

Global CPO (Crude Palm Oil) Change Impact Analysis About Domestic Cooking Oil Price Stability

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Abstract

Cooking oil is one of the main needs of the Indonesian people, while CPO (Crude Palm Oil) is not only the main raw material for cooking oil, but also has a strategic role in the national economy. In recent years, CPO prices have fluctuated sharply due to several factors that have caused domestic cooking oil prices to rise, triggering anxiety, panic buying, and reducing the purchasing power of low- and middle-income people. Therefore, this study aims to analyze the influence of global CPO prices, inflation rates, and domestic CPO production volume on the stability of cooking oil prices in the domestic market. What distinguishes this study from the previous research is that this study not only focuses on global CPO prices with cooking oil prices but also integrates the variables of CPO production volume and inflation. The results show that global CPO prices and CPO production volume have a significant effect on domestic cooking oil prices while inflation does not have a significant effect on domestic cooking oil prices.

Keywords: Global CPO prices, cooking oil prices, CPO production volume, inflation, price stability.

INTRODUCTION

Crude palm oil (CPO) is one of the most important agricultural commodities in Indonesia according to BPS (Central Statistics Agency) data in the third quarter of 2023, the agricultural sector contributes 13.57% to Indonesia's total GDP (Gross Domestic Product), Palm Oil is one of the plantation subsectors that has a major contribution to the

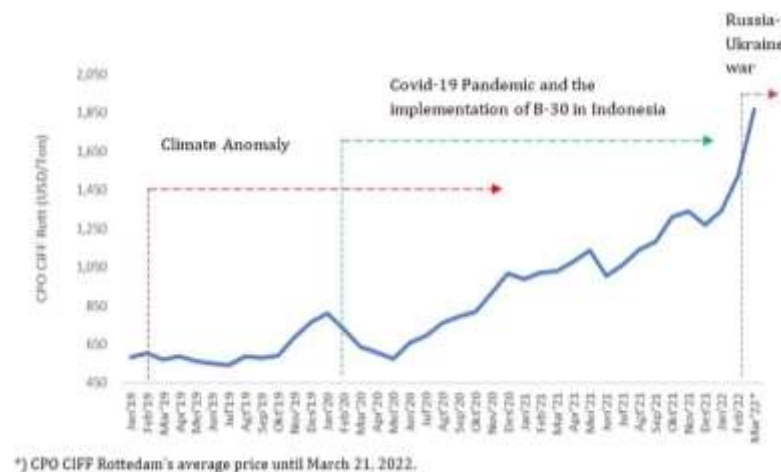
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national economy. Palm oil is a leading non-oil and gas export commodity that generates foreign exchange for countries outside oil and gas (Azwar, 2015) Indonesia, as the world's largest CPO producer, has a significant influence on the formation of global CPO prices. However, fluctuations in CPO prices in the international market often have an impact on the stability of domestic cooking oil prices, as can be seen in the graph below it can be seen that in the last three years the world palm oil has shown an increasing trend. In general, CIF Rotterdam's CPO prices increased from the beginning of 2019 to March 2022. This indicates an increase in demand or a decrease in the supply of palm oil in the global market. According to (Scott, n.d.) There were three supply shocks that affected world CPO inventories during the period, namely the climate anomaly, the Covid-19 pandemic, and the Russia-Ukraine conflict, which led to an upward trend in world CPO prices between 2019 and 2020.



*) CPO CIF Rotterdam's average price until March 21, 2022.

In addition to the selling price of crude palm oil (CPO) in the global market, there are several other important factors that affect the stability of domestic cooking oil prices such as production volume and inflation rate. The volume of domestic production plays a role in maintaining the stability of cooking oil prices, when production increases, prices tend to be more controlled or even decrease. On the other hand, if production decreases due to factors such as bad weather and supply chain disruptions, the availability of cooking oil will decrease and usually cause prices to increase (Sirohi et al., 2014). Meanwhile, inflation in general indicates an increase in the overall price of goods and services in the economy. High inflation rates can reduce people's purchasing power, including their ability to buy basic necessities such as cooking oil. In addition, inflation also affects the cost of cooking oil production, such as labor costs, transportation, and

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packaging materials, which ultimately has an impact on changes in the selling price of cooking oil in the market (Nugroho & Salsabila, 2022).

