Impact of Corruption Index to Indonesian Rubber (Hs-4001) Export

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ABSTRACT
This study aims to see the impact of the corruption index which is suspected to be a barrier to Indonesia’s rubber exports (HS-4001) to 30 major importing countries during the period 2010 - 2019. The type of data in this study is secondary data in the form of panel data with an estimated fixed effect model (FEM), to see the effect of the independent variables CPIS, ECONS, POPS and FDI on the dependent variable Indonesian rubber exports (HS-4001). The estimation results in this study indicate that the corruption index has no effect on fluctuations in Indonesia’s rubber exports (HS-4001) which is caused by the long expiration of rubber products (HS-4001), while the variables of economies of scale and population of scale have a positive effect with different percentages. (2.7% and 49.14%) to Indonesia’s rubber exports (HS-4001), for the FDI variable itself has a negative effect on Indonesia’s rubber exports (HS-4001) with a percentage of -0.4%.

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INTRODUCTION

International trade is a form of cooperation between countries as an effort to increase national income by exporting or importing. One of the factors that underlie the occurrence of international trade is the scarcity of resources. David Ricardo introduced the principle of comparative advantage, which in turn led to mutually beneficial trading. Comparative advantage applies whenever there are a difference in productivity between countries in other words the country exports relatively abundant commodities with the most efficient production costs and imported commodities that embody relatively rare factors with relatively expensive domestic production costs so that they are not efficient to produce domestically. In international trade activities, each country is indirectly required to establish relations with other countries through various agreements and cooperation.

The World Trade Organization (WTO) is one of the international organizations that Indonesia is participating in. With the entry of Indonesia into the WTO membership, the Indonesian government through Law no. 7 of 1994 has an obligation to comply with all the agreements contained therein and one of its policies is to be willing to open the domestic market for products from other countries. The purpose of the establishment of the WTO is to remove or reduce barriers to international trade tariffs in order to encourage export and import activities. The reduced tariff barriers in international trade have an impact on the emergence of barriers other than tariff barriers, one of which is the indication of an export bribe or an indication of an import bribe. Export bribes and import bribes aimed at facilitating the entry of goods so that goods can be allowed to enter are included in the practice of criminal acts of corruption.

Transparency International (TI) defines corruption as the behavior of public officials, both politicians and civil servants, who unnaturally and illegally enrich themselves or abuse the public power entrusted to them. Corruption is closely related to the economy, especially the institutional economy. In institutional economics, the quality of institutions is assessed based on 5 indicators and one of the indicators is the corruption index, the lower the level of corruption in a region, the better the quality of institutions in the region and this will have a positive effect on economic growth in the region. In the analysis of the impact of corruption in trade, there is a debate among economists on the analysis of the effects of corruption, as a “facilitator” or an “inhibitor” in trade.

De Groot et al. (2004) & Lambsdorff (1998) reveal the same result that corruption hinders trade because it causes uncertainty, resulting in additional costs to overcome the uncertainty problem and the wrong allocation of costs (indication of export and import bribes), which should be used for production allocation. Rock & Bonnet (2004) points out differently in East Asia, where corruption boosts economic growth. Corruption and bribery can prevent companies from the difficulty of bureaucratic regulations and better service and benefit the company because the bureaucracy serves the interests of the company more quickly, or corruption has no impact on the economy, especially trade.

In the world rubber market, Indonesia is the second-largest rubber exporting country (HS-4001) after Thailand which ranks first with a contribution of 34.19 percent or an average production of 4.39 million tons from 2010 to 2019. Indonesia is the largest rubber producing country the second contributing 24.26 percent or an average production of 3.11 million tons from 2010 to 2019, besides Indonesia, there was Vietnam with a contribution of 7.53 percent or an average production of 966.63 thousand tons from 2010 to 2019. Vietnam’s rubber production has increased since 2013 so as to shift the position of Ma-
laysia as the world’s fourth producer. The decline in rubber exports will have an impact on the Indonesian economy itself, this is because export activities are one indicator of economic growth so any changes that occur in exports will of course also have an impact on changes in people’s income.

