

Analysis of Response Policy for Import Surges on Horticulture Commodities in Indonesia

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Abstract. *Import surges in the form of import volume increase as well as significant import price decrease are something that Indonesia has to be cautious about in the globalization trade era. The primary objective of this study is to analyze whether there are import surges in horticultural commodities, particularly potatoes, red onions, and citrus (orange and mandarin). The method used to identify the occurrence of import surges is based on the framework of the Special Safeguard Mechanism by the World Trade Organization which is strengthened by the Vector Error Correction Model to analyze the impact of import surges on domestic prices. Based on the framework of the Special Safeguard Mechanism, the volume-based Special Safeguard Mechanism is triggered almost throughout the year in the period of 2002 to 2012, but the price-based Special Safeguard Mechanism is triggered in two years in citrus commodity. Based on the Impulse Response Function analysis, the impact of import surge shock on domestic prices is not really significant but has permanent effect. Based on the Forecast Error Variance Decomposition analysis, the contribution of import surges on the variability of domestic prices is relatively low but tends to escalate from year to year.*

Keywords: *Special Safeguard Mechanism, Vector Error Correction Model, AEC*

JEL codes: *C01, C33, F15*

Introduction

The pioneering of ASEAN Economic Community (AEC) in 2015 is getting closer. In the AEC Blueprint, there are numerous policies related to the integration of the ASEAN region, including the liberalization (tariff exemption) of various economic factors such as goods, services, investment, capital, and labour in the ASEAN region (Ministry of Trade 2012); this means opening the doors to globalization wider for Indonesia. Being more open means that Indonesia becomes more vulnerable to external shocks (Aminuddin et al 2009).

External shocks that are considered to highly affect the economy are very often associated with particular commodities; in this case the prices of oil and food. World food crisis that occurred in 2007-2008 was indicated by a dramatic increase

of the prices of agricultural commodities in the international market, between January 2007 to March 2008, increasing the world prices of rice and maize. The high world food prices will be transmitted to the domestic market, lowering the purchasing power of households and other end consumers. At national level, food-importing countries will face balance of payment pressure during the price increase of imported food that will affect the cost of food procurement program implemented in that country (Minot 2011).

In Indonesia, the world rice price shock can be influenced by the price of imported rice itself. In addition, some commodities such as rice have certain characteristic where domestic prices are higher than the prices abroad; therefore, the formation of domestic prices can be affected by foreign prices, especially import prices (Chintia 2013).

In addition to the influence of external shock in the form of increased prices, the significant increase of import volume leading to import surges can also be transmitted into and affect the domestic economy. In FAO (2011), there are concerns about the increase in the food import volume where the volume becomes a surge in developing countries. This import surge, for some population groups such as population group of community as consumers, will bring benefits because, aside from local products, there are available alternatives in the consumption of goods; but on the other hand, producers particularly small scale farmers will be disadvantaged because of the emergence of competitors.

Import surge phenomenon itself has been a concern of developing countries, where developing countries want special protection due to the negative impacts of import surges originated from trade liberalization. WTO as trade liberalization supervisor then put forward a specific protection manifested in the Safeguard Agreement stated in the article XIX of the General Agreement on Tariffs and Trade (GATT) in 1994 in the form of safeguard measures. Safeguard measures are defined as the act of "emergency" to the import increase of certain product when the import of that product can cause adverse effects to the domestic industry of the WTO members of importing countries. In its development, the article XIX of GATT applied to the entire products has specifically grown to the safeguard of agricultural commodities in the form of Special Safeguard (SSG) which contains a tariff enactment article in the event of import increase stated in the article XIX of GATT; then developing countries protect their local products more specifically by using the Special Safeguard Mechanism (SSM) concept. Based on the solutions provided by WTO, protection enactment on domestic producers from import onslaught can be in the form of tariff increases, meaning that WTO as trade globalization supervisor still approves the implementation of tariff if its enactment meets the conditions in the domestic protection of member countries.

Indonesia imports horticultural commodities, particularly sub-tropical fruit commodities, such as apples, pears, grapes, and longan, because these fruits are commonly consumed in Indonesia although Indonesia is not capable to produce them (or produce under consumption). Similar situation occurs in other horticultural commodities, for example garlic. In terms of vegetable horticulture, Indonesia is also capable of producing food ingredients such as peppers, red onions, tomatoes, carrots, and others. In fact, Indonesia also imports several of those commodities that are potential to produce; even some of them with relatively high volume, for instance potato commodity.

The high horticultural imports of Indonesia are not accompanied by the policy to protect domestic market, particularly regarding producer prices. The

problem is that the special safeguard policy in Indonesia has the right to impose SSG on 14 products (8-digit HS code based on HS code, but in general are four products (4-digit HS code), i.e. milk (HS0402), butter (HS0403), milkfat (HS0405), and cloves (HS0907). Thirteen products are livestock commodities and one product is plantation commodity; which means protection on horticulture is not included in SSG and it is important to propose another special safeguard to protect domestic prices, for example SSM.

The study focuses on three horticultural commodities, namely potatoes, red onions, and citrus. All three commodities have the potential to be produced in Indonesia, but on the other hand the import of these commodities is quite high in Indonesia; where in 2012, for each of these commodities, Indonesia imported more than one hundred thousand tonnes. The ratio between local products and imported products of these commodities is also quite high; the ratio for potatoes is 10.86 percent, for red onions is 12.73 percent, and for citrus is 16.06 percent. From both phenomena, it is important to examine further the potential of import surges on horticultural commodities which is manifested in the study issues as follows: (1) Is there an import surge phenomenon occurring in horticultural commodities? How often does the frequency of import surge occur in these commodities? and (2) What are the impacts of the increasing trends of horticultural imports on the domestic prices of potatoes in Indonesia?

The implementation of SSM if horticultural import surges occurred in Indonesia needs to be substantiated; and it has to be authenticated whether the impacts of import surges have affected domestic prices from 2002 to 2012 as the pioneering era of AFTA. Therefore, this study aims to: (1) Detect the phenomena and frequency of import surges that occur in the horticultural commodities of potatoes, citrus, and red onions in Indonesia based on SSM framework and (2) Analyze the impacts of import surge shocks on domestic prices in Indonesia

The scope of this research includes: First, horticultural commodities examined in this study are limited to potatoes, red onions, and citrus. Second, the data used in this study are monthly data during the period of 2002 to 2012, which are derived from the official data from the agency responsible for releasing statistical data. Third, the impacts of domestic economy of this study are limited to the observation of external factors influences, such as international prices, import prices, and import volume, without considering internal influences. This is done in order to vividly see the influence of external factors due to economic openness in both short and long terms.

