

Analysis of Competitiveness and Threshold Price Transmission of Indonesian Coffee in Importing Countries

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ABSTRACT

Coffee is a leading commodity export in Indonesia and contributes greatly to the national coffee exports. Indonesia is the world's fourth largest exporter. The objectives of this study are investigating business competitiveness of Indonesian coffee compared to the other of coffee exporting countries and threshold price transmission in importing countries uses Constant Market Share Analysis (CMSA) and ECM models, and threshold cointegration. The results concluded that the most influencing business competitiveness was the effect of market distribution, threshold price transmission of Indonesian coffee in importing markets, the United States amounting to 0.9, Germany at -0.6, Japan at 0.5, Italy at 0.2, and Malaysia at -0.4. This means that when the coffee price of deviation in importing countries and Indonesia in its long-term balance exceeds its threshold value, coffee prices in importers countries will adjust to achieve their balance so that both coffee prices are in the Indonesian market and the markets of countries importers have a cointegration relationship.

Keywords : Coffee, Business Competitiveness, Price Transmission, Threshold

I. INTRODUCTION

Coffee is a type of beverage that important for most people throughout the world. Not only for the enjoyment coffee drinkers but also because of the economic value for countries that produce and export coffee beans (such as Indonesia). Indonesia is the fourth largest coffee producing country in the world after Brazil, Vietnam and Colombia with 2016 production of 667 thousand tons or 11 percent of world coffee production. Coffee is a mainstay business in the plantation subsector in Indonesia. The role of coffee commodities on the Indonesian economy is quite important, both as a source of foreign exchange, as a producer of industrial raw materials, and as

providers of employment through processing, marketing and export and import trade.

The economy will be more open in the era of globalization for plantation commodity agroindustry products such as Indonesian coffee in the international market. Coffee business that leads to free markets has implications for the price of coffee in the domestic market which is increasingly open to market turmoil. Coffee prices on the world market are directly transmitted to domestic coffee prices. Coffee prices in Indonesia are influenced not only by the production and prices of domestic coffee, but also strongly influenced by prices formed in the world market, especially coffee prices in the Indonesian

coffee export market. the biggest coffee importing countries are the United States, Germany, Japan, Italy and Malaysia.

Price is an indicator to see the transmission between markets and the level of efficiency of the supply chain for a commodity. There is a price disparity between the price of Indonesian coffee exports and the price of imported coffee in the importer's markets. Price disparity causes a trade off between the price desired by the producer and the price desired by consumers in the importing country. Farmers as producers want high coffee prices. However, consumers want low coffee prices. Therefore, it is important to examine what the threshold price (threshold) desired by Indonesian coffee producers and consumers in the importing country.

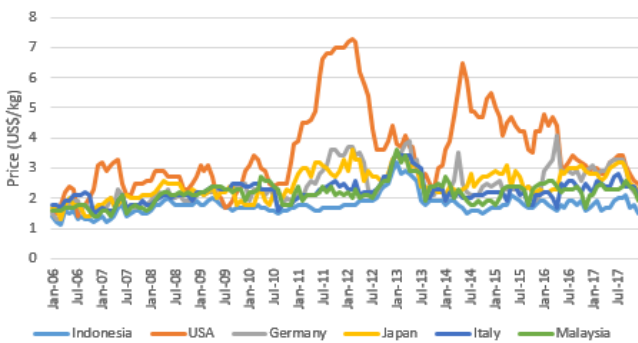


Figure 1: Coffee Price Movements in Importing Countries and Indonesia, 2006-2017

Price movements reflect the conditions of the development of demand and supply, strength from supply and demand have influence to changes and price fluctuations in the world market both exporters and importers markets. The growing coffee competition and market liberalization has made competitiveness even tighter because other countries that have the opportunity to export coffee products are a big challenge for Indonesia. The high supply of coffee in the world market is finally able to make prices fluctuate.

This study is focused on identifying the competitiveness of Indonesia's coffee business with other exporting countries, analyze price transmission and estimate threshold value of transmission of coffee prices between the Indonesian market and the main importing countries, namely the United States, Germany and Japan, Italy and Malaysia.

II. LITERATURE REVIEW

2.1 Price Transmission

Conforti (2004) defined that price transmission is an analytical study of how a price influences one another on the market, both spatially / geographically and vertically differences / seen from its marketing chain. Price transmission and level of market integration are efficiency indicators formed between two markets that interact, both vertically and spatially (Meyer and Von Cramon-Taubadel 2004).

Transmission of asymmetry prices occurs if there is a difference in the price response between positive price shock (at the time of price increase) and negative price shock (during a price decline). Several factors cause price asymmetry, (1) imperfect competition, for example the existence of information lags, promotions and market concentration (Henderson and Quant 1980), and (2) the response of market forces to imperfect competition markets characterized by the role of price leadership by major buyers and major sellers (Von Cramon and Taubadel 1997).

