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THE IMPORT RESTRICTION OF HORTICULTURAL PRODUCT, DOMESTIC ACTIVITIES, PRICE LEVEL, AND THE WELFARE

Wisnu Winardi[1]

Abstract

This paper analyzes the impact of entry ports reduction on horticultural production on the economic activities, prices and also toward social welfare by using the Computable General Equilibrium (CGE) model. The simulation shows that higher import restrictions on horticultural products will not only increase the income factor (at current value), but will also increase the composite prices. The higher effect of the latter leads to social welfare reduction, but on the other hand favors the agriculture household types. This finding shows import restrictions on horticulture products serves as an income redistribution policy instrument. With regard to this, the monetary authority should take into account this issue, especially in order to anticipate the effect of composite price increases, which could lead to the need of extra efforts in managing price stability.

Keywords: import reduction; prices, inflation, CGE; social welfare; income distribution.
JEL Classification: E25, E27

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I. INTRODUCTION

In September 2012 the Indonesian government established an entry port restriction for horticultural products which came into force on 28 September 2012. This policy was postponement pending of Minister of Trade Regulation No. 30/M-DAG/PER/5/2012 on Horticulture Import Products, which was originally went into effect June 15, 2012. With this provision the government would close some ports for imports of horticultural products, so that imports should only enter into the customs territory of Indonesia through four entrances, namely the Port of Belawan, Tanjung Perak, Makassar and Soekarno – Hatta Airport.

Under this regulation, there will be several other provisions regarding the import of horticulture, particularly those related to health and the environment. The goal is to protect the interests of consumers, especially in terms of controlling the entry of pests and diseases. Furthermore, this policy is expected to provide benefits to the national economy, especially for the general public as consumers and farmers as producers.

Policy restrictions on the entrance of horticultural products often come with restrictions to horticulture imports, since the implementation of this policy will almost certainly reduce the amount of imported horticulture. In a way, the policy response has pros and cons to various parties. Party pro stated that this policy could stimulate domestic producers to increase production. With this policy the income and welfare of farmers as producers of domestic horticulture is expected to increase. But on the other hand, this policy is also being challenged by counter parties both inside and outside the country. These parties are concerned about the availability of domestic horticultural products that have not been fully met from within the country and could impact inflation. Foreign parties or exporters feel this policy is detrimental to domestic production and consider the provisions of these regulations a violation of free trade.

According to the WTO, the United States with the support of the European Union countries, Australia, Chile, Canada, New Zealand and South Africa protest against closing some entrances to Indonesian imports of horticultural products, especially the port of Tanjung Priok (WTO, 2012). The government explained that closing some entrances is due to the very dense traffic of goods, and support facilities and human resources have not been adequate in addressing the issue of food safety protection. But this is still not acceptable to exporting countries, where for example the United States has reacted further by asking the WTO to abort the Indonesian horticultural import restriction policy (ABC, 2013) .

The profile of horticultural products in Indonesia in general showed a good condition. Provision of horticultural products mostly come from domestic production. Based on the balance of Foodstuffs (BoF), during the period 2008-2012 Indonesian horticultural imports of the total supply ranged between 8-12 percent. Imports of horticultural products is large and comprises many kinds of fruits such as oranges, apples, grapes, and durian. Types of vegetables include garlic, chillies, onions, and potatoes. The development of the role of imports to total supply

for almost all horticultural products showed a tendency to narrow, except for onion and garlic. The import role to the provision of both products showed an upward trend.

Table 1
Production and Import of Some Horticultural Products in Indonesia 2008-2012 (Thousand Tons)

Commodities	2008		2009		2010		2011*		2012**	
	Prod.	Imp.	Prod.	Imp.	Prod.	Imp.	Prod.	Imp.	Prod.	Imp.
Fruits										
- Orange	2.468	139	2.132	210	2.029	193	1.819	218	2.139	183
- Durian	682	25	798	29	492	24	884	27	766	17
- Mango	2.105	1	2.243	1	1.287	1	2.131	1	2.351	1
- Watermelon	371	0	474	1	349	1	498	1	419	0
- Apples	161	140	262	154	191	198	200	213	228	132
- Wine	22	27	10	37	12	43	12	58	14	44
- Other (Melon, Cantaloupe, Strawberries)	242	1	180	1	141	1	208	1	170	1
Vegetables										
- Shallots	551	83	623	43	677	47	577	104	724	60
- Potatoes	1.072	13	1.176	19	1.061	32	955	93	1.128	39
- Carrots	367	18	358	20	404	34	527	42	427	40
- Chilli	1.153	116	1.379	130	1.329	131	1.483	165	1.424	106
- Beans	267	6	291	7	336	9	335	9	348	2
- Garlic	9	304	11	289	9	259	10	300	9	201
- Mushrooms	43	2	38	2	61	2	46	2	67	2

Source: NBM Indonesia, 2008-2009, 2009-2010, and 2010-2011.

