

PRICE EFFICIENCY OF A COMMODITY IN THE DOMESTIC MARKET: A STUDY OF CINNAMON PRICE POLICY IN INDONESIA

Firwan Tan¹, Endrizal Ridwan¹, Asniati Bahari^{1*}, Febriandi Prima P¹, Afdhal Chatra P²,
Dewi Sartika³

¹Faculty of Economics Andalas University Padang

²STIE Sakti Alam Kerinci

³Faculty of Economics and Business Bina Darma University Palembang

Abstract

This study aims to analyze the efficiency of marketing price of export commodity cinnamon in the domestic market from 2015 to 2020. For that purpose, it is necessary to analyze a price relationship from exporter to middlemen traders and then to farmers during 2015-2020. Buying prices imposed at each level of marketing chains are considered independent variables, while farmers' buying prices are considered a dependent variable. Using Multiple Linear Regressions (MLR) supported by Error Correction Model (ECM), the study results show that exporters of cinnamon tend to impose the buying price for the cinnamon commodity in the domestic market in the manner of monopsony behavior. Therefore, the buying price received by farmers is relatively low and too far different from the export price of cinnamon. This condition is not fair because any increasing and decreasing price in the international market is not transmitted proportionally to the buying price of raw cinnamon at the farmer's level. It indicates that the exporters tend to practice the monopsonistic power in buying raw cinnamon bark either from intermediaries or directly to cinnamon farmers. Such conditions are considered one of the main reasons that have caused the poverty of cinnamon farmers that never ended in *Kerinci*, Indonesia. This study provides two breakthrough policies to improve the buying prices of cinnamon at the farmer's level, namely institutional innovation and entrepreneurial innovation. In this case, Regents and Mayors, as the government of the top policymaker in their regions, should be the main actor and take full responsibility for the successful implementation simultaneously of these two major policies.

Keywords: price efficiency, monopsonistic market, institutional innovation, entrepreneurial innovation.

I. INTRODUCTION

Indonesia is the biggest cinnamon producer with a production of 1,021 thousand metric tons. China, Vietnam, and Sri Lanka followed about 77, 35, and 16 thousand metric tons of production (2019). In recent years, there has been an increase in quantity demanded and prices of spices globally, including cinnamon. Eighty-five percent of cinnamon worldwide comes from the Kerinci region on the Indonesian island of Sumatra. Kerinci cinnamon is known for its unrivaled quality due to many factors, including its high oil percentage

(Dewi Alimah Hari, 2015; Menggala and Demme 2018; Nurhayani 2019; Research and Markets.com 2019).

However, the cinnamon subsector in Kerinci is facing several sustainability problems. The supply of the product is threatened because 99% of farmers sell the raw cinnamon bark, untreated material and do not have enough money to finance the drying process. Moreover, the increase in the price of cinnamon in the world market during 2015 -2020 was often used by middlemen traders and exporters to seek excessive profit. The pricing of exporters tends

to push down to middlemen traders and then to farmers. In this condition, farmers were the most harmful because they do not have strong bargaining power; they can only act as price takers. Unfavorable prices for farmers affect the decrease in cinnamon farming production. Farmers can switch to other crops that are more profitable and leave the cultivation of cinnamon plants that have been the flagship commodity of the region in the Kerinci region and the flagship commodity and Indonesia as the whole.

The fluctuation of buying prices of cinnamon in each level of marketing chains in the domestic market, according to Kustiari (2017) due mainly to farmers' ignorance of price changes. While the research results of Elvina. et al. (2018) confirm that the fluctuations in agricultural commodity prices have created difficulties for farmers to determine the actual selling price of raw cinnamon barks sold and estimate the profit they could receive at the time of harvest. Two factors cause the fluctuation of marketing price according to Conforti (2004), the first is due to a long marketing path, and the second is due to excessive market power owned by exporters. This condition leads exporters to be price makers and create higher distribution margins for their benefits and make unsymmetrical price transmission.

As "end buyers" of cinnamon products in the domestic market, exporters tend to maintain their market power by creating disguised contractual agreements with middlemen traders by providing them the soft capital loans to facilitate purchasing raw cinnamon barks from farmers. The cooperation between exporters and intermediaries traders will make exporters more robust as price makers in buying cinnamon barks from middlemen traders. Similarly, middlemen traders will react with the same manners when purchasing the raw cinnamon barks from farmers. Theoretically speaking, this condition can be said that the market mechanism fails to develop market equilibrium among actors in marketing flows from farmers to middlemen traders and then to exporters. Therefore, an intervention policy from government bodies in the related region is necessary to mitigate the problems to improve the efficiency of the pricing system in marketing chains of cinnamon barks from exporters to farmers.

Therefore, this study aims to formulate strategic policies to help the local government improve

the pricing system of cinnamon marketing in the domestic market so that cinnamon farmers get advantages. For that purpose, the buying prices of cinnamon barks on each level of marketing chains will be analyzed deeply. The analysis will also include their relationship between each and another.