2.2 Analysis of Competitiveness

Competitiveness has an understanding of the ability of a commodity to enter foreign markets and the ability to survive in that market. The competitiveness of a commodity can be measured on the basis of a comparison of the market share of the commodity in a fixed market condition. To be able to do trade between countries, a commodity needs to have a comparative advantage and competitive advantage. Economist David Ricardo states that the benefits of

trade will still be obtained by a country even though certain countries do not have any advantages, as long as the price ratio between countries is still different.

International coffee exports are regulated by regulations from the International Coffee Organization (ICO). The business traffic and coffee trade in the international market regulated by the ICO aims to maintain the stability of coffee prices on the international market due to unbalanced supply and demand of coffee on the international market. The regulation of the coffee trade by the ICO came into force in 1957 with a quota system, namely by limiting the amount of coffee exports to the international market.

In 1989 the quota system was dismissed, because it was deemed unfavorable for the coffee exporting country. Coffee exporting countries are free to export their coffee starting in 1989. Lubis (2002) The existence of freedom of trade actually reduced the trend of coffee prices in the international market which reached the lowest price level in 1993. To overcome the decline in coffee prices in the international market, control of international coffee coffee export quality standards by ICO.

2.3 Threshold Cointegration

Threshold model is used to explore and adjust price transmission speed and cointegration approach are used to determine whether there is integration in the long term or not. Balke and Fomby (1997) introduced Threshold cointegration that combines nonlinearity and cointegration by allowing nonlinear adjustments in the long run (nonlinear adjustments over the long run).

Threshold Vector Error Correction Model (TVECM) is a model that is used to determine a condition that is limited by a threshold, so that two or more different conditions are created. The expansion of this model increases the ability of cointegration analysis to represent the phenomenon of the real world economy

by loosening the assumption that the speed at which the cointegrated series moves toward a long-term equilibrium relationship is not constant over time.

III.METHODS

3.1 Analysis of Competitiveness

In this study to determine the competitiveness of the Indonesian coffee in importing countries analyzed using Constant Market Share Analysis (CMSA). CMSA or constant market share analysis is used to measure the dynamics of the level of competitiveness of an industry from a country and the effects that most influence it. To analyze the level of competitiveness of Indonesian coffee per year and its growth distribution based on four effects that can be mathematically formulated as follows (Tambunan 2004)

There are four indicators in CMSA analysis, namely:

- a. Standard Growth (SG), describe export growth coffee of a country caused by an increase in world coffee imports.

$$\frac{E_{(t)} - E_{(t-1)}}{E_{(t-1)}} = r$$

- b. Composition Effect (CE), related to world market interest in goods concerned.

$$\frac{\sum_i (r_i - r)E_{it-1}}{E_{(t-1)}}$$

- c. Market Distribution Effect (MDE), illustrates the growth of business coffee exports influenced by the ability of a country to market coffee commodities to markets that have high demand.

$$\frac{\sum_i \sum_j (r_{ij} - r_i)E_{ijt-1}}{E_{(t-1)}}$$

- d. Effect of Competitiveness (EC), describes the competitiveness of business coffee exports countries that are not caused by standard growth effects, effects market composition and distribution, but because of competitiveness excellence in product quality or price of exporting countries.

$$\frac{\sum_i \sum_j (E_{ij(t)} - E_{ij(t-1)}) - r_{ij} E_{ij(t-1)}}{E_{i(t-1)}}$$

$$r_i = \frac{E_{i(t)} - E_{i(t-1)}}{E_{i(t-1)}}$$

$$r_{ij} = \frac{E_{ij(t)} - E_{ij(t-1)}}{E_{ij(t-1)}}$$

where:

- $E_{(t)}$ = World export value of all commodity months t (US \$)
- $E_{(t-1)}$ = World export value of all commodities of month t-1 (US \$)
- r = Standard growth (all commodities) (US \$)
- r_i = Standard coffee growth (US \$)
- r_{ij} = Growth of coffee standards in country j (US \$)
- $E_{i(t)}$ = Indonesian coffee exports month t (US \$)
- $E_{i(t-1)}$ = Indonesian coffee exports month t-1 (US \$)
- $E_{ij(t)}$ = Export of coffee from Indonesia to importing country t (US \$)
- $E_{ij(t-1)}$ = Export of coffee from Indonesia to importing country t-1 (US \$)

3.2 Analysis of Price Transmission

The data used to provide an overview of competitiveness analysis and threshold price transmission of Indonesian coffee in importing countries during 12 years from 2006 to 2017. This study uses secondary data collected from various sources. coffee export value of exporting countries (Brazil, Vietnam, Colombia and Indonesia), Indonesian coffee prices, coffee import volume, coffee import value, and coffee prices in importing countries (United States, Japan, Germany, Italy and Malaysia), exchange rates rupiah, and inflation are obtained

from International Trade map, Statistics Indonesia, and Bank of Indonesia which are further processed used excel, eviews, and R software for the purposes of this study (Table 1).

