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Soybean Imports and Economic Resilience: Measuring Their Impact on National Development

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Abstract

Soybeans play an important role in meeting the consumption needs of the Indonesian people. Soybeans also serve as the main raw material in various food industries in Indonesia, such as tofu, tempeh, soy sauce, and other processed products. The high domestic demand has not been matched by domestic production capacity, so Indonesia still relies on imports to meet these needs. This study aims to analyze the factors influencing soybean import volumes in Indonesia using data spanning 23 years, from 2000 to 2022 (time series). This study uses data obtained from official sources such as the Central Statistics Agency (BPS), the Food and Agriculture Organization (FAO), the World Bank, and the Agricultural Information System (AMIS). The method used is a quantitative approach with the Autoregressive Distributed Lag (ARDL) regression technique. This study aims to analyze the influence of GDP, inflation, exchange rate, and production variables on the volume of soybean imports in Indonesia. A series of steps were conducted, starting from stationarity tests, selection of the optimal lag, cointegration tests, to ARDL model estimation. The results show that in the short term, none of the variables have a significant effect. However, in the long term, only GDP and exchange rate have a significant and positive effect on soybean imports.

Keywords: *Soybean Imports, Inflation, Exchange Rate, GDP, Soybean Production, ARDL*

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INTRODUCTION

Indonesia is one of the agricultural countries, where people make a living as fishermen and farmers. In addition, the climate in Indonesia is tropical so many kinds of plants can thrive in this country. However, although soybeans can be cultivated in tropical areas such as Indonesia, the reality on the ground shows that national soybean production has not been able to optimally meet domestic needs (Permana et al., 2024a). This can be seen from the many industries that depend on soybeans as the main raw material, which until now still experience a shortage of supply. As a result, soybean imports are a step taken to meet these needs.

International trade plays an important role in driving the economic growth of a country, including Indonesia. Through export and import activities, Indonesia is able to increase national income, expand employment, and strengthen global economic relations. Appropriate export-import strategies and policies have proven to be one of the main factors contributing to Indonesia's economic growth, where improved trade policies can increase the competitiveness of domestic products in the international market and fulfill domestic needs through imports. ((Ikaningtyas et al. 2024).

Furthermore, empirical studies show that both exports and imports have a positive relationship with Indonesia's economic growth in the long run. Export performance plays a role in driving state revenue through foreign exchange earnings, while imports support growth by providing raw materials, technology, and capital goods needed to support the national production sector (Utami et al. 2025). Therefore, optimizing international trade is a key factor in accelerating national economic development as well as a bridge that connects cooperation between countries in a broad and sustainable manner.

Based on data from the FAO and AMIS, it is known that Indonesia's soybean imports have shown a significant upward trend from year to year. In 1993, FAO and AMIS data showed that soybean imports exceeded 700,000 tons. However, in just seven years, by 2000, this figure had skyrocketed to 1,000,000 tons, reaching 1,278,000 tons of soybeans. This surge reflects Indonesia's increasing dependence on soybean supplies from abroad. The increase is not only due to demand for soybeans for consumption but also because of the need for raw materials for processed industries such as soy sauce.

On the other hand, low domestic soybean production volumes are one of the main factors driving annual increases in imports. Domestic soybean production has not been able to meet national demand due to various constraints, one of which is the production costs borne by farmers. These production costs include fertilizers, labor, and land maintenance, which are quite significant. This is further exacerbated by the fact that the selling price of domestic soybeans in the market is lower than production costs, resulting in significantly lower interest from local farmers. As a result, domestic production tends to decline. (Paryanto et al. 2025).

One of the main factors hindering domestic production is the high production cost that farmers have to bear. On the other hand, the selling price of soybeans on the market is relatively lower, resulting in very small profit margins or even losses, which in turn makes farmers reluctant to plant soybeans on a large scale (Prihtanti et al. 2023).This combination of industrial needs and weak local production is what drives the government or business actors to cover the supply shortage through import activities.

