Efficient Vol 7 (1) (2024): 73-81 DOI: https://doi.org/10.15294/gx9pvw29

EFFICIENT

Indonesian Journal of Development Economics

https://journal.unnes.ac.id/sju/index.php/efficient

The Effect of Export Tax on Indonesia Palm Oil Derivative Products

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Permalink/DOI: https://doi.org/10.15294/gx9pvw29

Received: July 2023 ; Accepted: October 2023 ; Published: January 2024

Abstract

In international trade, oilseed products are one of the most highly traded agricultural products (others include grains and meat), making this trade one of crucial importance for many countries, either through production or utilization (Krugman,2009). Based on that, since 2008 the government has issued a policy of imposing taxes on palm oil and its derivatives with the aim of ensuring domestic availability and to encourage the growth of the national industry. This study examines the impact of the imposition of export tax policies on the export performance of palm oil and its derivatives. We use panel data on exports of palm oil products and their derivatives to 10 main export destination countries during 2008 – 2021 period using Poisson Pseudo Maximum Likelihood (PPML) estimation method. The estimation results show that export taxes imposed on palm oil derivative products had a significant negative impact, while high export tax policy on the upstream sector (input) for palm oil effectively encouraged an increase in palm oil derivative exports through the availability of cheap palm oil as input for the palm oil industry.

Keywords: Crude Palm Oil, CPO, Tax Export, Export

How to Cite: The Effect of Export Tax on Indonesia Palm Oil Derivative Products. (2024). Efficient: Indonesian Journal of Development Economics, 7(1), 73-81. https://doi.org/10.15294/gx9pvw29

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INTRODUCTION

The palm oil industry and its derivatives play a vital role in driving Indonesia's economic growth. According to Siregar and Sinaga (2006), this industry significantly contributes to the economy, regional development, job creation, international trade, and an improved standard of living for the Indonesian people. The Indonesian Palm Oil Association (IPOA) reports consistent growth in palm oil production, reaching 29.5

million tons in 2014, 32.5 million tons in 2015, and 32 million tons in 2016 (Indonesia-Investment, IPOA, 2018).

This high production is driven by the increasing demand for palm oil derivatives in various sectors, such as food, cosmetics, and biofuel. Additionally, Indonesia's climate and soil conditions have made 22 provinces successful in developing palm oil plantations, with Sumatra, Kalimantan, and Riau provinces contributing 90% of the total production.

Apart from being a significant source of foreign exchange, palm oil is a crucial raw material for producing cooking oil, a staple food in Indonesia, and is also used in various derivative industries. To regulate the palm oil export market, the government implemented export tax policies since September 1994, with rates ranging from 40% to 60% based on the FOB price.

Over time, the method of calculating export taxes has evolved, with periodic government-determined export benchmark prices (KMK 300/KMK.01/1997) and a progressive ad-valorem tax scheme (PMK 94/PMK.011/2007) on palm oil and its derivatives introduced in 2007. Recently, the government revised the export tax rules, introducing specific tariff rates based on global palm oil prices across 12 different levels.

With the implementation of export taxes on palm oil and its derivatives, the tax rates are determined based on the level of product processing. Generally, tax rates on intermediate and final products are lower than those on raw palm oil products, aiming to encourage downstream palm oil industries by ensuring affordable domestic raw materials. Lower tax rates on derivative palm oil products will incentivize domestic industry players to produce more intermediate and final products, while lower import tariff rates on inputs will boost productivity through learning and quality improvements (Amiti & Konings, 2007; Amiti & Khandelwal, 2013; Gupta, 2022).

Furthermore, imposing export taxes on the upstream sector will enhance the productivity of downstream palm oil industries by ensuring sufficient raw material inputs (Agusalim, 2017; Hasibuan et al., 2012; Purba et al., 2018). Considering the explanations above, the export tax policy on palm oil and its derivatives aims to ensure domestic needs are met and support the development of downstream industries, particularly in the palm oil sector.

Therefore, this study aims to evaluate the role of export taxes as a driver of downstream industry development. Specifically, we will assess how the higher export tax on raw palm oil products positively impacts the performance of palm oil derivatives' exports.

To answer this question, we will use an empirical model developed by Amiti & Konings (2007), which examines the impact of tariff reductions on company productivity through the availability of cheap imported raw materials, and further extended by Pierola et al. (2018), who use export proxies to measure the influence of tariff reduction on inputs.