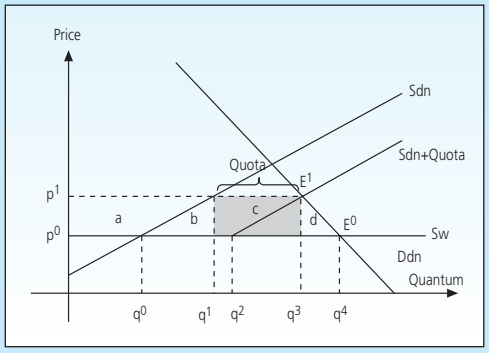
Under these conditions, this study will examine whether the import restriction policies for horticultural products will benefit the Indonesian economy. This study attempts to calculate the impact of restrictions on imports of horticultural products to the public welfare. The study was conducted with a simulation approach for the implementation of import quotas in the CGE model (Computable General Equilibrium). In addition, this study also attempts to calculate the impact of the restrictions on imports of horticultural products to other economic variables, such as the composite price of goods (composite goods), the real factor income, and income institutions.

II. THEORY

In general, the form of protection for domestic products over the competition with imported products can be done with a policy of tariff and non-tariff. Policy restrictions on the

entrance of imports of horticultural products can be categorized as non-tariff policies, because its implementation is expected to be able to reduce imports of commodities without the use of targeted rate instruments. The impact of restrictions on the price of the composite commodity in an economy can be explained by Figure 1. This image describes the changes caused by the partial equilibrium shifting of the supply curve to the left due to reduced imports. In this case the demand curve is considered fixed (Carbaugh, 2008).

If the supply line is represented Sdn domestic, the foreign supply is represented by Sw, and demand represented DDN, then the balance of the economy without import restrictions are at the point E^0. In this condition the realized price is $p^0$and goods sold q^4, where as many as q^0 of which comes from domestic products and as much q^4-q^0 is derived from imports. Enforcement of import restrictions would shift the balance toward the point E^1. In this condition manifested higher prices (p^1) and the amount of goods sold will be reduced (q^3), where as many as q^1 derived from domestic products and as much (q^3-q^1) is derived from imports.



Adopted from Carbough (2008):157

Figure 1
Enforcement of Import Restrictions in a Partial Equilibrium

Import restrictions would lead to higher prices and the quantity of goods sold will be less. Import restrictions would also raise the quota rent in the economy. The quota rent is the surplus value derived from the price increases paid by consumers in the country since the enactment of restrictions on imports. In a partial equilibrium it is not explained who is receiving benefits from the quota rent, so the impact received by individual economic actors (institutions) cannot yet be determined.

According to the theory, the quota rent redistribution effect can be decomposed into (a) the protective effect, (b) consumption effect, (c) and revenue effects/quota rent. The redistribution effect will lead to increased acceptance of domestic manufacturers, the protective

effect (a) and the consumption effect (b) would be the missing piece in the economy (*dead weight lost*), while the effect of revenue/quota rent income will be received by the acquiring institution benefits from protected markets.

III. METHODOLOGY

The data used to derive most of the parameters of the model were from adjusted social accounting matrix (SAM) of Indonesia in 2008. As for the other parameters in the form of constant elasticity of substitution (CES) and constant elasticity of transformation (CET), the parameters used in the study were adopted from Teguh (2010). CES and CET assumed the value of 0.5 for twenty three sectors, except for food, beverages and tobacco, which is assumed to be 1.5.

Adjusted SAM data was used to fulfill the purpose of analysis and synchronized with the equations used in the model. The adjustment was done by changing the format of SAM:

- Of the transaction based on the price, the buyer of the transaction on the basis of producer prices, and the elimination of trade margins block and transportation costs;
- Combines the production sector, domestic commodities, and commodity imports into a block of sectors;
- Incorporates the construction sector to include the chemical industry, fertilizer, and earth resources of clay, cement, electricity, gas and water, and
- Disaggregation of agricultural crops into agricultural and horticultural crops without the horticultural sector.

The analytical tool used is the CGE static model falls into the neoclassical class. Selection of the CGE model as an analytical tool is based on the consideration that this model is more suitable for the case in developing countries in determining economic policy than economic models such as simultaneous equations and other econometric models in the presence macroeconomic shock (Oktaviani, 2008). The CGE models provide a good framework for analyzing problems associated with structural adjustment: the impact of a shock that works through changes in market prices and incentives that affect the allocation and structure of demand, production, and trade (Robinson, 2006). As for choosing a static CGE, it is due to consider the size and complexity of models that can be handled (Hosoe et al., 2010).