TABLE I
VARIABLES WERE USED

Variable	Description	Unit
Volume Export (VOLE)	The export volume of coffee exporting countries	Ton
Value Export (VALE)	The export value of coffee exporting countries	Million US\$
Indonesian Coffee Price (ICP)	Indonesian market coffee prices	US\$/Kg
Importing Coffee Price (IMP)	Coffee prices in the main importer market	US\$/Kg
Volume Import (VOLIM)	The import volume of the importing countries	Ton
Value Import (VALIM)	Value of imported coffee in the main importer market	Million US\$
Inflation (INF)	Inflation rate calculated from consumer price index	%
Exchange Rate	The price of a country's currency at the price of another country's currency.	Rupiah/US\$

Analyzing price transmission using ECM developed by Von Cramon Taubadel and Loy (1996). The asymmetric ECM model used in this study:

$$\begin{aligned} \Delta ICP &= \alpha_0 + \sum_{i=1}^n \beta_{11}^- \Delta ICP_{t-i}^- + \sum_{i=0}^n \beta_{12}^- \Delta ICP_{t-i}^- + \pi_1 ECT_{t-i}^- + \sum_{i=1}^n \beta_{21}^+ \Delta ICP_{t-i}^+ + \\ &\quad \sum_{i=0}^n \beta_{22}^+ \Delta ICP_{t-i}^+ + \pi_2 ECT_{t-i}^+ + \varepsilon_t \\ \Delta IMP_t &= \alpha_0 + \sum_{i=1}^n \beta_{11}^- \Delta IMP_{t-i}^- + \sum_{i=0}^n \beta_{12}^- \Delta IMP_{t-i}^- + \pi_1 ECT_{t-i}^- + \sum_{i=1}^n \beta_{21}^+ \Delta IMP_{t-i}^+ + \\ &\quad \sum_{i=0}^n \beta_{22}^+ \Delta IMP_{t-i}^+ + \pi_2 ECT_{t-i}^+ + \varepsilon_t \end{aligned}$$

Where ICP is the price of Indonesian coffee exports, IMP is the price of coffee imports in the importing countries, ε_t is an error, and ECT is a form of deviation from long-term balance (cointegration balance) of ΔICP_{t-i} and ΔIMP_{t-i} , which are then separated in the form positive (ECT⁺) and negative (ECT⁻). ECT⁺ describes conditions when deviations are above the long-term equilibrium line, while ECT⁻ describes conditions when deviations are below the long-term equilibrium line.

The hypothesis used in this study are (1) In the world market of coffee trade, Indonesia has lower competitiveness compared to its competitors, (2) Price asymmetry occurs between Indonesian coffee prices and coffee prices in importing countries, namely the United States, Japan, Germany, Italy and Malaysia, and (3) There is a difference in the response of the transmission of coffee prices where the price of coffee in the Indonesian market reacts more quickly to changes in coffee prices that occur in the major importing countries.

3.3 Analysis of Threshold Price Transmission

The method used to estimate the threshold value, namely threshold cointegration through the TVECM model equation as follows (Hansen and Seo 2002):

$$\begin{aligned} \Delta IMP_t &= \theta_{11} + \alpha^1 \omega_{t-1}(\beta) + \lambda_{111}^1 \Delta IMP_{t-1} + \lambda_{121}^1 \Delta ICP_{t-1} \\ &\quad + \lambda_{112}^1 \Delta ICP_{t-2} + \lambda_{122}^1 \Delta ICP_{t-2} + u_t^1 \end{aligned} \left. \begin{array}{l} \text{if} \\ \omega_{t-1}(\beta) \leq \gamma \end{array} \right\}$$

$$\begin{aligned} \Delta ICP_t &= \theta_{12} + \alpha^1 \omega_{t-1}(\beta) + \lambda_{211}^1 \Delta IMP_{t-1} + \lambda_{221}^1 \Delta ICP_{t-1} \\ &\quad + \lambda_{212}^1 \Delta IMP_{t-2} + \lambda_{222}^1 \Delta ICP_{t-2} + u_t^1 \end{aligned}$$

$$\begin{aligned} \Delta IMP_t &= \theta_{21} + \alpha^2 \omega_{t-1}(\beta) + \lambda_{111}^2 \Delta IMP_{t-1} + \lambda_{121}^2 \Delta ICP_{t-1} \\ &\quad + \lambda_{112}^2 \Delta IMP_{t-2} + \lambda_{122}^2 \Delta ICP_{t-2} + u_t^2 \end{aligned} \left. \begin{array}{l} \text{if} \\ \omega_{t-1}(\beta) > \gamma \end{array} \right\}$$

$$\begin{aligned} \Delta ICP_t &= \theta_{22} + \alpha^2 \omega_{t-1}(\beta) + \lambda_{211}^2 \Delta IMP_{t-1} + \lambda_{221}^2 \Delta ICP_{t-1} \\ &\quad + \lambda_{212}^2 \Delta IMP_{t-2} + \lambda_{222}^2 \Delta ICP_{t-2} + u_t^2 \end{aligned}$$

