RESPONSE OF PRODUCER PRICE TO CHANGES OF SHALLOT CONSUMER PRICE IN IN INDONESIA

Illia Seldon Magfiroh[1], Rena Yunita Rahman[1], Intan Kartika Setyawati[1], dan Ahmad Zainuddin[1]
[1]Dosen, Program Studi Agribisnis Fakultas Pertanian Universitas Jember
email: illia.faperta@unej.ac.id

ABSTRACT

High price fluctuations in shallots can cause prices at the consumer level to change in a relatively quick time. However, the price change is not necessarily enjoyed by most of the shallot farmers. This implies a high marketing margin and low farmer prices. This study aims to analyze the integration of shallot consumer market with shallot producer market in Indonesia by using VECM (Vect or Error Correction Model). Monthly shallot price data with 48 time series period is used to analyze the shallot market integration. The results show that only the consumer market that affects the market of oni on producers (one way). There are short -term and long-term market integration between the consumer market and the shallot producers. However, the changes that occur in the consumer market are not always accepted by the producers of the same scale. This shows that the price of information on the producer's market is not always transmitted perfectly to the shallot producer market.

Keywords: *market integration, shallot, price change, VECM*

INTRODUCTION

Shallot is one of important and strategic agricultural commodities in Indonesia. There are several reasons that make shallots has an important and strategic role, namely (1) the development of shallot commodities as part of the horticulture subsector has the potential to become a new source of growth for the increasing of agricultural sector GDP; (2) the development of shallot commodity production supports efforts to increase food security and food availability; (3) changes in the price of shallot relatively fast (fluctuating) can cause inflation for the Indonesian economy.

The potential of shallot is very good because this plant can be cultivated almost throughout Indonesia, but the problem is often faced by the shallot is the fluctuation of the price is uncertain. At certain times such as Lebaran holidays and big days, the price of shallot sometimes becomes very high. These conditions must be balanced with an increase in supply in order to avoid inflation. The problem of price fluctuation is due to the production of seasonal shallot and as one of the easily damaged vegetables. In 2013, shallot ranks first in its contribution to inflation from the foodstuff category which is 0.38% (TPI 2013). Therefore, the price aspect becomes an important issue of shallot development in Indonesia.

The development of shallot consumer prices in Indonesia during the period 2012-2015 shows an upward trend but prices at the producer level are relatively stable. This resulted in the marketing margins of shallot among the bigger producers and consumers. The price margin indicates high of the price disparity that occurs. Increasing the price of shallot at a higher level of consumer compared to the increase in price at the producer level causes the shallot price margin to widen especially in June-August (Table 1).

High price fluctuations in shallots can cause prices at the consumer level to change in a relatively quick time. Price changes are expected to be responded quickly also by marketing agencies so that it can immediately take the right decision and the market becomes more efficient (Asmara, 2010). In fact, the price changes are not necessarily enjoyed by most of the shallot farmers. However, such price fluctuations are

