The Analysis of Export Potency for Indonesian Pepper

Lim Sanny1,2*, Johanes Ronaldy Polla2 and Ika Fatmawati3

1,2 Management Department, BINUS Business School Undergraduate Program, Bina Nusantara University, Jl. K.H. Syahdan No. 9, Kemanggisan, Palmerah, Jakarta 11480, Indonesia
3 Universitas Wiraraja, Jl. Raya Sumenep-Pamekasan KM. 05 Patean, Patean, Batuan, Kabupaten Sumenep, Jawa Timur 69451, Indonesia

ABSTRACT

The purpose of this study is to examine the factors that influence the Indonesian pepper export volume. Factors used in this research include: the area to plant pepper, the number of pepper farmers, total production of pepper, the exchange rate between the Indonesian rupiah and the US Dollar, the productivity of the Indonesian pepper industry, the consumption of pepper per capita, the export price of Indonesian pepper, and the price of Indonesian pepper in domestic market. The research was conducted using quantitative analysis and multiple linear analysis technique with estimation model OLS (Ordinary Least Square). Analytical results from this research conclude that the area under plant pepper, total production of pepper, the exchange rate between the Indonesian rupiah and the US Dollar, the productivity of Indonesian pepper, and the price of Indonesia pepper in domestic market have a significant positive influence on the volume of pepper export. Meanwhile, the number of pepper farmers, the consumption of pepper per capita, and the export price of Indonesian pepper

Keywords: Indonesia pepper export volume, the land area, the number of farmers, the total production, the exchange rate, the productivity, the export and domestic price

INTRODUCTION

Many governments have issued regulations that make trade become complex between the countries. There are many challenges that prevent a country from fulfilling their domestic demand on their own and therefore the importation of goods is required (Ebadi & Ebadi, 2015). A country will export
the product in which it has a comparative advantage and import the product in which it has a comparative disadvantage (Smith, 2013).

Indonesia has historically been known as an agrarian country and a leading producer of spices. Around 600 B.C., at a time when spices were one of the world’s most valuable commodities, pepper was introduced from south India to Indonesia’s Sumatra and Java Islands. Two main types of pepper continued to be produced in Indonesia today: black pepper and white pepper. Black pepper is the result of picking un-ripened fruits and drying them in the sun. While white pepper comes from larger fruits left on the vine until ripened. Many European countries still believe that Indonesia delivers high quality peppers that meet their standards and fulfil their demand.

Market demand for pepper is very high in almost every country because pepper is used to make the food more delicious. Pepper has an important role in Indonesia’s economy as an employment provider and is sold domestically and abroad as an industrial raw material and consumer good. Pepper has the potential to become an economic powerhouse for increasing farmers’ income if the government can manage it well through integrated agribusiness approaches. There are many programs initiated by the Indonesian government to develop and expand the pepper industry in addition to providing financial and technological support.

Indonesia is the fourth largest pepper producer in the world after Brazil, Vietnam and India. The aim of this paper is to identify the key factors affecting Indonesia’s export volume to aid government policy towards optimizing the industry’s profits and benefits to the country.

This research will analyse the export potency of Indonesian pepper. The triumph of Indonesia pepper export in each province will increase local competitiveness and incomes. If farmers can cut cost by reviewing their system, making it more efficient, it can compete better in the international market.

Looking at global pepper demand, indeed the area of cultivation will have an impact on exports. In Bangka, they turned there mining into agricultural sector because all the plants for cooper is vanished and would not be able to explore anymore. This is just a few examples, where this is the time for Indonesia could grow their pepper industry into global market. With Indonesia Rupiah is strategically in floating rate, which could attract investor and buyer to Indonesia. Therefore the productivity is high and consumption per capita will gradually increase with the number of export price become reasonable and competes within the global price. In this situation, in local price in Indonesia will clearly at the best price and will help pepper farmers to survive and at its best position to over best quality pepper to the world.

