

EFFECT OF RUBBER PRODUCTION, DOLLAR EXCHANGE RATE AND INFLATION ON RUBBER EXPORTS IN INDONESIA

Fatahillah^{*b}, Devi Andriyani^{*a}, Mutia Rahmah^{*c}, Syarifah Syafira

^{*}Faculty of Economic and Bussines Malikussaleh University

Corresponding Author: ^adeviandriyani@unimal.ac.id

^bfatahfatahillah29@gmail.com

^cmutia.rahmah@unimal.ac.id



ARTICLE INFORMATION

ABSTRACT

Keywords:

Total Production, Dollar Exchange Rate, Inflation and Rubber Exports

This study was conducted in Indonesia and aimed to examine the effect of rubber production, the dollar exchange rate, and inflation on rubber exports. The data analysis method used was multiple linear regression. The results showed that rubber production and inflation positively and significantly influenced rubber exports, while the dollar exchange rate negatively and significantly influenced rubber exports. Simultaneously, rubber production, the dollar exchange rate, and inflation positively and significantly influenced rubber exports in Indonesia, and the magnitude (R^2) of the effect of the amount of production, dollar exchange rate, and inflation on rubber exports was 0.5979 (59.79%)

1. INTRODUCTION

The advancement of the manor sub-area as a feature of the advancement of the agrarian area and public advancement is one of the significant possibilities in endeavors to work on individuals' government assistance. The essential job of the manor sub-area in further developing the public economy is shown by its commitment in different ways, one of which is as a supporter of Gross domestic product.

The estate area is the most elevated supporter of the Gross domestic product of the rural, animals, hunting and rural administrations areas. The manor area is one of the greatest unfamiliar trade workers for Indonesia. This is sensible when seen from the upsides of the Indonesian economy, which is for the most part found underway exercises dependent on normal assets contrasted with creation exercises dependent on innovation and capital. Normal elastic is one of the manor items that can be traded from Indonesia.

Indonesian natural rubber has bright prospects in the future to be developed considering that exports are increasing every year. Rubber is expected to be one of the prima donna of Indonesia's non-oil and gas exports, since the colonial period to the current reform era. By seeing the importance of the contribution made by natural rubber exports, it is economically necessary to carry out further development in order to increase exports in the context of increasing Indonesia's economic growth (Suryanto, 2016).

Indonesia's natural rubber exports are still experiencing several obstacles, such as fluctuating natural rubber prices, low productivity, world crude oil factors, exchange rate volatility and world economic conditions affecting the volume of Indonesia's natural rubber exports. Indonesia's natural rubber exports are also vulnerable to shocks in the economy (Suryanto, 2016).

The vulnerability in the measure of rubber creation in Indonesia makes a hole between the interest and supply of elastic at home and abroad. This likewise influences the cost of regular elastic, which obviously will vacillate each year. Tension from purchasers proceeds, particularly with the developing issue of significant degrees of rubber supplies in customer nations, particularly in China, which affects the current decrease in world elastic market costs (Suryanto, 2016). There are four gatherings of Indonesian elastic creation separated from non-creation, in particular territories with absolute rubber creation). low, medium, high and exceptionally high. There are 10 territories which are the biggest rubber creating areas in Indonesia with an absolute commitment of 87.99% there is an all out creation of 3,630,357 tons of Indonesian elastic. The biggest territories underway are South Sumatra, Riau, Jambi, Kalimantan West, South Kalimantan, Lampung, Focal Kalimantan, West Sumatra and Bengkulu.

