

The Export Performance of Indonesian Edamame in Japan Market

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Abstract: Edamame soybean is one of exporting vegetables from Jember, East Java of Indonesia. This condition makes Indonesia has to compete with exporting countries such as Taiwan, China, Thailand and Vietnam. China and Taiwan lead the export to the Japan market. These study goals are to know the export performance of Indonesian Edamame to Japan market. To reach that goals are needed to analyze the specialization, competitiveness and determinants of edamame export. The dataset using export value of edamame to Japan Market is from 1995 – 2015. The results of this study are from the RCA analysis; Indonesia has a negative comparative advantages compare with Taiwan and Thailand, the other countries China and Vietnam get comparative disadvantages. Market share index of Indonesia has been less competitive compared to China, Taiwan and Thailand. Indonesia's value market has experienced a steady increase. Linear regression has shown indicates a negative and statistically significant relationship between the price ratio of Indonesia and its quantity market share. This study has shown that in the Japanese market, Indonesia has improved its performance in terms of specialization, but it has failed to measure up in terms of competitiveness relative to the performance of especially Taiwan and Thailand.

Keywords: Edamame, Competitiveness, RCA, MSI, Linear Regression.

INTRODUCTION

Edamame is a special soybean (*Glycine max* L. Merr) harvested when the seeds expanded to 80 to 90 percent of the pod width. Edamame seeds are rich in protein and with high nutrients [1]. Edamame is popular in Japan and the demand for this commodity was about 140,000 tons in 2016, and half of the quantity needs to be imported. As a result, the market of edamame in Japan is competitive. Edamame is a kind of tropical plant and grows well in Indonesia because of its soil and climate. Both farmers and consumers can benefit from the crop due to its value-added properties which provide job opportunities to increase farmers' income. Because of the incentive, the planting area of edamame has been increased, and its harvested area has increased sharply from an average of 30.5 hectares in 1994-1998 to 504 hectares in 2010-2014. Total production of edamame has also increased from an average of 257 thousand tons in 1994-1998 to 3,510 thousand tons in 2010-2014.

The exportation of edamame from Indonesia to Japan has grown considerably, from 55 metric tons (Japan import market share 0.1%) in 1995 to 3,997 metric tons (Japan import market share 5.66%) in 2011, and its market share slightly reached 6.94% (3,107 metric tons) in 2015. It is important for Indonesia to examine its export of edamame to Japan because of the increase of competitiveness among neighboring countries. The standards needed to be examined include trading conditions and others, and this is the main goal of this paper. In addition, Indonesia performance will be compared to that of other neighboring countries like China, Taiwan,

Thailand, and Vietnam in terms of their regional balance and trading and tariff systems in the Japan market. Taiwan used to monopolize the Japanese market in the past, but China took over 50% of Japan's market share in the last few years, followed by 34% from Taiwan, 13% from Thailand, and 3% from other countries,

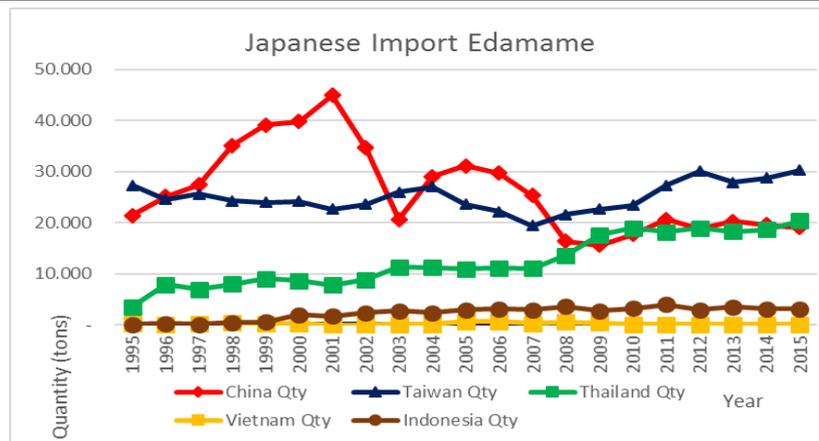


Fig-1: Japanese Import Edamame

Including Indonesia and Vietnam. Following the reality in this study, the purposes of this study want to know how far the export performance of Indonesian Edamame in Japan market such as the comparative advantage, market shares among export countries (China, Taiwan, Thailand, Vietnam and Indonesia) in Japan Market also the factors affecting the market shares of Indonesian Edamame.