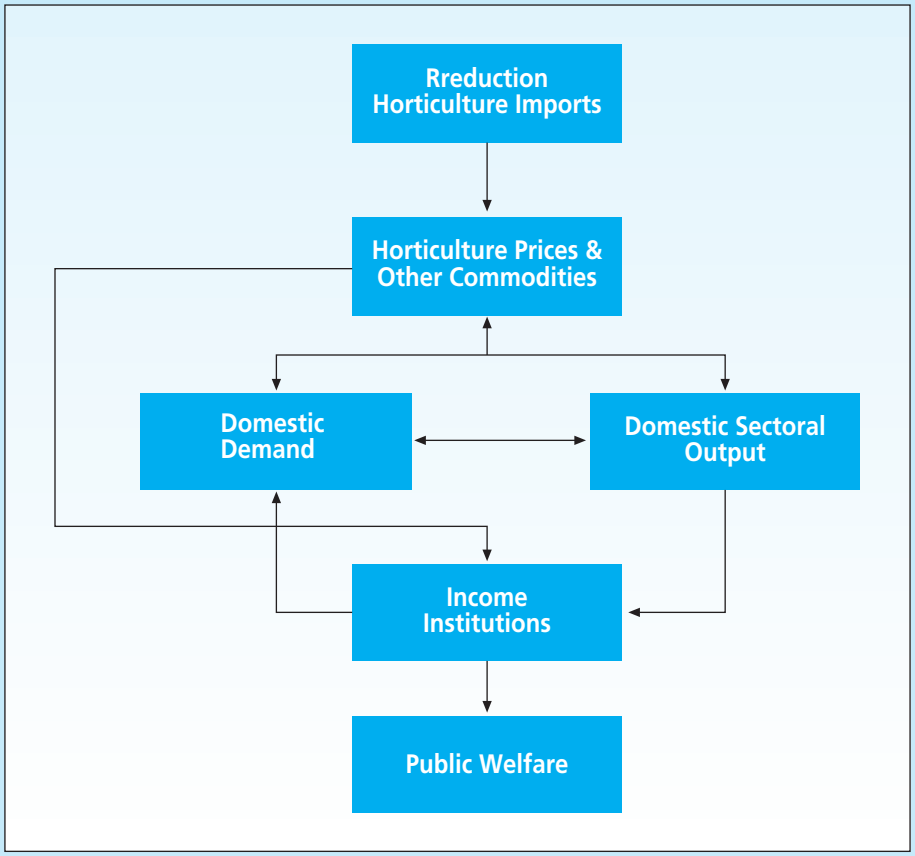
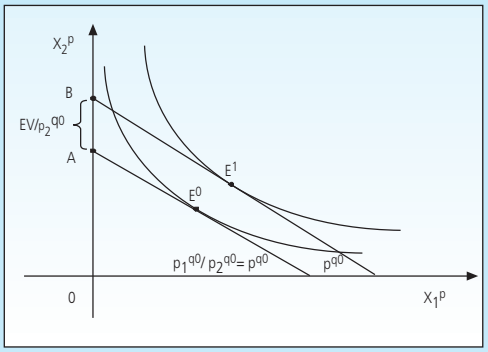


Figure 2
Conceptual framework

The equation used is largley adopted from research conducted by Winardi (2012). His framework begins with government policy in reducing the number of entry points (ports) of horticultural products, along with other relevant provisions of the health of the environment, and resulting in a decrease in imports of horticultural products. As shown in Figure 2, a decrease in imports leading to a reduction in domestic supply has an affect of raising the prices of the composite horticultural products and other commodities. The price increase would have an affect on domestic demand and sectoral output. Changes in sectoral output will have an affect on the revenue earned by economic actors (institutions) and will hedge on domestic demand and the welfare of society. On the other hand, price increases also affect the real income of the institution. Restrictions on imports may result in a shock in the economy and will impact on all aspects of the economy, including the public welfare.



Adapted from Hosoe et al. (2010): 135

Figure 3
Hicksian Equivalence Variation

The public welfare change indicator is calculated based on the difference between the value of *Hicksian equivalence coefficient variation* (EV). EV value measures the utility value changes due to the influence of income, regardless of the price change. The EV value is the transformation of the value of household utility as measured in an ordinal scale of expenditure values in monetary units. The value of household utility is itself an objective function of the CGE model used. The calculation of expenditure and coefficients of EV value use the following formula (Hosoe et al., 2012):

$$ep(p^q, UU) = \min_{X^p}\{p^q . X^p | UU(X^p) = UU\} \quad (1)$$

ep(.) : expenditure function

X^p : consumption vector

p^q : vector of prices faced by consumers

UU : utility value (*given*)

UU(.) : utility function

Function to minimize expenditure and consumption rates combined to produce utility value.

$$EV = ep(p^{q0}, UU^1) - ep(p^{q0}, UU^0) \quad (2)$$

EV : *Hicksian equivalence variation*

p^{q0} : vector price on condition *base line*

UU^1 : utility value in the presence of shock

UU^0 : utility value on conditions *base line*

EV results from the difference in household spending generated by the shock conditions and expenditures without shock (base line) to maintain the price at baseline conditions. Graphical illustration of the coefficients for the two commodities EV (X_1 and X_2) are shown in Figure 3, where the value $EV/p_2^{qo\ is}$ illustrated by the distance between points A and B.

