ANALYSIS OF FACTORS INFLUENCING INDONESIA'S TOBACCO EXPORTS 1975-2018

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Abstract

This study aims to examine the effect of Indonesia's real GDP, the area of Indonesian tobacco cultivation, and the quantity of Indonesian tobacco production on the quantity of Indonesian exports. This study uses Autoregressive Distributed Lag (ARDL) with time series data from 1975 to 2018 as its analytic tool. The information contained in this study was compiled from periodic reports published by organizations such as the Directorate General of Plantations and the World Bank between 1975 and 2018. The probability value for the number of exports should not exceed 5% if the test results for the short-term real GDP of Indonesia are positive and non-significant. Long-term, the amount of national tobacco production has a positive and significant effect on the quantity of tobacco exports from Indonesia. The long-term stability of the CUSUM and CUSUMQ test results for both analytical models.

Keywords: Autoregressive Distributed Lag, Real GDP, Tobacco Production, Tobacco Export

1. INTRODUCTION

Indonesia is a country with good geographical conditions, blessed by Allah SWT, Indonesia has fertile land so that it is called an agricultural country. For the Indonesian state, agriculture itself plays an important role and can have a positive impact on the entire national economy. This can be seen from the large number of people who work in the agricultural sector. The agricultural sector is the most important sector, one of the important potentials of the Indonesian state in an effort to improve people's welfare (Kusumaningrum, 2019).

Within the agricultural sector, there are several sub-sectors, including plantations. Plantations are one of the main contributors to Indonesia's development (Darmawan et al., 2021). Cultivation is one of the industries that has many significant changes and has strategic value for the development of the national economy (Saragih, 2018). One of the products in the horticulture sub-sector that makes a major contribution is tobacco. Tobacco is an important commodity with a role in providing economic and social benefits. The role of tobacco in the Indonesian economy itself is very important, which can be shown in particular by the amount of excise that must be paid as a source of state revenue and the large number of workers absorbed. Tobacco is one of the main commodities used as raw material by the tobacco industry. Tobacco itself contributes greatly to the Indonesian economy. Its main trade is tobacco leaves and cigarettes. Because tobacco and cigarettes are products that have economic value and are highly valued by some Indonesian people. In terms of state revenues, Indonesia in the world tobacco trade is a net exporter with greater importance. Indonesia exported 32,310 Tons worth US$ 169,055 in 2018 (Indonesian Plantation Statistics, 2018-2020).

Based on the background described above, this research aims to analyze the impact of Indonesia's real GDP, the total area of Indonesian tobacco, the amount of Indonesian tobacco production on the number of Indonesian exports.

2. LITERATURE REVIEW

International trade is the exchange of goods and services between countries. Participating nations in international trade are essentially nations with a variety of natural resources (Nopiana et al., 2022). International trade is formed because of differences in tastes in the way each country consumes goods. In other words, international trade is determined by differences in consumption. Allows a country to produce goods efficiently and exchange them for other goods.

International trade is also defined as trade between countries, including exports and imports. International trade is a commercial transaction in the form of goods and services from one country to another, whether carried out by individuals or by institutions that organize the trade (Naufal, 2021).

According to the Ministry of Industry and Trade, the act of exporting is removing goods from the customs department (Berata, 2014). In the Customs Law Number 10 of 1945, customs area is the territory of the Unitary State of the Republic of Indonesia which includes land, sea and air areas as well as certain places. According to Naufal (2021), the most important factor in determining exports is the ability of the country itself to produce goods that can compete in international markets. When the price of export goods or the quality of export goods must be in accordance with the goods or services traded in the international market.

Export sales is an effort to sell goods belonging to other countries for payment in foreign currencies and will create cooperation between countries (Adrian Sutedi, 2014). Exporting is also a lucrative activity for criminals. One company said these advantages are reflected in higher profits, opening up new markets in other countries, taking advantage of the country's excess export capacity and competitiveness in international markets (Hasibuan, 2020).

