# FISCAL EFFECTIVENESS UNDER REGIONAL ECONOMIC INTEGRATION: INDONESIAN AGRICULTURAL PERFORMANCE CASE

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**Abstract**

This paper investigates the effectiveness of fiscal policy in boosting agricultural sector performance and seeks the most effective policy in the presence of regional economic integration. It predicts the effectiveness of fiscal policy on the agricultural sector performance in four periods; the new order regime, the economic crisis, and pre and post China Free Trade Area (CAFTA). It also predicts the impact of fiscal policy on agricultural sector performance when CAFTA is fully implemented. It finds that fiscal policy is more effective in the optimum allocation of expenditures. It also finds that the agricultural sector can grow faster when the portion of capital expenditure increases.

**Keywords**: Fiscal effectiveness, economic integration, agriculture
**JEL Classification Numbers:** E62, F15, Q17

**Abstrak**

Makalah ini menyelidiki efektivitas kebijakan fiskal dalam mendorong kinerja sektor pertanian dan mencari kebijakan yang paling efektif dengan adanya integrasi ekonomi regional. Makalah ini memprediksi efektivitas kebijakan fiskal dalam meningkatkan kinerja sektor pertanian dalam empat periode; rezim orde baru, krisis ekonomi, sebelum pelaksanaan China Free Trade Area (CAFTA), dan setelah pelaksanaan CAFTA. Makalah ini juga memprediksi dampak kebijakan fiskal terhadap kinerja sektor pertanian saat CAFTA sepenuhnya dilaksanakan. Hasil analisis menemukan bahwa kebijakan fiskal lebih efektif dalam alokasi optimal dari pengeluaran. Analisis juga menemukan bahwa sektor pertanian dapat tumbuh lebih cepat ketika porsi peningkatan belanja modal meningkat.

**Keywords**: Efektivitas fiskal, integrasi ekonomi, pertanian
**JEL Classification Numbers:** E62, F15, Q17

## INTRODUCTION

The mainstream of economic theories predict that regional economic integration will have a positive impact on economic growth, including the sector of agriculture. With his free rate, then the manufacturers

may choose a more efficient input, so that the economy is predicted to grow faster. Domestic food prices should also be lower due to lower prices of imported food as well as food industry input cost efficiency. However, there is no significant Indonesian agricultural performance post the implementation of CAFTA.

The growth in Indonesian agriculture sector is not much different from that before the CAFTA implementation. The increasing food prices in Indonesian is sharper than that before the CAFTA impelementation, especially if we compare with Malaysia, Thailand and China (World Bank, 2014). Indonesian agricultural commodity trade balance with ASEAN and China showed a trend of deficit. UNCTAD (2014) shows that the deficit occurs in almost agricultural and food group commodities in the 3-digit of Standard of International Trade Classification (SITC).

The performance of the agricultural sector has not improved in this era of economic integration. The government's response in addressing regional economic integration are in the form of monetary and fiscal policies. Monetary policy is necessary to maintain macroeconomic stability. Fiscal policy has faster effect on the real sector through the transmission of rapid price adjustment and also to the rapid effect of macroeconomic equilibrium (For more on fiscal policy, please read Lane, 2010).

Previous studies suggest that the government intervention in terms of fiscal policies can improve the performance of the agricultural sector in the both form of policies; reducing the export tax and import tariff (Ratnawati, 1996) and increasing government spending (Jaroensathapornkul and Tongpan, 2007). However, Darsono (2008) and Tang et al. (2010) suggest that fiscal policies are not effective in improving economic output (GDP) and the performance of the agricultural sector in Indonesia. This finding is consistent with theoretical predictions of Mundel-Flemming that fiscal policy in small open economy in the floating exchange rates regime and perfect capital mobility, will not have an impact on economic output.

This paper investigates the effectiveness of fiscal policy in boosting the performance of agricultural sector, as well as fidning the most effective policies when the regional economic integration is implemented. By using annual time series data from 1990 to 2011, agricultural products are divided into two categories, namely raw materials and foods products. The data investigated in this paper are obtained from the World Bank, UNCTADStat, World Governance Indicator, LABORSTA-ILO, FAOSTAT, IMF, Badan Pusat Statistik (BPS) and Bank Indonesia (BI).

The theoretical background of fiscal policy effectiveness on the economy has been introduced by Mundell (1963) in the framework of the Keynesian IS-LM model. A study conducted by Hemming *et al.* (2002) suggested that the fiscal multiplier will be positive or large when there is an excess capacity, a closed or an open economy with a fixed exchange rate, and the households that have limited time horizons or liquidity restrictions. Ilzetzki *et al.* (2010) tested 44 countries with quarterly data and proved that the fiscal multipliers in open economies are lower than in closed economies. In open economies, the fiscal multiplier is relatively larger in economies with a predetermined exchange rate but zero in economies with flexible exchange rates.

A special issue in fiscal policy effectuvebes is the so-called crowding out effect. Crowding out effect is the decrease in private investment because of an increase in government borrowing. If an increase or decrease in government spending and tax revenue (which causes the budget deficit) is financed by debt that is increasing the interest rate, private investment will decline. This might happened in a closed economy because of an increase in interest

rates (due to fiscal expansion) which lowers investment. In an open economy with a flexible exchange rate and perfect capital mobility, crowding out occurs due to appreciation of the domestic exchange rate which lowers net exports (Hemming et al., 2002). Therefore, theoretically, the higher the degree of openness of the economy, the lower the fiscal policy effectiveness is.

Claeys *et al.* (2008), Hadiwibowo (2010), Kimakova (2006), Kueh *et al.* (2008) and Ridwan (2009) studies do not support the above suggestions, and still suggest that fiscal policies are effective. A higher degree of openness of an economy may have a greater government intervention (Kueh *et al.*, 2008). This is related to the fact that government and markets are complementary, although they might become substitute as well. As trade becomes more open, government spending will be a vital tool to reduce the external risks and to protect infant domestic industry. Crowding out effect of domestic interest rate is significant, but it is reduced by the cross-border spillover (Claeys *et al.*, 2008). Besides the fact that no country really embraced pure flexible exchange rate and perfect capital mobility, so Kimakova (2006) argues that fiscal policies remain effective. Other evidence, the opening up of the economy through economic integration of ASEAN, significantly boosts investment in ASEAN countries, due to the increase of competitiveness and ease of investment (Ridwan, 2009).

Fiscal policy can affect the agricultural sector through several pathways. Capital expenditures affect the performance of the agricultural sector through increased economic efficiency. Development of infrastructures and provision of public facilities improve the product distribution and increase the efficiency of the economy. That will affect the price and export competitiveness. Government capital expenditure will be more effective when it complementary and support with the private sector. However, some research is still ambiguous whether the government investment in Indonesia complementary or even substituted with private investment. Routine expenditures such as spending on personnel, goods (not capital) and services, affect the performance of the agricultural sector through the increasing in disposable income. In addition to increase output because the requested item, routine expenditure also increases the income of employees and their families. Similarly, the subsidy will increase the purchasing power of the people. Increased purchasing power would increase the food and non-food consumption and rise the demand for imported goods. All three affect the export-import, domestic prices, again affecting the output.

Meanwhile, government spending requires source of funds. In addition to tax income, sources of financing is the sale of government bonds that will affect interest rates. The high deposit interest rates may attract capital inflows, with the side effect of the high interest rates that might reduce investment. Increased burden of investors lose interest in private investment (including for agriculture) that would reduce economic output. While the high capital inflows led to appreciation of the exchange rate affecting export-import agricultural input costs (of imports) and domestic prices of agricultural commodities and food. Strip links between fiscal policies with the agricultural sector differences affect the effectiveness of fiscal policy that is often found in many previous studies. The linkages between macroeconomic policy and agriculture was proposed by Snell et al. (1997), and applied in Thailand case by Jaroensathapornkul and Tongpan (2007). Thh agricultural performance was not only influenced by government spending for agriculture but also by government spending in general. However, both studies have not considered the regional economic integration.

## METHODS

China-ASEAN FTA is an agreement to gradually reduce and to remove the barriers of all goods and services. It was agreed in 2002 and start to be implemented in 2004. The regional economic integration is measured by the tariff rate approach and the time approach which will be analyzed simultaneously to demonstrate the consistency of the results.

The performance of agricultural sector is measured by indicators in three aspects, namely growth of output (production aspect), trade balance (trade aspect) and price (stability aspect). Meanwhile, the agricultural sector analysis is distinguished by its functions; namely agriculture in general, agriculture as a provider of food, and agriculture as a provider of raw materials.