Table 1.1
Rubber Export, Rubber Production, Dollar
exchange rate and Inflation in Indonesia
Tahun 2005-2019

Tahun	Produksi Karet (Ton)	Kurs Dollar (USD)	Inflasi (%)	Ekspor Karet (USD)
2005	2.270.891	9.879	17,11	2.582.875
2006	2.637.231	8.975	6,6	4.321.525
2007	2.755.172	9.466	6,59	4.868.700
2008	2.754.356	11.005	11,06	6.023.323
2009	2.440.347	8.447	2,78	3.241.534
2010	2.734.854	9.036	6,96	7.326.605
2011	2.990.184	9.113	3,79	11.763.667
2012	3.012.254	9.718	4,3	7.861.947
2013	3.237.433	12.250	8,38	6.906.952
2014	3.153.186	12.502	8,36	4.741.574
2015	3.145.398	14.864	3,35	3.699.055
2016	3.357.951	13.503	3,02	3.370.341
2017	3.680.428	13.616	3,61	5.100.920
2018	3.630.268	12.553	3,13	6.506.758
2019	3.543.171	13.970	2,72	4.842.453

Sumber: Indonesian Plantation Statistics and Bank Indonesia (2019)

Based on Table 1.1 there was a problem with the rubber production variable against rubber exports in Indonesia in 2008 that the value of rubber production was 2,754,356 tons, decreased from the previous year but rubber exports in that year increased from the previous year of 6,023,323 USD, then it happened again. another problem in 2012 the value of rubber production was 3,012,254 tons, an increase from the previous year while the value of rubber exports in that year decreased from the previous year to 7,861,947 USD, so there was a problem with this variable because it was not comparable to the theory which states that when increased production value will increase the number of exports and vice versa (Sudarti, 2011). Besides, the issue with the dollar conversion standard variable against rubber export in Indonesia in 2007 was that the dollar swapping scale of 9,466 USD expanded from the earlier year however rubber export in that year additionally expanded from the earlier year of 4,868,700 USD, exactly the same thing likewise occurred in 2008, 2011, then, at that point, another issue happened again in 2016 the dollar conversion scale of 13,503 USD diminished from the earlier year while the worth of rubber export in that year additionally diminished from the earlier year to 3,370,341 USD, so there was an issue with this variable since it was not practically identical with the hypothesis that when the dollar conversion standard builds it will lessen the quantity of export as well as the other way around (Suryanto, 2016).

Then the problem with the inflation variable on rubber exports in Indonesia in 2006 that the inflation rate was 6.6% decreased from the

previous year but rubber exports in that year increased from the previous year of 4,321,525 USD, the same thing also happened in 2007, 2011, 2018, then another problem occurred again in 2012 the inflation rate of 4.3% increased from the previous year while the value of rubber exports in that year decreased from the previous year to 7,861,947 USD, so there was a problem with this variable because it was not comparable with the theory that when the inflation rate increases it will increase the number of exports and vice versa (Silviana, 2016).

Past examinations that have become references incorporate exploration led by Noviana (2018) with the title of examination on the investigation of the impact of swelling, the conversion standard, and the measure of creation on the export of rubber wares in Indonesia, that all the while expansion, the swapping scale, and the measure of creation significantly affect trades. elastic item in Indonesia. While somewhat the consequences of this review demonstrate that expansion and the conversion standard don't significantly affect rubber ware sends out in Indonesia, however the measure of creation affects trades.

2. THEORETICAL FOUNDATION

Export

Export is the implementation of the sale of goods from within to abroad (Sasono, 2013).

According to (Luh Irma Dewi, 2015) Exports can expand the market and allow exporting countries to gain profits and increase national income which in turn can increase economic growth. Export is an activity that influences other activities outside and within the country (Bagus Aditya, 2017).

From some of the opinions above, it can be concluded that export is the process of selling goods from within the country to abroad using several systems or conditions that have been agreed by the exporters and importers.

Production

Production according to Sukirno (2004) can be deciphered as a movement in delivering yield by utilizing certain creation methods to measure or deal with inputs in such a manner. Components of creation info and yield are the components that stand out enough to be noticed in the conversation of creation hypothesis. Underway hypothesis, input components can in any case be portrayed dependent on the kind or qualities of the info. Creation is an action to make and build the

utility of labor and products. The creation cycle as indicated by Dodd and Hasek (1957) in Suryanto (2016) is a way, strategy or method to build the handiness of a thing and administration by utilizing existing creation factors.