According to Rahmat (2019), Gross Domestic Product (GDP), also known as Gross Domestic Product (GDP), is national income measured in expenditure, or H. Total consumption expenditure, total investment, total government expenditure and total imports and exports. GDP is divided into nominal and real. When total GDP is given at current prices, it is called nominal GDP. At the same time, GDP calculated at period prices is called real GDP, and is also often called real national income.

An increase in GDP is an increase in people's income. An increase in income increases the demand for goods and services which in turn increases imports of these goods. Therefore, the level of GDP of the importing country affects the volume of trade.

The father of position theory Von Thunnen (1783-1850) developed position theory in the early 19th century. Based on observations in the area where he lived, various agricultural products were grown according to different types of crops in certain models. The farther a company is from suppliers, the higher the costs of transporting and distributing goods. The selling price of goods will be greatly influenced by the level of basic materials and other materials needed for the production process. Thus, minimum cost positioning will result in maximum profit. The size of the area can affect the

production of raw materials, and the larger the area, the more results the farmer can achieve. However, if the farmer does not have access to the area, large areas are difficult to monitor the use of factors of production and do not guarantee that farmers will produce large commodities. Sufficient labor and capital.

According to (Aziz, 2003), the theory of production can be divided into two parts: the first is the theory of short-run production, that is, when producers use the factors of production, there are variable factors and fixed factors. Second, the long-run theory: If all the inputs used are fixed inputs, then two factors of production can be produced, namely labor (TK) and capital (M).

The relationship between production and exports shows that the productivity level of each country is different, causing different production conditions in each country, and when domestic production is high, countries tend to export in large quantities. This explains that as production increases, so do supplies and so do exports. Otherwise, exports will decline as production declines. As production increases, so does domestic and foreign supply. Therefore, production will increase and exports will also increase (Naufal, 2021).

Putra (2013) in a study entitled "*Analisis Faktor-faktor yang Mempengaruhi Ekspor Tembakau Indonesia ke Jerman*". quantitative and secondary data types that include data series over time. 1970-2011 and the data analysis methods used are Ordinary Least Squares (OLS) and Error Correction Models (ECM).

The results indicated that the tobacco industry had a negative and insignificant effect on the negative export volume from Indonesia to Germany in the short term, but a significant negative effect in the long term. On the short term, tobacco production variables are known to have a positive and insignificant effect on the volume of India's exports to India and Germany, while on the long term, they have a positive and significant effect. In the short and long term, variables such as global tobacco prices and Germany's real GDP have a positive and significant effect on Indonesia's tobacco exports to Germany.

Other research was also conducted by Putri (2021) with the research title Analysis of Factors Affecting Indonesian Coffee Exports. From the results of this study obtained a coefficient of determination of 96.6636% which is indicated by R-squared, fluctuations in Indonesian coffee exports will be negatively affected by exchange rates and global coffee prices, inflation rates, and Indonesian interest rates simultaneously.

In the survey of determinants and stability of exports of Grude Palm Oil Indonesia 2017 written by Eva Nurul Huda, the survey method used is secondary data monthly time series for the period 2011: M10-2015: M12. The method used is autoregressive distribution lag (ARDL). The researcher uses the dependent variable, CPO exports, and the independent variable, palm oil production, CPO prices, and trading conditions. All this data has been converted to natural logarithm (In) format to provide valid and consistent results. This study demonstrates that international CPO prices have a negative and substantial effect on Indonesian CPO exports over the short and long term. Short-term and long-term fluctuations in trading conditions have a positive and significant impact on CPO exports, whereas the variables of palm oil production and the exchange rate of the rupiah against the US dollar have a negative and significant impact on CPO exports over the short and long term, respectively. We can conclude that the hypothesis that all independent variables affect Indonesia's CPO exports collectively is false because there is no correlation between the independent and dependent variables. Based on the CUSUM and CUSUMQ tests, it can be concluded that CPO exports are stable in the long

term (Putri, 2021). The equation in this study is the variable export, production, and testing tools using Autoregressive Distributed Lag (ARDL). While the differences in this study are the independent variables used, namely CPO Prices and Terms of Trade and the years used are 1990-2020.