The food commodities refer to UNCTAD which are products covered in chapter 0, 1, 22 and 4 of International Trade Classification (SITC) Standard Revision 4. Non-food agricultural commodities or agricultural raw materials, derived from all products included in Chapter 2 SITC other 22, 27 and 28. As a result, export food categories are dominated by SITC 42 (Vegetable Oils and Fats) especially palm oil, as well as non-food agricultural export category which is dominated by SITC 23 (Crude Rubber). Therefore, both commodity groups are differentiated into its own category.

This paper is a part analysis of the Indonesian Agricultural Trade under China-ASEAN Regional Economic Integration Model (Appendix 1), which focuses on the fiscal effectiveness. The model used in this paper is arranged in the econometric model of **simultaneous equations** because of inter-related between variables. Simultaneous equation model is not only able to perform simulations, but also estimate the coefficient of relationship between variables that are not done in computable general equilibrium model. The model consists of 51 structural equations and 24 identity equations, those arranged into six (6) blocks, namely: national income, fiscal, monetary and capital flows, trade, prices and the agricultural sector performance. Number of endogenous variables, whose value are determined in the system as much as 75 variables, while the number of exogenous variables, whose value are determined outside of the system as much as 70 variables. Beside this, there are 42 lag endogenous variables in the model. According to the order condition, the model is over-identified and therefore could not be estimated by ordinary least square. It can be estimated by Two stages least square (2SLS).

The analysis is carried out in two stages: (1) predict the effectiveness of fiscal policy over times by comparing the effects of fiscal expansion on the agricultural sector performances in four periods; the new order regime, the economic crisis, toward and after CAFTA, (2) predict the impact of fiscal policy scenarios on the agricultural sector performances when CAFTA is fully implemented, in a manner simulating a combination of zero percent intra-CAFTA tariffs and the driving factor scenarios.

## RESULTS AND DISCUSSION

### Effectiveness of Fiscal Policy in the Regional Economic Integration CAFTA

The impact of a policy is certainly different for every problem. The simulation of the fiscal expansion over time (Table 1) is intended to determine the conditions such as whether the policy would be effective to improve the performance of agriculture and the general economy. Keynesian economists argue that government intervention is needed when the market mechanism cannot run properly. The statement is relevant to the prediction by the model, where fiscal expansion is more effective during the crisis. By 10 percent increase in government spending, the increased real GDP during the economic crisis of 1997-1998 was 7.78

percent (0.11 percent in agriculture sector). The effectiveness of fiscal expansion was lowest when the economy was opened, namely 1.82 percent increase in output when government spending rose by 10 percent. It is not different from the theoretical predictions by Mundell-Fleming that fiscal expansion in an open economy, with a floating exchange rate regime, for a small economy such as Indonesia will lead to an appreciation of the domestic exchange rate. Strengthening the domestic exchange rate lowers the competitiveness of exports and reduces the effectiveness of fiscal expansion on the economy's output.

By the time approach, effectiveness of fiscal policy can be analyzed by predict the impact in the separate time. The 2004-2011 year is representation of CAFTA implementation (but not fully implemented yet). The low impact of fiscal policy in the regional economic integration (CAFTA) does not mean that fiscal policy is not necessary here. In an increasingly open economy, it takes a higher fiscal expansion to boost economic performance. The higher of economic openness degree, the vital role of government intervention becomes increasing. This is related to the fact between the government and the markets are complementary, although it could each substitution (Kueh et al., 2008). The high degree of openness of a country tends to the high external risks susceptible. It will have an impact on the volatility of the economic performance in developing countries. While in developed countries, by the big size of their government, then the volatility of the economy can be reduced. It is difficult for developing countries especially poor countries, because of its limited financial resources.

**Table 1:** The Impact of Fiscal Expansion on Agricultural Performance, 1991-2011

| Performance indicator | Symbol | Impact of increasing 10% in government spending (%) | | | |
|---|---|---|---|---|---|
| | | The New-Order era (1991-1996) | Economic Crisis (1997-1998) | Toward CAFTA (1999-2003) | CAFTA (2004-2011) |
| (1) | (2) | (3) | (4) | (5) | (6) |
| A. Macroeconomic | | | | | |
| Real GDP | YI | 2.45 | 7.78 | 2.04 | 1.82 |
| Tax revenue | NCII | 7.30 | -215.98 | -13.42 | -1.29 |
| Exchange rate per US$ | EXRI | 7.44 | 18.70 | 10.80 | 7.35 |
| Private investment | ISI | -0.62 | -2.21 | 2.45 | 2.26 |
| B. Production (agriculture sector) | | | | | |
| Real GDP of agriculture sector | YAGI | 0.02 | 0.11 | 0.03 | 0.00 |
| Food Production Index | QFI | 0.56 | 2.71 | 1.00 | 0.18 |
| Investment in agriculture | IAGI | 0.84 | 2.72 | 0.70 | 2.44 |
| C. Stability | | | | | |
| CPI general | PI | 6.36 | 17.51 | 7.96 | 2.97 |
| CPI for foods | PFI | 4.95 | 16.35 | 7.24 | 1.00 |
| CPI for non-foods | PNFI | 7.57 | 18.45 | 8.55 | 4.43 |
| D. Trade | | | | | |
| Total Export | XI | 0.05 | 0.21 | 0.01 | -0.25 |
| Export of agri raw material | XAIW | 0.19 | 0.09 | 0.06 | -1.78 |
| Export of foods | XFIW | -0.03 | 0.00 | -0.11 | 0.62 |
| Export of non-agriculture | XOIW | 0.06 | 0.06 | 0.02 | -0.34 |
| Total Import | MI | 1.10 | 1.90 | 0.63 | 0.58 |
| Import of agri raw material | MAIWI | 0.24 | 1.82 | 0.56 | 0.18 |
| Import of foods | MFIW | 5.69 | 8.50 | 3.21 | 3.84 |
| Import of non-agriculture | MOIW | 1.20 | 2.73 | 0.67 | 0.45 |

Notes Changes (% ) are calculated based on the simulation when the total government expenditure is up to 10 %.

**Table 2:** The Impact of Government Expenditure on Agricultural Performance, Pre and Post CAFTA

| Aspect | Indicators | Impact of Increasing US$ 2 Billions (Real) | |
|---|---|---|---|
| | | Not Fully Implemented of CAFTA | Fully Implemented of CAFTA |
| (1) | (2) | (3) | (4) |
| Macro economic | Real GDP (YI) | 1.37 | 1.08 |
| | Household consumption (CI) | 1.81 | 0.84 |
| | Government revenue (GRI) | 0.95 | 0.21 |
| | Tax revenue (TAXI) | 1.22 | 0.27 |
| | Private Investment (IS) | 0.96 | 0.48 |
| Moneter | Net capital inflows (NCII) | > 20.0 | < -20.0 |
| | Exchange rate (EXRI), Rp/US$ | 18.06 | -4.19 |
| | Real lending interest rate (RLI) | 1.81 | -1.11 |
| | Real deposit interest rate (RDI) | 1.71 | -1.27 |
| Trade | Net export (NXI) | 1.61 | 4.01 |
| | Export (XI) | -0.72 | 2.67 |
| | Import (MI) | -1.52 | 2.32 |
| Stability | CPI for foods (PFI) | 11.21 | -4.80 |
| | CPI for non-foods (PNFI) | 16.87 | -3.76 |
| | CPI general (PI) | 14.42 | -4.16 |
| | Prod Price Index (PPI) of agriculture | 7.80 | -3.97 |
| Agricultural Performance | Real GDP of Agricultural Sector (YAGI) | 0.88 | 0.37 |
| | Food production index (QFI) | 1.64 | -0.38 |
| | Real wage of agricultural worker (WAGI) | -0.26 | -0.84 |
| | Population activity in agriculture (LAGI) | 0.52 | -0.10 |
| | - employees/worker (LPAGI) | 1.26 | -0.14 |
| | - employer/enterpreneur/own worker (LEAGI) | -0.91 | -0.02 |
| | Agricultural investment (IAGI) | -0.95 | 0.28 |

Description: Column (3) contains simulations by scenario: government expenditure increase by US$ 2 billions. Column (4) contains simulations by scenario: government expenditure increase by US$ 2 billions and all tarif intra-CAFTA are 0%.

By the tariff approach, the effectiveness of fiscal policy be analyzed by comparing the impact of fiscal policy under fully implemented of CAFTA and under existing condition. Fully implemented of CAFTA is represented by scenario that all tariff intra-CAFTA are zero (removed). The simulation results have shown in the Table 2.

