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The Effect of Oil Price, Inflation, and Net Exports on Economic Growth in Indonesia the Period of 1980-2015

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ABSTRACT

The Gross Domestic Product (GDP) is one of the indicators of the success of the economic growth. As a developing country, Indonesia has a moderately good economic growth because it increases from year to year. This study to find out the effect of world oil price, inflation, and net exports to economic growth in Indonesia. This study employed the quantitative approach. The data were secondary data in 1980-2015. The data analysis technique in the study was the time series data analysis using the OLS (Ordinary Least Square). The results of this study indicate that the variable oil prices and net exports have a positive and significant impact on economic growth in Indonesia. This can be interpreted if the oil price and net exports increase, the economic growth in Indonesia will also increase. While the inflation and dummy variables have a negative and insignificant effect on economic growth in Indonesia. This can be interpreted, if inflation and dummy increase, then economic growth in Indonesia will decrease

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1. INTRODUCTION

Economic growth is the process of increasing output per capita continuously in the long run. Economic growth is one of the indicators of development success, which is the main source of efforts to improve people's living standards. Therefore, the higher the economic growth, the higher the welfare of the people. Readiness to face the global free trade era in the future is a challenge for Indonesia because at the same time it is also facing various unfavorable domestic economic situations. Indonesia's role in the midst of economic activity, international trade is still relatively small with a high level of dependence on international markets.

The purpose of this study is to analyze the effect of oil prices on Indonesia's economic growth in 1980-2015. To analyze the effect of inflation on Indonesia's economic growth in 1980-2015. to analyze the effect of net exports on Indonesia's economic growth in 1980-2015. To analyze the effect of the Dummy variable (monetary crisis) on Indonesia's economic growth in 1980-2015.

2. RESEARCH METHOD

2.1 Research variable

The independent variable is identical to the explanatory or independent variable or the preceding variable. These variables are usually considered as independent variables, including oil prices, inflation, net exports, and dummy variables. In this study, the dependent variable is Economic Growth.

2.2 Operational Definition of Research

The operational definition of each variable in this study is as follows:

a. Economic growth

The definition of economic growth is an increase in Gross Domestic Product / Gross National Income regardless of whether the increase is greater or less than the population growth rate or whether changes in economic structure occur or not, and is measured in (percent) from 1980-2015.

b. Fuel oil

Oil fuel is fuel originating and/or processed from petroleum which is measured in rupiah.

c. Inflation

Inflation is the tendency of a continuous increase in the price level, affecting individuals, businesses, and governments, and is measured in (percent)

d. Net Exports

Net exports are the value of goods and services produced domestically and sold abroad (exports) minus the value of goods and services produced abroad and sold domestically (imports) measured in (billions of rupiah).

e. Dummy (monetary crisis)

The dummy (monetary crisis) is an additional variable to see the very significant changes in data due to the monetary crisis that occurred in 1980-2015. For data before the monetary crisis in the proxy = 0, while after the monetary crisis the proxy = 1.

2.3 Data Types and Sources

This study uses secondary data with the type of time series data during the period 1980-2015. Secondary data is data that is not collected by the researcher himself, obtained from company brochures, magazines and literature.

2.4 Method of collecting data

a. Normality test

This test is conducted to determine whether the residuals we get from the regression results are normally distributed or not. The trick is to compare the statistical JB value with the Chi Square table value. If the JB statistic > Chi Square table then the residuals are normally distributed. The table value is obtained with a certain level of confidence and df = 2.

b. Heteroscedasticity Test

Heteroscedasticity test is carried out to test whether in a regression model there is an inequality of variance from one observation residual to another observation. If the variance from the residual of one observation to the residual to another observation remains, then there has been heteroscedasticity. If the variances are different, it is called heteroscedasticity. A good regression is one that does not occur heteroscedasticity. Heteroscedasticity occurs when the disturbance variable has the same variable for observation, to detect the presence or absence of heteroscedasticity, the white heteroscedasticity test is used. Then determine the hypothesis which states that if the calculation results in a significant t-count value / t-count > t-table, then it can be said that there is heteroscedasticity, if t-count <

c. Multicollinearity Test

This multicollinearity detection aims to determine whether each independent variable is linearly related in the regression equation model used. If multicollinearity occurs, as a result, the estimation variable tends to be too large, the t-count is unbiased, but not efficient. One way to analyze the presence or absence of the influence of multicollinearity in this study is to look at the value of the

Correlation Matrix. A data can be said to be free from multicollinearity symptoms if the correlation value between independent variables is less than 0.8 (correlation <0.8).

