The Impact of Agriculture Trade Liberalization on Farmers Income in Indonesia: Applying CGE Model

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ABSTRACT

Agriculture Trade Liberalization has been one of the crucial issues in Indonesia. It was indicated with increasing international trade, both export, and import. Indonesia as a country with an agriculture basis still has pro and contra about agriculture trade liberalization. The purpose of this research is to know the impact of agricultural trade liberalization (especially food crops commodities) on farmer income in Indonesia. This research used the Computable General Equilibrium (CGE) Model with the 2011 Social Accounting Matrix (SAM) Table as the data base. Simulate the impact of food crop imports. The results show that income in food crops import would decrease farmer income, while if an increase in food crops imports that followed by increasing export and production in non-agriculture products would increase farmer income.

Keywords: *Agriculture Trade Liberalization, Indonesia farmer income, CGE Model, SAM Table, Food Crops*

1. INTRODUCTION

Globalization has indicated the increased of an international trade transaction. It was an effect of increased multilateral or bilateral in several country relationships. The situation has increased the dependence of economic relationship and also competitiveness between each other country, not only in international trade but also in investment, financial and production. It indicate that globalization was increased export and import transaction in GDP. From 2009 until 2013, Indonesia's international trade was increased by about 29.5 percent. Besides that, in BPS data of 2009, export and import only contributed to Indonesia's GDP by about 42.8 percent and increased to 47.4 percent in 2013. It indicate that globalization has an impact on the increased of international trades volumes.

While for Indonesia, where was the Indonesia economic based on the agriculture sector in 1960 from BPS data which support till 53,92% and now although Indonesia's GDP was based of service sector, the agriculture sector still the biggest three which support Indonesia's economic. Shifting agricultural sector to industrial sector starts from early 1990 make globalization has been an issue and still debatable until nowadays. The pros about free trade have an assumption that free trade will give a positive impact on farmers' income as

the result of Joel and Glory [1] which said that free trade policies in Cameroon give positive impact to increase in agricultural production. while the contra has an opinion that free trade would give a negative impact on the farmer's income as Nugroho [2] said that ASEAN-China Free Trade (ACFTA) was implemented in Indonesia since 2010 need to renegotiate by the govenrment because the product and services are not ready yet, deversify export destination not only China,and prepare Indonesia's human resources with sharing information about opportunities, threats and rules in ACFTA.

The evidence of globalization also gives a high impact on agricultural trade in Indonesia can be seen in data of international trade on food crops production Indonesia in 2006-2011 from Ministry of Industry and Trade of Indonesia. While after the 2009 contribution of international trade to domestic production Indonesia increased significantly. Whereas, before 2009 the contribution of international trades of grain, corn, and soybean is tent to decrease. It indicated that globalization has done more after 2009, while before 2009 Indonesia government policy to agricultural trade and products was a tent to use the protective approach.

The contras have an opinion about free trade impact, that the food product from import would be fleed in the domestic

market. Food crops import policy has a purpose to solve the domestic needs that caused production below the needs, it could be a negative effect on farmers' income. Import of food crops tent to protect the customer when the production below the minimum needs [3][4]. But, in many cases, especially in agricultural segmented it still debatable about the impact of international trade on farmers' welfare level. The pros said that free trade increased the efficiency of using the land for agriculture activity.

The other way, the community that contras of free trade said that import of products agriculture in a developing country, whereas agriculture was the basis of the economy, would often give a financial loss to the farmers [5]. On the other side, commonly the agriculture product was the primary food that always needed, so the import hopefully could decreasing the price of agriculture product, it means import gave a benefit to the customer. Finally, the impact of import has two contra-side that was given a benefit to customers at the one side but also has a potential loss to the farmers on the other side [6].

The problem also followed that Indonesia was a big country with huge populations. The total area of Indonesia was about 1.919.440 km2 that was the 4th biggest in ASIA and the total citizen was about 237.641.326. Besides that Indonesia has a tropical climate that suitable to support the agriculture sector. Classic theory way, Indonesia has a comparative advantage for food crops. Thus, it is very disappointed if Indonesia as a country that has a gift from God, the fertile land was not able to fulfill the demand of food crops itself. Based on that background, the research objectives are to know how the impact of agricultural trade liberalization on farmer income. So Indonesia's population which most of them are farmer can maintain their resources and increase their capability to face this globalization era.

2. LITERATURE REVIEW

Basically, free trade cooperation will have a positive impact on the countries that join in it because they can fullfil their needs. There are still argued by peoples about this advantages and disadvantages, because manything should be prepare to face this free trade.