For the future this will be considered for increasing the export edamame in industry side, government policy in export also for the farmer to increase the production.

EDAMAME MARKET SITUATION IN JAPAN

Edamame production in Japan is concentrated in the north of Kanto of Eastern Japan and is limited to the west of the East Sea of Western Japan. The main areas of production include Niigata, Gunma, Chiba, Yamagata, and Akita Prefectures[2]. Prices vary according to their origins, which determine the quality and the appearance of the product. These, in term may affect food safety and consumers' preferences.

The production of edamame has been decreasing because of the increase in the cost and the aging of the harvesting labor force of edamame, and the increase of the yearly imports of frozen edamame. In addition, the advance of technology in Taiwan and China has led to the increase of the imports of edamame from these two countries.

Japan has imported frozen edamame from Taiwan, Thailand, Vietnam and Indonesia. However, the total import volume and value are decreasing. The Figure 1 shows that the imports from China were about 45,000 metric tons and the market share was about 58% in 2001. However, in 2003, the import volume was reduced to 20,635 metric tons, less than half of the 44,958 metric tons imported in 2001. After 2003, China's import volume decreased sharply. Although Taiwan replaced China as the leading market import country with a market share of 43% in 2003, there was a trend of fluctuation, from 26,013 metric tons in 1995 to 30,300 metric tons in 2015. an A rapid upward trend was seen in the import from Thailand, from 3,538 metric tons in 1995 to 20,389 metric tons in 2015. Relatively, a trend of steady growth was seen in the import from Indonesia, from 55 metric tons in 1995 to 3,107metric tons in 2015. Compared with the other countries, there is still a long way for Indonesia to catch up.

The unit price of soybean in Vietnam was the lowest, at about 140 to 170 yen per kilogram; followed by china, about 145 to 180 yen per kilogram, about 151 to 190 yen per kilogram in Indonesia, about 180 to 210 per kilogram in Thailand. On the contrast, the price in Taiwan was the highest, at around 190-215 yen per kilogram. This indicates that Taiwan and Thailand are the main competing countries for the market in Indonesia[3].

The major importers of edamame have successively signed trade agreements to reduce tariffs with Japan. Thailand and Indonesia signed an Economic Partnership Agreement (EPA) with Japan in 2007 and in 2008 separately to reduce tariff every year, which has reached zero tariff in 2015. Moreover free trade agreements between China and Japan and between Japan and South Korea or other ASEAN countries are in progress, which has a considerable impact on the competitiveness edge of the import of edamame from Indonesia.

The major problems faced by the edamame industry in Indonesia are as following: (1) Japan has reduced its import of edamame because its market has been saturated; (2) without cost advantage, the market share of edamame in Indonesia has been decreasing; (3) Japan has signed trade agreements with its major edamame importing countries and this has affected the competitiveness of Indonesia.

RESEARCH METHODS

This study was using data source which is taken from Japanese trade association and PT. Mitratani 27 for the period 1995 - 2015. The export quantity uses time series for China, Taiwan, Thailand, Vietnam and Indonesia. The data is from 1995 – 2015 and it is collected from PT. Mitratani 27 (2017) and Japanese Bureau Statistic (2017). The dataset on prices is collected by dividing the value of the export by the export quantity each country. It measures with Japanese Yen (¥) per thousand kilogram unit. The exchange rate between Japanese Yen (¥) and Indonesian Rupiah (Rp) were obtained from Index Mundi. In the value of export, the data is formed in Japan currency. Tariff shows edamame price among exporting countries, Economic Partnership Agreement (EPA) as a means to further promote the close economic relationship between the two countries. On December 16, 2004, Minister of Economy, Trade and Industry Shoichi Nakagawa of Japan and Minister of Trade Mari Elka Pangestu of the Republic of Indonesia shared the view on the need to launch the Joint Study Group to explore the future of the economic partnership between the two countries.

