ANALYSIS OF FACTORS AFFECTING SOYBEAN IMPORTS IN INDONESIA

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Abstract

The purpose of the study is to determine how much soybean imports contribute to the total imports of the food crop subsector and the effect of production, harvest area, exchange rate and consumption on Indonesia's soybean imports. The data used in this study are secondary data in the form of time series data for the period 2002-2022 derived from surveys that have been processed by the Central Bureau of Statistics. The analysis method used is descriptive and quantitative analysis using simultaneous analysis tools. The results showed that the contribution of soybean imports to the total imports of the food crop subsector in Indonesia experienced a fluctuating increase each year with an average of 24.87 percent. Based on the results of multiple linear analysis, it is concluded that the factors influencing soybean imports in Indonesia are jointly influenced by the variables of soybean production, harvest area, exchange rate and Indonesian soybean consumption. While simultaneously and partially the variables of soybean production and consumption have a positive and significant influence on Indonesian soybean imports, while the variable of harvest area has a negative and significant effect, the exchange rate has a negative and insignificant effect on Indonesian soybean imports.

Keywords: *Contribution, Import, Production, Harvested Area, Exchange Rate*

INTRODUCTION

Indonesia is a country that adheres to an open economic system so that it relies heavily on international trade activities. International trade is an activity to trade various outputs in the form of goods and services produced by a country to be sold abroad and to bring in goods and services from abroad to then be brought into the country with the aim of meeting domestic needs (Pambudi, 2011). Global trade is an important aspect of every country's economy. The purpose of global trade is to improve the welfare of people in a country. Mutually influencing relationships between countries can be created because of the domestic and foreign economies, one of which is the exchange of goods and services between countries. The absence of trade area boundaries in the world can expand market share to other countries (Iswandari, 2018).

Indonesia is currently the sixth largest soybean producing country in the world after the United States, Brazil, Argentina, China, and India. However, domestic soybean production has not been able to meet domestic needs which continue to increase over time far exceeding the increase in domestic production. To meet it, the government imports. Economic growth in developing countries that have an impact on increasing prosperity will continue (Sari, 2015). The source of protein commonly consumed by the Indonesian people is soybeans, soybeans are generally processed in the form of tempeh and tofu, besides that soybeans can also be made into soy sauce, soy milk and also into tauco. Indonesia is the largest tempeh producing country in the world and is the largest soybean market in Asia.

Based on the 2014 SUSENAS data released by BPS, the average consumption of tempeh per person per year in Indonesia is 6.95 kg and tofu 7.068 kg (Soybean Outlook, 2016). In Indonesia, until now, there is still a very wide gap between soybean production and consumption (Sari, 2015). The increase in soybean production has not been able to meet the availability of soybeans. So, to meet the need for soybeans, the government has implemented a soybean import policy. Soybeans are a strategic commodity in Indonesia because soybeans are one of the important food crops in Indonesia after rice and corn. This commodity receives more attention from the government in the national food policy. In addition to being a source of vegetable protein, soybeans are a source of fat, minerals, and vitamins and can be processed into various foods such as tofu, tempeh, tauco, soy sauce, and milk (Zakaria, 2010). The need for protein in soybeans will continue to increase along with the increase in population and income. However, on the other hand, the provider of protein sources in Indonesia is still insufficient. Rapid growth in

demand for both human consumption and animal feed on the one hand, while on the other hand the growth of domestic soybean production has not been able to meet the growth in demand. The gap between consumption and production is widening, so this has to be closed with imported soybeans. In an effort to spur increased soybean production to meet domestic demand and increasing import substitution, it is necessary to study the sources of production growth in various provinces in Indonesia (Aeni, 2014). Soybean imports in 2012 amounted to 1,211,230.0 US dollars with a growth of 48.77%, in 2013 there was a decrease in import value of 1,101,562.5 US dollars with a growth of -40.57%, in 2014 the value of soybean imports was 1,176,923.0 US dollars with a growth of 6.84%, but in 2015 it fell again to 1,034,367.6 US dollars with a growth of -12.11%, and in 2016 the import value was 959,041.1 US dollars with a growth of -7.28% (BPS, 2016).