Rubber is a non-oil and gas commodity that is included in the plantation sub-sector, according to the Ministry of Agriculture of the Republic of Indonesia, the sub-sector that provides the highest contribution compared to other sub-sectors, which reached 387,501.5 billion rupiahs in 2019. Rubber is the most exported plantation sub-sector commodity. In addition to palm oil, coffee, and cocoa with a fairly wide market share, including the United States, Turkey, Brazil, Canada, Germany, and France (Ministry of Agriculture of the Republic of Indonesia, 2020). The existence of rubber production provides benefits for the growth of new economic centers in the area around rubber plantations, the following are a number of locations in Indonesia that have suitable land conditions for rubber plantations, mostly in South Sumatra, North Sumatra, Riau, Jambi, West Kalimantan, Kalimantan Middle, and so on. Indonesia’s rubber production in the 2010 - 2019 period was dominated by 6 provinces, namely South Sumatra, North Sumatra, Riau, Jambi, West Kalimantan, and Central Kalimantan; these provinces contributed 75% to Indonesia’s total rubber production. South Sumatra contributed 27.57%, North Sumatra contributed 8.75%, West Kalimantan contributed 7.84%, Central Kalimantan contributed 5.05% and other provinces each contributed 26.14%.

The automotive industry is one of the other industries that depend on rubber raw materials. This industry plays a very important role in influencing the supply and demand of world rubber. The United States is one of the largest automotive producers in the world as well as Indonesia’s largest rubber (HS-4001) importer during the 2010 - 2019 period with the highest import demand in 2011 amounting to 607,870 tons and continuing to experience fluctuations in demand until 2019 amounting to 554,263 tons (Trademap, 2021).

Demand for Indonesian rubber exports (HS-4001) by the world market continues to fluctuate with the lowest demand occurring in 2010 at 2.4 million tons and the highest demand occurring in 2017 at 3 million tons, this fluctuation is due to two things, namely the demand for derivative goods, declining rubber or competition in the international rubber trading market with several major exporting countries, namely Thailand, Vietnam and Malaysia. Based on Figure 1.2 fluctuations in demand for Indonesian rubber exports (HS-4001) by the United States, it does not have a significant effect on fluctuations in demand for Indonesian rubber exports (HS-4001) by the world, even though the United States remains Indonesia’s strategic partner in rubber trading (HS-4001). Fluctuations in demand for Indonesian rubber exports (HS-4001) are not only influenced by rubber prices, production, and demand for rubber but there are several other factors that hinder Indonesia’s rubber exports (HS-4001), so further research is needed.

Related to agricultural product research with an analysis of several barriers that affect the export performance of agricultural products on the world trade market, there are several barriers that are used in the majority of agricultural product research including tariffs, non-tariff (SPS and TBT), quotas and other supporting factors as described above. researched by Wilson & Otsuki (2004) & Jongwanich (2009) on agricultural products with the Harmonized System (HS) code, as well as looking at the analysis on exports that are not specific or even the economic impact caused by the existence of criminal acts of corruption (CPI) previously studied by De Groot et al. (2004) & Lambsdorff (1998). In
In this study, the method used is a quantitative method, with the topic of the effect of the corruption index (CPI) on Indonesia's rubber exports (HS-4001). The objects used are 30 rubber importing countries (HS-4001) Indonesia with the selection of product code (HS-4001), considering the market share of these products is quite wide so that the data needs for use in this study are met.

The type of data in this study is secondary data in the form of panel data, data consisting of time series data (2010-2019), and cross-section data, namely 30 rubber importing countries (HS-4001) Indonesia, sorted by the highest import value to the lowest. Lowest. The data obtained in this study came from TradeMap, Transparency International (TI), the World Development Index (WDI), and the Indonesian Ministry of Agriculture.