This study aims to examine the relationship between various factors and the price stability of cooking oil in the domestic market and provide an understanding of the elements that can affect these price changes (Mustafa, 2022). An in-depth analysis of these factors is important to understand their impact on domestic cooking oil prices. The uncertainty of the global market forces domestic market players to adapt quickly, where cooking oil producers and traders must pay attention to changes in CPO prices as the main raw material in determining selling prices, which ultimately affects people's purchasing power.

Based on the background that has been explained, the main problem that wants to be answered in this study is how the influence of global CPO prices, inflation rates, and domestic CPO production volume on the stability of cooking oil prices in Indonesia. The research gap found is that no empirical study has simultaneously tested these three variables in the context of the domestic cooking oil market. This is important considering that fluctuations in cooking oil prices have a wide impact on people's welfare and national economic stability, especially in the midst of global market dynamics and post-pandemic economic challenges.

LITERATURE REVIEW

Heckscher Ohlin HO Theory

The theory (H-O) or Heckscher-Ohlin is one of the theories of international trade that explains how countries can utilize various different factors of production to produce goods and services, this theory was developed by Eli Heckscher and Bertil Ohlin which states that a country tends to export products whose manufacture takes advantage of available factors of production in large quantities and at a relatively low cost, Meanwhile, products that require rare and expensive production factors will be imported more. According to HE theory, international trade arises because of differences in the availability of production factors in each country, countries will focus on producing goods according to the production factors they have in abundance, so that a mutually beneficial trade pattern is formed between countries (Akther et al., 2022).

Market Theory

Adam Smith in his work entitled "The Wealth of Nations" (1776) described the market as a meeting place between sellers and buyers to carry out transactions of goods

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and services. This theory explains how the market mechanism in determining a balanced price where the number of goods that consumers want can be proportional to the number of goods, in this context the market price serves as an indicator for producers to allocate their resources efficiently and consumers to be able to decide on the allocation of their income to various goods (Indarti, 2015)

Supply Demand Theory

The theory of demand and supply according to Mankiw, N.G (2018) in his book Principles of Microeconomics (8th edition). Boston Teaching cengage. Provides a framework for understanding how the price and quantity of goods in the market are affected by the interaction between sellers and buyers. This theory explains how changes in global CPO prices affect domestic cooking oil prices through supply and demand mechanisms. Supply is influenced by production costs, technology, and policies such as Domestic Market Obligation (DMO), while demand is influenced by consumer income, the price of substitute goods and consumer preferences.

Price Stability Theory

Price stability is a condition in which the price level of goods and services in general is relatively stable or only experiences a low and controlled increase over a period of time. According to Law Number 18 of 2012 concerning food, maintaining price stability is an important responsibility of the government to prevent price increases that can cause public unrest. The price stabilization policy aims to maintain the price of goods or services at a certain level, especially during periods of high inflation, so that the price balance is maintained. Price stability is usually measured using a coefficient, the smaller the value of the coefficient, the lower the price fluctuation and the more stable the price will be (Nuryati & Farid, 2016)

Price Theory

Price theory also known as price theory provides an explanation for the formation of the price of goods in the market is basically influenced by the interaction between the number of goods demanded and offered, there are various other factors that also affect both aspects (Akther et al., 2022). Price theory discusses the process by which the price of goods or services is formed in the market and has an important function in the allocation of resources, information, and incentives for producers. In the context of research on the impact of global CPO price changes on cooking oil price stability, price theory is

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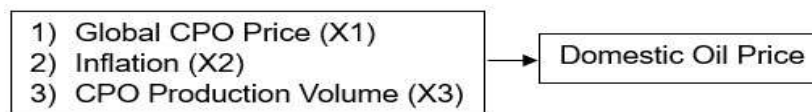


particularly relevant because changes in global CPO prices as an external factor can affect cooking oil prices in the domestic market.

RESEARCH METHODS

This study applies a quantitative analysis method to test the influence of global CPO prices on cooking oil prices in the domestic market, this method is to measure the relationship between CPO price changes and the statistical stability of cooking oil prices. This study uses multiple linear regression methods to analyze the influence of independent variables (global CPO prices) on dependent variables (domestic cooking oil prices). The type of data used is secondary data in the form of time series data from official sources such as the Central Statistics Agency (BPS), Bank Indonesia, the World Bank, the Ministry of Trade, and other reliable sources that are relevant to the research variables to be analyzed using statistical software.

