The impact of the economic crisis on Indonesian palm oil exports: a long term simulation analysis

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Abstract. This study aims to analyze the impact of the economic crisis on Indonesia's palm oil exports. The relationship between factors in palm oil trade was analyzed using the simultaneous equation system model and estimated using the Two-Stage Least Square (2SLS) method. This research uses time-series data (years 2000 - 2018). The results showed that Indonesia's economic growth contracted up to 5.32% leading to an economic recession due to the Covid-19 pandemic and the United States-China trade war which caused Indonesia's palm oil exports to decline significantly. However, the increase in domestic palm oil consumption is thought to be due to lower palm oil prices and the implementation of domestic industrial policies. In this condition, the depreciation of the rupiah (11%) and the reduction in import tariffs for palm oil from trading partner countries are predicted to be able to improve the performance of Indonesia's palm oil exports, but still low in net compared to conditions of average economic growth. This proves that the reduction in export tariffs (Indonesia) and import tariffs (trading partners) during the depreciation of the Rupiah due to contraction in economic growth can improve the performance of Indonesia's palm oil exports.

1. Introduction
The 2019 pandemic outbreak and the trade war between the United States and China have led to a decline in economic growth in various countries, and some of them even experienced a contraction in economic growth due to restrictions on economic and social activities. Several of Indonesia's central trading partner countries experienced an economic slowdown, such as China, India, America, Pakistan and European countries, which had implications for a decline in Indonesia's economic growth (contracted to -5.32 per cent) due to a decrease in import demand and lockdown policies in trading partner countries. On the other hand, there is a reduction in consumption and investment in Indonesia due to large-scale social restrictions (PSBB) which have implications for a decline in Indonesia's economic activities. The openness of the economy in a country has had a very significant impact on economic growth. The effect of foreign trade on welfare in an economy depends on the magnitude of a country's dependence on international capital markets [1].

During 2000-2018, Crude Palm Oil (CPO) exports showed a positive trend even though for specific years fluctuated (UN Comtrade, 2017) due to the global economic crisis, changes in import tariffs from importing countries [2], and black campaign issues (in 2007) which resulted in a decrease in the amount of CPO imports by western countries, namely the Netherlands and Italy. The Indonesian economic crisis in 1998 resulted in the Indonesian government issuing an export ban policy which resulted in a decrease in the performance of Indonesia's CPO exports to the international market. The
global economic crisis occurred again in 2009, resulting in a decline in the purchasing power of the central importing countries resulting in a decrease in the amount of Indonesian CPO [3]. The economic slowdown in China and the devaluation of the Yuan in 2015 also resulted in reduction of demand for imports from China, including palm oil [4].

The economic crisis was also marked by a decline in foreign exchange rates in several countries and a reduction in economic and trade activity (mainly a decrease in import demand). Indonesia's CPO export performance during January to February 2020 fell by about 20 per cent compared to the same period in 2019 due to a decrease in the purchasing power of a significant export destination country such as India, which was only 188 thousand tons (due to the plan to set a quota for imports of processed palm oil by the Indian government) China is only 500 thousand tons (due to the Covid-19 pandemic) [5]. From January to April 2020, the export contribution of CPO and its derivative products reached 12.4 per cent of Indonesia's total non-oil and gas exports with a value of US $ 6.3 billion. The volume of palm oil exports to India increased 11.2 per cent (YoY) to 1.64 million tonnes, and its value grew 55.3 per cent (YoY) to the US $ 1.09 billion. However, the export volume to Pakistan decreased by 3.0 per cent to 691.5 thousand tons even though the export value of palm oil increased by 22.3 per cent (YoY) to the US $ 452.7 million. In contrast, other major markets, such as China and the Netherlands experienced a decline. Palm oil exports to China by volume decreased 54.3 per cent (YoY) to 879 thousand tons and in value decreased 48.5 per cent (YoY) to the US $ 497.4 million. The importance of palm oil exports to the Netherlands decreased 27.9 per cent (YoY) to 895.4 thousand tons, and its value fell 9.3 per cent (YoY) to the US $ 348.3 million. The decline in demand for palm oil globally during the Covid-19 pandemic has implications for the decline in palm oil prices on the international market.

