Indonesian Coffee Competitiveness in the International Market: Review from the Demand Side

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Abstract **– The purpose of this study is to analyze the competitiveness of Indonesian coffee in domestic market and international market, in terms of the demand for Indonesian coffee. Secondary time series data from 1990 to 2011 are used to analyze the competitiveness of coffee in two different markets. Revealed Comparative Advantage (RCA) approach is employed to analyze the competitiveness in the domestic market, while Armington model is employed to analyze the competitiveness of Indonesian coffee in the international market. Based on the RCA index, Indonesian coffee competitiveness among 10 major commodities in the domestic market was at ranks 6th. While based on the Armington model, Indonesian coffee face different competitors in each export destination countries. This finding implies that Indonesia should establish cooperation with partner countries as well as countries which are neutral in order to compete with coffee from competitors.**

Keywords **– Competitiveness, Revealed Comparative Advantage (RCA), Armington Models.**

I. INTRODUCTION

Coffee is one of Indonesia's important export commodities. In terms of production, Indonesia ranks third after Brazil and Vietnam. On the other hand, the volume of Indonesia's coffee exports in the world market ranks third, after Brazil and Columbia. In 2000 and 2010, the volume and value of coffee exports increased by 4.7% and 14.7% respectively (Kustiari, 2012).

The increase of world coffee production unequal with demand for coffee cause international trade competition is getting tougher. Over-supply problem faced by world coffee market has caused the price of coffee beans in November 2000 in international market slumped. Coffee commodity prices in the national economy has decreased as a consequence of the collapse of world coffee prices due to over-production. The growth rate of Indonesian exported coffee prices fluctuated within 21 years. Coffee prices reached its highest point in 1994 (61.84%) and reached its lowest point in 1996 (-62.22%). Since 1997, the growth rate of coffee price fluctuated but never exceeded its highest point in 1994 (Intan NT, 2012).

On the other hand, the volume of exports of Indonesian coffee beans rose quite sharply in 2008, reaching approximately USD 989.41 million, but fell back in 2009 to USD 822.31 million, and decreased again in 2010 to USD 812,53 million. This situation means that the growth of Indonesia exported coffee is declining, but the decline faced by Indonesia is higher than the world. The growth of Indonesian coffee exports are negative, indicating some weaknesses, including the composition of the product, market distribution and competitiveness. Indonesia does not take advantage of the type of processed coffee products whose demand is growing in many countries, in addition to unability to compete with other exporting countries when the price of coffee has decreased.

Based on this background, there are two specific issues that will be examined in this study. First, how the competitiveness of Indonesian coffee among other commodities in the domestic market. Second, the competitiveness of Indonesian coffee in the international market among other coffee exporting country.

II. METHODOLOGY

This study uses secondary time series data with a period of 21 years, starting from 1990 to 2011. Secondary data are obtained from various government agencies and related institutions, including the Ministry of Agriculture, Ministry of Trade, the Central Statistics Agency (BPS), FAO, ICO and literature studies as well as other information. Term limitation to avoid differences in perception include:
1. Volume is measured in tonnes. This study is attempted only to examine the coffee beans, not including the varieties.
2. Value of exports and imports and the price is expressed in US dollars.
3. The competitiveness of Indonesian coffee in the international market is analyzed from demand side using Armington demand models.

Two methods are used in this study. First, to examine the competitiveness of Indonesian coffee among other commodities in the domestic market, Revealed Comparative Advantage (RCA) approach is employed. If the result of RCA index value is more than 1 (RCA>1), it indicate a comparative advantage. On the other hand, if the result of RCA index value is equal or less than 1 (RCA≤1), it indicates the absence of comparative advantage. Mathematically, RCA is written as follows:

$RCA = (X_{ij}/X_j)/(X_{iw}/X_w)$

where:

X_{ij} = exports of commodity i by country j

X_j = total exports of country j

X_{iw} = exports of commodity i in the world

X_w = total world exports

Second, Armington models is employed to determine the competitiveness of Indonesian coffee in the international market.

Econometric model to formulate the competitiveness of Indonesian coffee in the world market using Armington models consist of three (3) structural equation, namely: demand equation, supply equation, price equation, and market clearing equation. In this research review from the demand side. The model can be described in the following equations.

Demand Equation Importing Countries

Parameters which describe the elasticity of demand for state-*i* toward coffee produced by state-*j* (n_{ijj}) and the elasticity of demand for state-*i* toward coffee produced by state-*h* (n_{ijh}) are estimated using Armington Demand System.

