The impact of import quota and reference price policies on the shallot price and supply in North Sumatera

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Abstract. The government policy to limiting shallot import based on quota has an impact on the soaring of domestic shallot price triggering inflation. In order to reduce the inflation rate, the government has changed the basis consideration for import recommendation of shallot horticultural products to be based on a reference price determined by the Minister of Trade. This study analysed the impact of these import quota and reference price policies on the shallot price and supply in North Sumatera. In order to analyse the impact of these government policies, the time series data were analysed using the Compare Means Test, namely the Independent Samples t-Test, so that the differences between before and after the implementation of policies could be estimated. The results showed that the import quota and the reference price policies were not effective in increasing the shallot price at the producer level, but they were effective in decreasing the shallot price at the consumer level, improving the imported shallot price at the consumer level, and also developing the production, harvest area, and productivity of shallot farming.

1. Introduction

Free trade will be able to maximize world output and profit of each country involved. However, the reality shows that almost every country still implements various policies in the form of trade barriers. Trade policy is an instrument that is applied to improve national welfare. Trade policies in international trade usually take the form of trade barriers related to the trade interests of each country [1]. In the era of the ASEAN Economic Community (AEC), each ASEAN country is required to remove trade barriers in the form of tariffs to progress towards an unlimited economy. Indonesia is also required to follow these changes. After the Indonesian government agreed to a tariff elimination agreement with other countries in the Southeast Asia region, the impact on national prices and welfare began to be felt.

Shallot import is usually carried out by the Indonesian government to fill the national shallot supply shortage. In order to stabilize price and protect the welfare of producers and consumers of shallot from the impact of tariff elimination, the Indonesian government has adopted international trade policy instruments, namely non-tariff trade barriers in the form of quota, technical regulations from the Agricultural Quarantine Agency, and tax or subsidy incentive. If the government wants to decrease domestic price, the government will open the import tap, and vice versa if the government wants price increase, then the government will close the import tap.
The Government of Indonesia has implemented a policy of import restriction based on quota on the import of shallot regulated in Minister of Agriculture Regulation No. 60/Permentan/OT.140/9/2012 [2]. This policy has an impact on the price of domestic shallot surging up so as triggering inflation. To reduce the level of inflation, the government then changes the basis for consideration of recommendations for import of shallot horticultural products through Minister of Agriculture Regulation No. 86/Permentan/OT.140/8/2013 to be based on the reference price provision of the Minister of Trade [3]. If the price of shallot is above the reference price stipulated by the Minister of Trade Regulation, then the government can open the import tap, and vice versa if the price of shallot is above the reference price, then the government can close the import tap.

However, the fact shows that the government policies so far have not been effective in stabilizing the price of shallot and ensuring the welfare of producers and consumers of shallot. For horticultural commodities that affect inflation such as chilli and shallot, government policies often pay more attention to reducing prices to prevent inflation. A fall in price will increase consumers’ welfare, while producers’ welfare will decrease [4-6].

Belawan Harbour in North Sumatera Province is one of the official ports, which is the entry point for imported shallot to Indonesia [7]. Moreover, North Sumatera Province is one of the regions with the largest consumption of shallot in Indonesia [8], so naturally the impact of the import quota and reference price policies will be directly felt by the people of North Sumatera. This study analysed the impact of import quota and reference price policies on the price and supply of shallot in North Sumatera.

2. Methods
The research area in North Sumatera Province was determined purposively in accordance with the research objectives (Purposive Method). North Sumatera Province was chosen because ports in North Sumatera Province often became the entry point for imported shallot [7], so the import quota and reference price policies would have a direct impact on the price and supply of shallot in North Sumatera. The data used in the analysis were secondary data obtained from relevant agencies, including the Department of Agriculture and the Central Bureau of Statistics (BPS-Statistics). The impact of import quota and reference price policies on the price and supply of shallot in North Sumatera was estimated by analysing monthly time series data from January 2010 to December 2016.

To estimate the impact of the import quota and reference price policies on the price and supply of shallot in North Sumatera, the data were analysed using the Compare Means Test, namely the Independent Sample t-Test. The difference between before and after the implemented import quota and reference price policies could be estimated with Compare Means Test [9,10]. The hypothesis tested by the Compare Means Test was:
- $H_0$: There is an insignificant difference in the means of variable between before and after the import quota and reference price policies are enacted.
- $H_1$: There is a significant difference in the means of variable between before and after the import quota and reference price policies are enacted.