3. RESEARCH METHODS

The data used is secondary data on Indonesian tobacco exports during 1975-2018. Secondary data is data that has been published or has been used by other parties(Fadillah & Sutjipto, 2018). The data is obtained from the Directorate General of Plantations and the World Bank and other data sources such as journals and scientific articles. To answer the research problem, Using the Autoregressive Distributed Lag (ARDL) model, this research quantified the analytical technique used. This method is utilized due to its capacity to analyze both long-term and short-term relationships between the variables. Long-term analysis employs the cointegration test, whereas short-term (dynamic) analysis employs the Autoregressive Distributed Lag (ARDL) model. In this study, the data stationarity test for all variables was based on the Augmented Dickey Fuller (ADF) test, and Eviews 10 was also utilized.

The general form of Autoregressive Distributed Lag (ARDL) in this study are:

$$\Delta Y_t = \beta_0 + \sum_{i=1}^{n} \beta_1 \Delta Y_{t-1} + \sum_{i=0}^{n} \Delta X_{t-1} + \varphi_1 y_{t-1} + \varphi_2 x_{t-1} + \mu_t$$

To facilitate the analysis of the factors influencing Indonesia's tobacco exports, the author transforms the model into the following form:

$$\Delta EXPORT_t = \beta + \beta_1 \sum_{i=1}^{P} \Delta EXPORT_{t-1} + \beta_2 \sum_{i=1}^{P} \Delta GDP\ RIIL_{t-1} + \beta_3 \sum_{i-1}^{P} \Delta LARGE_{t-1} + \beta_4 \sum_{i=1}^{P} \Delta PRODUCTION_{t-1} + \beta_5 \Delta GDP\ RIIL_{t-1} + \beta_6 LARGE_{t-1} + \beta_7 PRODUCTION_{t-1} + \varepsilon_t$$

Information:
0	= Constant
Export	= Variable (Y) Indonesian tobacco export volume (tonnes)
Real GDP	= Variable (X_1) Indonesia's Real GDP (US$)
Area	= Variable (X_2) Indonesian tobacco land area (ha)
Production	= Variable (X_3) amount of tobacco production (tons)
$\beta_1, \beta_2, \beta_3, \beta_4,$	= Short-term dynamics of the model
$\beta_5, \beta_6,\ dan\ \beta_7$	= Long-term dynamics of the model
Δ	= Difference (change) between two values of a variable in successive time periods
ε_t	= Error Term in period t

3.1. Unit Root Test/Stationarity

In the analysis of time series data, first the stationarity test is carried out. When the data is not stationary, it can lead to unstable multiple linear regression results. In this study, the Augmented Dickey-Fuller (ADF) test was used to check the presence of unit roots in the model.

3.2. Cointegration Test

This test is used to determine whether or not the cointegration regression residue is stationary. Cointegration of variables indicates that there is a long-term relationship between the study's variables. The cointegration test can be performed using the bound test method.

CUSUM (cumulative sum of recursive balances) is used to test for stability. If the CUSUM chart is at the 5% significance level or is within the upper and lower limits, the estimate is stable, and vice versa. In addition to the CUSUM test, the CUSUMQ, or cumulative sum of recursive remainders, is also applied in the same manner.

3.3. Classic Assumption Test
3.3.1. Normality Test

According to Gujarati (2009), The purpose of the normality test is to determine if the residual values are normally distributed. A good regression model has residuals with a normal distribution, so this model tests the residuals rather than the normality of each variable. One of the tests can use the Histogram method or the Jarque Bera Statistics (J-B) method to determine whether there is a relationship between the variables.

3.3.2. Autocorrelation Test

Aims to check whether there is a relationship between variables from one period to another. To find out whether there is autocorrelation using the Breusch-Godfret Serial Correlation LM Test model.