Where:

ΔIMP_t = Coffee import prices in importing countries (US \$ / kg)

ΔICP_t = Coffee export prices in Indonesia (US \$ / kg)

$\omega_{t-1}(\beta)$ = Residual from the relationship of the

balance of coffee prices in importing

countries and Indonesia

representing

the threshold variable (ECT)

γ = threshold parameter that separates two regimes

Threshold cointegration is proposed by Balke and Fomby (1997) as feasible techniques for combining non-linearity and cointegration. In particular, this model allows for non-linear adjustments to long-run equilibrium. Hansen and Seo (2002) estimate two regime Threshold Vector Error Correction Models (TVECM) with one cointegration vector and threshold parameter based on error correction term.

IV. RESULTS AND DISCUSSION

4.1 Analysis of Competitiveness

Competitiveness Analysis in this study focused on the comparative advantage of the world's major coffee exporting countries, namely Brazil, Vietnam, Indonesia and Colombia. Whereas for the major coffee importing countries in the world, namely America, Germany, Japan, Italy and Malaysia. The analysis is done by comparing the export share and the Constant Market Share Analysis (CMSA) value.

Market share is used to see the level of competition between country for certain commodities. A large market share owned by a countries indicate their ability to compete in the world coffee trade.

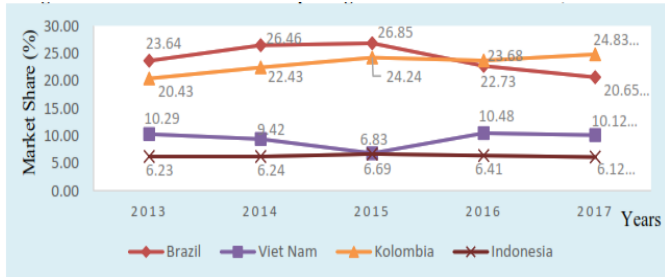


Figure 2: Market Share of Coffee Exporting Countries in USA's Market, 2013-2017

The decline in the share of Indonesian coffee exports to America in 2016 led to the lowest share of Indonesia's coffee exports to America compared to Vietnam which had a trend of export share which had a tendency to increase. While the export share of Brazilian, Vietnamese, Indonesian and Colombian coffee for the market in Germany can be seen in Figure 2.

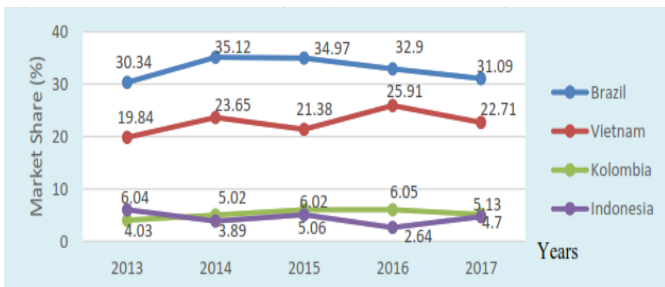


Figure 3: Market Share of Coffee Exporting Countries in Germany's Market, 2013-2017

Business competitiveness in Germany's coffee market, based on figure 3 that market share of Indonesian coffee market in 2013 it reached 6.04 percent. The share of Indonesian coffee exports to Germany continues to experience a downward trend over the period 2013-2017. The share of Brazil's coffee exports to Germany also declined. In 2013, the share of Vietnamese coffee exports to Germany reached 19.84 percent of total coffee imported by Germany and continued to experience an upward trend until 2017

reached 22.71 percent. In 2014, Brazil's share of the coffee trade in Germany reached the highest of 35.12 percent of Brazil's total coffee imports so that Brazil became the country that controlled the share of the coffee trade in Germany.

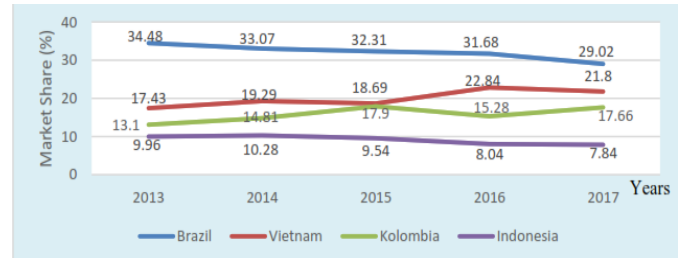


Figure 4: Market Share of Coffee Exporting Countries in Japan's Market, 2013-2017

Coffee business and trade in the Japanese market for the 2013-2017 period (Figure 4), the highest Indonesian coffee market share in 2014 reached 10.28 percent. The share of Indonesian coffee exports in the Japanese market also experienced a downward trend. On the other hand, the share of Colombian coffee exports for Japan continues to increase. In 2013, the share of Colombian coffee exports to Japan only reached 13.1. Brazil's share of the coffee trade in Japan still dominates despite a downward trend.