2.5 Multiple Linear Regression

The regression used in this study is multiple regression because it uses one dependent variable, namely economic growth, and four independent variables, namely oil prices, inflation, net exports, and dummy variables.

2.6 Estimated Coefficient of Determination (R2)

From the coefficient of determination (R2), it can be seen the degree of determination of multiple linear analysis. R2 shows the magnitude of the contribution of all independent and dependent variables.

2.7 Statistical Test

After testing the classical assumptions, the hypothesis is tested. If the model is free from deviations from classical assumptions, then hypothesis testing can be carried out. Hypothesis testing is done by testing the significance (significant effect) of the independent variable on the dependent variable, either partially or jointly, using the t-test (t-test) and F-test (F-test).

2.8 Conceptual Framework

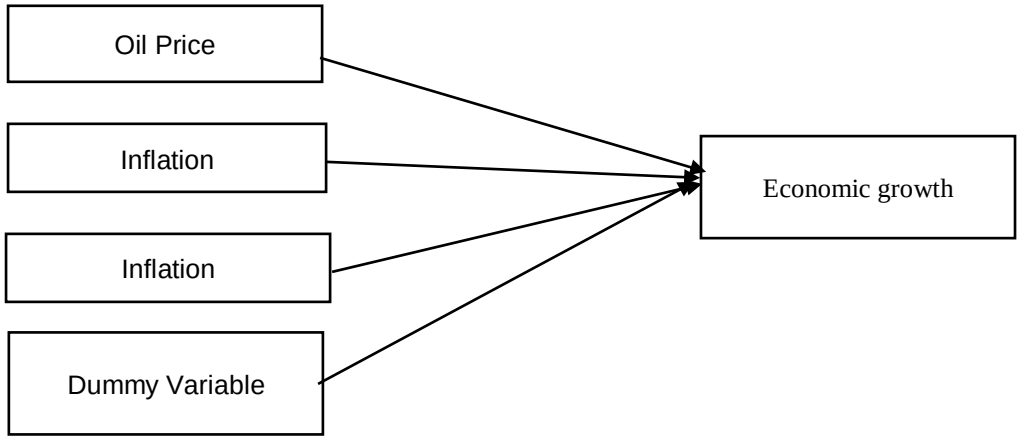

Image 1. Conceptual framework

2.9 Hypothesis

The hypotheses used in this study are as follows:

a. It is suspected that the oil price variable has a positive and significant effect on economic growth in Indonesia in 1980-2015.
b. It is suspected that the inflation variable has a positive and significant effect on economic growth in Indonesia in 1980-2015.
c. It is suspected that the net export variable has a positive and significant effect on economic growth in Indonesia in 198-2015.
d. It is suspected that the dummy variable (monetary crisis) has a negative and significant effect on economic growth in Indonesia in 1980-2015.

3. RESULTS AND DISCUSSIONS

3.1 Data analysis

Data analysis was carried out using multiple regression analysis using the computer program eviews 09. To get the best estimate, the secondary data must first be tested for classical assumptions, namely: multicollinearity test, heteroscedasticity test, autocorrelation test and normality test.

3.2 Classic Assumption Test

a. Multicollinearity Test

This test aims to measure the relationship between explanatory variables so that it can be said whether there are symptoms of multicollinearity between explanatory variables. To test the presence or absence of multicollinearity symptoms using the Correlation Matrix test.