Simulation results in Table 2 have shown that fiscal policies are still effective even in the regional economic integration. Fiscal policies in Indonesia are still effective to improve the agricultural performance of output production, price stability and trade balance. This is demonstrated by the impact of the fiscal expansion on real GDP and real GDP of agricultural sector are positive. But the effectiveness is lower than before the fully implemented of regional economic integration. These findings suggest that the Mundell-Fleming model that state the fiscal policy is not effective in small open economy, is not fully applicable in Indonesia. This is due to the regional economic integration is only part of the economic openness. In addition, other assumptions such as free capital mobility and a floating exchange rate is not entirely the case. Government still control for capital mobility. There are no countries that really floating exchange rate fully. Literature study of Hemming *et al.* (2002) as well as empirical studies of Heath (2010) argues that the higher the level of economic openness the effectiveness of fiscal policy will decrease, its relevant to the Indonesian case. With the last reason, this finding does not conflict with Claeys *et al.* (2008),

Hadiwibowo (2010), Kimakova (2006), Kueh et al. (2008) and Ridwan (2009) which looked at fiscal policy remains effective even in an open economy.

The impact of fiscal policy by increasing 10 percent of government spending, under the regional economic integration is 1.08 percent, lower than before fully implemented that 1.37 percent. It means that is required greater magnitude of fiscal expansion in the regional economic integration than before. It relates to the economic volatility due to greater external influences (Kueh *et al.*, 2008). As trade becomes more open, government spending will be a vital tool to reduce external risks and to protect infant domestic industry.

Generally, it is not enough evidence to state that the Mundell-Fleming theory fully applied to the case of fiscal policy and the performance of the agricultural sector in Indonesia. Some contributing factors include: (1) In the MF-models, fiscal expansion push up domestic interest rates attract capital inflows so that the domestic exchange rate is appreciated. Increased output by fiscal expansion is reduced by the decrease in net exports due to the appreciation of the exchange rate. But in the reality, to attract capital flows, other member countries a regional economic integration also do the same policy, resulting in interest rates 'competitive'. The increase in capital inflow does not occur, even though the fiscal expansion encourages the appreciation, but the effect is not as big as the tendency of depreciating dollars when CAFTA is fully implemented. Crowding out or back output due to its reduced fiscal expansion is not expected to occur. (2) Increased economic openness through regional economic integration may lead to a greater susceptibility to small fluctuations due to external economy. In such circumstances, fiscal policy acts as a domestic economic stabilizer and stimulator. Shown in Table 2, the fiscal expansion in regional economic integration tends to be able to stabilize the prices.

**Driving Factors of Fiscal Policy Effectiveness**

In a review of the theory has described some of the things that influenced to effectiveness of fiscal policy, including the optimization of the budget, additional government spending priorities, instruments and appropriate financing sources, the condition of infrastructure (physical, social, institutional) adequate, harmonization with other policies (monetary) and timeliness. The study focuses on the treatments in fiscal policy. Specific conditions of each country may be different. The results of simulation by econometric models for Indonesia outlined in the discussion below.

***Optimization of Budget Allocation***

In the IMF report, general posture of government expenditure can be divided into 4 (four) sections; personnel, goods and services, so-called as routine expenditures (GERI), capital expenditure (GEII), subsidies (GESI) and other expenses such as interest payments and the like (GEOI). To determine which parts should been prioritized, Simulation 01 to 13 shown in Table 3.

For the improvement of macroeconomic performance in regional economic integration (CAFTA), the government should prioritize spending on capital expenditure (GEII). At the same level of routine expenditure, increasing in output (Y) occurs when a portion of the capital expenditure is relatively high (output on SIM 01-04 < SIM 05-08 and SIM 09 < SIM 10). But with records, while providing adequate portion for subsidy at least 20 percent. The composition of spending such as SIM 05-08 is predicted to produce the output about 0.7 percent higher than the average all this time of spending composition, except for SIM 07. Output decreases when the lower portion of the subsidy, only 1/10 of government spending (SIM 07), showed the economy Indonesia is driven by consumption. This is reinforced by BPS

(2013), share of consumption in the quarterly GDP 2012-2013 is high for about 50-60 percent. So in the regional economic integration, spending of capital to increase output remains to be offset by subsidies increase purchasing power and encourage consumption.

**Table3:** The Simulation Impact of Government Expenditure Allocation on Agricultural Performance under All Tariffs Intra-CAFTA Zero Percent.

| Indicators | | Changes from the ExistingC ondition (%) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SIM 01 | SIM 02 | SIM 03 | SIM 04 | SIM 05 | SIM 06 | SIM 07 | SIM 08 | SIM 09 | SIM 10 | SIM 11 | SIM 12 | SIM 13 |
| | Routine | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 2 | 2 | 2.5 |
| | Investment | 1 | 1 | 1 | 1 | 2 | 2 | 3 | 3 | 3 | 4 | 4 | 2 | 2.5 |
| | Subsidy | 2 | 3 | 4 | 1 | 2 | 3 | 1 | 2 | 2 | 2 | 2 | 4 | 2.5 |
| | Other | 3 | 2 | 1 | 4 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 2.5 |
| (1) | | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
| A. Macro-economic | | | | | | | | | | | | | | |
| Real GDP | | -5.1 | -0.1 | -0.7 | -4.8 | 0.7 | 0.7 | -2.1 | 0.7 | -4.1 | 0.8 | -4.1 | -5.6 | -6.0 |
| Real GDP non agri | | -5.7 | -0.2 | -0.8 | -5.5 | 0.7 | 0.7 | -2.4 | 0.8 | -4.6 | 0.9 | -4.7 | -6.4 | -6.8 |
| Consumption | | -5.8 | 0.6 | 1.6 | -5.6 | 0.7 | 1.3 | -3.0 | 0.1 | -4.1 | 0.5 | -3.7 | -2.5 | -5.6 |
| Tax revenue | | -3.1 | -0.3 | -0.8 | -2.9 | 0.1 | 0.1 | -1.5 | 0.1 | -2.6 | 0.2 | -2.6 | -3.4 | -3.6 |
| Exchange rate Rp/US$ | | 55.6 | -2.7 | -33.5 | 18.5 | -2.3 | -35.5 | 27.8 | 4.1 | -30.5 | -2.6 | -29.6 | 21.3 | 17.8 |
| Lending interest rate | | -4.3 | -2.1 | -2.5 | -2.4 | -0.1 | -2.3 | -0.9 | 0.0 | -3.8 | -1.2 | -1.9 | -3.6 | -3.9 |
| Deposit interest rate | | -4.3 | -2.1 | -2.7 | -2.5 | -0.2 | -2.5 | -1.0 | -0.1 | -3.9 | -1.3 | -2.0 | -3.7 | -3.9 |
| Private investment | | 0.3 | 3.8 | 3.4 | -0.5 | -0.4 | 0.7 | -6.1 | -3.4 | -6.9 | 0.4 | -10.8 | -4.5 | -6.7 |
| B. Production | | | | | | | | | | | | | | |
| Real GDP agriculture | | -1.1 | 0.0 | 0.0 | -0.7 | 0.5 | 0.3 | -0.1 | 0.3 | -0.8 | 0.3 | -0.7 | -1.1 | -1.3 |
| Food production | | 4.4 | -0.3 | -3.3 | -1.9 | 0.0 | -3.2 | -2.8 | 0.4 | -3.3 | -0.2 | -2.8 | -2.3 | -2.2 |
| Activity in agriculture | | -0.2 | -0.2 | -0.1 | 0.1 | 0.2 | -0.1 | 0.2 | -0.1 | -0.1 | -0.1 | 0.0 | -0.1 | -0.2 |
| Agricultural investment | | -1.3 | 0.1 | -0.5 | -7.1 | -1.4 | 0.4 | -3.2 | 0.0 | -3.9 | 0.2 | -5.8 | -5.4 | -3.1 |
| C. Stabilisasi | | | | | | | | | | | | | | |
| CPI foods | | 44.9 | -2.4 | -29.2 | -12.9 | -3.0 | -29.3 | -24.5 | 1.3 | -25.1 | -3.3 | -22.0 | -14.6 | -12.0 |
| CPI non foods | | 46.6 | -1.8 | -37.3 | -22.6 | -2.3 | -37.2 | -33.9 | 1.3 | -35.3 | -2.8 | -31.1 | -25.4 | -21.6 |
| CPI general | | 45.9 | -2.0 | -34.0 | -18.6 | -2.6 | -34.0 | -30.0 | 1.3 | -31.1 | -3.0 | -27.4 | -21.0 | -17.7 |
| PPI agriculture | | 31.0 | -1.7 | -14.3 | 1.5 | -0.7 | -15.9 | -8.2 | 0.4 | -7.8 | -2.6 | -5.5 | 0.3 | 1.2 |
| D. Trade | | | | | | | | | | | | | | |
| Net export | | -0.2 | 5.9 | -4.6 | 1.8 | 3.6 | -1.6 | -8.6 | -3.2 | -4.2 | 3.1 | 0.5 | 2.3 | 2.4 |
| Total export | | 1.2 | 3.1 | 2.4 | -0.7 | 1.2 | 4.2 | -1.7 | -0.1 | 1.0 | 2.6 | -1.1 | 0.2 | 0.2 |
| Total import | | 1.5 | 2.4 | 4.3 | -1.4 | 0.5 | 5.8 | 0.1 | 0.7 | 2.3 | 2.4 | -1.5 | -0.4 | -0.4 |
| X of agr raw material | | -1.8 | 1.8 | -0.7 | -0.1 | 1.0 | 1.7 | -1.7 | 0.2 | -1.0 | 1.3 | -1.8 | -0.5 | -0.9 |
| X of foods | | 1.8 | 5.2 | 5.2 | -0.7 | 1.5 | 8.9 | -1.6 | -0.4 | 1.8 | 3.6 | 0.1 | 0.6 | 0.4 |
| X of non-agriculture | | 2.1 | 3.7 | 3.9 | 0.1 | 1.6 | 4.8 | -0.7 | 0.3 | 2.0 | 3.4 | 0.0 | 1.1 | 0.5 |
| X of palm oil (SITC 42) | | 16.1 | 2.6 | 2.2 | 8.1 | 6.4 | 1.6 | 5.5 | 0.8 | 8.8 | 1.2 | -2.1 | 9.5 | 15.2 |
| E. Income | | | | | | | | | | | | | | |
| Real wages in agric | | -1.2 | 1.0 | - 1.0 | 0.9 | - 0.4 | 0.8 | - 0.5 | 0.8 | - 1.2 | 0.9 | - 1.4 | 1.3 | - 1.3 |
| Labor productivity | | -1.0 | 0.2 | 0.1 | -0.8 | 0.3 | 0.4 | -0.3 | 0.4 | -0.7 | 0.4 | -0.7 | -1.0 | -1.2 |