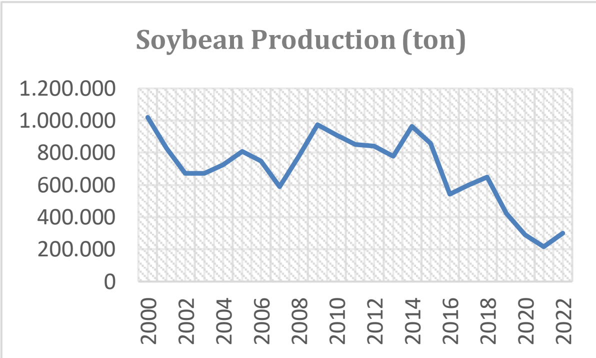

Figure 1. Production Indonesian Soybeans (ton)
Source: FAO and AMIS, 2025

Figure 1 explains that soybean production in Indonesia from 2000 to 2022 shows an interesting fluctuation pattern to analyze. Soybean production data shows that in 2000, soybean production was at its peak, approaching one million tons. However, this achievement did not last long because in 2001 there was a sharp decline. Throughout 2002 to 2007, soybean production tended to stabilize in the range of 600,000 to 700,000 tons, although with slight annual variations.

The year 2008 was a turning point as soybean production began to gradually increase. This period lasted until around 2014, with some years such as 2010 and 2014 showing relatively high production results. This increase was most likely influenced by government policies that focused on soybean self-sufficiency programs, improvements in agricultural technology, and support to farmers through programs to provide superior seeds and production facilities.

There are various factors that drive the increase of soybean imports into Indonesia, one of which is the low level of soybean productivity produced domestically. This low productivity is largely due to the suboptimal cultivation practices and agricultural management of soybean crops. One strategic solution that can be done to increase the availability of soybeans in the country is through the development of soybean varieties that have more advantages than previous varieties.

Based on data from the analysis of soybean trade performance, it is noted that soybean production in 2022 is estimated at 301.52 thousand tons of dry beans, this figure shows an increase of 88.66 thousand tons or an increase of 41.65% compared to the previous year. However, the national soybean demand reaches 2.8 million tons, so Indonesia still relies on imports to meet these needs.

Research by (Grace et al., 2021) shows that soybean imports in Indonesia are influenced by several key factors such as domestic production, consumption, exchange rates, and international prices. The study found that the lower the domestic soybean production, the more significant the dependence on imports becomes. Additionally, fluctuations in the exchange rate of the rupiah against the US dollar also play a role in determining the volume of imports carried out by the government and businesses.

Another finding by (Ningrum et al. 2018) reinforces this finding by analyzing trends in soybean production and imports in Indonesia. The researchers identified that the imbalance between consumption growth and domestic production is the main cause of increased imports.

This study also emphasizes the importance of strengthening the national soybean agricultural sector as an effort to reduce dependence on foreign supplies. Factors such as land productivity, government policies, and agricultural infrastructure support are cited as determinants of success in reducing imports.

Globally (Gale et al. 2019) show that soybean trade is greatly influenced by the interdependence between major countries such as China, the United States, and Brazil. These three countries play a central role in the global soybean market, so that trade policies, trade conflicts, and supply disruptions from these three countries will have a direct impact on soybean prices and availability in importing countries, one of which is Indonesia.

Therefore, understanding the global context is crucial in analyzing risks and formulating soybean import policy strategies in Indonesia. In addition to the productivity of soybeans, an increase in soybean consumption can increase soybean imports in Indonesia (Tri et al. 2024).

The demand for soybeans in Indonesia continues to increase along with the growth of domestic consumption, especially as raw materials for food industries such as tofu and tempeh. However, the high dependence on soybean imports indicates the weak domestic production capacity to meet this demand (Malik et al. 2020).

Import dependence not only has economic impacts, but can also have ecological consequences in producing countries, such as deforestation and land degradation due to the expansion of soybean growing areas, as evidenced in the global soybean trade (Sun et al. 2018).

Meanwhile(Permana, et al. 2024) explained that the high cost of production and the low selling price of soybeans cause farmers to be reluctant to plant soybeans, so that domestic soybean production has decreased and caused dependence on imports to increase.