Trade performance has received considerable attention in the literature, but there is a lack of conceptualization and operationalization of the construct [4] used high and low involvement exporters to know the performance of the export [5] used relationship between marketing strategy and export performance. [6] There are various methods and indicators for assessing trade performance. The choice of indicator will depend on the availability of data and the scope of analysis.

Indicators used to examine the performance include the revealed comparative advantage (RCA), which is used to analyze specialization, and the market share (MS) index, which is employed to measure competitiveness. Specialization refers to the emphasis of goods in which a country has some advantage whereas, competitiveness refers to the qualities of a product that enable a country to accomplish and preserve a certain market share. In this paper, export performance is analyzed through the estimation of the indicators: specialization and competitiveness, the analysis is based on trade data over the period from 1995 to 2015. An empirical analysis on the determinants of the Indonesia edamame export is also conducted, using the Armington trade model by OLS regression method from 1995 to 2015, with quantity market share as the dependent variable

Revealed Comparative Advantage

The concept of revealed comparative advantage pertains to the relative trade performance of individual countries in particular commodities. On the assumption that the commodity pattern of trade reflects [7]. The inter-country differences in relative costs as well as in non-price factors, this is assumed to “reveal” the comparative advantage of the trading countries. The factors that contribute to movements in RCA are economic: structural change, improved world demand and trade specialization. In this research measure the relative export edamame performance by the top five export countries such as China, Taiwan, Thailand, Indonesia, and Vietnam, defined as a country’s share of Japanese exports of a commodity divided by its share of total Japanese exports. RCA index introduced by [11] is defined as this

$$RCA = \ln \left(\frac{X_{ik}/X_i}{X_{Rk}/X_R} \right) \quad (1)$$

Where:

X_{ik} : Country i export of edamame to Japan Market

X_i : Total country i export of goods to Japan Market

X_{Rk} : The rival country’s export of edamame to the Japan Market

X_R : The rival country’s total export to Japan Market

A positive value might be interpreted as an indication of country’s comparative advantage against rival countries in the Japan Market.

Market Share Index

Increasing of product competitiveness in target market by measuring the ability of the country to export with market share index. Indonesia has 4 countries that compete for the edamame market in Japan. There are Taiwan, Thailand, China and Vietnam. The index is measured by the following formula:

$$MS_{ik} = X_{ik}/X_k * 100 \quad (2)$$

Where

MS_{ik} = market share of product Edamame by country i to Japan Market

X_{ik} = total export of edamame by country i to Japan Market

X_k = total import of edamame to Japan Market

The main advantages of this analyze is to know the percieve and know the position of competitiveness in the target market. Even though, changes in the market share are not totally attributable to changes in competitiveness, the index nevertheless provides an accepted indication of the exporting country’s or region’s competitiveness in relation to the export market [8].

Determinants

To find the factors affect the market share in Japanese Marker, this study uses multiple regression. The trade model developed by [9] distinguishes commodities by country of origin and import demand is determined in a two-step procedure. The basic assumptions underlying the Armington model are; separability between different import sources and homotheticity of import demands. The basic assumptions underlying the Armington model are; separability between different import sources and homotheticity of import demands. The implications of weak separability relate to the potential substitution effect among commodity groups [10]

The model is specified in the quantity market share. The general formula of multiple regressions is;

$$\ln MS_{ik} = \alpha + \alpha_1 \ln(p_i/P) + \alpha_2 \ln ExRt + \alpha_3 \ln RCA + \alpha_4 \text{dummy} + \varepsilon \tag{3}$$

In this study, the quantity market share form is adopted. The model is specified as:

$$q_i/Q = b_i^\sigma (p_i/P)^{-\sigma} \dots i= 1,2,\dots,m \tag{4}$$

Where,

Q =, Total import for edamame in Japan market

q_i = quantity total imported from country i

P = import price index, the trade weighted price of edamame

σ = target market elasticity of substitution for the commodity

b = country specific parameter

P_i = price of each country to Japan Market

m_i = the quantity market shares of edamame from country to the Japan market

Equation (4) can be converted in log- linear functional as:

$$\ln m_i = \alpha - \beta \ln(p_i/P) \tag{5}$$

The Armington model presents a useful tool for trade modeling, the linear form of the model allows for modification to the basic form on account for other factors such exchange rate, trend and dummy variables.

