The Effect of the Rupiah Course and Rate of Inflation on Total of Indonesian Non-Oil and Gas Exports (Study of 2005–2015)

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This study aims to determine the development of non-oil and gas exports as well as the factors that affect Indonesia's non-oil and gas exports. The independent variable in this study is the dollar exchange rate against the rupiah (X_1), and the inflation rate (X_2), with the dependent variable as non-oil and gas exports (Y). The type of research used is explanatory research, with a quantitative approach. The data for this study are non-oil and gas exports in Indonesia over the period 2005–2015. The data used is obtained from the official website of the Indonesian Statistics Agency and Bank Indonesia. The data analysis used is multiple linear regression statistical analysis. Simultaneous test results (F test), show that the Inflation Rate and dollar exchange rate against rupiah simultaneously have a significant effect on Indonesia's non-oil and gas exports. Then the exchange rate variable also shows a significant effect on Indonesia's non-oil and gas exports at 95% significance as well as the inflation level variable that has a significant effect on Indonesia's non-oil and gas exports.

Key words: *Exchange Rate of Rupiah, Inflation Rate and Non-Oil and Gas Export Value.*

Introduction

Non-oil and gas export activities and imports arise because of the awareness that there is no country that is truly independent because each country depends on other countries. Indonesia is one of the countries that is quite active in non-oil and gas export activities as commodities are a driver of economic growth. Hamdani (2012: 58) states that in order to improve national economic growth, it is necessary to encourage non-oil and gas exports, because the potential of Indonesia's non-oil and gas exports needs to be developed to become superior products. As a developing country, Indonesia relies on its industrial sector. The industrial sector provides enormous employment opportunities for the people of Indonesia, while in the process uses various inputs from both the industrial sector and other sectors. The linkages between these sectors will be very beneficial, because it will encourage the growth of other sectors and will ultimately accelerate economic growth. Purnomo (2008: 139) states that the Indonesian industrial sector and its products are one of the important areas for the national economy because they rely on several superior commodity products which are marketed in international trade. Some of Indonesia's mainstay commodities from the industrial sector and products make a considerable contribution to the national economy. Inflation is a price increase that occurs in a country's economy. This is in accordance with Dornbusch et al. (2008: 39) who state that "inflation is the rate of change in prices, and the price level is the cumulation of past inflations". Totonchi (2011: 459) states that inflation is a tool to determine the economic condition of a country. Mankiw (2006: 216) states that most developed countries increase the amount of money circulating so that inflation occurs and, in contrast to developing countries, inflation is caused by fiscal imbalances namely, the existence of exchange rate depreciation and a very high growth in the amount of money.

Governments in various countries definitely try to keep inflation in their country at a normal level. Inflation makes the economy sluggish because the prices of goods and basic necessities continue to soar. Raharja and Manurung (2004: 319) state that the increase in the price of raw goods causes producers to experience a decrease in the quantity of production and will ultimately affect value. In the event of inflation, the price of goods will continuously increase, and therefore will impact the cost of raw materials required to make the product itself. With the increase in inflation, the production costs of non-oil and gas export goods will be higher so that non-oil and gas exports are not maximised in production. This results in reduced competitiveness of non-oil and gas exports because non-oil and gas exports will become increasingly expensive and have an impact on non-oil and gas export. Other factors that affect Indonesia's non-oil and gas exports and products (TPT) are currency exchange rates, which can encourage an increase in prices and volumes of non-oil and gas exports such as textile and textile products. In the development of international trade, foreign exchange against the rupiah has a very important role to make payment transactions. Because in conducting international trade, two countries will need the same unit of currency that can be universally accepted. The

exchange rate is the price of a currency of a country that is measured or expressed in another currency. Besides that, it is necessary to look at the development of the domestic currency exchange rate against foreign currencies, especially the US dollar, because the United States' dollar is an international currency. The research conducted by Saunders et al. (2002: 317) states that if the foreign exchange rate increases with the domestic currency, then this can increase non-oil and gas exports. Conversely, if the foreign exchange rate decreases against the domestic currency, this can reduce non-oil and gas exports. According to Witjaksono (2010: 21), when the rupiah exchange rate depreciates against the dollar, it causes the price of imported goods to increase.

