

## AGREEMENT ON AGRICULTURE AND INDONESIAN RICE IMPORT

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### Abstract

Indonesian economy has been long supported by its agriculture sector. This paper analyzes the influence of the World Trade Organization's Agreement-on-Agriculture (AoA) to Indonesia's rice import using a Partial Adjustment Model. The independent variables included in the model are domestic production of rice, domestic income, world rice price, domestic rice price, and a dummy variable of AoA implementation. It estimates secondary annual data from 1979 to 2007. The result suggests that domestic income, domestic price and the dummy variable have significant effects on Indonesian import rice. It also suggests that world rice price and total domestic rice production have no impact on Indonesia rice import.

**Keywords:** Agreement-on-agriculture, world trade organization, rice import

**JEL classification numbers:** F13, F14

### Abstrak

Ekonomi Indonesia selama ini mendapatkan dukungan dari sektor pertanian. Makalah ini menganalisis pengaruh Organisasi Perdagangan Dunia tentang *Agreement-on-Agriculture* (AoA) terhadap impor beras Indonesia. Makalah ini menggunakan Partial Adjustment Model. Variabel-variabel independen yang dimasukkan ke dalam model adalah produksi beras dalam negeri, pendapatan dalam negeri, harga beras dunia, harga beras domestik, dan variabel dummy berupa pelaksanaan AoA. Penelitian ini menggunakan data tahunan sekunder 1979-2007. Hasilnya menunjukkan bahwa penerimaan dalam negeri, harga domestik dan variabel dummy pelaksanaan AoA memiliki pengaruh signifikan terhadap impor beras Indonesia. Hal ini juga menunjukkan bahwa harga beras dunia dan produksi padi dalam negeri tidak berdampak pada impor beras Indonesia.

**Keywords:** Agreement-on-agriculture, organisasi perdagangan dunia, impor beras

**JEL classification numbers:** F13, F14

### INTRODUCTION

Agriculture sector has been playing an important role in Indonesian economy. Before 1975, it contributed more than 30 percent of Indonesian Gross Domestic Product (GDP). In recent years, during 1990-2009, although agriculture sector contributes only 16.2 percent to Indonesian GDP but it has an important role regarding the labour force issue. According to *Badan Pusat Statistik* (or Indonesia Central Bureau of Statistics hereafter), 38.3 percent of labour forces

work in agriculture sector (August 2010). The latest data shows that in year 2010, 41.49 million people of age over 15 years old work in agriculture sector.

Rice is one of key agriculture commodities. Rice is a strategic commodity for Indonesia, not only as the main staple food for the majority of Indonesians, but is also the most important commodity for the country, because more than 10.1 percent of Indonesian income is spent on food-grain commodities within 2002-2009. Among poor household, this condition tends to be

higher. According to Indonesia Central Bureau of Statistics data, rice is commodity that has large contribution to inflation during January-December 2010, namely about 1.29 percent. Since rice is the staple food for most the Indonesian people and has become a strategic commodity, the Indonesian government has made intervention to domestic market in order to meet a domestic demand, to stabilize price of rice, and to make serious effects to get out of rice import dependency.

For several decades from 1960 to 1990, many Asian countries have experienced dramatic changes of domestic economic condition Kajisa and Akiyama (2005). The Increasing rice production proceeded from the Green Revolution, in addition to government support, such as the availability of chemical fertilizer, high yielding varieties of rice, and soft loan.

The Green Revolution has increased the rice production. However, it also has caused a dependence on agriculture modern inputs such as the use of chemical fertilizer and pesticide on its production process. This has made the farmers suffered, because high cost of fertilizer and pesticide, have not followed by farmer income. Moreover, by 1995, Indonesia started to decrease agriculture input subsidy, as part of the implementation of trade liberalization in Indonesia, where Indonesia is among the countries which ratify the rule of AoA (Agreement on Agriculture) WTO by Act No. 7/1994.

AoA WTO was a result of Uruguay Round. The agreement in the WTO regime involves goods and services, along with property right that have contained main principles of liberalization. The AoA was in effect by 1 January 1995, with the main objective of carrying out reformation trade policy on agriculture sector in order to make an invention in a fair agriculture trade system and more market oriented. This reformation program contains several specific commitments to decrease domestic subsidy,

export subsidy and to increase market access through make an invention of strong and effective GATT rules and discipline.

As a consequence of the agreement, Indonesia has been following AoA WTO in agriculture trade, where the AoA WTO has three pillars as the negotiation focus. The three of pillars are domestic support, market access, and export subsidy. All domestic support measures considered to distort production and trade. Domestic support is divided into three categories: Amber Box, Green Box and Blue Box. Each category has different impact on trade. The Amber Box is taken to be trade-distorting and have effect on production, such as input subsidies and price support. Green Box are assumed to have no effects on production, such as support for research, marketing assistance and the Blue Box category such as direct payments to farmers to compensate them for program to limit their production. LDCs are exempted from these reduction commitments; however they have also committed not to raise the level of support beyond the de minimum level.

The Market access is dealing to trade barrier reduction. All member countries have to abolish quantitative restrictions and non-tariff barriers and replace these with tariffs. Least developed countries (LDCs) do not have to reduce their tariffs, but also commit not to raise their bound rates. Export subsidy in reference to export subsidy reduction.