2.1. International Trade Theory

The debate theory of free trade still becomes the main issue in international trade. Economists who pro with free trade known as "mainstream" with the assumption that market is a perfect market, while who contra with free trade known as "non-mainstream" with the assumption is an imperfect market. In mainstream opinion, the principle of free trade to welfare rises. Whereas, the country's prosperity can be achieved through trade interaction with specialization based on comparative advantages and competitive advantage in each country.

David Ricardo thought about international trade known with the concept of comparative advantage. This theory emerging as an answer to the question of whether the country would get an absolute advantage in both goods as Adam Smith's theory explained. The country that gets a higher level of absolute advantages than a partner for some same product, so it can get comparative advantages [3].

Based on the views of "mainstream" the existence of international trade can lead to gains of trade. As revealed by [4] gains of trade that can be created, namely: (i) consumption gains of trade, (ii) production gains of trade, and (iii) GDP gains of trade. So that a country will gain a better standard of living by specializing in goods that have a comparative advantage and import goods that have a comparative disadvantage. The benefit of trade derived from a classical theory based on the principle assumption, as follows [3]:

a.   Markets are perfectly competitive market

b.   All actors have perfect information

c.   There are no transportation and marketing costs, meaning that the transaction costs are considered zero

International trade became one of the important steps to improve economic growth, especially in GDP. Krugman [7] said that recently, the growth of international trade has more than doubled. This process is accelerated by the formation of the Regional Trade Area (RTA). RTA formation creates new opportunities to achieve economies of scale. Production efficiency occurs when manufacturers can produce bigger output with the same amount of inputs. Thus, the company can sell products at lower prices, which in turn can increase the comparative advantage or competitiveness.

On the other side, the positive impact of the formation of the RTA does not always happen. One of the indicators to measure the impact of international trade is to look at the occurrence of trade diversion and trade creation [8][9]. The positive effect that trade creation is the result of the shift of trading domestic consumption of products that are high-cost products to imports which are low-cost. However, the difference in tariffs applied for partner and non-partner, change the direction of the tendency of the trade so that the negative effects of trade diversion, which refers to the displacement of imported products that are low - cost non-member countries with imported products that are high-cost from partner countries [8], in other words, trade occurs decreases with non-partner countries. Trade diversion would lower the welfare effects of a change in orientation concerning the source of supply to the relatively more expensive.

The benefits of free trade or regional cooperation are determined by one of the more dominant effects. The overall effect can be positive, negative or neutral, depending on the size of the magnitude of trade creation and trade diversion. FTA or free trade would be very beneficial if the impact on trade creation is greater than the impact on trade diversion [10].

The existence of trade diversion argument supporting the view of the "non-mainstream" which suggests that international trade can reduce the level of well-being with the assumption that the market is imperfect. This is can happen because of free trade will lead to two major problems. First,

the problem of dependence, with importing countries to meet the needs of the goods that are not produced domestically, the government will import from other countries. This activity may result in import dependence by importing country and it does not make domestic manufacturers are trying to produce more. Second, the problem of income inequality, which arises because of the differences in the ownership of resources and factors of production, especially the ownership of capital stock. Inequality is determined by the level of development, ethnic heterogeneity, inequality is also associated with the dictatorship and the governments that fail to respect property rights [11].

View of "non-mainstream" is found in the case of agriculture, where the characteristic of the agricultural market is imperfect markets. Until finally famous discusses an institutional theory regarding Transaction Cost Economics (TCE) with many use cases agricultural sector. However, the impact of free trade on the agricultural sector was also still causing debate [12].

2.2. The Impact of Agricultural Commodities Import

The impact of imports on farmers' welfare can be measured from the farmers' income still in debate. A view that supports free trade believes that free trade will give benefit both countries and the world actors, as well as improving the welfare of greater than no free trade [13]. This is because free trade will create production efficiencies and overcome scarcity, which in turn will improve the welfare of the people, especially consumers, due to a decrease in market prices resulting from the presence of imports.