Study of Literature
International Business

Hady (2004: 99) explains that international business is a business activity carried out across national borders. International business can be interpreted as a study of economic transactions that include trade in non-oil and gas exports and imports, and foreign investment (both direct and portfolio) carried out by individuals, companies or organisations with the aim of satisfying the needs of these individuals and organisations. A country or company has a certain reason for carrying out international business activities. Some things that are considered in international business activities include economic, political and socio-cultural considerations. Domestic business activities carried out by a company only need to pay attention to the domestic environment within the borders of a country, whereas companies whose business activities are engaged in the international business environment must pay attention to the domestic, foreign and international environment because international business activities are carried out across national boundaries.

Non-Oil and Gas Export Theory

Non-oil and gas exports are one of the most important parts of international trade. Non-oil and gas exports are the sale of goods abroad using the payment system, the quality, quantity and other sales conditions that have been approved by the non-oil and gas exporters and importers. Large-scale non-oil and gas exports generally require customs interference from sending and receiving countries. According to Hamdani (2012: 37), non-oil and gas exports involve selling goods from inside to outside the circulation of the Republic of Indonesia and the goods sold must be reported to the Directorate General of Customs and Excise of the Ministry of Finance. One of the benefits of non-oil and gas exports is the ability to find new market shares when the domestic market is too saturated by competitors. There are many benefits besides economic benefits, as explained by Hamdani, namely:

1) Benefits in micro:
a)   expanding and developing marketing
b)   increasing sales and income
c)   expanding company activities
d)   increasing production by utilising idle capacity.

2) Macro benefits:
a)   increasing national economic growth
b)   empowering potential economic sources in the country
c)   expanding employment and generating foreign exchange
d)   encouraging the growth of science and technology and human resources
e)   developing the nation's SOSBUD.

Non-oil and gas export transactions will usually relate to parties from other countries, so that the situation in the non-oil and gas export destination country will have a direct impact to this cross-border purchasing activity. Conditions that can have an impact on non-oil and gas exporting activities are generally called country risk.

Inflation Theory

Inflation is a process where the price level tends to rise and money loses its value. Whereas according to Keynes, inflation is an increase in the average price level, price is where money is exchanged for goods or services (Mankiw, 2006). This is similar to Tandelin's (2010: 342) characterisation of inflation as a tendency for an increase in the prices of products as a whole. Inflation has a broad influence on non-oil and gas exports in a country.

High inflation rates are associated with overheated economic conditions, namely economic conditions experiencing demand for a product that exceeds the capacity of its product offerings, so prices tend to increase. According to Rahardja and Manurung (2011: 359), there are three important components of inflation that must be met. First, there is a tendency towards increased prices. The price of a commodity is said to rise if it is higher than the price of the previous period. even if there is a decline at a certain time or an increase from the previous time. Second, the increase is general. The price increase of a commodity cannot be called inflation if the increase does not affect the increase in prices in general, which means that the increase in prices is only experienced by one or two commodities. Third, the increase takes place continuously. Although in general the increase in the prices of goods has increased, it cannot be said to be inflation if it only occurs in a short period of time. The calculation of inflation is carried out according to a monthly timeframe.

Tandelilin (2010: 343) states that an increase in inflation is a negative signal for investors in the capital market, because inflation causes an increase in production costs above the amount that could be enjoyed by the company, resulting in a decrease in the profitability of the company. Conversely, at a certain level inflation is needed to increase the growth of aggregate supply. Price increases can be a motivation for producers to increase their output so as to encourage producers to maximise production and create new employment opportunities. When inflation is more than the 10% level in general, it will disrupt economic stability.

