), FPE (Final prediction error), AIC (Akaike information criterion), SC (Schwarz information criterion), HQ (Hannan-Quinn information criterion). The result is as follows.

Table 2 Optimum Lag Test Results

lag	LogL	LR	FPE	AIC	SC	HQ
0	1858,702	NA	2.68e+27	4.508074	6.661074	5.56634
1	1690,7302	3.3606	1.16e+26	6.428969	1.93768	7.72020
2	1671,3318	1.80125	4.45e+26	6.293369	6.669968	8.81756
3	1644,1401	4.18913	6.31e+26	7.847169	8.35668	6.60436
4	1620,2315	3.53562	8.80e+26	7.531570	1.131868	5.52173*

Source: Data processed, 2021

Based on table 2 above, the four goodness criteria show the smallest value in the 4th lag, namely LR: sequential modified LR test statistic (each test at 5% level), FPE (Final prediction error), AIC (Akaike information criterion), and HQ (Hannan-Quinn information criterion). Meanwhile, the SC goodness criterion (Schwarz information criterion), shows the best lag in the 2nd lag. The goodness is suggested by each goodness criteria in the form of the smallest value, marked with a star (*) this study uses the 4th optimum lag to define the period of influence of each of independent variable on the dependent variable.

VAR Stability Test Results

The stable VAR equation has a stable error correction value. If the value of the VAR error correction is not stable, the results of the impulse response and variance decomposition are invalid, the VAR stability test has been carried out with the following results:

Table 3 VAR Stability Test Results

Root	Modulus
0.965487	0.965487
-0.049152 - 0.939517i	0.940801
-0.049152 + 0.939517i	0.940801
0.629173 - 0.691594i	0.934966
0.629173 + 0.691594i	0.934966
0.891992 - 0.184764i	0.910927
0.891992 + 0.184764i	0.910927
-0.757915	0.757915
-0.118805 - 0.748092i	0.757467
-0.118805 + 0.748092i	0.757467
-0.401231 - 0.582262i	0.707117
-0.401231 + 0.582262i	0.707117
0.610377 - 0.340514i	0.698934
0.610377 + 0.340514i	0.698934
-0.479021	0.479021
-0.209438	0.209438

Source: Processed Data, 2021

Based on the results of the VAR stability test described in table 4.3 above, it can be seen that the modulus value from the initial lag to the final lag has a value below 1 and continues to decrease. Especially in the lag used in this study, the 4th lag value is below one, which is 0.934966. So it can be concluded that the VAR model used in this study is stable.

Cointegration Test Results

Cointegration is two or more variables that have random values, but the movement of the values of these variables is linear. Cointegration can occur if the relationship affects between variables so that the movement of the values of the variables is in line. With the occurrence of cointegration, it is concluded that the long-run movement of the value of a variable an unidirectional tendency or there is a long-run relationship. To find out whether there is a long-run or short-run relationship in this study and to see whether there is an imbalance that will occur, a cointegration test is carried out. If there is an imbalance, an error correction model is needed. In this study, the cointegration test is carried out using the Johansen cointegration test in the eviews 10 application.

Table 4 Johansen Cointegration Test Results
Unrestricted Cointegration Rank Test
(Trace)

Hypothesize d	Trace Eigenvalu	0.05 Critical	Prob.*
No. of CE(s)	Statistics	Value	

	e	Value	*
None *	0.576710	91.5210 63.8761	0.0001
At most 1 *	0.397614	49.3958 42.9152	0.0099
At most 2	0.322663	24.5598 25.8721	0.0722
At most 3	0.105629	5.47010 12,5179	0.5303

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

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesize d	Eigenvalu e	Max- Eigen Statistics	0.05 Critical Value	Prob.*
None *	0.576710	42.1251 32.1183	2	0.0022
At most 1	0.397614	24.8360 25.8232	1	0.0671
At most 2	0.322663	19.0897 19.3870	4	0.0552
At most 3	0.105629	5.47010 12,5179	8	0.5303