The support of free trade can also be seen from the formation of the General Agreement on Tariffs and Trade (GATT) and the World Trade Organization (WTO), where the purpose of the establishment of the institution to achieve free trade by lowering tariff and other trade barriers. Indonesia is one of the country's most obedient to the rules of world trade, particularly with regard to trade agricultural commodities. Since the crisis in 1998, Indonesia has reduced the import duty tariff for all agricultural commodities and all subsidies to farmers. This attitude was not fair to the farmer, because farmers in Indonesia are faced with unfair competition with farmers from other countries that get more tariff and non-tariff protection and subsidies from the government. In fact, the basic principle of the formation of the WTO is not only emphasized on free trade alone but also on fair trade, it is written on the purpose of the WTO ".... To establish a fair and market-oriented agricultural trading system".

However, the trade-in agriculture sector tends to be losses to farmers, because more middlemen intervene in the market and utilize the information to suppress farmers. Injustice to the farmers, making the growing popularity of the view that rejects the existence of free trade. Whereas, they found the agricultural sector markets in developing countries, including Indonesia, an imperfectly competitive market. In fact, many studies that say it's actually a perfectly competitive market is not there, either through price or market approach affecting exporters in pricing decisions [7][14].

2.3. Agriculture Policies from Selective Countries

Agricultural policies have changed dramatically over the course of long-term economic development and continue to vary widely among countries, across commodities, and in the choice of policy, instruments used. Accordingly, the evolution of policies affecting this sector and the fundamental differences among countries provides an excellent empirical foundation for studying the determinants of policy choices, and in particular of political institutions [15]. Whereas, the goal of agriculture policy is to reduce disparity and developing the rural area.

Essentially, there are four reasons why agriculture is important. Namely [16][17][18][19]; [20] : (i) developing modern agriculture, (ii) increasing farmers' incomes, (iii) improving rural conditions, (iv) reduce income inequality, (v) protect the producers and consumers, and (vi) keep food security. Agriculture policy is very important and needs different mechanisms in trade with the other sector. Besides that, farmer welfare is the focus of agriculture policy. Hence, Farm income inequality negatively impacts [16]: (i) economic well-being, including farm family health, (ii) farm technology adoption, (iii) agricultural productivity, and (iv) agricultural sector growth.

Based on United States International Trade Commission [20], policy Instruments for agriculture policy in China are: (i) Investments in rural infrastructure, (ii) Investments in research and development for agriculture, (iii) Minimum purchase prices for agricultural commodities, (iv) Input subsidies, direct payments, and preferential credit, (v) Relief from agricultural taxes, (vi) Food reserves, (vii) Consumption subsidies (minimum living allowance), (viii) Strategic export and import controls, and (ix) Food safety law. Moreover, The Common Agricultural Policy (CAP) is an important player in rural areas in the EU and has a profound impact on agricultural and rural markets spanning from output and factor markets to income and environment. The emphasis of the early CAP was on encouraging agricultural productivity, ensuring a stable supply of affordable food to consumers and ensuring a viable agricultural sector. The support to farmers was implemented predominantly through market price support [21].

The implementation of agricultural policies gives a different impact on each country. Such as an impact of government payment, the effects of direct payments and rural development measures of the EU's Common Agricultural Policy (CAP) on employment in agriculture, not any gave significant impact for employment on agriculture. While there is some indication that investment subsidies have halted labor shedding on farms, a rise in the general wage level reduced labor use in agriculture. Changes in direct payments had no employment effects. Generally, labor adjustment exhibits a strong path dependence [22]. Also, Nugroho [2] explained that household income inequality is reduced by off-farm income and direct payments but is increased by market

income. As current direct payments cannot avoid that income from farming is drifting further apart. The opposite, in Japan, implied that the government's goal of transferring income to producers was efficient, but the transfer income through control area policy. The acreage control has been the principal policy measure for transferring income to producers, especially since the enforcement of the WTO Agreement on Agriculture. Acreage control is the policy measure with the lowest total efficiency and highest budgetary efficiency [19].

The government should implement alternative policies that support farmers' welfare but with limited financial cost and loss of consumers' welfare. It is vital to examine the effect of the conventional acreage control policy and to intensify direct payment that encourages extensive production, such as decoupled direct payment, without depending on market price control. At the same time, it is also important to encourage structural reforms so that protectionist policies become unnecessary in the political-economic environment [19].

United States International Trade Commission [20] noted, China significantly reduced its tariffs before its WTO accession. China's simple average tariff for agricultural products fell from 42.2 percent ad valorem in 1992 to 23.6 percent ad valorem in 1998.5 As a condition of its WTO accession, China reduced its agricultural tariffs to a simple average of 15 percent ad valorem. Most tariff reductions occurred by January 1, 2004, with the remainder completed no later than January 1, 2010. By 2007, China's trade-weighted average tariff had fallen to 12 percent ad valorem for agricultural products. China maintains high tariffs on the general product categories of sugars and confectionery, cereals (grains) and cereal preparations, cotton, and beverages and tobacco. Tariff peaks generally exist for agricultural products that China considers to be important to its food security or important for other reasons.