Exchange Rate Theory

The exchange rate is the price of a country's currency expressed in another currency that can be bought and sold. According to Triyono (2008: 156), the exchange rate is the exchange between two different currencies, which is a comparison of the value or price between the two currencies. The exchange rate shows how many rupiah must be paid for a unit of foreign currency, and how many rupiah must be paid when someone sells foreign currency. Currency rates indicate the price of a currency when exchanged for another currency. Determining the value of the exchange rate of a country's currency with another country's currency is determined based on where the goods are, namely by the demand and supply of the currency concerned. From the expert opinion above, it was concluded that the notion of exchange rate is the price of a currency against another currency. So that the rupiah exchange rate against the US dollar can be interpreted as the price of the rupiah against the US dollar. Putong (2013: 7) explains that based on its development, the currency exchange setting system is grouped as follows:

a. Fixed Exchange Rate System: The fixed exchange rate system that is equalled by an international financial institution (such as the IMF), or by each country in accordance with its economic capabilities (usually based on the value of Hard Currency) is a system of exchange rates that peg the exchange rate foreign to the currency of the country concerned with a certain value that is always the same in the period.
b. Floating Exchange Rate (FER): The exchange rate system determines that the value of a country's currency is determined by the strength of demand and supply on the (official) money market.
c. Related Exchange Rate System (Pagged Exchange Rate, PER): The exchange rate system is associated with the value of another country's currency, or a number of certain currencies.

PER uses the value of the middle currency of a particular currency which requires more or less than the middle exchange rate of 2.5%.

Research Methods

The type of research used is explanatory research with a quantitative approach. This research was conducted in Indonesia through an official website to obtain accurate data sources that can be used by the researchers to support this research. Such websites include: Central Bureau of Statistics (BPS), Indonesian Ministry of Industry and Trade and Bank Indonesia. The population in this study are data on all Indonesian rupiah exchange rates, Indonesian inflation rates and all Indonesian non-oil/gas exports, samples in the form of rupiah exchange rates against the US dollar monthly for the period 2005–2015, data for the 2005–2015 monthly inflation rate, and value monthly Indonesian exports and products (TPT) for the period 2005–2015. The data used in this study is secondary data. Data collection techniques used in this study were observations using the documentary method. Analysis of the data used in this study used descriptive analysis and multiple linear regression analysis. Before carrying out multiple linear analysis, a classical assumption is carried out first.

Results and Discussion
Descriptive Analysis
Rupiah Exchange Rate against US Dollar

**Figure 1.** Graph of Rupiah Exchange Rate Against US Dollar
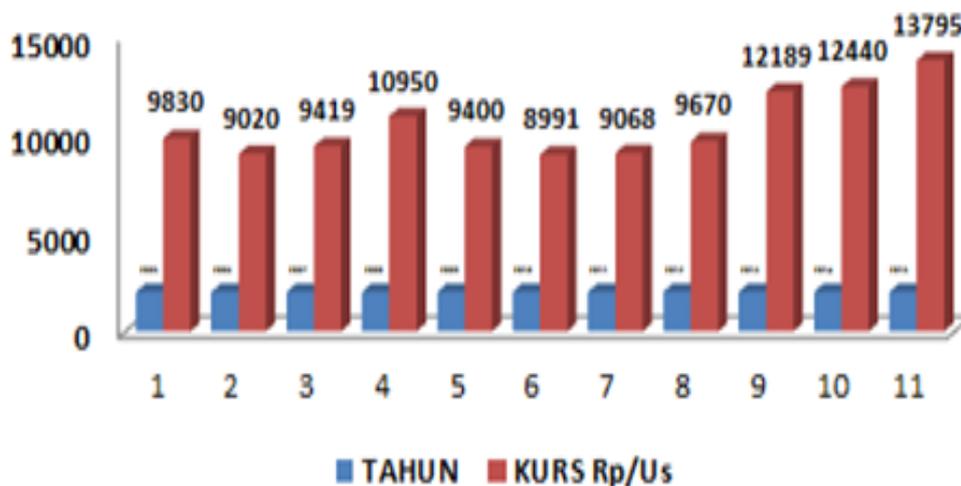
Source: Bank Indonesia (data processed by researchers, 2017)

Figure 1 above is a graph of the rupiah exchange rate against US dollars from 2005 to 2015. The movement of the rupiah value shows a negative trend. The value of the rupiah weakened to almost 14,000 rupiah/US dollar in 2015. This was due to the pressure of the global economic crisis and the effects of China's central bank reducing the value of the yuan, which also contributed to pressure on the rupiah exchange rate.

