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Rice Market Integration Between Indonesia with Rice Exporters Country in ASEAN

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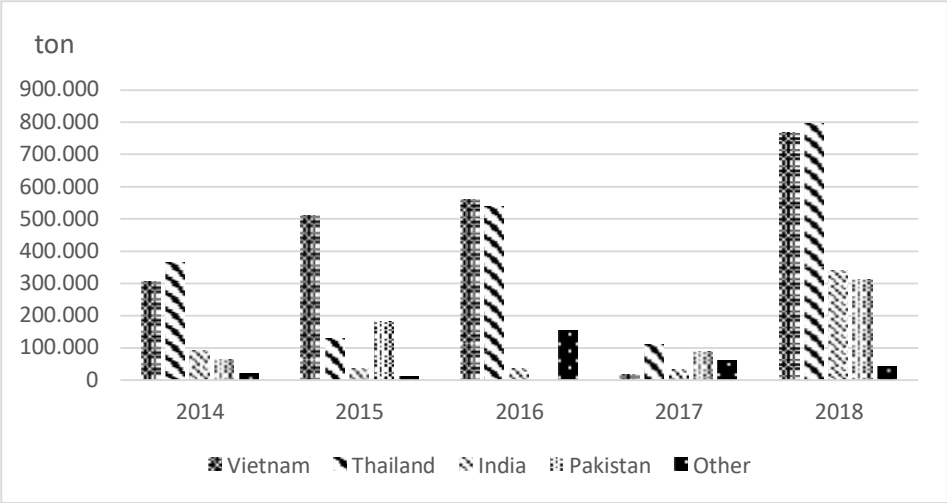
ABSTRACT— This study examines the integration of the rice market between Indonesia as a rice importing country and Thailand-Vietnam as a rice exporting country within the ASEAN region. The data used in this study were monthly data on rice prices in Indonesia, Thailand and Vietnam from January 2001 to May 2018. Data analysis used Johansen cointegration model and is estimated using a vector autoregretion in different using two different research models. The difference between the first and second models is differentiated in the endogenous variables of Indonesian rice prices, the first model uses the price in dollars while the second model uses the rupiah. In the second model, enter the exogenous variabel exchange rate into the model. The cointegration Johansen test results show that there is no market integration between the Indonesian market with Thailand and Vietnam. The results of the VAR in different test show that the short-term integration that occurs between Indonesia-Thailand and Indonesia-Vietnam is weak. Market integration was not formed due to the rice import policy and price stability implemented by the Indonesian government to protect domestic farmers and consumers.

KEYWORDS: ASEAN, Integration, Rice, Trade

1. INTRODUCTION

Indonesia, Thailand, and Vietnam since 1967 have collaborated in Association of South East Asian Nations (ASEAN), in the course of making changes in enhancing the form of their cooperation. Until 2015, ASEAN approved the ASEAN Economy Community (AEC) blueprint with five interrelated and mutually reinforcing characteristics, including 1) an integrated and fully integrated economy, and 2) an increase of connectivity and sectorial cooperation. The implication of the AEC is that there will be market integration among its member countries through reducing/eliminating tariffs, eliminating non-tariff barriers and improving trade policies that have been carried out during the implementation of the Asean Free Trade Area (AFTA). The AEC helps increasing the flow of trade in the Southeast Asian region. One of the trades that occurs is the export-import trade of rice. Thailand and Vietnam are the world's rice exporting country in the ASEAN region. Based on the rank of world's rice exporting country in 2018 and statistical data from the International Rice Research Institute (IRRI), Thailand is the second rice exporting country and Vietnam is the third rice exporting country which export, respectively, 11 million tons and 6.8 million tons of rice. Meanwhile, Indonesia is an importer of rice. Based on data from the Central Statistics Agency (BPS) in 2019, Indonesia imported 2.25 million tons of rice in 2018. Table 1 shows that Indonesia imports rice mostly from Thailand and Vietnam.