Also in Indonesia, the tariff for strategic commodities reduced year by year. In 2005, the average tariff is 25 percent ad valorem and it's fell to 10 percent in 2010. It's mean that trade in Indonesia leads to free trade. The impact of free trade is imported surges. So, several agriculture policies in Indonesia have been implemented, such as [23]: (i) price and economic policy, (ii) marketing policy, (iii) Structural policy, and (iv) correlated agriculture and industry policy.

Thus, each country has different policies but the goals are similar. While, there were countries that implemented the same policy, but the impact of the policy was different. This is indicated, that each country has different characteristics and respond. Besides that, the education level also gives a different effect.

3. METHODS

Based on the analysis method, source data used for the research was secondary data was contained from the Social Accounting Matrix (SAM) data or social economy balance system of Indonesia in 2008, because of the latest data of SAM was published in 2008 [24] . Indonesia SAM data only published once every three years. Then, the data would be analyzed using the CGE model in GAMS. Acquired SAM statistic data of Indonesia. The others supporting data are Gross Domestic Product (GDP) Indonesia, food crop production, food cropland area, export, and import food crop data, and also farmer household and several references that linked to the impact of the import of food crops. Source of data was collected from Indonesia Statistical Bureau, FAO and also the other publication.

The method of the research was to apply the Computable General Equilibrium (CGE) model with the Social Accounting Matrix (SAM) database [24][25] . The method was used to calculate the impact of the food crop import on farmer income and GDP. Moreover, it was also to calculate the impact of export and production of no agriculture on farmer income and GDP. GAMS was used to assist the computation models, the software that could solve mathematic models, including CGE. While the solver that we used was a concept, the general solver was commonly used for completed the non-linear programming (NLP) optimization function.

SAM's table was used for the research because SAM structures could be included all of goods and service transaction, also the monetary flow in the economy. It was very suitable for the CGE models because the basic of CGE models were linked between four of markets, there are (i) Commodity Markets, (ii) Labour Markets, (input), (iii) Capital Markets, and (iv) Money Markets.

Based on the graphic linked between the four markets economy shows that the equilibrium of each market was on the meet of the dot between supply and demand. Whereas in the domestic markets, demand was played by the household, government, and corporate, whereas on the supply side was played by corporate. On the labor markets (input), demand was played by government and corporate, while on the side of demand was played by the household that seeking for a job. For the capital markets, demand was played by household and supply played by corporate and government. At last, for the money market, demand was played by household and corporate, while supply for the money market played by the government.

The principle of CGE models, if there was a change in the domestic market, so the equilibrium the other markets also changed. For example, if demand in the domestic markets was increased, so the demand in the labor markets would be increased too. It was caused while the demand for goods was increased, it was caused the total production would be increased, to increase the production of the goods, the corporate absolutely would increase the input, so in the resulting demand of the input markets will be increased.

It was also for the demand in the capital markets would be increased. It was caused when the production was increased it indicated that corporate performance has an increased, so in the result, many people or household did investment to the corporate. So the demand in the capital markets would be increased. The other way, the demand in the money market was increased, caused by the household was bought more

goods and also the corporate need more money to did the production, so in the resulting demand in the money, markets would be higher.

The models and the equations of CGE were adopted from the Indonesia SAM models by Lewis with the original programs by S.Robinson, K.Hanson, and M.Kilkenny [25][26]. While the model simulation was adopted from the Santosa models [27]. The simulation was used in the research content of four simulations, there are: (i) 10% raised of the food crop import, (ii) 10% raised of the food crop import that followed by increasing of non-agricultural products export, (iii) 10% raised of the food crop import that followed by increasing of non-agricultural production, and (iv) 10% raised of the food crop import that followed by increasing of non-agricultural production and export. Each of the simulations has a purpose to know the impact of the import food crop to the farmer's income and GDP. This research occurring four simulations, there are (i) First Simulation (SIM-1), (ii) Second Simulation (SIM-2), (iii) Third Simulation (SIM-3), and Fourth Simulation (SIM-4).

4. RESULTS AND DISCUSSIONS

To find out the impact of free trade to farmer income, we did the simulation first about the impact of food crops import in Indonesia then we use the result to know the impact to the farmer income.

