International Journal of Social Science and Economic Research

ISSN: 2455-8834

Volume:03, Issue:08 "August 2018"

DETERMINANTS OF SOYBEAN IMPORT IN INDONESIA

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ABSTRACT

Soybean is the third strategic commodity after rice and maize. Since 1975, Indonesia was not able to meet the needs of soy, so it must import. This study aims to determine the factors that affect the import of soybean in Indonesia. This study uses secondary data (time series data) for 38 years. Data were analyzed using multiple linear regression, involving one dependent variable (Indonesia Soybean Imports) and five independent variables (Indonesia Soybean Production, Indonesia Soybean Demand, Indonesia Price Soybean Imports, Rupiah Exchange Rate to Dollar, and Lag of Indonesian Soybean Imports). The results showed: (1) Only Indonesia Soybean Production and Indonesia Soybean Demand significantly affect Indonesia Soybean Imports. While, Indonesia Price Soybean Imports, Exchange Rate Indonesia to Dollar, and Lag of Indonesian Soybean Imports was not significant. (2) Indonesia Soybean Demand dominant influence Indonesia Soybean Imports. Suggested suggestion are: 1) The Government of Indonesia through the Ministry of Agriculture should have to try to help improve soybean production in the country. 2) The Government of Indonesia through the Ministry of Commerce should import soybeans only at certain times (scheduled).

Keywords: Analysis, Factor, Import, Soybeans

INTRODUCTION

Soybean (Glycine max (L.) Merrill) is the third strategic commodity after rice and corn in Indonesia. Soybean seeds are a source of vegetable protein and fat as well as several other important nutrients, such as vitamins (phytic acid) and lecithin (Deptan, 2007). Soybeans are generally consumed in the form of processed products, namely: tempeh, tofu, soy sauce, tauco, soy milk and other forms of snacks (Sudaryanto and Swastika, 2007). Most soybeans are used as the main raw material of industrial tempeh and tofu (Sarwono 2010 and Firdaus, 2012).

Indonesian soybean market conditions can be explained in terms of demand and supply. According to Firdaus (2015), Indonesia's soybean demand is likely to increase. The increase was caused by several factors. *First*, the increase number of people. *Secondly*, the increasing volume

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of consumption per capita in line with rising incomes. *Third*, The spread of new soybean consumer, who previously did not consume soy. *Fourth*, many discoveries say that processed soy products (tempeh and tofu) are sources of food that are beneficial to health.

Indonesia has been self-sufficient in soybean with self-sufficiency index greater than one to 1974 (Swastika, 1997). But since 1975 the Indonesian position as a net importer of soybeans (Amang, 1996; Supadi, 2009; FAO, 2011). The highest soybean production in Indonesia occurred in 1992 with a production of 1.87 million tons. Furthermore, continuous decline in soybean production and ultimately production never reached 1 million tons after 2000 (Firdaus, 2013).

The increasing demand for soybeans can not be offset by domestic soybean production, causing greater imports of soybeans. Dependence on imported soybean (Import Dependency Ratio-IDR) becomes higher when Indonesia began to liberalize trade. IDR which was originally an average of only 25% (1975-1998), after trade liberalization, increased to 61% (1999-2010) (Firdaus, 2015).

Dependence on imported soybean in Indonesia last five years (2011-2015) the higher. This condition can be explained by looking at the Import Dependency Ratio (IDR) and Self Sufficiency Ratio (SSR). The value of Soybean IDR during the last 5 years amounted to 67.99%, indicating that Indonesia's dependence on soybean imports is quite high at 67.99%. The value of IDR is in line with the SSR value of 32.87%, SSR in this case explains that our country is only able to meet domestic soybean demand of 32.87%.

Dependence on soybean imports are very high of course, will affect the price and demand fluctuations in domestic soybean. These price fluctuations will ultimately affect the price and production of soybeans processed commodities both for human food and animal feed. As is known, for products tempeh and tofu for example, most of tempeh and tofu production costs are costs incurred for raw materials soybean.

Based on the above background, the study aims to determine the factors that influence the Indonesian soybean imports. Hopefully, this research can provide input to the government through relevant ministries (Ministry of Agriculture and Ministry of Commerce) to reduce imports of soybean in Indonesia.