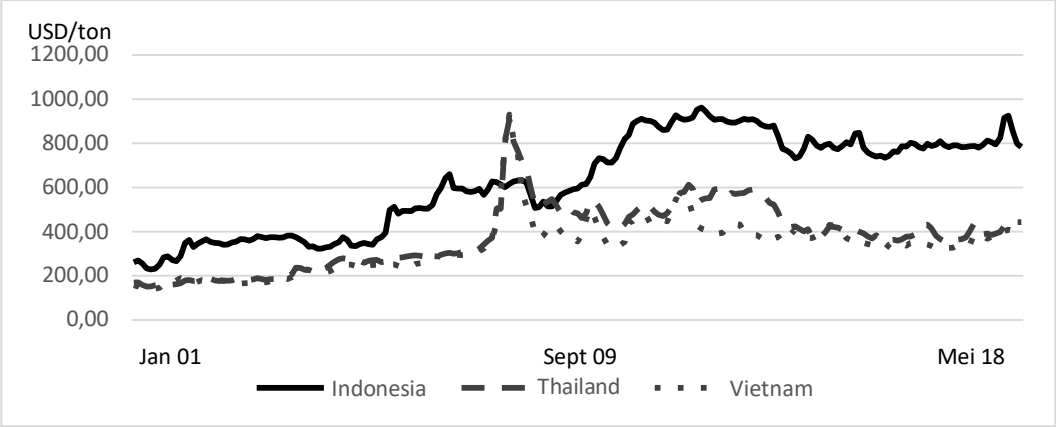
Source: BPS, 2019

Figure 1. The amount of rice imported by Indonesia in 2014-2018 based on importing countries

This research will examine whether there is an integration of the rice market between the exporting countries and an importing country as [20] stated that price transmission and market integration can be used as an indicator of the efficiency formed between two markets interacting vertically and spatially. Moreover, [4] stated that markets are said to be integrated if price changes that occur in world markets are directly forwarded to the domestic market. [28] support by stating that an efficiently integrated market will have a positive price relationship among markets in different regions. [21] stated that a market is spatially integrated with other markets if there is a trade between two markets, the price in the importer's area is the same as the price in the exporter's area and the transportation costs to move goods from the importer's area to the exporter's area. [19] stated that without trade friction (transportation costs and tariffs), in conditions of free competition and price flexibility where there is no individual seller or buyer that has the power to manipulate prices and prices can freely adjust, similar goods should be sold at same price even in different locations, if the price is in common currency (Law of one price). [28] stated that an efficiently integrated market will have a positive price relationship among markets in different regions. An increase in commodity prices creates opportunities for producers as well as challenges for consumers [29]. The increase in price opens opportunities for producers because it will increase income and encourage producers to increase their production. At the same time, rising prices also create challenges for consumers as they will potentially reduce purchasing power. In order to get benefit from rising international commodity prices, Indonesia's commodity market must be integrated with global commodity markets. This means that the flow of information must be free between world markets and domestic markets. If the flow of information is free, Indonesian farmers will know the relative value of their products on the international market. Thus, they will set a better strategy to benefit from the rising world commodity prices by optimizing resource use and maximizing their income.

There are some research results that explain the integration of markets and trade areas. [2] found that the trade integration process has increased among European Union members, while integration with non-members is progressing slowly. The Arribas indicator provides a more complete view of the difference in the speed of integration, which depends on the integration component in the form of openness. [13] conducted a study exploring the relationship between the Ukrainian rapeseed market and the European Union. There is a long-term relationship between Ukrainian and EU rapeseed prices which can be considered as an integration between prices. Meanwhile, in short term, the price of Ukrainian rapeseed responds to EU rapeseed prices. Regional currency relations and intra-regional trade area (RTA) integration in the form of U. When the replacement of regional currencies is low, it will hinder intra-RTA trade until the share of the currency is

above a certain threshold. It will reduce transaction costs and the integration of regional currencies will promote intra-RTA trade. This research also analyzed other factors such as the number of member countries participating, differences in economic growth between member countries, financial levels and trade openness in each member country. This research found that financial levels and trade openness affect currency relations and trade integration. When the level of trade openness is high, the turning point of the U-shaped relationship decreases, indicating a lower threshold at which currency integration can positively affect trade integration at the RTA level. The results of research by [1] on market integration between world and domestic rice markets covering the period of trade liberalization agriculture in Bangladesh used TVECM to explain the effect of transaction costs on market integration suggest that the Bangladesh rice market is partially integrated with world market partners. Only one-third of world price changes are transmitted to the Bangladesh rice market. The results of this study also found that there are costs that affect the integration of the rice market and trade liberalization.