4.1. Simulation Result: The Impact of Food Crops Import in Indonesia

The impact of food crops imports related to three of the primary components there are production, export, and import. So, in this research has been done the simulation with changes three of the primary components, there are the food crops import, non-agricultural export, and non-agricultural production. Hence, this research occurring four simulations, there are (i) First Simulation (SIM-1), (ii) Second Simulation (SIM-2), (iii) Third Simulation (SIM-3), and Fourth Simulation (SIM-4).

Firstly, SIM-1 is increased in the food crops import in the amount of 10 percent. This simulation is an interpretation of food scarcity in the domestic market. Which is the demand for food crops is higher than food crops domestic production. It caused the government did the import of food crops. Secondly, SIM-2 is increased of the food crops import in the amount of 10 percent that followed by increased of non-agricultural product export in the amount of 10 percent. The simulations appropriate with the forward effect theory from the agriculture sector to the non-agriculture sector. This is, the agriculture sector has a role in the next industry, like the manufacturing industry.

The third, SIM-3 is increased in the food crops import in the amount of 10 percent that followed by an increased in the non-agricultural production sector by 10 percent. The simulation still interpreted the forward effect of the agriculture sector. This is, the cheap of food crops is caused by the import could increase production activity of the non-agriculture sector. So in the result, there was increased production of the non-agriculture product. The fourth, SIM-4 is increased of the food crops import by 10 percent that followed by production and export of non-agriculture product, each component has increased by 10 percent. The simulation still interpreted the forward effect of the agriculture sector. This is, the cheap of food crops caused by the import of food crops that could increase production activity of the non-agricultural sector and the corporate of the agriculture sector can doing the expansion with the export of the non-agricultural product.

The income of the country could be divided into three kinds, there are (i) corporate income, (ii) Government revenue, and (iii) Household income. Based on the simulation result, could be known that the impact of food crops imports to the income, including corporate income, government revenue, and also household income. Detailed of the result can be seen in Table 1.

Table 1. Indonesia Gross Domestic Product Composition (Rp Million)

Items	BASE	SIM_1	SIM_2	SIM_3	SIM_4
Households Income	54264.79	53595.19	54262.41	59191.02	59252.98
Corporate Income	25169.97	32680.17	32743.13	32743.13	33411.36
Government Income	19333.30	11831.71	11829.82	11941.25	11939.37
Real GDP	98768.05	98107.06	98835.36	103875.40	104603.71

Source: Simulation Result, 2014

Table 1 shows the biggest Gross Domestic Product (GDP) composition including household income is 55 percent. The other, corporate income is 25 percent and the rest 20 percent is owned by government income. It indicated, if there is a shock in household income, so it's will affect the GDP.

Government revenue usually can be represented by tax revenue.

Moreover, based on the simulation result the food scarcity is happening with the increased of food crops import (SIM-1) causing real GDP decreased by 1 percent. The biggest fall down of the simulation impact is the government income by

63 percent. Decreased of the government income is caused by the decreasing of foreign exchange. While household income decreased by 1 percent. On the other way, corporate income increased by 23 percent. It indicated that the food crop import tends to give benefit to the corporate because they can minimize the cost of production. Although corporate income was increased, the real Indonesia GDP decreased by 1 percent. It's because some of the household income is decreased by 1 percent. The fact that, although it just happens a little decrease in income, it is proved too affected towards decreasing real GDP, because more than 50 percent of (GDP) comes from household income.

Furthermore, the impact increasing of imports that followed by increasing of the non-agricultural product export (SIM-2) caused household income to tend to constant or not change. It indicated that food crops import inflicts a financial loss to the household can be back to the beginning condition with the export of non-agriculture products by 10 percent so that the value of household incomes will not go down (break event point).

SIM-3, whereas the food crops import increased by 10 percent that followed by increasing of non-agricultural production by 10 percent, caused household income to increase by 8.3 percent. Besides that, corporate income increased by 23.1 percent and the real GDP increased by 4.9 percent. It indicated, that if the food crop import can increase

non-agricultural production, in the result, it can increase the whole economy.

The last, SIM-4, whereas an increase of food crops by 10 percent that followed with the increased export and production of non-agricultural production, 10 percent for each other. The impact of simulation is similar to SIM-3, which is increasing the household income by 8.4 percent and increasing of real GDP by 5.6 comparing to the database. It indicated that losses in the household income that caused by import can be avoided with increasing export and production of the non-agricultural sector.