The price of Indonesian palm oil in 2019, once reached the US $ 494 / ton below the cost of production which caused farmers and companies to reduce the use of fertilizers by 30% -40% which resulted in a reduction the productivity of palm oil yields. The decline in palm oil prices was also caused by a decrease in the quality of the palm fruit due to a prolonged drought throughout 2019 due to the El Nino phenomenon. The contraction in demand for palm oil in the international market and the decline in domestic production is expected to affect the consumption and export of Indonesian palm oil. The decline in import tariffs for trading partner countries during the depreciation of the Rupiah and the contraction in Indonesia's economic growth due to the Covid-19 pandemic is expected to have an impact on the performance of Indonesia's palm oil exports.

2. Literature review

2.1. Economic growth relationship with trade

Economic growth is one indicator of a country's economic progress. For this reason, the state strives to achieve an optimal level of economic growth by implementing various policies in the economy [6]. The relationship between exports and economic growth is bi-directional causation, namely, growth driven export and export-led growth. Economically, international trade will also affect aspects of consumption, production and income distribution [7].

Baharumshah, Lau and Fountas [8] stated that in the 1961-1999 period, there was an Asian crisis that hit most ASEAN countries. The crises that occurred in 1997 and 1998 caused a sluggish domestic economy in these ASEAN countries, so that even external imbalances could not be avoided. Bappenas [9] states that the impact of the global financial crisis on the Indonesian economy in 2008 was a decline in exports and a slowdown in investment growth as a source of economic growth. There is a strong correlation between competitive exchange rates and economic growth in developing countries. Net exports, or excess exports over imports, depending on income, which affects imports [10]. Economic growth is also determined by the country's ability to increase exports and reduce imports. Bo Tang [11] through an empirical study, shows that China's economy is stimulated by export expansion and foreign direct investment which has a positive impact on the real exchange rate and economic growth. In the long term, depreciation has an impact on the improvement of the trade account balance through increased international competitiveness which increases in export value [12][13][14].
2.2. Competitiveness of Indonesian palm oil in the international market

Competitiveness is the ability to enter and survive in foreign markets. Factors that influence competitiveness include world prices for input and output factors, social costs of domestic factors such as labor, capital and land, and production technology at the farm and marketing level [15]. Labour productivity and economic growth are key factors in maintaining and increasing a country’s competitiveness in the global market [16][17].

Indonesia is the largest producer and exporter of crude palm oil (CPO) in the world. Indonesia and Malaysia together control about 86 per cent of world CPO production [18][19]. CPO and its derivatives are important components for the food security of Indonesia and its consuming countries [20]. CPO exports from Malaysia and other CPO producing countries in the world are expected to continue to increase until 2035.

Based on the Revealed Comparative Advantage (RCA) analysis, the RCA index value of Indonesia, Malaysia, Colombia and Thailand averaged more than one from 2001 to 2015. This means that the competitiveness of CPO from Indonesia, Malaysia, Colombia and Thailand is above average - the world’s average CPO. The average RCA CPO index value for Indonesia (1.0076) is below these countries with Thailand being the country with the highest RCA index value (1.4249) followed by Malaysia (1.1582) and Colombia (1.0984). The low value of Indonesia's RCA index is influenced by the large consumption of CPO in Indonesia which reached 8.62 million metric tons with a growth rate of 7.41 percent / year at the end of 2015 [21].

3. Methodology

This research used a data time series which was arranged in periodic 2000 – 2018. This research used a simultaneous equation model and estimated by Two-Stage Least Square (2SLS) methods. The Model of Indonesian palm oil export performance consists of four equation/ dependent variables, which are: production, price, consumption, and export.