Source: BPS, 2018 and IRRI, 2019

Figure 2. Monthly average rice price in 2001-2018 in Indonesia, Thailand, and Vietnam.

Figure 2 shows the movement of rice prices in USD/ton from January 2001 to May 2018 in Indonesia, Thailand, and Vietnam. In general, the price of rice in each country has an increasing trend. Figure 2 shows that rice price in Indonesia is higher than the rice price in Thailand and Vietnam. Conditions in which rice prices abroad are lower than domestic one's result in export-import. Export-import is a form of trade cooperation that occurs in the ASEAN cooperation area. The purpose of this research is to analyze whether there is integration of the rice market between exporters and importers in the ASEAN cooperation area.

2. Material and Methods

The data used in this study are secondary data in the form of monthly time series data in January 2001 to May 2018. Sources of data were obtained from various formal institutions and agencies such as the Central Statistics Agency (BPS), Cipinang Rice Main Market, investing.com, Food and Agriculture Organization (FAO), and International Rice Research Institute (IRRI).

Table 1. Source of Data Used in This Study

No	Data	Simbol	Satuan
1	The price of rice broke 5% and 25% on FOB Thailand	PVI	USD/ton
2	Rice prices are 5% and 25% on FOB Vietnam	PTI	USD/ton
3	Average price of rice at Cipinang Indonesia Market	PGC	USD/ton and IDR/ton
	Dollar (USD) exchange rate against Rupiah (IDR)		

4	NDR	USD/IDR

The regional market integration research model refers to the Johansen Model. This model can describe the relationship that shows price changes in the reference market. The exporting country will cause price changes in the domestic market. An integrated market refers to a market where there is a price change in the exporter's market forwarding to the domestic market. The market integration model in this study is carried out with two models. The first is by converting the rice price in Cipinang Market into USD/ton (model 1) and the second by entering the USD/IDR exchange rate variable into model 1 with the rice price in Cipingang Market in IDR/ton (model 2), so that the research model can be written as follows:

$$\Delta X_t = \mu_t + \Gamma_1 \Delta X_{t-1} + \cdots + \Gamma_k \Delta X_{t-k} + \Pi X_{t-1} + e_t \quad (1)$$

$$\Delta X_t = \mu_t + \Gamma_1 \Delta X_{t-1} + \cdots + \Gamma_k \Delta X_{t-k} + \Pi X_{t-1} + NDR_t + e_t \quad (2)$$

where $\mu t$is intercept vector, M is long run coefficient matrix ($\Pi = \alpha\beta'$), α is loading matrix, β 'is cointegrating vector, Γ is coefficient matrix of short-run to long-run adjustment, X is endogenous variable vectors used in the model, where the endogenous variable in this study are PTI, PVI, and PGC. NDR is exogenous variable vector of USD/IDR and ε_t is error term.

In model 1, testing was carried out on endogenous variables on the prices of two different types of rice imported from Thailand and Vietnam, namely 5% broken rice and 25% broken rice. Model 1.1 refers to model 1 for 5% broken rice. Model 1.2 refers to model 1 for 25% broken rice. Model 2.1 refers to model 2 for 5% broken rice. Model 2.2 refers to model 2 for 25% broken rice. The test began with the stationary Augmented Dickey-Fuller (ADF) test at the same degree until stationary data was obtained. ADF testing used model 3.