Source: Processed Data, 2021

To find out whether a variable is cointegrated or not in the Johansen cointegration test, it can be seen from the trace statistic and maximum eigenvalue to the critical value at an error rate of 5%. Research variables are said to be cointegrated if the trace statistic or eigenvalue is greater than the critical value of 5%, or the probability value is below the percent error rate (5%)

Based on table 4 above, it can be seen that not all trace statistical values are greater than the critical value of 5%. At most 1, the trace statistic value is greater than the critical value of 5%, which is 91.52105 > 63.87610. while at most 2 and at most 3 the trace statistic value is smaller than the critical value. So it can be concluded that in this study there is a cointegration of at least one variable, which means that there is a long-run relationship in that variable.

Granger Causality Test Results

Causality between variables explains that there is a relationship in the variables in either one or two directions, and vice versa. In knowing the one-way or two-ways relationship between variables, the Granger causality test is used. The results of the Granger causality test were as follows:

Table 5 Granger Causality Test Results

Null Hypothesis:	F- Obs	Statistics	Prob.
EXPORT does not Granger Cause PE	50	0.48951	0.7434
PE does not Granger Cause EXPORT		0.53756	0.7089
IMPORT does not Granger Cause PE	50	0.59255	0.6700
PE does not Granger Cause IMPORT		0.11549	0.9763

INVESTMENT does not Granger Cause PE	50	0.56129	0.6920
PE does not Granger Cause INVESTMENT		1.11629	0.3620

Source: Processed Data, 2021

Based on table 5 above, the probability value of the Granger effect of exports on economic growth is $0.7434 > 0.05$, the Granger's influence of imports on economic growth is $0.6700 > 0.05$ and the Granger effect of investment on economic growth is $0.6920 > 0.05$. Which means that all independent variables do not affect the dependent variable because the probability value of each independent variable is above the percentage of error (5%).

VECM Estimation Results

VECM estimation is carried out to determine the magnitude of the influence and how significant is the occurrence of each variable on the other variables. Both on the 1st lag, the 2nd lag, the 3rd lag and so on. The results of the VECM estimation in this study are as follows:

Table 6 VECM Estimation Results

Variable	Coefficient	T Statistics	Information
D(PE(-1))	-0.351588	-0.84709	Not significant

D(PE(-2))	-0.268119	-0.77232	Not significant
D(PE(-3))	-0.018322	-0.05890	Not significant
D(PE(-4))	-0.034850	-0.15872	Not significant
D(EXPORT(-1))	0.000130	0.56872	Not significant
D(EXPORT(-2))	0.000273	1.41579	Not significant
D(EXPORT(-3))	0.000246	1.65120	Not significant
D(EXPORT(-4))	0.000203	1.33879	Not significant
D(IMPORT(-1))	-0.000151	-0.73981	Not significant
D(IMPORT(-2))	-0.000261	-1.45310	Not significant
D(IMPORT(-3))	-0.000252	-1.61101	Not significant
D(IMPORT(-4))	-0.000162	-0.99870	Not significant
D(INVEST(-1))	3.01E-05	0.41933	Not significant
D(INVEST(-2))	-4.24E-05	-0.44655	Not significant
D(INVESTMENT(-3))	-1.40E-05	-0.12352	Not significant
D(INVEST(-4))	3.83E-05	0.36179	Not significant

Source: Processed Data, 2021

Based on the table of VECM 6 estimation results above, it can be seen that all variables, both exports, imports, investment, and economic growth itself at lags (-1), (-2), (-3), and (-4) have