RESULTS AND DISCUSSION

Revealed Comparative Advantage

The result of Revealed Comparative Advantage (RCA) which was using value of edamame in Japan Market, there are 2 countries have comparative advantage Taiwan and Thailand. The other countries China, Vietnam and Indonesia have comparative disadvantages. This is signed by the score RCA have less than 0.

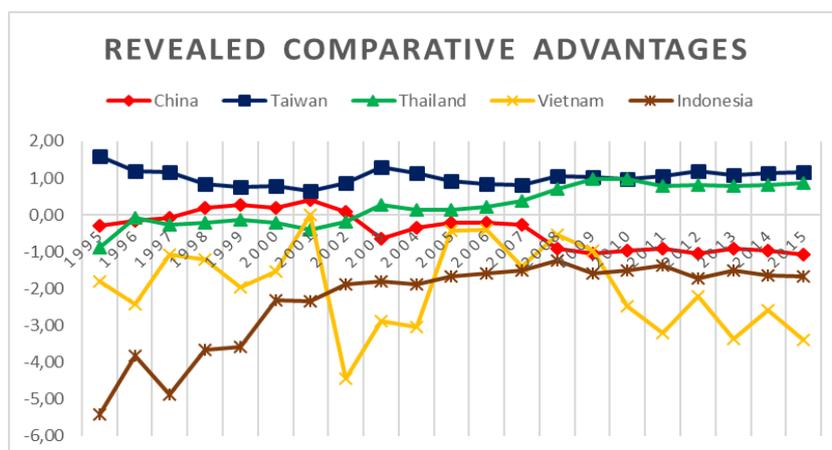


Fig-2: Revealed Comparative Advantage

Figure 2 shows Taiwan and Thailand lead the comparative advantage in Japan Market. China also had comparative advantage, but in 2003 China got comparative disadvantage. Taiwan got stable in Japan Market and Thailand increasing comparative disadvantage to the comparative advantage in 2003. Indonesia still got comparative

disadvantage, but Indonesia can decrease comparative disadvantage, close to China. Vietnam also got comparative disadvantage.

Market Share Index

To know the competitiveness of edamame exports to the Japan Market, this study uses Market Share Index that China, Taiwan and Thailand have a leded market of the Japanese Edamame Market. Indonesia has increased steadily from 1995 to 2008, and then shares slightly fluctuation from 2010 to 2015.

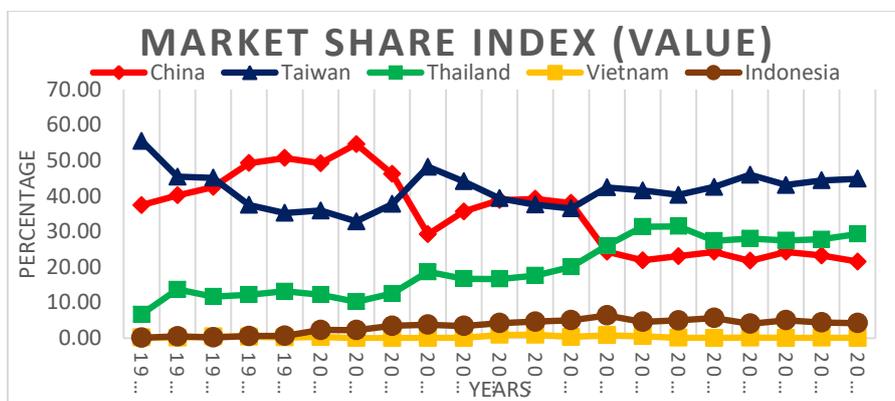


Fig-3: Market Share Index of Edamame in Japan Market

Figure 3 shows that China and Taiwan lead the Japan Market, but in 2008 China rapidly declining. Thailand takes the position and competes with China.in 2009 – 2010. Taiwan has leded in the Japan market share since 2008. Indonesia takes a 4th position, compared with the top three exporting countries, Indonesia export value is still small. Throught the export situation, Indonesia still has the competitiveness of the Japanese Market.