Dollar Exchange Rate

The exchange rate or currency exchange rate between two nations is the cost of the cash utilized by inhabitants of these nations to exchange with one another (Mankiw, 2006). As indicated by Anindita and Michael (2008) the conversion standard is a relative value which is characterized as the worth of one money against another.

As indicated by Rudy (2002) the conversion standard is the value that should be paid in a money to acquire various assets as an unfamiliar cash. The money of a nation can be traded or exchanged with the cash of one more country as per the conversion scale winning in the cash market for sure is frequently alluded to as the unfamiliar trade market.

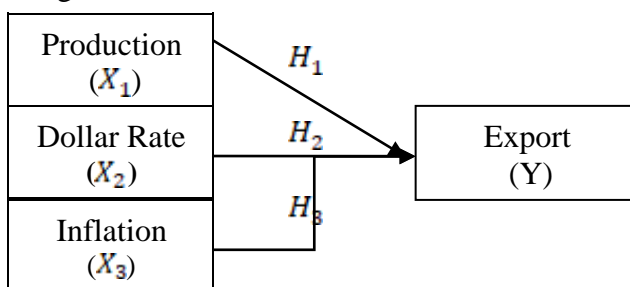
Inflation

Inflation is an economic condition in a country where there is a tendency to increase the prices of goods and services in general for a long time due to an imbalance in the flow of money and goods. Temporary price increases are not included in inflation, such as price increases ahead of Eid al-Fitr. In general, inflation occurs when the amount of money circulating in the community is more than what is needed (Hambasari, 2016).

Inflation is an economic phenomenon that cannot be completely eliminated. The various efforts made are usually only limited to controlling inflation (Kalsum, 2016). According to Parkin and Bede (2004) inflation is an upward movement of the price level. Basically it is related to the price, this can also be called the amount of money to get the item.

Conceptual Framework

The researcher describes the framework of thought into a chart as follows:



Conceptual Framework Drawing

Hypothesis

Based on the conceptual framework:

- H_1 : It is suspected that rubber production has a positive and significant effect on rubber exports in Indonesia
- H_2 : It is suspected that the dollar exchange rate has a positive and significant effect on rubber exports in Indonesia
- H_3 : It is suspected that inflation has a negative and significant effect on rubber exports in Indonesia
- H_4 : It is suspected that rubber production, dollar exchange rate and inflation have a positive and significant impact on rubber exports in Indonesia

3. RESEARCH METHODS

Object dan Research Location

The objects in this research are rubber production, dollar exchange rate, inflation and rubber exports. This research was conducted in Indonesia

Types and Sources Data

This study uses secondary data with the type of time series data for a period of 15 years taken from the period 2005 to 2019. The data were obtained from the Indonesian Plantation Statistics Book (2019) and Bank Indonesia (2019).

Data Analysis Method

To solve the problem in this study, the authors conducted data analysis using quantitative methods using statistical tools, namely the Eviews version 10 program in the form of the Multiple Linear Regression (RLB) method as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + et$$

- Dimana : Y = Export
- β_0 = Constanta
- β_1 = Coefficient Regression
- X_1 = Production
- X_2 = Dollar Rate
- X_3 = Inflation
- et = Error Term

Normality Test

Normality test is calculated to find out whether the research results are normally distributed or not. Normality testing can be done using the Jarque-Bera (J-B) method. If the probability value of the J-B statistic is greater than the 5% (0.05) confidence level, it means that the residual data is normally distributed and vice

versa(Widarjono,2013).

Classic Assumption Test

The classical assumption test used in this study is as follows:

Multicollinearity Test

The multicollinearity test was carried out to see whether there were interrelated or influencing variables (Subri, 2013).R²/k is the coefficient of determination (R²) multiple when X_k is regressed with other X variables. The Tolerance Value limit is 0.01 and the VIF limit is 10 When :

Tolerance value < 0,01 atau VIF > 10 Happen multicollinearity

Tolerance value > 0,01 atau VIF < 10 not occur multicollinearity

Autocorrelation Test

This autocorrelation test is intended to identify whether there is a correlation between the state of the disturbance variable (disturbance) in a certain period with the disturbance variable (disturbance) in another period. (Subri, 2013). Detection of deviations from classical assumptions for autocorrelation can be seen in the magnitude of the value of the Breusch-Godfrey Test. If the value of Obs. R-Squared is not significant then the data does not occur autocorrelation.