The Export Tax Policy in Indonesia has seen various changes over the years. Initially introduced in 1978, the export tax was later abolished in 1991 during a period of trade liberalization. However, due to the rising demand and high international prices of Crude Palm Oil (CPO), the government reinstated the export tax to protect the domestic palm oil industry.

This led to the issuance of PMK No. 439/KMK17/1994, which outlined the export tax

regulations for palm oil and its derivatives. The tax was calculated based on the difference between the FOB price and the base price. In 2007, the export tax policy underwent further revisions with the issuance of PMK No.97/PMK.011/2007.

The changes transformed the tax from being solely on crude palm oil to also include palm oil derivatives. The new export tax policy employed an ad-valorem tax rate, with lower rates imposed on downstream products compared to upstream products. Additionally, considering the impact of declining palm oil prices due to falling global crude oil prices and economic disruptions in major export destinations like China and India, the government issued PMK 136/2015.

This policy shifted the tax calculation from a percentage-based system to a specific-based tariff for CPO. Export tax, as a concept, is a levy imposed on goods destined for export, and its characteristics are determined by the government. Developing countries often use export taxes to ensure sufficient availability of goods domestically and maintain stable prices of exported goods in the local market.

Export taxes can take different forms, such as specific tariffs, ad-valorem tariffs (percentage-based), or a combination of specific and ad-valorem tariffs. There are several empirical studies that have looked into the impact of export taxes on the palm oil industry. The export tax policy has a significant effect on the palm oil industry in Indonesia.

It has successfully stabilized cooking oil prices during periods of rising global palm oil prices or when the Indonesian currency, the rupiah, weakens. However, the use of export tax policy has also resulted in a considerable decrease in palm oil production and prices at the farmer level (Syadullah, (2014). On the other hand, research on export taxes for other commodities has shown negative impacts on exports (Rifin, 2015; Solleder, 2013). Studies analyzing the impact of export taxes on palm oil have produced different results. Rifin (2014), Nugroho & Lubis (2020), and Amiruddin (2021) concluded that the export tax policy does not significantly affect palm oil exports.

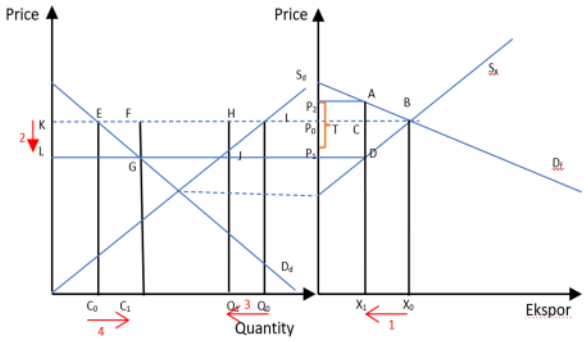

Figure 1. Impact Export Tax
Source : Data Processed, 2023

In Figure 1, Wong (1978) illustrates the impact of export taxes on export quantity, export production, and export prices. Sx represents the export supply curve, Df represents the export demand curve, Sd represents the domestic demand curve, and Dd represents the domestic demand curve. Initially, the world equilibrium condition is at point B.

When export taxes are imposed, producers receive lower sales revenue, leading them to shift their product sales from international to domestic markets, causing export activities to shift from Xo to XI. This shift increases the quantity of goods offered in the domestic market, causing the price of goods in the domestic market to decrease from K to L. Producers respond to this price decrease by

reducing production, resulting in an aggregate decrease from Q0 to Q1, while consumers increase their consumption from C0 to C1.

This scenario is applicable for commodities categorized as normal goods. The impact of export taxes on production occurs when the supply curve is elastic, meaning the imposition of export taxes will cause changes in the level of production. Conversely, if the supply curve is inelastic, the imposition of export taxes will not significantly affect the level of production.

Furthermore, the decrease in export commodity prices followed by an increase in domestic consumption will drive an increase in downstream industry production. This increased production will then lead to higher demand for labor in processing industries and stimulate the export of processed products (Karapinar, 2010).

Imposing high export taxes on upstream industries will increase trade costs, leading upstream industry players to withdraw from international trade. This condition ensures the availability of cheaper inputs for downstream industries. Reducing fixed costs in trading transactions encourages downstream industries to enter international markets (Melitz, 2003).

RESEARCH METHODS

The gravity model has been widely used to analyze international trade flows since its introduction by Tinbergen (1962) and Poyhonen (1963). It has provided robust empirical results (Kontantinos 2010). The inspiration for developing this model came from Newton's Law of Gravity, which led Tinbergen to examine international trade flows.

