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The Economic Performance of Indonesian Rice in the Integration of the ASEAN Economic Community (MEA) Free Market

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***Abstract*. Indonesia, a member of the ASEAN Economic Community (MEA) group, is now facing challenges, although it has been widely known as a specialist in the trade of natural resource-based products. In the integration of AFTA, Indonesia is one of the best-prepared countries, together with Malaysia, Thailand, and Singapore. Theoretically, free trade not only gives benefits to traders but also affect the domestic market. Indonesian dependence on rice is relatively higher compared to Malaysia and Thailand and even exceeds FAO standards. Another challenge faced by Indonesia is the increase in the population.MEA designs a concept of making ASEAN a single production and single market base, but how does MEA influence the production of Indonesian rice? This current study aims to analyze the economic performance of rice in Indonesia, including the productivity level and demand for Indonesian rice. It also aims to test the hypothesis that improving the economic performance of rice can be done by increasing production and productivity. The research method uses the Econometric Model of rice commodities in 18 equations, consisting of 12 structural equations and 6 identity equations. Based on the analysis using the Simulation Model method on improving rice performance in Indonesia, it was found that there was a decline in Indonesian rice production, and fertilizer prices and corn prices had a significant effect on land use variables.**

Keywords: production, productivity, MEA free trade, rice

INTRODUCTION

As a member of the ASEAN Economic Community (MEA), Indonesia faces challenges in the competition for natural resource utilization, increasingly narrow land, and conversion of agricultural land to non-agriculture climate change. The highest price of rice in ASEAN is in Indonesia (IDR 4,200/kg). The price is lower than in other countries like Thailand (IDR 2,400/kg), with Vietnam being the lowest (IDR 1,700/kg). Clearly, Indonesia faces the challenges of a complex global economy [1]

Indonesia is widely known as a specialist in the trading of natural resource-based products, and it is necessary to develop added value through increased production, improved quality, and product diversification [2]. Regional economic cooperation is being reconsidered in the ASEAN level [3], but in AFTA, Indonesia is among the best-prepared countries, together with Malaysia, Thailand, and Singapore. Theoretically, free trade will benefit the traders, but in reality, it tends to have a negative impact on the domestic market, especially when agricultural agreements under WTO applied on January 1st, 1995.[4]

The community dependence on rice is relatively higher (95 percent [5] per capita consumption of 93 kg/ year [6]) compared to Malaysia and Thailand, which only consume around 65–70 kg per capita per year. The number is beyond the FAO average standard of rice consumption of 60-65 kg per capita per year [7]. This situation is also caused by the increase in population number in Indonesia.

Geographically, Indonesia will continue to be a rice importer in the future, because Indonesia is an archipelago, which does not have rivers providing much water or flat land suitable for rice cultivation[8]. At the same time, alternatives to agricultural expansion seem to be more difficult [9].

Based on the reason above, this research seeks to analyze the economic performance of Indonesian rice and the impact of the integration of the ASEAN Economic Community (AEC).

METHOD

Data for this study were the secondary data from 2000 to 2013, collected from various sources, including Food and Agriculture Organization (FAO), Central Statistics Agency (BPS), World Food, and Ministry of Agriculture.

The step involved tabulating data using the Statistical Analysis System (SAS). The results were then analyzed in several stages, including model specifications, model

identification, model estimation, model validation from econometric models, and simulation with the type of forward simulation (ex-ante simulation). In this stage, two simulations were carried out, namely the simulation of the AEC impact, and policy simulation specifications of the rice econometrics model in Indonesia.

The econometric model of rice commodities in this study was compiled into 18 equations, which consisted of 12 structural equations and 6 identity equations. Structural equations are representations of endogenous variables and exogenous variables that operationally rely on signs and large parameter estimation values according to the theory. Stationary testing was performed using E-Views software, including stationary data analysis of Rice Production (QIN), Indonesian Rice Harvest Area (APB), and Indonesian Rice Productivity (RB).

Rice Production (QIN)

Rice production is a certain amount of rice obtained from the multiplication of the harvested area with the productivity of rice. Below is the mathematical equation of the identity of Indonesian rice production.