The analytical model used in this study refers to the research of Drogué & DeMaria (2012), in this study uses an econometric equation that is formulated as follows:

$$\ln X_{ij} = \beta_0 + \beta_1 CPI_I + \beta_2 ECONS_{ij} + \beta_3 POPS_{ij} + \beta_4 FDI_i + \varepsilon_{ij}$$

where $X$ is Rubber export value (HS-4001, CPI is Corruption scale, ECONS is Economies of scale, POPS is Population scale, FDI is Foreign investment that enters the country, $i$ is Exporting country, $j$ is importing country, $\varepsilon$ is Error term.

Data on the scale of corruption is obtained from the Corruption Perception Index (CPI) data of the importing country divided by the Corruption Perception Index (CPI) data of the exporting country with an explanation that the higher number indicates the low indication of the occurrence of export bribes and import bribes. GDP
per capita data of exporting countries with explanations of higher numbers show that the economy of a country has increased, this identifies the country has a greater economic capacity and high income of the population and will have an impact on increasing demand for goods and so does population-scale data. is data on the population of the importing country divided by the data on the population of the exporting country with an explanation that the higher the number indicates that the population scale of a country is high, this identifies the country as having a greater demand for goods.

The analysis technique used in this research is to use panel data regression model (pooled data). Panel data is a combination of two types of data, namely time series data and cross-section data. By combining time-series and cross-section data, the number of observations increases significantly without any treatment of the data. The data panel can also explain two kinds of information, including information about cross data on differences between time series and subjects that reflect changes in time subjects. To estimate the panel data regression method, there are three models that can be used. Gujarati and Porter (2012: 239), mention the three approaches, among others:

The pooled least square (PLS) approach is the simplest technique for estimating panel data regression. This approach combines (pooled) all cross-section and times series data, then estimates the model using the ordinary least square (OLS) method. The panel data model with the pooled least square (PLS) approach is as follows (Gujarati, 2012: 239):

\[ Y_{it} = \beta_1 + \beta_2 X_{2it} + \beta_3 X_{3it} + \ldots + \beta_n X_{nit} + \mu_{it} \]

The fixed effect (FEM) approach takes into account the possibility that the researcher will face the problem of committed variables, which may lead to changes in the intercept cross section or time series. This model adds dummy variables to allow for this intercept difference. The panel data model with a fixed effect model (FEM) approach is as follows (Gujarati, 2012: 243):

\[ Y_{it} = a_1 + a_2 D_n + \beta_2 X_{2it} + \ldots + \beta_n X_{nit} + \mu_{it} \]

The random effect (REM) approach is an estimation technique that takes into account the interrelated error variables both between individuals and over time. The panel data model with the random effect model (REM) approach is as follows (Gujarati, 2012: 250):

\[ Y_{it} = \beta_1 + \beta_2 X_{2it} + \ldots + \beta_n X_{nit} + \varepsilon_{it} + \mu_{it} \]

Next, there are two tests to determine the best model in the regression data panel. The test is to determine whether an estimation model is better using the pooled least square (PLS) model, the fixed effect model, or the Random Effect model. The following are some tests in model selection:

The null hypothesis in determining the pooled least square or fixed effect method is as follows:

- \[ H_0 = \text{Model pooled least square (PLS)} \]
- \[ H_1 = \text{Model fixed effect method (FEM)} \]

The null hypothesis in determining the PLS method or the fixed effect REM is that if the result value (Fcount > Ftable) is at a certain significance level (α), it rejects the \( H_0 \) hypothesis which states that the PLS technique is chosen, thus accepting \( H_1 \) which states using the FEM model and vice versa (Gujarati and Porter, 2012: 244). Hausman test procedure is as follows:

- \[ H_0 = \text{Random Effect Model (REM)} \]
- \[ H_1 = \text{Fixed Effect Model (FEM)} \]

If Chi Square count < Chi Square table or if p-value Chi Square (x2) > then hypothesis H1 is rejected. Thus, the most appropriate estimation technique used is the random effect model and vice versa (Gujarati and Porter, 2012: 251).