Production and harvest area can also affect soybean imports in Indonesia. We must see how the development of soybean production and harvest area in our own country, because if our production is small and domestic needs are not met, it is likely that Indonesia will carry out a lot of import activities. However, after 2002, soybean production can be said to have continued to decline and its value was always below 1 million tons. Production decreased in 2003 while consumption increased which has caused an increase in imports. After 2002, soybean production continued to decline which resulted in production not increasing above 1 million tons again from year to year and has resulted in a significant increase in import value from year to year.

In the concept if the soybean harvest area in Indonesia is small it can cause the volume of soybean imports to increase. Although our country has a large land area, there is no guarantee that each hectare of soybean production is the same. So Indonesia must pay attention to the development of soybean production, harvest area, the Rupiah exchange rate per Dollar, and also soybean consumption in Indonesia. The development of soybean commodities to become superior commodities in the food crop subsector needs to be supported by all related parties. If it has received support from all parties, it is certain that soybean production will increase so that it can meet the community's needs for soybeans and can become food self-sufficiency. Good food security can reduce Indonesia's dependence on soybean imports from other countries. Based on the background, the author is interested in conducting research on "Analysis of Factors Affecting the Value of Soybean Imports in Indonesia".

LITERATURE REVIEW

Research related to factors affecting soybean imports in Indonesia has been conducted using various approaches. One of them is a study by Putri (2015), which analyzed soybean imports during the period 1981-2011 using the Error Correction Model (ECM) method. This study focuses on the variables of soybean imports, soybean production, domestic soybean prices, and soybean consumption. The results show that soybean production has a negative and significant effect on imports, both in the short and long term. This means that increasing domestic production can reduce the amount of soybean imports. Conversely, domestic soybean prices have a positive and significant effect on soybean imports, indicating that increasing domestic soybean prices encourage increased imports to meet needs. In addition, soybean consumption also has a positive and significant effect on imports in both time frames, indicating that increasing domestic demand increases the volume of soybean imports.

Another study by Permadi (2015) used the Ordinary Least Square (OLS) method to analyze soybean imports by involving more variables, such as soybean import volume, domestic corn price, domestic soybean price, domestic chicken meat price, soybean harvest area, soybean productivity, domestic chicken egg price, population, foreign exchange reserves, GDP per capita, and exchange rate. The results showed that domestic soybean price and exchange rate had a significant negative effect on soybean imports. A decrease in domestic price or depreciation of the exchange rate can reduce soybean imports. Conversely, domestic corn price and domestic chicken meat price had a significant positive effect on imports, indicating substitution between these commodities. However, other variables such as harvest area, soybean productivity, domestic chicken egg price, population, foreign exchange reserves, and GDP per capita did not have a significant effect.

These two studies highlight the importance of domestic soybean prices as a significant factor in regulating soybean imports. The ECM approach by Putri allows for the analysis of long- and short-run relationships, while the OLS method by Permadi provides insight into additional factors, such as inter-commodity substitution. The results of this study provide a basis for formulating policies in managing soybean imports, including increasing domestic production, controlling prices, and considering commodity substitution in national food consumption. Bottom of Form.

RESEARCH METHODS

The type of data used in this study is Secondary Data, in the form of time series data for the period 2002-2022 originating from a survey that has been processed by the Central Statistics Agency. The research data comes from the Indonesian Central Statistics Agency, Bank Indonesia, FAO and IMF. Agricultural Statistics Database, Journal References, Papers, and so on. The analysis method used is simultaneous equation analysis. Analyzing the factors that influence soybean imports in Indonesia, a simultaneous model is used with the following equation:

$$YK_t = b_0 + b_1 * LAK_t + b_2 * CH_t + b_3 * TW_t + b_4 * LYK_{t-1} + \mu_2 \dots\dots\dots\dots\dots\dots\dots\dots(2)$$

Where:

YK_t	= Soybean productivity in year t (Ton/Ha)
LAK_t	= Area of soybean plantation in year t (Ha)
CH_t	= Rainfall in year t (mm/year)
TW_t	= Time trend
YK_{t-1}	= Soybean productivity in the previous year (Ton/Ha)
μ_2	= Interfering variables

Hypothesis: $b_1, b_2, b_3 > 0$; $0 < b_4 < 1$

RESULTS AND DISCUSSION

Contribution of soybean imports to total imports of the food crop subsector

Based on Table 1, the total contribution of soybean imports tends to fluctuate from year to year, this is due to the agricultural sector consisting of food crops, the import of commodities continues to increase. In the agricultural sector, Indonesia has several import commodities, one of which is soybeans. The food crop subsector is part of the agricultural sector that has a very important role in national resilience and as a supplier of population consumption needs, especially in Indonesia, food crops also have a strategic position in maintaining national economic stability.