3.3.3. Heteroscedasticity Test

This heteroscedasticity test is designed to determine whether the regression model holds true or whether there is an inequality in heteroscedasticity from one observation to the next using the Breusch-Pagan-Godfrey test. If there is a situation where the disturbed variable does not have the same heteroscedasticity for all observations, it is said that in the regression model there are symptoms of heteroscedasticity (Gujarati, 2009).

4. RESULTS AND DISCUSSION

Based on data of Perkebunan (2020) shows that in 2005 and 2006, it was Indonesia's largest producer of high quality tobacco. Tobacco in Indonesia as the largest export item, the number of Indonesian tobacco exports from 1975 to 2018 always fluctuated, where in 1975 the total number of tobacco exports was 19,762 tons and increased in 1976. It increased to 20.630 tons from 1977 to 1981. Total Indonesia's tobacco exports fluctuated until 2018 by 32.310 tons.

As a contributor to Gross Domestic Product (GDP), this sector also has other roles, such as agriculture which uses its high investment value to build the national economy, balances trade in state goods, generates export-based foreign exchange sources, helps

increase government export tax revenues. , taxes, export duties are based on export goods, then help to become suppliers of raw materials for industry, and this sector helps absorb labor energy.
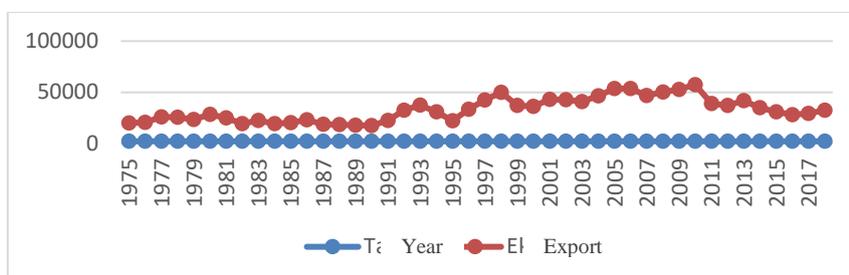
Source: Directorate General of Plantation, processed
Figure 1 Indonesia's Export Volume Growth

Figure 1 shows the growth of tobacco exports throughout Indonesia from 1975 to 2018. According to 2018-2020 tobacco book data, the directorate general of tobacco export plantations Indonesia exported 32.310 tons of tobacco in 2018. This number increased compared to 2018, the previous year only 29.134 tons were exported. Since 1987-1990, Indonesia's tobacco exports have decreased significantly compared to the end of 2018.

Table 1. Dicky Augmented Root Test Results – Fulley

Variable	Level	Information	First Difference	Information
Export	0,3248	Not Stationary	0,0000	Stationary
Indonesia's Real GDP	0,9926	Not Stationary	0,0020	Stationary
Land area	0,0000	Stationary	0,0000	Stationary
Production Quantity	0,4263	Not Stationary	0,0000	Stationary

Source: Secondary Data Processed

The results of the stationarity test in Table 1 above show that all data are stationary at the first difference level at a significance level of 5%. This means that the data is stationary where the data moves around the average in all periods and there is no confusion in the data.

Table 2. Cointegration Test Results (Bound Testing Approach)

F-Bounds Test				Null Hypothesis: No Levels relationship
Test Statistics	Value	Significant	I(0)	I(1)
F-statistics	5,4513303	10%	2,37	3,2
K	3	5%	2,79	3,67
		2,5%	3,15	4,08
		1%	3,65	4,66

Source: Secondary Data Processed

Based on the data processing above, the F-Statistic is 5. 5.451330 > I(1) with a significance level of 1%, 2,5%, 5%, and 10%. Thus, from these results it can be concluded

that there is a cointegration between the variables of Indonesia's tobacco exports, real GDP, land area, and the amount of national tobacco production in the long term.