3.1. Production equation

The Area of Indonesian palm oil Plantation (AKSI)

\[ AKSI_t = a_{10} + a_{11}PPOI_{t-1} + a_{12}WI_t + a_{13}AKSI_{t-1} + U_{1t} \]  (1)

The expected estimation parameters: \( a_{11} > 0, a_{12} < 0, \) dan \( 0 < a_{13} < 1. \)

The Productivity of Indonesian palm oil (YKSI)

\[ YKSI_t = a_{20} + a_{21}DAKSI_t + a_{22}QPOI_t + a_{23}YKSI_{t-1} + U_{2t} \]  (2)

The expected estimation parameters: \( a_{21}, a_{22} > 0, \) dan \( 0 < a_{23} < 1. \)

The production of Indonesia’s CPO (QPOI)

\[ QPOI_t = a_{30} + a_{31}PPOI_{t-1} + a_{32}YKSI_{t-1} + a_{33}QPOI_{t-1} + U_{3t} \]  (3)

The expected estimation parameters: \( a_{31}, a_{32} > 0, \) dan \( 0 < a_{33} < 1. \)

The production of Indonesian palm oil (QMSI)

\[ QMSI_t = a_{40} + a_{41}PMSI_{t-1} + a_{42}PXMSI_{t-1} + a_{43}QMSI_{t-1} + U_{4t} \]  (4)

The expected estimation parameters: \( a_{41}, a_{42} > 0, \) dan \( 0 < a_{43} < 1. \)

3.2. Price equation

The Price of Indonesian CPO (PPOI)

\[ PPOI_t = b_{10} + b_{11}PMSI_t + b_{12}PPOI_{t-1} + U_{5t} \]  (5)

The expected estimation parameters: \( b_{11} > 0, \) dan \( 0 < b_{12} < 1. \)

The Price of Indonesian Palm Oil (PMSI)

\[ PMSI_t = b_{20} + b_{21}CMSI_t + b_{22}XQMSI_{t-1} + b_{23}MQMSI_t + b_{24}PMSI_{t-1} + U_{6t} \]  (6)

The expected estimation parameters: \( b_{21}, b_{22} > 0, b_{23} < 0, \) dan \( 0 < b_{24} < 1. \)
The Export Price of Indonesian Palm Oil (PXMSI)

\[ PXMSI_t = b_{30} + b_{31}TXMSI_t + b_{32}PWMS_t + b_{33}PXMSI_{t-1} + U_{7t} \]  
(7)

The expected estimation parameters: \( b_{31}, b_{32} > 0 \), dan \( 0 < b_{33} < 1 \).

The International Price of Palm Oil (PWMS)

\[ PWMS_t = b_{40} + b_{41}XQMSW_t + b_{42}MQMSW_t + b_{43}PWMS_{t-1} + U_{8t} \]  
(8)

The expected estimation parameters: \( b_{41} < 0 \), \( b_{42} > 0 \), dan \( 0 < b_{43} < 1 \).

3.3. Consumption equation

The Consumption of Indonesian Palm Oil for Industry (CMSI)

\[ CMSI_t = c_{10} + c_{11}PWMS_{t-1} + c_{12}PMSI_t + c_{13}YDI_t + c_{14}CMSI_{t-1} + U_{9t} \]  
(9)

The expected estimation parameters: \( c_{11}, c_{12} < 0 \), \( c_{13} > 0 \), dan \( 0 < c_{14} < 1 \).

3.4. Export equation

The Export of Indonesian Palm Oil to India (XQMSIA)

\[ XQMSIA_t = d_{10} + d_{11}ERIA_t + d_{12}PXMSI_{t-1} + d_{13}DGI_t + d_{14}TMMSA_t + d_{15}XQMSIA_{t-1} + U_{10t} \]  
(10)

The expected estimation parameters: \( d_{11}, d_{12}, d_{13} > 0 \), \( d_{14} < 0 \), dan \( 0 < d_{15} < 1 \).