Literature Review

Import surges

Based on dictionary definition, the word surge in the English language is used to describe sudden, sharp, and unexpected increase. WTO Agreement in general trade remedy measures in Article 2 of the Agreement on Safeguards (ASG):

"When a product is imported into a country in such increased quantities, absolute or relative to domestic production, and under such conditions as to cause or threaten to cause serious injury to domestic industry that produces like or directly competitive products" (WTO 1994).

In general, WTO does not mention the import surge term, but the conditions in the safeguard are often defined as those phenomena (FAO 2011). Based on FAO study in 2011 (De Nigris 2005; Mosoti and Sharma 2005; Sharma 2005), a conclusion is constructed that import surge is a sudden increase in import and is generally short-term, but it can easily have negative impacts on trend increase in the long run or correlate with other factors in the market indicators. So, the defining of import surge in this study is a phenomenon that occurs when an increase in volume (or decrease in price) of imports exceeds the normal level during a certain time period based on certain criteria that can potentially trigger an impact to the domestic economy.

Special Safeguard

The establishment of local farmers' protection against import surges in the form of SSM has been initiated since 1994. In the process there are three types of safeguards that have been established in the process that ultimately became SSM, namely article XIX of GATT 1994, SSG, and SSM.

Article XIX of GATT 1994

Article XIX of GATT 1994 has three clauses that are generally talking about the act of "emergency" that needs to be done on certain import products. Special treatment is done if there is a case where certain import product experiences increased import volume (which can be accompanied by a decrease in price) that can cause adverse effects for domestic producers with the same product; the imported product is then positioned as the competitor product directly or indirectly. Article XIX does not specifically discuss the products that need to be given special treatment, so it can be concluded that there are no restrictions regarding the selected products to be given protection. It is important to know that in the Article XIX safeguards framework version, the trigger of protection occurrence applies only to the increased volume, if the price decline is not accompanied by an increase in volume, then the trigger is not valid.

Article XIX of GATT 1994 in the second and third clauses says that a member country of WTO that thinks that a certain product has led to an adverse effect suffered by the local producers can conduct quantity restriction (quota) as well as tariff increase. This is done by the agreement between exporting country and importing country in WTO surveillance corridor, where there is compensation for the negotiation. There is no time limit in the application of the special treatment of the product as long as the valid contact is approved. The application of Article XIX has been undertaken by two known countries (WTO 2013), namely Argentina for shoe products (footwear) and Korea for dairy products (dairy).

Special Safeguard (SSG)

SSG is a form of follow-up response of the GATT 1994, which then listed in Article 5 of the Agreement of Agriculture on Special Safeguard Provisions. Special Safeguards Provisions are different from the general safeguard, in which for agriculture the safeguards can be automatically enacted if the import value increases at a certain level or price declines to less than a certain level, and substantiation of adverse effect suffered by local producers due to those changes is not needed.

SSG can only be performed on agricultural products that have been awarded with "tariff" (which amount to less than 20 percent of the total agricultural products), where tariff serves as quantitative restriction that is converted into an

equal tariff which is then cut. SSG cannot be implemented to the imports under the tariff quota and is only limited to the governments of certain countries; not to mention that many developing countries have opted not to follow the “tariff”, so those countries are not entitled to implement SSG. In practice, only few countries implement SSG. Indonesia has the right to enact SSG on 14 products (8-digit HS code based on the HS code), but in general, there are four products (4-digit HS code), namely milk (HS0402), butter (HS0403), milkfat (HS0405), and cloves (HS0907).

Special Safeguard Mechanism (SSM)

The restriction against countries that have been granted the right to implement SSG and the condition of developing countries that have refused the enactment of “tariff” would then lead to the creation of new policy formulation that has SSG-like system but can be applied to developing countries which have not been granted the right previously. The newly designed safeguard is called the Special Safeguards Mechanism which is contained in the Draft Modalities for Agriculture of WTO in 2008.

The basic concept of SSM is very similar to the SSG, but with the lifting of restriction, especially the “tariff” problem which is then included in the Draft Modalities for Agriculture in article 123. SSM implements tariffs on imported products that have increased import volume (import surges) or decreased import price level, with temporary tariff enactment. However, SSM can be applied by all developing countries and those countries have the right to implement it in order to protect local producers for all agricultural products without having to prove injury.

Based on the Draft Modalities in July 2008, SSM is divided into two types, namely volume-based SSM and price-based SSM. The volume-based SSM can be started with the average of imports in the last three years, which is then used as the base imports (if the base year used is 2013, then the trigger safeguard will happen if import increases at a certain rate compared to the average of import that occurs in 2010-2012). Based on the revised Draft Modalities of December 2008, trigger and remedy of the volume-based SSM are divided into three types, namely:

1. When the import volume is worth 110 percent but does not exceed 115 percent (volume increase of 10 to 15 percent) against base imports. The remedy used is maximum tariff increase by 25 percent from the current bound tariff which is added to the applied tariff, or 25 percentage points are added to the applied tariff directly. The choice is determined based on the higher tariff¹.
2. When the import volume is worth 115 percent but does not exceed 135 percent (volume increase of 15 to 35 percent) against base imports. The remedy used is maximum tariff increase by 40 percent from the current bound tariff which is added to the applied tariff, or 40 percentage points are added to the applied tariff directly. The choice is determined based on the higher tariff.
3. When the import volume exceeds 135 percent (volume increase more than 35 percent) against base imports. The remedy used is tariff application at 50 percent from the current bound tariff which is added to the applied tariff, or

¹ For example country X has 60% of *bound tariff* and 30% of *applied tariff*, the country has two options: $(25\% * 60\%) + 30\% = 45\%$ or $25\% + 30\% = 55\%$

Therefore, during the import volume increase by 10-15 percent, tariff can be higher up to maximum 55%

50 percentage points are added to the applied tariff directly. The choice is determined based on the higher tariff.

To be noted, volume-based SSM cannot be implemented when import volume is negligibly significantly against domestic production and consumption (based on the revised Draft Modalities of December 2008 article 131); however, based on G-33, there is no restriction on the manifestly negligible characteristic of the imported products that are going to be imposed with SSM.

Based on the article 140 of the same draft, volume-based SSM can be implemented for maximum 12 months from the initial request of safeguard implementation, unless if the product is seasonal; if that is the case, then SSM is enacted for six months or during the applied seasonal period. For the next SSM implementation of the same product, the average of three-year import volume will use base imports in the new year, unless if the base import of the new year is smaller than the previous implementation year. After the enactment of two periods of SSM on the same product, the product is not allowed to enact SSM for the next two periods.