Similar to the law of gravity, the model's basic concept is that international trade flows are positively influenced by the size of economies and negatively influenced by distance, which represents trade costs. The basic equation of the gravity model is as follows:

$$Xij = A\frac{(Yi^{\beta 1} Yj^{\beta 2})}{(Dij)^{\beta 3}}$$

Here, Xij represents the bilateral trade value from country i to country j. Yi and Yj are the national incomes of country i and j, respectively. Dij represents the bilateral distance between the two countries. A is a constant parameter. In essence, the gravity model equation shows that trade between country i and j is directly proportional to their incomes and inversely proportional to the distance between them.

However, using the gravity model for estimation can lead to econometric problems, such as endogeneity, where explanatory variables in the equation may be correlated with errors. To address this, Baier & Bergstrand (2007) demonstrated that panel data is better suited for handling endogeneity issues compared to instrumental variables (IV) and control-function (CF) approaches.

Therefore, this study utilizes panel data to control for such issues. Another common issue in gravity equation estimation is zero trade flow. Simply eliminating trade data with zero values can introduce bias, as zero values in bilateral trade also contain valuable information for analysis. To handle this, Head & Mayer (2014) used Monte Carlo simulations and found that the Poisson Pseudo Maximum Likelihood (PPML) method proposed by Santos & Tenreyro (2006) is suitable for addressing heteroskedasticity and zero-trade flow issues.

The data used in this study consists of panel data, which includes both cross-section and time-series data. The time-series data used

covers the period from 2008 to 2021, while the cross-section data includes information on 10 palm oil derivative products exported to 10 main destination countries for palm oil exports.

The choice of the research period starting from 2008 is due to the changes made to the export tax policy for palm oil products during this period. Initially, the export tax was applied to crude palm oil (CPO) only, but later in 2015, there was another change in the mechanism, and the tax was applied specifically to both CPO and its derivative products. The use of an 8-digit harmonized tariff system code in this research aims to present the palm oil derivative products in a more detailed and comprehensive manner, supporting the analysis conducted.

The data and data sources used in this study include quantity/volume (in kg), GDP (in US$) from the World Bank, palm oil production obtained from the Central Statistics Agency (BPS), real GDP (in US$) from the World Bank, geographical distance between countries (in km) from www.timeanddater.com, exchange rates obtained from Bank Indonesia, and domestic consumption data obtained from the Central Statistics Agency (BPS).

Explanation of each dependent, independent, and control variable used in this study is as follows: Quantity/Volume of Indonesian palm oil product exports (Xjt): Export and import are trading activities of goods produced by one country to its trading partner countries. Export is the most commonly used dependent variable in gravity models of international trade flows (Kepaptsoglou et al., 2010). The dependent variable used in this study is the quantity/volume of 16 palm oil derivative products (10 HS codes) exported to the top 10 export destination countries during the period 2008-2021, measured in kilograms (kg).

Export Tax: The export tax in this study refers to the tariff imposed on goods intended for export. The rate of export tax imposed on palm oil commodity exports is determined by the Minister of Finance based on the preferential price issued monthly by the Minister of Trade. Gross Domestic Product (GDP): Real GDP represents the total value of per capita production of goods and services in a country during a specific period and serves as a general proxy for the size of the economy and the purchasing power of the importing country to buy/import goods and services from the exporting country.

A larger GDP also has a positive impact on the exporting partner's exports to that country. The GDP variable in this study refers to the real GDP of the export destination country (importing country) during the period 2008-2021, measured in US dollars (USD). Production of Indonesian palm oil products (Prodt)

The production variable of palm oil plantation products (CPO) used in this study refers to the total production of Indonesian palm oil products during the years 2008-2021, measured in kilograms (kg). The production of palm oil products represents the availability of raw materials that can be used by the industry to produce Indonesian palm oil products.

Distance between Indonesia and export destination country (Jarakjt): Distance in international trade serves as a proxy for transportation costs (Thangavelu, 2010). The closer the distance between two countries, the lower the transportation costs incurred, thus increasing the trade flow between the two countries.

Conversely, the farther the distance between two countries, the higher the transportation costs incurred, which reduces the

trade flow between the two countries. In this study, the distance variable represents the weighted average economic distance between Indonesia and the export destination country (importing country).