no significant effect. the value of economic growth that occurs, seen from the statistical t value of each variable is smaller than the t table value. The t table value is 1.67591, taken from the t distribution value book in the third column and 50th row, where the third row represents the percentage of errors received by 5% for a one-way relationship and the 50th row is the number of observations minus the research variables used. The value of t statistic is absolute which does not look positive or negative. As an example, the import variable in the 3rd lag has an insignificant negative effect on economic growth in the current period, because the value of t statistic is smaller than t table, namely $-1.61101 < 1.67356$ with a coefficient of -0.000252 which means an increase of one million dollars in imports will only increase economic growth by 0.000252% . In fact, economic growth itself, for example, in the 2nd lag has a negative and significant effect on economic growth because the value is $-0.77232 < 1.67356$ with a coefficient of -0.268119 . It means that an increase in economic growth in the previous 2 periods by 1% will reduce the level of the current period's economic growth about -0.268119% the coefficient of 0.000252 means an increase of one million dollars in imports will only increase economic growth by 0.000252% . In fact, economic growth itself, for example, economic growth in the 2nd lag has an insignificant negative effect on economic growth because the value is $-0.77232 < 1.67356$ with a coefficient of -0.268119 , which means that an increase in economic growth in the previous 2 periods by 1% will reduce the level of the current period's economic growth about is -0.268119% . 0.000252 the coefficient of means an increase of one million dollars in imports will only increase economic growth by 0.000252% .

In general, the results of the VECM estimation of export variables on economic growth in the 1st lag, 2nd lag, as well as 3rd and 4th lags, all have positive coefficients on economic growth but are not significant. It can be concluded that Indonesia's exports have no positive and significant effect on Indonesia's economic growth.

The import variable can be seen to have a negative coefficient on economic growth, in the 1st lag, 2nd lag, and 3rd and 4th lags, but the effect is not significant. So it can be concluded that Indonesia's imports have a negative but not significant effect on Indonesia's economic growth.

The results of the VECM estimation of investment on economic growth in Indonesia vary. As seen in lag 1 and lag 4, investment value has a positive but not significant effect on economic growth in Indonesia. On the other hand, investment variables at the 2nd and 4th lags have a negative but not significant effect on economic growth. However, lag 4 (optimum lag) has a negative effect where the optimum lag is the optimal time interval to see the response of the dependent variable to changes in the value of the variable. So Indonesian investment has a negative but not significant effect on economic growth in Indonesia.

Impulse Response Results

Impulse response analysis aims to see the effect of shock from one variable to other variables. Changes in the value of one variable will affect other variables as well as the variable itself. Provide direction of the relationship between the magnitude of the influence between variables and how long the estimated time required to achieve a balance of values on a variable, the results of the impulse response analysis can be seen as follows:

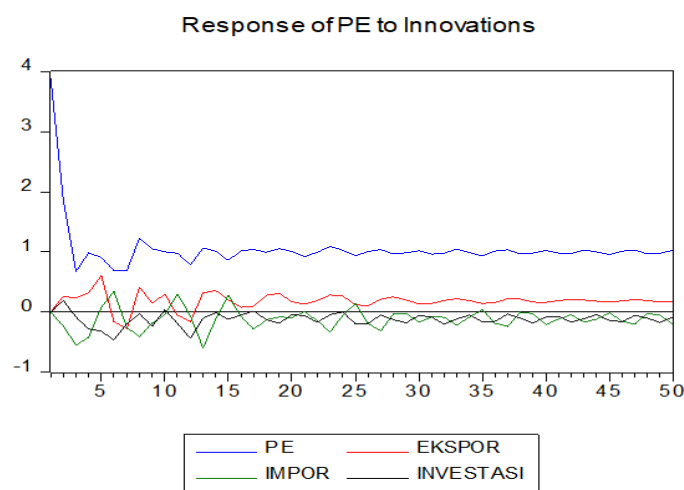


Figure 6 Impulse Response Graph of Economic Growth

Source: Processed Data, 2021

Based on figures 6 above, the response from economic growth is to changes in economic growth itself received a positive response from the beginning to the end of the 50th period. However, changes occur in economic growth that will greatly increase economic growth in the first period, which is 3.891009. the response of economic growth to changes in economic growth itself varies greatly from the first period to the 15th period until it finally starts to balance in the

20th period and until the 50th period with a value range of 0.9-1.1%.

The response of economic growth to changes in exports tends to vary in the value of positive and negative responses from the first period to the 20th period. The negative response from changes in exports to economic growth exist in the 6th, 7th, 11th and 12th periods. Finally, the value of the response of economic growth to exports have a balance from the 25th to 50th period, with a positive value ranging from 0.1-0.2%. This means that in the long run changes in the value of exports will affect the value of economic growth for the next 25 periods.