Price-based SSM begins with the determination of average import price level during the previous three years as the starting point of reference price. The trigger for price-based SSM is price decline by 15 percent or more (85% or less than reference price). The tariff enacted has no more than 85 percent gap between import price and trigger price.

Previous Studies

Univariate Study

The univariate study aims to analyze price transmission starting from the Law of One Price (LOP) theory. This theory is related to shock influence on domestic market, which becomes the basis of study conducted by Minot (2011), Conforti (2004), and Abbot, Wu, and Tarp (2011) that examine the transmission of world price to domestic price. The shock study in the form of price changes has then evolved with ECM method which is usually used to study price transmission.

Price transmission is a term used to describe the impact of price from one market to another. Price transmission is usually measured in transmission elasticity, in which the price change percentage in one market will change the price in other market by one percent.

Price transmission analysis can be started with a simple case sample where market is the perfect competition market, with characteristics (assumption) as follows:

1. Commodity goods are homogenous, there are no variation in quality
2. There are a lot of small sellers and buyers, so there is no one who has market power
3. Sellers and buyers have perfect information
4. Buying and selling occur instantaneously
5. There is no tax in buying and selling or restrictive policy in trade
6. There are no transportation and transaction costs

Thus, it can be ascertained that in this case spatial arbitrage guarantees that commodity prices will be the same for all market. If the price in Market A (P_A) is higher than the price in Market B (P_B), then it will be advantageous to distribute goods from Market B to Market A until the price back into balance. Price transmission in this case can be considered perfect because price changes in one

market will be directly reflected by changes in other market, or in other words the value of transmission elasticity is one. This condition is Law of One Price (LOP).

According to Conforti (2004), there are four groups of factors that contribute to the deviation of domestic prices from the world prices, namely transportation cost & transaction cost, imperfect exchange rate pass-through, product differentiation, and domestic price policy. Furthermore, price transmission is violated if transportation cost and transaction cost are not stationary, fixed (not proportional against the traded good quantity), and multiplicative (not additive).

The initial approach to detect price transmission was by observing the correlation coefficient between two price series, or estimated by simple linear regression as practiced by Mundlak and Larson in 1992 (Mundlak and Larson in Abbot, Wu, and Tarp, 2011) which was later on modified by inserting lag as short term dynamics, resulting in the forming of time series approach that has been used regularly in better analysis model in the dynamic processes (Baffes and Gardner in Abbot, Wu, and Tarp, 2011). Error Correction Model (ECM) was then developed to explain the short term dynamics and long term equilibrium simultaneously in one model.

Multivariate Study

The study on pass-through impacts, particularly on the influence of international trade on domestic market in general, is to calculate the exchange rate pass-through against the changes on price changes, either for import price, export price, or price rate in the domestic market measured by CPI/IHK; therefore, the term of pass-through is more familiar as ERPT (Exchange Rate Pass-Through). ERPT study using modern econometrics popularized by McCarthy (2000) uses restricted VAR model (SVAR) that has been widely used as reference in model formation of the impacts of pass-through against the domestic economy of certain countries; such as the study of Tandrayeen-Ragoobur and Chicooree (2013) for Mauritius, the study of Cozmanca and Manea (2002) for Romania, and the study of Hartati (2004) for Indonesia.

The study using SVAR was also conducted by Khan and Ahmed (2012) that examined the impact of world food price and world oil price shocks that are transmitted to macroeconomic variables, such as inflation rate, output, money balances, interest rates, and exchange rate for Pakistan. The study conducted used SVAR for monthly data of research periods from 1990M1 to 2011M7. As a result, the world oil price shock has negative impact on industrial production, appreciates exchange rate (REER), and has positive impact on inflation rate and interest rate. World food price shock increases industrial output, interest rate, and inflation rate, but there is variation in the interest rate, in that bigger increase occurs during food price shock compared to that during oil price shock. GIRF shows that REER is the main source of economic distortion besides both shocks and GFEVD strengthens this. The result clearly shows that world food price and world oil price shocks affect output, short term interest rate, inflation rate, and REER significantly.

Import Surge Study

The study on import surges in terms of deviation (shock) of prices and import volume that later enters a certain country and causes changes in domestic market, according to FAO (2011), does not have unique approach due to the heterogeneity in sector and country. One of the studies on import surges is that of Wambua and Miencha (2007) that conducted a study on the import surges of livestock products in Kenya by using primary and secondary data.

Raff and Schmitt (2009) conducted a study on the impacts of trade liberalization where the pass-through from import is towards retail prices and its impacts on retail market policy. The study used trade model. The model shows the variation of sensitivity of retail prices against import prices and the pass-through of import prices in influencing retail price rates. Heterogeneity plays an important role in explaining the occurring pass-through degree; high pass-through on consumer price occurs during low fixed cost against import. Pass-through increase also occurs during weaken trade barriers, which cause retailers to import more due to a decrease in trade cost or because retail prices become more sensitive due to the new openness. The sensitivity of retail prices is also highly influenced by the characteristics of that retail sector. Different pass-through rate are also seen in different restrictions in trade; France, Belgium, and Japan protect domestic small retailers. With this restriction, inefficient retailers can remain active.

The study in Indonesia on import surges by using SVAR method has been conducted by Setiyanto (2011). His study implemented SVAR method in analyzing import surge and its factors as well as the pass-through of international trade for main food commodities and its relation to SSM formulation. In the period of September 1994 - October 2009, it has been proven that import surges occurred in rice, maize and soybean commodities in Indonesia, with different intensity and pressure rates. Rice and maize commodities have higher pressure and intensity in import surges compared to those of soybean. In that period, Indonesia was hit by numerous frequencies of import surges and the falling of rice prices in both nominal and real terms was more common compared to that of maize and soybean.

SSM formulation as the objective and final conclusion of Setiyanto's study (2011) contained eight important aspects. First, in terms of country eligibility, Indonesia is one of the countries eligible to obtain SSM facility and in accordance with the proposal of the G-33 that has agreed that all developing countries are entitled to receive SSM (country eligibility) and all products are feasible for SSM (product eligibility). Second, in terms of product eligibility, all products derived from rice, maize, and soybean commodities are eligible to obtain SSM facility, regardless whether they have high or low bound tariff rates. Third, the physical quantity of volume trigger if based on the influence of world price changes is 5 percent for rice, 10 percent for maize, and 9 percent for soybean above the average trends. Fourth, the physical quantity of price trigger based on nominal import price is 12 percent for rice, 14 percent for maize, and 14 percent for soybean below the average trends. In terms of real import price (2007 = 100), the physical quantity of price trigger is 10 percent for rice, 11 percent for maize, and 10 percent for soybean below the average trends. Fifth, based on volume trigger, SSM is enacted if an increase in import occurs due to world decline and import price maximum 5 percent for rice, 10 percent for maize, and 9 percent for soybean above the average trends.