II. LITERATURE REVIEW

Several researchers have done researches related to price efficiency for purposes to measure the price efficiency of various agricultural commodities and plantations. The research conducted by Syamsurijal and Firwan (2017), entitled "Indonesian Crude Palm Oil Export Performance during the Period (1990Q1-2015Q4)". They found that RCA-Indices during that period of study are, on average, greater than one; signify that Indonesian CPO export performance is sufficiently profitable. However, some policies are still needed to improve the quality and buying price of FFB at the farmer level. The parameter coefficient of dependent variables in functional relationship to the independent variable is quite responsive. At the same time, the residual regression of coefficient variable (ECT) has a negative sign and significant impacts on the CPO export growth. The negative sign of the ECT coefficient indicates a low adjustment level in the short term toward the long-run equilibrium conditions.

Research conducted by Lisa Nesti et al. (2018) concerning market competitiveness and efficiency of CPO in the domestic market and the world market found that the competitiveness of CPO in West Sumatra and the World Market is quite strong. The average value of RCA indices indicates it in the domestic market from 2000 to 2016, which is equal to 5.0., it is far greater than one, meaning that the CPO of West Sumatra has a strong competitiveness domestic market of Indonesia. However, the value of RCA Indices of CPO of West Sumatra in the world market is on average equal to (1,10). It is a little bit greater than one, indicating that export of CPO of West Sumatra in the world market still has competitiveness but not too strong. Therefore, it is necessary to make the position of FFB's farmers more robust than before. For that purpose, it could be better to create specific training programs to increase the farmer's knowledge and skill to become more productive

and efficient. They also found that marketing practice in buying FFB is not efficient; the purchasing prices received by palm oil farmers are considered too low, inadequate manner.

Firwan et al. (2019), in their research concerning "Market Conduct and Derivative Product Development of CPO and PKO in Solok City, Indonesia." The research question is whether the market conducts support or not developing CPO and PKO derivative products in Solok City. For this purpose, analyzed six related aspects: (i) by using time series data (2010-2018) therefore examined the hypothesis of price relationship equation where the dependent variable, i.e., P_p , which is considered as the realization of buying price of FFB at the farmer's level while the independent variables are P_a , P_b , P_e , P_k (P_a =buying price at first-level of intermediary traders, P_b =buying price at second-level of intermediary traders, P_e =selling price or export price of CPO, P_k = selling price or export price of PKO); (ii) RCA indices of CPO (2004-2018); (iii) LQ values of each business fields forming GRDP of Solok City; (iv) HDIs of Solok City (2014-2018); (v) the palm oil industrial tree; and (vi) the location of Solok City. Even though the purchasing prices received by palm oil farmers are found considerably too low, far from expectancy, all findings confirm that the existing condition of market conduct supports the development plan of derivative products CPO and PKO in Solok City. Derivative products will push the increase of selling prices of products at the farmer's level.

Market integration is influenced by several factors such as market structure, firm behavior, market effectiveness, government policy, transfer fees, price movements, technology transfers, and exchange rates (Zorya, 2014). Vertical market integration can spread price information evenly throughout marketing agencies in marketing chains. If an integrated market can be practiced fairly, the information will be disseminated ideally, and then the price formed in the market indicates an excellent price and fair prices. However, suppose the price information is not disseminated evenly. In that case, it implies that the market at each level of marketing is not integrated efficiently. In other words, the buying prices applied to each level of the marketing system only benefit one party, meaning that monopsony power case may occur. (Asmarantaka et al., 2018). Inaccurate

information between manufacturers and consumers will cause information asymmetry. According to Anindita (2017), information asymmetry is one of the causes of market failure due to incomplete price information between producers and consumers, thus distorting marketing decisions at the market level. It can be concluded that vertical market integration aims to see the tightness of relationships between a marketing agency and other marketing agencies in marketing chains. It will help the government to determine the right pricing policy. According to Cramon-taubadel (2017), price transmission is an efficient marketing system indicator.

Therefore, price transmission can be used as an indicator of efficiency formed between two interconnected markets, vertically and spatially (Meyer & Cramon-taubadel, 2004). Price transmission can explain welfare distribution between producers and consumers in marketing channels (Cramon-taubadel, 2017). The transmission price is measured by the transmission elasticity approach that compares the percentage of price changes in one market with the change in 1% in another market (Minot, 2014).

According to Asmarantaka et al. (2018), marketing efficiency can be done with several measurements: 1) operational efficiency and 2) price efficiency. Operational efficiency relates to the handling of activities that can increase the ratio of marketing outputs. Marketing inputs are resources (human resources, packing, machinery, and others) needed to carry out marketing functions. Marketing output related to consumer satisfaction. Therefore, resources are cost while usability is the benefit of the marketing efficiency ratio.

Price efficiency emphasizes the ability of the marketing system to match the wishes of consumers. The target of price efficiency is resource allocation efficiency and maximum output. Price efficiency can be achieved if the parties involved in marketing are responsive to the prevailing prices. According to Soekartawi (2000), if the profit obtained as a result of price influences, it can be said that the allocation of production factors meets price efficiency.