Table 1. Contribution of soybean imports to total imports of the food crop subsector

Year	Soybean imports (million US)	Food crops subsector imports (million US)	Contribution (%)
2018	959,041.1	6,498,553.0	14.76
2019	1034,065.3	6,345,424.0	14.83
2020	1076,085,2	6,456,876.0	15.21
2021	1123,087.6	6,476,658.0	15.46
2022	1146,094.3	6,562,346.0	15.68
Average			**24.87**

Source: Statistics Indonesia, 2024 (processed)

The contribution of soybean imports to the total imports of the food crop subsector in Indonesia from 2002 to 2022 averaged 24.87 percent. The highest contribution of soybean imports to the total imports of the food crop subsector occurred in 2004, with a soybean import value of 967,957.30 or 39.94%. The second highest contribution occurred in 2002, with a soybean import value of 557,148.0 or 38.34%. And the third highest contribution occurred in 2005, with a soybean import value of 801,778.85 or 37.90%. Until 2016, soybean imports were able to contribute to the imports of the food crop subsector by 14.76% with a soybean import value of 959,041.1. The contribution of the soybean commodity is indeed not high enough when compared to the contribution of other commodities that are able to contribute quite high to the total import value of the food crop subsector. This is because in Indonesia natural resources (SDA) are abundant starting from the agricultural sector whose food crop subsector commodities are rice, corn, sugar, soybeans, red chilies and shallots and other commodities. The description of this contribution shows that the contribution of soybean imports to food crop subsector imports is still stable even though other commodities make a large contribution to the food crop subsector.

Analysis of factors influencing Indonesia's soybean imports

The results of simultaneous calculations in this study can be seen in Table 7, using simultaneous with a significance level of $\alpha = 5\%$, namely as follows:

Table 2. Indonesian Soybean Import Results

Independent Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant (C)	660,219.6	475,013.1	1,389,898	0.1898
Soybean Production (PROD)	2,755,887	0.853036	3,230,680	0.0072
Harvested Area (LP)	-3,728,264	1,127,296	-3,307,264	0.0063
Exchange Rate (RATE)	-4,491,439	3,319,700	-1,352,966	0.2010
Soybean Consumption (CONS)	0.448897	0.173528	2,419,169	0.0324

Source: Processed data, 2024

Based on Table 2, the following simultaneous equations can be obtained:

NMi = 660219.6 + 2.755887PRODi-3.728264 LPi-44.91439 SEATS+ 0.286479 CONSi

These simultaneous equations can be interpreted as follows:

The constant value of 660219.6 means that if PROD (soybean production), LP (harvested area), KURS (exchange rate), CONS (soybean consumption) are assumed = 0, then the value of Indonesia's soybean imports (NM) will decrease by 660219.6 million US dollars.

The independent variable PROD (soybean production) has a simultaneous coefficient of 2.755887, meaning that soybean production has a positive effect on the value of Indonesian soybean imports and a significant probability of 0.0072 at $\alpha = 5\%$. This shows that every increase of 1 ton per year will increase the value of Indonesian soybean imports by 2.755887 million US dollars.

The independent variable LP (harvested area) has a coefficient of -3.728264, meaning that the soybean harvested area has a negative effect on the value of Indonesian soybean imports and a significant probability of 0.0063 at $\alpha = 5\%$. This shows that every 1 hectare increase in land will reduce the value of Indonesian soybean imports by 3.728264 million US dollars.

The independent variable KURS (exchange rate) has a coefficient of -44.91439, meaning that the exchange rate has a negative effect on the value of Indonesian soybean imports and the probability of 0.2010 is not significant at $\alpha = 5\%$. This shows that every increase of 1 rupiah per US dollar will reduce the value of Indonesian soybean imports by 44.91439 million US dollars.