**LITERATURE REVIEW**

According to Purwito and Indriani (2014), export-import refers to the exchange of the following things: 1) Goods that are produced, physically distributed, and sold.
in customs areas; 2) Services that are provided for foreigners abroad; 3) Capital invested outside of customs areas for direct investment or portfolio investment in the form of tangible assets and deposits.

Research by Fitri and Purbadharmaja (2015) found that one of the factors that influence the export volume of pepper is the available area to plant pepper. However, research by Wardani and Sudirman (2015) concluded that there is no effect of the area to plant pepper to the export volume of pepper. In India, research has also shown land area influences the export volume of pepper (Yogesh & Mokshapathy, 2013). Moreover, the area to plant pepper has tight relationship with productivity. Crop area has an uncertain effect to productivity - it could be linear or vice versa. A study in Pakistan had concluded that agricultural exports and agricultural productivity has a bi-directional causality, in other words there’s a relationship between export volume and productivity (Jacob, 2015). These conflicting results from various studies points to the need for further research relating the crop area of pepper to total export volumes.

Human resource capabilities have also been shown to have an indirect influence on the export volume of pepper. According to Idayanti and Dewi (2016), human resources have a positive and significant influence on exports. Farmers have a significant role in determining the production of pepper (Jacob, 2015). The skill of farmers in Indonesia is still low with respect to technology and production systems. In international markets, Dradjat (2002) said that the competitiveness of main field crops was estimated to be lower than those of its competitors. Low competitiveness was also present in the domestic market, thus resulting in low prices received by farmers. This points to a wide price gap between the exporters and the farmers. Addressing this problem has been the focus of government policymaking and program development of agricultural marketing (Directorate General of Processing and Marketing of Agricultural Products, 2001).

Radam and Ismail (1999) said that frontier production functions proved significant in computing efficiency level in pepper production. The results can assist those involved in the industry’s decision making to formulate strategy in abating inefficiency and increasing productivity. For example, a low level of technical efficiency indicates that increasing production would require new innovations or high-tech farming systems. Through the utilization of the current technology’s rapid development, the pepper industry could grow into a stronger commodity in Indonesia.

In 2008, Indonesia’s pepper export growth rate in value and volume reached 17.01% and 4.07% respectively – a rate stronger than the average for world exports. In 2009-2010, the export growth rate increased to 75.7%, which is higher than other major producing countries (Sudjarmoko, 2015). When it comes to increasing profit and opportunity, Indonesia needs to learn a better and new way to meet the international market’s expectations.
Moreover, Indonesia needs to accomplish this while also meeting the local pepper demand.

Another factor that determines the success of the export volume of pepper is the currency exchange rate. Dewi and Setiawina (2015) has shown it to have a large effect on export volume. This statement is also supported by a collaborative study between Iran and Canada that claim exchange rates are one of the most determinant macroeconomic variables that can influence other economic variables such as production, export, balance of payments, etc. (Fitri & Purbadharmaja, 2015). Nevertheless, other research findings show exchange rates having no significant impact to export volume (Wardani & Sudirman, 2015).

Domestic demand in the form of consumption per capita also has an effect on export volume. In a study on fresh pineapple exports from Ghana, domestic consumption was shown to have an inverse association with export volume (Boansi, OdilonKounagbeLokonon, & Appah, 2014). Technically, increasing consumption will decrease the export volume. This calls for Indonesia to balance domestic and international demand. Mercantilism is one of the concepts applied when countries like Indonesia want to reduce imports and increase exports by focusing on production, whether it is the volume, quality, service, distribution, or marketing, through the open world (Gilani, 2015).