The use of economic distance is to avoid the constant and unchanging geographical distance impact between exporting and importing countries each year, thus reflecting the current trade flow between the two countries. The obtained economic distance can represent the magnitude of transportation costs that must be incurred between the two countries. The calculation of economic distance is represented by the following equation:

$$JEjt = JGi \times \frac{GDPjt}{\sum GDPjt}$$

Where JE_{jt} is Economic distance between the export destination country/ j (country) at t (time), JG_j is Geographical distance between the main export destination country of palm oil/j (country), GDP_{jt} is Real GDP of the export destination country/ j (Country) on t (year), J is Export destination country (importing country) and T is Time in months.

Geographical distance between the exporter and the importing country represents the distance between the capital cities of the countries, measured in kilometers (km). The data for geographical distance is obtained from www.timeanddate.com.

Exchange Rate (Kurs): The exchange rate variable in this study refers to the value of the Indonesian Rupiah against the US dollar at t (time). The depreciation of the Indonesian Rupiah is one of the factors affecting the volume of exported goods. For CPO exporting companies, a depreciation of the Rupiah can impact the company's profit margin as it leads to higher revenue due to the exchange rate difference with the US dollar. This depreciation of the country's currency encourages an increase in palm oil export activities (Rohmawati, 2022).

Domestic Consumption Value (Conc): The variable "conct" in this study represents the value of palm oil consumption as a raw material in the processing industry for both domestic and export purposes. It is measured in metric tons (mt) at t (time). The higher the domestic CPO consumption, the more negatively it impacts the quantity of palm oil upstream product exports, and the more positively it impacts the quantity of palm oil downstream product exports.

Empirical Models: This study employs econometric analysis with panel data regression using the Poisson Pseudo Maximum Likelihood (PPML) method proposed by Silva (2006). To address the research question, which is to examine the impact of high export tax imposition on upstream products on the performance of palm oil derivative exports, the author adopts the empirical specification developed by Amiti et al. (2007), who analyzed the impact of reducing tariffs on intermediate and final goods, and tax rates on productivity. This specification is further developed by Pierola et al. (2018), who used export proxies to measure the influence of tariff reductions on both output and input.

However, we make adjustments by considering the decisions of companies to enter international markets. The policy of imposing export taxes on downstream palm oil products (output) will increase export costs, leading to a reduction in palm oil export volumes in the downstream industry. On the other hand, high export taxes on palm oil (upstream) can enhance productivity and profitability in the downstream industry by providing cheap palm oil raw

materials (input).The availability of affordable raw materials reduces production costs and boosts profits in the palm oil derivative industry, consequently encouraging the downstream industry to increase its palm oil derivative exports. This estimation aligns with the theory of firm decisions in international trade (Melitz, 2003) and previous studies (Agusalim, 2017; `Purba et al., 2018).

$$Xjt = \beta 0 + \beta 1TAXOUTPUTit + \beta 2TAXINPUTit + \beta 3PRODt + \beta 4GDPjt + \beta 5JARAKjt + \beta 6KURSt + \beta 7CONCt + \varepsilon jt$$

Where i, j, and t are indices for products (based on HS code), destination countries, and time in months, respectively. The dependent variable Xijt represents the quantity (volume) of palm oil derivative exports to j at t. TAXOUTPUT is the export tax on palm oil derivative product i at time t. TAXINPUT is the export tax on raw materials for palm oil derivative product i to j at t.

Prodt represents the palm oil production at t. GDPjt is the real GDP of j at t. JARAKjt is the economic distance to j at t. KURSt represents the exchange rate of Indonesian Rupiah to the US dollar at t, and Conc denotes domestic palm oil consumption at t. Additionally, to examine the downstream palm oil industry harmonization policy, other export tax destinations are considered.

RESULTS AND DISCUSSION

In this analysis, we aimed to understand the impact of high export taxes on upstream palm oil on the volume of palm oil derivative exports. To achieve this, we performed two separate regressions based on different time periods of export tax imposition. The first regression covered the period from 2008 to 2015, where export taxes were imposed in ad valorem form. The second regression covered the period from 2016 to 2021, when export taxes were imposed in specific form.

The reason for conducting two separate regressions based on the time period of export tax imposition is that our independent variables include output tax, which represents the export tax on downstream palm oil derivative products, and input tax, which represents the export tax on palm oil (upstream). Meanwhile, the dependent variable is the volume of palm oil and its derivatives exports. To obtain the best results in our estimation, we conducted separate regressions for the periods with ad valorem and specific export tax structures.