The test criteria were at 95% confidence level ($\alpha 5\%$), with some conditions, those were:
- If the probability value $\leq \alpha 5\%$ or 0.05, $H_0$ is rejected and $H_1$ is accepted.
- If the probability value $> \alpha 5\%$ or 0.05, $H_0$ is accepted and $H_1$ is rejected.

3. Results and discussion
The policies of limiting the import of commodities will have an impact on the reduced supply of these commodities in the domestic market. The reduced number of goods on the market will have an impact on the increasing of price. It will affect the welfare of consumers and producers. Consumers will decrease their welfare (consumers surplus decrease), otherwise producers will increase their welfare (producers surplus increase) [4]. Developing price will encourage producer farmers to increase production. Increased production can be done by increasing the use of production inputs, such as
gaining the area of cultivation, the use of seeds, the use of fertilizers, the use of labour for plant maintenance, and the use of technology.

3.1. The impact of import quota and reference price policies on shallot producer price

Table 1 showed the estimated results of the impact of import quota and reference price policies on shallot producer price in North Sumatera.

| Group Statistics | Policy | N  | Mean        | Std. Deviation | Std. Error Mean |
|------------------|--------|----|-------------|----------------|-----------------|
| North Sumatera Shallot Producer Price (IDR) | Before | 24 | 18430.8333 | 7661.70130 | 1563.93823 |
|                   | After  | 21 | 16857.1429 | 2246.23494 | 490.16865 |
|                   | After (subtracted with inflation value) | 21 | 14630.3143 | 0.00000 | 0.00000 |

The difference in the price before the policies subtracted with an inflation value

| t-Test for Mean Difference | T   | df  | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference |
|----------------------------|-----|-----|-----------------|-----------------|-----------------------|----------------------------------------|
|                            |     |     |                 |                 |                       | Lower | Upper |
| North Sumatera Shallot Producer Price (IDR) | 0.960 | 27.436 | 0.345 | 1573.69048 | 1638.95335 | -1786.66444 | 4934.04540 |

The difference in the price after the policies subtracted with an inflation value

| t-Test for Mean Difference | T   | df  | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference |
|----------------------------|-----|-----|-----------------|-----------------|-----------------------|----------------------------------------|
|                            |     |     |                 |                 |                       | Lower | Upper |
| North Sumatera Shallot Producer Price (IDR) | 2.430 | 23.000 | 0.023 | 3800.51903 | 1563.93823 | 565.26631 | 7035.77175 |

Table 1 showed the t-Test probability of 0.345 (> α 5% or 0.05) in case the difference in the price before the policies subtracted with an inflation value, so H₀ was accepted and H₁ was rejected. It means that there was an insignificant decrease in the mean of North Sumatera shallot producer price after the import quota and reference price policies were imposed. The mean of North Sumatera shallot producer price only decreased by 1573.6905 IDR or 8.54%. However, in case the difference in the price after the policies subtracted with an inflation value, Table 1 illustrated the t-Test probability of 0.023 (< α 5% or 0.05), so H₀ was rejected and H₁ was accepted. It means that the applying of the import quota and reference price policies demonstrated a significant decrease in the mean of North Sumatera shallot producer price. The mean of North Sumatera shallot producer price decreased by 3800.5190 IDR or 20.62%.

The results of this analysis indicate that the import quota and reference price policies are able to reduce the shallot producer price in North Sumatera. In fact, the quantity limitation of shallot import should have increased the price of domestic shallot producers, but the opposite happened. There are many factors causing this situation. First, there are a number of factors influencing the shallot producer price besides the amount of imported shallot. Second, although imported tap has been closed since the second quarter of 2014, in reality imported shallot is always available in the market. Observation on markets in all regions in North Sumatera showed that imported shallot remains available even imported tap has been closed since the second quarter of 2014. It is suspected that
imported shallot entered the market illegally. The fall in the price of shallot at the farm level results in a decrease in the level of income and welfare of farmers. The import quota and reference price policies are not effective in increasing the price and welfare of shallot farmers because imported shallot remains available and the price of shallot at the farm level remains down.