$$\Delta X_t = \alpha_0 + \gamma X_{t-1} + \sum_{i=1}^{p} \beta_i \Delta X_{t-i} + \varepsilon_t \quad (3)$$

where X_t is rice price variables (PTI, PVI, and PGC) and NDR in t period. X_{t-1} is rice price variable in the previous period, X_{t-i} is rice price variable in period t minus the leg value, ΔX_t is $X_t - X_{t-1}$, p is the amount of leg used in the model. α_0 is intercept, γ *and* β are parameter coefficient, and ε_t is *error term*. Decision making criteria: If ADF statistical value is less than Mackinnon critical value or prob value is more than 0.05, then X_t contains a unit root. Meanwhile, if the statistical ADF value is more than the Mackinnon critical value or the prob value is less than 0.05, then X_t does not contain a unit root The second step is to test the optimal leg determination by utilizing information from Akaike Information Criterion (AIC). Testing the optimal leg length is very useful for eliminating the autocorrelation problem in the VAR model, so that by using the optimal leg to estimate the VAR model, autocorrelation problems will not occur. Determination of the optimal leg was done by selecting criteria marked with an asterisk or the smallest value.

The Johansen method was estimated using the Maximum likelihood Lmax (r) which is a function of the cointegration rank r. To test the existence of a long-term relationship between variables, two testing methods were used, namely the trace test and the maximum eigenvalue test. Trace test was done to find out the most cointegration vector r (rank matrix Π), by following equation 4, where T is the number of observations and λ_{trace} is the eigenvalue.

$$\lambda_{trace} = -T \sum ln(1 - \lambda_i) \quad (4)$$

The maximum eigenvalue test was done by testing the relevance of r + 1 in β ($\Pi = \alpha\beta'$) with equation 5, where

r is the number of cointegration vectors in the null hypothesis.

$$\lambda_{max}(r, r+1) = -T \sum ln(1 - \lambda_{r+1}) \quad (5)$$

Decision making criteria: If the trace statistical value is more than the critical value or the prob value is less than 0.05, then Ho is rejected, which means there is a cointegration. While based on the maximum eigenvalue test value, Ho is rejected if the maximum eigenvalue is more than the critical value or the prob value is less than 0.05. Based on the results of the cointegration test, Model 1 and 2 were then estimated using the vector autoregression in different vector with data on the first different to determine the short-term relationship between variables.

3. Results

The results of the ADF test carried out on the data used in the study showed that the price data at the Cipinang Wholesale Market, in Thailand, and in Vietnam as well as the rupiah exchange rate against the dollar (USD) were not stationary at this level. The data is stationary at first different with a probability value below 0.05. The ADF test results can be seen in Table 2.

Table 2. Augmented Dickey-Fuller (ADF) Test Results

Variable	Level	First Different
PGC (USD/Ton)	0.5003	0.000
PGC (IDR/Ton)	0.9254	0.000
PTI 5%	0.1195	0.000
PTI 25%	0.3034	0.000
PVI 5%	0.0073	0.000
PVI25%	0.0059	0.000
NDR	0.9362	0.000

Table 3 shows the optimal leg test results. Where each model used has a different optimal leg length. Of the four models tested, three models have the same optimal leg and one different model. More details can be seen in the table of leg order selection test results below.

Table 3. The Results of the Lag Order Selection Test Using the AIC Criteria

Model	Panjang Leg Optimal
Model 1.1 (5% broken)	7
Model 1.2 (25% broken)	7
Model 2.1 (5% broken)	6
Model 2.2 (25% broken)	6

Table 4 explains the trace static values and maximum eigen statistics in models 1 and 2 for 5% and 25% broken rice prices. All models (1.1, 1.2, 2.1 and 2.2) have a prob trace static value and a maximum eigen statistic above 0.05 so that the decision is Ho is accepted. Ho is accepted means that there is no long-term co-integration between the price of rice in the exporting country (Thailand and Vietnam) with the rice price in the importing country (Indonesia) and the exchange rate (USD/Rp).

Table 4. Cointegration Test Results

	Trace Statistic	Prob**	Max-Eigen Statistic	Prob**
Model 1.1 (5% broken)				
Cointegrasi PGC, PTI,				