Therefore, in this study the author wants to know what factors can affect soybean imports in Indonesia and why soybean imports are getting higher while domestic soybean production is still not as expected. So the author uses the ARDL method in data processing to find out how the short-term and long-term relationships between the variables used in a certain period of time (time series). The variables used in this study are the amount of Indonesian soybean imports, Gross Domestic Product or economic growth, the rupiah exchange rate, the inflation rate, and the total soybean production in Indonesia.

RESEARCH METHODS

This study uses secondary data which is divided into dependent variables and independent variables. The dependent variable used is total soybean imports, total soybean imports are the total soybean imports received from various soybean producing countries. The source of the data is *Food and Agriculture Organization* (FAO) and *Agricultural Market Information System* (AMIS).

As for the independent variables used, it uses time series data sourced from the Central Bureau of Statistics, FAO, World Bank and AMIS. The independent variables in this study consist of economic growth written in domestic GDP, domestic inflation, exchange rates to total domestic soybean production. The research data used is time series data from 2000 to 2022.

In this study, variables were converted into natural logarithm form, such as LImpr, LGDP, LKurs, and LProd, in order to address the issue of outliers. Using logarithms reduces extreme scales and makes the data distribution closer to normal. In addition, logarithms can help convert non-linear relationships into linear ones and stabilize variance so that the regression results are more reliable.

In this study, the analytical approach applied is the Autoregressive Distributed Lag (ARDL) model. This method was chosen because it is able to examine both short-term and long-term relationships between the variables under study, especially when the data are time series with different levels of integration, namely I(0) or I(1), but not I(2) (Pesaran, Shin, and Smith 2001; Kaukab and Anggara 2024). In the context of this study, ARDL is used to evaluate the influence of a number of economic variables on the volume of soybean imports in Indonesia.

Table 1. Dependent and Independent Variables

Variable	Source	Unit
Soybean import	FAO, AMIS	Ton
Inflation	World Bank, BPS	Percent
Exchange Rate (Kurs)	World Bank	Rupiah
GDP	BPS, World Bank	Rupiah
Soybean Production	FAO, AMIS	Ton

Source: BPS, World Bank, FAO, AMIS 2025

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The use of ARDL in this analysis provides several important benefits, including ARDL allows simultaneous identification of short-term dynamics and long-term equilibrium relationships between variables. By using this approach, it is expected to obtain a comprehensive picture of the extent to which the various variables used affect soybean imports.

The results of the model estimation are expected to provide strategic recommendations regarding the prospects of domestic soybean production and soybean import policies, which will ultimately contribute to national food security and economic stability (Kong et al. 2024; Malik and Nainggolan 2020).

Stationarity testing is essential in ARDL testing. Stationarity testing is performed using the Augmented Dickey-Fuller (ADF) test. This test is performed to determine whether the research variable is stationary at the level, first difference, or other levels.

The hypothesis used are H_0 (null hypothesis): The data is non-stationary, accepted if the probability value is greater than the significance level (alpha) of 5% and H_1 (alternative hypothesis): Data is stationary, accepted if the probability value is smaller than 5% alpha.

Thus, if the test results show that the p-value < 5%, then the variable is declared stationary. Conversely, if the p-value > 5%, then the variables are considered non-stationary, which means that further data transformation, such as differentiation, is required for the data to meet the stationarity properties required in time series analysis.

One of the crucial aspects in applying the ARDL model is choosing the optimal lag length. This is because choosing an inappropriate lag can cause problems such as overfitting and underfitting (Khim-Sen Liew, et al. 2004).

To determine the optimal lag length, various information criteria are used such as Akaike Information Criterion (AIC), Hannan-Quin Criterion (HQC) and Schwarz Bayesian Information Criterion (SBIC).

These criteria help in balancing between model complexity and model fit to the data. The testing stages carried out in ARDL are stationarity test, determining the optimum lag, autocorrelation test, cointegration test (Bound test), and conditional ECM. The model in this study is as follows (Khim-Sen Liew, et al. 2004):

$$LImprt = \alpha + \beta 1\ Inflation + \beta_2\ LGdp + \beta_3\ LKurs + \beta_4\ LProd + \varepsilon_{it}$$

Where Limpr is Indonesia's total soybean imports; Inflation is inflation rate; LGdp is economic growth; Lkurs is exchange rate; Lprod is soybean production in Indonesia and ε_{it} is error term.