According to Feridhanusetyawan and Pangestu (2003), one important characteristic of the Uruguay Round agreement is its progressive agricultural liberalization. Other international trade agreements, many of which are more progressive than the Uruguay Round in terms of eliminating barriers on non-agricultural products, often exclude or have minimum commitments for agricultural liberalization. Hence, the success of the Uruguay Round in including agriculture in its agreement has become the primary source of efficiency gains from this sector.

Prior to this agreement, trading economies could impose inefficient and costly barriers since the sector was not regulated under GATT or the WTO rules. Apart from greater access to external markets, Indonesia should also benefit from its participation in the WTO because of pressure to impose internal discipline, for example by reducing domestic distortions in agriculture, refraining from imposing higher tariffs on the bound items committed in the WTO, and further reducing tariffs on the remaining sensitive and exempted items.

Implementations of AoA WTO have differences time schedule between developed countries and developing countries. Developing countries have 10 years to implementation agreement (1995-2004), much longer than developed country that have 6 years (1995-2000). Nevertheless, Indonesian as developing countries has implemented this agreement earlier than time schedule, because on 1997 Indonesia have experienced economic crisis. Due to recover from its economic crisis, Indonesia has followed the advices that recommended by the IMF and the World Bank. The IMF and the World Bank have pressurized Indonesian to open the markets and had contributed more to the liberalization. One of their advices was opened the domestic rice market to free trade, especially during September 1998 to September 1999.

Substantively, the participation of Indonesian government in AOA WTO has a good aim, namely the implementation AOA WTO was expected to encourage trade, increase market access as well as economic efficiency, improve consumer prosperity, and increase domestic rice production.

To examine impact of AoA WTO implementation to Indonesia rice import, this study will using demand on import demand function. Theoretically, a traditional import demand function explains that import is a function of domestic riel income and domestic relative price to import price.

If price elasticity and income are constant, so import demand function could be writing as  $M = (P_F E / P_D)^\psi Y^\pi$ , where  $Y$  refers to domestic income,  $P_F$  points out foreign price,  $E$  refers to nominal exchange rate,  $P_D$  points out domestic price,  $\psi$  refer to demand price elasticity, and  $\pi$  points out income elasticity (Paulino, 2001). The elasticity of import demand price was estimated have negative sign for foreign price. When foreign price increase, so demand import will be decrease, *ceteris paribus*. At the moment that import price increase, then import demands will decline because there happened substitution effect and income effect happened. Substitution effect has explained consumer behaviour when increasing price occurs. Consumer will substitute these goods with the cheaper ones. Income effect has explained impact of increasing price will cause consumer riel income to go down, with the result that consumer will be decrease their demand.

When domestic price was increase, then import demand will be increase because substitution effect was happened. Substitution effect has explained consumer behaviour when increasing price occurs. They will replace expensive goods with the cheaper ones, when domestic price have increased, then consumer will replace domestic product with cheaper import product

Income elasticity was estimated have positive sign for normal goods, whereas for inferior goods have negative sign. It means that when income increases, import demand declines. Higher domestic income would increase consumption demand of both the government and society. The increment of consumption demand does not always completed by domestic product. Therefore, to fulfil the shortage then import must be down. Thereby, the increasing of income caused import has tended to increase, if it is normal goods. However, if their goods are inferior goods, so increasing income will tend to decline import demand.

According to Malian et al. (2004), that import demand function of rice besides influenced by national income and price, even was influenced by total domestic production of rice. The elasticity of total production at as guess has negative impact on import demand. If total domestic production of rice increase, then import demand will be decline, because the domestic need for rice in compliance with domestic product.

Several studies in reference to rice import have done inter-alia by Malian et al. (2004), and Nastiti (2007). Malian et al. (2004) have analyzed determinants that influence production, consumption, price of domestic rice and rice food index in Indonesia among 1970-2002. This study uses a simultaneous equations with the Two Stage Least Square (2SLS) method, where import equation is a function of domestic rice price, world rice price, exchange rate, total of rice product, and import on the previous year. Nastiti (2007) have examined the factors that influenced rice import in Indonesia period 1982-2002. According to this study result that using Partial Adjustment Model (PAM), the factor that influenced Indonesia rice import were domestic rice produced have negative impact on rice import, Indonesian GDP has negative impact on rice import, dummy variable indicated self-sufficient rice production would be in the right position, with the result that indicated there was difference between self-sufficient era and non self-sufficient era. Lag variable indicated import on the previous year have negative influence to rice import.

The AoA WTO is one form a part of trade liberalization. Trade liberalization was a process where have tended to decline tariff and non-tariff barriers. The declining of tariff has caused increase consumer surplus, nonetheless producer surplus and government revenue have declined. The declining of tariff contributed to increasing consumer welfare, because consumer

would be accepting relative cheaper price before than liberalization.

Market liberalization is one of three pillars of Washington Consensus advice throughout the 1980s and 1990s, be sides fiscal austerity and privatization. When trade liberalization – lowering of tariffs and elimination of other protectionist measure – is done in the right way and the right pace, so that new jobs are created as inefficient jobs are destroyed, there can be significant efficiency gains (Stiglitz, 2002)

According to IMF (2001) that clarify that policies that make an economy open to trade and investment with the rest of the world are needed for sustained economic growth. Furthermore IMF declares that evidence on this is clear. No country in recent decades economic success, in terms of substantial increases in living standards for its people, without being open to the rest of the world. In contrast, trade opening has achieved the benefit of trade liberalization.

