

Price Volatility of Main Food Commodity in Banyumas Regency Indonesia

Rahmi Hayati Putri[#], Putri Dwi Cahyani^{*}

[#] Faculty of Agriculture, University of Muhammadiyah Purwokerto, Purwokerto, 53182, Indonesia
E-mail: raiya_azzahra@yahoo.com

^{*} Faculty of Economics, University of Muhammadiyah Purwokerto, Purwokerto, 53182, Indonesia
E-mail: putri.dece@gmail.com

Abstract— Agricultural product is commodity which tends to fluctuate. Price volatility is caused by the change of agricultural production due to climate change as well as pest and disease. Furthermore, it is also caused by the change of agricultural land and high demand of agricultural products on religious holidays. This study was conducted to examine how volatile some of main food commodities in Banyumas Regency. Secondary data analysis method with quantitative approach was used in this research. Time series data of some food commodity prices (rice IR 64, local soybean, maize, chili red peppers, onion and garlic) from January 2008 – December 2013 were utilized. The coefficient of variation was calculated to determine price volatility. The result showed that the price of red chili pepper, onion and garlic was tending to volatile. The coefficient of variation ratio of those commodities was about 20% - 35%. While the price of rice, local soybean and maize was stable. The coefficient of variation ratio of those commodities was less than 9%. This study also includes some policies that can be suggested to prevent price volatility.

Keywords— main food commodity; price volatility; coefficient of variation

I. INTRODUCTION

Agricultural products are products that are vulnerable to price fluctuations. Instability of price occurs because agricultural production is changing due to climate change, pests and diseases. It is also caused by changes in agricultural land. The political game also plays a role in a food prices on the world and domestic market. Some global food needs are controlled by a few business groups whose purpose is not solely the benefit for the public welfare.

Volatility can be defined as instability or tendency to vary and it is hard to estimate. Variation of price will not be a problem when price moves slowly and steadily, but when the price variation is extremely high and cannot be anticipated, it could be a problem that causes uncertainty that increase the risk for producers, traders, consumers and government. Price volatility is not that significant on the long-term agricultural commodities either in numbers or the real price, but short-term will effect much. However, the high increase of price is often followed by relatively low, even stable prices. The extreme price fluctuations have a large impact on developing countries, especially the poor, who depends their expenditure on foodstuffs [1], [2], [3].

The other factor in the price of diversity is the change in supply. Food supply that available each year is based on the existing productions, imports, and the rest of inventories the previous harvest. The annual fluctuations in the production of agricultural commodities are particularly vulnerable to several economic and non-economic factors. The demand can change price fluctuation through export demand for goods, the price variation of substitution commodity, and the systematic increase in population and income [4].

Development in food prices that occurred in each region is different. Four main food commodities that studied such as maize, soybean, onion and red chili peppers in 4 provinces in Java; West Java, Central Java, Yogyakarta and East Java in 2008 - 2012 showed that the development of highest prices were found in red chili peppers 47% (Central Java), then followed by onion 26% (East Java), maize 11.87% (West Java), and soybeans 6.57% (East Java) [5].

Banyumas is one of regency in Central Java that experienced fluctuations in food commodity prices. The price spikes often occur on the day of religious festivities. It also happens due to the production instability and natural disasters. One of the examples is the increase of onion price in early 2013 in Banyumas due to lack of supply of onions which was caused by the decrease of onion production in Brebes [6]. Therefore, it needs to be studied further dealing

with how the price volatility occurs in some of main food commodities in Banyumas so that it can be determined the policy that should be taken to prevent such price volatility.

II. MATERIALS AND METHODS

This study uses secondary data analysis through a quantitative approach. The time series data from January 2008 – December 2013 in form of prices of rice IR 64, maize, local soybean, red chili peppers, onion, and garlic were utilized in this research. A simple statistical analysis was used to calculate the coefficient of variation to determine the price volatility. Here is the formula [7]:

$$CV = \frac{SD}{M} \times 100\% \quad (1)$$

Description:

CV = coefficient of variation

SD = standard deviation

M = average value

According to Ministry of Trade of Republic of Indonesia Strategic Plan 2010 - 2014, the prices of basic commodities are said to be stable if the coefficient of variation is ranging between 5 – 9% or below and said unstable or volatile if the coefficient of variation is above 9% [8].