The Export of Indonesian Palm Oil to China (XQMSIC)

\[ XQMSIC_t = d_{20} + d_{21}ERIC_t + d_{22}TMMSC_t + d_{23}PWMS_{t-1} + d_{24}Gl_t + d_{25}XQMSIC_{t-1} + U_{11t} \]  
(11)

The expected estimation parameters: \( d_{21}, d_{22}, d_{23} > 0 \), \( d_{24} < 0 \), dan \( 0 < d_{25} < 1 \).

The Export of Indonesian Palm Oil (XQMSI)

\[ XQMSI_t = d_{30} + d_{31}ERI_t + d_{32}PXMSI_{t-1} + d_{33}PWMS_{t} + d_{34}TXMSI_t + d_{35}Gl_t + d_{36}XQMSI_{t-1} + U_{12t} \]  
(12)

The expected estimation parameters: \( d_{31}, d_{32}, d_{33} > 0 \), \( d_{34} < 0 \), dan \( 0 < d_{35} < 1 \).

The International Export for Palm Oil (XQMSW)

\[ XQMSW_t = XQMSIA_t + XQMSIC_t + XQMSIR_t + XQMSR_t \]  
(13)

Description:

- \( W_{it} \) = Wages of Indonesian workers at year \( t \)
- \( YDI_t \) = Income per capita at year \( t \)
- \( DPWMS_t \) = Changes in world palm oil prices at year \( t \)
- \( DAkSI_t \) = The changes of Indonesian palm oil area at year \( t-1 \)
- \( MQMSI_t \) = The Import demand of Indonesia palm oil at year \( t \)
- \( XQMSW_t \) = The World palm oil export at year \( t \)
- \( XQMSR_t \) = The Import request of Palm oil from other countries at year \( t \)
- \( TXMSI_t \) = The export tariff of Indonesian palm oil at year \( t \)
- \( TMMSA_t \) = The import tariff of India palm oil at year \( t \)
- \( TMMSC_t \) = The import tariff of China palm oil at year \( t \)
- \( ERI_t \) = The Rupiah exchange rate against US $ at year \( t \)
- \( ERIA_t \) = The ratio of the Rupiah exchange rate ratio against Rupees at year \( t \)
- \( ERIC_t \) = The ratio of the Rupiah exchange rate to the Yuan at year \( t \)
- \( Gl_t \) = Indonesia's economic growth at year \( t \)
- \( CMGI_t \) = The Consumption of palm oil for Indonesia cooking oil industry at year \( t \)

Simulation model is forecasting simulations (2019-2025 periods). As for policy simulations as follows:

- Indonesian economic growth
- Rupiah depreciation against US$
- India and China import tariff policies
Model validation was carried out in the period 2000-2018 to see an overview of the performance of Indonesian palm oil production, price, consumption and exports. Model validation criteria based on Root Mean Squares Percent Error and Theil's Inequality Coefficient.

4. Empirical result and discussion

4.1. Indonesian palm oil export development during the economic crisis

In the long term, world demand for palm oil shows an increasing trend as a raw material for food and cosmetic products as well as government support from several countries for the biodiesel program. Indonesia's CPO export performance in 2000-2018 experienced a fairly volatile development (Figure 1). The main export destination countries for Indonesia's palm oil are China, India, Pakistan, Malaysia and the Netherlands [3].

The export value of Indonesian palm oil has fluctuated, in 2008 the export value of Indonesian palm oil of US $ 16.6 billion decreased to the US $ 10.0 billion, then in 2010 it increased to the US $ 16.4 billion due to the decline in commodity prices on the international market due to the crisis. The economy. Ermawati and Saptia [22] stated that in 2009, there was a decline in the value of CPO exports from several countries, especially Pakistan (−83.45) and India (20.74), even though India has been the largest importer of Indonesian CPO in 2008, wherein 2008 Its CPO export value reached US $ 3.3 billion. Still, in 2009 it decreased to the US $ 2.6 billion. There were many factors that resulted in a decline in the value of CPO exports, including a 25.36 per cent decrease in CPO prices from the US $ 862.94 per metric ton in 2008 to the US $ 644.07 per metric ton in 2009. In 2011, CPO prices began strengthened to the US $ 1076.50 per metric ton or increased 25.18 per cent compared to the previous year. However, this is not sufficient to increase the performance of CPO exports. As of 2012, Indonesia's palm oil exports have been dominated by refined palm oil (55.61 per cent).