III. METHODS

3.1. Locus, Focus, and Sources of Data

The locus of study taken place in Kerinci region, which consists of Kota Sungai Penuh (Sungai Penuh City) and Kabupaten Kerinci (Kerinci Regency). The focus of the study is to analyze the price efficiency of cinnamon commodity marketing in the domestic market from 2015 to 2020. In this context, the data used is mainly secondary. The data was obtained from several government agencies and institutions, including private bodies. From government side such as the Department of food crops and horticulture (dinas tanaman pangan dan hortikultura) and the Department of Industry (dinas perindustrian), Departement of trade (dinas perdagangan) of Kabupaten Kerinci and Kota Sungai Penuh while from private side such as data of export-import from Teluk Bayur Harbor in Padang (PELNI), Regional Chamber of Commerce (KADINDA). Those data consist mainly of cinnamon's selling price at the level of farmers in the domestic market measured by Rp/Kg. The selling prices middlemen traders to exporters as the buyer and selling prices of cinnamon export (fob prices) for six years (time series data) or from January 2015 to December 2020. The primary data also used, taken during the Kerinci Regency and Sungai Penuh Municipality survey, to support the analysis.

3.2. Price Efficiency Analysis

The hypothesis raised in various scientific meetings is that poverty among cinnamon farmers because of the selling price of raw cinnamon at the farmer level is still relatively low. In contrast, the demand for and the price of cinnamon tends to continue to increase globally. Because of this, exporters are suspected of engaging in monopsony practices when buying raw cinnamon, either from intermediaries or directly to farmers. Likewise, when buying raw cinnamon bark from farmers, middlemen traders also do the same way as exporters. Economically, this condition shows that the price-fixing behavior to buy raw cinnamons inefficient in the domestic market. Since there has been no research specifically related to the problems in Kerinci, that is the main reason for this research. For analyzing the price efficiency of the cinnamon commodity at each level of marketing flows in Kerinci. Therefore, it is

necessary to create a functional relationship between the dependent and independent variables. In this case, the selling price of cinnamon at the farmer level is considered the dependent variable, while the selling price of cinnamon at the middleman traders and the selling price of cinnamon to the world market at the export level are considered as independent variables, including the ECT variable. The functional equation relationship between dependent and independent variables can be written as follow:

$$Pp = f (Pc, Pe, ECT) \dots\dots\dots (1)$$

Before finding the results of the regression equation, the data must meet the classic assumption tests, which consist of five testing models, i.e. (a). multicollinearity test, (b). heteroskedasticity test, (c). Autocorrelation test, (d). normality test, and (e). linearity test. Therefore, after the classic assumptions are met, ADF (Augmented Dickey-Fuller) models, consisting of conducting cointegration tests and compiling error correction models, will further test static data using EViews version 10 program software.

ECM is a model used to correct the regression equation among variables that are individually not stationary, aiming to analyze economic phenomena in the short and long term with the main condition of cointegration relationships between the constituent variables (Rahmawati et al., 2017). If a discount is found in the short term, then ECM will correct it in the next period (Acquah & Acquah, 2015). ECM analysis is conducted by three stages of data analysis, namely; (1). Data stationary test; (2). Cointegration test, and (3). Build ECM models (Damodar N. Gujarati, 2015). In this study, ECM was used to overcome time series data problems that are not stationary on cinnamon prices in the Kerinci region during 2015 -2020. The following equation defines the complete equation model of ECM in this study;

$$Pp_t = \alpha_0 + \alpha_1 \Delta Pc_t + \alpha_2 \Delta Pe_t + \alpha_3 ECT_t + \varepsilon_t \dots\dots\dots (2)$$

with $ECT_t = Pp_{t-1} - \beta_0 - \beta_1 Pp_{t-1} - \beta_2 Pe_{t-1}$

$$\frac{1}{\Delta(Pp)} \times \frac{\partial \Delta(Pp)}{\partial \Delta(Pe)} = \frac{b}{\Delta(Pe)}$$

$$\Delta Pp_t = Pp_t - Pp_{t-1}, \Delta Pe_t = Pe_t - Pe_{t-1}$$

$$b = \frac{\partial \Delta(Pp)}{\partial \Delta(Pe)} = \frac{\Delta(Pe)}{\Delta(Pp)} \dots \dots \dots (4)$$

For non-linear regression, by inserting a log into the equation:

$$\log Pp_t = \alpha_0 + \alpha_1 \Delta \log Pp_t + \alpha_2 \Delta \log Pe_t + \alpha_3 ECT_t + \varepsilon_t$$

with $ECT_t = \log Pp_{t-1} - \beta_0 - \beta_1 \log Pp_{t-1} - \beta_2 \log Pe_{t-1} \dots \dots \dots (3)$

where:

ΔPp_t = Difference in cinnamon sales price at the farmers level (Rp/Kg)

ΔPp_t = Difference in cinnamon sales price at the middlemen traders level (Rp/Kg)

ΔPe_t = Difference in cinnamon sales price to the world market (fob prices) at exports level (Rp/Kg)

ECT_t = Error Correction Term, ε_t = error term, α_i = Short-term coefficient, β_i = Long-term Coefficient, α_3 = the imbalance correction coefficient is an absolute value that explains how quickly it takes to obtain a balance value if the probability value of the α_3 the coefficient is less than 0.05. Then it is indicated to have a short-term relationship.