Table 1. The development of producer and consumer shallot prices, 2012 - 2015

Year	Month												Growth
	Jan	Feb	Mar.	Apr	May	Jun	Jul	Ags	Sep	Oct	Nov	Dec	Averag
	Manufacturer Price (Rp / kg)												
2012	12,463	12,393	12,268	12,471	12,802	13,167	13,159	13,013	12,771	12,745	12,980	13,565	0.7
2013	14,264	14,583	15,023	15,185	14,653	14,358	14,959	15,610	15,023	14,720	14,699	14,749	0.3
2014	15,638	15,460	15,428	15,499	15,528	15,771	16,129	15,909	15,498	15,478	15,294	15,465	-0.0
2015	16,030	15,775	15,950	16,499	16,668	17,091	16,433	15,584	15,254	15,432	15,550	16,039	0.0
	Consumer Price (USD / kg)												
2012	21,103	20,696	20,649	21,358	22,546	23,521	23,020	22,081	21,681	21,138	22,001	23,588	1.0
2013	23,742	25,575	29,740	31,720	28,933	27,180	32,519	36,582	34,834	32,163	32,241	33,783	3.6
2014	31,182	28,738	27,401	26,407	26,260	27,123	28,440	27,226	24,843	24,052	23,213	23,247	-2.5
2015	23,307	22,727	23,773	26,091	26,986	28,626	26,736	24,062	22,424	22,972	22,958	25,238	0.9
	Producer and consumer price margin (Rp / kg)												
2012	8,640	8,303	8,382	8,887	9,745	10,354	9,861	9,068	8,910	8,393	9,021	10,023	1.5
2013	9,478	10,992	14,717	16,535	14,280	12,822	17,560	20,972	19,811	17,443	17,542	19,034	7.8
2014	15,544	13,278	11,973	10,908	10,732	11,352	12,311	11,317	9,345	8,574	7,919	7,782	-5.
2015	7,277	6,952	7,823	9,592	10,318	11,535	10,303	8,478	7,170	7,540	7,409	9,199	3.0

Source: Data and Information Center of the Ministry of Agriculture, 2016

often used by traders to play price information at the producer level. This leads to the asymmetry of price information from the consumer market to the producer market, which means that the rising consumer price is not necessarily followed by the price increase at the producer level and otherswise (Simatupang, 1999). The implication is higher marketing margins and lower farmer prices. Irawan (2007) suggests that the condition of the occurrence of price fluctuations will open opportunities for price games at the level of farmers by traders with the reason of price changes at the consumer level.

The availability of market information of the price is necessary to prevent the asymmetry of market information, so that price changes can be immediately responded by market participants and decision-making can be done quickly and accurately (FAO, et al, 2011). It shows that between one market with other market has been well integrated. This is in accordance with Ravalion (1986) which states that in an integrated market the prices of different markets have a positive relationship as a reflection of the smooth flow of market information. An integrated market will be achieved if there is market information that is equal, adequate, distributed quickly to other markets and has a positive relationship between the prices in different markets (Asmarantaka, 2009; Baffes and Bruce, 2003). Integrated pricing information from shallot consumers to shallot producers / farmers will have implications for the efficiency of shallot marketing. This is because changes in the price of shallots at the consumer level will be followed by price changes at the level of producers / shallot farmers so as not to harm the marketing players both manufacturers and marketing agencies. But the facts in the field show that the lower price changes of the shallot at the consumer level are not always followed by price changes at the producer level with the same scale (Figure 1). Based on the background, this paper will emphasize on how the response of producer price changes to the price changes of shallot consumers in Indonesia. Therefore, it is important to analyze the price response at the farm level against changes in consumer prices in Indonesia. This study aims to analyze the market integration of shallot consumer with shallot producer market in Indonesia.

RESEARCH METHODS

Research price response of producer to consumer price changes used secondary data. The data used to analyze the market integration at the level of producer and consumer are secondary data, time series data *(time series,* with a period of 48 series monthly that from

January 2012 to December 2015. The monthly data type collected is shallot price at the producer level, and shallot price at the consumer level.

Data processing to answer the purpose of research used *Excel 2007* and Eviews 7.0 software. The result of data processing is presented in tabulation and graph. The VAR (*Vector Autoregressive*) / VECM (*Vector Error Correction Model*) model is used to analyze the occurrence or absence of market integration of the producers and consumers of shallots.