Furthermore, the trade liberalization could impact to the household income. In this research, household income divided into 4 categories, such as (i) Farmer worker's income, (ii) Farmer owner income, (iii) Urban low worker income, and (iv) Urban high worker income. Farmer's workers' income is Indonesian people that work in a rural area, whereas most people in rural are working in the agriculture sector. Farmer owners' income is Indonesian people in the rural area that get an income from the agriculture sector as a capital owner, for example, is a landlord. Urban low worker income is Indonesian people that work in an urban area, mostly they work in the industrial sector. Last, Urban high worker income is Indonesian people that have capital, mostly they are a businessman.

Table 2. The Impact of Import Food Crops on Household Income in Indonesia (Rp Million)

No	items	BASE Existing conditions	SIM_1 10% increasing in import for food crops	SIM_2 10% increasing in import for food crops and export for non-agriculture products	SIM_3 10% increasing in import for food crops and production for non-agriculture products	SIM_4 10% increasing in import for food crops, export and production for non-agriculture products
1.	Farmer workers income	4860.60	4794.61	4860.37	5346.10	5352.21
2.	Farmer owners income	20156.87	19916.29	20156.01	21926.78	21949.04
3.	Low wage households income	12319.26	12163.10	12318.71	13468.15	13482.60
4.	High wage households income	16928.05	16721.18	16927.32	18449.98	18469.12
	Households income	**54264.79**	**53595.19**	**54262.41**	**59191.02**	**59252.98**
5.	Corporate income	25169.97	32680.17	32743.13	32743.13	33411.36

6.	Government income	19333.3	11831.71	11829.82	11941.25	11939.37
	Real GDP	**98768.05**	**98107.06**	**98835.36**	**103875.40**	**104603.70**

Source: Simulation result, 2014

Table 2 shows the impact of liberalization, which SIM-1 showed that all of the household income was decrease. Between four category of household income, the most decreased of farmer workers income is from 4860.60 m illion rupiah become 4794.61 million rupiah, it happens the to the decreased by 1.4 percent. Furthermore, farmer-owners income is decreased by 1.2 percent, urban low worker income decreased by 1.4 percent, and urban high worker income decreased by 1.2. As a result, if it just an import of food crops that increased, it is caused by the farmer's income even all of the household income will fall.

It is different from the result of SIM-2 that showed that farmer income tends to constant, and also with the other household income. It is caused by food crop imports that followed by the export of non-agricultural products, for each is 10 percent.

SIM-3 showed that the farmer's income and the other household income also increased. Whereas compared to the BASE, farmer worker's income increased by 9.1 percent, from 4,860.60 million rupiah become Rp5,346.10 million, the former owner's income increased by 8.1 percent, the urban low worker income is increased by 8.5 percent, urban high worker income increased by 8.2 percent. It indicated that, if the increase in the import of food crops is followed by increases in the production of non-agriculture will increasing farmer worker's income. It is good for the whole economy growth, whereas the income distribution can be equal, especially to the farmer worker that always in the marginal condition.

The growth of the non-agriculture sector could indeed be an equalizer of the increasing of food crops import. It is supported with the result on the SIM-4, whereas increased food crop imports that followed with the increasing of non-agriculture export and production can increase all of the actors' economy income. The increasing value of each household income is bigger than if only increased the production. It indicated that household income and real GDP will be increased if the expansion of the non-agriculture sector happens.

4.2. The Impact of Food Crops Import on Farmer Income

The implication of increased food crop imports is based on the simulation result. First, it shows from the result of SIM-1, which the impact of the increased of food crops imports as a response to the food scarcity that decreased the farmer's income. If the demand for domestic food is higher than food domestic production makes the supply of domestic food crops increased, it caused the supply curve to move downward. It caused the domestic price to go down and the quantity of market products is increased. But, because of the product quantity increased obtained from the import, so the total revenue of Famer is decreased.

Therefore, food crop imports will be decreased farmer income and indirectly decreased the entire household income. It means that the urban low worker income and urban high worker income also decreased. It caused the production of the non-agricultural product is not increased, but the decreased in cost production as a consequence of decreased raw material price, like a decreased in a food crop price. It is also can be viewed on the simulation result that corporate income is always increased.

The impact increased of the food crop import is also can be viewed whereas, household income that represents the value on the labor column and household row decreased by 1 percent, from the database 100 percent to 99 percent. Then, the worker compensation also decreased to 99 percent and agriculture capital/land income decreased to 37 percent. Whereas value on the activity column and commodity row shown increased by 5 percent, it means purchasing of raw material that agriculture base like a food crop will be increased to the next industry needed. So, if the food crop import has increased without balancing activity growth in the non-agricultural sector, it will happen the whole depression of economy and income inequality between worker and the capital owner (corporate).