Coffee import demand equation models generated by each importing country can be formulated as follows:

$$LnQd_{ij} = Ln\beta_0 + \beta_{ij}LnP_{ij} + \beta_i LnY_{ij} + \beta_{ij}LnQd_{ijt-1} + \varepsilon_{ij}$$

Where:

i = 1, 2, 3, 4, 5, 6 for coffee importing countries, namely Japan, the Netherlands, USA, Germany, Australia and ROW (Rest of the World) Import

j = Indonesian coffee exporters

III. RESULTS

A. Competitiveness of Indonesian Coffee in Domestic Market

Based on the calculation of Revealed Comparative Advantage (RCA) Index, it can be seen that among the 10 commodities, 8 competitive commodities in domestic market (indicated by average values > 1) are respectively areca nut (39,65); palm (19.07); rubber (18.53); coconut

(11.90); pepper (9.83); cocoa (6.47); coffee (2.87); and tea (2.19). While the 2 commodities are considered to be uncompetitive (indicated average values < 1) are respectively tobacco (0.22) and sugarcane (0.11). As seen on Figure below, areca nut is the most advantageous commodity in Indonesian domestic market. In Indonesia, betel nut is used as a traditional medicine. The trees are often used to celebrate Indonesian Independence Day as well. Therefore, areca nut is having a comparative advantage from another commodities in domestic market. On the other hand, rubber is considered to be uncompetitive in domestic market.
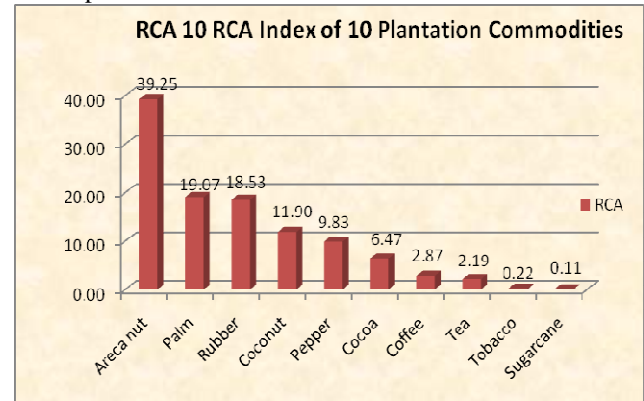

Fig. RCA Index of 10 Plantation Commodities

B. Indonesian Coffee Competitiveness in International Markets

Armington Demand Model is employed to analyze the demand of Indonesian coffee in Japan, the Netherlands, United States, Germany and Australia. Using 8 (eight) independent variables which are Indonesian coffee price, Brazilian coffee prices, Columbian coffee prices, Mexican coffee prices, Vietnamese coffee prices, coffee prices from other countries (ROW), income and demand for Indonesian coffee last year, the detailed results are presented in Table 1. below.

Table: Demand Analysis Results of Indonesian Coffee in 5 Importing countries

Independent Variables	P-Value (α)				
	Japan	The Nether land	USA	Germany	Australia
Price Brazil	0,68* (0,02)	0,26 (0,38)	0.09 (0,71)	0.82* (0,13)	0.79 (0,26)
Price Columbia	0,77* (0,11)	0,57* (0,20)	0.42 (0,22)	-1.08* (0,01)	-1.06* (0,04)
Price Mexico	0,15 (0,69)	-0,13* (0,18)	-0.60* (0,06)	0.25 (0,52)	0.39 (0,35)
Price Indonesia	-0,46* (0,13)	-0,11 (0,53)	-0.47* (0,01)	-0.78* (0,01)	-0.28 (0,3)
Price Vietnam	0,03 (0,88)	0,04 (0,83)	-0.05 (0,53)	-0.09 (0,58)	0.13 (0,38)
Price ROW	-1,51* (0,03)	-0,83* (0,10)	-	-	-0.19 (0,68)
Income	-	-	0.50* (0,004)	0.79* (0,00)	1.08* (0,00)
Last year demand	-	-	0.37* (0,06)	-	-

Source: Data processed, 2013

Based on the analysis of Indonesian coffee demand in 5 countries above, it can be concluded that Indonesian coffee face different competitors in each country. Income only affected Indonesian coffee demand in United States, Germany, and Australia. While demand for Indonesian coffee last year only affected demand for Indonesian coffee in United States.

The results of the analysis in detail are as follows:

1. Japan

Based on the partial test results, Indonesian coffee demand in Japan affected by the price of Indonesian coffee, Columbia coffee prices, coffee prices of other exporting countries, and demand of Indonesian coffee in Japan last year. While Mexican coffee price and Vietnamese coffee prices had no significant effect (neutral).

The influence of Indonesian coffee prices acounted for -0.4581 with alpha 0.1301 meaning that if the price of coffee in Indonesia increased 1%, the demand for Indonesian coffee in Japan decreased 0.46% (inelastic because <1) at 87% confidence level. It was reasonable, in accordance with the law of demand, increase in the price of an item will cause a decline in demand for the respective goods. With the rising price of Indonesian coffee, coffee consumers in Japan will switch to coffee from other countries that are relatively less expensive.