Sixth, in the implementation of SSM, Indonesia should have the right to use one of the determining bases, world prices or import prices, and to choose one of the triggers, volume or price. In this case, price trigger indicator is considered relatively more appropriate because it can be quickly identified and has fast response. Seventh, the actions needed to be taken if import surges occur by implementing additional tariff or remedial tariff are: (1) if there is a decrease in producer prices due to a decline in world prices by one percent, then the additional tariffs needed are 11.16 percent for rice, 2.93 percent for maize, and 2.81 percent for soybean; (2) if there is a decrease in producer prices due to import prices by

one percent, then the additional tariffs needed are 10.68 percent for rice, 11.60 percent for maize, and 2.81 percent for soybean; and (3) if there is a decrease in producer prices due to the surge of import volume by one percent, then the additional tariffs needed are 14.48 percent for rice, 6.01 percent for maize, and 2.70 percent for soybean. Eighth, the duration of SSM implementation by using additional tariff is until the balance point occurs where both the world prices and import price shocks have no more influence which is four years and it can be implemented generally. The implementation duration of four years comes with additional anticipation time due to the difference in cycle length of the falling of world price against the specific condition of Indonesia's location of one year or twelve months.

Framework

This study started from the Indonesian openness approach which would then trigger a scenario in Figure 1. The scenario begins from the world price shock that is transmitted to the prices and volume of imported goods that have the potential to become an import surge. The occurrence frequency of import surges in Indonesia and their impacts on domestic prices in Indonesia are analyzed. From both analyses, it is expected that the formation of SSM protection for domestic prices can be done as a form of response of Indonesia's policy on import surges that has been approved by the WTO in this era of globalization.

Research Methods

Commodity Scope and Data Source

This study uses monthly time series data with the period of 2002-2012. The selection of this period is based on how active Indonesia is in the AFTA international trade that is predicted to trigger Indonesian openness further for import. The data of horticultural commodities to be examined in this study cover red onion, potato, and citrus commodities. Indonesia has the potential to produce domestic horticultural commodities, but in reality import for these commodities is still conducted in relatively high amount. Potatoes represent vegetable horticulture, citrus represent fruit horticulture, and red onions represent horticulture that contributes to inflation.

Figure 1 Research Framework

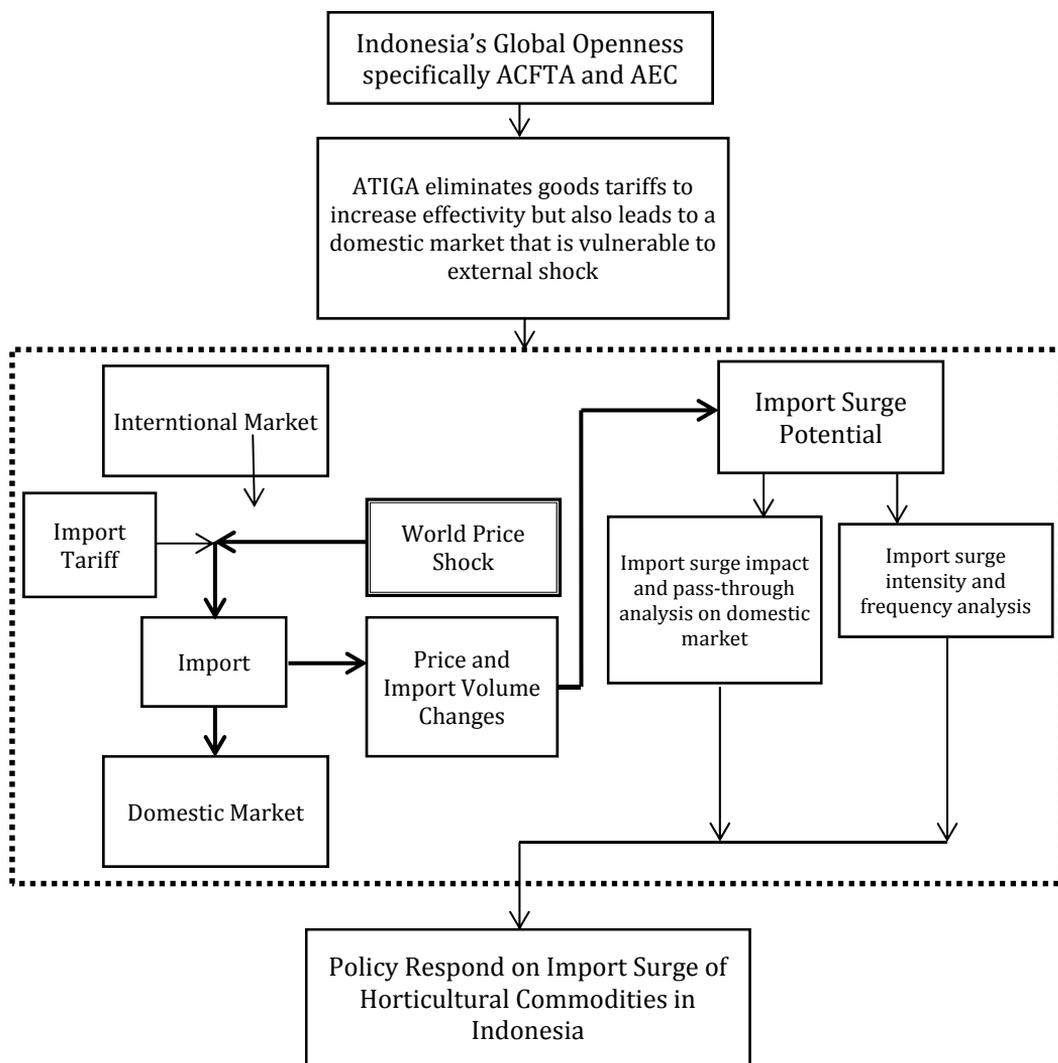


Table 1 Study Main Data

No	Variable	Unit	Symbol	Source
1	World Price	Rp/kg	PW	World Bank, USDA
2	Import Price	Rp/kg	PM	BPS
3	Import Volume	kg	QM	BPS
4	Consumer Price	Rp/kg	PC	BPS
5	Producer Price	Rp/kg	PF	BPS

Table 1 describes the main data to be used in the study model. Aside from the data on the table above, there are complementary secondary data from the Bank of Indonesia, FAO, the Ministry of Trade, and other relevant data provider agencies.