The VAR / VECM model is a system of equations that shows each variable as a linear function of the constant and the lag value of the variable itself as well as the lag value of another variable present in the system. Thus, the explanatory variables in the VAR / VECM Model include the lag values of all the dependent variables in the system. The VAR model of the market integration of producers and consumers of shallot is as follows:

$$Pkon_t = \alpha_1 + \delta_1 t + \varphi_{11} Pkon_{t-1} + \ldots + \varphi_{1p} Pkon_{tp} + \beta_{11} Ppro_{t-1} + \ldots + \beta_{1q} Ppro_{tq} + \varepsilon_t \quad (1)$$

and

$$Ppro_t = \alpha_2 + \delta_2 t + \varphi_{21} Ppro_{t-1} + \ldots + \varphi_{2p} Ppro_{tp} + \beta_{21} Pkon_{t-1} + \ldots + \beta_{1q} Pkon_{tq} + \varepsilon_t \quad (2)$$

where $Pkon_t$ is the vector *n* x1 of the price of shallot at the consumer level at first order, generally denoted I (1); $Ppro_t$ is the price of shallot at the producer level and εt is *n* x1 vector of innovation (Rosadi, 2012). In this study *n* studied amounted to 2 variables price (each shallot price at consumer level and at producer level). If the variables are transformed in vector can be seen in the formulation below:

$$Pkon_t = \alpha_1 + \delta_1 t + \varphi_{11} Pkon_{t-1} + \ldots + \varphi_{1p} Pkon_{tp} + \beta_{11} Ppro_{t-1} + \ldots + \beta_{1q} Ppro_{tq} + \varepsilon_t \quad (1)$$

and

$$Ppro_t = \alpha_2 + \delta_2 t + \varphi_{21} Ppro_{t-1} + \ldots + \varphi_{2p} Ppro_{tp} + \beta_{21} Pkon_{t-1} + \ldots + \beta_{1q} Pkon_{tq} + \varepsilon_t \quad (2)$$

where $Pkon_t$ is the vector *n* x1 of the price of shallot at the consumer level at first order, generally denoted I (1); $Ppro_t$ is the price of shallot at the producer level and εt is *n* x1 vector of innovation (Rosadi, 2012). In this study *n* studied amounted to 2 variables price (each shallot price at consumer level and at producer level). If the variables are transformed in vector can be seen in the formulation below:

$$\begin{bmatrix} Pprod_t \\ PKons_t \end{bmatrix} = \begin{bmatrix} \alpha_1 \\ \alpha_2 \end{bmatrix} + \begin{bmatrix} \alpha_{11}\ \alpha_{12} \\ \alpha_{21}\ \alpha_{22} \end{bmatrix} \begin{bmatrix} PKons_{t-1} \\ PProd_{t-1} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \end{bmatrix} \quad (3)$$

Where:

Pprod = price of shallot at the producer level (Rp / kg)

Pkons = price of shallot at consumer level (Rp / kg)

α_1 = parameters to be estimated

The specifications of the VECM model of shallot market integration at producer and consumer level are as follows:

$$\Delta Pkons_t = \varphi_1 + \delta_1 t + \lambda_1 e_{t-1} + \gamma_{11} \Delta Pkons_{t-1} + \ldots + \gamma_{1p} \Delta Pkons_{tp} + \omega_{11} \Delta Pprod_{t-1} + \ldots + \omega_{1q} \Delta Pprod_{tq} + \varepsilon_{1t} \quad (4)$$

and

$$\Delta Pprod_t = \varphi_2 + \delta_2 t + \lambda_2 e_{t-1} + \gamma_{21} \Delta Pprod_{t-1} + \ldots + \gamma_{2p} \Delta Pprod_{tp} + \omega_{21} \Delta Pkons_{t-1} + \ldots + \omega_{2q} \Delta Pkons_{tq} + \varepsilon_{2t} \quad (5)$$

Where:

$Pprod_t$ = vector containing the variables analyzed in the study (shallot prices me rah at producer level (Rp / kg)

$Pkons_t$ = price of shallot at consumer level (Rp / kg)

φ_x = *intercept* vector

$\gamma_{2p}; \omega_{2q}$ = vector of regression coefficients

t = *time trend*

γ_{2p} = αxβ ‹where b› contains long-term cointegration equations

$Pkon_{t-1}$; $Ppro_{t-1}$ = variable *in-level*

λ_x = regression coefficient matrix showing integration short-term

= *error term*

RESULTS AND DISCUSSION

The price of shallot in the normative theoretical consumer market will affect the price changes of the shallot at the producer level, if the price of the shallot at consumer level has increased, the price at the producer level will also increase and vice versa. This will happen if both markets are integrated where there will be a transmission of prices from the consumer market to the producer and jg But in fact, the price of shallot at the consumer level has a high fluctuation rate but the price at the producer level is relatively stable. This indicates that the increase of shallot price at the consumer level is not transmitted to the producer level perfectly. So if there is an increase in prices at the consumer level, producers may not necessarily enjoy the increase in prices. This can be seen in Figure 2 below.

