

ANALYSIS OF IMPORT DEPENDENCY AND TRADE CONCENTRATION OF INDONESIA'S GARLIC

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ABSTRACT

This research objectives are as follows: (1) Analyze the import dependency and the trade openness and (2) analyze the geographic trade concentration of garlic imports of Indonesia. This study used 2014–2018 annual time series data for HS 070320. The results shows that import dependency of Indonesia for garlic is very high. Imported garlic is about 95.57% of domestic demands. However, the trade openness for garlic is very low, with import expenditure is about only 6.17e-5 of Indonesia's GDP. Indonesian garlic imports are highly concentrated geographically; 99.35% of Indonesia's garlic imports came from China. This shows that Indonesia is very dependent on China's garlic.

**Keywords:** Import dependency, trade openness, trade concentration.

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INTRODUCTION

Garlic is important foodstuff for Indonesian people as a cooking spice. Indonesian consumes garlic either directly by consumers, or indirectly through the industry. Indonesia is one of the largest garlic consumers in the world (Yovirizka, 2020). The consumption of Indonesian garlic is increasing, along with the grow of population and income (Hariwibowo *et al.*, 2014; and Hadianto *et al.*, 2019).

However, Indonesia's garlic production unable fulfill domestic demands (Sakinah *et al.*, 2019). During 2014–2018, Indonesia's garlic production was only 4.38% of domestic demands. The growth of Indonesian garlic consumption and production is shown in Fig. 1.

Import is an alternative to cover the gap between domestic production and consumption (Benny, 2013). Due of that, the import volume of garlic is increasing. (Pusdatin Kementan, 2019). During 2014–2018, Indonesia's imports volume of garlic increased by 5,07% (Ditunjukkan Pada Gambar 1).

Theoretically, import caused by excess demand in importer countries. Import allows the consumption of more goods than produced in the country, with the presence of more products from other countries (Astuti and Ayuningtyas, 2018). Import also causes prices in importer countries fall to match world prices (Rachmadhan *et al.*, 2020).

The import dependency of food shows the role of import in fulfill domestic demands in the food balance and become an indicator of food self-sufficiency and food security. Indonesia's import dependency on food commodities can endanger national food security (Farid and Sukesu, 2011).

The import dependency burden the country's economy. The proportion of import expenditure to the country's GDP is shown by the trade openness (Atmadji, 2004; and Tian *et al.*, 2011). The trade openness shows the percentage of import financing to GDP. Practically, the trade openness grow along with import dependency of a country.

The import characteristics of a country are also described by the geographic trade concentration. It is important to note, the greater of the geographic trade concentration, so the greater import dependency of a country (Atmadji, 2004; Brata and Yasa, 2015).

Empirical studies of Indonesia's import dependency have been carried out from various perspectives and commodities, especially on food

commodities. However, an empirical study of the Indonesia's import dependency of garlic has not been carried out. The degree of import dependency and trade openness of Indonesia's garlic import is still unknown.

This research objectives are as follows: (1) Analyze the import dependency and the trade openness and (2) analyze the geographic trade concentration of Indonesia's garlic import. The scope of research is garlic products of HS 070320 (garlic, fresh, or frozen).

METHODS

This study used annual time series data of Indonesia's consumption, import and export of garlic HS code 070320 (garlic, fresh, or frozen), and Indonesia's gross domestic product (GDP) of 2014–2018. The data were obtained from the Ministry of Agriculture Republic Indonesia, World Bank, and International Trade Center (ITC) with further data processing. The analysis method is as follows:

Import dependency analysis

The import dependency ratio is based on Indonesia's total import, export, and consumption volume of garlic (Pujitiasih *et al.*, 2014; and Rachman *et al.*, 2003), with following formula:

$$\text{Import dependency ratio} = \frac{\text{Import volume of garlic} - \text{Export volume of garlic}}{\text{Domestic consumption volume of garlic}} \times 100\%$$

Trade openness analysis

The trade openness shows the percentage of garlic import financing to GDP (Atmadji, 2004; Brata and Yasa, 2015), with following formula:

$$\text{Trade openness} = \frac{\text{Import value of garlic}}{\text{Gross domestic product}} \times 100\%$$

Geographic trade concentration index analysis

Geographic trade concentration index is used to analyze the concentration of Indonesia's garlic import based on the four largest origin countries. The calculation is based on the following formula (Atmadji, 2004; Brata and Yasa, 2015):

$$\text{Geographic trade concentration index} = 100 \sqrt{\sum_{i=1}^n \left( \frac{M_i}{M_t} \right)^2}$$

Where,

$M_i$  = import volume by each origin countries

$M_t$  = total import volume of garlic

$n$  = total origin countries (four largest origin countries)

The result value will be compared with the standard trade concentration value. The standard value are obtained by: (1) Determine the total origin countries ( $n$ ); (2) the maximum value is  $\frac{100}{\sqrt{n}}$  100, while the smallest possible is ; and (3) the standard DKG value is the median between the largest and the smallest DKG values. So that with four countries ( $n$ ), the smallest value is 50 and the standard value is 75.