RESULTS AND DISCUSSION

Based on the research results obtained, the initial stage is to conduct a stationarity test, which aims to determine whether the variable data used is stationary or not. Stationarity testing is done through the unit root test method, where one of the techniques used is the Augmented Dickey-Fuller (ADF) test. The ADF test aims to detect the presence of unit roots in time series data, which is an indicator of whether the data is stationary. Before conducting the ADF test, a normality test was performed and the results showed that the data used is normally distributed.

Table 2. Normality Test

Test	P-Value	Information
Shapiro-Wilk	0.068	Normally distributed

Source: Processed data, 2025

Table 2 shows that the results of the normality test using Shapiro-Wilk obtained a p-value of more than 5%, namely 0.068, meaning that the residuals from the model are normally distributed, so the normality assumption is fulfilled and the model can be used for further testing.

Table 3. ADF Test Results at Level Level

Variabel	P-Value	Alpha (5%)	Information
Inflation	0,0903	0,05	Not Stationary
LGdp	0,1800	0,05	Not Stationary
LKurs	0,8849	0,05	Not Stationary
LProd	0,8181	0,05	Not Stationary
LImpr	0,7105	0,05	Not Stationary

Source: Processed data, 2025

Based on the ADF test results at the level presented in Table 3, it can be concluded that of all the variables tested, only one variable show significant results at the level with a significance level (α) of 5%. The variable is Inflation, which means that this variable have met the stationarity requirement at the initial level. Meanwhile, the other variables, LGdp (real gross domestic product), LKurs (real exchange rate), LProd and LImpr (imports total), do not show stationary characteristics at that level. Thus, for the three variables that are not stationary, further testing is required by transforming the data to the first difference level. This step aims to eliminate non-stationarity in the data and ensure that all variables used in the model meet the basic assumptions of time series analysis.

Table 4. ADF Test at Level First Difference

Variabel	P-Value	Alpha (5%)	Information
D(Inflation)	0,0000	0,05	Stationary
D(LGdp)	0,0225	0,05	Stationary
D(LKurs)	0,0011	0,05	Stationary
D(LProd)	0,0002	0,05	Stationary
D(LImpr)	0,0076	0,05	Stationary

Source: Processed data, 2025

Based on the results shown in Table 4, after stationarity testing using the Augmented Dickey-Fuller (ADF) test at the first difference level, all tested variables show probability values smaller than the 5% significance level.

Thus, the null hypothesis (H_0) is rejected for all variables, which means that all variables are stationary at the first difference level. There are no variables that require testing up to the second difference level. Based on these stationarity characteristics, the appropriate estimation method to use in the study is the Autoregressive Distributed Lag (ARDL) model, which is able to accommodate variables with different integration levels, namely I(0) and I(1) (Abid et al., 2024).

The next step is to determine the optimal number of lags. The optimum lag selection is done using the Akaike Information Criteria (AIC) approach. The estimation results of AIC are presented in Figure 2. The figure shows the 20 best models based on the smallest AIC value, thus providing an overview of the models with the best estimation performance for further analysis.

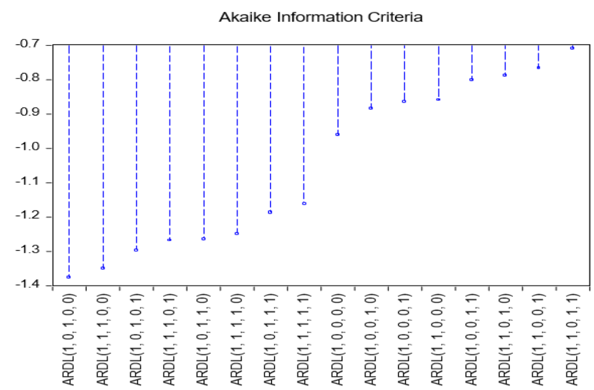

Figure 2. Akaike Information Criteria
Source: Processed data, 2025

Based on the test results, the best ARDL model obtained is ARDL (1,0,1,0,0) which shows the lowest error value compared to other alternative models. The selection of this model considers the minimization of the Akaike Information Criteria (AIC) value to obtain the optimal model specification. This test aims to determine the existence of a cointegration relationship among all variables, namely to see if there is a long-term relationship between variables in the system.