In 2015, the export value of Indonesian palm oil was in the range of US $ 18.6 billion due to a decrease in demand from China due to China's economic slowdown and encouraging China to devalue the Yuan and decline in world crude oil prices (since mid-2014).

In 2019, the export value of palm oil decreased by 14.7 per cent (reaching the US $ 19.24 billion) compared to 2018 (the US $ 22.08 billion) even though the export volume has increased, due to the implementation of RED II in the European Union which eliminates the use of oil palm oil as a feedstock for biodiesel, differences in import tariffs for Indonesian palm oil to India, prolonged drought, the trade war between the USA and China and the price of CPO which continues to decline. Palm oil exports to the United States, Bangladesh, Pakistan, the European Union and India have decrease. Still, palm oil exports to the Middle East, Africa and China have increased quite rapidly.

Figure 1. The development of Indonesian palm oil consumption and exports, 2000-2018

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The global economic crisis due to the Covid-19 pandemic has caused a slowdown in the economy of Indonesia and several countries, as shown in Figure 2. The World Bank [25] states that if China's economic growth slows ten percentage points, Indonesia's economy will decrease by 0.3 percentage points. During the 2009 global recession, world economic growth fell 6.2 percentage points, and the Indonesian economy declined 1.7 percentage points. As of the first quarter of 2020, Indonesia's economic growth was 2.97 per cent and fell sharply to minus 5.32 per cent in the second quarter of 2020 (second quarter GDP at current prices is IDR 3,687.7 trillion and based on constant base prices with the base year 2010 is IDR 2,589.6 trillion) due to the Covid-19 pandemic. Territorial restrictions and community activities have reduced the level of consumption, investment, and decreased Indonesia's export and import performance.

The export volume of Indonesian palm oil amounted to 15.5 million tonnes in the first semester of 2020, down by 11.7 per cent compared to the same period in 2019. The export value of palm oil reached 10.06 billion US dollars, driven by the increase in crude palm oil prices. (CPO) globally. The average CPO price as of June was US $ 602 per tonne-Cif Rotterdam, an increase from the May position of US $ 526. Palm oil production was 23.5 million tonnes, a decrease of 9.3% compared to the same period last year. Consumption of palm oil has continued to decline since February 2020 by 1.5 million tons to 8.7 million tons in August 2020. On average, the domestic demand for Indonesian palm oil is only 46 per cent (as a raw material in the manufacture of cooking oil, oleochemicals), soap, margarine) and 54 per cent are exported to the world vegetable oil market. The Indonesian Palm Oil Association (GAPKI) is optimistic that Indonesia can produce at least 40 million tonnes of palm oil per year starting from 2020. Small-scale farmers produce around 40 percent of Indonesia's total production. However, most of these smallholders are very vulnerable to the decline in world palm oil prices due to the difficulty of accessing bank loan capital [5].

4.2. The impact of the economic crisis on Indonesian palm oil exports

Indonesia's palm oil export model has gone through the repeated specification and estimation stages. The estimation results show that the sign and the parameter estimation of each equation are by the economic measures. Based on statistical criteria, the R-square value is between 0.72–0.99 and the F-test is substantial at the level <0.0003 and the t-test shows that several explanatory variables have a significant effect on endogenous variables in the equations in the model, so the model is good enough to be used for subsequent analyzes.

Model validation was carried out in the period 2000-2018 to see an overview of the performance of Indonesian palm oil production, price, consumption and exports. Based on the results of model validation, all endogenous variables have RMSE values less than 25% and U-Theil values of range from 0.19 to 0.47. This shows that the predicted value of the endogenous variable is quite close to the actual cost. Based on the value of the RMSPE, and U-Theil indicators, it shows that the model is good to use for simulation analysis of the impact of the economic crisis on Indonesia's palm oil exports.