Table 1. Multicollinearity Test (Correlation Matrix)

	Dummy	Export_Net	Price_Oil	Inflation
Dummy	1,000,000	0.575989	0.732142	0.116282
Export_Net	0.575989	1,000,000	0.104488	0.222829
Price_Oil	0.732142	0.104488	1,000,000	-0.175482
Inflation	0.116282	0.222829	-0.175482	1,000,000

Source: Eviews 9 processed data

Based on table 1, it can be seen that the results of the calculation of the correlation matrix value between the explanatory variables are less than 0.8, meaning that all explanatory/independent variables do not occur multicollinearity so that they do not bias the interpretation of the results of the regression analysis.

b. Heteroscedasticity Test

This test is to see whether each confounding variable has the same variable or not. To find out whether this problem exists, a white heteroscedasticity test will be carried out using eviews 09 in table 2:

Table 2. White heteroskedasticity test results

Heteroskedasticity Test : White			
F- statistics	F- statistics	Prob. F(5,29)	0.8892
Obs*R-squared	1,896,598	Prob. Chi-Square(4)	0.8633

Source: Eviews 9 processed data

c. Normality test

Normality test aims to test whether in a regression model, the dependent variable, the independent variable, or both have a normal distribution or not. A good regression model is the data distribution is normal or close to normal. To see the normality of the data in this data, a test using eviews is used as shown in Figure 1 below:

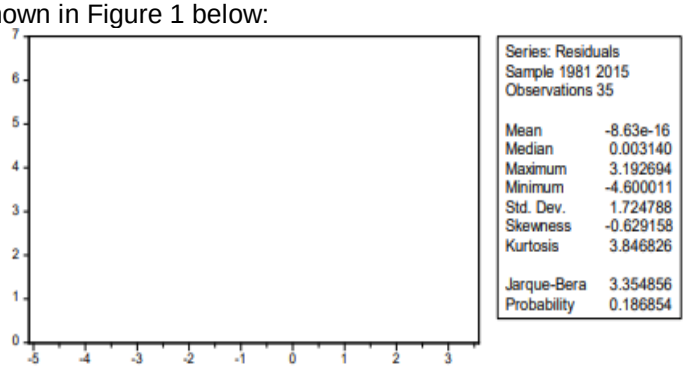

Figure 2. Normality test results

d. Autocorrelation Test

Autocorrelation in the regression model means that there is a correlation between sample members sorted by time of correlation. To find out the existence of autocorrelation in a regression model, it is done through testing the Durbin Watson test value (DW Test) with the following conditions:

Less 1.10 = There is autocorrelation
1.0 to 1.54 = No conclusion
1.55 to 2.46 =No autocorrelation
2.46 to 2.90 = No conclusion
More than 2.91 = There is autocorrelation

Table 3.OLS . Method Estimation Results

Variable	Coefficient	Standard Error	t. Statistics	Prob
C	7,498,735	0.809979	9,257,932	0.0000
Price_Oil	0.000583	0.000294	1,985,373	0.0560
Inflation	-0.193127	0.034199	-5,647.102	0.0000
Export_Net	9.70E-05	4.89E-05	1,982,251	1,982,251
Dummy	-5,064.928	1,694,071	-2,989,797	0.0054
R-squared	0.653420	Mean dependent var		5,152,778
Adjusted R-squared	0.608700	SD dependent var		3,588,751
SE of regression	2,244,906	Akaike info criterion		4,583,451
Sum squared resid	1,562,277	Schwarz criterion		4,803,384
Likelihood logs	-7,750,211	F-statistics		1,461.137
Durbin-Watson stat	1,497,649	Prob (F-statistic)		0.000000

Source: Eviews 9 processed data

3.3 Regression Equation Model

The results of the classical assumption test that have been carried out, it can be concluded that the regression model in this study is feasible to use because the regression model is free from data normality problems, does not occur multicollinearity, does not occur autocorrelation, and does not occur heteroscedasticity. Furthermore, multiple linear estimation tests can be carried out and interpreted in table 3, namely based on the linear regression output of the multiple regression model used in this study can be formulated as follows:

Economic Growth= 7.498735 + 0.000583Oil Prices - 0.193127Inflation + 9.70E-05Net Exports - 5.064928Dummy.

3.4 Estimated Coefficient of Determination (R2)

The coefficient of determination (R2) reflects the magnitude of the effect of changes in the independent variables in explaining changes in the dependent variables together, with the aim of measuring the truth and goodness of the relationship between variables in the model used. The value of the coefficient of determination is between 0 to 1 (0<R2), where the coefficient value is close to 1, then the model is said to be good because the closer the relationship between the independent variable and the dependent variable is. The estimation results of the model using the OLS method show the coefficient of determination (R2) of 0.653420, meaning that about 65.34% of changes in economic growth are influenced by the determinant variables in this model, while the remaining 34.66% is explained by other variables not included in this model.