Determining by the operational definition of competitiveness as the ability of the product to achieve and maintain a certain market share, China, Taiwan and Vietnam were not competitive. Thailand and Indonesia increased their market share values and these two countries were competitive. Indonesia experienced a significant increase; this is indicated by the changes in the pattern applied by PT. Mitratani27 by expanding and increasing edamame production for export to Japanese market.

Linear Regression

To find factors affect the export performance of Indonesian edamame in Japanese Market, this study uses multiple regression analysis. The Armington model provided in equation (4) is transformed into a log-linear functional form. The model was estimated using the following extended form:

$$\ln MS = \alpha + \alpha_1 \ln\left(\frac{P_i}{P}\right) + \alpha_2 \ln ExRt + \alpha_3 RCA + \alpha_4 \text{dummy} + \varepsilon$$

The result indicates a high coefficient of R square (R²), which 90.7% of the total vaariation in Indonesia’s market share can be attributed to the variation in the independent variable and 9.3% to random variations. Durbin Watson statistics indicates no conclusion for the autocorrelations of the least squares residuals. F Statistic 39.119, it means all the independent variables koint effects are significant. A negative relationship between quantity market share and the price ratio, anegative relationship between market share and exchange rate and a positive relationship with level of specialization (measured by RCA) are expected. A 5% significance level is applied to determine whether a coefficeint is elastically significant.

Table-1: Regression Analysis

Variables	Coefficient	T Statistic	P Value
Intercepts	9.695	3.432	0.003
$\ln\left(\frac{P_i}{P}\right)$	-2.774	-3.052	0.008*
RCA	-1.851	-2.184	0.044*
$\ln ExRt$	-0.608	-1.747	0.100
Dummy	0.313	1.662	0.116
R- Squares	0.907		
Durbin Watson	1.491		
Samples	21		

*Significantcy: 95%

Table 1 shows $\ln(P_i/P)$ and RCA have negative signs as the prior expectation and they are statistically and significantly different from zero. The coefficient of the price ratio indicates that demand for Indonesian Edamame is elastic. This means that, a percentage increase in price will lead to greater than proportionate decrease in quantity market share of Indonesia. The effect of exchange rate on Indonesia's quantity market share is also negative. The relationship between the levels of specialization (measured by RCA index) is negative and it is statistically different from zero. This suggests that, as Indonesia decrease its comparative disadvantages in export of edamame, its quantity market share will increase. The coefficient of the dummy variable, representing the effect of reduced tariff for Indonesia's was positive but insignificant.

CONCLUSION

In view of the RCA index of the analysis, Indonesia and Vietnam have a negative level of comparative advantage in the export of edamame to the Japanese market, but Indonesia is mitigating the comparative disadvantage of trade performance. Taiwan and Thailand have comparative advantage in the export of edamame. Based on the RCA analysis, China has gradually reduced its comparative advantage in the Japanese market. To increase the comparative advantage, China, Vietnam and Indonesia need to increase not only quantity of edamame, but also quality of edamame. This will increase the consumption of Japanese people.

Examining the competitiveness of Indonesia's edamame export, the market share index has explained that Indonesia has been less competitive compared to China, Taiwan and Thailand. Indonesia's value market has experienced a steady increase. As per the operational definition of competitiveness, Indonesia can be said to uncompetitive in the export of edamame. It may indicate that the Japanese market has appeared over-saturated phenomenon. This condition has to expand the market in Japan, but it has to be followed by quantity and quality of the edamame

The result of the linear regression analysis indicates a negative and statistically significant relationship between the price ratio of Indonesia and its quantity market share. The significant relation of price and RCA to market share are inversely related to what is happening in the Japanese market, which the smaller tariff given by Japan to edamame Indonesia, affecting a percentage increase in price will lead to less than proportionate decrease in quantity market share of Indonesia. The comparative advantages show that the Japan market is too competitive and make competitor countries can not get the advantages. It means, Indonesia needs to find another market such as US, Europe or another country who consume edamame in high rate.

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