Figure 2 shows that the price at the producer level with the price at the consumer level has the same tendency, but the price at the consumer level has a high fluctuation while the price at the producer level is relatively stable.

Fluctuations in the price of shallot at the consumer level caused the resulting marketing margin is also relatively very high. This indicates that the increase in price at the consumer level is not necessarily transmitted or transmitted rapidly to the shallot producers. This has an impact on relatively stable farmer profits even though the price of shallot at the consumer level tends to be high. High margins are enjoyed by traders who often take advantage of price changes that occur in the consumer market. This is in line with Simatupang (1999) study which states that high price fluctuations will give traders an opportunity to manipulate price information at the farm level so that the transmission of prices from the consumer market to farmers tends to be asymmetric in the sense that there is a price increase at the consumer level, the price

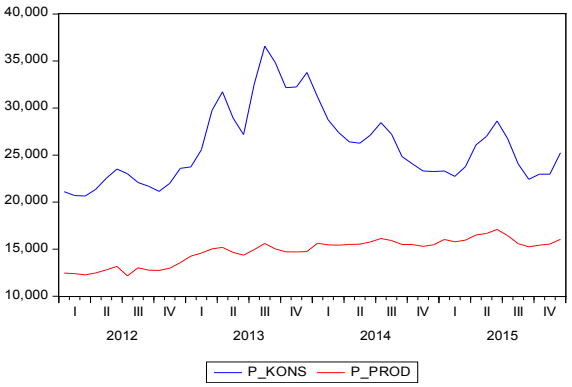

Figure 2. The Movement of Shallot Price at Producer and Consumer Level

is not passed on to the peasants quickly and perfectly, on the contrary if there is a decline in prices.

1) Stationary Test

Based on Table 2 it can be explained that the variable of shallot price at producer and consumer level has been done stationary analysis at the error rate of 1%, 5%, and 10% by using criteria with traceless intercept. The results showed that the price of shallot at the producer level and the consumer level is not stationary at the level (stationer on first difference). This is indicated by the statistical ADF value at a greater level than the critical value of McKinnon, whereas the ADF value on the first difference shows a value smaller than the McKinnon value so it is said to be stationary at first difference.

2) Optimal lag determination

The determination of the optimal lag or hose used is based on AIC (Akaike Infromation Criteria) criteria. The length of the lag optimum can be seen in Table 3.

Table 2. Root Test Results on Variable Red Shallot Prices at Producer and Consumer Level

Variables	Differenced	Trend without trends				Conclusion
		The value of ADF test statistics	1%	5%	10%	
P_Prod	I (0)	-1.619138	-3.577723	-2.925169	-2.600658	Not Stationer
	I (1)	-6.349093	-3.581152	-2.926622	-2.601424	Stationer
P_Kons	I (0)	-2.067229	-3.588509	-2.929734	-2.603064	Not Stationer
	I (1)	-3.7 55884	-3.588509	-2.929734	-2.603064	Stationer

Source: Data processed

Table 3. Criteria of Optimum Price Lag Shallot at Consumer and Producer Level

Lag	AIC	SC	HQ
0	36.29327	36.37437	36.32334
1	32.57429	32.81758 *	32.66451
2	32.54252	32.94801	32.69289
3	32.42015	32.98785	32.63068 *
4	32.37096 *	33.10086	32.64164

Source: Data processed

Based on Table 3 it can be explained that the optimal lag that can be used in the VAR / VECM model is lag 4. This is based on the value generated on the AIC (Akaike Infromation Criteria) criterion which shows the results in lag 4. Determination of lag length is used to eliminate the problem of autocorrelation and the heteroscedasticity present in the VAR / VECM model to be used (Enders, 1995).