and PVI				
None	29.3856	0.0557	19.0919	0.0942
At most 1	10.2937	0.2588	14.2646	0.4138
At most 2	2.6285	0.1050	3.8415	0.1050
Model 1.2 (25% broken)				
Cointegrasi PGC, PTI and PVI				
None	25.5148	0.1439	15.9710	0.2265
At most 1	9.5438	0.3175	6.9360	0.4967
At most 2	2.6078	0.1063	2.6078	0.1063
Model 2.1 (5% broken)				
Cointegrasi PGC, PTI, PVI and NDR				
None	40.0951	0.2191	26.0137	0.0783
At most 1	14.0814	0.8360	9.3571	0.8026
At most 2	4.7243	0.8374	4.6705	0.7827
At most 3	0.0538	0.8166	0.0539	0.8166
Model 2.2 (25% broken)				
Cointegrasi PGC, PTI, PVI and NDR				
None	34.0957	0.4966	20.3366	0.3183
At most 1	13.7591	0.8539	9.0211	0.8307
At most 2	4.7380	0.8360	4.7152	0.7773
At most 3	0.0228	0.8799	0.0228	0.8799

** Trace and max-eigenvalue test indicates no cointegration at the 0.05 level

In models 1.1 and 1.2, where the prices in each market are converted into USD, the prices in the exporting country and the importing country do not occur long-term cointegration. Likewise, in models 2.1 and 2.2, where prices in Indonesia continue to use the rupiah currency but include the exchange rate against USD in the model, the results of the cointegration test show that there is no long-term integration between exporters and importers. When viewed from the quality of rice traded (5% and 25% broken), it also shows that there is no long-term integration between prices in exporting and importing countries. Long-term integration does not occur in all models, even though the three countries are involved in one ASEAN trade cooperation area. The short-term integration between the rice price of the exporting countries (Thailand and Vietnam) and the importing rice price (Indonesia) can be seen from the results of the vector autoregression with different estimation in Table 5. Of the four models that have been estimated, price integration between exporting countries and importing countries is very low. In terms of models 1.1 (for 5% broken rice quality) and 1.2 (for 25% broken rice quality) also prices in dollars, prices in Indonesia are integrated in the short term with prices in Thailand for the 6th leg and prices in Vietnam for the 3rd leg. In terms of model 2.1 (5% broken rice quality) and 2.2 (25% broken rice quality) as well as the importing price in rupiah, prices in Indonesia are not integrated in the short term with prices in Thailand and Vietnam. However, there is only one rice price in Thailand leg 3 (at level 0.10) which is integrated with the rice price in Indonesia.

Table 5. Results of Vector Autoreggresion

	DPGC (1.1)	DPGC (2.1)	DPGC (1.2)	DPGC (2.2)
DPGC(-1)	0.4693**	0.4030**	0.4862**	0.4262**
DPGC(-2)	-0.4207**	-0.4598**	-0.4182**	-0.4540**
DPGC(-3)	0.2088**		0.2222**	

DPGC(-4)	-0.1743**	-0.2070**	-0.1786**	-0.1750**
DPGC(-5)	0.1421*		0.1484*	
DPTI 5%(-3)		-1499.23*		
DPTI 5%(-6)	-0.1381*			
DPVI 5%(-3)	0.1990**			
DPTI 25%(-6)			-0.1581**	
DPVI 25%(-3)			0.1940**	
DNDR	-	22.046	-	17.476
R-squared	0.3152	0.2985	0.3161	0.2798

**at 0.05 level *at 0.10 level

Another finding in this study is the short-term integration between the exchange rate (USD/IDR) and the rice price in importing countries based on the quality of the rice being traded. Table 6 shows that in model 2.1 (5% broken rice), there is no short-term integration between the exchange rate and the rice price in Thailand and Vietnam. However, in model 2.2 (25% broken rice), there is integration at the 0.05 level between the exchange rate and rice prices in Thailand and Vietnam where the parameter value is negative. This negative value indicates that if the value of the USD currency strengthens against the rupiah, the rice price in the importing country will decrease by the value of its parameter.