The effect of Columbian coffee price (0.7684) with α=0.1084, meaning that if Columbian coffee price increased by 1%, the demand for Indonesian coffee in Japan rose by 0.77% (inelastic because <1) at 89% confidence level. It was shown that Columbian coffee can replace the function Indonesian coffee in Japan or coffee Columbia is a substitute (competitors) of Indonesian coffee.

The effect of the price of coffee from other exporting countries (-1.5118) with α=0.0266, meaning that if the price of coffee from other countries increased by 1%, the demand for Indonesian coffee in Japan fell by 1.51% (elastic because >1) at the level of 97%. It means that the coffee from other countries (ROW - Restof the World) is complementary to Indonesian coffee. This indicates that Indonesian coffee and coffee from other countries are difficult to distinguish or identical.

Mexican coffee prices and Vietnamese coffee price that does not give effect, indicating that Japanese consumers prefer domestic coffee or coffee from other countries than Mexican coffee or Vietnamese coffee.

2. The Netherland

Partial test results indicated that demand for Indonesian coffee in the Netherland influenced by Columbia coffee prices and Mexican coffee prices. While the price of Brazilian coffee price and Vietnamese coffee prices had no significant effect (neutral).

The effect Columbia coffee price accounted for (0.5651) with α=0.1960 means that if the price of coffee Columbia increased by 1%, the demand for Indonesian coffee in the Netherlands was reduced to 0.57% at 81% confidence level. It can be concluded that the Columbian coffee is a substitute of Indonesian coffee, means that Columbian coffee is a competitor of Indonesian coffee.

The effect of Mexican coffee price accounted for (-0.1317) with α=0.1754, meaning that if the price of Mexican coffee increased by 1%, the demand for Indonesian coffee in the Netherlands fell by 0.13% at 83% confidence level. It means that Mexican coffee is a complement of Indonesian coffee. In other words, Mexican coffee is a partner of Indonesian coffee.

On the other hand, Brazilian coffee prices and Vietnamese coffee prices had no significant effect, indicates that consumers prefer domestic coffee or coffee from other importing countries such as Columbia and Indonesia.

3. United States

Partial test results indicated that Indonesian coffee demand in the United States are affected by Brazilian coffee price, Columbian coffee prices, income and demand for Indonesian coffee last year.

The effect of Mexican coffee price accounted for (-0.60305) with α = 0.0619 means that if Mexican coffee price increased by 1%, the demand for Indonesian coffee in the United States decreased by 0.60% in the 94% confidence level. It means that Mexican coffee is a complementary of Indonesian coffee. Thus, Mexico can partner with Indonesia to meet the demand for coffee in the United States.

The effect of Indonesian coffee price accounted for (-0.46944) with α=0.0063 means that if the price of coffee in Indonesia increased by 1%, the demand for Indonesian coffee in the United States decreased by 0,47% at 99% confidence level. This is in accordance with the law of demand, when the price of goods is increased, the demand will fall. Indonesian coffee consumers in the United States will switch to coffee from other countries.

The effect of U.S. income accounted for (0.496877) with α=0.0037 means that if income rose by 1%, the demand for Indonesian coffee in the United States increased by 0.50% at confidence level >99%. It indicates that Indonesian coffee in the United States is a normal good.

The effect of Indonesian coffee demand last year accounted for (0.370429) with α=0.0554 means that if the United States' demand for Indonesian coffee last year increased by 1%, the demand for Indonesian coffee this year will increase by 0.37% at 94% confidence level. It is caused by Indonesian coffee consumption in the United States had increased the confidence of Indonesian coffee. The reason for this confidence is due to the good quality of Indonesian coffee, or due to Indonesian coffee meet the taste of consumers in the United States.

4. Germany

Based on the partial test results, the variables that significantly affect the demand for Indonesian coffee in Germany is Brazilian coffee prices, Columbian coffee prices, Indonesian coffee prices, and Germany's income. While Mexican coffee prices and Vietnam coffee prices had no significant effect (neutral).

The effect of Brazilian coffee prices accounted for (0.823846) with α=0.1288 means that if the Brazilian coffee prices increased by 1%, the demand for Indonesian coffee in Germany increased by 0.82% at 87% confidence level. It means that Brazilian coffee is a competitor of Indonesian coffee.

The effect of Columbian coffee prices accounted for (-1.08039) with α=0.0063, meaning that if Columbian coffee price increased by 1%, the demand for Indonesian coffee in Germany fell by 1.08% at confidence level >99%. It means that Columbian coffee is a

complementary to Indonesian coffee. Thus, Columbia could be Indonesia's partner in meeting the demand for coffee in Germany.