After the data is collected, the next stage is to conduct an analysis to answer the research questions that have been formulated. This study uses a double linear regression analysis method. Before the analysis was carried out, the researcher conducted a series of classical assumption tests to ensure that the analysis model used was free from bias. Classical assumption tests include normality, multicollinearity, heterokedasticity, and autocorrelation tests. To test the research hypothesis, the determination coefficient test, the F test and the t test were used. The research framework used in this study is designed as follows.



Based on the above research framework, multiple linear regression equations can be expressed in the following form:

$$\text{Domestic Oil Price} = \alpha + \beta_1 \text{Global CPO Price} + \beta_2 \text{Inflation} + \beta_3 \text{CPO Production Volume} + \epsilon$$

Source : Researcher, 2025

Information:

Y	= Domestic Cooking Oil Prices
A	= Constant
$\beta_1 - \beta_3$	= Regression Equation
X1	= Global CPO Prices
X2	= Inflation



X3

= CPO Production Volume

E

= Error

RESULT**Linear Multiple Regression Analysis**

This study examines the influence of global CPO prices, inflation, and CPO production volume prices on domestic cooking oil prices in Indonesia using the multiple linear regression method with time series data from 2006-2023. Before the regression analysis was performed, a classical assumption test was performed and showed that the model was qualified without problems of multicollinearity, autocorrelation heterogeneity and normal distributed data.

Table 1. Results of Multiple Linear Regression Analysis

Variable	Coefficient	Prob.
C	-0.287049	0.7783
HARGA CPO GLOBAL	2.428813	0.0292
INFLASI	1.941262	0.0726
VOLUME PRODUKSI CPO	4.377007	0.0006

Source : EvIEWS Output Results 12

Based on the tests listed in the table above, the model of the double linear regression equation can be structured as follows:

$$\text{Domestic Oil Price} = -543.0125 + 1.441732 \text{ Global CPO Price} + 291.8109 \text{ Inflation} + 0.000184 \text{ CPO Production Volume} + \epsilon$$

Regression equations are obtained that can be deduced:

- The constant value (c) -1121,587 indicates that if the global CPO price (X1), inflation (X2), and production volume (X3) are zero or constant, then the total domestic cooking oil price will be worth -1121,587 rupiah.
- The value of the global CPO price variable regression coefficient (X1) is 1.883494. This means that if the global CPO price is 1 USD/ton, then the price of domestic cooking oil will increase by 1.883494 rupiah.
- The value of the inflation variable regression coefficient (X2) is 5.511538. This means that if there is an increase in inflation by 1%, the price of domestic cooking oil will increase by 5.511538 rupiah.



- d. The value of the variable regression coefficient of CPO production volume (X3). This means that if there is an increase in CPO production volume by 1 ton, the price of domestic cooking oil will increase by 0.000187 rupiah.

Coefficient of Determination (R²)

Table 2. Determination Coefficient Test Results (R²)

R-squared	0.778695
Adjusted R-squared	0.731272

Source : Eviews Output Results 12

Based on the test results in the table, it is explained that the R-Squared value is 0.664333 which means that the variables of global CPO prices, inflation, and CPO production volume are at around 77.86% model. The rest can be explained through other variables outside of the model or research.

Test F

Table 3. Test F Results

F-Statistic	16.42035
Prob (F-Statistic)	0.000073

Source : Eviews Output Results 12

Based on the test results in the table, it is explained that the calculated value F is 9.235995 while table F is 3.34 which means that the calculation value of F is greater than the F table $9.235995 > 3.34$. and can be observed from the probability value (Fstatistics), where the probability obtained is less than 0.05 or $0.001267 < 0.05$. This shows that the variables of global CPO prices (X1), inflation (X2), and CPO production volume (X3) simultaneously affect the price of domestic cooking oil (Y).

T Test

Variable	Coefficient	Prob.
C	-0.287049	0.7783
HARGA CPO GLOBAL	2.428813	0.0292
INFLASI	1.941262	0.0726
VOLUME PRODUKSI CPO	4.377007	0.0006

Source : Eviews Output Results 12



Based on the test results listed in the table, a decision is taken by comparing the calculated value t with the t -table. With the formula $Dk = n - k = 18 - 3 = 15$ with a confidence level of 0.05. A t -table value can be obtained, which is 2.13145. According to the results of the t -test, the global CPO price variable (X_1) has a positive and significant influence on domestic cooking oil prices, shown by a t -calculation value of 2.43 which is greater than the t -table of 2.13 and a probability of 0.0292 which is less than 0.05. On the other hand, the inflation variable (X_2) has no significant influence because the t -value of 1.94 is smaller than the t -table and the probability is 0.0726 which is greater than 0.05. Meanwhile, the production volume of CPO (X_3) showed a positive and significant influence on domestic cooking oil prices with a t -count of 4.38 which exceeded the t -table and a probability of 0.0006 which was far below 0.05. Thus, only global CPO prices and CPO production volumes contribute significantly to domestic cooking oil prices, while inflation has no significant effect.