Table 6. Results of Vector Autoreggresion for Exchange Rates

	Model 2.1		Model 2.2	
	DPTI	DPVI	DPTI	DPVI
DNDR	-0.0060	-0.0061	-0.0227	-0.0146
Standar errors	0.0086	0.0085	0.0087	0.0067
t-statistics	-0.7011	-0.7169	-2.6166**	-2.1756**

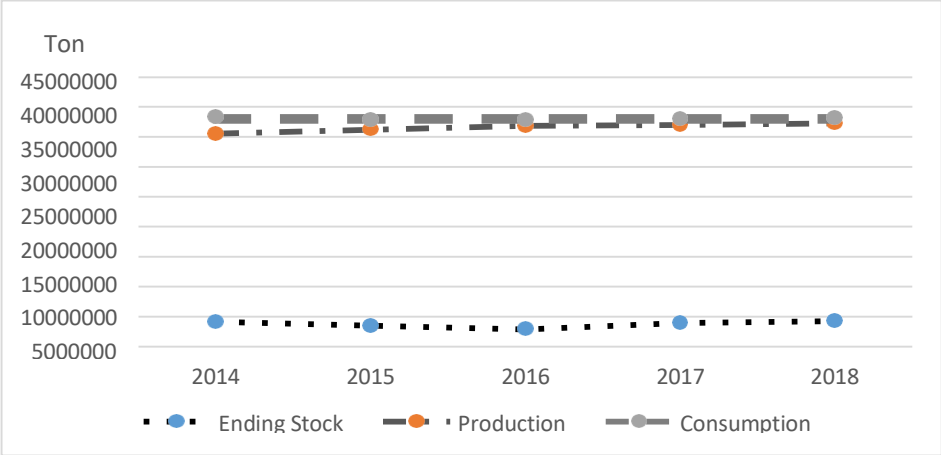
**at 0.05 level

The results of this study includes exchange rates in the model. The rice price in the exporting country is integrated with the exchange rate of the importing country's currency. In this study, the rice price which integrates with the exchange rate of the importing country's currency is the product with the lowest quality, namely rice with 25% broken quality.

4. Discussion

The results of this study carried out obtained the same results as [7] which states that the Indonesian rice market is not integrated with the Vietnamese and Thai rice markets in the long term. While in the short term, the Indonesian rice market is integrated with the Vietnamese rice market but is not integrated with the Thailand rice market. [3] in his research on rice market integration in three ASEAN countries stated that the rice market in Thailand, the Philippines and Indonesia was integrated with very weak level of integration. While [9] in his study on the integration of the Indonesian and world rice markets showed a long-term integration relationship but in the short term the integration is weak, so adjustments are needed to achieve long- term balance. Meanwhile, there is long-term integration between rice prices in Indonesia, Thailand and Vietnam. Thailand's rice price which is a significant benchmark for Indonesian and Vietnamese rice [14]. Likewise, [15] stated that there is an integration between the Cipinang Rice Main Market (PIBC) and international rice prices. The different results obtained from several studies are due to the different data sources used. [7] uses data source from Perum Bulog and rice price at the trader level with 20% of the type of broken rice. [9] uses data sources from Perum Bulog using the rice price at the retail level. [15] uses the rice price of IR-64 quality II for Thailand 15% broken and Vietnam 15% broken. Meanwhile, the researchers used data on Thai and Vietnamese rice prices from FAO and 5% used also 25% broken rice types. The Indonesian rice price used data on the average rice price (excluding glutinous rice) traded at the Cipinang Rice Main Market. Trade in rice through an import

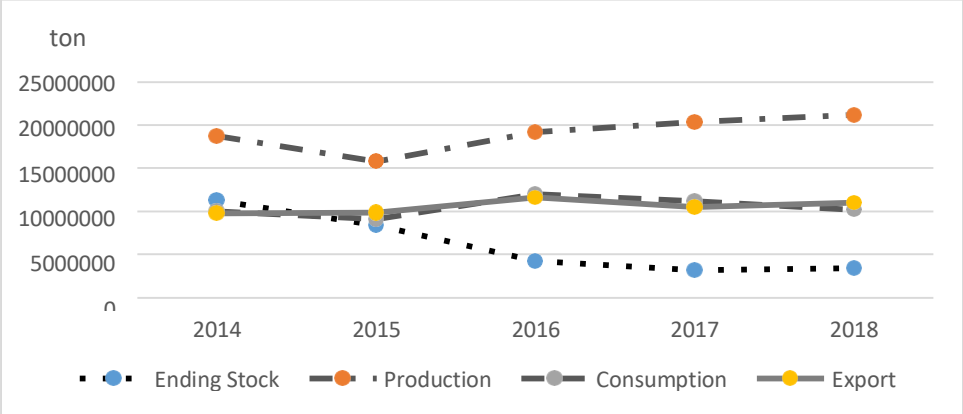
mechanism is carried out by a country to maintain the availability and fulfillment of the consumption needs of its citizens. Figure 3 illustrates that the rice consumption curve in Indonesia is above the production curve. This condition must be overcome by Indonesia through import mechanisms. Imports carried out by Indonesia aim to meet and maintain the availability of rice for the fulfillment of food for the Indonesian people. In addition, the characteristics between rice production and rice consumption are different. Rice production is discontinuous while rice consumption is continuous, requiring reserves. This reserve aims to maintain the stability of food availability and as a reserve to face certain conditions that will disrupt food availability. The amount of Indonesia's rice reserves in 2018 was 4.21 million tons or 11.02 percent of the total consumption of Indonesian people.