The increase in imports is causing reduced farmer income. On the other side, corporate income was increased. It is indicated that food crops import, besides causing a decrease in national economic, it is also causing increasing of income inequality between the agricultural worker and non-agricultural workers.

The liberalization of food, in this case, is food crops import, even though giving losses to the national economy, particularly to the decreasing of farmer income, not necessary to be worried as long as the import of food could causing reduced national food prices. So, the production and export of the non-agricultural sector could be increased. Therefore regulation of food trade system that ensures that condition will be important along with the food crops import.

4.3. The Impact of Non-Agricultural Export on Farmer Income and GDP

Based on SIM-2, whereas the increase of food crops imports by 10 percent that followed with increased of non-agriculture product export by 10 percent, can make the farmer income not to go down although with doing the food crops import. Although in the beginning the impact of the increased food crops import make the price go down and in the end decreasing of farmer total revenue. But, farmer income will be increased again because of the export of non-agriculture has increased by 10 percent.

Increased export of agriculture products by 10 percent will increase the farmer's income and GDP to the beginning point (BASE). It caused when happening the decreasing in the food price that causes the cost of production of the non-agricultural product to become more competitive. It will encourage the corporate to do the export.

The low cost of production and increasing foreign demand, make the corporate to the increased worker that has a higher wage than the agricultural sector wage. It caused the migration of agriculture labor to the industry for a higher wage. While the wage of the industry sector not increased. It caused corporate tend to make more profit from the reduced total cost of production.

There was increased demand for workers, the agriculture worker moves to the industry sector to get a higher wage. It caused the supply of worker in agriculture sector reduces. Reducing of agricultural sector worker make the wage increased. The result showed that the value of farmer income represented on the labor column and household row is constant on 100. While corporate income has increased, that represented on capital column/land and corporate row in the amount of 135. It indicated that import losses can be solved, minimum with increased of non-agricultural product export in the same amount if the import has increased by 10 percent, so the export of non-agriculture should also be increased by 10 percent, by the result, the break event point on the farmer will happen.

The condition of the domestic food market must be eliminated by the speculators that usually played by the middleman. If the regulation of the food trade system was not able to reduce the speculators, so the impact of import will not reduce the domestic food price. Therefore, regulations of good business competition become important in the food trade.

4.4. The Impact of Non-Agriculture Production

Based on the result of SIM-3, increasing food crops import that followed by increased non-agriculture production has an impact on increasing farmer income and real GDP. It indicated that increasing non-agricultural products has a significant impact on farmer income and economy entirely.

A commodity market in agriculture, import of food crops tend to decrease total revenue, while on the non-agriculture ten to increased quantity or production total. Increase of production in the non-agricultural sector is caused by raw material price (food crops) has become cheaper. As a result, encourage corporate to increase production.

The increase of non-agricultural production has consequences to the demand for a worker of the non-agricultural sector increased. Then, higher productivity can increase household income. The increasing of non-agriculture sector workers leads to rising wages and rising a total worker's needs. It encouraging farmer workers moving to the non-agricultural sector to get a higher wage. It caused a supply worker in the agriculture sector was go down. In the result, the agriculture sector wage is also increased.

Increasing food crops imports that followed by increasing non-agricultural production will give consequences of economy transform. Whereas, farmer worker moves to the city to work in the industry sector because the industrial sector has higher wages. Theoretically, the market changes would create a new equilibrium market. More likely in the agricultural sector, because of farmer workers moved to the non-agricultural sector, so the farmer worker becomes less, while the agricultural sector also needs a worker. The decreasing supply input market in the agricultural sector will make the supply curve move upward. It caused farmer wages increased. As a result, farmer income will be increased. An industrial worker that including urban low wages income and urban high wages income increased, and also the whole of the economy that interpretation by real GDP will be increased.

When it viewed from SAM table, increasing farmer income and GDP can be seen in an increase in household income become 109 percent. Besides that, the corporate income also increases become 113 percent. It indicated if the decreasing price of the agricultural product really can increase or support the non-agricultural sector, so in that way, the negative impact of import to the decreasing farmer income could be solved.