3) Cointegration Analysis

The cointegration test is used to see whether the shallot price variables at the consumer and producer level are integrated to the same degree so it can be said to be cointegrated. Cointegration test results can be seen in Table 4.

Table 4 indicates that there is a cointegration relationship (long term integration) between the shallot consumer market and the shallot producer market.The indication is indicated by the value of trace statistic and the maximum eigenvalue which rejects H0 to the 5% level of significance is at rank 1, this means there is one cointegrated equation or there is one equation which can explain the cointegration relationship in the variables in the model (price consumers and shallot producers).

If testing using the Granger test method indicates that a causal relationship occurs in both directions indicates an integrated market is integrated. Granger causality test results can be seen in Table 5.

Based on the probability values generated in the Granger causality test in Table 5 shows that only the price hypothesis of shallot consumers does not cause the price of the rejected shallot producers. This is because the resulting probability value is less than 5% error rate, so it can be concluded that the price of shallot at the consumer level affects price changes at the producer level. While the price of shallot at the producer level does not affect the price at the consumer level.

This shows that the consumer market acts as a reference market while the producer market acts as a market follower. These results are in contrast to the Januar Research (2016) showing that the price of shallot producers affects the wholesale price (PIKJ) vice versa the wholesale price does not affect the producer price of red grass (Brebes), but this research is in line with Nuraeni et al (2015) which shows that there is one-way causality that is the price at the level of shallot producers affected by the price at the wholesale level. This is because the price formed in the market is more dominantly determined by price changes at the consumer level (can be seen in Table 2 where producer prices are relatively stable while consumer prices are very fluctuating). Thus, indicating price formation among shallot market in Indonesia is more influenced by demand side or one way (from consumer market to producer market).

Estimation Results Vector Error Correction Model

Based on Granger causality analysis results obtained that the price of shallot at the producer level is influenced by the price of shallots

Table 4. Test Results of Johansen Cointegration

Hypothesis		Trace Statistic	Critical 5%	Mx-Eigen Statistic	Critical 5%
H_0	H_1				
r = 0	r = 1	15.49471	7.930193	4.862485	14.26460
r = 1	r = 2	3.067708	3.841466	3.067708	3.841466

Source: Data processed

Table 5. Granger Causality Test Result

Null Hypothesis:	Obs	F-Statistic	Probability
P_Prod does not Granger Cause P_Kons	45	0.16216	0.9212
P_Kons does not Granger Cause P_Prod		3.62125	0.0215

Source: Data processed

at the consumer level. In addition, the cointegration test results show that the price of shallot consumers is integrated in the long run with the price of the shallot producers.

The VECM model estimation results in Table 6 show that there is only one long-term cointegrated equation in the shallot consumer market and the shallot producer market. This result is also in accordance with the granger causality test results that show only the consumer market that affects the market of shallot producers (one way). This happens because the shallot producers only act as price takers that simply do not have the ability to influence the price. Thus, the consumer market is reference markets determine price changes in the followers market (shallot producer market).