For the effect of changes in the value of imports on economic growth, changing in the value of imports greatly shake the changes in the value of economic growth in the first period to the 20th period. The value of changes in economic growth on changes in imports tends to be negative until the 50th period. The balance of the value of economic growth against changes in the value of imports begins to occur in the 27th period to the 50th period with a negative value. This means that in the long run changes in the value of imports will affect the value of economic growth for the next 27 periods.

Changes in the value of investment to economic growth provide a large shock to changes in the value of economic growth in the first period to the 12th period. And then, so on until the 50th period reaches a balance with a value that tends to be negative with a range of 0.8-0.11%. That is, in the long run changes in investment value will affect the value of economic growth for the next 12 periods.

Variance Decomposition Results

Variance decomposition is a method of decomposition of one variable into the shock another variable in the VAR. VAR Usually uses to forecast data. Analysis of variance decomposition aims to determine the magnitude of the role of a variable against other variables in percent so that it can be predicted what variables should be changed to achieve the value of a desired variable. Generally, the biggest source of changes in a variable is the variable itself. The results of variance decomposition are as follows:

Table 7 Variance Decomposition Results of Economic Growth

Peri	SE	PE	EXPO	IMPO	INVESTM
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od			RT	RT	ENT
1	3.891009	100,0000	0.000000	0.000000	0.000000
2	4.330321	99.14163	0.364244	0.294373	0.199756
3	4.424500	97.31438	0.624957	1.833159	0.227506
4	4.572089	95.78177	1.075223	2.552990	0.590014
5	4.711936	93.88171	2.675605	2.431261	1.011427
6	4.799494	92.55187	2.692263	2.848503	1.907362
7	4.867459	91.99739	2.933791	3.046626	2.022193
8	5.053734	91.25154	3.388533	3.481392	1.878538
9	5.172916	91.23003	3.317266	3.447084	2.005618
10	5.277801	91.24993	3.498429	3.319445	1.932196
11	5.379873	91.12484	3.375204	3.514069	1.985891
12	5.456982	90.63471	3.364029	3.428967	2.572291
13	5.602010	89.62069	3.516034	4.388885	2.474393
14	5.705311	89.55337	3.786451	4.274371	2.385811
15	5.780928	89.42649	3.807850	4.398414	2.367242
16	5.871677	89.71054	3.709802	4.278885	2.300775
17	5.970929	89.79955	3.613227	4.361574	2.225653
18	6.062090	89.80467	3.718974	4.273948	2.202406
19	6.164805	89.77766	3.852407	4.151317	2.218618
20	6.249452	89.95145	3.823946	4.060420	2.164183
21	6.318183	90.11709	3.784420	3.972571	2.125923
22	6.402378	90.16965	3.771623	3.918568	2.140162
23	6.509663	90.03571	3.837882	4.051466	2.074938
24	6.595964	90.12131	3.904405	3.953285	2.020996
25	6.667679	90.16642	3.854792	3.913538	2.065245
26	6.749379	90.22121	3.785903	3.899333	2.093148

	03	61	6	3	
27	6.839385	90.17052	3.782612	4.003710	2.043156
28	6.912903	90.20781	3.837166	3.921265	2.033763
29	6.988220	90.26886	3.837293	3.838277	2.055572
30	7.066228	90.38132	3.791563	3.810384	2.016738
31	7.133906	90.49677	3.758736	3.751164	1.992434
32	7.206984	90.52540	3.753787	3.689765	2.031043
33	7.290197	90.53341	3.761090	3.695035	2.010468
34	7.359581	90.62827	3.757647	3.637016	1.977071
35	7.421734	90.69524	3.732093	3.579051	1.993614
36	7.495970	90.72913	3.705327	3.569121	1.996427
37	7.574503	90.73436	3.713993	3.594610	1.957037
38	7.639762	90.79490	3.729896	3.533465	1.941741
39	7.706420	90.85105	3.711665	3.474020	1.963264
40	7.779356	90.89707	3.685607	3.480492	1.936833
41	7.844716	90.95904	3.684555	3.443731	1.912673
42	7.909705	90.89971	3.692762	3.390522	1.927009
43	7.981542	91.02434	3.690389	3.373857	1.911411
44	8.047054	91.09383	3.682026	3.340728	1.883416
45	8.106761	91.15023	3.670682	3.291993	1.887097
46	8.174926	91.17360	3.661087	3.272882	1.892427
47	8.245043	91.19391	3.664305	3.276770	1.865017
48	8.304488	91.24890	3.666892	3.230795	1.853408
49	8.365507	91.28963	3.653462	3.187568	1.869343
50	8.433319	91.31247	3.640053	3.196944	1.850530