QIN = APB * RB…….....(2.1)

Description:

QIN = Indonesian Rice Production (000 Tones)
APB = Indonesian Rice Harvest Area (000 ha)
RB = Indonesian Rice Productivity (Ton / ha)

Indonesian Rice Harvest Area (APB)

APB = ao + a1PB + a2PPUK + a3PJAG + u1 ..... (2.2)

Description:

APB = Rice Harvest area (Thousand Ha)
PBt = Rice price for year t (US Dollar / Tones)
PPUK = Fertilizer Price (IDR / Kg)
PJAG = Corn Prices (IDR / Kg)

Indonesian Rice Productivity (RB)

Indonesian rice productivity is influenced by rice prices (PB), harvested area (APB), fertilizer prices (PPUK), and productivity of Indonesian rice in the previous year (RBt-1), and formulated as follow,

RB = b0 + b1PB + b2PINA + b3APB + b4PPUK + b5RBt-1 + u2 …….(2.3)

Description:

RB = Productivity in Years to t (Tones / Ha)
PB = rice price Farmer Level (USD / tones)
PINA = Indonesian rice price (USD / Tones)
PPUK = Fertilizer Price (Kg / Rp)
RBt-1 = Previous Year Productivity

RESULT

The main problem faced by Indonesia in increasing its rice production is the cultivation of rice in Java (56%), Sumatra (22%), Sulawesi (10%), Kalimantan (5%) and other provinces (7%). In Java, the land owned by farmers is only 0.30 ha, and rice farmers are mostly farm laborers (70%) and small farmers. 60% of the farmers are net consumers, and the average income earned from rice farming is about 30 percent of the total family income, as can be seen in table 3.1. below.

Table 1 Estimate Results Parameter of Indonesian Rice Harvest Area (APB)

No	Variable	Estimate Parameters	t Value	Significant Level	Variabel Name
1	Intercept	4978.490	3.07	0.0134	Intercept
2	PB	-10.3998	-2.01	0.0758	Producer Rice Prices (US$/Tones)
3	PPUK	20.52267	3.70	0.0049	Fertilizer Price (US$/Tones)
4	PJAG	-69.5485	-1.60	0.1450	Corn Price (US$/Tones)

F-value = 115.56 R^2 = 0.97 DW = 1.85

The factors influencing the rice harvest area (APB) is shown by the F-value of 115.56 at a significant level of <.0001. It means that the rice price (PB), fertilizer price (PPUK), and corn price (PJAG) equally affect the harvest area in Indonesia (APB). The coefficient value (R^2) is 0.97, meaning that rice price (PB), fertilizer price (PPUK), and corn price (PJAG) variables can explain 97 percent of the variation in endogenous variables of Indonesian rice harvest area (APB). Meanwhile, the direction of the estimated parameters corresponds to economic criteria with the DW value of 1.85.[10] Rice farmers usually consider the types of land and manure. Previous research [11] also found that some farmers used special fertilizers when using SRI planting system. .Another study [12] showed that fertilizer use is influenced by land area, agricultural machinery, and other income sources outside the agriculture field.

The price of corn does not affect the harvested area in Indonesia (APB). It means that farmers use the harvested area considering the price of rice as a staple food. Relatively small agricultural land, which is an average of 0.30 hectares, causes farmers to pay more attention to cultivating rice as the staple food because farmers are also net consumers, so they can also consume the rice they produced.

Estimate Indonesian Rice Productivity Parameters (RB)

The decline in rice production was due to the limited use of new technology. Between the period between 1990 and 1996, rice productivity decreased by 21%.

Farm business credit (KUT), rice price (PB), harvested area (APB) fertilizer price (PPUK), and previous year's productivity (RBL) equally impacted on Indonesia's rice productivity (RB). R^2 value is 0.97023, which means that farm business credit (KUT), price of rice (PB), harvested area (APB), fertilizer price (PPUK), and productivity of the previous year (RBt-1) explain 97 percent of the variation of endogenous variables, namely Indonesian rice productivity (RB), where the direction of the presumptive parameters corresponds to economic criteria. However, some other variables have not been included in the model (3%), which can be used by future researchers as other technology variables.