This refers to the VECM estimation results indicating that in the long run, price movements of shallot producers are affected by the price movement in the shallot consumer market significantly at a 1% error rate. Consumer prices have a positive effect on the change of the price of shallot producers by 0.4 498844. The sign complies with Ravalion's (1986) statement which states that in an integrated market the prices of different markets have a positive relationship as a reflection of the smooth flow of market information. Baffes and Bruce (2003) also state that market integration will be achieved if there is equal, adequate, market information that is transmitted rapidly to other markets and has a positive relationship between the prices in different marketThe mark is normatively appropriate where if there is a change (increase / decrease) the price of shallot 1 % consumers will respond positively with the change (increase / reduction) shallot price at the producer level of 0.449884 %. Although it has a positive sign, the effect of shallot prices on the consumer level is inelastic, where large changes in the consumer market are not always accepted by the shallot producers of the same magnitude. This indicates that the price information of shallot in the producer's market is not always transmitted perfectly to the shallot producer market. These conditions indicate that there is an information gap between producers and consumers. The information gap can be caused by imperfect information. Simatupang (1999) states that the price changes of a good is often used by traders to manipulate price information at the producer level so that the transmission of prices from the consumer market to the producers tends to be asymmetric in the sense that if there is a price increase at the consumer level then the price increase is not forwarded quickly and perfect to the producer level, and vice versa.

After the long-term cointegration value is known, the next step is to analyze the VECM output in the form of error correction term (ECT). The value of ECT shows the speed of adjustment from short-term balance to long term equilibrium. The result of ECT estimation and short-run output for consumer market integration model and producer market can be seen in Table 7.

Table 7 shows that only the market of shallot producers has a significant error correction (ECT) at the 5% level whereas for shallot consumer market does not have error correction value (ECT) which has significant effect. The value of ECT owned by the shallot producer market is -0.01. This means that there is an adjustment of short-term to long- term equation of -0.01 or every month a corrected error of -0.01 towards long-term equilibrium.

Table 7 also shows short-term cointegration results that indicate changes in shallot prices at the producer level in the short term are significantly affected at the 5% level by the price of shallot at the consumer level in the previous month (lag 2). The price of shallot at the producer level in the previous month had an effect of 0.103. The figure indicates that any 1% increase of shallot consumer price increase in the previous month will increase the price of shallot producers in the current period by 0.103%. This indicates that in the short term, the formation of the price of shallot

Table 6. Long-term Cointegration between the consumer market and the Red Shallot producers

Cointegration Equation	Variable shallot price		
	P_ Cons	P_ Prod	C
Cointegration 1		0.4 49884	-93106.88
1,000,000		(3.08190)	
		[10,45976] ***	

Source: Data processed

Table 7. Short-term Commodity Cooperation between the Shallot Market at producer and consumer level

Error Correction:	D (P_Kons)	D (P_ Prod)
CointEq1	-0.046659	-0.013472
	(0.02873)	(0.00729)
	[-1.62389]	[-2.83636] **
D (P_Kons (-1))	0.493314	0.103489
	(0.16253)	(0.04125)
	[3.03514] ***	[2.50862] **
D (P_Kons (-2))	-0.538845	-0.098625
	(0.16414)	(0.04166)
	[-1 .28277]	[-1 .36727]
D (P_Prod (-1))	0.275679	-0.126243
	(0.67549)	(0.17145)
	[0.40811]	[-0.73633]
D (P_Prod (-2))	0.243516	0.050501
	(0.67549)	(0.17145)
	[0.36050]	[0.29456]
C	64.04388	88.19585
	(236493)	(60.0250)
	[0.27081]	[1.46932]

Source: data processed

producers is influenced by the price of shallot at the consumer level or the formation of the price of shallot producers in the short term refers to the change of shallot price at the consumer level.

The price of shallot at consumer level in the short term is influenced by consumer price in the previous month. The price of shallot at the consumer level in the previous month gave the effect of 0.49 on the price change of the shallot of the present period. This figure indicates that if there is an increase of shallot price of consumer level in the previous month by 1% will cause the increase of shallot price at consumer level by 0,49% in the current period. This figure indicates that the formation of the price of shallots at the consumer level refers to changes in the price of shallots consumers in the previous period. It also shows that the price trend of shallots at the consumer level will continue to increase every period if seen in the short term.