III. RESULT AND DISCUSSION

A. Price Volatility of Some Main Food Commodities in Banyumas Regency

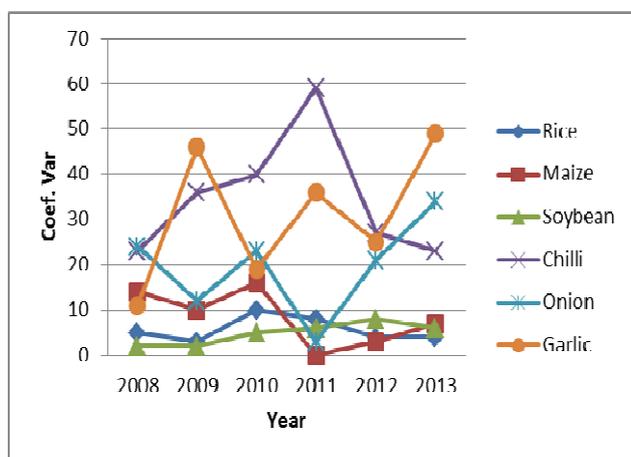


Fig. 1 Price Volatility of Some Main Food Commodities in Banyumas Regency (in %)

The graph shows that:

1) *Rice IR 64*: Based on the average value of the coefficient of variation, the price of rice is stable because the value of the coefficient of variation is 6%. However, price fluctuations have occurred in 2010. Although the price fluctuation of rice was not too high, but it was the highest contribute to inflation in certain months in one of the areas in Banyumas, such as Purwokerto.

Price fluctuation happened due to the declining rice production caused by climate change, plant hoppers, and rats.

The target of production was hard to achieve because of prolonged rain. Rice production fell up to 40 – 50%. Leafhopper resistant seeds were very expensive. Farmers prefer seeds that were not too resistant to pests but affordable than the resistant one [9].

Furthermore, the supply speculation of rice in Central Java was done by wholesalers from Jakarta and East Java to aggravate it. Some companies such as cigarette companies which usually do not run rice business also get involved to make things worse. The price of rice was getting more difficult to control because of it.

Distributing Raskin (cheap rice) to the market was one of the government actions to overcome the situation at that time. Although this was not fully able to lower the price, at least it could suppress it. Before the distribution of the cheap rice, the price of rice was increasing day by day. Nevertheless, after the distribution, the price was no longer increasing every day [10].

2) *Maize*: The price of maize is said to be stable because the average value of the coefficient of variation is 8%. Price volatility has occurred in 2008 – 2010 and the highest volatility was in 2010. The high of world maize price in 2007 affected the increase of maize price in the country. It is impacted to the products which use maize as main raw material. The price of the product also increased as well, for example animal feed.

Moreover, the insufficient maize production also took part in this case. Maize productivity decreased due to rainy season, thereby local maize supply considerably declined. Many maize crops failed to harvest because the leaves turn yellow so that the corn cannot bear fruit [9]. The impact of this was the imported maize increasing up to 275% [11]. In 2011 - 2013, maize prices began stable because maize productivity increased from 4.6 tons/ha in 2010 to 5.77 tons/ha in 2011-2012, and 6.32 tons/ha in 2013 [12]. The supply of local maize could meet the need of consumers.

3) *Local Soybean*: The price of local soybean in Banyumas is stable. The coefficient of variation is ranging between 2-8% each year. In 2012, the coefficient of variation of prices was higher than the others. Although soybean production in Banyumas was increasing but insufficient consumer demand, as many industries soybean processed that require soybean supplies. Government imported soybean from America to fulfil the consumer needs. Unfortunately, the soybean production of the largest exporting country - America, declined and thus has an impact on domestic soybean supply. Supply shortages and delays in the arrival of imported soybean were also the reasons for price fluctuation of soybeans at the time.

However, the situation still been able to controlled so that high price spikes do not occur [13]. Imported soybean price was not different from the local price. The price difference occurred since last few months of the end of 2013, ranging from IDR 100 to IDR 200. The price of soybeans was higher due to the depreciation of the rupiah value.