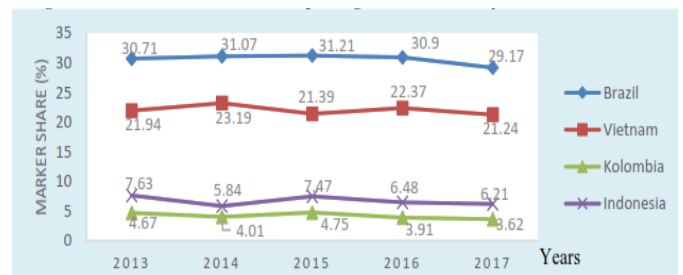


Figure 5 : Market Share of Coffee Exporting Countries in Italy's Market, 2013-2017

The coffee market share of major coffee exporting countries, namely Brazil, Vietnam, Indonesia and Colombia in the Italian market in Figure 5 shows fluctuating dynamics. In 2013-2017, Indonesia had a higher share of coffee exports than Colombia for the Italian market, which averaged 6.34 percent of total Italian coffee imports. However, in the following years the market share of Indonesian coffee exports to

Italy experienced fluctuations with a downward trend. Whereas Vietnam, which in 2015 also experienced a decline in market share of 2.59 percent compared to 2014.

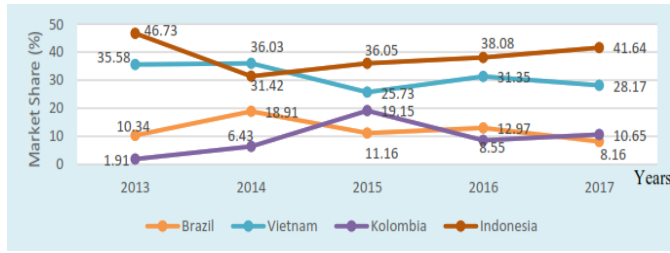


Figure 6: Market Share of Coffee Exporting Countries in Malaysia's Market, 2013-2017

In the Malaysian market, Indonesian coffee exports dominate the export share with the trend that has experienced the largest increase compared to other major exporters. The average share of Indonesian coffee exports in the Malaysian market (Figure 6) during the 2013-2017 period amounted to 38.78 percent, far surpassing Brazil and Colombia which only reached 12.30 percent and 9.33 percent respectively.

TABLE III

CMSA VALUE OF INDONESIAN COFFEE EXPORTS AND EXPORTING COUNTRIES

Indicators CMSA	Exporting Countries			
	Brazi l	Vietna m	Indonesi a	Colom bia
Standard Growth (SG)	0.066	0.155	0.071	0.064
Composition Effect (CE)	- 0.000	-0.000	0.000	-0.001
Market Distribution Effect (MDE)	0.019	0.139	0.158	0.026
Effect of Competitiveness (EC)	0.020	-0.153	-0.168	-0.074

Competitiveness is an important factor in a country's business growth and commodity trading. Positive business and trade growth shows the performance of

the country's commodity exports is good. The results of the CMSA analysis in Indonesia show that Indonesia's ability in the competitiveness of the coffee export business is more influenced by the effects of market distribution.

The ability of Indonesian coffee exports is quite good in marketing coffee to markets that have high demand in the world coffee importing countries. Based on Table 2 shows that in 2006-2017 Brazil as the largest coffee producer in the world has the ability to compete with coffee exports more influenced by the effects of standard growth in the growth of its exports. This is indicated by the positive average value of standard growth effects and shows that there is an increase in coffee exports due to the high demand for world coffee imports.

4.2 Analysis of Coffee Price Transmission

In each market, the price transmission analyzed is the transmission that occurs at coffee prices at the local or Indonesian level and in the main importing country. The coffee price data in the analysis uses US\$/kg. In Table 3, a statistical description of the price data used is presented.

TABLE IIIII

DESCRIPTIVE STATISTICS ON INDONESIAN COFFEE PRICES AND IMPORTING COUNTRIES, 2006-2017

Countries	Statistics of Coffee Business		
	Means	Std. Deviation	Coefficient of Variation
Indonesia	1.78	0.32	0.18
Amerika	3.57	1.37	0.38
Jerman	2.22	0.78	0.35
Jepang	2.38	0.51	0.22
Italia	1.94	0.39	0.20
Malaysia	1.98	0.41	0.24

Based on the coefficient of variation, it can be seen that in the coffee market, the price of coffee in the USA's market is a price that has the highest level of

price fluctuations compared to other market. This is because the price level of importers in the USA's market is strongly influenced by the available supply. Fluctuations in the availability of coffee from various regions can influence supply at the level of wholesalers or importers so prices also become more volatile (Mahayana 2016).