Indonesian Inflation Rate

**Figure 2.** Graph of Inflation Rate in Indonesia
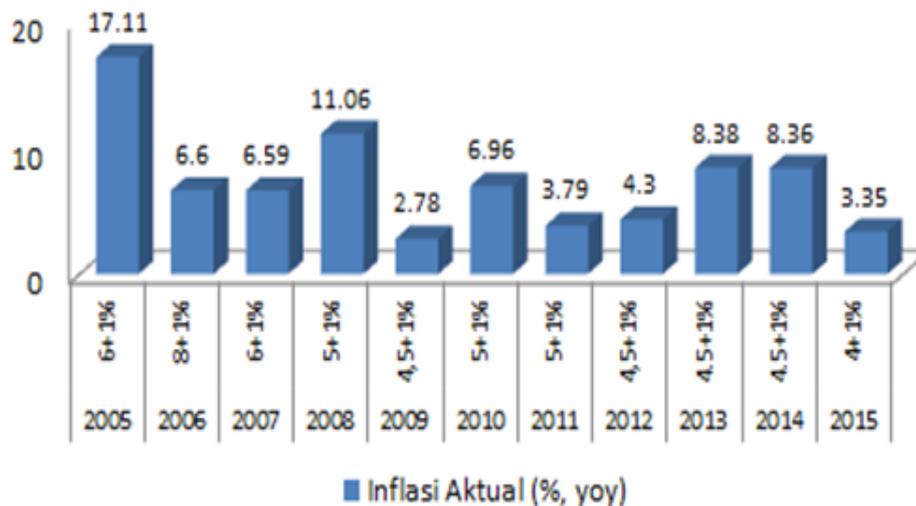
Source: Bank Indonesia (data processed by researchers, 2017)

Figure 2 illustrates Indonesia's inflation rate for the period 2005 to 2015. The movement of Indonesia's inflation rate is very volatile, as can be seen from the movement of the graph, which fluctuates every year. This illustrates that the price of goods circulating in Indonesia is not stable. The uncertain domestic and import conditions in Indonesia means that the prices of goods in Indonesia is reversed with the amount of money in circulation, consequently the amount and price of raw materials for industrial production is uncertain.

Indonesia's Non-Oil and Gas Export Value

Figure 3. Graph of Indonesia's Non-Oil and Gas Export Value
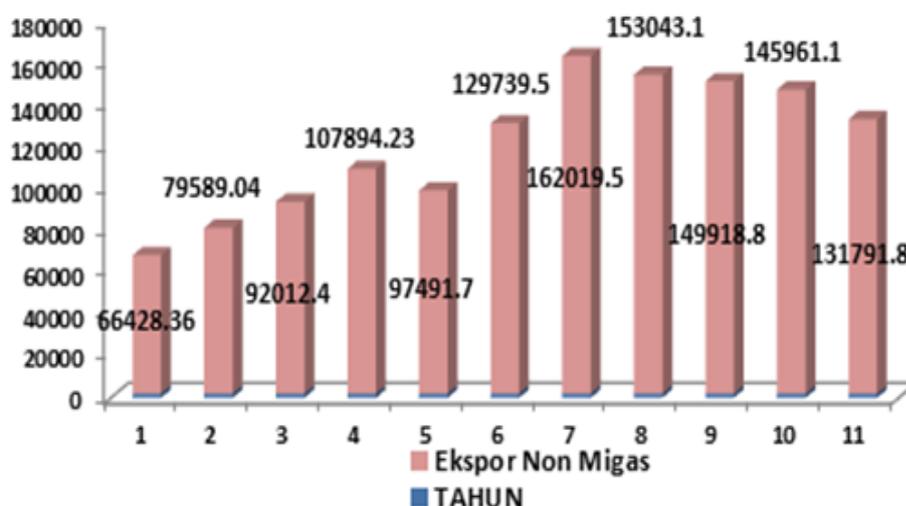
Source: Bank Indonesia (data processed by researchers, 2017)