To determine the optimal lag length, this study uses Akaike Information Criteria (AIC) as the model selection criterion. This analysis is one of the pieces of information used to assess the balance between the level of model fit and the number of parameters used in the study. Selecting the optimal lag using AIC makes it possible to capture the relevant dynamics in the data without overfitting.

A lag that is too short can cause important information to go undetected in the model, especially historical information, but a lag that is too long can reduce the efficiency of the estimation. The ARDL model is known to be able to test the long-run relationship as well as the short-run dynamics between variables integrated at the I(0) and I(1) levels (Pesaran et al., 2001).

The next step after estimating and selecting the best model is to test whether or not there is a correlation between variables over time using the autocorrelation test. This test was conducted using the Breusch-Godfrey Serial Correlation LM Test. The test results using the Breusch-Godfrey Serial Correlation LM Test in Table 5 show that the P-value of 0.0219 is smaller than α = 5%. This indicates that the null hypothesis (H_0) fails to be rejected, which means that the ARDL model used does not experience autocorrelation.

Table 5. Breusch-Godfrey Serial Correlation LM Test.

Test	P-Value	Information
Breusch-Godfrey Serial Correlation LM Test	0.0219	There is no Autocorrelation

Source: Processed data, 2025

After conducting stationarity testing and selecting the best model, the next step is to conduct cointegration testing. This test aims to identify whether there is a long-term relationship between the variables in the model, which is reflected in the residuals of the estimated model. If the variables are integrated in the form of cointegration, then it can be said that there is a long-term equilibrium relationship between the variables (Engle & Granger, 1987). This is important to ensure that the relationship between variables in the model is stable and not affected by short-term fluctuations.

Table 6. Breusch-Pagan heteroskedasticity test

Test	Prob>Chi2	Information
Breusch-Pagan	0.4579	There is no heteroskedasticity

Source: Processed data, 2025

After conducting the LM test to see whether autocorrelation occurs or not, a heteroscedasticity test is performed. Heteroscedasticity may occur if the residual variance in the model is not constant. Table 6 shows the results of the Breusch-Pagan test, where the prob>chi2 value is greater than alpha 5% at 0.4579. This means that there is no heteroscedasticity in the model.

After ensuring that all variables used are stationary, the analysis stage continues by conducting a cointegration test. This test is important to determine whether there is a long-term equilibrium relationship between variables in the econometric model. In this study, the Bound Test approach is applied to test for cointegration.

The test results in Table 7 show that the F-statistic value of 6.353972 is higher than the critical upper limit (I1 Bound) of 3.09 at a significance level of 10%, so that the null hypothesis (Ho) stating that there is no cointegration can be rejected. This indicates a long-term relationship between gross domestic product (lGdp), inflation, production (lProd), and exchange rate (lKurs) on total soybean imports (lImpr). This finding in line with recent studies that emphasize the importance of cointegration analysis in understanding the relationship between macroeconomic variables (Nkoro et al. 2016).

Table 7. Cointegration Test

F-Statistic	Critical Value I0 Bound	Critical Value I1 Bound	Decision
6.353972	2.2	3.09	There is Cointegration

Source: Processed data, 2025

The final stage in ARDL analysis is the application of the Conditional Error Correction Model (ECM). This model is used to estimate the long-run and short-run relationships between the variables analyzed. ECM combines information from the previously found long-run equilibrium relationships with short-run dynamics. The results of the analysis can be reviewed through Table 8 and Table 9. The short term model can be seen from the following model:

LImprt = $\alpha + \beta 1$ Inflation + β_2 LGdp+ β_3 DLKurs + β_4 LProd + ε_{it}

Based on the analysis results in Table 7 related to the short-term conditional ECM, it shows that all variables have no effect on soybean imports, while in Table 7 related to the results of the long-term conditional ECM estimation, it shows that there is an effect of the exchange rate with GDP on Indonesia's soybean importsIn the short term, Table 7 shows that the probability values of Inflation, LKurs, LGdp, and LProd are greater than alpha (α) 5%, meaning that in the short term there is no effect on the level of soybean imports in Indonesia. These results indicate that in the short term, variables such as inflation, LKurs, LGdp, and LProd do not have a significant effect on the dependent variable.