The influence of trade liberalization to import demand have analyzed from different point of view. Melo and Vogt (Paulino, 2001) suggest that increasing of trade liberalization will be decline income elasticity, with the result that will be increase import demand. In to the bargain import demand price elasticity will be increase, it's consequently from ability to replace domestic product with importing product will easier. Bertola and Faini (Paulino, 2001) suggest influence of trade liberalization to import demand on developing countries pass through reduction of tariff and non-tariff barriers. The reduction of quantity has obvious influence both of import and income and price sensitively.

There have been studies that try to measure the impact of import liberalization in general, and there are others that measure the impact specifically in regard to the recent WTO agreements. Paulino (2001) explain that trade liberalization, that in form reduction of tariff and non-tarif have

proved to increase import on 22 developing countries during 1976-1998. The similar result suggested by Thomakos and Ulubasoglu (2006) study, where the result suggests that trade liberalization influences Turkey import demand.

Study of Korinek, and Melatos (2009) provides an in-depth examination of the trade effects of three regional trade agreements. (RTAs) – the ASEAN Free Trade Agreement (AFTA), the Common Market for Eastern and Southern Africa (COMESA) and the Southern Cone Common Market (MERCOSUR) -- in the agricultural sector. Results from a gravity model suggest that the creation of AFTA, COMESA and MERCOSUR have increased trade in agricultural products between their member countries. There is no robust indication of trade diversion with respect to imports from outside the region. The agreements are therefore net trade creating. There is no robust indication however that there has been strong trade creation with non-members in the case of any of the RTAs under study. In some RTAs, countries have a comparative advantage in exporting many of the same agricultural products, thereby decreasing the impact of the preferential market access.

(Minot et al., 2007) have been studied impact of agricultural trade liberalization on the countries of the Near East and North Africa (NENA), with emphasis on the impact on small-scale farmers in the region. In particular, the study has four objectives, first to examine current agricultural trade policies in the NENA region, second objective was evaluate the degree of agricultural liberalization likely to occur as part of various trade agreements. Third objective was analyze the impact of further trade liberalization on small farmers and other poor households, and last objective was explore policy options for mitigating the negative effects of agricultural trade liberalization. The study focuses on 13 countries and territories in the region: Algeria, Djibouti, Egypt, Jordan,

Lebanon, Morocco, Somalia, the Sudan, Syria, Tunisia, Turkey, the West Bank and Gaza, and Yemen. We refer to these as the NENA13 countries.

The evidence suggests that global trade liberalization, by reducing agricultural support policies in countries of the Organization for Economic Co-operation and Development and by reducing protection, will increase world agricultural prices. The markets for wheat, rice, sugar, cotton and dairy products are the most distorted, and the prices in these markets will rise by 3-20%. Almost all the NENA13 countries are net agricultural importers; so, there is clearly some basis for concern that these countries will lose as a result of global trade liberalization. Our analysis finds that the terms-of-trade effect of a 15% increase in all world agricultural prices on the NENA13 countries is approximately USD 1.2 billion, or 0.2% of regional GDP. This estimate is an upper limit because it assumes no response on the part of producers and consumers and because it does not include the efficiency gains associated with reducing distortions in domestic agricultural markets. Most studies of trade liberalization suggest that the efficiency benefits are larger than the terms-of-trade losses.

Nongsina (2007) have analyzed the influence of trade liberalization to Indonesian growth export and import volume during 1980-2006. The aims of this study were examine the influence of income variable, relative price, and trade liberalization policy to export-import fluctuation growth. Trade liberalization policy was measured by export tax indicator and admission charge, besides several dummy variable that indicate inception of trade liberalization policy.

The co-integration test result and error correction model refer that on the long run trade liberalization policy have obvious influence to export-import growth rate. On the short run, trade liberalization policy has negative influence to export, whereas have

positive influence to import. According to the result of this study, the concluding was trade liberalization policy on the short run caused growth of import faster than growth of export.

There were several studies in reference to implementation of AoA WTO itself. According to several studies have done had similar results. Rose (2004a) examined the influence of international trade multilateral agreement such as WTO, GATT and GSP that have been among developed country and developing countries. This study uses a gravity model of bilateral trade that comprises panel data about 175 countries during 50 years. This study founded that membership on WTO have not able to increase trade of them. Another Rose (2004b) study has examined hypothesis about membership on WTO and GATT that declare will increase trade flow and trade will be more predictable. The study using panel data that comprise 175 countries during 1950-1999, have founded that membership on WTO have no impact to encourage international trade more stabile and more predictable.

One of the most comprehensive studies of the effects of the WTO Agriculture Agreement was conducted by the Food and Agriculture Organization (FAO), which surveyed the experience of 14 developing countries in implementing the agreement. The two-volume study (FAO 2001, 2000) made several interesting findings (Khor, 2003) such as import liberalization had a significant effect. The average annual value of food imports in 1995-98 exceeded the 1990-94 level in all 14 countries. This finding examined that increasing in food imports greater than increases in agricultural exports and generally significant. Although bound tariffs were generally high, the applied tariffs were on average much lower for the countries surveyed.