Figure 3 above is a graph of the value of Indonesia's non-oil and gas exports from 2005 to 2015 in December sourced from Bank Indonesia reports. The period of 2005 to 20qq the value of Indonesia's non-oil and gas exports increased rapidly. In 2015, the value of Indonesia's non-oil and gas exports dropped, this was due to the global economic crisis which caused reduced demand for goods in the global market, especially the economic slowdown that occurred in the United States due to the effect of the Fed's interest rate changes.

Table 1: Descriptive of variables for Non-Oil and Gas Exports, Exchange Rates and Inflation

	NON_MIGAS	KURS	INFLASI
Mean	119626.3	10433.82	7.207273
Median	129739.5	9670.000	6.600000
Maximum	162019.5	13795.00	17.11000
Minimum	66428.36	8991.000	2.780000
Std. Dev.	32555.20	1663.194	4.135599
Skewness	-0.260950	0.920952	1.219320
Kurtosis	1.689397	2.413349	4.006447
Jarque-Bera	0.912111	1.712686	3.189952
Probability	0.633779	0.424712	0.202913
Sum	1315890.	114772.0	79.28000
Sum Sq. Dev.	1.06E+10	27662132	171.0318
Observations	11	11	11

Source: Data Eviews (2019)

Classic assumption test: Normality test

Table 2: Normality Test Results with test results

	Ekspor non Migas	Kurs	Inflasi
Jargue Berra	0.912	1.712	3.189
Probability	0.633	0.424	0.202

Source: data processed by researchers (2019)

Table 2 is the results of normality test data with the Jargue berra test where the non-oil export variable value is 0.912 and the exchange rate of 1.712 has a value smaller than 2, so the data is normally distributed, the J_B value is not significant and the probability is greater than 5%. The significance of the data is 95%, the data are normally distributed except for the inflation variable where the value of Jargue Berra is 3.189> 2 so that the variable data inflation is abnormal and significant.

Autocorrelation Test

Table 3: Autocorrelation Test Results

Mean dependent var	118409.773
S.D. dependent var	34051.61617309621
Akaike info criterion	23.51918817676461
Schwarz criterion	23.60996370466282
Hannan-Quinn criter.	23.41960764391338
Durbin-Watson stat	1.287665646125286

Source: data processed by researchers (2019)

Table 3 displays the results of the value of the autocorrelation test using the Durbin Watson Test of 1.969. If adjusted for the basis of decision making where (dU <d <4-dU) then the calculation for this study becomes (1.6942 <1.287 <2.3058) where H0 is accepted, which means that the assumption is that there is no autocorrelation.

Multicollinearity Test

Based on Table 3, the tolerance value between each independent variable is > 0.1 so that it can be concluded if there is no multicollinearity. Judging from the VIF value, each variable shows a VIF value <10 so it can be concluded that there is also no multicollinearity. It can be concluded that the assumption that multicollinearity has not occurred has been fulfilled.

Heteroscedasticity Test

Table 4: Heterocedasticity Test Results

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	7.297385	Prob. F(2,8)	0.0157
Obs*R-squared	7.105293	Prob. Chi-Square(2)	0.0286
Scaled explained SS	0.867579	Prob. Chi-Square(2)	0.6480

Source: Data processed by researchers (2019)

It is known that the value of the two independent variables, namely the Indonesian inflation rate, IDR / USD exchange rate, is smaller than 0.05 so that Ho is accepted using the Breosk heteroskedasticity Test, Pagagan Godfrey. This means that it can be concluded that the data in this study did not experience symptoms of heterocedasticity.