The independent variable CONS (consumption) has a coefficient of 0.448897, meaning that soybean consumption has a positive effect on the value of Indonesian soybean imports and a significant probability of 0.0324 at $\alpha = 5\%$. This shows that every increase of 1 ton per year will increase the value of Indonesian soybean imports by 0.448897 million US dollars.
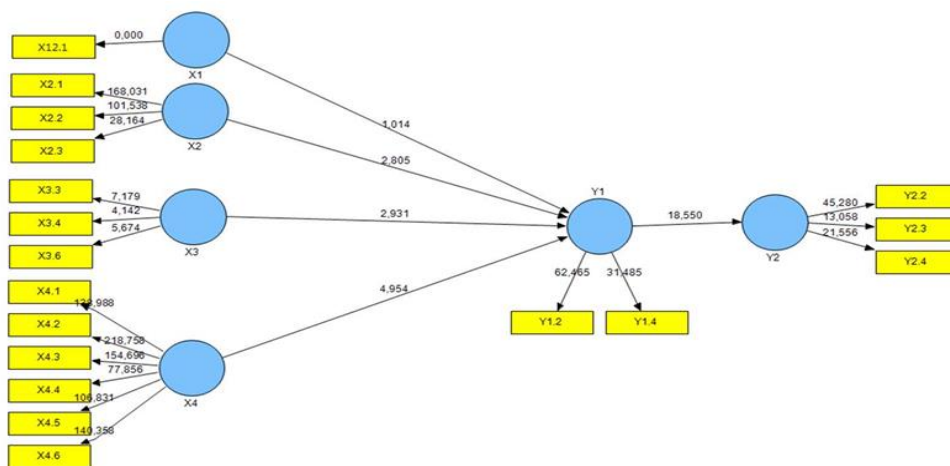
Picture 1 Re-Sampling Results

The path diagram used in the Structural Equation Modeling (SEM) model shows the causal relationship between latent and observed variables that affect soybean imports in Indonesia. Latent variables are represented by circles, such as external factors (X1), local production factors (X2), domestic consumption factors (X3), macroeconomic factors (X4), soybean imports (Y1), and the impact of soybean imports on the agricultural sector (Y2). Meanwhile, observed variables are represented by rectangles and are used to measure latent variables, such as trade policy indicators, harvested area, productivity, consumption levels, and other macroeconomic indicators. The path coefficient in the path diagram shows the strength and direction of the relationship between variables. The results of the analysis show that external factors (X1) have a positive effect on soybean imports (Y1) with a path coefficient of 1.014. Although its contribution is relatively small, international trade policy remains an important factor in influencing import flows.

Local production factors (X2) have a more significant effect on soybean imports with a coefficient of 2.805, indicating that the imbalance between domestic demand and production also drives the increase in imports. Furthermore, domestic consumption (X3) has a fairly significant effect on soybean imports with a coefficient of 2.931, reflecting domestic food dependence on imported products. Macroeconomic factors (X4) have the most dominant effect on soybean imports with a path coefficient of 4.954, indicating that the exchange rate, inflation, and economic growth greatly determine the amount of soybean imports. Soybean imports (Y1) also have a significant impact on the agricultural sector (Y2) with a path coefficient of 18.550. This shows that soybean imports have a significant impact on the trade structure, domestic prices, and the welfare of local farmers. Observed variables such as import volume and price impact show a direct relationship with latent variables (Y1 and Y2), emphasizing the importance of understanding the relationship between imports and domestic economic indicators.

The literature review supports these findings. According to Kuncoro (2015), macroeconomic factors such as exchange rates and inflation play a key role in determining the level of imports in developing countries, including Indonesia. In addition, research by Rahim et al. (2018) shows that low domestic productivity and imbalance in demand for local production increase dependence on strategic food imports, including soybeans. A similar thing was also expressed by Nugroho et al. (2020), who stated that high domestic consumption without food diversification exacerbates dependence on imported products. In the context of this study, increasing local productivity through agricultural intensification and food diversification can be a solution to reduce dependence on soybean imports. In addition, controlling macroeconomic factors such as exchange rate stability and inflation is also a priority for policy makers. The results of this study provide a strong basis for the government's efforts to formulate long-term strategies to achieve food security and economic independence.