According to several studies that explain above its mean the aim of trade liberalization to encourage trade (export) and

to opening market access was not happened. The aims of this study to examine impact of implementation AoA WTO to Indonesian rice import demand on period 1970-2007. Whether this implementation will be increase Indonesia rice import demand or not, which make Indonesian dependence to importing food product, and would be change Indonesian food basic. Into the bargain this study will examine too several factors that we guess have influence to rice import demand, such as, world rice price, domestic rice price, domestic rice production, and domestic income (GDP). According to the explanation above, so this study will be examine several temporary notions as follow: implementation AoA WTO has influence to import demand. Domestic income has influence to rice import demand; the sign is depend on type of goods, if normal goods will has positive influence, whereas inferior goods will has negative sign. World rice price has negative influence to rice import demand. Domestic rice price has positive influence to rice import demand. Domestic rice production has positive influence to rice import demand.

The paper is organized as four parts. The first part is foreword that explains about background, study literature of import and trade liberalization, review of empirical studies and objection of study. The second part presents the modelling framework, including data and source of data. The third part presents the results of the study. The paper closes with a number of conclusions and recommendations.

## METHODS

This study uses secondary time series data range from 1970 to 2007 from several reports that comprise data of rice import value, world rice price, domestic rice price, domestic income (GDP) and domestic rice product from Indonesia Central Bureau of Statistics, World Rice Statistics, International Financial Statistics and Key Indicators from Asian Development Bank.

The first step in the analysis is tabulating the data, followed by choosing empirical model using an MWD (Mackinnon, White and Davidson) test. The second step is estimating the factors that influence Indonesian rice import demand with using Partial Adjustment Model (PAM).

The model will be use to estimate rice import demand as follows:

$$M_t = f(PF_t, PD_t, PB_t, Y_t, DW_t, M_{t-1}), \quad (1)$$

where  $M_t$  refers to rice import demand,  $Y_t$  points out domestic income,  $PF_t$  refers to world rice price,  $PD_t$  refers to domestic rice price,  $PB_t$  points out quantity of rice domestic produced,  $DW_t$  refers to dummy of implementation AoA WTO, and  $M_{t-1}$  points out import on the previous year.

The equation that using in this study as follows:

$$M_t = \beta_0 + \beta_1 Y_t + \beta_2 PF_t + \beta_3 PD_t + \beta_4 PB_t + \beta_5 DW_t + \beta_6 M_t + u_t \quad (2)$$

After transforming the model in log linear function, it becomes

$$LM_t = \beta_0 + \beta_1 LY_t + \beta_2 LPF_t + \beta_3 LPD_t + \beta_4 LPB_t + \beta_5 LDW_t + \beta_6 LM_t + u_t \quad (3)$$

where  $M_t$  is import rice value (USD million)  $Y_t$  is Indonesian domestic income (billion Rupiah),  $PF_t$  is world rice price (rice price of Thailand 5% broken fob Bangkok, \$/ton),  $PD_t$  is domestic rice price (wholesale rice price in Jakarta, rupiah/ton),  $PB_t$  is domestic rice (000 ton),  $DW_t$  is dummy of implementation AoA WTO,  $D = 0$  refers to pre AoA WTO regime (1970-1994),  $D = 1$  refers to post implementation AoA WTO regime (1995-2007),  $M_{t-1}$  is rice import previous year,  $\beta_0, \dots, \beta_6$  are parameter's coefficient, and  $\mu$  is the disturbance factor. The

expectation of the sign of the parameters are  $\beta_2, \beta_4 < 0, \beta_3, \beta_5, \beta_6 > 0; 0 < \beta_1 > 0$ .

The long run coefficient of PAM are as follows:

$$\begin{aligned} \text{Constant} &= \beta_0 / (1 - \beta_6) \\ LY &= \beta_1 / (1 - \beta_6) \\ LPF &= \beta_2 / (1 - \beta_6) \\ LPD &= \beta_3 / (1 - \beta_6) \\ LPB &= \beta_4 / (1 - \beta_6) \\ DW &= \beta_5 / (1 - \beta_6) \end{aligned}$$

To examine the hypothesis that have been arranged, we test against economic priory using statistic tests such as  $t$  and  $F$  tests. In addition, we also conduct the classical assumptions tests including normality, heteroscedasticity, multicollinearity, and autocorrelation tests.

## RESULTS DISCUSSION

The result of empirical estimates using the MWD test can be seen from the regression result equation as follows.  $Zm$  in the linear form is insignificant, whereas  $Zlm$  in the log linear form is significant at  $\alpha = 5\%$ , therefore empirical model function form that will be used is the non linear form. According to the regression result that suggest log linear form, and what is more this equation could net the criteria of PAM, is import lag variable ( $M_{t-1}$ ) that lays between  $0 < \beta_6 < 1$  and it is significant.

### Linear Function

$$\begin{aligned} M = & 327,3155967 + 1,102968889PF + \\ & (2.182457)^* \quad (2.340608)^* \\ & + 0,7671416018PD - 0,01498549725PB \\ & (4.545271)^* \quad (-2.993481) \quad (4) \\ & - 0,0010539995184Y + 407.0154938 * DW \\ & (-5.049201) \quad (2.575728) \\ & - 69.01053334 * ZM \\ & (-0.609819) \end{aligned}$$

### Non Linear Function

$$\begin{aligned}
 LM = & 46,26080899 + 2,317946418LPF + \\
 & (2.052606)^* \quad (4.087181)^* \\
 & + 1,15067446LPD - 5.49269097 \\
 & (0.848699) \quad (-2.003489) \quad (5) \\
 & - 0,3230307558LY + 2,213217983DW \\
 & (-0,273916) \quad (2.792058) \\
 & - 0,002663504105 ZLM \\
 & (-2.292895)^*
 \end{aligned}$$

The final estimation result of rice import demand can be seen in Equation (6). All of the signs of the regression coefficient are consistent with the theory, except the coefficient of world rice price.