Source: IRRI, 2019

Figure 3. Indonesian rice production, consumption and stock in 2014-2018.

Figure 4 describes the amount of rice production in Thailand from 2014-2018 where the rice production curve is above the consumption curve. Thailand exports the excess of the production after calculating the safety stock for Thailand. According to IRRI, the number of exports carried out by Thailand in 2018 was 11 million tons, which is responsible for 23% of the world market. Figure 4 shows Thailand reduced the amount of domestic stock. Since 2014, the amount of stock was reduced continuously until 2018. Thailand's stock amount was 3.44 million tons or 33.71% of Thai people's consumption.

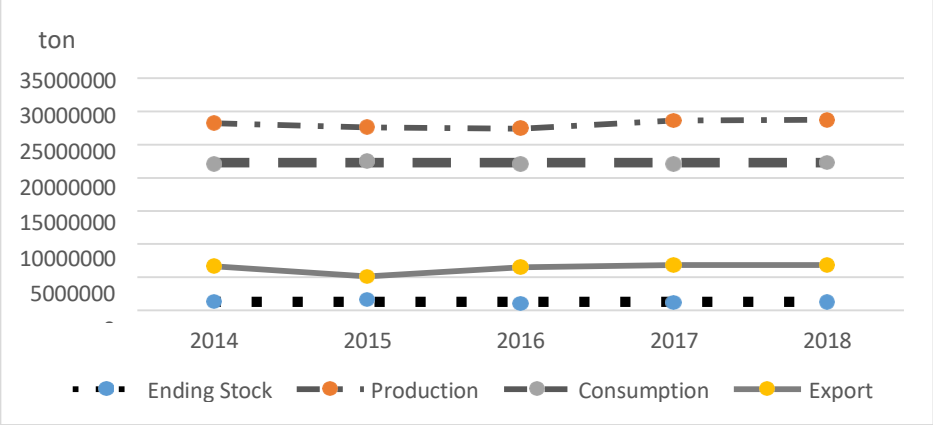


Source: IRRI, 2019

Figure 4. Thailand's production, consumption, export and rice stock in 2014-2018.

Figure 5 shows the amount of rice production in Vietnam from 2014-2018 where the rice production curve is

above the consumption curve of its citizens. Vietnam exports the surplus after calculating the safety stock. According to IRRI, the number of exports carried out by Thailand in 2018 was 6.8 million tons which is responsible for 14% of the world market. Figure 5 describes that Vietnam's stock amount is stable from 2014 to 2018, where the amount of Vietnamese rice stock in 2018 was 1.22 million tons or 5.50% of Vietnamese people's consumption. One of Vietnam's successes in becoming a rice exporting country according to [31] study was that Vietnam succeeded in expanding cultivated areas and increasing crop yields and achieving food self- sufficiency in 1989. Improved irrigation and drainage, use of intensive fertilizers and the rice export quota program was held by government owned company. Vietnam's exporting program has made Vietnamese rice prices lower than Thai rice prices.



Source: IRRI, 2019

Figure 5. Vietnam's production, consumption, export and rice stock in 2014-2018.