Table 1 shows the simulation results of the volatility of Indonesia's financial growth and the depreciation of the Rupiah (the excess of the global economic crisis in 2020) and the policy of reducing import tariffs in trading partner countries) on the performance of production, price, consumption and exports of Indonesian palm oil for the 2019-2025 period. When the Indonesian
Economy grows by 2.97 per cent and the Rupiah depreciates against the United States dollar (10%) (S1). Indonesian palm oil exports are predicted to increase by 0.87 per cent. Regardless of the exchange rate, Indonesia’s palm oil exports are predicted to decline by 12.15 per cent.

There was a shift in Indonesia’s palm oil exports from China to India by 0.18 percent. Based on data from the Ministry of Agriculture of the Republic of Indonesia [24], palm oil exports to China in February 2020 only reached 84,000 tonnes (a decrease of 82.56 per cent), lower than exports in January 2020 of 487,000 tonnes (a result of 19) having an impact on trade Indonesian agricultural products and in the same period in 2019, which reached 371,000 tons or decreased by around 77.27 per cent. To that end, the Indonesian government needs to anticipate a decline in agricultural exports to China through coordination by utilizing alternative export markets such as India, the Middle East and Russia.

Table 1. Impact of the economic crisis on Indonesian Palm Oil Exports, 2019-2025

| Performance Indicators                  | Unit       | Base value | S1          | S2          | S3          | S4          |
|----------------------------------------|------------|------------|-------------|-------------|-------------|-------------|
| Indonesian oil palm land area          | hectares   | 18549612   | 18551327    | 18490465    | 18490315    | 18490292    |
| Productivity of Indonesian palm oil    | ton/ha     | 4.4625     | 4.4634      | 4.4306      | 4.4305      | 4.4305      |
| Indonesian CPO Production              | ton        | 30068882   | 30096002    | 29122307    | 29119817    | 29119450    |
| Indonesian palm oil production         | ton        | 41695362   | 41760539    | 39701082    | 39680401    | 39679394    |
| Indonesian CPO Prices                  | Rp/ton     | 10954.7    | 10990.2     | 9624.6      | 9622.5      | 9622.2      |
| Indonesian palm oil prices             | US$/ton    | 102446.1   | 102726.5    | 91644.7     | 91612.2     | 91611.0     |
| Indonesian palm oil export prices      | US$/ton    | 946.3      | 948.2       | 961.6       | 959.0       | 959.6       |
| World palm oil prices                  | US$/ton    | 1027.5     | 1029.6      | 1043.7      | 1041.1      | 1041.7      |
| Indonesian palm oil consumption        | ton        | 17022716   | 16999914    | 17444833    | 17462572    | 17461173    |
| Indonesian palm oil exports to India   | ton        | 7513169    | 7526729     | 7560711     | 7902573     | 7903256     |
| Indonesian palm oil exports to China   | ton        | 4280438    | 3975625     | 1910548     | 1908412     | 1795903     |
| Total Indonesian palm oil exports      | ton        | 40071851   | 40422893    | 26197262    | 26157074    | 26158652    |
| World palm oil exports                 | ton        | 63418245   | 63126992    | 61095896    | 61435622    | 61323796    |

Source: SAS output.
Information:
Base value = Applicable conditions, 2019-2025
S1 = Simulation of Indonesia’s economic growth of 2.97% and depreciation of the Rupiah by 10%
S2 = Simulated Indonesian economic growth contraction (-5.32%) and Rupiah depreciation (11%)
S3 = Simulated Indonesian economic growth contraction (-5.32%) and Rupiah depreciation (11%) and reduction in import tariffs for Indian palm oil
S4 = Simulated Indonesian economic growth contraction (-5.32%), Rupiah depreciation (11%) and reduction in import tariffs for Indian and Chinese palm oil

Domestic palm oil prices are expected to increase by 0.27 per cent, which encourages an increase in production by 0.15 per cent, while household consumption decreases by 0.13 per cent. In other
words, an increase in domestic palm oil prices by 0.27 per cent will reduce domestic palm oil industry consumption by 0.13 per cent.