TABLE IVv

ECM MODEL OF COFFEE MARKET PRICE TRANSMISSION IN THE USA, GERMANY, JAPAN, ITALY, MALAYSIA AGAINST INDONESIA COFFEE

Variable	USA ↑ Indonesia	Germany ↑ Indonesia	Japan ↑ Indonesia	Italy ↑ Indonesia	Malaysia ↑ Indonesia
Intercept	-0.06 ^a (0.74) ^b	0.06 (0.27)	-0.04 (0.61)	0.02 (0.25)	-0.01 (0.39)
ΔICP_{t-1}	0.42 (0.33)	0.34 (0.72)	0.05 (0.83)	0.61 (0.56)	0.03 (0.84)
ΔICP_{t-1}^*	0.04 (0.53)	0.08 (0.76)	0.11 (0.47)	0.26 (0.33)	0.08 (0.64)
ΔIMP_t^*	0.28*** (0.00)	0.46*** (0.00)	0.21 (0.11)	0.38* (0.07)	0.56* (0.10)
ΔIMP_t^*	0.61*** (0.00)	0.22 (0.18)	0.29 (0.14)	0.13 (0.18)	0.32* (0.08)
ΔIMP_{t-1}	-0.41*** (0.00)	0.36 (0.87)	-0.36 (0.08)	0.20 (0.95)	0.17** (0.02)
ΔIMP_{t-1}^*	0.29 (0.26)	0.18 (0.62)	0.30** (0.02)	0.02*** (0.00)	0.30** (0.03)
ECT^-	0.08 (0.67)	2.14 (0.60)	0.06 (0.54)	4.62 (0.70)	0.02 (0.57)
ECT^+	0.03 (0.49)	7.21 (0.15)	0.15*** (0.00)	6.83 (0.14)	0.06 (0.37)
R^2	0.56	0.37	0.24	0.27	0.37
$R^2\text{-adj}$	0.48	0.25	0.13	0.26	0.31
F-statistik	7.86 (0.00)	3.27 (0.00)	1.89 (0.03)	2.01 (0.01)	7.63 (0.00)

Based on Table 4, the decline in coffee import prices on the German market it has a significant effect on the 1 percent level of the price of coffee exports in the Indonesian market with a positive coefficient value, meaning that when German import prices fall in the period the Indonesian coffee export market will respond the same way lowering prices, while when the increase in the price of imported coffee in the German market does not affect the price of coffee exports in the Indonesian coffee export market, this means that when the price of imported coffee in the German market rises in the coffee export market in Indonesia.

In the long-term transmission price relationship between the price of coffee in the main importer market and the price of coffee exports in the Indonesian market, ECT (*Error Correction Term*) values are seen. Based on the ECT value in Table 4,

the import price of coffee in the United States market on the price of coffee exports in the Indonesian market shows that ECT⁺ and ECT⁻ has positive value. It means that price deviations are above the equilibrium line (when the decline in coffee import prices in the United States import market is not followed by a decline the price of coffee exports in the Indonesian market) and when the price deviation is below the balance line (when the increase in the price of imported coffee in the United States market is not followed by an increase in export prices in the Indonesian export market).

TABLE V
CAUSALITY TEST

Relationship Price between Indonesia's Market and Importing Countries	USA's market and Indonesia's market	Germany's market and Indonesia's market	Japan's market and Indonesia's market	Italy's market and Indonesia's market	Malaysia's market and Indonesia's market
(IMP → ICP)	2.59 ^a (0.07*) ^b	0.97 (0.02**)	3.29 (0.07*)	3.27 (0.04**)	3.88 (0.05*)
(ICP → IMP)	1.50 (0.22)	0.20 (0.65)	0.00 (0.94)	0.71 (0.49)	0.48 (0.48)

Causality testing is done to ensure the direction of price transmission. This test is conducted to see the direction of price transmission, namely price shock caused by changes in demand or shock due to changes in supply. In this study causality testing was carried out using the Granger Causality Test as seen in Table 5.

Causality between the Indonesian coffee market and the main coffee importers markets, namely the United States, Germany, Japan, Italy and Malaysia. The results of the causality test show that there is a unidirectional relationship namely the price of coffee imports in the markets of the United States, Germany, Japan, Italy, and Malaysia capable of influencing the price of coffee exports in Indonesia.

The price of coffee exports in Indonesia is not able to influence the price of coffee imports in the markets of the United States, Germany, Japan, Italy and Malaysia. This is because these markets are the main export

destination markets for Indonesian coffee which are seen from the import market share (Khumaira 2016).

The price of coffee exports in Indonesia is not able to influence coffee prices in importing countries. This is because Indonesia is a small market, so Indonesian coffee prices will not be able to influence prices because the market share of coffee exports in Indonesia to the main importing countries is not the dominant coffee exporter. Overall from the results of testing the coefficient using wald test in the asymmetry model shows that for the price transmission coefficient in the short term an asymmetry relationship occurs except the coffee import at Germany's market.