Description:

1. Agricultural raw material trade exclude rubber (SITC 23), foods trade exclude palm oil (SITC 42).
2. The impacts are calculated by percentage change from the base value.
3. Base value : predicted when all tariff intra-CAFTA=0 under the existing composition of government expenditure (on average) that is, Routine (GERI) : Investment (GEII): Subsidies (GESI) : Other (GEOI)= 4,1 : 2,0 : 2,3 : 1,6.
4. The simulation be done by arranges (reallocation) the expenditure composition without change the fiscal value.
5. Simulation scenario by the ratio of 4:2:1:3 is not convergent.

According to the simulation results, other expense (interest payment on loans) is not effective to increase output. When the other expense is relatively dominant (SIM 01 and 04), it be predicted to highest potential decline in output. This result is not surprising and is not much different from previous studies. Abdullah et al. (2009), Hadiwibowo (2010) and Hussain et al. (2009) have previously been observed that the government's budget allocation for development such as infrastructure, education and health will increase investments and economic growth, while the non-development budget al.location for such defense and mortgage debt will give the negative effect.

For short-term economic stabilization, the economic was growth by maintaining consumption through subsidies (SIM 06). In cases when the entire fare freed, fiscal expansion can generally withstand price fluctuations. In an open economy, fiscal expansion will lower the price (especially imports) through exchange rate appreciation. This was indicated by a negative value (rupiah appreciation) of the fiscal impact on the exchange rate. Appreciation of exchange rate impact on the export competitiveness, so net exports declined. The increase in output (and income) encourage rising in consumption of non-food (and imported) which is higher than the rising in food consumption (according to the Engle's theory). Investment and output of non- agricultural growth encouraged, but imports were expected increasing because the Indonesian marginal propensity to import was expected to be high relatively.

Performance of the agricultural sector is more inelastic than the general economy. The fluctuations (increasing/decreasing) are smaller than the non-agricultural sector. Table 3 shows that in general by a variety of simulation scenarios, agricultural sector performance rise when the portion of capital expenditures (GEII) in the government spending (GEI) ride. Increased agricultural output only occurs when the portion of the capital expenditure of at least 20 percent (SIM 05, 06, 08 and 10). It means that the agricultural sector now requires public facilities (infrastructure). Increased subsidy able to increase consumption but not always followed by an increase in production. Fuel and energy subsidies, especially for households (not for industry and services) increase disposable income. However, their increase in disposable income generally not spent for agricultural products, but for non-agricultural products, which mostly imported. Agricultural input subsidies, if not followed by a rise in output prices, not able to stimulate production.

When the entire tariffs of intra-CAFTA are exempt, exports and imports will almost certainly increase. Fiscal policy is expected to improve the performance of trade, increase exports and curb imports. However, trade issues can not be answered with the optimization of the composition of the fiscal. Simulation results of trade issues have not provided consistent information to be analyzed.

Government spending can not be separated from personnel, goods and services (routine). In the case of Indonesia, when CAFTA is fully implemented, routine expenditure can not be less than 3/10 of budget (SIM 11, 12, and 13). Therefore, the alternative compositions of expenditures that may be selected are: Simulation 05, 06, 08 and 10, depending on the country's interest. Simulation scenarios in Table 3 suggest no one policy can solve entire problems. The increase in one hand is not followed by an increase in the other. Simulation scenarios above are just providing information, while policy maker may take the policy accordance to the side which is prioritized. For example, to pursue the economic growth, it can not rely on the agricultural sector, due to the characteristics of agriculture cannot grow fast. Non-agricultural sector grew higher when the

portion of the capital expenditure is high, then the SIM 08 and 10 are the best choice. Conversely, if the price reduction is a priority, then the SIM 06 is the best option.

So, when CAFTA is fully implemented, the performance of the agricultural sector and the economy in general could be improved by reallocation of government spending. Capital expenditure is a priority, but with a constraint the subsidy must be require a minimum of 20 percent and the routine expenditure of at least 30 percent. It should be underlined that this case is only for the reallocation of expenditures in order to optimization the budget, without increasing the amount of the fiscal. In the case of fiscal expansion (increasing the amount of government expenditure) are described in the next explained.

***Priorities of Spending Expansion***

By looking at the differences in economic and agricultural performance for different budget al.locations, the fiscal expansion through additional government spending should be prioritized on the proper expenditure items. The government spending as measured in the value of 2000 year US$, on average increased by almost US$ 2 billion per year. To determine the additional budget priorities, then simulated for the extreme points as in the SIM 14 to 19 below. The addition in the form of absolute is selected to scenario, not in relative (percentage increase), because of due to the initial amount of each expenditure is not balanced. Expenditure items whose value is small, with the same percentage increase, the increase will be small, so the impact is not equal to the initial value expenditure items are great.

According to the simulation results in Table 4, when CAFTA is fully implemented, additional in capital expenditure (SIM 16) can improve the performance of the economy and agriculture better than the addition in other expenditures. The economic output is expected to be 1.6 percent higher than without fiscal expansion. The output of agricultural sector is also expected to be higher by 0.5 percent from the previous. But there is an indication that the government's capital expenditure not complement with the private investment. It evidenced by a decrease in private investment when the government increased capital expenditures. This contrasts to Kwan (2006) that concluded there is an inter-substituted of public and private consumption in 9 East Asian countries, except in Indonesia and Singapore which are complementary. Even though lowering in private investment, output still growth because the negative impacts of crowding out effects on private investment (because of high interest rates), offset by the crowding-in effects associated with high consumption of household reduction of risk and uncertainty (Hur et al., 2010).

Performance of the agricultural sector when the tariff exempt intra-CAFTA is generally higher when there is a fiscal expansion, compared with no expansion. Agricultural sector output, agricultural investment and labor productivity increases with fiscal expansion. The number of people working in the agricultural sector declined, due to the non-agricultural sector's growth higher, while the agricultural sector real wages tend to decline. The decreasing of the people working in agriculture are mainly labor/agricultural workers, while the entrepreneur (own-account worker and employers) increases. Presumably increase occurred for own-account worker, which is usually of small-scale food crop farmers. It seen with the index of food production tends to decline.

Fiscal expansion is also predicted to play a role in the price stabilization, except routine expenditure. Routine expenditures (GERI) means as spending on personnel, goods and services, increase revenue some people, raising the demand of consumer goods as well as psychological influences (price expectations) in the market. These conditions push up prices. Price increasing

in this case tends to be detrimental to farmers, due to rising prices of agricultural products at the producer level is much lower than the increase in food and non food prices at the consumer level.