Hypothesis Test

Partial Test (t-Test)

The t-test was carried out to see whether there was a relationship between the independent variable and the dependent variable partially (Subri, 2013). The test criteria are as follows::

1. If t-count > t-table Ho is rejected and Ha accepts, it means that the independent variable (X) partially affects the dependent variable (Y).
2. If t-count < t table Ho is accepted and rejected Ha, which means that the independent variable (X) partially does not affect the dependent variable (Y).

Concurrent Test (F-Test)

The F test was carried out for the simultaneous effect of the independent variable on the dependent variable. If the calculated F test is greater than the F table value, the independent variable as a whole has an effect on the dependent variable (Gujarati, 2004). The test criteria used are as follows:

1. If F-count > F table then Ho is rejected and Ha accepts which means the independent

variable (X) simultaneously or simultaneously has a significant effect on the dependent variable (Y)

2. If F-Count < F table then Ho is accepted and Ha rejects, which means that the independent variable (X) simultaneously or simultaneously has no significant effect on the dependent variable (Y).

Coefficient Of Correlation (R)

According to (Sugiyono, 2015) The connection coefficient (R) is an outline to see the impact of the general factors that we can contrast and different examinations. Rules for giving translation of the coefficients are as per the following (Sugiyono, 2013):

>0,00 – 0,199	= Very low
>0,20 – 0,399	= low
>0,40 – 0,599	= Currently
>0,60 – 0,799	= strong
>0,80 – 0,99	= Very Strong
>1	= Perfect correlation

Coefficient Of Determination (R²)

The coefficient of Determination (R²) is an action used to gauge the impact of the free factor on the reliant fluctuation, with 0 R² < 1. The coefficient of assurance in straight relapse is regularly deciphered as how much the capacity of all free factors to clarify the change of the reliant variable. (Subri, 2013).

4. RESEARCH RESULT AND DISCUSSION

Multiple Linear Regression Analysis Results

To see the consequences of the assessment of the information research model that was handled with the assistance of the Eviews form 10 program, the aftereffects of the relapse examination estimations were gotten as displayed in the accompanying figure:

Table

Multiple Linear Regression Analysis Results

Dependent Variable: LOG(Y)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-23.97273	10.02314	-2.391739	0.0358
LOG(X1)	4.243475	0.907774	4.674592	0.0007
LOG(X2)	-2.611276	0.586196	-4.454610	0.0010
LOG(X3)	0.280411	0.150119	1.867928	0.0886
R-squared	0.684130F-statistic			7.941494
Adjusted R-squared	0.597984Prob(F-statistic)			0.004267
	Durbin-Watson stat			1.867591

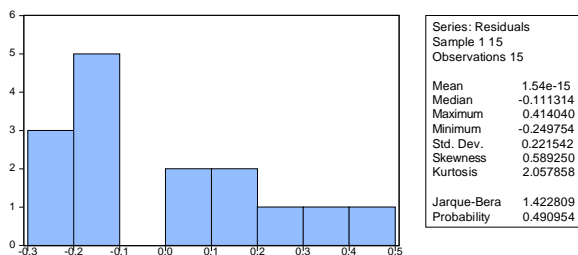
Sumber: Research result, 2021

$$\text{LogY} = -23.972 + 4.243\log X_1 - 2.611\log X_2 + 0.280\log X_3$$

The consistent worth of - 23.972 implies that if the factors of elastic creation, the dollar conversion standard and expansion are viewed as steady, then, at that point, the reliant variable of elastic fares will likewise be consistent at - 23.97%. The relapse coefficient worth of the elastic creation variable is 4.243 appearance a positive relationship which implies that if the elastic creation variable increments by 1%, it will build the elastic fare variable by 4.24%. The regression coefficient value of the dollar exchange rate variable is -2.611 showing a negative relationship which means that if the dollar exchange rate variable increases by 1%, it will reduce the rubber export variable by 2.61%.