Classical assumption testing Multicollinearity test

Multicollinearity is a condition where there is a "perfect" or exact linear correlation between some or all of the independent variables in a simultaneous equation. After the estimation results, a multicollinearity test can be carried out which can be seen from the variance inflation factor (VIF) value as follows:

Table 3. Multicollinearity Results

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	2.26E+11	173.1040	NA
PROD	0.727671	384.4442	7.418927
LP	1.270795	365.7896	6.300317
EXCHANGE RATE	1102.041	90.29775	2.054740
CONS	0.014023	55.28397	1.338956

Source: Processed data, 2024

Table 3 shows that the VIF value results of the soybean production variable (PROD) are 7.418927, the harvested area (LP) is 6.300317, the exchange rate (KURS) is 2.054740 and soybean consumption (CONS) is 1.338956 against Indonesian soybean imports is less than 10, so it can be stated that there is no symptom of multicollinearity in the study.

Heteroscedasticity test

The heteroscedasticity test is used to see whether or not there is a deviation from the classical assumption. If heteroscedasticity occurs, the OLS estimator remains unbiased and consistent, but the estimator is no longer efficient in both small and large samples. The heteroscedasticity model can be seen in the following table:

Table 4. Statistical Results

Statistics	Mark
R^2	0.737512
F-statistic	8,429,116
Probability F	0.001774

Source: Processed data, 2024

Table 4 shows that the Chi-Square probability results are greater than the selected α value, which is 0.2885> 0.05 and does not experience significance in this Glejser test model, meaning that the variables of soybean production, harvested area, exchange rate, and Indonesian soybean consumption on the value of Indonesian soybean imports do not have heteroscedasticity.

Autocorrelation Test

Autocorrelation test using the Breusch-Godfey method is commonly known as the Lagrange Multiplier (LM) test. Autocorrelation problems usually appear in time series data although it is also possible in cross-section data. The following Heteroscedasticity model can be seen in the following table:

Table 5. Simultaneous Model Results

Model	Variables	Parameter Estimation	P-Value (Sig)	R-Square
Model 1 (Soybean Production)	Constant (C)	660,219.6	0.1898	0.096
	Harvested Area (LP)	-3,728,264	0.0063	0.085
	Exchange Rate (RATE)	-4,491,439	0.2010	0.082
	Soybean Consumption (CONS)	0.448897	0.0324	0.09

Model 2 (Soybean Consumption)	Constant (C)	660,219.6	0.1898	0.107
	Soybean Production (PROD)	2,755,887	0.0072	0.095
	Harvested Area (LP)	-3,728,264	0.0063	0.086
	Exchange Rate (RATE)	-4,491,439	0.2010	0.092

Table 5 shows that the resultsSimultaneous model analysis using the Two-Stage Least Squares (2SLS) method shows a significant reciprocal relationship between soybean production (PROD) and soybean consumption (CONS). In Model 1 (Soybean Production), the constant (C) is not significant with a p-value of 0.1898, which means that the basic value of soybean production does not significantly affect the results. However, the harvested area (LP) has a significant negative effect on soybean production, with a p-value of 0.0063, indicating that increasing the harvested area tends to reduce soybean production. This may be related to land quality or other factors that reduce production efficiency. The exchange rate (KURS) does not show a significant effect on soybean production, with a p-value of 0.2010, indicating that exchange rate fluctuations do not directly affect soybean production. Meanwhile, soybean consumption (CONS) has a positive and significant effect on soybean production, with a p-value of 0.0324, meaning that increasing soybean consumption tends to encourage an increase in soybean production. However, the R-Square value of 0.096 indicates that only 9.6% of the variation in soybean production can be explained by the variables in this model, so there are still many other factors that influence soybean production.