Table 3. Short-Term Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(Export(-1))	-0.011197	0.125114	-0.089494	0.9294
D(Export(-2))	-0.357795	0.111520	-3.208345	0.0035
D(Export(-3))	-0.370674	0.140042	-2.646870	0.0136
D(GDP)	2.29E-08	1.46E-08	1.573983	0.1276
D(GDP(-1))	3.14E-08	1.51E-08	2.079095	0.0476
D(area)	-0.089352	0.039201	-2.279346	0.0311
D(Area(-1))	0.041905	0.020998	1.995661	0.0565
D(Area(-2))	0.016777	0.020554	0.816207	0.4218
D(Area(-3))	0.046340	0.019903	2.328291	0.0279
D(Production)	0.036045	0.037024	0.973543	0.3393
CointEq(1)*	-0.324874	0.057930	-5.608028	0.0000

Source: Secondary Data Processed

Based on the results of data processing above, short-term patterns were found which can be explained as follows:

1) The historical value of the coefficient D (export volume (-1) is not statistically significant or influential and is negatively correlated with Indonesia's tobacco export volume in the short term.
2) Coefficient D for historical value (exports (-2) is significantly or negatively correlated with Indonesia's tobacco exports in the short term.
3) The D coefficient on past values (Exports (-3) is statistically significant or negatively correlated with Indonesia's tobacco exports in the short term.
4) The current coefficient D (GDP) is not statistically significant or has no effect and is positively correlated with Indonesia's tobacco exports in the short term.
5) The historical value of the coefficient D (GDP(-1) has a significant and positive correlation with Indonesia's tobacco exports in the short term.
6) The coefficient D (area) of the time value is statistically significant or negative and has a negative effect on Indonesia's tobacco exports in the short term.
7) Coefficient D for historical value (broad (-1) is not statistically significant or has no effect and is positively correlated with Indonesia's tobacco exports in the short term.
8) Coefficient D for historical value (broad (-2) is not statistically significant or has no effect and is positively correlated with Indonesia's tobacco exports in the short term.
9) The historical value of the coefficient D (region (-3) has a significant and positive correlation with Indonesia's tobacco exports in the short term.
10) The coefficient D (result) has no statistical significance or effect at this time and is positively correlated with Indonesia's tobacco exports in the short term.
11) The CointEq coefficient (-1)* is known to have a value of -0.324874 which is significant at the 5% level, which means that there is cointegration between the variables in the model and the independent variables. The value for ECT or CointEq is considered valid if the coefficient is negative with a significant probability of 5%, meaning ARDL-ECM is valid. In this study, the ARDL model (4,2,4,1) met the validity requirements.

Table 4. Long-Term Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP	-7.06E-08	2.92E-08	-2.415119	0.0231
Large	-0.822061	0.351510	-2.338654	0.0273
Production	0.814658	0.242362	3.361325	0.0024
C	102090.1	49072.13	2.080408	0.0475

Source: Secondary Data Processed

As shown in the table above, Real GDP and acreage have a negative impact on exports over the long term. And the amount of production over the long term is substantial and has a positive effect on the number of exports.

CUSUM and CUSUMQ are used to evaluate both long-term and short-term stability. If the CUSUM chart is at the 5% level or falls within the upper and lower limits, the estimate is deemed stable. CUSUMQ yields identical results. Based on the results of the CUSUM test, the model utilized in this study is viable because it is stable and effective enough to be used as a tool for analyzing phenomena. Picture2 displays the outcomes of the CUSUM and CUSUMQ examinations.
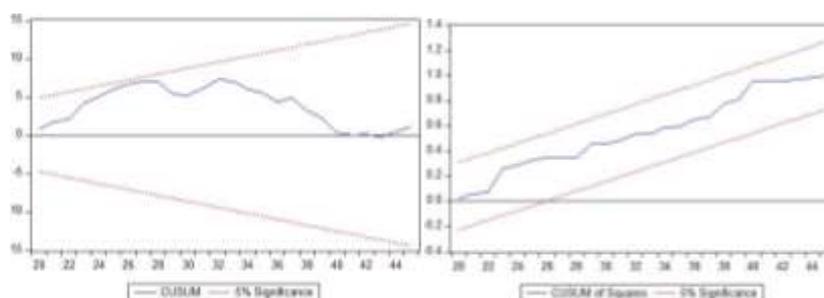
Source: Secondary Data Processed
Figure 2. CUSUM Test Model Stability Test and CUSUMQ Test Model