The regression coefficient value of the inflation variable is 0.280 showing a positive relationship which means that if the inflation variable increases by 1%, it will increase the trade balance variable by 0.28%.

Normality Test



Sumber: Research Result, 2021

Table worth with $df(3) = 7.81$. When contrasted and the J-B esteem in Figure 4.5 of $1.42 < 7.81$, it very well may be presumed that the relapse model, the jumbling factors or residuals in the model are typically dispersed. This can likewise be seen from the likelihood (P-worth) of $0.49 > 0.05$

Classical Assumption Test Result

Multicollinearity Test Result

Tabel
Multicollinearity Test Result

	Produksi Karet	Kurs Dollar	Inflasi
Produksi Karet	1.000000	0.786833	-0.588648
Kurs Dollar	0.786833	1.000000	-0.282828
Inflasi	-0.588648	-0.282828	1.000000

Sumber: Research Result, 2021

The *Correlation Matrix* esteem between autonomous factors, for example, elastic creation with a dollar swapping scale of 0.786833, elastic creation with swelling of - 0.588648 and the dollar

conversion standard with expansion of - 0.282828, so all relationship esteems between free factors don't surpass 0.8, so it tends to be said in this review there is no sign of multicollinearity in these three free factors.

Autocorrelation Test Result

Table 4
Autocorrelation Test Result

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.016160	Prob. F(3,8)	0.9970
Obs*R-squared	0.090353	Prob. Chi-Square(3)	0.9930

Sumber: Research Result, 2019

From these result, it tends to be seen from the obs*R-Squared < (Chi-Square) table at $df(3) = 7.81$ or $0.99 < 7.81$. This can likewise be seen from the likelihood esteem (P-worth) of $0.09 > 0.05$.

Heteroskedasticity Test Result

Heteroskedasticity Test: White

F-statistic	0.185980	Prob. F(3,11)	0.9037
Obs*R-squared	0.724100	Prob. Chi-Square(3)	0.8675
Scaled explained SS	0.205968	Prob. Chi-Square(3)	0.9766

Sumber: Research Result, 2019

These results are seen from the obs*R-Squared < table at $df(3) = 7.81$ so $0.87 < 7.81$. This can also be seen from the probability value (P-value) of $0.72 > 0.05$.

Hypothesis Test

Partial Test (t-Test)

The Value rubber production is 4,674 with a critical worth of 0.0007, while the worth with $(df) = nk (15 - 4 = 11)$ at = 1% acquired a worth of 3.10 which implies it is more prominent than the level of mistake of 1% (0.01). So the choice to acknowledge and dismiss or $4.67 < 3.10$ which implies that to some extent the elastic creation variable has a positive and critical impact on elastic fares in Indonesia.

Moreover, the worth of the dollar conversion scale is - 4.454 with a critical worth of 0.0010, while the worth with $(df) = nk (15-4 = 11)$ at = 1% got a worth of 3.10 which implies it is more modest than the level of mistake of 1% (0,01). So the choice to acknowledge and dismiss implies that somewhat the dollar swapping scale has a negative and huge impact on elastic fares in

Indonesia. Then, at that point, the worth of expansion is 1.867 with a huge worth of 0.0886, while the worth with $(df) = nk (15-4 = 11)$ at = 10% is gotten a worth of 1.79 which implies it is more modest than the level of mistake of 10% (0.1). So the choice to acknowledge and dismiss implies that to some extent expansion has a positive and critical impact on rubber export in Indonesia.

Concurrent Test (F-Test)

The value is 7,941 with a critical worth of 0.00426 at the close to 100% certainty level. In the interim, with $df = (n-k) (k-1) = (15-4) (4-1) = (11) (3)$ acquired a worth of 6.22 at = 1% a critical worth of $0.004 > 0.001$. In this way, rubber production, the dollar conversion scale and swelling together fundamentally affect rubber export in Indonesia.