4) *Red Chili Pepper*: The price of chili is very volatile. The average value of the coefficient of variation reaches 35%. Red chili pepper is a kind of plant that is highly depends on the season while nowadays it is really hard to be predicted. In the rainy season the red chili pepper production

will decline whereas in the dry season the production of it will increase. Some farmers in one of the sub-districts in Banyumas suffered from the losses due to rotting chili [14]. To meet the demand, Banyumas took the supply of red chili pepper from Purbalingga and Banjarnegara. However, farmers in the area also experienced the same thing during the rainy season, the harvest failure. This causes the high increase of the chili price. In addition, pest attack was also a caused of its failure.

5) *Onion*: Price of onion is also volatile because the average value of coefficient of variation is 20%. Banyumas is not an onion producing region. It takes supply from Brebes. Brebes is the center of onion production in Indonesia.

The highest price fluctuations occurred in 2013. The decline in production due to harvest failure and the influence of rainy season and pests were not only the reasons of all, but also as a result of entrepreneur's behaviour in doing speculation on onion price. The importing activities done by the companies were so tricky. The role of the capitalists and speculation on the futures exchanges also took part in this case.

Furthermore, the price fluctuations occurred due to the inappropriate government policy regarding the import of onions, in Regulation No. 47 Year 2013 concerning changes to the Regulation No. 16 Year 2013 which concern about the provision of imported horticultural products, and the Director General of Domestic Trade No. 118 / PDN / KEP / 10/2013 concerning the importation of onion based on the reference price and the Law No.13 of 2013 on horticulture. When the reference price system is issued, the import quota system is still valid. It leads to confusion importation basis that affect the wholesalers, farmers and price patterns [15] [16].

6) *Garlic*: The price of garlic is also very volatile as the average value of the coefficient of variation is 31%. The highest price fluctuations occurred in 2013 in the amount of 49%. This happened due to lack of garlic supply. In order to fulfil the demand of garlincs, Banyumas took garlincs from Brebes. Unfortunately, production of garlincs in Brebes decreased due to climate.

To overcome this situation, Banyumas took garlincs from East Java, but unfortunately it was restrained in Surabaya. To suppress price increased and to meet the demand, the import policies were set by government. Most of the imported garlincs were imported from China. Unfortunately, these policies were used by the garlic importers to play the price [15], [17], [18].

For further information, the following table shows the coefficient of variation of some main food commodities since 2008 – 2013:

TABEL I

THE COEFFICIENT OF VARIATION OF SOME MAIN FOOD COMMODITIES

Year	Commodity					
	Rice IR 64	Maize	Local Soybean	Red Chili Pepper	Onion	Garlic
2008	5%	14%	2%	23%	24%	11%
2009	3%	10%	2%	36%	12%	46%
2010	10%	16%	5%	40%	23%	19%
2011	8%	0%	6%	59%	3%	36%

2012	4%	3%	8%	27%	21%	25%
2013	4%	7%	6%	23%	34%	49%
Average Value	6%	8%	5%	35%	20%	31%

B. Policies to Prevent Price Volatility

There are several things that can be done to address food price volatility in Banyumas Regency:

1) *Incentives and Available Market*: The government should provide incentives for farmers to keep doing the cultivation of food crops. Provision of seed and fertilizer subsidies may attract farmers to keep cultivating food commodities. Besides that, government also can give guarantees to farmers who failed to harvest and provide market for them.

In case of soybean, many farmers were unwilling to cultivate it just because the local soybean was not saleable. Many customers prefer to buy imported soybean than the local one due to the quality. It should be considered by government to provide good quality of seeds and market to attract them to cultivate so imported soybean can be decreased gradually.

2) *Import Policy*: The government have to set the import policy appropriately. Similarly to onions and garlic, import will be better done after predicting the ability of domestic production. It can protect farmers and reduce fraud committed by entrepreneurs. The implementation of appropriate import policy will help to maintain price stability in the country.

3) *Information*: The government should provide transparent information about the changes that occur in the field so there is no certain parties will take advantage to the situation.

4) *Sufficient Infrastructure*: The government should provide and repair the infrastructure. The commodity to be supplied from outside the area will go smoothly if the means can be provided with good support.