RESULT AND DISCUSSION

The selection of the panel data es-
The estimation method can be done through two stages of testing to determine the best model, namely the F-Restricted test and the Hausman test. The first test was conducted using the F-Restricted test which aims to determine which method of pooled least squares (PLS) panel data regression or fixed effect model (FEM) is better used in research. The hypothesis used is if $H_0 =$ using pooled least square (PLS), and if $H_1 =$ using fixed effect model (FEM) with value of 5%.

Based on the test criteria when the probability of the F-Restricted test is < 5%, then $H_0$ is rejected. The results of calculations using STATA 13.0 in table 1.1 show the probability of the F test of 0.0000, then $H_0$ is rejected because 0.0000 < 5%. In conclusion, the best model is the fixed effect model (FEM).

After the fixed effect model (FEM) estimation method is selected, the next step is to perform the Hausman test which aims to choose between the panel data regression method, fixed effect model (FEM) or random effect model (REM) which is better used in research. The hypothesis used is if $H_0 =$ using the random effect model (REM), and if $H_1 =$ using the fixed effect model (FEM) with a value of 5%.

Based on the test criteria when the Hausman test probability is chi < 5%, then $H_0$ is rejected. The results of Hausman test calculations using STATA 13.0 in table 1.2 show prob < chi of 0.0003 meaning $H_1$ is accepted because 0.0003 < 5%.

The conclusion is that the best model in this study uses the estimated fixed effect model (FEM). After estimating the data, the best model is obtained, namely the fixed effect and then the classical assumption test is carried out as a prerequisite for the regression analysis of the fixed effect model (FEM) panel data.

The estimation results of the fixed effect model (FEM) are in Table 3. The above shows that the variables ECONS, POPS and FDI have an effect on Indonesia’s rubber exports (HS-4001). The CPIS variable does not affect Indonesia’s rubber exports (HS-4001).

The estimation results on the CPIS variable show a probability value of 0.554 which means it is not significant, so reject $H_1$ and accept $H_0$. The corruption index has no effect on Indonesia’s rubber exports (HS-4001) because indications of export bribes and import bribes are not obstacles that will cancel incoming goods, but only temporarily buy time for goods to be registered for entry considering that rubber has a harmonization code (HS-4001). does not have a fast expiration date and can last for quite a long time, this is justified in the WTO (2014) which classifies the level of product expiration based on the harmonization code. It is different with the research conducted by De Groot et al. (2004), Lambsdorff (1998) and Drogué & DeMaria (2012) which show that the corruption index has a negative effect on exports, this is due to differences in the
The estimation of the ECONS variable shows a probability value of 0.000 which means it is significant at the 1 percent level with a coefficient value of 0.273, thus rejecting H0 and accepting H1. ECONS has a positive relationship/influence on Indonesia's rubber exports (HS-4001), this shows that the larger the economic scale of the export destination country towards Indonesia, the greater the growth of trade margins (cateris paribus), with higher trade openness to foreign countries, and high economies of scale in a country. This causes the demand for an item to be greater for the import of a commodity (SUN & LI, 2018) & (Kamal & Zaki, 2018). In measuring ECONS, the ratio of GDP per capita from the destination country to the country of origin is used, so that the higher the GDP value of the two countries (economy scale) is, the greater the level of production of the country so that it has an impact on increasing exports. The large economy of scale owned by the importing country can also increase the number of imports of that country because the purchasing power of imported products is greater.

The impact of a high importer's GDP (economy of scale) provides an advantage for the exporting country to increase the volume exported to that country. In addition, high economies of scale by exporting countries reflect the country's high productivity in producing goods. For economies of scale (ECONS) in this study, it shows a positive and significant relationship to Indonesia's rubber exports (HS-4001). The coefficient value is 0.273 with a significant level of 1 percent, which means that an increase in the economy of one unit of scale will have an impact on increasing Indonesian rubber exports (HS-4001) by 2.7% or in other words, rubber (HS-4001) is a commodity superior to the destination country. Along with the development of the economy and globalization, companies will buy more and more rubber raw materials.