The Impacts of Import Surge Shock on Domestic Price Analysis

Based on Setiyanto (2011) that adapted McCarthy (2000), the model construction to analyze import surges is developed with three stages. First, supply and demand shocks of the world market can make import surges identifiable with the price changes of world commodities. Second, the existence of that shock will change prices and import volume, which then transmitted into the domestic market with consumer price changes of the domestic market. Third, consumer price changes in domestic market then trigger the supply and demand changes of the domestic market between production and consumption, resulting in the occurrence of producer price changes. These three stages are then formulated back into the basic model by using the following description:

$$PW_t = E_{t-n}(PW_t) + \varepsilon_{it}^{PW} \dots\dots\dots (1)$$

$$PM_t = E_{t-n}(PM_t) + z_{1i}\varepsilon_{it}^{PW} + \varepsilon_{it}^{PM} \dots\dots\dots (2)$$

$$QM_t = E_{t-n}(QM_t) + z_{1i}\varepsilon_{it}^{PW} + z_{2i}\varepsilon_{it}^{PM} + \varepsilon_{it}^{QM} \dots\dots\dots (3)$$

$$PC_t = E_{t-n}(PC_t) + z_{1i}\varepsilon_{it}^{PW} + z_{2i}\varepsilon_{it}^{PM} + z_{3i}\varepsilon_{it}^{QM} + \varepsilon_{it}^{PC} \dots\dots\dots (4)$$

$$PF_t = E_{t-n}(PF_t) + z_{1i}\varepsilon_{it}^{PW} + z_{2i}\varepsilon_{it}^{PM} + z_{3i}\varepsilon_{it}^{QM} + z_{4i}\varepsilon_{it}^{PC} + \varepsilon_{it}^{PF} \dots\dots\dots (5)$$

Where:

i and j = variable (j aka i)

T = time period (month)

N = lag distance

PW_t = world price at t time

PM_t = import price at t time

QM_t = import volume at t time

PC_t = consumer price at t time

PF_t = producer price at t time

$E_{t-n}(i)$ = lag variable i in the previous period

z_{ij} = variable restriction i on variable j

ε_{it}^j = variable j of vector orthogonal shocks caused by variable i at t time

SVAR model will be used when stationary data of the study are at the level; if the data are not stationary at the level but not co-integrated, then the VAR model of first difference will be used. Another option is to use VECM model if the data used in this study are not stationary at the level and co-integrated.

Impulse Response Function

Impulse Response Function (IRF) is a method used to determine the response of an endogenous variable to a shock given. This is because a shock variable, for example the i^{th} , does not only affect the i^{th} variable alone, but it is transmitted to all other endogenous variables through dynamic structure or lag structure. In other words, IRF measures the effect of a shock at a certain time to the endogenous variable innovation at that time and in the future (Paradise 2011).

In this study, the IRF is used to describe the impact of import surge shock of horticultural commodities in the form of increased import volume and decreased import prices on domestic prices.

Forecast Error Variance Decomposition

Firdaus (2011) describes the Forecast Error Variance Decomposition (FEVD) as a method conducted to see how changes in a variable indicated by the changes of the error variance are influenced by other variables. This method characterizes a dynamic structure in the VAR/VECM model. In this method, the strengths and weaknesses of each variable in affecting other variables in a long period of time can be seen.

FEVD details the variety of error forecasting into components that can be associated with each endogenous variable in the model. By calculating the squared percentage of error prediction of the next stage of k^{th} of a variable due to innovation in other variables, the amount of differences between the error variances before and after the shock emanating from within or from other variables can be seen. Through FEVD, it can be known with certainty the factors that affect the fluctuation of certain variables.

FEVD is used in this study to look at the contribution of import surges in the domestic price formation, which in general an increase in potato import occurs from year to year.

SSM Implementation

Volume-Based SSM can be triggered if the import volume increases to a certain level, specifically divided into three levels. To facilitate sharing, in this study Trigger A is used to describe an increase between 110 percent and 115 percent, Trigger B to describe the increase between 115 percent to 135 percent and Trigger C to describe the increase above 135 percent. Base import can be described by an average import volume from the last three years or in other words a three year moving average of the import volume of a particular commodity. Price-based SSM is triggered if the import price decreases by 15 percent or more compared to the reference price (85 percent of the reference price). The reference price is calculated based on the average monthly price of the last three years.

Discussion

Model Estimation

Based on the data stationary test, the data for the potato model, citrus model, and red onion model are mostly not stationary at the level, but stationary at the first difference. Based on the optimum lag test, the three optimum models are at the first lag. Based on the stability test, at the optimum lag of the first lag, the models are already stable. Based on Johansen Cointegration Test, all three models have cointegration. So for this study, the suitable model to be used on the three models of horticultural commodities is Vector Error Correction Model (VECM).

Volume-Based SSM Import Surge Detection

Volume-based SSM for potato commodity for the period of 2002-2012. In Table 2, import surges are detected seven times during the period of 2002 to 2012, where there are three years (2002, 2003, and 2008) in which the import volume can be considered as not surging up. However, in the other seven years, there are four of trigger B category and four of trigger C category that are triggered by the

increase in import volume compared to its base import; which means an increase in the import volume from year to year can be quite extreme.

Table 2 Volume Based SSM of Potato Commodity^a

Year	Import Volume (kg)	Base imports (kg) ^b	Change (%)	Trigger
2002	2 336 447	3 474 730	67.24	-
2003	2 404 294	3 194 763	75.26	-
2004	3 148 342	2 473 174	127.30	Trigger B
2005	5 031 392	2 629 694	191.33	Trigger C
2006	4 210 572	3 528 009	119.35	Trigger B
2007	5 559 153	4 130 102	134.60	Trigger B
2008	5 345 285	4 933 706	108.34	-
2009	11 727 189	5 038 337	232.76	Trigger C
2010	24 203 560	7 543 876	320.84	Trigger C
2011	78 418 905	13 758 678	569.96	Trigger C
2012	46 587 879	38 116 551	122.22	Trigger B

^aSource: BPS/Statistics Indonesia (2013), processed; ^bcalculated based on the three year moving average

Table 3 in general outlines the volume-based SSM for citrus commodity (orange). From 2005 to 2009, the import of citrus (orange) does not experience any import surges, with the change percentage change during 2005-2009 of only about 66 percent (in 2007) to 105 percent (in 2008), so it does not trigger the volume-based SSM at this period. But in 2002 to 2004 volume-based SSM of category C is triggered. In recent years, the import volume of citrus (orange) also triggers volume-based SSM trigger, although they are not as severe as in the early years of observation with the volume-based SSM of trigger B category.