Other essential factors that can influence export is price, whether it is the domestic price or export price. In a study on black pepper in India, domestic price and export price it was shown to have an influence on export volumes, although not significantly (Hema, Kumar, & Singh, 2007). Increasing prices is just one way to increase profits. In Indonesia, with lower labour wages, the COGS for pepper is relatively cheaper than other countries. With this cost advantage, Indonesia has an opportunity to compete in the international market. Pepper farmers also could increase earnings by selling directly to other countries. Price setting could be a considerable factor for Indonesia as higher prices can increase the volume of export, to an extent.

**MATERIALS AND METHODS**

**Types and Sources of Data**

This study used time series secondary data for the quantitative analysis. The numbers of an observational period as the time series data were 31 years, from 1985 to 2015. The objects of this study were whole pepper and ground pepper using the 6-digit classification of harmonized system (HS) code, with code 090411 for whole pepper and 090412 for ground pepper.

The respective data on the volume of pepper exports, the area to plant pepper, the number of pepper farmers, and total production of pepper were obtained from the Indonesian pepper statistics book published by the Directorate General of Estate Crops. Furthermore, the data on productivity of Indonesian pepper, the consumption of pepper per capita, the export price of Indonesian pepper, and the price of Indonesian pepper in the domestic market...
were obtained from an Indonesian pepper outlook report published by the Agricultural Information System and Data Center, from the Ministry of Agriculture. The exchange rate data between Indonesian Rupiah and the US Dollar was obtained from the Bank of Indonesia and the Indonesian Ministry of Finance website.

**Data Analysis**

This research used a multiple linear regression with *Ordinary Least Squares* (OLS) estimation model to analyse the quantitative data. In this study, the data was analysed using a model of export demand. The dependent variable of this study is volume of pepper exports. Meanwhile the independent variables are the area to plant pepper, the number of pepper farmers, total production of pepper, the exchange rate between the Indonesian Rupiah and the US Dollar, the productivity of Indonesian pepper, the domestic consumption of pepper per capita, the export price of Indonesian pepper, and the price of Indonesian pepper in domestic market. The model equation of export demand can be written as follow:

\[
Y_{it} = \beta_0 + \beta_1 LX_{1t} + \beta_2 LX_{2t} + \beta_3 LX_{3t} + \beta_4 LX_{4t} + \beta_5 LX_{5t} + \beta_6 LX_{6t} + \beta_7 LX_{7t} + \beta_8 LX_{8t} + e_t
\]

Where:
- \(Y_{it}\) = volume of pepper exports
- \(\beta_0\) = intercept
- \(LX_1\) = the area to plant pepper
- \(LX_2\) = the number of pepper farmers
- \(LX_3\) = total production of pepper
- \(LX_4\) = the exchange rate between Rupiah and USD
- \(LX_5\) = the productivity of Indonesian pepper
- \(LX_6\) = the domestic consumption of pepper per capita
- \(LX_7\) = the export price of Indonesian pepper
- \(LX_8\) = the price of Indonesian pepper in domestic market
- \(\beta_{1,2,\ldots,8}\) = estimated parameter
- \(t\) = period-t
- \(e_t\) = error term

The selected regression model has to meet the classical assumptions based on Gauss-Markov theory in order to at the best linear unbiased estimator. The model must have no heteroscedasticity, autocorrelation. Moreover, the model must pass the normality, multicollinearity, and linearity test. Still, the model has to meet statistical tests such as t-statistic test, F-statistic test, and coefficient of determination test (Hayashi, 2000).

**RESULTS AND DISCUSSIONS**

The determinants of export volume of Indonesian pepper were analysed to explain the effect of economic and noneconomic variables to the trade flow of Indonesian pepper in the international market. The results of the data regression model of Indonesian pepper exports can be seen in the Table 1.
Based on those data, the Adjusted R-squared of this model is 0.169267, showed that 16.92% of the change of Indonesian pepper export volume can be explained by the independent variables in the model, while 83.08% of the change can be explained by other factors outside the model.