Furthermore, the distribution of income is used to measure the Williamson index which has a value between 0 and 1. The more the index is close to 0, it indicates the more equal distribution of household income; while the closer it is to 1, it indicates high inequality. The Williamson index calculation uses the following formula (Daryanti, 2010; modified):

$$W = \frac{\sqrt{\sum \left(y_i - \overline{y}\right)^2 f_i / n}}{\overline{y}} \tag{3}$$

W : Williamson index

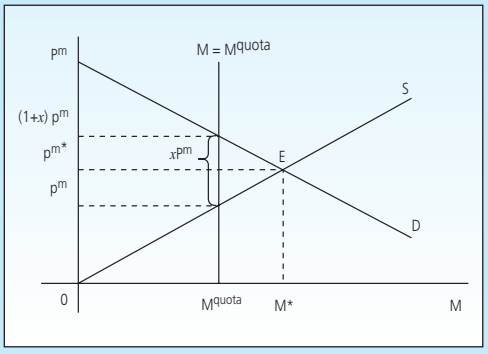
f_i : number of households to population groups -*i*

n : the total population

y_i : group household income to -*i*

Σ : household income per capita

The impact of restrictions on imports of horticultural against household income distribution is seen from the comparison of the generated Williamson index. When the policy index is



Adapted from Hosoe et al. (2010): 184

Figure 4
Enforcement of Import Restrictions

lower than the index at baseline conditions, it can be concluded that the policy will reduce the gap. And vice versa, when the index policy is higher than in the baseline condition, it can be concluded that the policy will increase the gap.

In order for the model to describe the economic realities that occurred and able to answer the research objectives, it is necessary to: make adjustments to the portion of the equation that is adopted, the addition of the new equation, and the addition of several new variables and parameters. These three things are determined by considering how the policy of import restrictions is set forth in the model. Horticulture import restrictions in the model can be described in Figure 4.

If it is assumed that the initial equilibrium price of imported goods is p^m*and the amount of imports is M*, then the imposition of import restrictions would reduce the amount of horticultural imports amounted to M^{quota}. In this condition the import price of horticulture rose to $(1+\chi)\ p^m$, and *quota rentis* created by $M^{quota}.(1+\chi)\ p^m$. As Figure 1 and Figure 4 describes the application of the import restrictions in partial equilibrium, so that the institution has not explained who benefits from a reduction in the import policy. In a general equilibrium model like the one used in this study, it is assumed that the quota rent will be received by the farm household (farm workers and agricultural employers) as an institution that produces products in the market are protected horticulture.

Based on these explanations, the equation is adjusted, the new equations are added, and new variables and parameters are:

- The equations in the model is adjusted:

$$M_i = \left[\frac{\gamma_i^{\acute{\eta}_i} . \delta m_i . p_i^q}{(1+\chi_i+\tau_i^m)p_i^m}\right]^{\frac{1}{1-\acute{\eta}_i}} Arm_i \qquad \forall i \qquad (4)$$

M_i : imported goods to -i

Arm_i : composite goods (a combination of domestic and imported goods) to -i

$\tilde{a}_i$: *scaling coeficient* the composite goods to -i

ή : parameters specified by the function coefficients CES

$\hat{o}^m{}_i$: the ratio of import tax on imported goods to -i

$p^m{}_i$: import prices

δmi : *input share* the Armington composite goods functions ($0 \leq \delta$ mi ≤ 1)

$T^d{}_r$: direct taxes to households -r

$\hat{o}^d{}_r$: the ratio of direct taxes on household income to -r

p^f_h : factor prices to -h

FF_{hr} : *endowment factor* to -h owned by household to -r

trhhr : acceptance tansfer between households

trhohest : acceptance of the company's domestic tansfer

trhohgov : acceptance of the government's domestic tansfer

trhohext : tansfer from abroad to households

ε : exchange rate (Rupiah / foreign currency)