POPS on the estimation results of the fixed effect model (FEM) shows a probability value of 0.000 which means it is significant at the 1 percent level with a coefficient value of 4.914, thus rejecting H0 and accepting H1. POPS has a positive relationship/influence on Indonesian rubber exports (HS-4001), this is in line with Wilson & Otsuki (2004) which states that larger population scales often have higher demand for agricultural imports. The increase caused by high demand does not rule out the possibility to increase the variety, quantity and even price of the exported commodities and is in accordance with the initial predictions in the study of population growth theory which was debated by economists in (Mankiw, 2012: 231) which states that the population importing countries can affect exports from the demand side, population growth will be able to encourage increased consumption of both domestic and foreign commodities. Therefore, every one percent increase in population will encourage an increase in the number of imported rubber goods (HS-4001) demanded by 49.14%.
The FDI variable has a negative effect on Indonesia's rubber exports (HS-4001) with a probability value of 0.002 which means it is significant at the 5 percent level and a coefficient value of -0.004, thus rejecting H0 and accepting H1, which means if there is an increase in foreign investment of one unit percent, will have an impact on decreasing demand for rubber (HS-4001) by -0.4%. This is contrary to research conducted by (Oberhofer & Pfaffermayr, 2012) & (Jongwanich, 2009) which states that there is a positive relationship between FDI on exports and is also different from the initial hypothesis, which states that an increase in the amount of foreign investment can increase the amount of rubber production for export. The incoming investment is used to improve infrastructure to support trade activities such as transportation and modernization to increase rubber production. With the increase in foreign investment can also expand employment so that it can reduce the unemployment rate of a country.

As the country with the largest economy in ASEAN, Indonesia is the largest recipient of foreign direct investment (FDI) from the region. This investment is expected not only to expand the market and find resources, but also to make Indonesia a production base for exports, but the increase in FDI actually reduces exports, this is allegedly caused by FDI entering Indonesia not shown to modernize the increase in rubber production but to development factories and industrial modernization in the electronics sector, which is in line with Veeramani (2018) which states that FDI in developing countries in ASIA states shows a positive trend in the electronics industry. On the demand side, the increase in FDI will cause a decrease in the demand for rubber raw materials (HS-4001) which along with the development of technology there are rubber substitutes (HS-4001) in the raw material for product production in export destination countries (Wei, 2005).

CONCLUSIONS

Indonesia's rubber exports (HS-4001) to 30 importing countries of Indonesian rubber (HS-4001), which are sorted by the number of highest import values to the lowest, show a lot of fluctuations in import demand and these fluctuations cannot be separated from the influence of the internal factors of the importing country, one of which is each other, there must be differences and similarities in factors, so that in this study 4 variables were selected which were thought to affect fluctuations in Indonesian rubber exports (HS-4001), namely CPIS, ECONS, POPS and FDI.

Based on the estimation results, it is found that the corruption index which in the hypothesis of this study is suspected to have a positive or negative effect does not have an effect on Indonesia's rubber exports (HS-4001), this is presumably because indications of export bribes and import bribes are not obstacles that will cancel incoming goods, but only delaying temporary time for goods to be registered for entry considering that rubber with a harmonization code (HS-4001) does not have a fast expiration date and can last for quite a long time, this is justified in the WTO (2014) which classifies product expiry date according to the harmonization code.

The effect of the corruption index on exports in the study was limited to one product, namely rubber (HS-4001) not on all of Indonesia’s exports, as well as the limitations of corruption index data that were not yet available in the last 2 years in the study, namely 2018 and 2019. Researchers recommend for further research on the use of dynamic panel estimation to be able to complete this research using static panel estimation, so that new findings can be obtained that can provide input in policy making by the government in an effort to increase exports in general and Indonesia's rubber exports (HS-4001) in
particular.

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