Analysis of Multiple Linear Regression

Table 5: Multiple Regression Analysis Dependent Variable: NON_MIGAS(-1)
Method: Least Squares Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	14897.64	71667.40	0.2078	0.841
KURS(-1)	14.24	7.38	1.928	0.095
INFLASI(-1)	-5301.27	2317.92	-2.287	0.056

Source: Data processed by researchers (2019)

The Table 5 regression equation is:
$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \varepsilon_r$$

Using this equation the results of the study are as follows:
$$Y = 14897.64 + 14.24 X_1 - 5301.27 X_2 + \varepsilon_r$$

The following interpretations are produced:

a. Variable coefficient of exchange rate IDR/USD Indonesia (X_1) non-oil and gas export value (Y) with a regression coefficient of 14.24. The regression coefficient shows that every change in the variable exchange rate IDR/USD Indonesia (X_1) increases by one unit so the non-oil and gas export value (Y) will increase by 14.24 assuming the other variables are constant.

b. Variable inflation coefficient (X_2) with the value of the regression coefficient of - 5301.27 shows that every change in the inflation variable (X_2) increases by one unit so the non-oil and gas export value (Y) will decrease by 5301.27 assuming the other variables are constant.

Hypothesis testing Coefficient of Determination

Table 5: Results of Calculation of R^2

R-squared	0.4957
Adjusted R-squared	0.3516
S.E. of regression	27419.045
Sum squared resid	5262627182.449
Log likelihood	-114.59
F-statistic	3.440
Prob(F-statistic)	0.091

Source: Data processed by researchers (2019)

Based on Table 5, the results of R^2 are 0.495 which means that the independent variables discussed in this study X_1 and X_2 contribute 49.5% to the dependent variable non-oil and gas export value (Y) while the remaining 50.5% is explained by other variables which were not discussed in this study.

Simultaneous Significance Test (F Test)

Based on Table 5, the results of the F test indicate that the calculated F value is 3.440, with a probability of 0.091 significant value (Sig.) with $\alpha = 10\%$, then Sig. F $<\alpha = 0.091 <0.10$. It can be concluded that the multiple linear regression model estimated has a significant effect simultaneously between (X_1), (X_2) and (Y).

Test of Significance of Partial Effect (t Test)

Based on Table 5, it can be explained how far the influence of each independent variable partially on the dependent variable is as follows:

1) Rate of change in IDR / USD Exchange (X_1)T test for variable IDR / USD (X_1) shows the results of t count of 1.928 significance t (Sig.) of 0.095 because of Sig. t smaller than 10% (0.095 <0.10). The results of this study conclude that H0 is rejected and Ha is accepted, which means that the variable Exchange = IDR / USD (X_1) has a positive effect on the Indonesian Non-Oil and Gas Export variable (Y).
2) Indonesian Inflation Change Rate (X_2) The t test for the variable (X_2) shows the result of t count of - 2,287 with significance t (Sig.) Of 0.056, because of Sig. t smaller than 10%

(0.056 <0.10). The results of this study conclude that H0 is rejected and Ha is accepted, which means that the Indonesian inflation variable (X_2) has a significant negative effect on the variable value of Indonesia's Non-Oil and Gas Export (Y).

Discussion
a. Hypothesis 1

The results of testing hypothesis 1 are the results of calculations from the simultaneous test statistics and the results of the coefficient of determination (R^2). It is known that the exchange rate of the rupiah against the US Dollar (X_1) and the inflation rate (X_2) has a simultaneous or joint effect on Indonesia's non-oil and gas exports (Y). Based on the Simultaneous Test or F Test, the sig value is obtained, equal to 0.091 or below the significance level indicated (0.083> 0.10). This proves that the first hypothesis which states that there is a significant influence between the exchange rate of the rupiah against the US dollar (X_1) and the inflation rate (X_2) on non-oil and gas exports (Y) simultaneously or jointly received. This significant influence is due to the fact that most of the raw materials for production are imported goods, so when the inflation level increases, lower production costs along with the strengthening rupiah exchange rate also increase the demand for non-oil and gas exports so that increased domestic production of commodities and products is driven by a stronger exchange rate. The results of the coefficient of determination (R^2) also show that the value of non-oil and gas exports (Y) is influenced by variables and the exchange rate of the rupiah against the US dollar (X_1) and inflation rate (X_2) is 0.495 or 49.5%, which means the exchange rate of the rupiah against the US dollar (X_1) and inflation rate (X_2) contribute 49.5% to non-oil and gas export value (Y) while the remaining 50.5% which affects non-oil and gas exports is GDP, FDI, FTA, employment, domestic production, costs and the quality of raw materials, technology, as well as tariffs and tariff barriers.