In Model 2 (Soybean Consumption), the results are similar, where the constant (C) is not significant with a p-value of 0.1898. Soybean production (PROD) has a positive and significant effect on soybean consumption, with a p-value of 0.0072, indicating that increased soybean production drives increased soybean consumption. However, the harvested area (LP) also has a significant negative effect on soybean consumption, with a p-value of 0.0063, indicating that the wider the land used for harvesting, the soybean consumption tends to decrease. The exchange rate (KURS) again shows insignificance, with a p-value of 0.2010, confirming that the exchange rate does not significantly affect soybean consumption. The R-Square value of 0.107 indicates that this model can only explain 10.7% of the variation in soybean consumption, indicating that there are other factors that influence soybean consumption that are not included in the model.

Overall, this analysis highlights the existence of a reciprocal relationship between soybean production and consumption, with harvested area having a negative effect on both variables. The exchange rate does not have a significant impact on either soybean production or consumption. However, soybean consumption plays an important role in driving soybean production, and conversely, soybean production also increases soybean consumption. The low R-Square values in both models indicate that although there are some significant variables, there are still many factors that are not included in this analysis that influence soybean production and consumption. Thus, further research is needed to identify other variables that can explain greater variations in both phenomena. Bottom of Form

Hypothesis testing
Simultaneous significance test (F-test)

The results of the study obtained a calculated F value of 8.429116 with a probability of (0.001774) or less than the value of $\alpha = 0.05$ (0.001774 < 0.05), meaning that H0 is rejected and Ha is accepted at a confidence level of 95%. So it can be concluded that the variables of soybean production, harvested area, exchange rate and consumption of Indonesian soybeans on the value of Indonesian soybean imports have a joint effect.

Partial significance test (t-test)

The t-test is used to determine the significant influence of independent variables (i.e. production, harvest area, and soybean consumption) partially (individually) on the dependent variable (Indonesian soybean imports), namely by looking at the significance of $\alpha = 5\%$. If the significance level is smaller than $\alpha = 5\%$.

The results of the study explain that the simultaneous coefficient test of the PROD variable (production), it can be seen that the t-value is 3.230680 with the probability of the PROD variable (production) of 0.0072 or less than the value of α = 5% (0.0072 <0.05), then H0 is rejected and H1 is accepted. This means that it can be concluded that partially the production variable has a significant influence on Indonesia's soybean imports.

The simultaneous coefficient of the LP variable (harvested area), it can be seen that the calculated t value is -3.30726 with the probability of the LP variable (harvested area) of 0.0063 or less than the value of α = 5% (0.0063 < 0.05), then H0 is rejected and H1 is accepted. This means that it can be concluded that partially the harvested area variable has a significant influence on Indonesia's soybean imports.

The simultaneous coefficient of the KURS variable (exchange rate), it can be seen that the calculated t value is -1.35297 with the probability of the KURS variable (exchange rate) of 0.2010 or greater than the value of α = 5% (0.2010> 0.05), then H0 is accepted and H1 is rejected. This means that it can be concluded that partially the exchange rate variable has an insignificant effect on Indonesian soybean imports.

The simultaneous coefficient of the CONS variable (soybean consumption), it can be seen that the t-value is 2.419169 with the probability of the CONS variable (soybean consumption) of 0.0324 or less than the value of α = 5% (0.0324 <0.05), then H0 is rejected and Ha is accepted. This means that it can be concluded that partially the soybean consumption variable has a significant effect on Indonesia's soybean imports.

Coefficient of determination (R2)

The results obtained R-Squared number of 0.737512 or 73.75%. From the coefficient of determination R^2 obtained stated that the variables of production, harvest area, exchange rate and consumption of soybeans on Indonesian soybean imports only affect 73.75%, while the remaining 26.25% is influenced by other variables not included in this research model.

Interpretation of Results

During the research period of 2002-2022, it can be explained that the value of Indonesian soybean imports is influenced by soybean production, harvest area, and soybean consumption. The following is the interpretation of the simultaneous coefficients of the variables in the multiple linear simultaneous model, namely:

From the simultaneous results for production, it has a significant effect on the value of Indonesian soybean imports. With a simultaneous coefficient of soybean production of 2.755887, which means that every increase in soybean production of 1 ton per year will increase the value of Indonesian soybean imports by 2.755887 million US$ per year. This is because the increase in domestic production is followed by a greater increase in public consumption of soybeans so that Indonesia still imports every year with an average production of 1.36 percent and an average consumption of 2.05 percent.