4.3 Estimated Threshold Value of Indonesian Coffee Prices with Importing Countries Coffee Prices

The estimation of the threshold value and price transmission in this study is the transmission of coffee prices in the Indonesian market with the main importing countries including the United States, Germany, Japan, Italy and Malaysia. the study of price transmission and threshold aims to find out how much the trade margin between the coffee exports of Indonesian exporters and importing countries varies from time to time.

The threshold value of coffee price transmission in the Indonesian market with coffee prices in importing countries is analyzed using the Threshold Vector Error Correction Model (TVECM) method using real prices. TVECM can explain the effects of transaction costs on price transmission without directly depending on information about these costs. Threshold cointegration is proposed by Balke and Fomby (1997) as feasible techniques for combining non-linearity and cointegration.

In particular, the TVECM model allows for nonlinear adjustments to long-run equilibrium. In this study TVECM used single threshold which divided the model into two regimes to estimate the parameter of

Threshold Vector Error Correction Model. Threshold can be explained as a shock value, determined in the smallest percentage change in coffee prices in the Italian market from long-run equilibrium which will shift the system to different regimes, thus indicating a shift in the adjustment pattern.

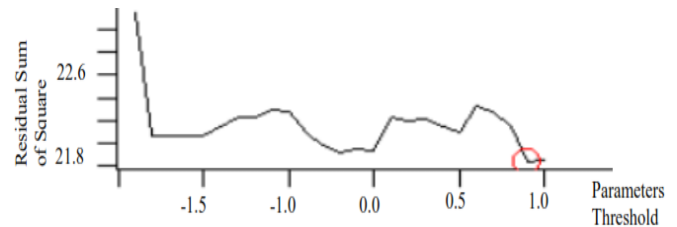


Figure 7: Threshold Value of Indonesian Coffee Prices and USA Coffee Prices

The Threshold Vector Error Correction Model (TVECM) test on Indonesian coffee prices with coffee prices in the United States is based on the approach taken by Hansen and Seo (2002). Based on Figure 7, TVECM test results obtained a threshold value of 0.9, which divides the model into two regimes namely regime one (lower regime) and regime two (upper regime) with the percentage of observations in each regime amounting to 90.8 percent and 9.2 percent.

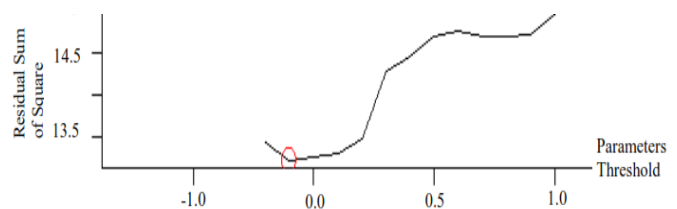


Figure 8: Threshold Value of Indonesian Coffee Prices and Germany Coffee Prices

P-value in supLM testing with a value of 0.049 smaller than the value of critical value $\alpha = 0.05$. This means that the price of Indonesian coffee with German coffee has a threshold cointegration. Based on Figure 8, the TVECM test results obtained a threshold value of -0.6, which divides the model into two regimes namely regime one (lower regime) and regime two (upper regime) with the percentage of observations in each regime at 9.2 percent and 90.8 percent.

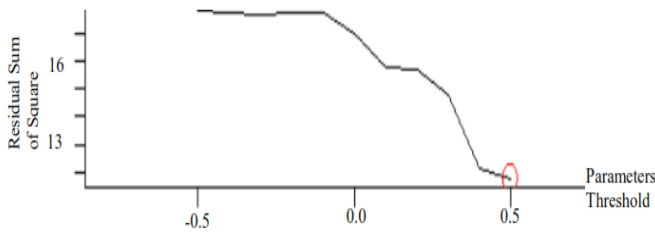


Figure 9: Threshold Value of Indonesian Coffee Prices and Japan Coffee Prices

The threshold value represents the values of the residual terms of cointegration regression that initiate changes in the response pattern to the presence of shocks (deviations from long-term balance). Based on Figure 9, threshold value of 0.5 indicates that when the deviation from the average coffee price in the Japanese market and the price of coffee in the Indonesian market increases at a long-term balance exceeding 50 percent, the price will adjust to achieve its balance so that the two coffee prices in the two markets have a cointegration relationship which happened in regime one.

Conversely, when the deviation from the average price of coffee in the Japanese market and farmers in the long-term balance is less than 50 percent, there will be no price adjustments which occur in regime 2 (the top regime).