However, there is a significant correction mechanism toward long-term equilibrium, as indicated by the negative and significant coefficient of CointEq (-1). This means that although there is no significant short-term effect, the long-term relationship between variables will improve, as shown in Table 7.

Table 8. Short-Term Conditional ECM Estimation Results

Variable	Coefficient	Probability
Inflation	-0.00699	0.609
DLKurs	-0.107233	0.778
LGdp	-0.00284	0.390
LProd	0.020963	0.859
CointEq(-1)	-2.193617	0.0023
R-squared	0.66654	
Adjusted R-squared	0.15872	
F-Statistic	13.652	

Source: Processed data, 2025

Table 8 shows the results of long-term processing of conditional ECM results, in which two variables have probability values less than alpha (α) 5%, namely LKurs with a probability value of 0.009 < alpha (α) 5% and LGdp with a probability value of 0.0008 < alpha (α) 5%. This indicates that in the long term, an increase in the exchange rate (LKurs) and LGdp will increase the level of soybean imports in Indonesia. An increasing exchange rate (depreciation of the domestic currency) drives up demand for soybean imports, as it enhances export competitiveness.

Additionally, the rising LGdp reflects increasing economic activity, which in turn drives higher levels of soybean imports. The increase in the exchange rate followed by an increase in soybean imports can be explained by several economic mechanisms that can influence the relationship between the exchange rate and international trade.

Table 9. Long-Term Conditional ECM Estimation Results

Variable	Coefficient	Probability
Inflation	-0.010519	0.324
LKurs	0.96038	0.009
LGdp	0.106134	0.0008
LProd	0.11445	0.327
C	-4.236486	0.420
R-squared	0.94592	
Adjusted R-squared	0.85093	
F-Statistic	25.074	

Source: Processed data, 2025

Besides that, He et al. (2023) Analyzing the impact of exchange rate depreciation on trade and imports in developing countries, it was found that currency depreciation will encourage an increase in imports of certain goods, especially for a country that relies on imported raw materials.

The success of increasing soybean imports depends on the elasticity of demand for price. If soybeans as an import have high demand elasticity, then a price decrease caused by a lower exchange rate can encourage more imports. This is in line with research conducted by Liu (2024) shows that imported soybeans from the United States have negative price elasticity, which means that a decrease in price can increase imports.

In addition, this finding is in line with a study conducted by Adi (2017) which shows that the exchange rate has a positive and significant relationship to import activities. In his research, it is explained that when the US dollar exchange rate increases and the rupiah exchange rate weakens, import activities also tend to increase. This phenomenon is caused by the tendency of Indonesian people's consumption, where most consumers prefer to buy foreign products rather than domestic products.

The influence of economic growth (LGdp) on soybean imports is closely related to changes in domestic demand, purchasing power, and industrial needs for imported raw materials, one of which is soybeans. Along with economic growth, there are several industries that depend on soybean raw materials such as the animal feed industry, processed foods will experience increased production.

To encourage the fulfillment of greater raw material needs, of course the industry will seek soybean supplies from abroad. The increasing needs of the industry will encourage soybean imports as an effort to meet domestic supply shortages (Sneha et al., n.d.).

In addition, Damayanti et al. (2023) explain that Indonesia's GDP has a positive and significant effect on the volume of soybean imports. The scientific explanation is based on the import function theory, namely $M = Mo + mY$, where M is imports, Mo is autonomous imports, and Y is national income or GDP.

When GDP increases, purchasing power also grows. This situation drives higher demand for products made from soybeans. If this trend continues and domestic production cannot meet market demand, imports become the primary solution to address the issue.