The t-statistic shows that the area to plant pepper, the number of pepper farmers, total production of pepper, the exchange rate between rupiah against the US Dollar, the productivity of Indonesian pepper, the consumption of pepper per capita, the export price of Indonesian pepper, and the price of Indonesian pepper in domestic market does not have a significant effect either at 5% or 10% of the significant level. The estimation model of Indonesian pepper export volume can be written as follow:

\[
Y = 0.051 + 0.229 \text{LX1} - 0.136 \text{LX2} + 0.481 \text{LX3} + 0.004 \text{LX4} + 0.380 \text{LX5} - 0.007 \text{LX6} - 0.092 \text{LX7} + 0.164 \text{LX8}
\]

### The Area to Plant Pepper

The area to plant pepper (LX1) has a positive effect and statistically insignificant effect on the volume of Indonesian pepper exports. The estimated coefficient of this variable is 0.229, which implies that a 1% increase in the area to plant pepper in Indonesia (LX1) will lead to a 0.229% increase in the export volume of Indonesian pepper. It implies that the area to plant pepper (LX1) has a positive and statistically insignificant effect on the volume of Indonesian pepper exports.

### The number of pepper farmers

The number of pepper farmers (LX2) has a negative effect and statistically insignificant effect on the volume of Indonesian pepper exports. The estimated coefficient of this variable is -0.136. It shows that with a 1% increase in the number of pepper farmers in Indonesia (LX2), the export volume of Indonesian pepper will decrease by

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>Probability</th>
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<tbody>
<tr>
<td>C</td>
<td>0.051635</td>
<td>0.9909</td>
</tr>
<tr>
<td>LX1 (the area to plant pepper)</td>
<td>0.229566</td>
<td>0.7623</td>
</tr>
<tr>
<td>LX2 (the number of pepper farmers)</td>
<td>-0.136139</td>
<td>0.7297</td>
</tr>
<tr>
<td>LX3 (total production of pepper)</td>
<td>0.481272</td>
<td>0.4962</td>
</tr>
<tr>
<td>LX4 (the exchange rate between rupiah against the USD)</td>
<td>0.004392</td>
<td>0.9821</td>
</tr>
<tr>
<td>LX5 (the productivity of Indonesian pepper)</td>
<td>0.380954</td>
<td>0.3340</td>
</tr>
<tr>
<td>LX6 (the consumption of pepper per capita)</td>
<td>-0.007733</td>
<td>0.9720</td>
</tr>
<tr>
<td>LX7 (the export price of Indonesian pepper)</td>
<td>-0.092570</td>
<td>0.5818</td>
</tr>
<tr>
<td>LX8 (the price of Indonesian pepper in domestic market)</td>
<td>0.164233</td>
<td>0.4235</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td></td>
<td>0.169267</td>
</tr>
<tr>
<td>Prob (F-statistic)</td>
<td></td>
<td>0.139180</td>
</tr>
</tbody>
</table>

*Source: Researchers, 2017*
0.136%. This implies that the number of pepper farmers (LX2) has a negative and statistically insignificant effect on the volume of Indonesian pepper export.

**Total production of pepper**
Total production of pepper (LX3) has a positive effect and statistically insignificant effect on the volume of Indonesian pepper exports. The estimated coefficient of this variable is 0.481, which implies that a 1% increase in the total production of Indonesia pepper (LX3) will lead to a 0.481% increase in the export volume of Indonesian pepper. It implies that total production of pepper (LX3) has a positive and statistically insignificant effect on the volume of Indonesian pepper exports.

**The exchange rate between the Indonesian Rupiah and the US Dollar**
The exchange rate between Rupiah and the US Dollar (LX4) has a positive effect and statistically insignificant effect on the volume of Indonesian pepper exports. The estimated coefficient of this variable is 0.004, which implies that a 1% increase in the exchange rate of the Rupiah against the USD (LX4) will lead to a 0.004% increase in the export volume of Indonesian pepper. It implies that the exchange rate between rupiah against the US Dollar (LX4) has a positive and statistically insignificant effect on the volume of Indonesian pepper exports.