The influence of Indonesian coffee prices in Germany accounted for (-0.78150) with α=0.0111, meaning that if Indonesian coffee price increased by 1%, the demand for Indonesian coffee in Germany fell by 0.78% at 99% confidence level. This is in accordance with the law of demand that if the price of goods rise, the demand for goods will fall, and vice versa. When the Indonesian coffee prices rise, consumers will switch to coffee from other countries.

The influence of Germany's income accounted for (0.794564) with α<0.0001 means that if the Germany's income increased by 1%, the demand for Indonesian coffee in Germany increased by 0.79% at confidence level >99%. It means that Indonesian coffee is normal good in Germany. This increased of confidence of Indonesian coffee is due to the good quality of Indonesian coffee, or as consumer tastes prefer Indonesian coffee than coffee from other country.

5. Australia

Based on the partial test results, demand for Indonesian coffee in Australia is influenced by Columbian coffee prices and Australia's income. While Brazilian coffee prices, Mexican coffee prices, Vietnamese coffee prices and coffee prices from other exporting countries had no significant effect (neutral).

The effect of Columbian coffee prices accounted for (-1.06127) with α=0.0409 means that if Columbian coffee prices increased by 1%, the demand for Indonesian coffee in Australia was reduced to 1.06% at 96% confidence level. It indicates that Columbian coffee is a complementary with Indonesian coffee, thus Columbia can be Indonesia's partner to meet the demand for coffee in Australia.

The effect of Australian income accounted for (1.079162) with α<0.0001 means that if the Australian revenue increased by 1%, the demand for Indonesian coffee in Australia in creased by 1.08% at confidence level >99%. It shows that Indonesian coffee is a normal good in Australia.

It can be seen that the demand for Indonesian coffee in Australia is only influenced by two variables, namely Columbian coffee prices and Australian income, while the price of coffee from other exporting countries are not significant. It can be explained that Indonesian coffee meet the Australian consumer tastes, especially Australia is a close neighbor of Indonesia that Indonesian coffee can go relatively easy. When compared with the previous four countries, Indonesian coffee has few competitors in Australia.

In relation to the characteristics of product, if the degree of difference between the two products is getting larger, then the products will be difficult to be substituted by other goods. Indonesian coffee in Australia can be considered very different from other exporting countries. Therefore, it is difficult for Indonesian coffee to be substituted by coffee from other countries.

Based on the analysis of Indonesian coffee demand in

some countries above, it can be concluded that Indonesian coffee face different competitors in each country of export destination. In Japan, Indonesian coffee competes with Columbian coffee. However, in Australia and Germany, Indonesian coffee can partner with Columbian coffee. This indicates that the elasticity of substitution for the same product would be different regarding the conditions faced in different countries.

Countries with relatively similar income per capita, will tend to trade with each other, *ceteris paribus*, because consumers in these countries tend to have the same tastes, and products produced by the country can meet the tastes of each other (Linder: 1996, in Blonigen: 1999). In addition, consumers can also make country of origin as a signal of quality. Products from certain countries that have been considered to have a low control of quality or weak attention to the surrounding environment will be difficult to be accepted in a country that has serious attention to both of these things.

CONCLUSION

From the results of research and discussion in this study, it can be concluded that:

1. Among 10 plantations, there are 8 commodities which considered to be competitive in the domestic market. The competitiveness of Indonesian coffee commodity is in ranks 7. The eight commodities are areca nut; palm; rubber; coconut; pepper; cocoa; coffee; and tea. While tobacco and sugarcane considered to be uncompetitive commodities.

2. The competitiveness of Indonesian coffee in international market among 4 other exporting countries (Brazil, Columbia, Mexico, Vietnam) in the importing countries (Japan, the Netherlands, USA, Germany, Australia) are as follow:

3. In Japan, Brazilian coffee and Columbian coffee are competitors of Indonesian coffee; while Mexican coffee and Vietnamese coffee are neutral.

4. In the Netherlands, Columbian coffee is a competitor of Indonesian coffee, while Mexican coffee is a partner of Indonesian coffee. On the other hand, Brazilian coffee and Vietnamese coffee are neutral.

5. In the United States, Mexican coffee is a partner of Indonesian coffee, while Brazilian coffee, Columbian coffee and Vietnamese coffee are neutral.

6. In Germany, Brazilian coffee is a competitor for Indonesian coffee, while Columbian coffee is a partner of Indonesian. On the other hand, Mexican coffee and Vietnamese coffee are neutral.

7. In Australia, Columbian coffee is a partner of Indonesian coffee, while Brazilian coffee, Mexican coffee and Vietnamese coffee are neutral.

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