Economic growth accompanied by increased domestic production capacity will have an impact on the expansion of the export sector, including processed soybean products. However, even though the export rate increases, soybean imports are still carried out, this is because it is to maintain the balance of domestic supply and demand, especially when domestic soybean production is insufficient to meet needs.

CONCLUSION

Based on the results of the analysis and discussion that have been carried out properly, it is concluded that in the short term all variables used do not affect soybean imports. While in the long term there are two variables that affect soybean imports in Indonesia, namely the exchange rate and economic growth.

Given that economic growth has a positive and significant relationship to soybean imports, the government needs to formulate policies that encourage consumption of local products. The exchange rate affects imports, so one strategic step is to manage the exchange rate to be more stable and not too weak against the US dollar. The government can consider instruments from fiscal and monetary policies to maintain a competitive exchange rate.

Although soybean production has no effect on import volume, in the future the government needs to increase domestic production capacity. This can be achieved through modernization of agricultural technology, provision of superior seeds, training for farmers on more effective planting techniques, and improving the quality of soybean products, especially black soybeans which are widely used for the tofu and tempeh industry. In addition, land intensification programs and technical assistance to farmers are expected to increase the productivity and competitiveness of local soybeans.

REFERENCES

Abid, M., Munaf, H. *, & Hmood, Y. (2024). Nonstationary Time Series Models Using ARDL and NARDL Estimation This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0). *Journal of Economics and Administrative Sciences*, *30*(141). http://jeasiq.uobaghdad.edu.iqhttp://orcid.org/0000-0002-1134-9078

Adi, L. (2017). Pengaruh Exchange Rate dan GDP Terhadap Ekspor dan Impor Indonesia. *Develop*, *1*(1). https://doi.org/10.25139/dev.v1i1.69

Chain, P. (1997). Same or Different?: A Comparison of the Beliefs Australian and Chinese University Students Hold about Learning's Proceedings of AARE conference, Swisburne University. Available at: http://www.swin.edu.au/ aare/97pap/CHAN97058.html. Diunduh pada 3 Juni 2003.

Damayanti, A. P., Darwanto, D. H., & Masyhuri, &. (2023). THE IMPACT OF IMPORT LIBERALIZATION POLICY ON INDONESIAN SOYBEAN IMPORTS. *Journal of Agribusiness Management and Development*, *4*. https://journal.ugm.ac.id/v3/JAMADEV/

Engle, R. F., & Granger, ; C W J. (1987). Co-Integration and Error Correction: Representation, Estimation, and Testing. In *Econometrica* (Vol. 55, Issue 2).

Gale, F., Valdes, C., & Ash, M. (2019). Interdependence of China, United States, and Brazil in Soybean Trade. www.ers.usda.gov

Grace, N., Rahma, ;, Candra, N. ;, Prodi, M., Pembangunan, E., Ekonomi, F., & Bisnis, D. (2021). Analisis faktor-faktor yang mempengaruhi impor kedelai di Indonesia. In Journal Perdagangan Industri dan Moneter (Vol. 9, Issue 2).

He, X., & Zeng, J. (2023). Effect of Exchange Rate Volatility in Chinese Export and Import. In *BCP Business & Management EMFRM* (Vol. 2022).

Ikaningtyas, M., Andarini, S., Maurina, A. C., Pangestu, I. A., Pembangunan, U., Veteran, N. ", & Timur, J. (2024). *Strategi dan Kebijakan Ekspor Impor atau Perdagangan Internasional terhadap Pertumbuhan Ekonomi Indonesia*. 5, 160.

Kaukab, M. E., & Anggara, A. A. (2024). Journal of Economics, Finance and Management (JEFM) Does Trade Openness and Inflation Rate Have Dynamic Interconnected Patterns? An Autoregressive Distributed Lag (ARDL) Model Co-integration Approach L'ouverture commerciale et le taux d'inflation ont-ils des schémas dynamiques interconnectés ? Une approche de co-intégration par le modèle ARDL (Autoregressive Distributed Lag). https://doi.org/10.5281/zenodo.10702368

Khim-Sen Liew, V., Khim, V., & Liew, S. (2004). Which Lag Length Selection Criteria Should We Employ? In *Economics Bulletin* (Vol. 3, Issue 33).