Source: Processed Data, 2021

From the variance decomposition table 11 above, economic growth itself has the greatest

influence on economic growth. This contribution continues to decline from 100% to 89.77% in the 20th period, but remained the dominant influence on economic growth. The influence of economic growth itself on economic growth then continues to increase from the 21st period to the 50th period reaching 91.31%. That is, the effect of economic growth itself greatly affects the variables of economic growth.

Next, there are exports that also influence changes in economic growth with a value that tends to be small from the 1st to the 50th period with a value range of 1-4%. The influence of exports on economic growth is initially 0% and so on it tends to continue to increase until the 24th period reaching 3.90% and then continues to decline until the 50th period with a value of 3.60%. This means that Indonesian exports have a small role and are not strong enough to affect Indonesia's economic growth.

In the magnitude of the role of variables affecting economic growth, imports are in second place. the role of imports in influencing the value of economic growth ranges from 0-4.5%. Initially, imports has no effect on economic growth (0%) and so tends to increase until the 15th period with a role value of 4.39% and continues to decline until the 50th period. This means that Indonesian imports also have a small role and are not strong enough to affect Indonesia's economic growth

The investment variable has a small role in influencing the economic growth variable, even the range of its influence is only 0-2.5%. Initially, investments does do not have a role in changes in economic growth and so its role continues to increase but fluctuates until the 12th period with the highest role value of 2.57%. And in the end the role continues to decline until the 50th period to a value of 1.85%. This means that Indonesian investment has a small role and is not strong enough to affect Indonesia's economic growth

Discussion on the Effect of Exports on Economic Growth

Basically, exports have a positive and significant effect on economic growth, because exports provide foreign exchange reserves for the country to support economic activities. Based on the results of research and observations that have been carried out, Indonesian export variables have a positive but not significant effect on Indonesia's economic growth and are not in line with the ELG

(Export led Growth) theory that exports are the trigger of economic growth. Although the research results do not support the ELG theory, it does not prove that the ELG theory is not correct. The insignificant influence of exports on economic growth can be caused by the competitive factors of Indonesia's exports, which are generally controlled by countries and companies with competitive and comparative advantages in international trade. namely advantages both in terms of price and quality. Buyers certainly want to get cheaper goods with good quality. Indonesia's export goods are generally not high-tech goods. As the results of research conducted by Kilavuz & Topcu (2012) where high-tech goods have a higher value in the export market. The export value that is too low can also be the reason why the influence of exports on Indonesia's economic growth is not significant. For this reason, it is necessary to increase the value of Indonesia's exports so that exports can significantly affect economic growth. The government should stimulate the budget for the entire export sector so that exports are able to increase economic growth. The results of this study are in line with research conducted by Bakari (2019) in his research entitled "The relationship between Export, Import, Domestic Investment and Economic Growth in Egypt: Empirical Analysis", Bakari (2018) in his research entitled "Impact of Exports and Imports on Economic Growth in Canada: Empirical Analysis Based on Causality, Priyono & Wirathi (2017), Nature (2003), and Ajmi et al. (2015)