### Short Run Function

$$\begin{aligned}
 LM = & 1.069259666 + 2.002460761LPF \\
 & (0,058869) \quad (3,355082)^* \\
 & + 2.77061607 - 2.207787873 \\
 & (2,034043)^{**} \quad (-2,098452)^* \quad (6) \\
 & - 0.04044604955LPB + 1.971133414DW \\
 & (-0,018609) \quad (2,243077)^* \\
 & + 0.3.4399074 LM(-1) \\
 & (1,969875)^{**}
 \end{aligned}$$

### Long Run Function

$$\begin{aligned}
 LM = & 1,53717 + 2,87875LPF + 3,98305LPD \quad (7) \\
 & - 3,1739LY - 0,0582LPB + 2,83371DW
 \end{aligned}$$

where \* and \*\* indicate significant at 5% and 10% significance level, respectively.

From Equations (6) and (7) we can see that the long run coefficient is larger than that of the short run. This indicates that in the long run, each coefficient of variable is more elastic than that of short run.

The equations show some significant variables, namely domestic rice price, domestic income, dummy variable of AoA WTO, and lag of import. The variables that are not significant are total product of do-

mestic rice variable and world rice price. The  $F$  test is significant at  $\alpha$  1%, and the coefficient of determination,  $R^2$ , is 0.54. This finding is consistent with Malian et al. (2004), which states that the  $R^2$  is small for import function in associated with monopoly rice policy which government gave to BULOG (the bureau responsible for the food control in Indonesia) until 1998, with the result that rice import could be controlled and the influence of rice price on market world to rice price domestic could be reduced.

The classical assumption tests on PAM show that the model is free from autocorrelation, heteroscedasticity, and normality. The Jaque-Berra test suggests that the residual  $u_t$  is normally distributed. Heteroscedasticity test using ARCH test suggests that heteroscedasticity is rejected. The autocorrelation using Breusch-Godfrey (BG) test suggests that the autocorrelation in this model can be rejected. Whereas to test multicollinearity in this study using Variance Inflation factors (VIFs), where if value  $VIFs > 5$ , could be concluded was multicollinearity happened. According to data processing result refers that was multicollinearity for 3 equations, however on economic dependability among variables is considered as common.

The PAM estimation suggests that coefficient of lag import is positive and significant, which means that PAM could be used for further estimation. The adjustment coefficient is 0.695601, suggesting that about 69.6 percent of the difference between the actual and desired imports will disappear in one year.

The dummy variable of the AoA-WTO implementation is proven to significant, as signalled by the high  $t$ -value. This suggests that the implementation of AoA-WTO has influenced the rice demand in Indonesia. According to rice import and export data from *World Rice Statistic*, before implementation AoA-WTO implementation, Indonesia relied more on the domes-



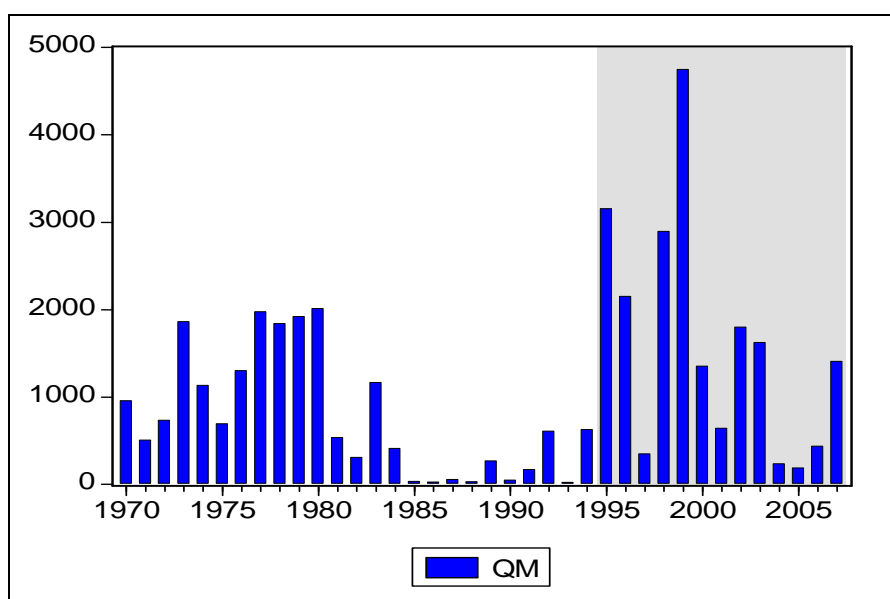
tic production, while after the implementation, Indonesian relies more on imports. One decade before the implementation of AoA (1984-1994), the rice import value was \$648 million, while nine years after the implementation (1995-2003), rice import value jumps up to be \$5,078 billion (an increase of 683,7%). On the contrary, rice export value have decline from \$216.02 million to \$6.15 million (a decline of 97%). If this trend continues, it will threaten not only the income of farmer, but also shatter domestic food basic. This means that Indonesia will be more dependent on rice imports.