Table 1. Estimation of Second Model Regression

Variable	2008 to 2015		2016 to 2021	
	Coefficient	P-Value	Coefficient	P-Value
TAXOUTPUT	-2.15E-01*** (0.0385)	0.000	-1.54E-03 (3.99E-03)	0.699
TAXINPUT	9.65E-02*** (0.0250)	0.000	5,27E-03* (0.00285)	0.064
PROD	5.12e-08** (1.58e-08)	0.001	7.02E-07* (3.38E-07)	0.038
GDP	6.88E-12 (3.69e-12)	0.062	-5.00E-12 (6.32e-12)	0.429
JARAK	-5.16E-03* (2.05E-03)	0.012	1.17-02 (1.18E-02)	0.321
KURS	1.60E-04** (5.59E-05)	0.004	1.15E-04 (1.58E-04)	0.467
Conc	1.02E-06 (7.28)	0.160	-2.19E-06** (9.22)	0.018
_Const	15.18*** (0.651)	0.000	12.57* (5.164)	0.000
Observation	2537		2017	
Pseudo R2	0.6939		0.6427	

Source : Data Processed, 2023

Results of the regression analysis for the period 2008-2015 show that the output export tax variable has a coefficient value of -2.15E-01 with a significance level (α) of 1%. Holding other factors constant, a 1% increase in ad valorem export tax will lead to a decrease in the volume of palm oil derivative exports by -2.15E-01%. This

indicates that during the period 2008-2015, the imposition of ad valorem export taxes had a significant negative impact on the volume of palm oil derivative exports.

In contrast, the input export tax variable has a coefficient value of 9.65E-02 with a significance level (α) of 1%. Holding other factors constant, a 1% increase in export tax on upstream palm oil in ad valorem form will increase the volume of palm oil derivative exports by 9.65E-02%.

This suggests that during the period 2008-2015, export taxes imposed on palm oil derivative products had a significant negative impact, while high export tax policy on the upstream sector (input) for palm oil effectively encouraged an increase in palm oil derivative exports through the availability of cheap palm oil as input for the palm oil industry.

Moving to the period 2016 to 2021, the results of the regression analysis show that the output export tax variable has a coefficient value of -1.54E-03 with a significance level above 10%. This indicates that during the period 2016-2021, the imposition of specific form export taxes did not have a significant impact on the volume of palm oil derivative exports.

On the other hand, the input export tax variable has a coefficient value of 5.27E-03 with a significance level (α) of 10%. Holding other factors constant, a 1% increase in export tax on upstream palm oil (hulu) in specific form will increase the volume of palm oil derivative exports by 5.27E-03%.

This shows that during the period 2016-2021, export taxes imposed on palm oil derivative products had a non-significant negative impact, while the high export tax policy on the upstream sector (input) for palm oil remained effective in encouraging an increase in palm oil derivative exports through the availability of cheap palm oil as input for the palm oil industry.

CONCLUSION

Based on the empirical analysis, the impact of export taxes on the volume of palm oil derivative exports during the period 2008-2015 showed a significant negative effect with a coefficient value of -2.15E-01 and a significance level (α) of 1%. However, during the period 2016-2021, the impact of export taxes on the volume of palm oil derivative exports showed a non-significant negative effect.

This indicates that a 1% increase in ad valorem tariff has a much greater impact compared to a 1 US$ increase in specific tariff. The change in export tax mechanism from ad valorem tariff to specific tariff is intended to provide incentives for the downstream palm oil industry, where the export tax on packaged cooking oil and biodiesel is lower than the ad valorem tariff.

The policy of low export tax on palm oil derivatives (downstream) is aimed at anticipating a significant increase in palm oil prices in the world market, which may lead to the diversion of the entire production of palm oil derivatives for export purposes due to potential margin increase. Therefore, when palm oil prices in the world market stabilize, it is expected that export tax policy will not significantly affect palm oil exports.

On the other hand, the input variable in the form of export tax on upstream palm oil products used as the main raw material for palm oil derivative products during the period 2008-2015 showed a significant positive effect with a coefficient value of 9.65E-02 and a significance level (α) of 1%. Similarly, during the period 2016-2021, it showed a significant positive effect with a

coefficient value of 5.27E-03 and a significance level (α) of 10%.

These findings are consistent with the research hypothesis and theories, where high export taxes on upstream industries will make trade costs more expensive and cause upstream industries to exit international trade. This situation will ensure the availability of inputs for downstream industries at cheaper prices. By reducing fixed costs in trade transactions, it encourages downstream industries to enter international trade (Melitz, 2003).

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