b. Hypothesis 2

The t test is carried out to determine the results of testing hypothesis 2. Based on the results of the calculation of t-test statistics, it can be seen that there is a significant positive effect of the exchange rate of the rupiah (X_1) on the value of non-oil and gas exports (Y). The exchange rate (X_1) partially has a positive and significant effect on Indonesia's non-oil and gas exports (Y). The strengthening of the rupiah causes the price of non-oil and gas commodities to increase. Based on the t test that has been done, the hypothesis which states that there is a significant influence between the exchange rate of the rupiah against the US dollar (X_1) on the value of Indonesia's non-oil and gas exports (Y) is partially accepted. This is due to several factors including the fact that raw materials for commodities and products are mostly imported. The increase in the exchange rate will make the price of products in the international market more expensive but, because the raw materials of commodities and products are mostly imports, the

prices of commodities and Indonesian products are not expensive. The results of this study are in accordance with Mankiw's (2012) theory which explains that when the price of an item rises the number of items requested will go down and when the price drops, the number of items requested will rise.

b. Hypothesis 3

The t test is conducted to find out the results of testing hypothesis 3. Based on the results of the calculation of t-test statistics, it can be seen that there is a significant effect of the inflation rate in Indonesia (X_2) on the value of non-oil and gas exports (Y). Based on the t-test that has been conducted, the hypothesis states that there is a significant partial effect between the inflation rate in Indonesia (X_2) on the value of Indonesia's non-oil and gas exports (Y) received. The results of this study are also in accordance with the theory put forward by Tandelin (2010: 342) that inflation has a broad influence on non-oil and gas exports in a country. The influence of higher inflation results in reducing the total non-oil and gas exports that exist so that inflation causes a reduction in export activities in agriculture, mining and consumer goods.

Conclusions and Suggestions
Conclusion

1. Regression analysis shows that there is a simultaneous influence between changes in the rupiah exchange rate and changes in the inflation rate against the US dollar and the value of Indonesia's non-oil and gas exports. The results of the coefficient of determination show a contribution of 49.5% to the dependent variable value of non-oil and gas exports (Y) while the remaining 50.5% is explained by other variables not discussed in this study.
2. There is a significant positive effect of the changes in the exchange rate of the rupiah to the US dollar in Indonesia (X_1) on Indonesia's non-oil and gas exports (Y).
3. There is a significant negative effect of the rupiah exchange rate on changes in the level (X_2) of Indonesia's non-oil and gas exports (Y).

Suggestion

1. The results of this study can be considered by the government and Bank Indonesia in preparing monetary policy related to inflation and exchange rates.
2. It is hoped that the government can make appropriate legislation regarding the inflation rate. The inflation rate in Indonesia is determined not only by the motivation to reduce the money supply in Indonesia. The government must be able to increase domestic production which is non-oil and gas oriented.
3. It is hoped that the government will develop raw materials which also have the potential to increase Indonesia's non-oil and gas exports. The increasing availability of raw materials

will improve the situation as it will mean less reliance on imports for production and products in Indonesia's non-oil and gas exports. This is because if raw materials that can be obtained from within the country by not importing are available, the producers and products are more effective.

4. It is expected that the results of this study can be considered for further researchers in examining the influence of macroeconomic indicators on a country's non-oil exports. The very small coefficient of determination in this study is that the independent variables in this study do not have a large influence on the dependent variable, then other macroeconomic indicators such as GDP and FDI can be used. In addition, further research could use other research methods such as the Granger causality method and path analysis.

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