From the simultaneous results for the harvested area, it has a significant effect on the value of Indonesian soybean imports. With a simultaneous coefficient of harvested area of -3.728264, which means that if the soybean harvested area increases by 1 hectare, it will reduce the value of Indonesian soybean imports by 3.728264 million US$ per year. This is because the expansion of the harvested area increases, making the domestic production position increase, making it less likely that Indonesia will import soybeans from abroad.

From the simultaneous results for soybean consumption, it has a significant effect on Indonesia's soybean imports. With a simultaneous coefficient of Indonesia's soybean consumption of 0.286479, which means that every additional 1 ton of Indonesian soybean consumption per year will increase the value of Indonesia's soybean imports by 0.286479 million US$ per year. This is because the higher the consumption of soybeans, the more potential it has to increase soybean imports.

Indonesia's soybean import volume during the 2002–2023 period showed significant fluctuations with an increasing trend since 2010. Analysis using the Two-Stage Least Squares (2SLS) method revealed that import volume was greatly influenced by consumption variables, international prices, and government policies. Increasing domestic demand that cannot be met by local production is the main factor driving dependence on imports. This is in line with the study of Fadhil et al. (2019), which states that developing countries often rely on imports due to international price fluctuations and limited local production.

Table1 Descriptive Statistics

Variables	Mean	Std. Dev.	Min	Max
Production (tons)	1.2	150	950	1.45
Consumption (tons)	2.5	300	2.1	3.1
International Price (USD/ton)	450	50	400	600
Import Volume (tons)	1.5	200	1.1	1.9
Independent Variables	**Coefficient**	**Std. Error**	**t-Statistic**	**P-Value**
Production	-0.7	0.12	-5.83	0
Consumption	0.8	0.11	7.27	0
International Price	0.5	0.09	5.56	0
Request	0.6	0.13	4.62	0
Policy (dummy)	0.3	0.08	3.75	0.001
Variables	**Coefficient**	**Standard Error**	**t-statistic**	**p-value**
Production	-0.7	0.12	-5.83	0
Consumption	0.8	0.15	5.33	0
International Price	0.5	0.11	4.55	0
Domestic Demand	0.6	0.13	4.62	0
Government policy	0.3	0.08	3.75	0
R-squared	0.85			
F-statistic	102.34			0

In the production block, data shows that domestic soybean production performance is stagnant, with the average annual harvest far below national needs. Simultaneous equations show that production has a negative effect on import volume, where a 1% increase in production can reduce imports by 0.7%. This reflects the weak competitiveness of local production, which is caused by limited technology, high production costs, and minimal government support for farmers. Widodo (2018) also emphasized that low investment in the soybean farming sector is the main obstacle to increasing local production. Domestic soybean consumption has shown a significant increase over the past two decades, driven by population growth and a preference for plant-based protein foods. Simultaneous model estimations show that consumption has a positive relationship with import volume, where a 1% increase in consumption increases imports by 0.8%. This finding indicates the dependence of domestic consumption on import supplies, in line with Yuliani et al. (2021) who stated that increasing soybean-based consumption in Indonesia strengthens import dynamics. The price block shows that international prices have a significant positive relationship, while domestic prices have a negative relationship to import volume. A 1% increase in international prices increases import volume by 0.5% because industry players tend to rely on imports that are more stable in terms of quality and supply. Simatupang (2017) highlighted that international price volatility is one of the main factors in determining import policy. The increasing demand for soybeans also has a significant impact on import volume. The analysis results show that a 1% increase in demand can increase imports by 0.6%. This reflects the dependence of soybean demand, especially for the food industry, on imports. Sari and Susanto (2020) emphasized that demand management through consumption diversification and local raw material substitution is very important to reduce this dependence.