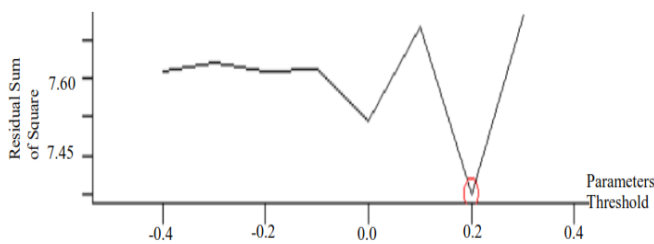


Figure 10: Threshold Value of Indonesian Coffee Prices and Italy Coffee Prices

ECT (Error Correction Term) value of coffee in the Italian market is greater than the ECT value of the price of coffee in the Indonesian market. The results show that the deviation from the long-run equilibrium of coffee prices on the Italian market is generally higher than the price of coffee in the Indonesian market. In other words, the price of coffee

in the Italian market has increased faster than the price of coffee in the Indonesian market. So that the process of price adjustments made by the price of coffee in the Italian market to achieve equilibrium inefficiency.

Based on Figure 10, threshold value of 0.2 indicates that when the deviation from the average coffee price in the Italy's market and the price of coffee in the Indonesian market increases at a long-term balance exceeding 20 percent, the price will adjust to achieve its balance so that the two coffee prices in the two markets have a cointegration relationship which happened in regime one. Conversely, when the deviation from the average price of coffee in the Japanese market and farmers in the long-term balance is less than 20 percent, there will be no price adjustments which occur in regime 2 (the top regime).

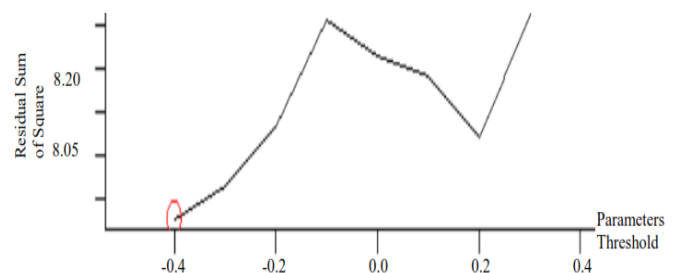


Figure 11: Threshold Value of Indonesian Coffee Prices and Malaysia Coffee Prices

Threshold vector error correction model (TVECM) in this study uses one threshold, two regimes to estimate the parameter of threshold vector error correction model. Based on Figure 11, Indonesian coffee prices with Malaysian coffee prices produce a threshold parameter $\lambda = -0.4$ and show there are two regimes, regime 1 (the lower regime) has 7% of observations, while regime 2 (top regime) has 93% of observations.

The threshold parameter (λ) represents the values of residual terms of cointegrating regression that initiate changes in the pattern of responses to shocks. The threshold value of -0.4 means that when the deviation of the average coffee price in the Malaysian market

increases and the price of coffee in the Indonesian market decreases at a long-term balance of more than 40 percent, the price will adjust to achieve balance so that the two coffee prices have a cointegration relationship where occurs in regime 2 (top regime). Conversely, when the deviation from the average price of coffee in the Malaysian market and the price of coffee in the Indonesian market at a long-term balance is less than 40 percent, there will be no price adjustments that occur in regime one.

The threshold model shows a significant adjustment in coffee prices in the Indonesian market on long-term balance deviations. Because transaction costs on the agricultural market are relatively small and the price adjustment process is more efficient. The results also show that prices at the level of the main importing countries at the VECM threshold have a significant adjustment to long-term balance deviations.

V. CONCLUSION

1. Analysis of Competitiveness of Indonesian coffee is influenced by the effect of market distribution. This indicated by the average value of market distribution during the period 2006-2017 which shows a positive value. It means that business of Indonesia coffee has a quite good in marketing to market that have high demand in the importing countries. Compared to other coffee exporting countries, in terms of standard growth parameters, business competitiveness of Indonesian coffee is still inferior to Vietnam. Parameters effect market distribution and distribution, Indonesia coffee is superior compared to Brazil, Vietnam, and Colombia. The parameter effect of competitiveness, Indonesia coffee is still not strong enough to defeat the dominance of competitiveness of Brazilian and Vietnamese coffee.

2. Price transmission in the short term has an asymmetry relationship in all markets of major importing countries except the coffee import market in Germany. In the long run, in terms of speed of completion, there is a symmetrical relationship between the prices of Indonesian coffee exports and prices in the main importer markets (USA, Japan, Germany, Italy, and Malaysia). Price transmission is formed because of the existence of a one-way relationship, namely the price of coffee in the market of the main importer's country affects the price of coffee in the Indonesian market and does not occur otherwise.

3. The estimated threshold value between the Indonesian coffee market and the coffee market are the main importing countries, the United States is 0.9, Germany is -0.6, Japan is 0.04, Italy is 0.2, and Malaysia is -0.4. This shows that when the coffee price deviation in importing countries and Indonesia in its long-term balance exceeds its threshold value, coffee prices in importing countries will adjust to achieve their balance so that both coffee prices are in the Indonesian market and the markets of countries importers have a cointegration relationship. Conversely, when the coffee price deviation in importing countries and Indonesia is less than the threshold value, there will be no price adjustment. The price of coffee in the markets of importing countries has increased faster than the price of coffee in the Indonesian market.

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