The price efficiency value is shown in the regression coefficient of the equation that can be described as follows;

$$\Delta Pp) = \log \log \alpha + b \Delta(\log \log Pe)$$

$$\frac{\partial \Delta(\log Pp)}{\partial \Delta(Pe)} = \frac{\partial \log \alpha}{\partial \Delta(Pe)} + b \frac{\partial \Delta(\log Pe)}{\partial \Delta(Pe)}$$

According to Pejman et al. (2017), a market is efficient if the price transmission elasticity coefficient is worth one (b =1). The price transmission elasticity coefficient is a crucial requirement to declare market efficiency. The implications of the elasticity coefficient are as follows:

- 1) If (b_i = 1) means the rate of price change of one percent at the buyer level produces a change of one percent at the producer level (farmer). The prevailing market is a perfect competition market. The price is efficient and symmetrical for each level in the marketing system, where the marketing agency entirely passes on the price of the information under it.
- 2) If (b_i < 1), the rate of price change of one percent at the buyer level results in a change of less than one percent at the producer (farmer) level. The prevailing market is an imperfect competition market meaning an inefficient price and asymmetrical marketing system where the marketing agencies do not fully pass on price information.
- 3) If (b_i > 1), which means the rate of price change of one percent at the buyer level results in a change greater than one percent at the producer (farmer) level. The prevailing market is an imperfect, inefficient competition market meaning an inefficient and asymmetrical marketing system where the marketing agencies do not thoroughly pass on price information.

IV. RESULTS AND DISCUSSION

4.1. Classic Assumption Test

a. Multicollinearity test.

VIF test (variance inflation factor) is a test to prove whether exist multicollinearity or not in a

regression model. Suppose $VIF < 10$; thus, there is no multicollinearity. When $VIF > 10$, it implies that multicollinearity existed in the regression equation model. The VIF value in each independent variable should be below 10,

so there is no multicollinearity in the cinnamon regression model, see Table 1

Table 1. Multicollinearity Test Results

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
D(LOGPC)	0.006028	6.121026	6.058620
D(LOGPE)	0.006186	6.306089	6.260084
ECT(-1)	0.011813	1.122489	1.122488
C	3.64E-06	1.011244	NA

b. Heteroscedasticity test.

One of the methods used to test the heteroscedasticity is to using the Breusch-Pagan test. If the $obs * R\text{-square} > 5\%$, the criteria used is that the regression model does not have

heteroscedasticity problems in the ECM model (Damodar N. Gujarati, 2015). Heteroscedasticity test results $Obs * R\text{-squared}$ significance value of 0.1361. The value is more significant than 0.05 so that there is no heteroscedasticity; see Table 2.

Table 2. Heteroscedasticity Test Results

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.891210	Prob. F(3,67)	0.1395
Obs*R-squared	5.542969	Prob. Chi-Square(3)	0.1361
Scaled explained SS	13.43747	Prob. Chi-Square(3)	0.0038

c. Autocorrelation test.

Autocorrelation tests are used to test whether in linear regression models there is a correlation between a bully error in the t period and a bully error in the $t-1$ period (Ghozali, 2016). How to

detect autocorrelation in this study is by looking at Durbin-Watson's (DW test) value. Here are the results of the autocorrelation test :

Table 3. Autocorrelation Test Results

Durbin-Watson stat	1.753293
DU value	1.673
DL value	1.5284

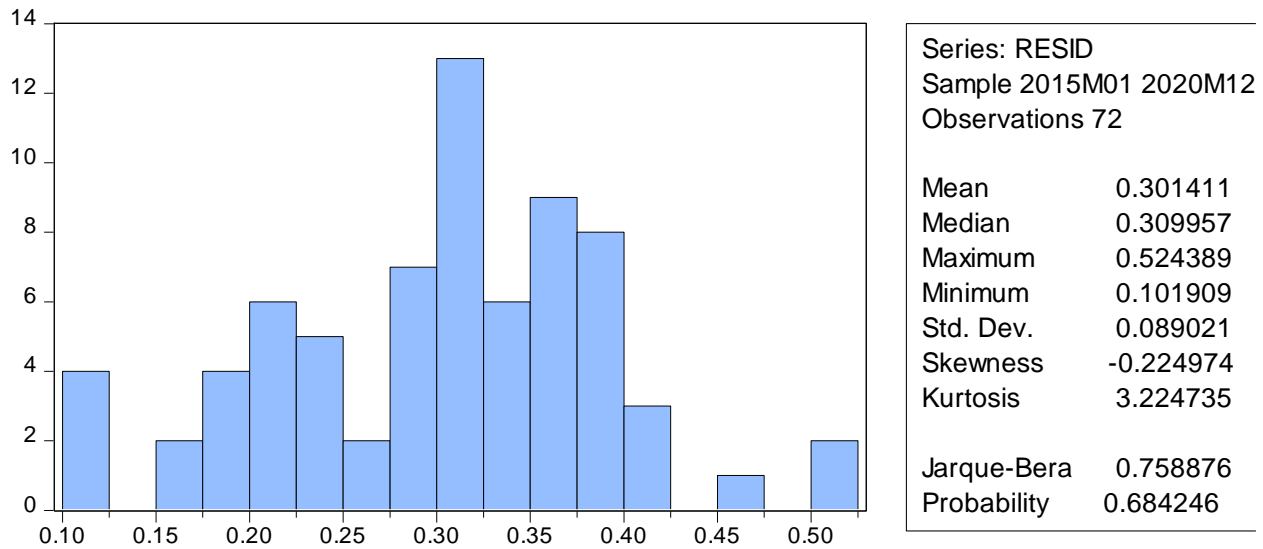
Based on the test, the DW value indicates the number 1.753 with the number of independent variables (k) = 2 and total of observation (n) = 72. Based on the DW table, significance level is