Coefficient of Correlation (R)

The correlation coefficient value is $R = \sqrt{R^2} = \sqrt{0,5979} = 0.7732$ which indicates that the relationship between rubber production variables, dollar exchange rate and inflation on rubber exports has a strong positive relationship because the correlation value of 0.7732 is close to a positive value of one (+1).

Coefficient of Determination (R^2)

The value of the coefficient of determination (R^2) is 0.5979, which means that the rubber production variable, the dollar exchange rate and inflation affect rubber exports in Indonesia by 0.5979 (59.79%), while the rest is $(1-0.5979 = 0.4021)$ (40.21. %) is influenced by other variables outside this research model.

Discussion

The Relationship of Rubber Production to Rubber Exports

Based on the result of the test that have been done, it tends to be presumed that elastic creation has a positive and critical impact on elastic fares, which implies that when elastic creation builds it will likewise expand elastic fares, so when the Indonesian state can send out abroad, it implies that the structure for elastic in Indonesia is adequate. request and surpass the limit that should exist in the nation so the stock of elastic will happen abroad which will later work on the economy in Indonesia. The result of this review are in accordance with research led by Suryanto (2016) with the title the impact of trade rates, GDP and elastic creation on elastic fares in

Indonesia by getting the outcomes that somewhat elastic creation has a positive and huge impact on elastic fares in Indonesia which will later be increment Indonesia's financial development also.

The Relationship of the Dollar Exchange Rate to Rubber Exports

Based on the result of the test that have been done, it tends to be presumed that the dollar swapping scale has a negative and huge impact on elastic fares, which implies that if the dollar conversion standard builds, it will lessen elastic fares in Indonesia. This happens in light of the fact that the worth of the cash will be shaped by the interest and supply of the market in the money of that country. The results of this study are in line with research conducted by Safuan (2017) with the title *exchange rate volatility and Export Volume: the case of Indonesian and its main trading partners*, the results of his research that exchange rate volatility has a negative impact on exports. This shows that the stronger the exchange rate will lead to a decline in exports.

The Relationship of Inflation to Rubber Exports

In view of the aftereffects of the tests that have been done, it very well may be reasoned that expansion has a positive and critical impact on elastic fares, which implies that if swelling expands it will likewise build elastic fares in Indonesia. that is all. With the increment in the costs of labor and products, it will urge individuals to do creation exercises so the economy can be prodded to build public creation exercises and the local area will contend to expand elastic creation which will be traded too.

This review is in accordance with research led by Isnawati (2015) entitled Impact of swapping scale, public pay, and expansion on trade costs in Indonesia that swelling rates in the short and long haul have a positive and huge impact.

5. CONCLUSION AND SUGGESTION

Conclusion

1. Rubber production has a positive and significant impact on rubber exports, meaning that when rubber production increases it will also increase rubber exports, so that when the Indonesian state is able to export abroad, it means that the composition for rubber in Indonesia is able to meet the needs and exceed the capacity that should exist domestically so that the supply of rubber will occur abroad

which will later improve the economy in Indonesia.

2. The dollar exchange rate has a negative and significant effect on rubber exports. This happens because the value of the currency will be formed by the demand and supply of the market in that country's currency. Changes in the demand and supply of a currency, which in turn causes changes in the exchange rate, are caused by many factors, including changes in people's tastes, changes in the prices of exported and imported goods, increases in general prices (inflation), changes in interest rates and the rate of return on investment, and economic growth.
3. Inflation has a positive and significant effect on rubber exports, which means that if inflation increases it will also increase rubber exports in Indonesia.

Suggestion

1. There needs to be special attention for the government to increase rubber exports so that they can be increased.
2. It is trusted that the public authority can help and discover answers for the decrease in exercises in the manor area, especially rubber, which will affect rubber export, one arrangement that should be possible is to give appropriations to the expense of plant crude materials, for example, rubber to rubber farmer so they can keep on developing work on the nature of rubber production.
3. There is a need for further research, so that more varied and better findings are obtained in explaining the trade balance variables with different research methods.

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