3.5 Statistical Test

a. F-statistics test

F-statistical testing is used to test the significance of all independent variables as a unit or measure the independent variables together. The test is carried out using the F distribution by comparing the calculated F value obtained from the regression results with the Ftable. The results of the analysis show that the F-count (F-statistics) is 14.61137 and the F-table with N1=4 N2=36 at the 0.05 level is 2.63, thus F-count (14.61137) > F-table (2, 63) means that all independent variables together have a significant effect on the dependent variable. In other words, the variables of oil prices, inflation, net exports and dummy variables (monetary crisis) together significantly affect the direction of Indonesia's economic growth.

b. T-Statistics Test

The t-statistical test was conducted to determine the significance of each independent variable in influencing the dependent variable. In this test, a coefficient is said to be statistically significant if the t-statistic is in the critical region bounded by the t-table value according to a certain level of significance. In the econometric model used to estimate, the critical values obtained are as follows:

Degree of freedom Df = (nk)	significance level	t-table
31	0.05(5%)	1,696

1) The significant test of the oil price variable on the economic growth variable.

From the estimation results obtained t-count = 1.985373 and t-table (left side) 1.696 with = 0.05 (5%) and df = nk = 36-5 = 31. This study proves that t-stat (1.985373) > t.table (1.696), then it

is in the H1 reception area, not in the H0 reception area. So the decision is to accept the correct hypothesis. This means that the oil price variable is significant and has a positive effect on Indonesia's economic growth.

2) The significant test of the inflation variable on economic growth.

Estimation results obtained t-count = -5.647102 and t-table (left side) 1.696 with = 0.05 (5%) and df = nk = 36-5=31. This study proves that t-stat (-5.647102) < t.table (-1.696), then it is in the H0 reception area, not in the H1 reception area. So the decision is to accept the wrong hypothesis. This means that the inflation rate variable has no significant negative effect on Indonesia's economic growth.

3) The significant test of the net export variable on the economic growth variable.

The estimation results obtained t-count = 1.982251 and t-table (left side) 1.696 with = 0.05 (5%) and df = nk = 36-5=31. This study proves that t-stat (1.982251) > t.table (1.696), then it is in the H1 reception area, not in the H0 reception area. So the decision is to accept the correct hypothesis. This means that the net export variable is significant and has a positive effect on Indonesia's economic growth

4) The significant test of the dummy variable (monetary crisis) on the variable of economic growth.

From the estimation results obtained t-count = -2.989797 and t-table (left side) 1.696 with = 0.05 (5%) and df = nk = 36-5 = 31. This study proves that t-stat (-2.989797) < t.table (-1.696), then it is in the H0 reception area, not in the H1 reception area. So the decision is to accept the correct hypothesis. This means that the dummy variable is not significant and has a negative effect on Indonesia's economic growth.

3.6 Discussion

a. The Effect of Oil Price Variables on Economic Growth in Indonesia.

Based on the results of multiple regression estimates, it shows that the variable coefficient of oil prices has a positive effect on economic growth in Indonesia in 1980-2015. The oil price variable has a coefficient of 0.0005 which means when the oil price increases by 1% it will result in an increase in economic growth of 0.0005%. The energy needs of a country are closely related to the population and the level of development, especially industrial development. The world's energy needs today are still very dependent on fossil fuels, especially oil. Oil is a non-renewable energy resource, this causes the price of fuel oil to be very important in the trade sector, given the uneven distribution of oil reserves in the world. Many countries are still dependent on other countries to fulfill their oil supply. Oil prices are directly proportional to economic growth, rising oil prices also affect economic growth. This is because Bank Indonesia has increased interest rates to reduce inflation and increase government spending so that GDP increases, so that it is able to generate investor confidence which causes a return of capital flows and strengthens the rupiah exchange rate.

b. The Effect of Inflation Rate Variables on Economic Growth in Indonesia

Based on the results of multiple regression estimates, it shows that the variable coefficient of the inflation rate is -0.19. The negative sign (-) indicates that there is an opposite relationship between inflation and economic growth, that is, if inflation is high, economic growth will decline. According to Bick (2010) in Threshold Effect of Inflation on Economic Growth in Developing Countries, states that there is a significant relationship between inflation and economic growth. So the results of research conducted by Bick (2010) show results that are not the same as this study which shows that inflation has a negative effect on economic growth.