The results of the simulation scenarios fiscal expansion has not given consistent results that can be used as the basis for policy-making trade performance. However, except the addition of routine expenditures (SIM 15), all scenarios predicted can reduce the declining of net export when all tariffs intra-CAFTA removed.

**Table 4.** The Impact of Fiscal Expansion by US$ 2 Billion of Government Expenditure Increase (Constant 2000) on Indonesian Agricultural Performance

| Indicators | Base Value | Change (%) | | | | | |
|---|---|---|---|---|---|---|---|
| | | SIM 14 | SIM 15 | SIM 16 | SIM 17 | SIM 18 | SIM 19 |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| A. Macro-economic | | | | | | | |
| Real GDP (YI) | 192,725.0 | 1.1 | 1.4 | 1.6 | 1.4 | 0.8 | 1.4 |
| Household consumption (CI) | 108,171.0 | 0.8 | 1.0 | 1.2 | 1.9 | 0.3 | 1.2 |
| Tax revenue (TAXI) | 24,649.8 | 0.3 | 0.6 | 0.6 | 0.5 | 0.1 | 0.5 |
| Exchange rate, Rp/US$ (EXRI) | 12,318.0 | -4.2 | 22.7 | -0.9 | -2.0 | -5.2 | -0.7 |
| Private investment (ISI) | 36,452.3 | 0.5 | 0.9 | -1.1 | 0.9 | 0.5 | 0.3 |
| Real GDP of Non-agriculture (YNAGI) | 164,881.0 | 1.2 | 1.6 | 1.8 | 1.6 | 0.8 | 1.6 |
| B. Production | | | | | | | |
| Real GDP of Agricultural Sec (YAGI) | 27,843.5 | 0.4 | 0.3 | 0.5 | 0.4 | 0.2 | 0.4 |
| Food production index (QFI) | 106.5 | -0.4 | 1.7 | 0.0 | -0.1 | -0.5 | 0.0 |
| Pop activity in agriculture (LAGI) | 47,647.8 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| - employees/worker (LPAGI) | 31,278.3 | -0.1 | -0.6 | -0.2 | -0.2 | 0.1 | -0.2 |
| - employer/enterpreneur (LEAGI) | 16,369.5 | 0.0 | 0.7 | 0.2 | 0.1 | -0.4 | 0.2 |
| Agricultural investment (IAGI) | 3,007.5 | 0.3 | 0.5 | 1.1 | 0.6 | 0.7 | 0.8 |
| C. Stability | | | | | | | |
| CPI for foods (PFI) | 158.3 | -4.8 | 13.4 | -2.3 | -3.5 | -4.7 | -2.3 |
| CPI for non-foods (PNFI) | 175.6 | -3.8 | 21.1 | -2.1 | -3.4 | -3.9 | -1.9 |
| CPI general (PI) | 168.1 | -4.2 | 17.9 | -2.2 | -3.4 | -4.3 | -2.1 |
| Prod Price Index of agriculture (PPI) | 136.1 | -4.0 | 4.4 | -2.8 | -3.4 | -3.6 | -2.6 |
| D. Trade | | | | | | | |
| Net export (NXI) | 19,900.2 | 4.0 | -4.2 | 0.7 | 0.7 | 3.9 | 0.6 |
| Total export (XI) | 95,250.9 | 2.7 | 0.6 | 2.3 | 3.0 | 2.7 | 2.3 |
| Total import (MI) | 75,350.7 | 2.3 | 1.9 | 2.7 | 3.6 | 2.4 | 2.8 |
| Import of agric. raw material (MAIW) | 2,193.9 | -1.2 | 10.9 | 0.3 | -0.4 | -1.4 | 0.2 |
| Export of agric. raw material (MAIW) | 4,023.3 | 0.8 | 0.0 | 1.4 | 1.3 | 3.4 | 1.0 |
| Import of foods product (MFIW) | 6,812.4 | -7.5 | 16.4 | 0.7 | -0.2 | -7.3 | 0.7 |
| Export of foods product (MFIW) | 10,538.3 | 3.7 | 1.2 | 3.2 | 4.9 | 4.6 | 3.6 |
| Import of non-agricultural (MOIW) | 50,338.1 | 4.5 | 0.3 | 4.0 | 5.4 | 4.6 | 4.1 |
| Export of non-agricultural (MOIW) | 63,398.6 | 3.6 | 1.2 | 2.9 | 3.5 | 3.2 | 3.2 |
| E. Income | | | | | | | |
| Real wage in agriculture (WAGI) | 30.3 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 | -0.8 |
| Labor productivity (YAGI/LAGI) | 584.4 | 0.5 | 0.5 | 0.6 | 0.6 | 0.3 | 0.5 |

Description:

- The figure of 2000 is government expenditure measured in US$ constant 2000 year, increased amount US$ 1999 (about US$2000) per year on average.
- Base value: simulation of all intra-CAFTA tariffs 0% (fully implemented of CAFTA), without fiscal policy.
- Simulation scenarios: SIM 14: GEI+2000 SIM 15: GERI+2000

SIM 16: GEII+2000 SIM 17: GESI+2000

SIM 18: GEOI+2000 SIM 19: GERI+500, GEII+500, GESI+500, GEOI+500

***Fiscal Instruments***

Fiscal expansion in an effort to increase the economic performance, can be performed with two instruments; increases in government spending and or tax cuts. In the past ten years the real government expenditure was measured by a constant 2000 of US$, an average increase of U.S. $ 1,999 million per year, or nearly two billion. If the intra-CAFTA tariffs completely zero percent, then government spending rose by US$ 2 billion, or do the withholding tax, the impact on agricultural performance shown in Table 5. In regional economic integration, both fiscal expansions through government spending or tax cuts have a positive impact on the performance of the economy and the agricultural sector. Real GDP and real GDP of agriculture sector with an expansionary fiscal policy (SIM 22, 23 and 24) are higher than in a neutral fiscal policy (SIM 20 and 21). Similarly to international trade, crowding out a decrease in output by a decrease in net exports did not materialize. On the contrary, the net export under fiscal expansion is higher than without expansion.

For the improvement of production performance, fiscal instruments through taxes over the role of government spending. Production performance indicators (economic or agricultural) in SIM 22 and 24 is higher than SIM 23. Withholding tax (SIM 24) as well as the increase in spending which not financed by taxes (SIM 22) is predicted to have an impact on the economy better than the increase in government spending primarily financed by taxes (SIM 23). By a reduction in taxes of $ 2 billion but still retain massive government spending, will have an impact on output growth of 1.6 percent (economy) and 0.2 percent (agricultural sector). The growth occurs because of an increase in consumption of 1.7 percent and private investment of 1.9 percent. This prediction can explains further the Ducanes, *et al.* (2006) research who found a short-term spending multiplier is found positive, but its magnitude is less than one in four countries (China, Philippines, Indonesia and Bangladesh), while the tax multiplier was lower. The low of spending multiplier can be explained mainly due largely funded from taxes. Similarly, in the long run, the study of Tang et al. (2010) on the ASEAN-5 (Indonesia, Malaysia, Thailand, Philippines and Singapore) by a structural VAR models found that government spending does not have a significant impact on output, while the tax effect is precisely opposite to the conventional theory .

The pattern on the agricultural sector is not much different from the economy in general. However, simulations in Table 5 were performed when entire tariffs of intra CAFTA zero percent, the changes in the agricultural sector output is not very responsive to fiscal expansion. Naturally, because of the characteristics of the agricultural sector who cannot grow rapidly. The rapid growth of non-agricultural sector attracts labor from rural agriculture to urban non-agricultural. It also reflected a potential decline in agricultural labor by the expansionary fiscal policy. The highest mobility mainly is workers/agricultural laborers, while the agricultural self-employment is projected to increase when the taxes rate are lower.

For stabilization performance, the government spending plays a greater role than tax cuts instrument. The prices as an indicator of stabilization in SIM 22 and 23 (an increase in government spending) is better (more stable) than SIM 24 (tax cuts). Government spending increase is equivalent to the increase in procurement services and public facilities. When government spending is financed by non-tax fund sources, the cost of inputs per unit becomes lower. It will lead to a more efficient production sector, that will, eventually, reduce the prices. In some scenarios, the price at the farm level is the need to get the spotlight. When prices rise, the price in the producer (farmer) level increases at the

lower rate. Meanwhile, when the prices go down, the price reduction at the farmer level are sharper. Thus, the stabilization efforts through macro-fiscal policy are not able to raise the level of farmer's welfare, especially small-scale farmers.