**The productivity of Indonesian pepper**
The productivity of Indonesian pepper (LX5) has a positive effect and statistically insignificant effect on the volume of Indonesian pepper exports. The estimated coefficient of this variable is 0.380, which implies that a 1% increase in the productivity of Indonesian pepper (LX5) will lead to a 0.380% increase in the export volume of Indonesian pepper. It implies that the productivity of Indonesian pepper (LX5) has a positive and statistically insignificant effect on the volume of Indonesian pepper exports.

**The consumption of pepper per capita**
The consumption of pepper per capita (LX6) has a negative effect and statistically insignificant effect on the volume of Indonesian pepper exports. The estimated coefficient of this variable is -0.007. It shows that with a 1% increase in the consumption of pepper per capita in Indonesia (LX6), the export volume of Indonesian pepper will decrease by 0.007%. This implies that the consumption of pepper per capita (LX6) has a negative and statistically insignificant effect on the volume of Indonesian pepper exports.

**The export price of Indonesian pepper**
The export price of Indonesian pepper (LX7) has a negative effect and statistically insignificant effect on the volume of
Indonesian pepper export. The estimated coefficient of this variable is -0.092. It shows that with a 1% increase in the export price of Indonesian pepper (LX7), the export volume of Indonesian pepper will decrease by 0.092%. It implies that the export price of Indonesian pepper (LX7) has a negative and statistically insignificant effect on the volume of Indonesian pepper exports.

**The price of Indonesian pepper in domestic market**

The price of Indonesian pepper in domestic market (LX8) has a positive effect and statistically insignificant effect on the volume of Indonesian pepper exports. The estimated coefficient of this variable is 0.164, which implies that a 1% increase in the price of Indonesian pepper in domestic market (LX8) will lead to a 0.164% increase in the export volume of Indonesian pepper. This implies that the price of Indonesian pepper in the domestic market (LX8) has a positive and statistically insignificant effect on the volume of Indonesian pepper exports.

**CONCLUSION**

This study examines the influence of the export volume of Indonesian pepper against several independent factors. The area under plant pepper, total production of pepper, the exchange rate between the Indonesian Rupiah and the US Dollar, the productivity of Indonesian pepper, and the price of Indonesian pepper in domestic market show positive effect to the export volume of Indonesian pepper. Meanwhile, the number of pepper farmers, the consumption of pepper per capita, and the export price of Indonesian pepper have a negative effect to the export volume of Indonesian pepper. However, all independent variables have a statistically insignificant to the volume of Indonesian pepper export.

There are several hypotheses that can explain the relationship between each independent variable to dependent variable. The area of plant pepper influences positively and not significantly on the pepper export volume due to low productivity. The number of pepper farmers influence negatively and not significantly on the pepper export volume due to lack of information on how to take care of pepper plants. Total production of pepper influences positively and not significantly on the export volume because the more total production of pepper the more we can sell so it’ll increase the export volume of pepper literally, but due to high domestic demand for pepper in local market also makes this variable have insignificant effect. The exchange rate between the Rupiah and the US Dollar influences positively and not significantly on the pepper export volume because changes in exchange rates will have an impact only on the level of earnings of exporters and farmers so importers do not consider it as a big concern.

An increase in productivity will also increase the export volume of pepper; unfortunately, Indonesia still has low productivity compared with other pepper producing countries. The consumption of pepper per capita has a negative and
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statistically insignificant effect on the volume of Indonesian pepper exports because the more domestic consumption the less pepper is exported. The export price of Indonesian pepper has a negative and statistically insignificant effect on pepper exports because price is one of the most sensitive issues. An increase in price will lead to decrease in demand. The price of Indonesian pepper in the domestic market influences positively and not significantly on the export volume due to the desire of exporter who wants to reap the profits as much as they can. However, it has insignificant effect according to the decline of the importers interest.

REFERENCES