S^p_r : household savings to -r

ss^p_r : coefficient of *average propensity to save* households to -r

X^p_{ir} : commodity consumption to -i by households to -r

p^q_i : composite goods prices to -i

trhhc : transfer between households

tresthoh : acceptance of the transfer of the company's domestic

α_{iq} : ratio of i-th commodity consumption by households to -q

• The new equation is added:

$$T_r^d = \tau_r^d \left(\sum_h p_h^f . FF_{hr} + trhhr(r) + trhohest(r) + trhohgov(r) + \varepsilon . trhohext(r) + rrt_r \sum_i RT_i \right) \quad \forall r \tag{5}$$

$$S_r^p = ss_r^p \left(\sum_h p_h^f . FF_{hr} + trhhr(r) + trhohest(r) + trhohgov(r) + \varepsilon . trhohext(r) + rrt_r . \sum_i RT_i \right) \quad \forall r \tag{6}$$

$$X_{ir}^p = \frac{\alpha_{ir}}{p_i^q} \left(\sum_h p_h^f . FF_{hr} + trhhr(r) + trhohest(r) + trhohgov(r) + \varepsilon . trhohext(r) + rrt_r \sum_i RT_i - T_r^d - S_r^p - trhhc(r) - tresthoh(r) \right) \quad \forall i, r \tag{7}$$

- The new variable is added:

χ_i : *quota rent*

RT_i : surplus caused by the application of import quotas

- The new parameters added are:

M_i^{quota} : import quota

rrt_r : *share* acceptance of *quota rent* by households to -r

Parameters quotas share rent receipts by farm worker households and agricultural entrepreneurs and re calculated based on a comparison of domestic income factor receipts of agricultural workers and agricultural employers in the baseline condition to the total of both.

This model uses the savings - driven closure, i.e. the value of savings is determined first, and then investments to each sector is adjusted to the amount of savings. These models included in the category of neoclassical class, the production function is assumed to be constant returns to scale, and the market is in perfect competition. The model works on the principle of optimization that maximizes the value of the goal, i.e. the number of each class of household utilities. Selection of total utility as a variable to be maximized is based on the consideration that the measures taken in the economy have a goal to improve the welfare. The total value of utility is considered as an indicator to represent the characteristics of well-being.

To help, computational models used GAMS, software to solve mathematical models, including the CGE. As the *solver* used is conopt, a *solveris* commonly used to solve non-linear programming optimization function (non-linear programming, NLP). Simulations are performed to calculate the impact if the entrance import restrictions would reduce the amount of horticultural imports by 5, 10 and 20 percent .

Before analyzing the simulation results, the CGE model used needs to be tested first to ensure appropriate and consistent simulation results. Because CGE models belong to the deterministic model, then there is no statistical tests that were performed on model parameters as done in the models that are stochastic. Tests were conducted in the CGE model to test the sensitivity to parameter potential to provide considerable influence on the results of the calculation. In cases related to international trade as this is done, the sensitivity test can be made to the parameters CES and CET (Hosoe et al., 2010) .

The sensitivity test results to parameters CES and CET suggest that used CGE models provide simulation results affect the reduction of horticultural imports by 5, 10, and 15 percent of the value of each class of household EV appropriate and consistent. The test results showed that when the CES and CET parameters of each commodity changes by about forty percent lower or higher than the value of the baseline conditions, the simulation results will remain

accurate and consistent. This is evidenced by the EV value is consistently viewed according to positive/negative sign, and the EV value according to the households class order on the condition of changed values of the CES and CET (Appendix 1).

IV. ANALYSIS AND RESULTS

The following describes the simulation results of horticultural import declines by 5, 10 and 20 percent on some economic variables, namely: the price of composite goods, the real factor income, revenues institutions, and public welfare.

Impact on Prices of Composites Goods

A reduction of 5 per cent of horticultural imports is expected to have an impact on the increase in the average price of 0.01 per cent composites. Composite price increases is mainly due to the increase in the price of the composite commodity horticultural sector, which rose by 0.6 percent, while commodity prices of other sectors remained unchanged. The magnitude of the impact of a reduction in the price of imported horticultural composites in each sector are shown in Table 2 .

As described in Figure 1, a reduction in imports will lower the supply of goods in the market so it will increase the price of the composite and reduce the amount of goods sold. Price changes are localized only to the horticultural sector as the products of the horticultural sector do not have many forward linkages. Horticultural outputs are not used as much the inputs (raw materials or auxiliary) by other sectors to produce goods, so the price increase changes that occurs have no effect on output prices .

The reduction of horticultural imports by 10 and 20 percent of the composite price change is expected to have an impact on changes in higher prices and increasing spread to other sectors. The sectors that were previously not affected react with greater import reduction. The simulation results showed that the reduction of horticultural imports by 10 percent will increase the average price by 0.02 per cent and there are three sectors that experienced price increases while at 20 percent reduction an impact on the increase in the average price is 0.08 percent, and there were seven sectors that experienced price increases. The impact of price increases resulted in more widespread roles (share) in the horticultural sector to changes as the average price was lowered, while the other sectors increased. The role of horticulture sector fell from 100.0 percent reduction in imports by 5 percent to 80.7 percent and 55.7 percent reduction in imports by 10 and 20 percent .