**Table 5.** The Simulation Impact of Government Revenue and Expenditure on Agricultural Performance, when All Intra-CAFTA Tariffs are Zero Percent

| Indicators | Base Value | Change (%) | | | | |
|---|---|---|---|---|---|---|
| | | Neutral | | Expansion | | |
| | | SIM 20 | SIM 21 | SIM 22 | SIM 23 | SIM 24 |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| A. Macroeconomic | | | | | | |
| Real GDP (YI) | 192,725.0 | -0.3 | -0.3 | 1.7 | 0.6 | 1.6 |
| Household consumption (CI) | 108,171.0 | -1.4 | 0.4 | 1.0 | -0.9 | 1.7 |
| Exchange rate, Rp/US$ (EXRI) | 12,318.0 | 0.7 | -1.2 | -3.9 | -4.5 | 27.8 |
| Private investment (ISI) | 36,452.3 | 0.0 | 0.4 | 1.8 | 1.2 | 1.9 |
| Real GDP of Non-agriculture (YNAGI) | 164,881.0 | -0.3 | -0.3 | 1.9 | 0.8 | 1.8 |
| B. Production | | | | | | |
| Real GDP of Agricultural Sec (YAGI) | 27,843.5 | -0.3 | -0.1 | 0.2 | -0.2 | 0.2 |
| Food production index (QFI) | 106.5 | -0.1 | -0.2 | -0.3 | -0.6 | 2.5 |
| Pop activity in agriculture (LAGI) | 47,647.8 | -0.2 | 0.0 | -0.3 | 0.3 | -0.3 |
| - employees/worker (LPAGI) | 31,278.3 | -0.1 | 0.0 | -0.4 | -0.2 | -1.3 |
| - employer/enterpreneur (LEAGI) | 16,369.5 | -0.3 | -0.1 | 0.1 | -0.4 | 1.7 |
| Agricultural investment (IAGI) | 3,007.5 | 0.1 | -0.4 | 2.6 | 2.7 | 1.4 |
| C. Stability | | | | | | |
| CPI for foods (PFI) | 158.3 | 0.9 | -1.2 | -3.0 | -3.4 | 20.7 |
| CPI for non-foods (PNFI) | 175.6 | 0.4 | -0.9 | -2.8 | -3.1 | 31.2 |
| CPI general (PI) | 168.1 | 0.6 | -1.0 | -2.9 | -3.2 | 26.9 |
| Prod Price Index of agriculture (PPI) | 136.1 | -0.3 | 0.6 | 5.1 | 4.6 | 6.6 |
| D. Trade | | | | | | |
| Net export (NXI) | 19,900.2 | -0.6 | 0.4 | 2.0 | 2.7 | 2.5 |
| Total export (XI) | 95,250.9 | 2.3 | 0.4 | 4.1 | 6.4 | 0.6 |
| Total import (MI) | 75,350.7 | 3.0 | 0.4 | 4.6 | 7.3 | 0.0 |
| Export of agric.raw material (MAIW) | 4,023.3 | 2.0 | 0.2 | 1.1 | 3.7 | -1.7 |
| Export of foods product (MFIW) | 10,538.3 | 4.6 | 0.7 | 6.8 | 10.3 | 2.9 |
| Export of non-agricultural (MOIW) | 63,398.6 | 1.6 | 0.4 | 4.4 | 5.5 | 1.6 |
| Import of foods product (MFIW) | 6,812.4 | 5.9 | -0.7 | 7.7 | 7.2 | 33.5 |
| Import of non-agricultural (MOIW) | 50,338.1 | 3.7 | 0.7 | 5.8 | 9.9 | -4.8 |
| E. Income | | | | | | |
| Real wages in agricultural (WAGI) | 30.3 | -0.1 | 0.0 | -0.3 | -0.3 | -0.3 |
| Labor productivity (YAGI/LAGI) | 584.4 | 0.0 | 0.6 | 0.6 | 0.3 | 0.1 |

Description:
- The figure 2000 is average of government expenditure (in US$ 200 year), increase by 1999 billion US$ per year.
- Base value: simulation result when zero intra-CAFTA tarif (CAFTA fully implemented), without change of fiscal policy.
- Simulation scenarios:
  SIM 20: GEI up by US$2M, financed from tax (TMCAFTA=0, GRI+2000, TAXI+2000, NTAXI+0, GEI+2000)
  SIM 21: Tax down by US$2M, followed by down of GEI (TMCAFTA=0, GRI-2000, TAXI-2000, NTAXI+0, GEI-2000)
  SIM 22: GEI up by US$2M, financed from non-tax (TMCAFTA=0, GRI+2000, TAXI+0, NTAXI+2000, GEI+2000)
  SIM 23: GEI up by US$2M, current ratio, tax:nontax=7:3 (TMCAFTA=0, GRI+2000, TAXI+2000, NTAXI+0, GEI+2000)
  SIM 24: Tax down by US$2M, without down of GEI (TMCAFTA=0, GRI+2000, TAXI+2000, NTAXI+0, GEI+2000)
- Export-import of foods, without palm (SITC42)
- Export-import of agriculture raw material, without rubber (SITC23)

It's an anomaly when the tax cuts were not able to reduce prices. It has been mentioned that the simulation is done for the condition if CAFTA tariff is fully released. Tax revenue from foreign trade is relatively small compared to the total tax revenue, especially reduced taxes by intra-CAFTA imports were freed. Tax can be charged to producers, consumers and income earners. Eventhough goods and services taxare levied to producers, but consumers will pay some parts of them. Consumers are price takers, while manufacturer are price makers. As long as consumers are still able to pay, then it is still possible to be charged a high price. While consumers' disposable income increases, due to tax cuts, their purchasing power increase, then the actual consumers price is higher than the market price. Therefore, the tax cuts in general tend to increase the price. It should be further separated, the parts where the tax should be cut and which parts do not need to be cut.

## CONCLUSION

In the frame of regional economic integration, in which the degree of economic openness increases, the impact of fiscal policies on agricultural performance are positive. But the effectiveness is lower than one without the integration. However, it does not mean that fiscal policy is not required at the time of regional economic integration. The higher magnitude of fiscal policy is needed to reduce the domestic risk from external shocks.

Fiscal policy will be more effective in conditions of the optimum allocation of expenditures, the appropriate of spending expansion and the precise of financing instruments. Fiscal expansion without placing appropriate priority of expenditure may be counter-productive in the regional economic integration era. The agricultural sector can grow higher when the portion of capital expenditure increases, which means that the agricultural sector requires public facilities and infrastructure. Giving subsidy is not the right solution for the development of the agricultural sector. Increased subsidies are enjoyed mostly by non-agricultural sector, because the inexpensive price of their input. Meanwhile, the increase in agricultural commodity prices at the producer level is not as high as the increase in consumer prices that farmers must pay.

Therefore, the best steps would be to, first, expand the economic and government size, and then to compete in trade liberalization, including regional economic integration. If it is a must to compete in the free market, while economic and government size is still relatively small, it should prioritize the budget for capital expenditures to increase the adequacy of public facilities and infrastructure. It can be achieved by increasing the government budget of General Allocation Funds (DAU) to encourage agriculture sector, especially in the districts or regencies.

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## Appendix

**Model of Indonesian Agricultural Trade under the China-ASEAN FTAs**

**Block A National Income**

1. $YI_t = CI_t + ISI_t + GEII_t + GERI_t + XI_t – MI + ICI_t$
2. $CFI_t = a_{10} + a_{11}YDI_t + a_{12}PFI_t + a_{13}CFI_{t-1} + U_1$
3. $CNFI_t = a_{20} + a_{21}YDI_t + a_{22}PNFI_t + a_{23}CNFI_{t-1} + U2$
4. $CI_t = CFI_t + CNFI_t$
5. $YDI_t = YI_t - TAXI_t + GESI_t$
6. $ISI_t = b0+b1RLI_t+b2YI_t+b3NCII_t+b4ROADI_t+b5ENGI_t+b6ETRI_t+b7GEII_t+b8ISI_{t-1}+U_3$

**Block B Fiscal**

7. $TAXCAFTA_t = [TMAIC_t*MAIC_t+TMAIA_t*MAIA_t+TMFIC_t*MFIC_t+TMFIA_t*MFIA_t+TMOIC_t*MOIC_t +TMOIA_t*MOIA_t+TMOIR_t*MOIR_t+TMPIC_t*MPLIC+TMPIA_t*MPLIA_t +TMRIC_t*MRBIC_t+TMRIA_t*MRBIA_t] / 100$
8. $TAXNCAFTA_t = [TMAIR_t*MAIR_t+TMFIR_t*MFIR_t+TMOIR_t*MOIR_t+TMPIR_t*MPLIR_t +TMRIR_t*MRBIR_t] / 100$
9. $TAXI_t = d_0 + d_1YI_t + d_2TAXCAFTA_t + + d3TAXNCAFTA_t + U_4$
10. $GR_t = TAXI_t + NTAX_t$
11. $GERI_t = e_0 + e_1GRI_t + e_2GERI_{t-1} + U_5$
12. $GEII_t = f_0 + f_1GRI_t + f_2POPI_t + f_3GEII_{t-1} + U_6$
13. $GESI_t = g_0 + g_1GRI_t + U_7$
14. $GEI_t = GERI_t + GEII_t + GESI_t + GEOI_t$

