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Export-Import Of Sugar In Asean Countries And The Impact To Indonesia Sugar Market

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Abstract. Sugar is a second food commodity that most widely produced in ASEAN. Sugar is produced and consumed by the ASEAN countries with vary level production and consumption. AFTA is one of trade liberalization applied in Southeast Asia. The implementation of AFTA will lead to market integration among countries, which means the market of the country will interact with other markets. This study will give description of sugar trade especially about export and import in ASEAN countries. It will also be seen the influence of the Thailand and Philippines sugar market to Indonesia sugar market. Secondary data used in this study namely export and import of sugar, price of sugar, and the exchange rate in Thailand, Philippines and Indonesia. The impact of Thailand and Philippines sugar market to Indonesia sugar market will be analyzed by VAR analysis. The results showed that from 2003 to 2007 the average of Thailand sugar exports amounted to 370,268,470 USD and Philippines about 72,001,500 USD. Indonesia became a net importer, the average of imports reached 267,235,800 USD. Tariff and non tariff policies are applied to the sugar trade by these countries. This is causes the small impact of sugar markets from other countries on domestic sugar market in each country.

Keywords: ASEAN, Sugar, Market, Export, Import

1. Introduction

Rice, corn, soybeans, sugar and cassava are the five major food commodities in ASEAN. Sugar is a second food commodity that most widely produced. Sugar is produced and consumed by the ASEAN countries with vary level production and consumption. Thailand and the Philippines are the world's sugar exporting countries, while Indonesia is a net importer of sugar. The production of Indonesia sugar is slightly so it does not meet consumption needs. In 2006 Indonesia sugar production is only 2.267 million tons, so far compared to Thailand which reached 54.149 million tons and the Philippines at 24.345 million tons (ASEAN Secretariat, 2008).

AFTA is one of trade liberalization applied in Southeast Asia. AFTA is a form of economic integration that occurs among countries in ASEAN. The implementation of AFTA will lead to market integration among countries, which means the market of the country will interact with other markets. Trade liberalization carried out by all ASEAN countries or by a state either by the exporter or importer will directly affect demand and supply of food commodities in ASEAN. The changes that occur will be having an impact on trade at domestic level. Based on these conditions, the purpose of this study is to give description of sugar trade especially about export and import in ASEAN, to the three sample countries, namely Thailand, Philippines and Indonesia. It will also be seen the influence of the Thailand and Philippines sugar market to Indonesia sugar market.

2. Research Method

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The data used in this study is secondary data of export and import of sugar, price of sugar, and the exchange rate in three ASEAN countries (Thailand, Philippines and Indonesia). Data obtained in the field are mathematically processed, tabulated and presented descriptively. The impact of Thailand and Philippines sugar market to Indonesia sugar market will be analyzed by Vector Autoregression (VAR) using Eviews.5.1 Program. VAR with order p and n dependent variables in the t periods can be modeled as follows (Thomas, 1997):

$$Y_t = a_o + a_1 Y_{t-1} + a_2 Y_{t-2} + \ldots + a_p Y_{t-p} + \varepsilon_t$$

Notes:

Y_t = vector of dependent variables ($Y_{1.t}$, $Y_{2.t}$,..., $Y_{n.t}$), size n x 1
a_o = intercept vector size n x 1
a_i = parameter matrix size n x m for each i = 1, 2,..., p
ε_t = residual vector (ε1.t, ε2.t,..., εn.t) size n x 1
n = number of rows in the matrix n x m
m = number of columns in the matrix n x m

3. Result and Discussion

3.1. Export and Import of Sugar in Thailand, Philippines and Indonesia

The value of exports and imports of sugar in Thailand, Philippines and Indonesia from 2003 to 2007 are presented in Table 1. From 2003 to 2007 the average of Thailand sugar exports amounted to 370,268,470 USD annually. Philippines sugar production is the second largest in ASEAN after Thailand, average exports each year about 72,001,500 USD. Exports value of Philippines less than Thailand, but in that period Philippines only one time (2006) did import of sugar at a relatively small amount 316,380 USD. Different to Thailand and Philippines, Indonesia became a net importer of sugar with a relatively large amount. During 2003 to 2007 Indonesia doing imports of sugar reached 267,235,800 USD.