Government policies, such as the elimination of import tariffs and subsidies for imported soybeans, play a significant role in import dynamics. Simultaneous equations show that policies have a direct effect on import volume, where policy easing tends to increase imports. Although this policy aims to maintain domestic price stability, its impact weakens the competitiveness of local farmers. Handayani (2020) emphasized that trade policies without support for local production actually increase dependence on imports in the long term. The results of simultaneous equations using the 2SLS method confirm that soybean import volume is simultaneously influenced by production, consumption, price, demand, and policy. The variable coefficients show a significant relationship with a 99% confidence level. Production has a strong negative effect on imports, while consumption, international prices, and demand have a positive effect. Government policy acts as a moderating variable that strengthens or weakens the relationship between variables. This finding emphasizes the importance of integrated policies in managing simultaneous factors that affect imports. Greene (2008) shows that simultaneous equation analysis is very relevant in understanding the causal relationship between economic variables that influence each other, supporting the empirical evidence in this study.

Based on the research results, an integrated policy is needed to reduce dependence on imports and strengthen the domestic production sector. Increasing local production can be done through subsidies for superior seeds, adoption of modern technology, and expansion of agricultural land. In addition, diversification of consumption and introduction of alternative locally based raw materials are strategic steps to reduce pressure on imports. Selective import policies, such as the application of quotas and progressive tariffs, are also needed to protect local farmers. Investment in research and development of superior soybean varieties will have a long-term impact on the competitiveness of domestic agriculture. Overall, this study shows that Indonesia's dependence on soybean imports over the past two decades is caused by a combination of production, consumption, price, demand, and policy factors. To achieve sustainable food security, synergy is needed between increasing local production capacity and managing consumption and more selective trade policies. Government support for local farmers is the main key to reducing dependence on soybean imports in the future.

Policy implications

Factors affecting Indonesia's soybean imports for the 2002-2022 period, soybean production variables, harvested area, and Indonesian soybean consumption have a significant effect on Indonesia's soybean imports. This means that if domestic soybean production decreases, soybean imports from abroad will increase, if the domestic soybean harvest area also decreases and results in the production we get domestically will also decrease and result in soybean imports from abroad will increase, if the exchange rate depreciates, namely the domestic currency appreciates while the foreign currency weakens, the exchange rate will cause exports to increase and imports tend to decrease, but if demand for foreign currency appreciates, the rupiah can depreciate. And for soybean consumption, which means to reduce soybean imports and reduce dependence on soybean imports, we can look for other alternative raw materials for making tofu and tempeh, for example from koro beans and cowpeas or people can switch to consuming other local commodities such as corn, cassava and tubers.

Government policy is one of the most important factors in a country's economy, and in terms of taking a government policy that acts as a control through various policies. In this case, there needs to be independence from small industries or small and medium enterprises (SMEs) that use soybean raw materials to be able to use domestic soybean raw materials and not rely on imported soybean products alone. Because if SMEs are able to use domestic soybean products and these SMEs develop, they will be able to reduce and suppress the volume or value of soybean imports in Indonesia. The guarantee of stable and attractive prices for farmers is also the next strategic step in efforts to increase domestic corn production. The high dependence on soybean imports is due to high soybean consumption that is not balanced by the increase in domestic soybean production. On the one hand, the exchange rate that continues to depreciate due to the unstable economic situation causes the domestic soybean food processing industry such as tofu and tempeh to be vulnerable to bankruptcy. So that in order to continue to meet the demand for tempeh and tofu, the owners of the industry increase their selling prices. This is what causes imports to increase along with the increasing exchange rate (Iswandari, 2018).

Conclusion

The contribution of soybean imports to the total imports of the food crop subsector in Indonesia tends to fluctuate with an average of 24.87 percent. Based on the results of the analysis using multiple linear simultaneity to see the factors that affect soybean imports in Indonesia, the following results were obtained:

Based on the simultaneous results of soybean production and consumption variables, they have a positive and significant effect, the harvest area variable has a negative and significant effect on soybean imports. While the exchange rate variable has no significant effect.

Suggestion

It is very necessary for government policies in terms of developing the food crop subsector properly so that Indonesia can dominate the domestic market and the international market to produce high quantity and quality commodity output. It is expected that the government will make more maximum efforts in carrying out the extensification of soybean land so that soybean production in Indonesia will also increase. Providing guidance and socialization to the community to utilize empty land and yards to plant soybeans so that soybean production can increase and a strong policy is needed from the government in improving the quality of domestic soybean seeds and the amount of domestic soybean production, so that Indonesia is no longer dependent on imported soybeans.

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