**Block C Moneter**

15. $EXRI_t = h_0 + h_1NXI_t + h_2NCII_t + h_3PI_t + U_8$
16. $RDI_t = i_0+i_1YI_t+i_2BIRATE_{t-1}+i_3PI_t+ i_4GEI_t + i_5GEI_t*(XI_t+MI_t)/YI_t+U_9$
17. $RLI_t = j_0 + j_1RDI_t + U_{10}$
18. $NCII_t = k_0+k_1YI_t+k_2RDI_t+k_3REGI_t+k_4RDA_t+k_5(RDI/RDC_t)+k_6(RDI/RDR_t)+U_{11}$

**Block D Trade**

**Agricultural Raw Material**

19. $MAIC_t = l_0+l_1YI_t+l_2TMAIC_t+l_3CAI_t+l_4PPI_t+l_5EXRI_t+l_6TMAIR_t+l_7MAIC_{t-1}+U_{12}$
20. $MAIA_t = m_0 + m_1YI_t+m_2TMAIA_t+m_3CAI_t+ m_4PPI_t+m5EXRI_t+m6MAIA_{t-1}+ U_{13}$
21. $MAIR_t = n_0 + n_1YAGI_t + n_2YNAGI_t + n_3TMAIR_t + n_4QAI_t + n_5MAIR_{t-1} + U_{14}$
22. $MAAI_t = o_1YA_t+o_2TMAAI_t+o_3QAI_t+o_4(PPI_t/PPA_t)+o_5EXRI_t+o_6MAAI_{t-1} + U_{15}$
23. $MACI_t = p_0+p_1YC_t+p_2TMACI_t+p_3QAI_t+p_4(PPI_t/PPA_t)+p_5EXRI_t+p_6TMACR_t+p_7MACI_{t-1}+U_{16}$
24. $MARI_t = q_0 + q_1YR_t + q_2TMARI_t + q_3QAI_t + q_4PPR_t + q_5MARI_{t-1} + U_{17}$
25. $MAIW_t = MAIA_t + MAIC_t + MAIR_t$
26. $XAIW_t = MAAI_t + MACI_t + MARI_t$

**All Foods Item**

27. $MFIC_t = 0+r1YI_t+r2TMFIC_t+r3CFI_t+r4QFI_t+r5(PFI_t/PFC_t)+r6(EXRI_t/EXRC_t)+r7TMFIR_t +r8MFIC_{t-1}+U_{18}$
28. $MFIA_t = s_0+s_1YI_t+s_2TMFIA_t+s_3CFI_t+s_4CAI_t+s_5(PFI_t/PFA_t)+s6TMFIR_t+s7MFIA_{t-1}+U_{19}$
29. $MFIR_t = t_0 + t_1YI_t + t_2TMFIR_t + t_3QFI_t + t_4PFI_t + t_5TMFIA_t + t_6MFIA_{t-1} + U_{20}$
30. $MFAI_t = u0 + u1YA_t + u2TMFAI_t + u3QFI_t + u4QFA_t + u5(PFA_t/PFI_t)+ u6EXRI_t + u7MFAI_{t-1} + U_{21}$
31. $MFCI_t = v0+v1YC_t+v2TMFCI_t+v3QFI_t+v4QFA_t+v5(PFC_t/PFI_t)+v6(EXRC_t/EXRI_t)+v7MFCI_{t-1}+U_{22}$
32. $MFRI_t = w0+w1TMFRI_t+w2QFI_t+w2QFR_t+w3PFI_t+w4PFR_t+w4EXRI_t+w5TMFRR_t+w6MFRI_{t-1}+U_{23}$
33. $MFIW_t = MFIA_t + MFIC_t + MFIR_t$
34. $XFIW_t = MFAI_t + MFCI_t + MFRI_t$

**Non-agricultural products (*Others)***

35. $MOIC_t = x0 +x1YI_t+x2TMOIC_t+x3CNFI_t+x4PNFI_t+x5PNFC_t+x6TMOIR_t+ x7MOIC_{t-1} + U_{24}$
36. $MOIA_t = y0+y1YAGI_t+y2YNAGI_t+y3TMOIA_t+y4CNFI_t+y5(EXRI_t/EXRA_t)+y6MOIA_{t1}+U_{25}$
37. $MOIR_t = z0+ z1YI_t+z2TMOIR_t+z3PNFR_t +z4EXRI_t + z5MOIR_{t-1}+U_{26}$
38. $MOAI_t = aa1YA_t +aa2TMOAI_t +aa3(PNFA_t/PNFI_t) + aa4MOAI_{t-1}+U_{27}$

39. $MOCI_t = ab0+ab1YC_t+ab2TMOCI_t+ab3(PNFI_t/PNFC_t)+ab4EXRI_t+ab5TMOCR_t+ab6MOCI_{t-1}+U_{28}$
40. $MORI_t = ac0 + ac1YR_t + ac2TMORI_t + ac3(PR_t/PI_t) + ac4MORI_{t-1}+ U_{29}$
41. $MOIW_t = MOIA_t + MOIC_t + MOIR_t$
42. $XOIW_t = MOAI_t + MOCI_t + MORI_t$

**Palm and Its Products (SITC-42)**

43. $MPLIC_t = ad0+ad1YI_t+ad2TMPIC_t+ad3PWPL_t+ad4TMPIA_t+ad5MPLIC_{t-1}+U_{30}$
44. $MPLIA_t = ae0 + ae1YI_t + ae2TMPIA_t + ae3EXRI_t + ae4MPLIA_{t-1} +U_{31}$
45. $MPLIR_t = af0 + af1YI_t + af2TMPIR_t + af3EXRI_t + af4EXRR_t + af5TMPIA_t + af6MPLIR_{t-1} +U_{32}$
46. $MPLAI_t = ag0 + ag1YA_t + ag2TMPAI_t + ag3TXPI_t +ag4PWPL_t + ag5PPI_t + ag6MPLAI_{t-1} +U_{33}$
47. $MPLCI_t = ah0+ah1YC_t+ah2TMPCI_t+ah3TXPI_t+ ah4PWPL_t+ah5PI_t +ah6EXRI_t+ah7MPLCI_{t-1} +U_{34}$
48. $MPLRI_t = ai0+ai1YR_t +ai2TMPRI_t +ai3TXPI_t +ai4PWPL_t+ai5EXRR_t+ai6EXRI_t+ai7MPLRI_{t-1}+U_{35}$
49. $MPLIW_t = MPLIA_t + MPLIC_t + MPLIR_t$
50. $XPLIW_t = MPLAI_t + MPLCI_t + MPLRI_t$

**Rubber and Its Products (SITC-23)**

51. $MRBIC_t = aj0 + aj1YI_t + aj2TMRIC_t +U_{36}$
52. $MRBIA_t = ak1YI_t + ak2TMRIA_t + ak3(EXRI_t /EXRA_t) +U_{37}$
53. $MRBIR_t = al1YI_t + al2TMRIR_t +al3EXRI_t + al4MRBIR_{t-1} + U_{38}$
54. $MRBAI_t = am0+am1YA_t+am2TMRAI_t+am3QRBI_t+am4PWRB_t+am5PPI_t+am6MRBAI_{t-1}+U_{39}$
55. $MRBCI_t = an0 + an1YC_t + an2TMRCI_t + an3PWRB_t + an4PPI_t + U_{40}$
56. $MRBRI_t = ao0+ao1YR_t+ao2TMRRI_t+ao3QRBI_t+ao4PWRB_t+ao5PPI_t+ao6EXRR_t+ao7MRBRI_{t-1}+U_{41}$
57. $MRBIW_t = MRBIA_t + MRBIC_t + MRBIR_t$
58. $XRBIW_t = MRBAI_t + MRBCI_t + MRBRI_t$

**Total of Export-Import**

59. $XI_t = XAIW_t + XFIW_t + XOIW_t + XPLIW_t + XRBIW_t + XSI_t$
60. $MI_t = MAIW_t + MFIW_t + MOIW_t + MPLIW_t + MRBIW_t + MSI_t$
61. $NXI_t = XI_t - MI_t$