3.2 The impact of import quota and reference price policies on shallot consumer price

Table 2 showed the estimated results of the impact of import quota and reference price policies on shallot consumer price in North Sumatera. Table 2 illustrated the t-Test probability of 0.000 (< α 5% or 0.05) in case the difference in the price before the policies subtracted with an inflation value, so H₀ was rejected and H₁ was accepted. It means that there was a significant decrease in the mean of North Sumatera shallot consumer price after the import quota and reference price policies were enacted. The mean of domestic shallot consumer price decreased by 7177.1970 IDR or 22.57%.

| Group Statistics                                      | Policy | N  | Mean        | Std. Deviation | Std. Error Mean |
|-------------------------------------------------------|--------|----|-------------|----------------|-----------------|
| North Sumatera Shallot Wholesale Price (IDR) Before   | 36     | 31806.1667 | 7591.45291   | 1265.24215     |
| After                                                 | 33     | 24628.9697 | 4325.67768   | 753.00383      |
| After                                                 | 33     | 19804.1545 | 0.00000      | 0.00000        |
| Before                                                | 36     | 17769.7500 | 8857.40551   | 1476.23425     |
| After                                                 | 33     | 25800.8788 | 4945.58236   | 860.91539      |
| After                                                 | 33     | 20754.7800 | 0.00000      | 0.00000        |

| The difference in the price before the policies subtracted with an inflation value |
|---------------------------------|------------|----------------|----------------|----------------|----------------|
| T                               | df         | Sig. (2-tailed)| Mean Difference| Std. Error Difference| 95% Confidence Interval of the Difference |
| North Sumatera Shallot Wholesale Price (IDR)            | 4.875      | 56.440         | 0.000          | 1472.36289     | 4228.20732 10126.18662 |
| Imported Shallot Wholesale Price (IDR)                  | -4.700     | 55.797         | 0.000          | -11454.80302   | -4607.45456  |

| The difference in the price after the policies subtracted with an inflation value |
|---------------------------------|------------|----------------|----------------|----------------|----------------|
| T                               | df         | Sig. (2-tailed)| Mean Difference| Std. Error Difference| 95% Confidence Interval of the Difference |
| North Sumatera Shallot Wholesale Price (IDR)            | 9.486      | 35.000         | 0.000          | 12002.01217    | 9433.43405 14570.59029 |
| Imported Shallot Wholesale Price (IDR)                  | -2.022     | 35.000         | 0.051          | -5981.94486    | 11.88486    |
Similarly, in case the difference in the price after the policies subtracted with an inflation value, Table 2 showed the t-Test probability of 0.000 (< α 5% or 0.05), so H_0 was rejected and H_1 was accepted. It means that after applying the policies, there was a significant decrease in the mean of North Sumatera shallot consumer price. The mean of domestic shallot consumer price decreased by 12002.0122 IDR or 37.73%.

The results of this analysis indicate that just like the shallot producer price in North Sumatera, the import quota and reference price policies are able to reduce consumer price for domestic shallot in North Sumatera. The decline in the price of shallot at the consumer level results in increased purchasing power and consumers’ welfare. The import quota and reference price policies are effective in reducing the price and improving the welfare of domestic shallot consumers, but they will be more effective if imported shallot is completely unavailable on the market.

On the imported shallot consumer price in North Sumatera, Table 2 demonstrated the probability of t-Test of 0.000 (< α 5% or 0.05) in case the difference in the price before the policies subtracted with an inflation value, so H_0 was rejected and H_1 was accepted. It means that there was a significant increase in the mean of imported shallot consumer price after the policies were applied. The mean of imported shallot consumer price increased by 8031.1288 IDR or 45.20%. However, Table 2 also illustrated the t-Test probability of 0.051 (> α 5% or 0.05) in case the difference in the price after the policies subtracted with an inflation value, so H_0 was accepted and H_1 was rejected. It means that after the import quota and reference price policies were applied, there was an insignificant increase in the mean of imported shallot consumer price after the import quota and reference price policies were applied. The mean of imported shallot consumer price only increased by 2985.0300 IDR or 16.80%.