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the shallot market integration analysis in Indonesia, the price at the producer level with the price at the consumer level has the same tendency, but the price at the consumer level has high fluctuation while the price at the producer level is relatively stable. Fluctuations in the price of shallot at the consumer level caused the resulting marketing margin is also relatively very high. Granger causality test results show only the consumer market that affects the market of shallot producers (one way). This happens because the shallot producers only act as price takers that simply do not have the ability to influence the price. The consumer market is a reference market that determines price changes in the market of followers (the market of shallot producers). To cope with the high price fluctuations in the level of consumer needs a high price policy (ceiling price) to prevent price-fixing by traders so that consumers are not harmed.

The VECM estimation results show that in the long run and short run consumers prices have a positive effect on the price changes of shallot producers. The marks are normatively appropriate where if there is a change (increase / decrease) the price of shallot consumers will be responded positively to the change (increase / reduction) shallot price at the producer level. Although it has a positive sign, the effect of shallot price at the consumer level is inelastic, where large changes in the consumer market are not always accepted by the shallot producers of the same scale. This shows that the price information of shallot in the producer's market is not always transmitted perfectly to the shallot producer market. These conditions indicate that there is an information gap between producers and consumers. Therefore, the active role of market information service (Pelayanan Informasi Pasar (PIP)) officers is needed to disseminate pricing information to the main marketing agents of shallot farmers. In addition, farmers should be aware of the importance of accessing market information primarily to changes in shallot prices.

BIBLIOGRAPHY

Journal Articles

Asmara, Rosihan dan Ardhiani, Ruri. 2010. *Integrasi Pasar Dalam Sistem Pemasaran Bawang Merah.* Agrise 10 (3): 164-176.

Baffes J and Bruce G. 2003.*The Transmission of World Commodity Prices to Domes-*

tic Markets Under Policy Reforms in Developing Countries. Journal of Economic Policy Return 6 (3): 159-180.

Engle, Robert F. and Clive W.J. Granger (1987), "Co-integration and error correction: representation, estimation, and testing", *Econometrica.* Vol. 55, pp. 251-276.

Irawan, Bambang. 2007. *Fluktuasi Harga, Transmisi Harga dan Marjin Pemasaran Sayuran dan Buah.* Analisis Kebijakan Pertanian Vol 5 (4): 358 - 373.

Ravalion, M. 1986. *Testing Market Integration*. American Journal of Agricultural Economics 88 (1): 102 - 109.

Book Reference

Ajija S, Setianto D, Primanti M. 2011. *Cara Cerdas Menguasai Eviews*. Jakarta (ID): Salemba Empat.

Asmarantaka, R.W. 2009. *Pemasaran Produk-produk Pertanian. Bunga Rampai Agribisnis: Seri Pemasaran*. IPB Press, Bogor.

Enders, Walter. (1995). *Applied Econometric Time Series*. New York: John Wiley & Sons.

Firdaus, M. (2011). *Aplikasi Ekonometrika untuk Data Panel dan Time Series*. Bogor: IPB Press.

Rosadi, Dedi. (2012).*Ekonometrika dan Analisis Runtun Waktu Terapan dengan Eviews*. Yogyakarta: Penerbit Andi Yogyakarta.

Simatupang, Pantjar. 1999. *Industrialisasi Pertanian Sebagai Strategi Agribisnis dan Pembangunan Pertanian*. Pusat Penelitan Sosial Ekonomi Pertanian, Bogor.

Widarjono A. 2012. *Ekonometrika Pengantar dan Aplikasiny*a. Yogyakarta (ID): Ekonisia.

Research Report

Pusat Data dan Informasi Kementerian Pertanian. 2016. Analisis Kinerja Perdagangan Bawang Merah. Jakarta: Pusat Data dan Informasi Kementerian Pertanian.

Tim Pemantauan dan Pengendalian Inflasi [TPI]. 2013. *Laporan pelaksanaan tugas tahun 2013*. Jakarta (ID): Kementerian Keuangan.

Online Articles

FAO, IFAD, IMF, *et al*. 2011. *Price Volatility in Food and Agricultural Markets: Policy Responses*. Interagency Report to The G20 on Food Price Volatility.