**Block E Price**

62. $PNFI_t = ap0 +ap1MOIW_t +ap2XOIW_t +ap3\ CNFI_t + ap4YI_t + ap5PNFI_{t-1} + U_{42}$
63. $PFI_t = aq0 + aq1MFIW_t + aq2XFIW_t +aq3\ CFI_t + aq4PNFI_t + aq5PFI_{t-1} + U_{43}$
64. $PI_t = 0.434*PFI_t + 0.566*PNFI_t$
65. $PPI_t = ar0 + ar1MAIW_t +ar2XAIW_t +ar3\ CAI_t + ar4PI_t + ar5PPI_{t-1} +U_{44}$

**Block F Agricultural Performances**

66. $QFI_t = as0 + as1PFI_{t-1} + as2PPI_{t-1} + as3QFI_{t-1} + U_{45}$
67. $QAI_t = ax0 + ax1PPI_t + ax2XAIW_{t\,1} + ax3QAI_{t-1} + U_{46}$
68. $WAGI_t = at0 + at1YAGI_t + at2WI_t + at3WAGI_{t-1} + U_{47}$
69. $LEAGI_t = av0 + av1ROADI_t + av2PPI_{t-1} + av3LEAG_{t-1} + U_{48}$
70. $LPAGI_t = au0 + au1POPI_t + au2SCHI_t + au3WAGI_t + au4WI_t + au5LPAG_{t-1}+ U_{49}$
71. $LAGI_t = LEAGI_t + LPAGI_t$
72. $IAGI_t = c0 + c1RLI_t + c2YI_t + c3LEAGI_t + c4IAG_{t-1} + U_{50}$
73. $KAGI_t = (1-0.016)*KAGI_{t-1} + IAGI_t$
74. $YAGI_t = aw0 + aw1KAGI_t + aw2LEAGI_t + aw3(LPAGI_t * SCHI_t ) + U_{51}$
75. $YNAGI_t = YI_t - YAGI_t$

**Description:**

**Endogenous Variables**

YIt = Real GDP
CFIt = Food Consumption (real)
CNFIt = Non-food Consumption (real)
CIt = Household Consumption (real)
YDIt = Disposable income
ISIt = Private Investment
GEIIt = Public Investment
GERIt = Routine Govt. Expenditure
GESIt = Subsidies
GEIt = Total of Govt. Expenditures
GRIt = Total of Govt. Revenue
TAXCAFTAt= Tax Revenue from CAFTA
TAXNCAFTAt= Tax Revenue from NonCAFTA
TAXIt= Tax Revenue
RLIt = Real Lending Interest Rate (%)
RDIt = Real Deposit Interest Rate (%)
NCIIt = Net Capital Inflows
EXRIt = Exchange Rate (Rp per 1US$)
MAICt = Agri Raw Material Import from China
MAIAt = Agri Raw Mat Import from ASEAN
MAIRt = Agri Raw Mat Import from ROW
MACIt = Agri Raw Material Export to China
MAAIt = Agri Raw Material Export to ASEAN
MARIt = Agri Raw Material Export to ROW
MAIWt = Total Import of Agri Raw Material
XAIWt = Total Export of Agri Raw Material
MFICt = Food Import from China
MFIAt = Food Import from ASEAN
MFIRt = Food Import from ROW
MFCIt = Food Export to China
MFAIt = Food Export to ASEAN
MFRIt = Food Export to ROW
MFIWt = Total of Food Import
XFIWt = Total of Food Export
MOICt= Other Import from China
MOIAt = Other Import from ASEAN
MOIRt = Other Import from ROW
MOCIt = Other Export to China
MOAIt = Other Export to ASEAN
MORIt = Other Export to ROW
MOIWt = Total of Other Import
XOIWt = Total of Other Export
MPLICt = Import of SITC 42 from China
MPLIAt = Import of SITC 42 from ASEAN
MPLIRt = Import of SITC 42 from ROW
MPLCIt = Export of SITC 42 in China
MPLAIt = Export of SITC 42 in ASEAN
MPLRIt = Export of SITC 42 in ROW
MPLIWt= Total Import of SITC 42
XPLIWt = Total Export of SITC 42
MRBICt= Import of SITC 23 from China
MRBIAt= Import of SITC 23 from ASEAN
MRBIRt= Import of SITC 23 from ROW
MRBCIt= Export of SITC 23 to China
MRBAIt= Export of SITC 23 to ASEAN
MRBRIt= Export of SITC 23 to ROW

**Exogenous Variables**

ICIt= Inventory change
ROAIt= Paved roads (%)
ENGIt= Energy used per US$1000 GDP (kg oil ekivalen)
ETRIt= % entreprener per total labor
NTAXIt= Non-tax revenue
GEOIt= Other Govt. Expenditure
BIRATEt= BI rate (%)
REGIt= Regulatory Quality Index
RDAt= Real Deposit Interest Rate of ASEAN
RDCt= Real Deposit Interest Rate of China
RDRt= Real Deposit Interest Rate of ROW
PPAt = Agri Prod Index of ASEAN ( 2000=100)
PPRt= Agri Prod Index of ROW (2000=100)
TMAICt=Import tariff of agri raw from China
TMAIAt= Import tariff of agri raw from ASEAN
TMAIRt= Import tariff of agri raw from ROW
TMACIt= Import tariff of agri raw in China
TMAIAt= Import tariff of agri raw in ASEAN
TMARIt= Import tariff of agri raw in ROW
EXRAt= Exchange Rate ASEAN/US$
EXRCt = Exchange Rate China/US$
YAt= Real GDP of ASEAN
YCt= Real GDP of China
YRt= Real GDP of rest of the world
CAIt= Konsumsi produk pert sbg bahan baku
TMFICt= Import tariff of food from China
TMFIAt= Import tariff of food from ASEAN
TMFIRt= Import tariff of food from ROW
TMFCIt= Import tariff of food in China
TMFIAt= Import tariff of food in ASEAN
TMFRIt =Import tariff of food in ROW
TMFRAt = Import tariff of food ROW from ASEAN
TMOICt = Import tariff of other from China
TMOIAt= Import tariff of other from ASEAN
TMOIRt =Import tariff of other from ROW
TMOCIt =Import tariff of other in China
TMOIAt =Import tariff of other in ASEAN
TMORIt = Import tariff of other in ROW
TMPICt= Import tariff of SITC 42 from China
TMPIAt= Import tariff of SITC 42 from ASEAN
TMPIRt= Import tariff of SITC 42 from ROW
TMPCIt= Import tariff of SITC 42 in China
TMPAIt= Import tariff of SITC 42 in ASEAN
TMPRIt = Import tariff of SITC 42 in ROW
TMRICt = Import tariff of SITC 23 from China
TMRIAt = Import tariff of SITC 23 from ASEAN
TMRIRt = Import tariff of SITC 23 from ROW
TMRCIt = Import tariff of SITC 23 in China
TMRAIt= Import tariff of SITC 23 in ASEAN
TMRRIt= Import tariff of SITC 23 in ROW
PFCt = CPI of Foods, China (2000=100)
PFAt = CPI of Foods, ASEAN ( 2000=100)
PFRt = CPI of Foods, ROW (2000=100)
PNFCt= CPI of Non-foods, China (2000=100)
PNFAt= CPI of Non-foods, ASEAN( 2000=100)

MRBIWt = Total Import of SITC 23
XRBIWt = Total Export of SITC 23
XIt= Total export
MIt= Total import
NXIt= Net Export
PFIt = CPI of Foods (2000=100)
PNFIt= CPI of Non-foods (2000=100)
PIt= General CPI (2000=100)
PPIt= PPI of Agriculture (2000=100)
QFIt= Food Production Index (index 2000=100)
QAIt = Agric. Raw Mat. Production Index (2000=100)
WAGIt = Agricultural Real Wages (US$ konstan 2000 per person per month)
LPAGIt = Agricultural Labor (000 persons)
LEAGIt= Agricultural Employers (000 persons)
LAGIt = Activity in Agriculture (000 persons)
KAGIt = Capital stock of agricultural sector
IAGIt1= Investment in agricultural sector
YNAGIt = Real GDP of non-agricultural sector
YAGIt = Real GDP of agricultural sector

PNFRt= CPI of Non-foods, ROW (2000=100)
PRt = CPI General, ROW (index 2000=100)
PWPLt = World price of CPO (US$/MT)
PWRBt = Word price of natural rubber (cents US$/kg)
QFRt = Food production of ROW (2000=100)
PXIt=Agricultural price export index (2000=100)
XSIt =Export of services
MSIt =Import of services
WIt =Real wages (US$ constant 2000 per person/month)
SCHIt= Adult mean years schooling (year)
t-1 represent of previous year
Export and import in value (million US$ constant 2000)