DISCUSSION

The Effect of Global CPO Prices on Domestic Miyak Cooking Oil Prices

The results of the analysis show that global CPO prices have a positive and significant effect on the stability of domestic cooking oil prices. This means that changes in CPO prices in the international market directly affect the costs that must be paid by cooking oil consumers in Indonesia. This relationship confirms how the domestic cooking oil market is greatly influenced by global market dynamics. When global CPO prices rise, the cost of cooking oil production also increases, so producers tend to increase their selling prices. In contrast, a decline in global CPO prices is usually followed by a decline in domestic cooking oil prices, although the domestic market's response is often not as rapid or balanced due to factors such as transportation costs, merchant margins, and government policies such as subsidies and pricing.

This is in line with the findings by (Mustafa, 2022) and (Scott, n.d.) which states that fluctuations in world CPO prices directly affect the price of cooking oil in the domestic market, because CPO is the main raw material in cooking oil production. Empirical support is also obtained from (Pratiwi et al., 2023), which found that global CPO prices are one of the main factors determining the price of fried noodles in Indonesia.

The Effect of Inflation on Domestic Cooking Oil Prices

The results of the analysis show that inflation (X_2) does not have a significant effect on the stability of domestic cooking oil prices (Y). Although economic theory usually links

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inflation to increases in the prices of goods and services, including cooking oil, in this study this effect was not statistically proven. In theory, inflation can affect the price of cooking oil through an increase in production costs and changes in consumer purchasing power that have an impact on demand and prices.

These findings are in line with the results of the study (Nurrahmawati, 2020) which states that the price of cooking oil is not significantly affected by inflation. This shows that the dynamics of cooking oil prices are more influenced by other factors, such as the price of raw materials (CPO), distribution mechanisms or government policies related to subsidies and price controls, rather than the general inflation rate.

The Effect of CPO Production Volume on Domestic Cooking Oil Prices

Although the results of previous studies vary, this study provides strong evidence that the production volume of CPO (X3) has a significant influence on the stability of domestic cooking oil prices (Y). In contrast to the view that emphasizes the dominance of global factors, these findings highlight the importance of internal factors in maintaining the stability of cooking oil prices in Indonesia. With a significant regression coefficient, the results of the study show that increasing domestic CPO production has the potential to reduce the price of cooking oil and provide direct benefits to consumers.

These findings are in line with research (Sirohi et al., 2014) which states that cooking oil shortages can occur due to factors such as bad weather and supply chain disruptions. Although the study does not explicitly address production volume as an independent variable, the implications suggest that disruptions in the supply chain that affect production volumes can lead to shortages and increases in cooking oil prices. In other words, fluctuations in disrupted production volumes have the potential to have a significant impact on the price of cooking oil. This shows that policies that focus on increasing oil palm plantation productivity, supply chain efficiency, and optimizing the allocation of CPO for domestic needs are essential to maintain the stability of cooking oil prices in the market.

CONCLUSION

This study concludes that global CPO prices and domestic CPO production volume have a positive and significant influence on domestic cooking oil prices in Indonesia. The increase in global CPO prices has driven the increase in domestic cooking oil prices, while the increase in CPO production volume plays a role in stabilizing or suppressing domestic cooking oil prices. In contrast, inflation was not shown to have a significant

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influence on cooking oil prices during the study period. Thus, fluctuations in cooking oil prices are more influenced by global CPO price factors and domestic CPO production than inflation rates.

Based on these findings, it is suggested that governments and policymakers focus on maintaining global CPO price stability and increasing domestic CPO production volumes through increasing the productivity of oil palm plantations, strengthening supply chains, and optimizing CPO allocation for domestic needs. The government also needs to continue to monitor global price dynamics and carry out policy interventions such as regulating exports or establishing cooking oil reserves so that prices at the consumer level remain affordable and stable. Further research is expected to cover other relevant variables and use broader data to enrich the analysis and provide more comprehensive policy recommendations.

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