These results also indicate that the import restriction policy horticulture will also have an impact on the monetary policy indicator. The complementary nature of goods and substitution as well as the demand-supply mechanism happen in the market resulting in more widespread

price changes. Decomposition in the context of inflation, raises commodity prices meaning that the import restriction policy will affect changes in commodity prices that are monitored in the calculation of inflation, both of which are volatile, administered, and at the core.

Table 2
The Effectof Horticulture Import Restrictions Against Change Composite Price of Goods (Percent)

Sector	5%	Share	10%	Share	20%	Share
1. Agricultural crops other than horticultural	-		-		-	
2. Horticulture	0,6	100,0	1,3	80,7	3,0	55,7
3. Other food crops	-		-		-	
4. Other crops	-		-		-	
5. Livestock and results	-		-		0,1	3,9
6. Forestry and Hunting	-		-		-	
7. Fishery	-		-		-	
8. Coal mining, metal & oil seeds	-		-		-	
9. Other mining and quarrying	-		-		-	
10. Manufacture of food, beverages and tobacco	-		-		0,1	12,4
11. Spinning industry, textile, apparel & leather	-		-		0,1	3,1
12. Manufacture of wood and products of wood	-		-		-	
13. Paper industry, printing, transportation equipment and metal goods and industrial	-		-		-	
14. Industry oil refineries, chemical, fertilizer, results from clay, cement, LGA, and construction	-		-		-	
15. Trade & restaurants	-		-		0,1	13,4
16. Hospitality	-		0,1	1,3	0,2	0,8
17. Rail transport	-		-		-	
18. land transport	-		-		-	
19. Air transport, water and communications	-		-		-	
20. Transportation support services, and warehousing	-		-		-	
21. Banks and insurance	-		-		-	
22. Real estate and business services	-		-		-	
23. Government	-		0,1	18,0	0,2	10,7
24. Personal services, and other ruta	-		-		-	
Total	**0,01**	**100,0**	**0,02**	**100,0**	**0,08**	**100,0**

The price and total composite horticultural sector was inelastic relative to the decline in imports of horticulture. The percentage increase in the price of the composite was lower than the decrease in horticultural imports. This is because the role of the supply and import of horticultural horticultural forward linkages were not great, and its use does not spread to many sectors. The sectors most affected were horticulture itself, followed in other sectors of horticulture such as a raw material input or auxiliary to the production process in large enough quantities.

Impact on Real factor incomes

The reduction of horticultural imports by 5, 10 and 20 percent was expected to have a negative impact on the total amount of income, and the real factor incomes were different for each sector. A greater reduction in horticultural imports will lead to a greater reduction in real factor incomes. The magnitude of the impact of the reduction in imports of horticultural on the real factor incomes by sector is presented in Table 3.

Table 3
Impact of Horticultural Import Restrictions to the Real factor incomes (Percent)

Sector	5%	10%	20%
1. Agricultural crops other than horticultural	0,010	0,020	0,043
2. Horticultural	-0,032	-0,070	-0,163
3. Agriculture Horticulture *	1,124	2,314	4,947
4. Other food crops	0,000	0,000	0,001
5. Other crops	0,001	0,001	0,004
6. Livestock and results	0,006	0,013	0,025
7. Forestry and Hunting	0,005	0,011	0,024
8. Fishery	0,013	0,027	0,057
9. Coal mining, metal & oil seeds	-0,006	-0,011	-0,018
10. Other mining and quarrying	0,002	0,004	0,009
11. Manufacture of food, beverages and tobacco	-0,002	-0,004	-0,009
12. Spinning industry, textile, apparel & leather	-0,003	-0,006	-0,005
13. Manufacture of wood and products of wood	0,002	0,005	0,013
14. Paper industry, printing, transportation equipment and metal goods and industrial	0,001	0,003	0,009
15. Industry oil refineries, chemical, fertilizer, results from clay, cement, LGA, and construction	0,002	0,005	0,012
16. Trade & restaurants	0,000	0,001	0,001
17. Hospitality	-0,067	-0,140	-0,306
18. Rail transport	0,011	0,022	0,048
19. Land transport	0,008	0,017	0,037
20. Air transport, water and communications	0,008	0,016	0,034
21. Transportation support services, and warehousing	0,003	0,006	0,015
22. Banks and insurance	0,005	0,010	0,021
23. Real estate and business services	0,004	0,009	0,018
24. Government	-0,024	-0,051	-0,118
25. Personal services, and other ruta	0,008	0,017	0,037
Total	**-0,0002**	**-0,0004**	**-0,0006**
Total *	**0,017**	**0,035**	**0,076**

* Revenue faktor + *quota rent*

Reduction would lead to the provision of horticultural imports to be reduced. Reduced availability would result in horticultural needs being met as intermediate inputs by the

production sector which would also to be reduced affecting the production output in some sectors. This, in turn would drop the revenue factor in some sectors. On the other hand, the reduction of horticultural imports would effect the composite price increase which would also suppress demand. Pressure on demand would bring down production, which will also be a factor contributing to revenue decline. The simulation results showed that the reduction of horticultural imports by 5, 10 and 20 percent would result in a decrease in total real factor income amounted to 0.0002 percent, 0.0004 percent, and 0.0006 percent, which is caused by a reduction in the decline in six sectors.