Table 2 Estimate Results of Indonesian Rice Productivity (RB) Parameters

No	Variable	Estimate Parameter	t-value	Significant Level	Variable Name
1	Intercept	1.901250	1.64	0.1440	Intercept
2	KUT	5.7096-7	1.17	0.2810	Farm Bussiness Credit
3	PBA	0.000369	0.17	0.8694	Producer Rice Prices (US$/Ton)
4	APB	3.299e-6	0.02	0.9837	Harvest Area (Ha)
5	PPUK	0.002574	1.96	0.0909	Fertilizer Price (US$/Ton)
6	RBL	0.258920	0.45	0.6661	Productivity (Tones/Ha)

F-value = 45.63 R^2 = 0.97023 DW = 2.238987

Simulation results of 3% increase in rice productivity showed that there was a need to add 400.3 hectares of harvest area and increase production by 900 tones, so rice exports from Indonesia to overseas would increase by 13.726 ton. In this case, easy access to seed purchases will encourage farmers to increase their production of rice [13].

CONCLUSION

Factors affecting the rice harvest area are the price of rice and fertilizer. The price of corn does not affect the harvested area in Indonesia, which means that farmers will continue to plant rice although there is a decrease or increase in corn prices,

The impact of the market integration of the ASEAN Economic Community on the economic performance of Indonesian rice is indicated by the significant influence of the agriculture business credit, the price of rice and fertilizer, as well as previous year's productivity.

REFERENCES

[1] N. McCulloch and C. P. Timmer, "Rice policy in Indonesia: A Special Issue," *Bulletin of Indonesian Economic Studies*, 2008.

[2] D. Alighiri, W. T. Eden, K. I. Supardi, Masturi, and A. Purwinarko, “Potential Development Essential Oil Production of Central Java, Indonesia,” in *Journal of Physics: Conference Series*, 2017, vol. 824, no. 1.

[3] G. L. Ooi, “The Indonesia-Malaysia-Singapore Growth Triangle: Sub-regional economic cooperation and integration,” *GeoJournal*, 1995.

[4] P. U. Hadi, “TERHADAP EKONOMI BERAS DI INDONESIA,” *J. Agro Ekon.*, 2005.

[5] D. K. Swastika, “Membangun Kemandirian dan Kedaulatan Pangan Untuk Mengentaskan Petani dari Kemiskinan,” *Pengemb. Inov. Pertan.*, 2011.

[6] Badan Pusat Statistik, “Rata-rata konsumsi per kapita seminggu beberapa macam bahan makanan penting 2007-2015 (Average per capita consumption for each important food item 2007-2015),” *Badan Pusat Statistik (Central Bureau of Statistic)*. 2017.

[7] FAO, “FAO Rice Market Monitor,” 2015.

[8] D. Dawe, "Can Indonesia trust the world rice market?" *Bull. Indonesia. Econ. Stud.*, 2008.

[9] N. Kusnadi, N. Tinaprilla, S. H. Susilowati, and A. Purwoto, “Analisis Efisiensi Usahatani Padi di Beberapa Sentra Produksi Padi di Indonesia,” *J. Agro Ekon.*, 2017.

[10] R. Ghimire, W. C. Huang, and R. B. Shrestha, “Factors Affecting Adoption of Improved Rice Varieties among Rural Farm Households in Central Nepal,” *Rice Sci.*, 2015.

[11] P. Ly, L. S. Jensen, T. B. Bruun, and A. de Neergaard, “Factors explaining variability in rice yields in a rain-fed lowland rice ecosystem in Southern Cambodia,” *NJAS - Wageningen J. Life Sci.*, 2016.

[12] A. A. Adesina, “Factors affecting the adoption of fertilizers by rice farmers in C[illegible]te d’Ivoire,” *Nutr. Cycl. Agroecosystems*, 2004.

[13] N. T. Chung, A. Jintrawet, and P. Promburom, “Impacts of Seasonal Climate Variability on Rice Production in the Central Highlands of Vietnam,” *Agric. Agric. Sci. Procedia*, 2015.