So that the research is supported by the theory presented by Sukirno (2003), in principle not all inflation has a negative impact on the economy. Especially if there is mild inflation, namely inflation below ten percent. Mild inflation can actually encourage economic growth. This is because inflation is able to encourage entrepreneurs to further increase their production. Entrepreneurs are enthusiastic about expanding their production because with the increase in prices, entrepreneurs get more profits. In addition, the increase in production has another positive impact, namely the availability of new jobs. Inflation will have a negative impact if the value exceeds ten percent.

c. The Effect of Variable Net Export Rate on Economic Growth in Indonesia

Based on the results of multiple regression estimates, it shows that the coefficient of the net export variable has a positive effect on economic growth in Indonesia in 1980-2015. The net export variable has a coefficient of 9.70 which means that when net exports increase by 1%, it will result in an increase in economic growth of 9.70%. International trade can occur along with the increasing level of openness of the economy. Prices play an important role in international trade, price differences allow a country to export or import goods and services. International trade will involve various currencies so that the role of the exchange rate becomes important in economic interactions between countries (Samuelson, 2004). Exports occur because the need for goods and services is fulfilled domestically or because the production of goods and services is competitive both in price and quality with similar products in the international market. Exports by themselves provide foreign exchange income for the country, which will be used to finance the import needs of NORTH SUMATRA UNIVERSITY and development. Exports are considered as the driving force for domestic economic growth. Greater exports mean there is an increase in investment, create new jobs, increase income and generate foreign exchange. Exports will affect economic growth, especially in the case of developing or poor countries that urgently need foreign exchange to import capital goods for domestic production.

d. The Effect of Dummy Variables (Monetary Crisis) on Economic Growth in Indonesia

Based on the results of multiple regression estimates, it shows that the coefficient of the dummy variable (monetary crisis) is -5.06, which has a negative effect on economic growth in Indonesia in 1980-2015. This is in accordance with the hypothesis which states that the dummy variable (monetary crisis) has an insignificant negative effect on economic growth in Indonesia. In fact, the occurrence of the economic crisis in Indonesia did not significantly affect the economic development in Indonesia. This can happen due to overlapping mechanisms, such as regional income from domestic investment (PMDN) and foreign investment (PMA), which can overcome the negative effects of the crisis. Until the time of the economic crisis (until 1997), it can be seen that Indonesia's economic growth fluctuated (where the economic growth in 1980 was 9.9%, and in 1997 it was 4.7%. During the period 1980 to 1997 the fluctuations in the increase in Indonesia's economic growth were relatively low (illustrated by 9, 9-4.7% = 5.2%) As the impact of the Indonesian economic crisis that occurred in 1997, Indonesia's economic growth in 1998 decreased by 13.1%. Furthermore, after the economic crisis in the period 1999-2015, growth Indonesia's economy is quite stable with growth between 0.8-4.8% which means the fluctuation is quite low, namely 4.8-0.8 = 4%) which is quite stable. Thus, Indonesia's economic growth, seen from the stable economic growth.

4. CONCLUSION

Based on the results of the analysis and discussion that has been carried out, some conclusions is, the test results with Eviews for the t-test show that the oil price and net export variables have a positive and significant effect on economic growth in Indonesia and are significant based on the results of the processing according to the existing hypothesis, while the inflation and dummy variables have a negative and insignificant effect on economic growth in Indonesia so that processing results are not in accordance with the hypothesis. Based on the t-test results, the net export variable is the variable that has the most influence on economic growth in Indonesia with a tcount of 1,985 and a significant value of 0.0560 using a significant of 5%. The test results with Eviews for the F test show that the independent variables, namely oil prices, inflation, net exports and dummy, simultaneously have a significant and significant effect on the dependent variable, namely economic growth. The test results with Eviews for the F test show that the independent variables, namely oil prices, inflation, net exports and dummy, simultaneously have a significant and significant effect on the dependent variable, namely economic growth.

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