Table 3 Volume Based SSM of Citrus Commodity (Orange)^a

Year	Import Volume (kg)	Base imports (kg) ^b	Change (%) ^c	Trigger
2002	21 514 168	13 070 547	164.60	Trigger C
2003	24 224 697	17 777 726	136.26	Trigger C
2004	50 928 160	19 373 265	262.88	Trigger C
2005	29 712 680	32 222 342	92.21	-
2006	26 151 317	34 955 179	74.81	-
2007	23 566 660	35 597 386	66.20	-
2008	28 024 440	26 476 886	105.84	-
2009	19 586 201	25 914 139	75.58	-
2010	31 344 357	23 725 767	132.11	Trigger B
2011	33 073 963	26 318 333	125.67	Trigger B
2012	32 491 885	28 001 507	116.04	Trigger B

Source: BPS/Statistics Indonesia (2013), processed; ^bcalculated based on the three year moving average

Then for citrus commodity, import surge detection is conducted for citrus commodity (mandarin) which is imported more by Indonesia as explained in Table 4. The import volume of mandarin citrus from 2002 to 2006 experiences insignificant volume increase between 30 thousand tonnes to 50 thousand tonnes, however volume-based SSM trigger has been triggered starting from 2005 because import volume has started to increase little by little. From 2006 to 2012, the increase in import volume can be clearly seen, so each year the SSM trigger is triggered to the highest level.

Table 4 Volume Based SSM of Citrus Commodity (Mandarin)^a

Year	Import Volume (kg)	Base imports (kg) ^b	Change (%) ^c	Trigger
2002	53 270 455	48 579 355	109.66	-
2003	31 278 854	57 538 674	54.36	-
2004	43 278 619	48 490 662	89.25	-
2005	53 658 734	42 609 309	125.93	Trigger B
2006	68 535 374	42 738 736	160.36	Trigger C
2007	89 125 467	55 157 576	161.58	Trigger C
2008	109 598 159	70 439 858	155.59	Trigger C
2009	188 956 251	89 086 333	212.10	Trigger C
2010	160 254 789	129 226 626	124.01	Trigger B
2011	182 345 871	152 936 400	119.23	Trigger B
2012	179 394 411	177 185 637	101.25	-

Source: BPS/Statistics Indonesia (2013), processed; ^bcalculated based on the three year moving average

For red onions, from 2002 to 2008, there is quite a high increase in the import volume of red onions starting from 32 thousand tonnes in 2002 to 128 thousand tonnes in 2008, but it can be said quite fluctuating because in 2009 the import volume decreases until half of it at 63 thousand tonnes and then sharply surges up in 2010 at 70 thousand tonnes and 156 thousand tonnes in 2012. The high increase during the period of 2002 to 2008 triggers volume-based SSM trigger for 5 years from 2004 to 2008, and it is triggered again in 2011. However in 2012 there is no import surge occurrence because the import of red onions is declining. For the three horticultural commodities, volume-based SSM is triggered most of the time for the three commodities above because of two things; first, it is because the import of those three commodities tends to increase from year to year, or it is because of the sudden import increase at a certain year compared to the previous years; therefore, import volume should be suppressed so as not to impact on the domestic economy, especially the price.

Table 5 Volume Based SSM of Red Onion Commodity

Year	Import Volume (kg)	Base imports (kg) ^a	Change (%)	Trigger
2002	32 928 783	46 810 813	70.34	-
2003	42 007 961	45 861 968	91.60	-
2004	48 927 071	40 961 025	119.45	Trigger B
2005	53 071 439	41 287 938	128.54	Trigger C
2006	78 462 101	48 002 157	163.46	Trigger C
2007	107 649 163	60 153 537	178.96	Trigger C
2008	128 015 473	79 727 568	160.57	Trigger C
2009	63 754 799	104 708 912	60.89	-
2010	70 572 756	99 806 478	70.71	-
2011	156 381 011	87 447 676	178.83	Trigger C
2012	95 156 067	96 902 855	98.20	-

Source: BPS/Statistics Indonesia (2013), processed; ^acalculated based on the three year moving average

Price-Based SSM Import Surge Detection

From 2002 to 2012, the import price of potatoes does not experience significant increases so it does not trigger price-based SSM trigger. It is different from citrus commodity, where the price fall in 2004 and 2005 triggers price-based SSM for both orange citrus and mandarin citrus imports. There is no import price decrease in red onion commodity that triggers price-based SSM despite a decline in 2012 which is close to the trigger where the import price in that year is 88 percent of the reference price. Based on the comparison of the two triggers for SSM, for the three observed horticultural commodities, the trigger is much more often triggered from a surge in the import volume. It also indicates that import prices have relatively more stable prices so the fluctuation of import volume does not affect the change in import prices themselves.

The Impacts of Import Surges on Domestic Prices

Impulse Response Function of the three VECM models can be used to describe the impacts of import surges on domestic price formation. Figure 2 shows the import surges in the form of increased import volume shocks in affecting consumer prices. Import volume shocks will lower consumer prices, although in general the response of the shocks is not great, but it gives permanent effect to the price reduction.

Figure 3 later on complements the description on the impacts of import surges in their influence on producer prices. The same occurs at the producer price formation where the decreased producer price response also occurs, with small response value but with permanent impact. So, it can be concluded that even though the impact is relatively small to the domestic price decrease, the import surge shocks can still influence domestic price formation permanently.