Discussion on the Effect of Imports on Economic Growth

Basically, imports have a negative effect on economic growth because they reduce the value of foreign exchange reserves and threaten domestic products. Based on the results of research and observations that have been made, it is found that the Indonesian import variable has a negative and insignificant effect on economic growth in Indonesia. The state of large imports for a country can threaten domestic companies that are unable to compete in price and quality. Indonesia's competitiveness is still ranked 34th out of 144 countries, Singapore is ranked 2nd and Malaysia is ranked 20th. So that the entry of imported goods into Indonesia beats the sale of goods from domestic companies, so that in the end the flow of financial income goes abroad, and reduces

economic growth. Furthermore, the composition of Indonesia's imports is still mostly raw materials for industrial support, which is between 70-80%. Meanwhile, goods for low consumption are between 10-20%. The government must pay attention to import raw materials so that they can be produced domestically so that import dependence will decrease. If the state tends to import a lot of consumer goods, it can reduce economic growth. The results of this study are in line with research that has been carried out by If imports tend to be carried out for consumptive purposes, it will certainly exacerbate the negative influence of imports on economic growth. The results of this study are in line with research that has been carried out by Ramos (2001), Bakari (2019), Bakari, (2018) and Astuti & Ayuningtyas (2018)

Discussion of the Effect of Investment on Economic Growth

Basically, investment will increase economic growth by increasing production equipment and supplies. Based on the results of research and observations that have been made, it is found that Indonesian investment has a negative and insignificant effect on economic growth in Indonesia. The conclusion is seen in both short-term and long-run observations, where the short-run path has a variety of positive and negative effects, but in the long run it has an insignificant negative effect on economic growth, such as the results contained in the impulse response graph where the long-run balance investment tends to be negative. The results of this study are in line with research conducted by Bosanac & Požega (2016), Khaliq (2007), Ilman (2016) and Bakari (2017).

Table 8 Total Investment in Indonesia 1992-2020

Investment Type	Total Investment (Rupiah)
Domestic Investment	2,647,247 Trillion
Overseas Investment	7,344.919 Trillion

Source: nswi.bkpm.go.id (data processed), 2021

Basically, investment can build state and community income and services to meet the needs of the community. An increase in the number of goods and services will increase the value of gross domestic product, which in turn will increase economic growth. One of the causes of the negative influence of investment on economic growth in Indonesia is the amount of Indonesia's

foreign investment which is much larger than the amount of domestic investment as shown in great table 4.12 above. Where Indonesia's total foreign investment is almost three times the amount of domestic investment. This is as said by Bosanac in his research, that the state should not depend on foreign investment. Starting from the uncertainty of the number of foreign investors, the number of adjustments needed according to requests from the home country, the length of involvement of foreign investors in making investment decisions and the risk if they withdraw their investment. Basically, the state must rely on the capabilities of domestic production and investment. So that the Indonesian state is able to stand strong in meeting the country's needs.

5. Conclusions and suggestions

Conclusion

Based on the results of the study, we can draw conclusions, namely:

1. Indonesian exports have an insignificant positive effect on economic growth in Indonesia in the short run.
2. Indonesian imports have an insignificant negative effect on economic growth in Indonesia in the short run.
3. Indonesian investment has a varied and insignificant impact on economic growth in Indonesia in the short run.
4. Economic growth will be stable in the 20th period that will come in the long run if there are shocks to changes in the value of economic growth.
5. influencing economic growth. Followed by exports and investment.

Suggestion

Based on the results of research and observations that have been made, suggestions can be given

1. In order to increase the significance of exports, the Indonesian state needs to improve the quality of technology in order to be able to compete in the international market both in terms of quality and price. In order to win domestic and foreign market share.
2. The Indonesian state must maintain a good import composition, namely imports are carried out to increase the amount of domestic production by buying production raw materials, and as much as possible import substitution, namely producing industrial raw materials themselves in order to be able to reduce the negative impact of imports on

economic growth and is expected to increase imports can boost Indonesia's economic growth

3. The Indonesian state must be able to support the amount of domestic investment to have a good influence on the economic climate of the Indonesian state. The Indonesian state needs to increase investment in real production goods in order to be able to increase national production and create greater employment opportunities.

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