Based on the results of the Bounds Test for the ARDL model (4,2,4,1) in Figure 2. It can be seen that the F-statistics of the model is 5. 5.451330, greater than the upper bound value, although still above the upper bound of 2,5%. This proves that the four variables in this study, namely the number of Indonesian tobacco exports, Indonesia's real GDP, the total area of domestic tobacco, and the amount of national tobacco production are closely related together in the long term or it can be said that these three variables grow together in the long term.
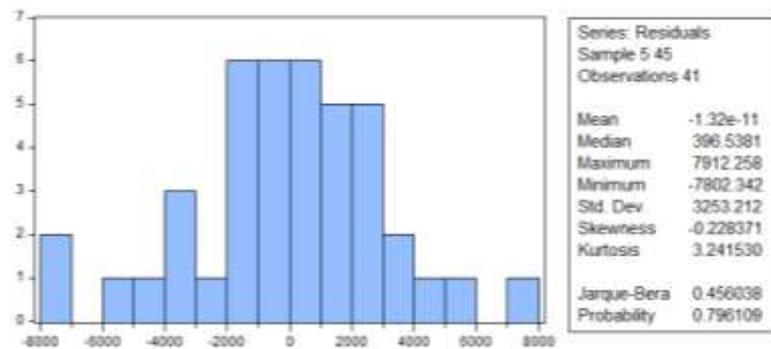
Source: Secondary Data Processed
Figure 3 Normality Test Result

According to the results of the normality test in the model, it shows that the probability obtained is 0.796109 > 5%. Then the results of the test are normally distributed.

Table 5. Autocorrelation Test Results

Breusch-Godfrey Serial Correlation LM Test:			
F-statistics	1,589084	Prob. F(2,24)	0,2248
Obs*R-squared	4,794469	Prob. Chi-Square(2)	0,0910

Source: Secondary Data Processed

In the results above, seen from the value of Prob. Chi-Square (2) of 0.0910 > 5% cannot reject H_0. So, these results have no autocorrelation.

Table 6. Breusch-Pagan-Godfrey Test Result

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistics	0.868397	Prob. F(14,26)	0.5978
Obs*R-squared	13.06320	Prob. Chi-Square(14)	0.5216
Scaled explained SS	5.887664	Prob. Chi-Squared(14)	0.9692

Source: Secondary Data Processed

From Table 6 shows the probability of Chi-Square is 0.5216 > α (0.05). Therefore, H_0 is accepted which means the model used has no variable variance

5. CONCLUSION

A study of the factors that affect Indonesia's tobacco exports using the Autoregressive Distributed Lag (ARDL) approach and the classical assumption revealed that Indonesia's Real GDP is not significant and has a positive impact in the short term, but is significant and has a negative impact in the long term. In the short term, the national tobacco area is significant and has a positive impact on the number of Indonesian tobacco exports, while in the long term it is significant and has a negative impact, and the total national tobacco production is not significant and has a positive impact in the short term, but is significant and has a positive impact in the long term on Indonesia's tobacco exports.

The real GDP of a country can be used by Indonesian tobacco exporters as an indicator for determining tobacco marketing objectives, which is expected to increase Indonesia's tobacco exports. The study's findings indicate that the regional variable has a significant positive effect on tobacco exports in the short term, but a significant negative effect on tobacco exports in the long term. The government needs to be careful in making decisions about limiting land for growing tobacco. This is related to people's lives who believe that tobacco has a higher selling value than agricultural products, so the government needs to maximize the tobacco intake of local farmers to be exported more. The relationship between production and exports shows that the productivity level of each country is different, causing different production conditions in each country, and when domestic production is high, countries tend to export in large quantities. This explains that as production increases, so do supplies and so do exports. Otherwise, exports will decline as production declines.

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