The results of this analysis indicate that the import quota and reference price policies are able to increase the imported shallot consumer price in North Sumatera. The rising price of imported shallot at the consumer level results in decreased purchasing power and consumers’ welfare, so it is hoped that consumers will be reluctant to buy imported shallot and switch to domestic shallot. The import quota and reference price policies are quite effective in suppressing the amount of imported shallot in the market, thereby increasing consumer price for imported shallot, but not effective enough in eliminating the availability of imported shallot on the market.

3.3. The impact of import quota and reference price policies on production, harvest area, and cultivation area

Table 3 demonstrated the estimated results of the impact of import quota and reference price policies on production, harvest area, and cultivation area in North Sumatera. Table 3 showed the t-Test probability of 0.046 (< α 5% or 0.05) in case the shallot production, so H_0 was rejected and H_1 was accepted. It means that there was a significant increase in the mean of shallot production after the implementation of the import quota and reference price policies. The mean of shallot production increased by 148.1111 tons or 27.04%. In case the shallot harvest area, Table 3 also showed the probability of t-Test of 0.010 (< α 5% or 0.05), so H_0 was rejected and H_1 was accepted. It means that there was a noticeable increase in the mean of shallot harvest area after the implementation of the import quota and reference price policies. The mean of shallot harvest area increased by 19.1667 Ha or 27.32%. The increased percentage is almost the same as the increased percentage in production. The import quota and reference price policies are quite effective in stimulating farmers to develop production and harvest area.

On the cultivation area of shallot, Table 3 showed the probability of t-Test of 0.677 (> α 5% or 0.05), so that H_0 was accepted and H_1 was rejected. It means that there was an insignificant decrease in the mean of shallot cultivation area after the implementation of the import quota and reference price policies. The mean of shallot cultivation area actually decreased by 5.9722 Ha or 5.51%. It shows that although the cultivation area is fixed and even tends to decrease, the import quota and reference price policies are actually quite effective in stimulating farmers to increase the productivity of their shallot farming, so that production continues to increase.
Table 3. The impact of import quota and reference price policies on shallot production, harvest area, and cultivation area

| Group Statistics | Policy       | N   | Mean      | Std. Deviation | Std. Error Mean |
|------------------|--------------|-----|-----------|----------------|-----------------|
| Shallot Production of North Sumatera (ton) | Before       | 12  | 547.6667  | 77.45067       | 22.35808        |
|                  | After        | 9   | 695.7778  | 183.10023      | 61.03341        |
| Shallot Harvest Area of North Sumatera (ha) | Before       | 12  | 70.1667   | 8.91203        | 2.57268         |
|                  | After        | 9   | 89.3333   | 16.83746       | 5.61249         |
| Shallot Cultivation Area of North Sumatera (ha) | Before       | 12  | 108.4167  | 33.24143       | 9.59597         |
|                  | After        | 9   | 102.4444  | 31.00448       | 10.33483        |

The difference of shallot production, harvest area, and cultivation area

| Policy Statistics          | T   | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | Lower | Upper |
|----------------------------|-----|----|-----------------|-----------------|-----------------------|------------------------------------------|-------|-------|
| Shallot production in North Sumatera (ton) | -2.279 | 10.158 | 0.046 | -148.11111 | 64.99970 | -292.63445 | -3.58778 |
| Shallot harvest area in North Sumatera (ha) | -3.104 | 11.351 | 0.010 | -19.16667 | 6.17403 | -32.70458 | -5.62875 |
| Shallot cultivation area in North Sumatera (ha) | 0.423 | 18.007 | 0.677 | 5.97222 | 14.10288 | -23.65606 | 35.60051 |

4. Conclusions
The import quota and reference price policies are not effective in increasing the price and welfare of shallot farmers because imported shallot remains available and the price of shallot at the farm level continues to fall. The import quota and reference price policies are effective in reducing price and improving the welfare of consumers of domestic shallot, but it will be even more effective if imported shallot is not available in the market. The import quota and reference price policies are quite effective in reducing the amount of imported shallot in the market, to induce the increasing of imported shallot price. However, it is not effective enough in eliminating the availability of imported shallot on the market. Import quota and reference price policies are quite effective in stimulating farmers to increase production and harvest area. The import quota and reference price policies are quite effective in stimulating farmers to increase their shallot farming productivity.

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