Indonesia became a net rice importer country since 1988. A few years later, it became the biggest rice importer in the world, where Indonesia imported 50 percent from rice world stock. According to the World Rice Statistic, during 1990-1999, Indonesia has imported about 1478.35 million ton rice per year. The statistic is not much different until 2004 (see Figure 1).

The increase of rice import could endanger foreign exchange stock of the country and reducing local farmers role. According to Indonesia Central Bureau of Statistics, there were 38.4 million people

living in poverty, and 53.9% are farmers in 2002. In 2003, from 24.3 million land base farmers, 21.1 million among them have categorized as poor. Indonesia government prohibited rice import in 2004, and managed to fulfil domestic needs by domestic rice. However, during 2005-2006, Indonesian government carries out to re import rice commodity with the reason to make sure food stock and to stabilize of rice price.

Suparmoko (2002) highlighted that an increase in rice imports could create economic and political problems in Indonesia. Firstly, it might reduce the domestic rice producer incomes and discourage farmers as well as the government to increase the productivity of rice. Since rice has strong backward and forward linkages in the economy, an increase in import dependence will affect the rural based economic activities in the urban sectors of the economy. Furthermore, the trade liberalization has increased the import dependence for rice and affected the rice production in Indonesia. The impact spreads through the price of rice which became much cheaper after the trade liberalization of rice.



Source: Indonesia Central Bureau of Statistics and World Rice Statistic.

**Figure 1:** Indonesia's Rice Import in the Period of 1966-2007

The flood of importing food has resulted in food trap, where the economy does not have any national food sovereignty, since it depends on the importing food product. Such condition will threaten national food sovereignty, because food to be primary element of food security. (Wahyudidjafar, 2008)

The trade liberalization also causes a decline in wholesaler real price in Indonesia. Swastika and Nuryani (2006) find that due to protection and subsidy given by developed countries to their agriculture products, they sold their agricultural products (about 80% food) to the world market at a lower price, which distorts the price of food in the world market, especially rice, maize, soybeans, sugar, wheat, and meat. The growth of real price of the three commodities is negative during 1998-2005. The real price of rice, soybeans and milk grow at the rates of -2.18 percent, -1.87 percent and -0.94 percent. If the production cost of these three commodities in Indonesia continuously increases, while their price declines, then farmers will suffer.

The results of this research are consistent with previous studies that have suggested a negative impact of AoA implementation to trade. Such studies are FAO (2001), Rose (2004a) and Rose (2004b). Khor (2003) explains that the AoA contains several types of imbalances which are favourable to developed countries and unfavourable to developing countries. However, the AoA is unbalanced in some ways, such as the scheme which enables developed countries to continue high levels of protection, while developing countries have liberalized their international trade, and their farmers are facing severe and often damaging competition, often from cheap imports as the results of subsidies. Swastika and Nuryani (2006) explain that trade liberalization in agriculture has been designed in the form of AoA-WTO, which was initially aimed to accelerate the economic development of developing countries through in-

ternational trade of agriculture product. However, the fact is that the imports of agricultural products from developed countries were steadily increasing. On the other hand, the exports of agricultural product from developing countries were declining. Most of developed countries actually protect their farmers, through provision of farming subsidy and market support. To some extent, these practices are allowed in the AoA-WTO which was designed by the developed countries.

Trade liberalization for rice in Indonesia has caused import dependence and turns down the domestic rice production which further increases the poverty in Indonesia, especially those from agriculture sector. To overcome such situation, the government needs to impose policies. Istiqomah (2004) suggests ways to face trade liberalization by increasing the potential gains from trade liberalization. Indonesian government should cooperate with other developing countries to bargain with developed countries that impose protection policies for their farmers. Indonesian government might need to increase its import tariff for agriculture products, since the current tariff is consider very low. Another policy that can be imposed is to enhance the competitiveness of agriculture sector by improving infrastructures such as irrigation, increasing financial budget for research, and supporting from banking system.

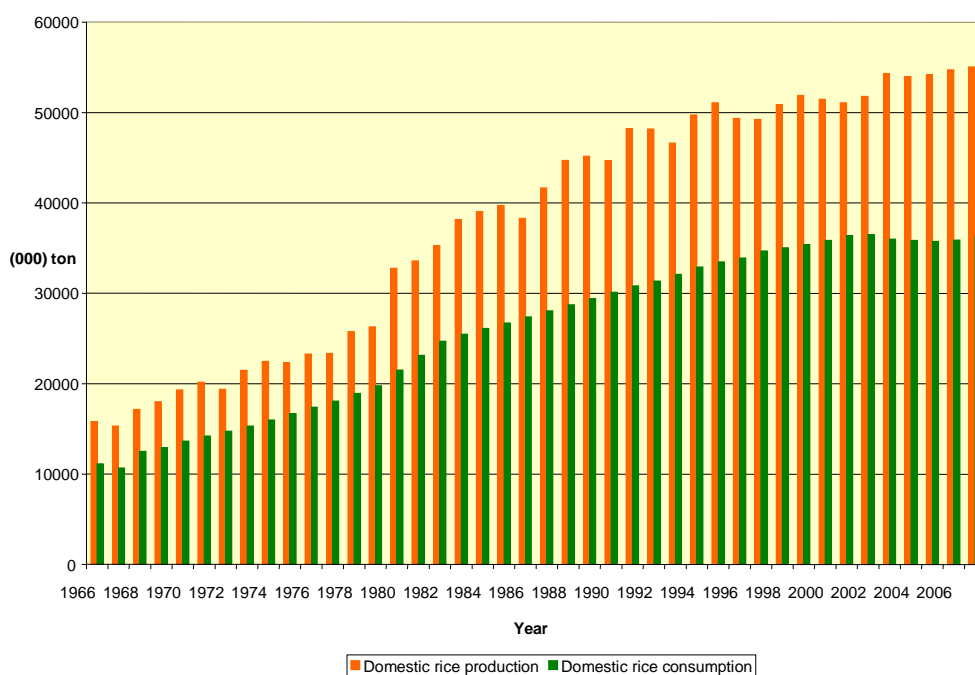
This paper also suggests that domestic income has a negative influence on Indonesian rice import demand. When domestic income increase 1%, Indonesian rice import demand declines by 2.2% (3.2%) in the short run (long run). The long run elasticity of domestic income has been greater than that of the short run. This finding is consistent with the result of Bond et al. (2007), who explains the influence of income growth on western style foods, and that Indonesian diets have gradually been changing. However, Bond et al. suggest that rice, vegetables and seafood remain