Kong, W., Wei, M., Khan, N., Liang, J., Han, D., & Zhang, H. (2024). Assessing sustainable future of import-independent domestic soybean production in China: policy implications and projections for 2030. *Frontiers in Sustainable Food Systems*, *8*. https://doi.org/10.3389/fsufs.2024.1387609

Liu, S. (2024). Impact of Exchange Rate Fluctuation on Import and Export Enterprises in China and Japan and Countermeasures. In *Business, Economics and Management EMFRM* (Vol. 2023).

M., Mega Utami, A., Putri Bajri, A., Adistia Putri, E., Yoshi Luki, M., & Syahwildan, M. (2025). *Neraca Analisis Pengaruh Perdagangan Internasional (Ekspor dan Impor) terhadap Pertumbuhan Ekonomi di Indonesia* (Vol. 735, Issue 4). Jurnal Ekonomi dan Akuntansi

Malik, A., & Nainggolan, S. (2020). Factors affecting the import of soybean in Indonesia. *Jurnal Perspektif Pembiayaan Dan Pembangunan Daerah*, *8*(5), 523–530. https://doi.org/10.22437/ppd.v8i5.11015

Narayan, P. K. (2005). The saving and investment nexus for China: Evidence from cointegration tests. *Applied Economics*, *37*(17), 1979–1990. https://doi.org/10.1080/00036840500278103

Ningrum, I. H., Irianto, H., & Riptanti, E. W. (2018). Analysis of soybean production and import trends and its import factors in Indonesia. IOP Conference Series: Earth and Environmental Science, 142(1). https://doi.org/10.1088/1755-1315/142/1/012059

Nkoro, E., & Uko, A. K. (2016). Autoregressive Distributed Lag (ARDL) cointegration technique: application and interpretation. *Journal of Statistical and Econometric Methods*, *5*(4), 63–91.

Paryanto, E., Harisudin, M., Sutrisno, J., & Kusnandar, K. (2025). Simulation model to realize soybean self-sufficiency and food security in Indonesia: A system dynamic approach. Open Agriculture, 10(1). https://doi.org/10.1515/opag-2025-0427

Permana, F., Karim, A. R., & Hidayat, P. (2024). Produksi Dan Impor Kedelai Di Indonesia : Systematic Literature Review Production And Soybean Import In Indonesia : Systematic Literature Review. Jurnal Agroradix, 8(1).

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, *16*(3), 289–326. https://doi.org/10.1002/jae.616

Prihtanti, T. (2025). 329 Feasibility of Soybean Farming in Indonesia: A Systematic Literature Review| Tinjung Mary Prihtanti FEASIBILITY OF SOYBEAN FARMING IN INDONESIA: A SYSTEMATIC LITERATURE REVIEW. In Desember (Vol. 35, Issue 2).

Sneha, S. B., Srivastava, S. K., & Ray, M. (n.d.). *Praveen K V, and Alka Singh: Agricultural wages in India: Trends and structural changes Bahahudeen Shafiwu: Exploring carbon dioxide emissions and their drivers in global leading economies-A Panel vector autoregression perspective Chandra Pant, and Neha Joshi: Unveiling the impacts of global uncertainties ITSA Approach for quantifying the impacts of Covid-19 on agricultural trade Impact of climate change on agriculture in Indo-Gangetic Plains of India* (Vol. 37, Issue 1).

Sun, J., Mooney, H., Wu, W., Tang, H., Tong, Y., Xu, Z., Huang, B., Cheng, Y., Yang, X., Wei, D., Zhang, F., & Liu, J. (2018). Importing food damages domestic environment: Evidence from global soybean trade. *Proceedings of the National Academy of Sciences of the United States of America*, *115*(21), 5415–5419. https://doi.org/10.1073/pnas.1718153115

Tri, I., Reviane, A., Khalifah Fil'ardy Yunus, A., & Adinda, D. N. (2024). *Jurnal Ekonomika dan Dinamika Sosial Kajian Determinan Impor Kedelai Indonesia*.