Table 1: Export and Import of Sugar in Thailand, Philippines and Indonesia, Period 2003-2007 (USD 000)

Year	Thailand		Philippines		Indonesia	
	Export	Import	Export	Import	Export	Import
2003	425 686.70	0.03	62 023.24	0.00	67.58	85 310.65
2004	347 143.85	6.83	67 265.58	0.00	67.47	94 414.79
2005	333 122.62	1 292.59	66 264.82	0.00	147.74	235 351.74
2006	375 120.71	3 372.49	84 687.54	316.38	179.73	291 091.23
2007	417 118.81	-	79 766.34	0.00	280.91	630 010.59
Average	370 268.47	1 167.99	72 001.50	63.28	148.68	267 235.80

Resource: World Bank, 2009
Note : '-' not available at the time of publication

Trading sugar among Thailand, Philippines and Indonesia, during 2003 to 2007, besides Thailand, Philippines is also an exporter for Indonesia. In the period 2005, sugar from Philippines to Indonesia amounted to 12,467,510 USD and in 2007 amounted to 10,250,360 USD. Only in 2006 Philippines doing imports slightly of sugar from Thailand amounted to 140,680 USD (Table 2).

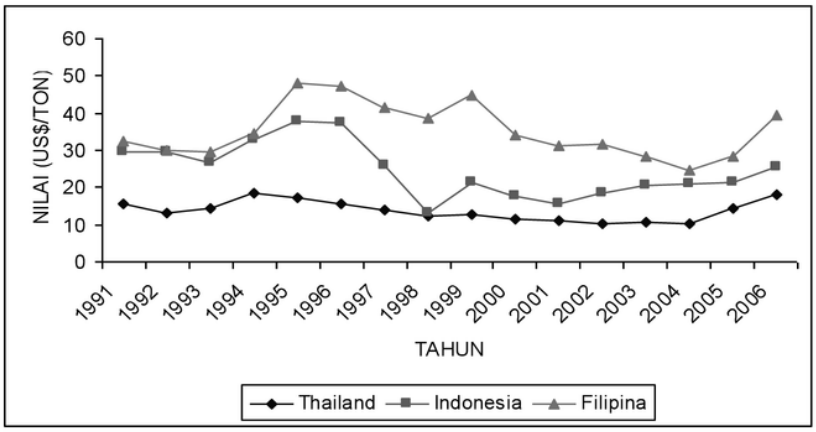
Table 2: Value Chain Sugar Trading Inter Thailand, Philippines and Indonesia, Period 2003-2007, (USD 000)

Export	Import									
	2003		2004		2005		2006		2007	
	Philippines	Indonesia	Philippines	Indonesia	Philippines	Indonesia	Philippines	Indonesia	Philippines	Indonesia
Thailand	0.00	47 318.36	0.00	60 747.29	0.00	102 277.35	140.68	35 690.10	0.00	233 841.33
Philippines	n.a.	0.00	n.a.	0.00	n.a.	12 467.51	n.a.	0.00	n.a.	10 250.36
Indonesia	5.31	n.a.	0.00	n.a.	0.00	0.00	0.00	n.a.	0.43	n.a.

Resource: World Bank, 2009
Note : n.a. not applicable

Based on the price of sugar in Thailand, Philippines and Indonesia, it can be said that the relationship of price in three markets indicated move together. However, Fig. 1 shows that when the price of these countries is plotted from 1991 to 2006 shows that the price trend is not always the same place or direction.

Thailand sugar market is very contrast to the Philippines and Indonesia sugar market, which has almost the same price trend from 1991 until 1994. Can be seen in Fig. 1, starting in 1995 there is a big difference in the price of sugar in the Philippines and Indonesia. In 1998, when the economic crisis that hit Indonesia can be seen that the price of sugar Indonesia in USD per ton moved down so drastically, this is because the exchange rate of domestic currency (rupiah) weakening against the USD. Starting in 2004 the price trend began to show almost the same direction, this may be caused by the entry into force of AFTA which resulted in the integration of sugar market between three countries. AFTA means going liberalization of trade among countries of ASEAN members as a result of the reduction and elimination of tariffs, elimination of non-tariff barriers and the improvement of trade facilitation policies.



Resource: FAO Statistics Division, 2008

Fig. 1: Sugar Producer Price in Thailand, Indonesia and Philippines, Period 1991-2006

3.2. The Impact of Thailand and Filipina Sugar Markets to Indonesia Sugar Market

Model of this research is analyzes the time series data. This study used analysis tools the Vector Autoregression. First stage carried out in data processing is stationary testing data, performed with the unit root tests. For this purpose use Dickey-Fuller test (DF) and Augmented Dickey-Fuller (ADF) (Thomas, 1997). Stationarity test results indicate that the data used in this study are not stationary at levels but stationary at first difference or I (1). The next step is testing the optimal lag length, it is useful to eliminate the problem of autocorrelation in the VAR system. So that the optimal lag used in the analysis are expected autocorrelation problem does not arise again. Determination of optimal lag level could use some information criteria, namely: (1) Akaike Information Criterion (AIC), (2) Schwartz Information Criterion (SC), (3) Hannan-Quinn Criterion (HQ), (4) Likelihood Ratio (LR), and (5) Final Prediction Error (FPE) (Widarjono, 2007). Based on all of criteria; LR, FPE, AIC, SC dan HQ, optimal lag candidate is lag 2. Cointegration analysis, VAR analysis or the establishment of VECM system followed by analysis of Impulse Response and Variance Decomposition will described below.