staples, consumers have moved toward a wider variety of foods. In particular, there have been increases in consumption of wheat based products, fruit and livestock products, including beef and dairy products. Consumption of rice per person declines between 1990 and 2005. This is in contrast with the increase in consumption of many other food products, including seafood, beef, poultry, fruit and vegetables. As a result, the contribution of rice to per person daily calorie intake declines from 55% in 1990 to 48% in 2005. However, rice consumption did not decline uniformly over this time. During the Asian financial downturn, rice consumption increased as consumers turned to cheap food sources. Rice consumption began to fall again once economic growth resumed after the financial downturn.

Domestic rice price has a positive influence on Indonesian rice import demand. When domestic rice price increases by 1%, rice import increases by 2.8% (3.98%) in the short run (long run). The elasticity of demand price of substitution goods is more elastic in the long run than in

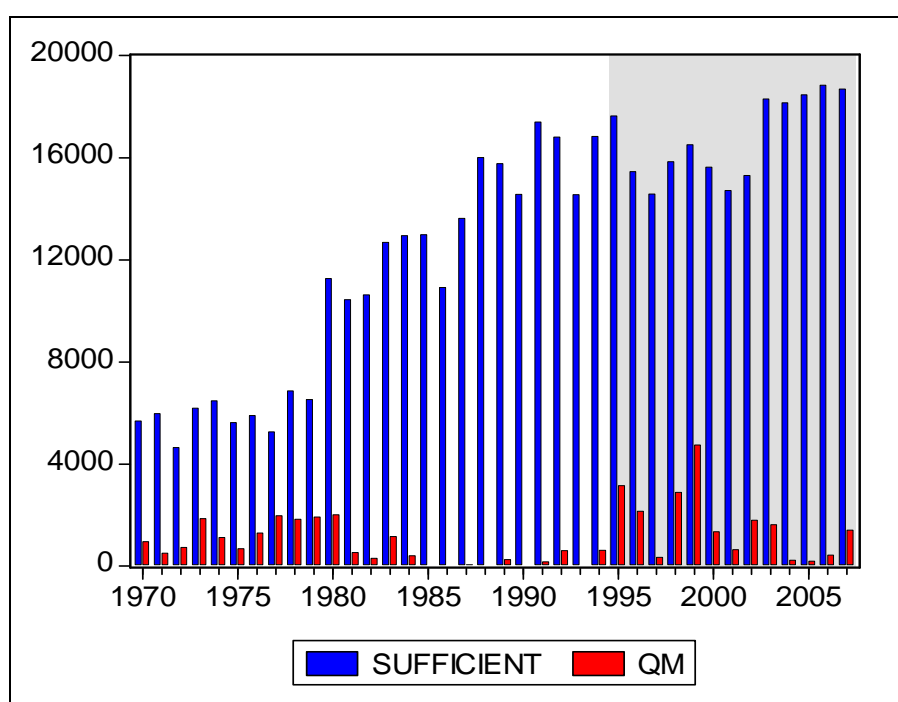
the short run. This finding is in line with the aim of rice import that carried out by the government, namely taking care of domestic rice price and domestic rice stock stability.

The world price of rice has a positive insignificant coefficient, which means that it does not influence Indonesian rice import. This finding is consistent with the result of Soekartawi (2006) who shows that Indonesia rice import such as those in January-September 1998, occurred when the world price of rice is higher than the domestic rice price, measured with NPR (Nominal Protection Rate). This might happened because the objective of this import is to maintain domestic rice stock. Oxfam (2001) declares that the domestic price of rice in Indonesia is higher than those in Thailand and Vietnam, two of the world's major rice exporters. In mid-2001, the international price of rice ranged from USD 145 to USD 155 per ton. In Rupiah, the price of the imported rice was Rp 1,500 per kilogram, which is 25% lower than the price of locally produced rice (Rp 2,000 per kg).



Source: Indonesia Central Bureau of Statistics and World Rice Statistis.

Figure 2: Production and Consumption of Domestic Rice, 1966-2007



Source: Indonesia Central Bureau of Statistics and World Rice Statistic

**Figure 3:** Indonesia's Domestic Rice Sufficiency and Rice Import, 1966-2007

Domestic rice production has a positive insignificant coefficient. This might be caused by the fact that even though Indonesia was a big rice producer, it was also a big consumer. Therefore, to fulfil domestic rice stock, Indonesia had to import the rice. Figure 2 shows the level of Indonesia rice production and consumption during 1966-2007. All this time Indonesian rice production always exceed from Indonesian rice consumption. However, Indonesia remains carry out to importing rice, besides to fulfil domestic rice stock, also to stabilize domestic price.