Contraction in Indonesia's economic growth of up to -5.32 per cent and Rupiah depreciation of 11 per cent (S2) are estimated to have an impact on reducing Indonesia's palm oil exports by 34.62 per cent. If the rupiah does not depreciate, exports are expected to fall by 47.65 per cent. In other words, under these conditions, the depreciation of the Rupiah could increase exports by up to 13.03 per cent. This is supported by research by Zuhroh and Kaluge [13] and Petrovic and Gligoric [25], that the weakening of the exchange rate is a signal for improving exports and decreasing imports. The trade balance position will increase after the real exchange rate depreciation.

Domestic consumption is expected to increase to 2.50 percent (a stimulus from the implementation of the mandatory B20 program (2019) and the mandatory B30 program (2020) and is supported by lower CPO prices). In Indonesia's economic conditions which led to an economic recession, the decline in CPO prices by 12.13 percent had an impact on the decline in CPO production by 3.15 percent and productivity by up to 0.71 percent. The Ministry of Agriculture of the Republic of Indonesia [24] stated that palm oil production in 2020 is expected to decline due to drought and fertilizer reduction in 2019. The dry season (drought) this year will have a minimum impact of 8 months to 1.5 years on palm oil production. The subsequent and intense world palm oil prices in the previous two years resulted in many farmers reducing the intensity of their use of fertilizers. As a result of the low use of fertilizers, the production of fresh fruit bunches (FFB) will decrease at least 1.5 to 2 years.

When the Indonesian economy contracts and the rupiah depreciates, the reduction in India's import tariff (S3) will increase Indonesia's palm oil exports to India by 5.18 per cent. In this condition, the reduction in import tariffs by India and China (S4) is predicted to increase Indonesia's palm oil exports. However, the simulation results show that only exports to India will increase (around 4.94 per cent); it is suspected that there will be a shift in exports to other countries. In other words, the reduction in import tariffs from trading partner countries when the Indonesian economy contracted and the Rupiah depreciated was able to improve the performance of Indonesia's palm oil exports however still low in net compared to conditions of average economic increase. This is because the growth in Indonesia's palm oil production is relatively stagnant. To anticipate this, the implementation of the mandatory B30 program is the right step for the Government of Indonesia in improving the performance of the domestic palm oil industry.

The Mandatory B-30 Program is a government program that requires mixing 30 per cent of biodiesel with 70 per cent of diesel fuel, implemented since January 2020. This program is aimed at meeting Indonesia's renewable energy sources and encouraging increased demand for palm oil derivative products (FAME) in the market domestic. To maintain CPO price stability in Indonesia, the government has also set export levies on palm oil and its derivative products through the Minister of Finance Regulation [28], namely increasing the number of export levies by an average of the US $ 5. This is also done to support the downstream policy of the domestic palm industry.

5. Conclusion
The contraction in Indonesia's economic growth leading to an economic recession hurt on the performance of Indonesian palm oil production and exports. In the 2019-2025 period, Indonesia's economic growth contraction (-5.32 per cent) and Rupiah depreciation (11 per cent) are predicted to have an impact on reducing Indonesia's palm oil exports by 34.62 per cent. The depreciation of the Rupiah will encourage the growth of Indonesian palm oil exports to 13.03 per cent. Domestic consumption will increase by 2.50 per cent, supported by lower CPO prices. However, the decline in CPO prices by 12.13 per cent is estimated to have an impact on the decline in Indonesian CPO production by 3.15 per cent.

The reduction in import taxes by trading partner countries (India) was able to increase Indonesia's palm oil exports to India. When economic growth contracts and the Rupiah depreciates, the reduction in import tariffs by India and China is predicted to be able to improve the performance of Indonesia's palm oil exports, however, it is still low in net compared to conditions of average economic growth. This is because the increase in Indonesia's palm oil production is relatively stagnant.
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