If the result value is closer to the maximum value, then imports are relatively concentrated geographically. Conversely, if the result value is close to the lowest possible value, then imports are relatively geographically distributed. Thus, the standard DKG value is used as a separator indicator whether imports are relatively concentrated or geographically distributed (Atmadji, 2004; and Michaely, 1958).

## RESULTS AND DISCUSSION

### Indonesia's import dependency and trade openness of garlic

The result of Indonesia's garlic import dependency and trade openness analysis shows how dependent Indonesia for imported garlic and the proportion of Indonesia's expenditure for importing garlic every year, as shown in Table 1.

Indonesia's import dependency on garlic is very high. During 2014–2018, Indonesia's import dependency was about of 92.95–96.72,

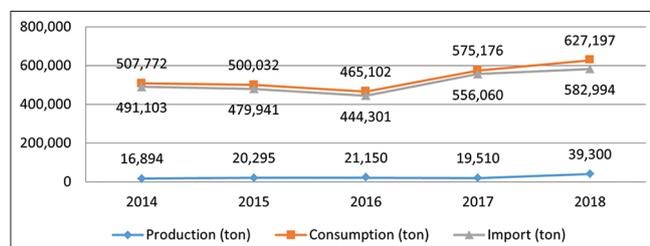


Fig. 1. Indonesia's garlic production, consumption, and import  
Source: Pusdatin Kementan (2019), ITC (2020)

Table 1: Indonesia's import dependency and trade openness of garlic

Year	Import dependency	Trade openness
2014	96.72	4.85e-5
2015	95.98	5.13e-5
2016	95.53	6.16e-5
2017	96.68	7.88e-5
2018	92.95	6.81e-5
Average	95.57	6.17e-5

Table 2: Indonesia's import and geographic trade concentration of garlic

Source	Import (ton)					
	2014	2015	2016	2017	2018	Average
China	488.799	479.498	441.232	547.528	580.845	507.580
India	0	377	3.069	8.112	464	2.404
Taiwan, Chinese	1.958	0	0	138	1.685	756
Vietnam	290	0	0	0	0	58
Trade concentration	99,12	99,82	98,63	96,98	99,27	98,78

with an average of 95.57. This shows that 95.57% of Indonesia's garlic demands are fulfilled from import.

Indonesia's import volume of garlic (HS 070320) is averaged 510,080 tonnes per year, with an average domestic consumption of 535,056 tons per year. However, the domestic consumption of households and industries specifically are unknown.

In contrast condition to import dependency, the trade openness of Indonesia's garlic import is very low. During 2014–2018, Indonesia's trade openness averaged 6.17e-5. This results shows that Indonesia only spend 6.17e-5% of the GDP for importing garlic.

Although the large population in Indonesia causes import dependency on food face various problems; theoretically, the high import dependency on imported food is not a problem as long as: (1) There is enough foreign exchange in the country; (2) technically and economically, it is more profitable to import than to produce domestically; and (3) guaranteed availability of food supply in the international market (Pujitiasih *et al.*, 2014; and Rachman *et al.*, 2003). Due of that, Indonesia's garlic import allowed to continue. The result shows that garlic import financing is very low. In addition, domestic production of garlic is not sufficient for domestic demands (Fig. 1).

### Indonesia's geographic trade concentration of garlic

The geographic trade concentration is used to see the import concentration based on the import origin countries. The analysis results of the Indonesia's geographic trade concentration on garlic are shown in Table 2.

The result shows that Indonesia's garlic import is geographically concentrated. The degree of geographic trade concentration of Indonesia's garlic imports during 2014–2018 was averaged 98.78. The largest volume of Indonesia's garlic import during 2014–2018 was from China, it is about 99.35% of total import of Indonesia's garlic (ITC 2020). Geographically, Indonesia's garlic import is very concentrated from China.

## CONCLUSION

Indonesia's import dependency on garlic is very high; 95.57% of Indonesia's garlic demands is fulfilled from imports. However, the trade openness of Indonesia's garlic is very low, with garlic import financing averaged 6.17e-5% of Indonesia's GDP. Due of that, Indonesia's garlic import allowed to continue. In addition, garlic production is not sufficient for domestic demands.

Indonesia's garlic import is geographically concentrated, with the geographic trade concentration degree averaged 98.78. It is about 99.35% of Indonesia's garlic import is come from China. Geographically, imports of Indonesian garlic are very concentrated from China. Indonesia is very dependent on China to fulfilled domestic garlic demands.

Garlic import should be geographically distributed, so Indonesia does not depend on one import origin country. The more import

geographically concentrated, the greater import dependency of a country on import origin country.

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