5%, it can be determined in the Durbin-Watson table that the DL value is 1.5611 and the DU value is 1.6751. Based on Durbin-Watson value, $DU < DW < (4-DU) = 1,6751 < 1,753 < 2,325$,

it can be concluded that in the model there is no autocorrelation.

The Normality Test aims to determine if the data in a regression models, independent variables and dependent variables have normal distribution or not. In this normality test, researchers used Jarque-Bera. The result of Jarque-Bera are in the table

d. Normality test.



The picture above explains that the result of Jarque – Bera value is 0.758876 and jarque – Bera probability value is 0.684246 or 68.42%, the result is above the significance level of 5%. It means the data used in the ECM model is normally distributed.

e. Linearity test

Linearity test results showed that the statistical F value of 0.7713 was greater than 0.05. It can be concluded that the model used was appropriate to present the influence of cinnamon prices at the middlemen trader level, the price at the exporter level against the price of cinnamon at the farmer level, see Table 4.

Table 4. Linearity Test Results

	Value	df	Probability
t-statistic	0.291881	66	0.7713
F-statistic	0.085194	(1, 66)	0.7713
Likelihood ratio	0.091589	1	0.7622

4.2. Degree of Integration Test.

Root test units with ADF (Augmented Dickey-Fuller) models at the level of $p > 0.05$ or not stationary. Therefore, that variable needs to be seen at the level of the first difference. The result shows that all variables can be stationary at the first difference p -value < 0.05 . The root unit test

results for ECT found that stationary residuals at the level stated by the prob value $< 5\%$ could thus be noted that the data is integrated. If the ECT has been stationary at the level, regression equations with ECM can be continued.

Table 5. Unit Root Test Results

Variable	Stationary Level					
	Level			First Difference		
	ADF	p-value	Keterangan	ADF	p-value	Keterangan
Log Pp (Farmers)	-1,00	0,748	Non- Stasionary	-13.973	0,000	Stasionary
Log Pc (Middlemen traders)	-0,845	0,799	Non Stasionary	-14,061	0,000	Stasionary
Log Pe (Exporters)	-0,772	0,820	Non- Stasionary	-15,293	0,000	Stasionary

4.3. Cointegration Test.

Test stationary cointegration if the probability value is below 0.05. Cointegration Test is a test of residual value, whether stationary or not.

Stationary residual values indicate that a short-term effect or ECM model can be used. The test results showed that the residual data was stationary so that the data passed the cointegration, see Table 6.

Table 6. Cointegration Test Results

Residual	Stationary Level	
	test-statistic	Description
Model (logPp, logPc, logPe)	0,000	Stasionary

4.4. ECM test

ECM tests are used to confirm the functional relationship between dependent variables and independent variables. The dependent variable is the selling price of cinnamon at the farmer level. Independent variable is the selling price of cinnamon at the level of middlemen traders or collectors and the selling price of cinnamon to the world market (fob price) at the exporter level.

To analyze how much influence the realization of the price of cinnamon sales at the level of collectors and the realization of the price of sales of cinnamon at the export level with the realization of the price of sales of cinnamon at the farmer level in the long term, the results of the regression of price relations equation in the

form of functional equations in the long term can be written as follows:

$$\text{Log } P_p = 0.420868 + 0.984646*(\text{Log } P_c) - 0.081954*(\text{Log } P_e) + e \dots\dots\dots (5)$$

Table 7 shows in the long term, there is a significant influence from the realization of sales prices at the Farmer level (Pp) with the realization of sales prices at the middleman or collectors (Pc) and the realization of sales prices at the export level (Pe) indicated by the prob value (F-statistic) of 0.000 and R-squared equal to 0.98 close to one. in this functional equation shows that all independent Pc and Pe variables together have a significant effect on pp dependent variables