The world rice market is a market classified as a thin market because world rice production is mostly used for the consumption of its citizens and stocks. The excess is only traded between countries. According to Tables 3, 4, and 5, Indonesia can produce rice more than Thailand and Vietnam, but the amount of consumption exceeds the amount of production so that Indonesia still has to import rice. [25] states that the potential for importing rice is unavoidable and will cause domestic rice prices to be depressed. This condition is due to lower competitiveness on the production side than other ASEAN countries. Domestic rice prices are 60-70 percent above the import equality price, while production costs are higher. [5] stated that international trade can affect prices and the response of signals transmitted. The difference in transaction costs and prices between markets becomes a signal for traders to move their goods from a market with a low price to a market with a higher price. This can affect market integration which is also a reflection of how price changes in one market determine the flow of goods between markets. Market integration has implications for short-term food shortages but also has implications for long-term production growth. [10] also stated that in order to run the international trade market well, it still requires trade barriers to maintain food stocks in areas with insufficient production. [5] mentioned an example of intervention in food procurement by procuring food from surplus areas that are not market integrated with deficit areas. [11] stated that the integration of the ASEAN rice market will reduce domestic rice prices in importing countries by 39% in Indonesia, 26% in Malaysia and 45% in the Philippines. In addition, the integration of the ASEAN rice market will also have an impact on producers in importing countries and poor consumers in exporting countries. Indonesia as a rice importing country in rice trade determines trade barriers in the form of import tariffs. Import tariffs are regulated in [22] concerning the establishment of a classification system for goods and the imposition of import duties on imported goods No. HS 1006 of IDR 450/kg. This regulation was changed due to amendments to the Harmonized System (HS) 2012 became the 2017 Harmonized System (HS) and the 2012. Revised ASEAN Harmonized Tariff Nomenclature (AHTN) became the 2017 ASEAN Harmonized Tariff Nomenclature

(AHTN). Apart from regulating import tariffs, the Indonesian government has also regulated a ban on rice imports one month before the main harvest and two months after the main harvest. In addition, during the rice import period, imports can be done by regulating the quantity (import quota), port, quality and time. This provision is based on the [8] concerning rice import provisions. Regulation of the Minister of Trade of the Republic of Indonesia Number 01 of 2018 concerning provisions for export and import of rice, rice imported for the public interest is carried out by the Bulog Public Company with the approval of the Minister of Trade based on the results of the coordination meeting at the Ministerial level for the Economy.

Rice is included in the HS code and has an elasticity value below one. This condition causes Indonesia to be able to maintain rice price stability. [18] conducted a study in the European Union and found that the reasons for food inflation are economic openness and exchange rates. Meanwhile, [6] stated that the factors determining food prices are imported commodities, market forces, transportation costs, transaction costs, exchange rates and government intervention. [27] stated that countries succeeded in maintaining price stabilization are the countries with the most developed economies in the world. If the stable price of food is not maintained, then political stability and economic growth will be disrupted. Food price stability intervention carried out by the Indonesian Government was set at the highest retail price (HET) which is determined based on the [22] where the amount of HET for rice is divided into seven categories based on region. HET is divided into medium rice price and premium rice price. Another form of intervention by the Indonesian government is the setting of the Government Purchase Price (GPP) for unhulled rice and rice. The GPP was first implemented on January 1, 2003 on the basis of the legal basis of the [17]. GPP is periodically adjusted to increase production input prices, and the latest revision of GPP for grain and rice was regulated in the Minister of Trade [23]. [26] stated that the Indonesian government policy in setting GPP aims to increase rice production by receiving a reasonable price for unhulled rice. This policy is a form of government support for farmers. The policies carried out by the Indonesian government aim to protect both parties, namely farmers and consumers. The government must protect consumers, because rice is still the staple food source of Indonesian society. This form of protection by the Indonesian government against the rice price has prevented the integration of the rice market between Indonesia as an importing country and Thailand-Vietnam as an exporting country. This condition causes the cooperation that has been established in the ASEAN region between Indonesia, Thailand and Vietnam which is unable to integrate the Indonesian and Thailand-Vietnam rice markets. This happens because Indonesia as an importing country maintains the price of domestic rice to protect domestic rice farmers and the public as its consumers.

5. Acknowledgement

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