Figure 3 shows the level of domestic rice sufficiency. When Indonesia experienced rice self-sufficient in 1980s, the rice import was very small, because domestic production could fulfil the domestic need. Import start to increase in 1995, although at this time the level of domestic rice sufficiency was high. This condition coincided with the implementation of agriculture liberalization when Indonesia ratified AoA-WTO.

## CONCLUSION

This paper investigated the impact of the Agreement on Agriculture of World Trade Organization (AoA-WTO) on Indonesian rice import. The estimation result using PAM suggested that the implementation of AoA-WTO influenced Indonesian rice import. It also found that domestic income had a negative influence on Indonesian rice import, while domestic rice price had a positive influence on Indonesia rice import. Furthermore, world rice price and domestic rice production did not influence Indonesian rice import.

It can be inferred that the implementation of AoA-WTO influenced import rice demand, and that trade liberalization has increased the import dependence for rice. Another impact had been the cheaper price of rice after the trade liberalization. Therefore, full reliance on import of rice was very dangerous for food national security and for political stability. The paper also concluded that Indonesia was not ready to participate in a liberalized agricultural international trade, so that government

was better to reconsider the policy. One of the possible government policies is to re-examine the application of import and export tariffs to protect domestic farmer and to take care Indonesia food security.

The paper also suggested conducting a deep observation, both from price aspect using NPR (Nominal Protection Rate) framework and other aspects such as production, consumption, and national rice

stock. The more important thing is to make a serious effort to diversify Indonesia basic food from local commodity, in order to avoid Indonesia from rice dependence. Further possible research might be carrying out the impact of AoA-WTO implementation to both Indonesian rice import and export, and the impact on other agriculture commodities.

## REFERENCES

- Bond, R., G. Rodriguez, and J. Penm (2007), "Agriculture in Indonesia: A Review of Consumption, Production, Imports and Import Regulations," Proceeding of the 13<sup>th</sup> Meeting of the Australia-Indonesia Working Group on Agriculture, Food and Forestry Cooperation (WGAFFC), Gold Coast, Queensland.
- Feridhanusetyawan, T. and M. Pangestu (2003), "Indonesian Trade Liberalization: Estimating the Gains," *Bulletin of Indonesian Economic Studies*, 39(1), 51-74.
- Kajisa, K. and T. Akiyama (2005), "The Evolution of Rice Price Policies over Four Decades: Thailand, Indonesia, and the Philippines," *Oxford Development Studies*, 33(2), 337-361.
- Khor, M. (2003), "The WTO Agriculture Agreement: What Is at Stake," Southern and Eastern African Trade, Information and Negotiations Institute (SEATINI) Bulletin, 6(2), 1-8.
- Korinek, J. and M. Melatos (2009), "Trade Impacts of Selected Regional Trade Agreements in Agriculture," OECD Trade Policy Working Papers, No. 87, OECD Publishing.
- Malian, A.H., S. Mardianto, and M. Ariani (2004), "Faktor-faktor yang Mempengaruhi Produksi, Konsumsi and Harga Beras serta Inflasi Bahan Makanan," *Jurnal Agro Ekonomi*, 22(2), 119-146.
- Minot, N., M. Chemingui, M. Thomas, R. Dewina, and D. Orden (2007), "Impact of Trade Liberalization on Agriculture in the Near East and North Africa," Working Paper, International Food Policy Research Institute and International Fund for Agricultural Development.
- Nastiti, A. (2007), "The Analysis of Factors Affecting Imports of Rice of Indonesia (1982-2004)," Unpublished Paper, Faculty of Economics, Universitas Islam Indonesia, Yogyakarta.
- Nongsina, F.S. (2007), *Pengaruh Kebijakan Liberalisasi Perdagangan Terhadap Laju Pertumbuhan Ekspor-Impor Indonesia*, Postgraduate Thesis, Postgraduate Programme, Faculty of Economics, Universitas Indonesia.
- Rose, A.K. (2004a), "Do We Really Know that the WTO Increase Trade?" *American Economic Review*, 94(1), 98-114.

- Rose, A.K. (2004b), "Does the WTO Make Trade More Stable?" NBER Working Paper No. 10207, Cambridge.
- Soekartawi (2006), "Impor Beras: Benarkah Merugikan Petani?" Inovasi Online Working Paper, Vol. 7, No. 18, June.
- Stiglitz, J.E. (2002), *Globalization and Discontent*, W.W. Norton and Company, New York.
- Suparmoko, M. (2002), "The Impact of the WTO Agreement on Agriculture in the Rice Sector," Paper Presented at the Workshop on Integrated Assesment of the WTO Agreement on Agriculture in the Rice Sector, Geneva, Switzerland, April the 5<sup>th</sup>.
- Swastika, D.K.S and S.S. Nuryani (2006), "The Implementation of Trade Liberalization in Indonesia," *Jurnal Analisis Kebijakan Pertanian*, 4, 257-267.
- Wahyudidjafar (2008), *Pengaruh Implementasi AoA terhadap Regulasi Pangan Nasional*, Undergraduate Thesis, Law Faculty, Universitas Gadjah Mada, Yogyakarta.