Table 7. Price Efficiency of Cinnamon Commodity Marketing in Domestic Market in the Long Term, Results of Regression Supported by ECM

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.420868	0.084852	4.960016	0.0000
LogPc	0.984646	0.056125	17.54383	0.0000
LogPe	-0.081954	0.064154	-1.277461	0.2057
R-squared	0.984938	Mean dependent var		4.410300
Adjusted R-squared	0.984501	S.D. dependent var		0.150780
S.E. of regression	0.018771	Akaike info criterion		-5.072220
Sum squared resid	0.024313	Schwarz criterion		-4.977359
Log-likelihood	185.5999	Hannan-Quinn criter.		-5.034455
F-statistic	2256.024	Durbin-Watson stat		1.032488
Prob(F-statistic)	0.000000			

a. **Constant Value (C)** in positive modelling of 0.420868, implicating a significant influence on the realization of the purchase price of raw cinnamon at the farmer level and the value of probability C, which is 0.0000 smaller than the real level of 5% means that the constant value (C) has a significant influence on modelling.

b. **The value of the Coefficient of Middlemen or collector traders (Pc)** of 0.984646 indicates the elasticity of the price transmission is inelastic where the value of the transmission price is smaller than one (bt <1) meaning that if there is a change in the price of cinnamon at the middleman level or the collector trader by 1 percent then the price at the farmer level will change by 0.984 percent in the same relationship. The value of 0.984 percent less than the figure of 1% can be stated in the long term that price changes at the traders level are not transmitted well to farmers' prices. From the elasticity of the price, transmission is less than 1 percent. Then it can be stated that the sensitivity of price changes at the farmer level is smaller than the price change at the trader level.

The probability value of the price of cinnamon at the level of middlemen or collectors (Pc) of 0.000 is smaller than the real level of 5%. This indicates that the change in the price of cinnamon at the level of middleman traders or collectors in the long term is significant and

affects the purchase price of cinnamon at the farmer level.

c. **The coefficient value of Export (Pe)** of -0.081954 and the probability value of the price of cinnamon at the export level (Pe) of 0.2057 is greater than the real level of 5 percent. This indicates that the change in the price of cinnamon at the export level in the long term has a negative relationship meaning, thus any increase in the price of cinnamon at the export level in the long term will not affect the price of cinnamon at the farmer level. The implications of business and economics show that exporters in the long run also act as monopsonists in buying raw cinnamon bark from both farmers and middlemen or collecting traders

By using time series data for the six-year observation period (2015-2020), the regression results of price relation equations can be written entirely in the form of functional equations in the short term as follows:

$$D(\log P_p) = -0.000357 + 1.023134 * D(\log P_c) - 0.039553 * D(\log P_e) - 0.437217 + ECT \dots (6)$$

Each coefficient value and its mark, either positive or negative, in this functional equation indicates that all independent variables affect

dependent variables significantly at all or one at a time. Or, in other words, an independent variable can significantly describe a dependent variable. This is determined by the value and magnitude of the prob (F-statistic), which is too small, equal to 0.00, and R-squared equal to 0.94, close to one. The ECT value marks with an average at a real rate of 5%. Probability equals 0.0001.

Independent variable of middlemen or collector traders (Pc) significantly affect dependent

variable of cinnamon farmers (Pp) in the short term with a probability value of 0.0000, while independent variable exporters (Pe) have no significant effect affecting dependent variables of cinnamon farmers (Pp) in the short term with a probability value of 0.6167. The economic and business implications of one by one coefficient of independent variable parameters can be interpreted as seen in Table 8

Table 8. Price Efficiency of Cinnamon Commodity Marketing in Domestic Market in the Short Term, Results of Regression Supported by ECM

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000357	0.001909	-0.186761	0.8524
D(LogPc)	1.023134	0.077641	13.17780	0.0000
D(LogPe)	-0.039553	0.078654	-0.502881	0.6167
ECT(-1)	-0.437217	0.108688	-4.022672	0.0001
R-squared	0.941093	Mean dependent var		0.005696
Adjusted R-squared	0.938455	S.D. dependent var		0.064476
S.E. of regression	0.015995	Akaike info criterion		-5.378359
Sum squared resid	0.017142	Schwarz criterion		-5.250884
Log-likelihood	194.9317	Hannan-Quinn criteria.		-5.327666
F-statistic	356.7944	Durbin-Watson stat		1.753293
Prob(F-statistic)	0.000000			

a. The constant value (C) in short-term modeling is very small and negatively marked at -0.00035, implicating in an insignificant influence on the realization of the purchase price of raw cinnamon at the farmer level and the C probability value of 0.85 means that the constant value (C) does not have a significant influence on modeling.

b. The coefficient value of the middleman traders or collectors (Pc) of 1.023 indicates that the elasticity value of the price transmission is greater than one ($bt > 1$). This means that any change in the price of cinnamon at the middle level positively affects the purchase price of cinnamon at the farmer level. Economic and business implications show that

every one percent price change in the middleman traders is transmitted to farmers by 1.023 percent. This condition indicates that the price change at the farmer level is greater than the price change received by the collector from the exporter. This indicates that the working as a middleman traders in the raw cinnamon bark trade-in Kerinci is increasingly competitive, and quite profitable.