The decline in revenue due to the reduction factor is offset by the emergence of import quota rents generated by the horticultural sector. If the quota rent aggregated with income factors, the reduction of horticultural imports is expected to result in a higher revenue factor. The simulation results showed that the greater the deterioration in horticultural imports, the greater the quota rent. Reduction of horticultural imports by 5, 10 and 20 percent would result in an increase in the income factor at 0.017 percent, 0.035 percent, and 0.076 percent.

Revenue Impact on Institutions

Reduction of horticultural imports by 5, 10, and 20 percent was expected to have an impact on the increase in institutional revenue (at current values). The entire institution has increased revenue, where a high rise was experienced by household and agricultural employers of agricultural workers. The magnitude of the impact of a reduction of horticultural imports to income institutions is presented in Table 4.

Table 4
Impact of Horticulture Import Restrictions Revenue to Institutions, (Percent, unless marked ^)

Institution	Import Reduction 5%	Import Reduction 10%	Import Reduction 20%
1. Agricultural labor households	0,077	0,159	0,343
2. Household agricultural entrepreneurs	0,104	0,216	0,463
3. Households in rural areas scored lower	2,12E-04	6,76E-04	0,003
4. Non household labor force in rural areas	2,61E-04	7,88E-04	0,003
5. Households in rural areas scored above	7,89E-04	0,002	0,005
6. Households in urban areas scored below	3,33E-04	8,66E-04	0,003
7. Non household labor force in urban	5,62E-04	0,001	0,004
8. Households in urban areas scored above	6,64E-04	0,002	0,004
Total household	0,003	0,007	0,017
9. Company	0,003	0,007	0,017
10. Government	5,10E-04	0,002	0,009
Williamson Index of household difference ^	-0,00028	-0,00058	-0,00125

The reduction of horticultural imports by 5,10, and 20 percent had an impact on the institutions income rise in the same order. On reducing the horticultural imports by 5 percent, the greatest increase in incomes occurred in households and firms (0.003 percent) and government (0.0005 percent). Households classes that experienced high revenue growth were the agricultural entrepreneur (0.104 percent) and the agricultural workers (0.077 percent). Gains derived by agricultural households was quota rent. Price increases due to reduced supply of horticultural, increase the income of the farmers as horticultural producers.

The amount of quota rent earned by farmers will depend on the size of the owned endowment factor. Household agricultural employers have a larger endowment factor than the agricultural laborers so that the quota rent earned by household agricultural entrepreneurs is greater than the agricultural labor households. The simulation results showed that the reduction of horticultural imports by 5, 10 and 20 per cent would lead to an increase in household income and increased agricultural entrepreneurs respectively at 0.104 percent, 0.216 percent, and 0.463 percent. On the other hand, household incomes of agricultural workers would increase by 0.077 percent, 0.159 percent, 0.343 percent, respectively. In addition to the agricultural employers household and the agricultural workers, the increase in earned institutional income is lower than the composite price increase (see Table 1 and Table 4) .

Furthermore, by using the Williamson index, the horticultural imports declined by 5 percent, the index decreased by 0.00028 compared to the baseline conditions. While the decline by 10 and 20 percent of the index value decreased by 0.00058 and 0.00125, respectively. Despite the decline in the index was not too big, it does indicate that the reduction in growing horticultural imports will affect the household income, which contribute to a widening of the distribution gap.

In this context, a policy of reducing horticultural imports is on the one hand according are to be executed when the condition is associated with the more gap of income distribution in Indonesia. Based on the Gini ratio indicators, gaps in Indonesia tend to increase, from 0.31 in 1999 to 0.37 in 2009, and continuously increased up to 0.41 in 2012 (CBS, 2013). This policy is expected to help decrease the gap through increased farm household income; a major issue for a number of poor households in Indonesia.

Impact on Social Welfare

Reduction of horticultural imports by 5, 10 and 20 percent was expected to impact on general social welfare. Six groups of households were impaired EV, while the two groups of households increased, agricultural laborers and employers. The magnitude of the horticultural import restriction on social welfare is presented in Table 5.