RESEARCH METHODS

Data source

This study uses secondary data (time series data) for 38 years were obtained from various sources. The main source of data derived from Pusdatin Deptan, BPS, and FAOSTAT.

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Data analysis

Analysis tool to answer the purpose of this study use multiple regression analysis.

1. Multiple Regression Model

Regression analysis is a the study of the dependence of a variable, namely the dependent variable, on one or more other variables, namely the independent variable, with the intention of estimation or forecasting the value of the arithmetic mean (mean) or the mean average (population) of the dependent variable, based on the values that are known or fixed (in a repeated sampling) of the independent variable (Firdaus, 2011).

Multiple regression model (Sarwoko, 2005) formulated as follows:

$Yi = a + b_1 X_1 + \ldots\ldots\ldots\ldots .. + b_n X_n + \in_i$

Where:

Y = dependent variable

a = constants

b = coefficient of regression

$X_1 \ldots\ldots\ldots X_n$ = independent variable

$\in_i$ = Error

Multiple regression model in this study use one dependent variable and five independent variables. Indonesian Soybean Imports amount affected by Indonesia Soybean Production, Indonesia Soybean Demand, Indonesia Price Soybean Imports, Rupiah Exchange Rate Against Dollar, and Lag of Indonesian Soybean Imports. According to mathematical equation behavior Indonesian soybean imports formulated as follows:

$$IKIN = h0 + h1PI + h2DKIN + h3QKIN + h4ERI + h5LIKIN + \in_i$$

Where:

IKIN = Indonesian Soybean Imports

PI = Indonesia Price Soybean Imports

DKIN = Indonesia Soybean Demand

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QKIN = Indonesia Soybean Production

ERI = Rupiah Exchange Rate to Dollar

LIKIN = Lag of Indonesian Soybean Imports

2. Classic Assumption Test

Prior to hypothesis testing, it is necessary to examine whether there is any violation of classical assumptions. According to Gujarati (2004), classical assumption test is done so that the regression equation is built is BLUE. The assumptions test used normality test, multicollinearity, heteroscedasticity test and autocorrelation test.

3. Coefficient of Determination

The coefficient of determination (R^2) is used to determine how many the percentage contribution of independent variables (X_1, X_2 ..., X_n) of the variation (fluctuation) Y as simultant. R^2 value between zero to one: $0 \leq R^2 \leq 1$. The closer R^2 with one, the more fit of the regression line for predicting Y. Hence, R^2 is used as a criterion to measure whether or not a fit regression line to predict the dependent variable Y (goodness of fit criteria) (Supranto, 2005).

In general, the coefficient of determination for the crosssection data relatively low due to the large variation between each observations. While for the time series data usually has a high coefficient of determination (Ghozali, 2005).

4. Hypothesis Testing

Hypothesis testing is done to determine the effect of the independent variable on the dependent variable statistically. Simultaneous testing use F test statistic (F test). This test is performed to determine whether all the independent variables together (simultaneously) has significant effect on the dependent variable. While the partial testing use a statistical t-test (t test). The test is performed to determine whether each independent variable individually significant effect on the dependent variable (Supranto, 2005).

The decision-making criteria to make inferences of influence (significant/not) independent variables on the dependent variable contained in the model, either simultaneously or individually, use the probability number (Sig.).

According Algifari (2010), how to compare the probability (Sig.) with the level of significance used (α), namely:

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1. If the value of probability accept the null hypothesis is smaller than the significance level used (α), then the decision is to reject the null hypothesis and accept the alternative hypothesis (Ha). This means that the independent variables tested significant influence (real) on the dependent variable.
2. If the value of probability accept the null hypothesis is greater than the significance level used (α), then the decision is to accept the null hypothesis and reject the alternative hypothesis (Ha). This means that the independent variables tested did not significantly (real) on the dependent variable.