c. The coefficient value of Export (Pe) of -0.039, much smaller than one ($bt < 1$). This indicates a one hundred percent increase in the purchase price of cinnamon on the world market. Still, the purchase price of exporters transmitted both to cinnamon farmers and to middlemen or collectors is well below one

hundred percent. This means that the increase in the selling price of cinnamon exports produced by exporters to the world market is not transmitted proportionally to the purchase price of raw cinnamon either from middlemen or directly to farmers. The implications suggest that exporters tend to act as monopsonis in buying raw cinnamon bark from both middlemen and farmers in the economic and business fields.

d. The negative sign marks the ECT Coefficient (ECT = -0.43), stating that there is approximately a 43 percent imbalance that occurs in the short term of the relationship between the dependent variable (Pp) with the independent variables (Pc, Pe). Therefore, this condition explains that an adaptation rate of 43% is required to reach the equilibrium point in the long run in terms of economics. In other words, it takes 43% effort to correct imbalances at any period.

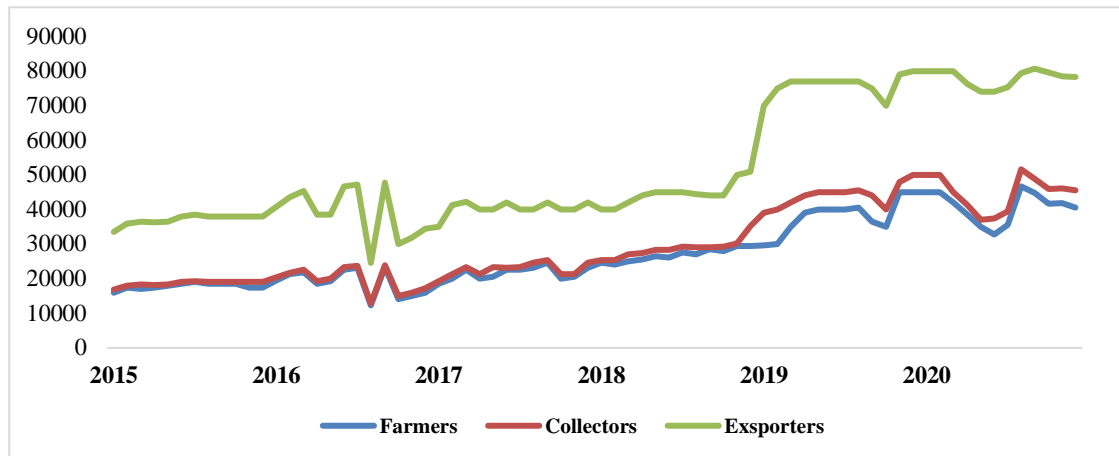
In short: Based on the results of the analysis, the error correction model (ECM) seen that in the short term, the price of cinnamon at the middleman traders or collectors (Pc) has a positive and significant relationship to the change in the price of cinnamon at the farmer level, while the price of cinnamon at the export level (Pe) negatively and insignificantly affect the change in the price of cinnamon at the farmer level. The ECT variable value is marked negatively with the coefficient value -0.437217 and a probability value of 0.0001 means that the ECM model used already has model eligibility.

For the long term, the price of cinnamon at the level of middlemen or traders gatherers (Pc) has a negative and significant relationship to the change in the price of cinnamon at the farmer level, while the price of cinnamon at the export level (Pe) in the long term negatively affects and insignificant to the change in the price of cinnamon at the farmer level which means that any increase in the price of cinnamon at the export level in the long term does not affect the increase in the price of cinnamon at the farmer level.

It can be concluded that the marketing conditions of cinnamon in Kerinci have not been efficient. Lack of access to information on price developments in the market in each marketing

agency shows an indication of asymmetric information between marketing agencies. Market information that occurs at the level of marketing agencies is not distributed well to other marketing agencies. There is one agency that has more information than others, namely exporters. In addition, pressure from marketing agencies at a higher level makes the prices received by farmers (local markets) not integrated with the price of cinnamon at the exporter level (reference) both in the short and long term. This proves that no matter how much price changes occur in the export market, it does not affect the price of cinnamon at the farmer level so that farmers are only the recipients of prices. Therefore, it can be said that the purchase price of raw cinnamon bark at the farmers market level is unfair and does not provide much profit for farmers.

The findings above are strengthened by the economic and business implication of the pricing graphic shown in figure 2, which shows the tendency of the same movement pattern with different price fluctuations. The cinnamon price at the export level tends to fluctuate more than at the middlemen trader and farmer levels. The movement of cinnamon's price at the export level tends not to be followed proportionally by changes in cinnamon's price at the farmer level. The movement of the price of cinnamon at the farmer level is not parallel and proportional to the change in the price of cinnamon at the export level. In comparison, the decline in the price of cinnamon is transmitted more quickly to the traders and farmers. In addition, it is also seen that the value of the price margin is very much different between farmers and exporters, even though farmers are considered one of the important actors in the cinnamon agribusiness subsystem. However, unfortunately, they cannot control the dynamics of price changes in other subsystems, so that cinnamon farmers are often disadvantaged because they do not know price information regularly, do not have strong bargaining power, and only act as price takers.