IV. CONCLUSIONS

Basically the price fluctuations occur due to a shortage of supply of the commodity market, either because of lack of production due to pests and diseases, uncertainty climate, or because of the market game. From 6 commodities studied, three of which are volatile (red chili pepper, onion and garlic), while the others are remain stable. Those which are volatile were caused by lack of supply and market speculation. Some policies should be taken to prevent the situation so that price stability can be realized. Further study needs to be done regarding the supply and demand of food commodities.

ACKNOWLEDGMENT

Thanks to the University of Muhammadiyah Purwokerto which has funded this study through a grant program for study program organized by the Institute for Research and Community Service.

REFERENCES

- [1] Sumaryanto, "Analisis Volatilitas Harga Eceran Beberapa Komoditas Pangan Utama dengan ARCH/GARCH", *Jurnal Agro Ekonomi*, vol. 27, No 2, pp. 135 – 163, Oktober 2009.
- [2] FAO., et ll., *Price Volatility in Food and Agricultural Markets: Policy Responses*, Policy Report, June 2011.
- [3] FAO., "Price Volatility in Agricultural Market", *Economic and Social Perspectives – Policy Brief*, Dec. 2010.
- [4] Anindita, R., *Pemasaran Hasil Pertanian*. Papyrus, 2004.
- [5] Pusat Data dan Sistem Informasi Pertanian, *Statistik Harga Komoditas Pertanian Tahun 2013*, Sekretariat Jenderal Kementerian Pertanian, 2013.
- [6] Putri, R.H., dan Watemin, "Analisis Trend dan Estimasi Harga Bawang Merah di Kabupaten Banyumas Periode Tahun 2008 -2013", *Jurnal Dinamika Ekonomi dan Bisnis*, Vol. 11, No. 1, pp. 65 – 69, Maret, 2014.
- [7] Kustiari, R. Dan Nurhayati, S., "Perubahan Tingkat Harga Komoditas Pangan di Pasar Dunia dan Dampak Terhadap Konsumsi dan Harga di Pasar Domestik", *Pusat Analisis Sosial Ekonomi dan Kebijakan Pertanian*, Departemen Pertanian, in *Seminar Nasional*, November, 2008.
- [8] Jati, K., "Staple Food Balance Sheet, Coefficient of Variation, and Price Disparity in Indonesia", *Journal of Advanced Management Science*, Vol. 2, No. 1, pp. 65 – 71, March, 2014.
- [9] The Kompas Website. [Online]. Available: <http://properti.kompas.com/read/2010/09/14/03091392/.Produktivitas.Beras.Merisaukan>. 2010
- [10] The Bulog Website. [Online]. Available: <http://www.bulog.co.id/berita/37/1895/18/7/2010/BULOG-Banyumas-Percepat-Penyaluran-Raskin-Bulan-September.html>. 2010
- [11] The Kontan Website. [Online]. Available: <http://industri.kontan.co.id/news/impor-jagung-2010-naik-275-dibanding-tahun-lalu-1>. 2010
- [12] BPS Kab. Banyumas, "Banyumas dalam Angka", Banyumas, 2013.
- [13] The Agrica Website. [Online]. Available: <http://www.persma-agrica.com/2012/08/menerka-swasembada-kedelai-di-banyumas.html>. 2012
- [14] The Okezone Website. [Online]. Available: <http://economy.okezone.com/read/2011/11/22/320/532515/hujan-petani-cabai-banyumas-rugi-puluhan-juta>. 2011
- [15] The Tempo Website. [Online]. Available: <http://m.tempo.co/read/kolom/2013/03/20/660/mengatasi-kenaikan-harga-bawang>. 2013
- [16] Mudatsir Blogspot.[Online]. Available: <http://mudatsir-oke.blogspot.com/2014/01/kebijakan-impor-bawang-merah-kepada.html>. 2014
- [17] The Ciputra News Website. [Online]. Available: <http://www.ciputranews.com/riil/pasokan-bawang-putih-ke-banyumas-merosot>. 2013
- [18] The Detik Finance Website. [Online]. Available: <http://finance.detik.com/read/2011/08/01/170729/1694080/4/>. 2011.