Figure 2 The IRF of Increased Import Volume on Consumer Price

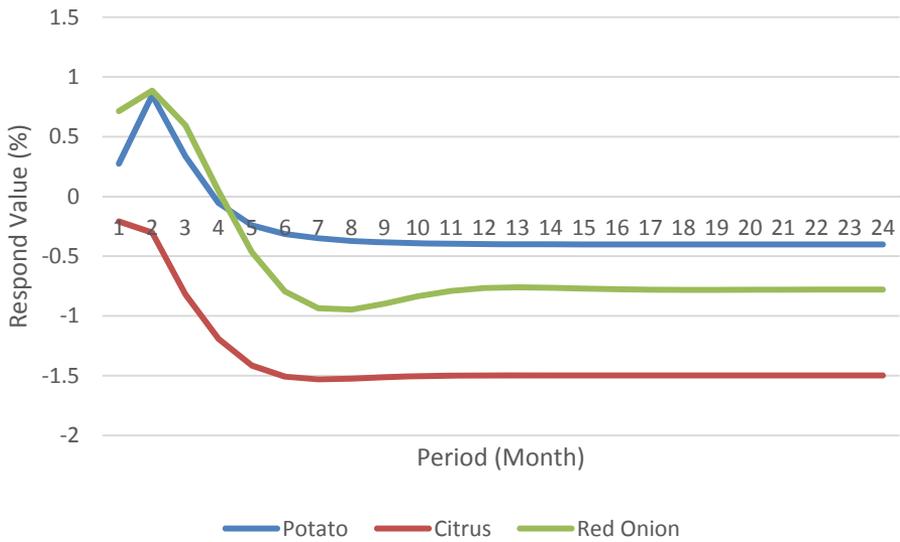
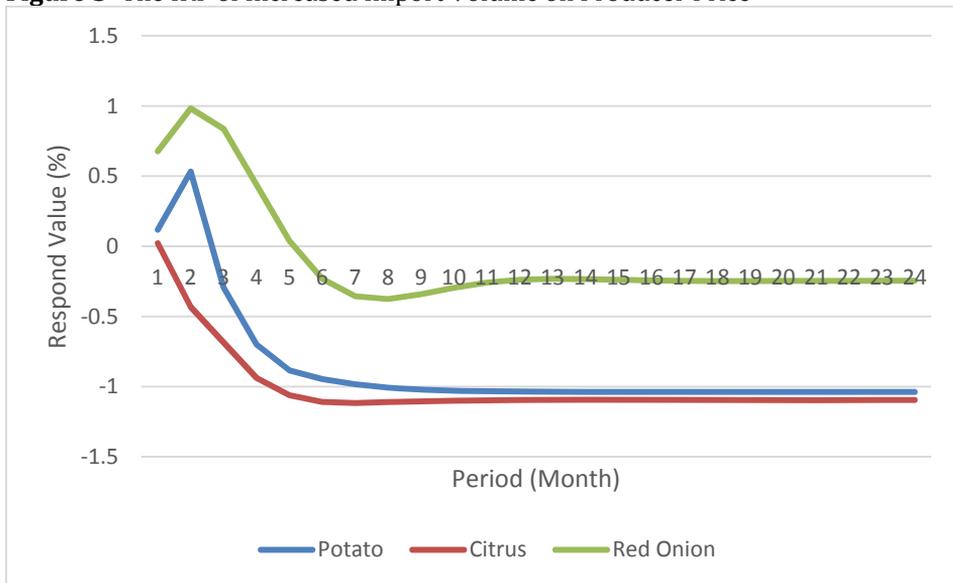


Figure 3 The IRF of Increased Import Volume on Producer Price



Basically, import volume shocks will affect domestic prices due to competition, as seen in general in red onion commodity. The competition with import prices will encourage a decrease in domestic prices in order to keep domestic goods sold.

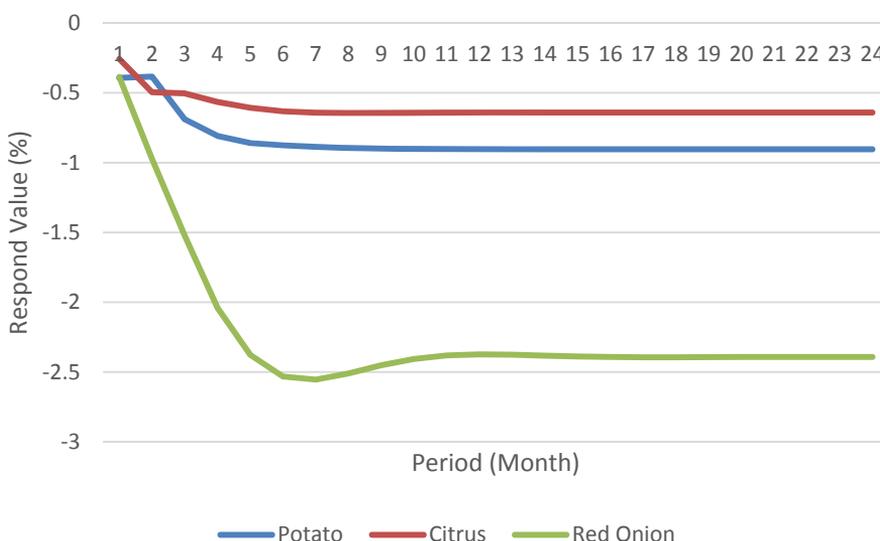
The impacts of import volume shock of potatoes on domestic products do cause a decrease in prices, but the price fall is not too big. This is because most of the potatoes imported by Indonesia is Atlantis type potatoes which are the type of

potatoes used in the industry². Atlantis potatoes enter the consumption market in the form of processed potatoes, especially French fries, so they do not directly influence Granula potatoes (vegetable potatoes) that are locally produced in Indonesia.

The biggest shock impact can be seen in citrus commodity; this is due to the increasing import volume, in that there are more imported citrus in the market leading to the competition with local citrus. Imported citrus enter Indonesia with relatively cheaper prices³, so the shock of import volume will push the price of domestic citrus so that they can compete with imported citrus, resulting in the price decrease of local citrus.

Import surges in the form of price fall also affect domestic prices and the impacts can be seen in Figure 4, in which for red onions the price fall shock is responded by relatively big price decrease, whereas for potatoes and citrus the decrease is not that significant. Just like import volume shocks, price fall shocks also give permanent impact on consumer price formation.

Figure 4 The IRF of Decreased Import Price on Consumer Price



Similar occurrence is also substantiated in the impacts on producer prices. In Figure 5, the response of relatively big decrease of producer prices also occurs in red onion commodity, but it is not too big for potatoes; and as for citrus, the price fall does not lead to producer price changes. The impacts of price fall on producer prices are also permanent.

The quite high decline against the shock of import price fall for red onion commodity can be explained as follow. Red onion commodity in Indonesia is a staple commodity in Indonesian daily cuisine cooking; which means that when people come to the market for consumption activities, they always buy red onions every day. This daily consumption tendency that makes the people keep buying red onions at any prices; meaning that if a shock occurs, either it is an increase or

² <http://www.tempo.co/read/news/2011/10/11/090360822/Indonesia-Hanya-Impor-Kentang-French-Fries>

³<http://finance.detik.com/read/2013/02/23/130046/2177721/4/>

decrease in import price, and then it enters the market and influences the price, immediately domestic price will respond to the shock with the same movement.