It evidence by the result of SIM-4, whereas increasing food crops import that followed by increasing export and non-agricultural production give the positive impact to increase farmer income and household income, besides that, the real GDP also increasing higher than only the increased of production. The combination between export increase and non-agricultural production is indicated that when food price becomes cheaper, so it should the price of the non-agricultural product more competitive indeed and can doing market expansion that in the end could increase the economic growth.

Increasing domestic production and also export of the non-agricultural sector could reduce the negative impact of food crops import, especially to the national economic growth and farmer income rate. But, it does seem the problem of income inequality between the agricultural sector and the non-agricultural sector tends to worsen. It caused the weakness of non-agricultural capacity to provide the many work chances in the agricultural sector. This condition indicated that weakness of linkage between the development of the non-agricultural and agricultural sector.

The industry development or non-agricultural sector must be accommodating agricultural sector workers if it does not happen, so the wages of farmer workers will not be increased. Hence, the development of humans quality in the agricultural sector become strategic to be done as an effort to revitalize agriculture in Indonesia.

4.5. The Implication of Liberalization Food on Income

The liberalization of food has indicated with increasing in food crops import, whereas, it was supported by a huge population. With the result that demand for domestic food is higher than domestic food production. So, the import of food crops is increased. It caused a decreased in household income,

including farmer worker income, farmer owner income, urban low worker income, urban high worker income, and corporate income.

Increasing import of food crops was caused domestic food price goes down. It makes the cost of producing the nation agriculture goes down, even though non-agricultural wages went down, with the result that comparative advantages of the non-agricultural product are increased. Then, to encourage the export of the non-agricultural product. Increasing export of non-agricultural product, caused increasing of household income, including the farmer worker, farmer owner, urban low worker, and urban high worker, and also corporate income will be increased. It caused an increase in the real GDP. But, if the export of non-agriculture is followed by increasing food crops import with the same magnitude, it will make real GDP constant. It indicated that the export of non-agricultural products can be the balancer of the negative impact of food crops import.

The decreased in food domestic prices that make agricultural wages is down, and also cost of production tends to down, causing an increased in the production of non-agricultural products. It causing the household income and corporate income increased. So, the real GDP also increased.

So, an increase in the food income import will not give a negative impact if it followed by export and increase the production of the non-agricultural product. Even it will give a benefit for household income and corporate income and also the whole economy. But if only impart that happening without followed with the growth of the other's activity, so the food crops import will very be disadvantaging for household income, particularly farmer income.

5. CONCLUSION

Based on purposes and result of this research, there are 3 conclusions, namely:

a. Increase of import is causing reduced farmer income. On the other side, corporate income was increased. It is indicated that food crops import, besides causing decrease of national economic, it is also causing increasing of income inequality between the agricultural worker and non-agricultural worker.

b. Increasing domestic production and also export of non-agricultural sector could reduce the negative impact of food crops import, especially to the national economic growth and farmer income rate. But, it does seem the problem of income inequality between agricultural sector and non-agricultural sector tend to worse. It caused of the weakness of non-agricultural capacity to provide the many work chances in agricultural sector. This condition indicated that weakness of linkage between development of non-agricultural and agricultural sector

c. The food liberalization, in this case, is an increase in food imports, still has a positive impact on the Indonesia economic growth and reduces poverty, especially in the urban area. But, there are tend to worsen the income

inequality between inter-sectors. Besides that, the rapid Indonesia population growth, increase of food crop import has a big potency to food scarcity problems, although for the last problem not appear on the CGE models in this research.

Considering the conclusion above, the writer would like to propose some suggestions, namely:

a. The liberalization of food, in this case is food crops import, even though giving a losses to the national economic, particularly to the decreasing of farmer income, not necessary to be worried as long as the import of food could causing reduced national food prices. So, production and export of non-agricultural sector could be increase. Therefore regulation of food trade system that ensures that condition will be important along with the food crops import.

b. The condition of domestic food market must be really eliminated the speculators that usually played by middleman. If the regulation of food trade system not able to reduce the speculators, so the impact of import will not reducing the domestic food price. Therefore, regulations of good business competition become important in the food trade.

c. Remembrance of the importance of agriculture sector development in Indonesia, so the development of agro-industry is the main strategy of national development in this globalization era. If it is not, so the poverty problem and inequality of growth between sectors become so bad, especially to the free trade economic world era. Thus, the improvement of agricultural technology can ensure the increase of productivity becomes important, to do the transformation of national economic structure. So that, food scarcity can be realized with the increase of farmer income and will simultaneously with the national industrialization.

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