3.2.1. Cointegration Analysis

Two variables are not stationary before deference but stationary at first deference are likely to occur cointegration, which means there is a long term relationship between them (Winarno, 2007). In the sugar market is known that based on the trace test and max-eigenvalue test there are two linear equations in the long run. Because there are two cointegration vectors (Vector Autoregression) or a stationary linear combination of sugar market, the long-term analysis of cointegration vectors can be specified for the price of sugar in the producer countries or exporters, namely Thailand and Philippines. This is because of sugar produced by the two main producing countries are mostly exported, so the price of domestic sugar prices in the countries affected by the consumer or importer.

Cointegration on model can be interpreted that there is a relationship or long-term equilibrium among each variable in the model, in the short term it can be imbalance (disequilibrium). The imbalance is often encountered in economic behavior. Models that include adjustments to correct for the imbalance referred to as error correction model (ECM) (Widarjono, 2007). In this study due to time series data used is not stationary at level but stationary in the deference data and have cointegration, the VECM analysis will performed.

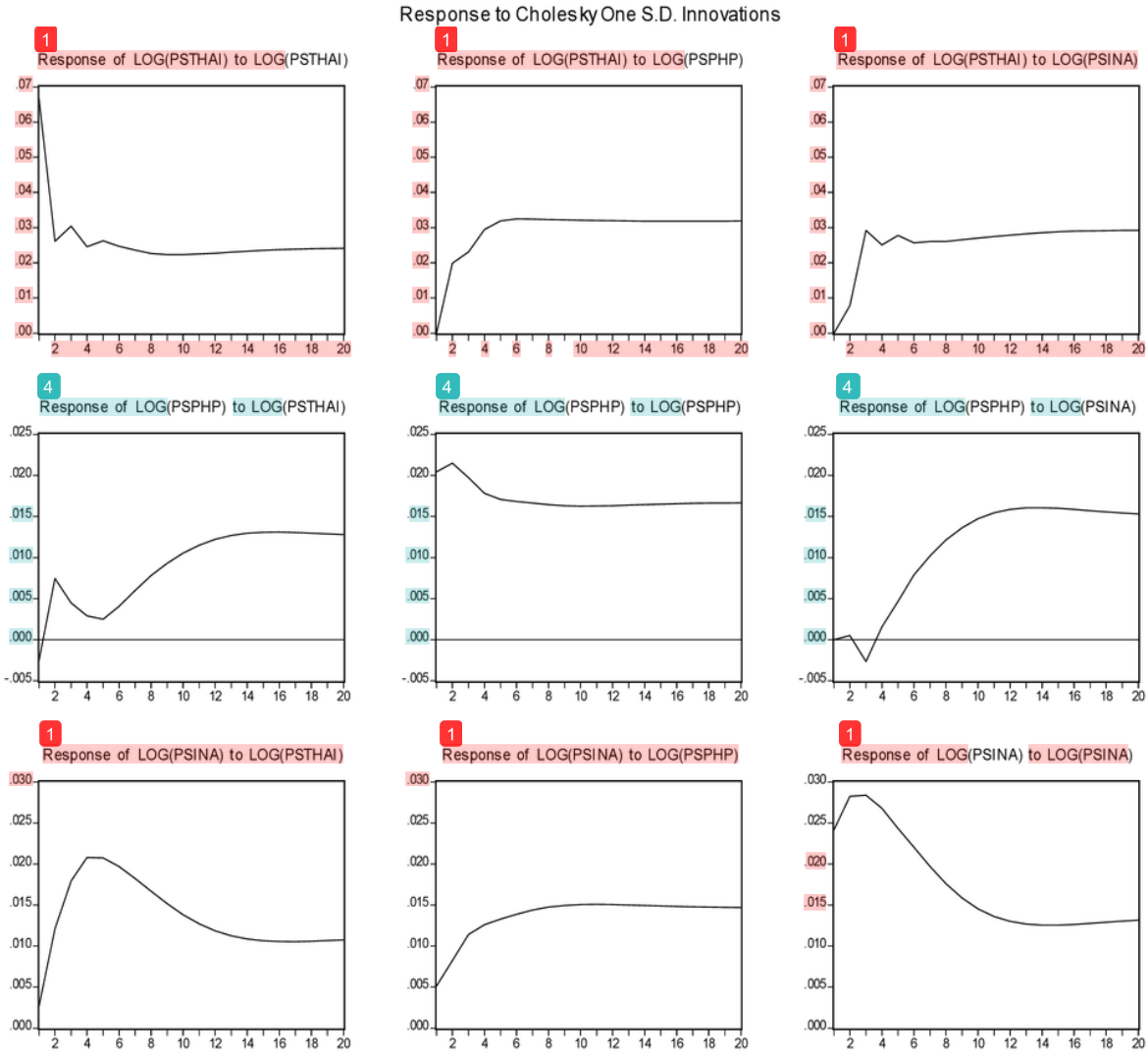


Fig. 2: Impulse Response Graphs

3.2.3. Impulse Response Analysis

Impulse Response Graphs of sugar models are presented in Figure 2. Can be seen the first line is the Impulse Response for the price of Thailand sugar, the second line is the Impulse Response for Philippines sugar prices and the third line is the Impulse Response for the price of Indonesia sugar. There is nine graphs presented, only 6 charts to be discussed because three other charts only explain a response variable because of the change or the shock of the variable itself. The analysis used 20th periods, which means that the response of a variable is valid until 20 next period.

3.2.2. VECM Analysis

Analysis of VAR/VECM, requires a modeling every endogenous variable as a function of the lag of all endogenous variables in the system. Thailand sugar prices in the short term are not influenced by any variable except the exchange rate itself. Thailand exchange rate variable coefficient is positive for Thailand sugar prices, which means the effect of exchange rate changes in the direction of price changes. Philippines sugar price is influenced by the LR relationship; it is also affected by changes in Thailand sugar price lag 1 and Indonesia sugar price lag 2. Indonesia price sugar in the short term rates are affected by Indonesia's own of sugar prices lag 1 is also influenced by exogenous variables, namely the exchange rate of the domestic currency (significant at 5 percent) and Thailand exchange rates (significant at 10 percent). Indonesia's exchange rate variable is positive which means having to change the direction of the Indonesia sugar price. Thailand exchange rate coefficients are negative on the price of Indonesia sugar; it means if the Thailand exchange rate go down it will affect the prices of Indonesia sugar.