The other two observed commodities do not have such big impacts against import price shocks because their consumption can be alternated with other similar commodities, or people can even cancel on buying if the prices are too expensive. Thus, the sensitivity of the other two commodities is not as high as red onions.

In addition, import surges also have an impact in contributing to domestic price formation as seen in table 2. The domestic price formation of citrus is influenced by 15 to 18 percent of the citrus import volume; for red onion commodity, the import price of red onions influences domestic price formation at 7 to 10 percent; whereas for potato commodity, both import price and import volume affect less than six percent.

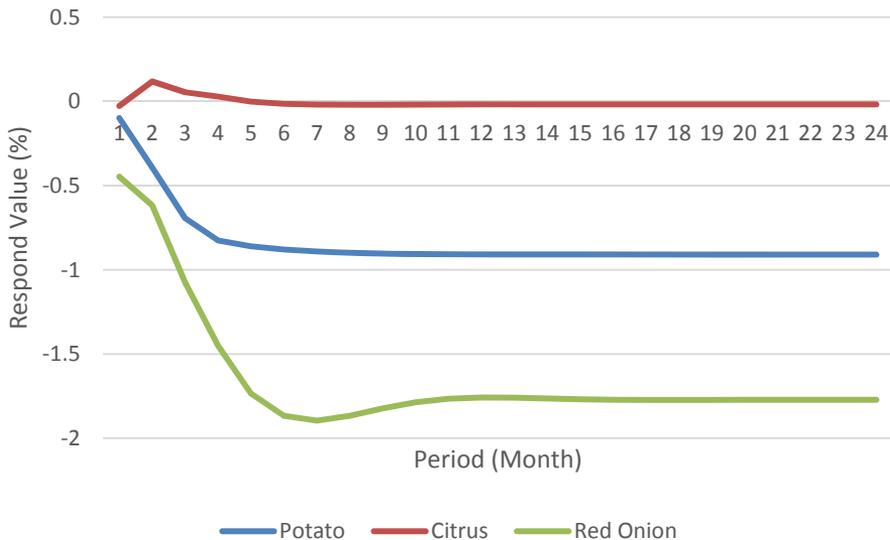
Table 2 FEVD of Domestic Price Formation

Year	Consumer Price				Producer Price			
	PM	QM	PC	PF	PM	QM	PC	PF
Potatoes								
1	4.47	1.12	90.75	1.02	4.44	5.04	30.07	57.35
2	4.76	1.05	89.69	1.05	4.76	5.86	30.37	55.00
3	4.85	1.03	89.36	1.06	4.86	6.11	30.46	54.27
4	4.89	1.02	89.20	1.06	4.91	6.23	30.51	53.92
5	4.92	1.01	89.11	1.07	4.94	6.31	30.53	53.71
Citrus								
1	3.23	15.78	77.10	1.38	0.02	12.17	2.95	84.65
2	3.40	17.70	74.65	1.45	0.01	13.83	2.60	83.45
3	3.46	18.30	73.88	1.48	0.01	14.38	2.49	83.06
4	3.48	18.60	73.50	1.49	0.01	14.65	2.43	82.86
5	3.50	18.78	73.27	1.50	0.01	14.81	2.40	82.74
Red Onions								
1	7.87	0.99	90.60	0.10	8.41	0.83	61.16	29.02
2	8.63	0.99	90.10	0.05	9.40	0.51	61.85	27.91
3	8.88	0.99	89.93	0.03	9.73	0.41	62.08	27.53
4	9.00	0.99	89.84	0.02	9.90	0.36	62.19	27.34
5	9.08	0.99	89.79	0.02	10.00	0.32	62.26	27.23

Note: PM = import price; QM = import volume; PC = consumer price; PF = producer price

Although the contribution of domestic price formation of imports for some commodities is no more than ten percent, it can be observed along with the increase of FEVD year that an increase in the contribution of imports in domestic price formation occurs. In the end, the impact of the import surges from 2002 to 2012 can be seen from their ability to permanently affect domestic prices and the increasing influence of imports in domestic price formation.

Figure 5 The IRF of Decreased Import Price on Producer Price



SSM Remedy

Based on the review of volume-based SSM, with the calculation of tariff increase (based on the tariff data of WTO) for 2013, the applied tariff of Indonesia for potatoes is zero percent (without tariff) with 50% bound tariff. If volume-based SSM is triggered based on three criteria, then the calculation of tariff increase are as follows:

1. If trigger A is triggered (volume increase of 10-15 percent), resulting in the application of volume-based SSM for potato commodity, then in 2013 Indonesia can increase the tariff for potato commodity up to maximum 25 percent.
2. If trigger B is triggered (volume increase of 15-35 percent), resulting in the application of volume-based SSM for potato commodity, then in 2013 Indonesia can increase the tariff for potato commodity up to maximum 40 percent.
3. If trigger C is triggered (increase > 35 percent), resulting in the application of volume-based SSM for potato commodity, then in 2013 Indonesia can increase the tariff for potato commodity up to maximum 50 percent.

The above SSM calculation is a policy recommendation that is still appropriate with the current position of Indonesia which cannot be separated from the international trade supervised by the WTO. SSM is the form of WTO’s protection for developing countries since WTO still desires the absolute abolition of trade tariffs, but on the other hand WTO implement protection in the form of tariff increase to protect domestic producers from import onslaught.

Conclusions and Recommendations

Conclusions

1. Based on the import surge detection through SSM trigger, the volume-based SSM is triggered in potatoes, citrus, and red onions in a large majority of years of observation. This means that the increase in volume from 2000 to 2012

can be regarded as import surges of horticultural commodities. But on the other hand, the price-based SSM is only triggered for citrus commodity in 2004 and 2005; hence an increase in the import volume is not followed by a decline in import prices.

2. The impacts of horticultural import surges, in general, affect price decline and are permanent. Import surge also slightly contributes to the formation of domestic prices but its contribution increases with the passage of years. In particular, the domestic prices of potato commodity are relatively unaffected by their import commodity, the domestic prices of red onion commodity are more affected by their import commodity's prices, and the domestic prices of citrus commodity are influenced more by their import commodity volume.

Recommendations

1. The substantiation of import surges and SSM implementation should be the main agenda in order to reduce imports despite the elimination of import tariffs on almost all commodities because this policy framework has been proposed by the WTO.
2. The government should also encourage domestic productivity to meet domestic needs since import dependency may lead to a situation where domestic economy is increasingly influenced by factors from abroad.

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