The effect of decreased imports on the welfare of society according to the sequence of results showed that it is in line with effects to institutional incomes. The increase in the value

received by the EV was high in households, agricultural employers and agricultural laborers, while other households groups decreased, with the highest decline experienced by non-agricultural households in the urban lower class. On the reduction of imports by 5 percent, households of agricultural employers increased by 336 billion rupiah and agricultural laborers increased by 93 billion rupiah, while the non-agricultural households in the urban lower classes fell by 204 billion rupiah.

Table 5 Impact of Horticulture Import Restrictions Equivalent to the value of Variation (EV) Household, (Billion USD, %)

Household Type	Import Reduction 5%		Import Reduction 10%		Import Reduction 20%	
	EV	%	EV	%	EV	%
1. Agric. worker	93	0,06	191	0,12	402	0,25
2. Agric. Entrepreneur	336	0,05	674	0,10	1.365	0,21
3. Lower Rural Household	-78	-0,02	-165	-0,04	-371	-0,08
4. Non labor, rural.	-25	-0,02	-52	-0,03	-117	-0,07
5. High Rural Household	-54	-0,01	-114	-0,03	-257	-0,07
6. Lower Urban	-204	-0,03	-431	-0,07	-971	-0,15
7. Non labor, urban	-51	-0,02	-109	-0,05	-245	-0,11
8. High Urban	-72	-0,01	-153	-0,02	-348	-0,05
Total	**-55**	**-0,002**	**-158**	**-0,005**	**-543**	**-0,016**

On the reduction of imports by 10 percent and 20 percent, the simulation showed results with the same structure. The difference lied only in the magnitude of the impact. The greater reduction in horticultural imports, the further the increase of the EV value of agricultural households, and the more the reduction of the EV for other household classes.

On the reduction of imports by 5 percent, agricultural labor households increased by 0.06 percent and agricultural entrepreneurs increased by 0.05 percent, while the non-agricultural households in the urban lower classes fell by 0.03 per cent. Households that had a relatively high increase were agricultural laborers and agricultural entrepreneurs, while the highest decrease was experienced by non-agricultural households in the urban lower class. Although agricultural entrepreneurs nominally increased higher than the agricultural laborers, but not so when viewed in relative terms. This is due to the value of household consumption of agricultural entrepreneurs in baseline conditions which seem to be more distant than the agricultural laborers.

V. CONCLUSION

Based on the results of the research, the purpose of government policies to protect consumers by applying horticultural import quotas have a trade off in various aspects. Reduction of horticultural imports by 5 percent , 10 percent and 20 percent were expected to give different

results in magnitude, but not too different in structure. The simulation results showed that the greater the impact on the reduction of horticultural imports :

- the higher composite prices rose and spread to other sectors;
- a more decrease in real factor income;
- increase in factor income (at current values), but the increase was lower than the increase in the price of the composite;
- the decline in household income distribution gap, and
- a decline of social welfare in aggregate, but improvement in the welfare of farm households.

Based on these results, horticultural import restriction policies can be referred to as equity-oriented policies (pro- equality) and not growth (pro-growth). A form of equalization that is not caused by an increase in productivity, but more due to higher revenues from the agricultural household quota rent of horticultural products.

For monetary authorities, composite goods price pressure due to import restriction policies calls for more attention. Pricing pressures brings consequences on greater effort to anticipate its effect on price stability and monetary.

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APPENDIX 1

Appendix 1
Test sensitivity: Impact Reduction Imports 5, 10, and 15 Percent
EV Group Against Value of Household

No	Household Group	Import Reduction of 5%			Import Reduction of 10%			Import Reduction of 15%		
		40% lower	*Base line*	40% higher	40% lower	*Base line*	40% higher	40% lower	*Base line*	40% higher
1	Lower classes in urban	-343,39	-203,82	-143,08	-748,75	-430,69	-297,83	-1.812,51	-971,48	-649,55
2	Lower classes in rural	-132,20	-78,32	-54,89	-287,40	-165,14	-114,05	-692,52	-370,98	-247,88
3	Urban elite	-128,33	-71,92	-47,50	-281,24	-152,66	-99,33	-688,89	-347,80	-218,72
4	Rural elite	-91,84	-53,76	-37,22	-200,58	-113,75	-77,56	-487,72	-257,34	-169,58
5	Labor force in urban	-87,05	-51,43	-35,95	-189,90	-108,73	-74,85	-460,29	-245,46	-163,35
6	Labor force in rural areas	-41,66	-24,74	-17,38	-90,54	-52,14	-36,09	-218,08	-117,06	-78,39
7	Agricultural laborers	154,43	93,18	66,50	327,27	190,72	133,86	748,27	402,42	271,75
8	Agricultural entrepreneurs	549,01	335,55	242,58	1.142,63	674,25	479,47	2.514,41	1.364,65	933,09