Changes in Thailand sugar prices cause the price of Philippines sugar has increased to the first period and fell to the 5th period. Before stabilizing at the end of the period, the price of sugar had increased from the 5th period to 13th period. Indonesia sugar prices has stable respond to changes of Thailand sugar prices, which has increased in the early period and continued to fall until it reaches stability from 14th period until the end of the period.

Sugar price of Thailand and Indonesia respond the same direction of movement to changes in Philippines sugar prices, which has increased at the beginning of the period and re-starting stable in 6th period. Thailand sugar price response is more stable than the Philippines sugar price response to changes in the price of Indonesia sugar. Rise in the early period and stabilized during the third period to the end of the period. In the beginning of change period, Indonesia sugar price does not give effect to the Philippines sugar prices. It is shown from the graph that shows a stable position. The price dropped from second period to third period and return until the middle period and then stabilized until the end of the period.

On the model can be seen that the changes that occur due to disruption one of the market is very small impact on changes in other markets where almost all its value approaches zero. Tariff and non tariff policies are applied to the sugar trade by these countries. This is causes the small impact of sugar markets from other countries on domestic sugar market in each country.

3.2.4. Variance Decomposition Analysis

During the next 20th periods Indonesia sugar prices are more influenced by itself; it is equal to 47 percent, 27 percent of Thailand sugar and the Philippines variable sugar prices by 26 percent. It can be seen that in the long term effect of Thailand sugar markets and the Philippines is almost the same in determining to the Indonesia sugar price. It is because of Indonesia is a net importer of sugar from these countries (Thailand and Philippines) so there is the substitution effect. Where if the price of sugar in one country is much higher, so then Indonesia is likely to import sugar only from country that offer lower prices.

4. Conclusion

Based on the results of research, it can be concluded that Thailand and the Philippines are sugar exporters in ASEAN while Indonesia became a net importer. During 2003 to 2007 the average of Thailand sugar exports amounted to 370,268,470 USD and Philippines about 72,001,500 USD. The changes that occur due to disruption one of the market is very small impact on changes in other markets where almost all its value approaches zero. Tariff and non tariff policies are applied to the sugar trade by these countries. This is causes the small impact of sugar markets from other countries on domestic sugar market in each country. During the next 20th periods Indonesia sugar prices are more influenced by itself; it is equal to 47 percent, 27 percent of Thailand sugar and the Philippines variable sugar prices by 26 percent.

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