Meanwhile, to determine the most dominant factor among the variables used elasticity analysis. Having know the elasticity coefficient it can be interpreted (Case and Fair, 2007; Sukirno, 2013): (1) If $\in_i > 1$, then it is said to be elastic. (2) If $0 < \in_i < 1$, then it is said to be inelastic. (3) If $\in_i = 0$, then it is said to be perfectly inelastic. (4) If $\in_i = \infty$, then said to be perfectly elastic. And (5) If $\in_i = 1$, then it is said to be unitary elastic. The highest elasticity value (regardless of the value of the positive / negative) is said to be a dominant factor affecting soybean imports in Indonesia.

RESULTS

Equation behavior Indonesia Soybean Imports (IKIN) was built by five variables: Indonesia Soybean Production (QKIN), Indonesia Soybean Demand (DKIN), Indonesia Price Soybean Imports (PI), Rupiah Exchange Rate Against Dollar (ERI), and Lag of Indonesian Soybean Imports (LIKIN) (see Table 1). The behavioral equations have R^2 value of 0.99997. This means that changes in these five variables are able to explain 99.997% of the variation of the independent variable, while the rest (0.003%) is influenced by other variables out of the equation.

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Table 1: Results of Parameter Estimation and elasticity on the Indonesia Soybean Imports Equation (IKIN)

Variables	Estimation Parameter	t	Sig.	ESR	ELR
Intercept	37172.35	1.51	0.1422		
Indonesia Soybean Production (QKIN)**	-0.98442	-61.15	<0.0001	-1.3059	-1.3284
Indonesia Soybean Demand (DKIN)**	0.986436	79.07	<0.0001	2.3000	**2.3397**
Indonesia Price Soybean Imports (PI)	-114 622	-1.94	0.0631	-0.0441	-0.0448
Rupiah Exchange Rate Against Dollar (ERI)	-1.36857	-0.68	0.5002	-0.0124	-0.0126
Lag of Indonesian Soybean Imports (LIKIN)	0.016976	1:03	0.3132		
F_{hitung}		177 660	0.0001		
R2		0.99997			
DW		2.816488			

Note:
ESR = Elasticity of short-term
ELR = Elasticity long term
Source: Analysis

Dependent variables give the direction and magnitude of the estimated parameters according to economic criteria. Furthermore, the value of Durbin Watson (DW) by 2.82 interpreted as "no conclusion", so in this study can be viewed as a "no" autocorrelation in the equation Indonesian soybean imports.

The analysis also showed that together these five variables significantly affect Indonesia's soybean imports. This is evident from the F test that has a confidence level of 99.99%. Meanwhile, partial assay against each of the variables showed that soybean production and soybean demand Indonesia Indonesia significantly affect Indonesia's soybean imports with a confidence level of more than 99.99%. Imported soybean prices significantly with 93.69% confidence level. While the previous year's soybean imports Indonesia only significant at a confidence level of less than 68.68%.

Indonesian Soybean Imports response, both in the short and long term, elastic due to changes in Indonesia Soybean Production and Indonesia Soybean Demand. But Indonesia Soybean Demand elasticity are more elastic than Indonesia Soybean Production. Indonesia Soybean Production increase of 1% would lead to a reduction Indonesian Soybean Imports by 1.31% in the short run and 1.33% in the long term. While, the rise in Indonesia Soybean Demand by 1% will push up Indonesia Soybean Imports amounted to 2.30% in the short run and 2.34% in the long term. Vice versa.

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But Indonesia Price Soybean Imports and Exchange Rate Indonesia to Dollar, both in the short and long term, is inelastic. Any increase in Price Indonesia Soybean Imports by 1% will only result in a decrease in Indonesian Soybean Imports amounted to 0.044% in the short term and 0.445% in the long term. And any increase (appreciation) Indonesia Exchange Rate to Dollar at 1% resulted in a decrease in Indonesian Soybean Imports amounted to 0.012% in the short term and 0.013% in the long term. Vice versa.

CONCLUSIONS

The conclusion of the results of this study are: (1) Only Indonesia Soybean Production and Indonesia Soybean Demand significantly affect Indonesia Soybean Imports. While, Indonesia Price Soybean Imports, Exchange Rate Indonesia to Dollar, and Indonesian Soybean Imports previous year was not significant. (2) Indonesia Soybean Demand dominant influence Indonesia Soybean Imports.

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