Source: Several related government agencies (data processed)

Figure 2. Price Trend of Farmers, Middlemen Traders/Collectors, Exporters

In the marketing chain of the domestic cinnamon market.

V. POLICY IMPLICATIONS

Being poor was not something their plan and expectancy. Experiences showed that the behavior of somebody and their economic condition were much formed by the environment where they live. Therefore, no civilized society can be more innovative, creative, productive, efficient, and live in prosperous economic conditions without government intervention policies to help them.

This study suggests that local governments must improve the economic conditions of cinnamon farmers in Kerinci. For that purpose, local government agencies have to intervene in two ways, i.e., on one side, by creating the new entrepreneurial spirit for cinnamon's farmers; it is called "Entrepreneurial Innovation." On another side, establishing new institutions is called "Institutional Innovation" and these two innovations must be integrated and interrelated with each another in one management system. In this perspective, Bupati of Kabupaten Kerinci (*Regent of Kabupaten Kerinci*) and Wali Kota Sungai Penuh (*Mayor of Kota Sungai Penuh*) as the top policy makers in his region, have to work together to form "a joint venture organization". Both must be the leading actors and take full responsibility in implementing

these two grand policies. Each of these two can be elaborated as follow:

5.1. Entrepreneurial Innovation

Entrepreneurial innovation is primarily aimed to develop an entrepreneurial and industrial spirit for cinnamon farmers. Three strategic programs should be implemented in a manner simultaneously, i.e. (1) Transforming the traditional cinnamon's farmers' mindset; (2) Transforming the traditional production; (3) Transforming traditional organization. Each can be explained as follow:

[1]. **Cinnamon's farmers' mindset.** Transforming of cinnamon's farmers' mindset. This objective is required specific programs which are more focused on the mindset transformation of cinnamon farmers. The target is to realize that all cinnamon farmers have the entrepreneurship spirit and work in industrialization. Industrialization is not always associated with the connotation of advanced technology. A more straightforward understanding of "industrialization is a process to transform the input factors to be the output factor so that it will have high added value either in intermediary products or end products and accepted by the market. Only by an industrial process can raw cinnamon bark increase its added value as high as possible. An entrepreneur who has a habit as a "risk-taker" likes to be because of his talent is diligently trying to do the transformation and processing to create more

benefits. The entrepreneurs can be born due to experiences, education, training, guidance, and mentoring, conducted regularly, systematically, and sustainable by a professional agency.

[2]. **Traditional Production.** Cinnamon's farmers, in general, were not yet used to work in a manner of using technological pieces of equipment and information technology systems. That is why they still produce mostly in the form of raw cinnamon. Even if they did the processing, but only to the extent quarter of finished goods. The production process conditions were also not so clean because it was done in a less sterile environment.

[3]. Moreover, they did not give much attention to the control quality of cinnamon processing. Thus, it is time to improve and develop their technical know-how and technological equipment to change production patterns from solely produce raw cinnamon to the production patterns that produce processed products with high added value. The way to do so is by introducing the production pattern in agro-industry, supported by a better agribusiness management system.

[4]. **Legal Status.** The condition of existing business organizations owned can not support if they are going to enlarge their businesses professionally because cinnamon's farmers' community is dominated by the activities of individuals, not organized in the form of a legal entity. The unclear legal status of cinnamon's farmers who lived in plantation areas made them in difficulties when they would like to borrow money from the formal financial institutions and get grants or subsidies from the government. Therefore, cinnamon's farmers' traditional organization style must be encouraged and facilitated to be an organization with clear and clean legal status.

5.2. Institutional Innovation

There are three kinds of policies that relate to institutional innovation and are considered very important to be established, i.e. (1) Cinnamon Special Zone (CSZ); (2) Cinnamon Training Centre (CTC); and (3) Cinnamon Venture Capital (CVC). Each can be explained as follow:

[1]. **CSZ.** Local governments, i.e., Regents and Mayors, have to set a certain number of areas as a Cinnamon Special Zone. The objectives are to bring the government service support closer to cinnamon's farmers and centralize all action programs efficiently in CSZ. It is a business entity with a legal form as corporate ownership or Limited Liability Company (PT or Ltd.), managed by a Board of Directors (BOD). All of the cinnamon farmers or a group of cinnamon farmers and local government should own CSZ. The local government must be enrolled as the controlling shareholders. The other shareholders can come from outsiders after getting legal approval from cinnamon's farmers and local government as shareholders. The main functions of CSZ are: the first is to manage the zone of cinnamon plantation areas and its resources, then promoting infrastructure development, improving the socio-economic welfare of cinnamon farmers households living in the zones. The second is to create and integrate production from upstream to downstream so that the products sold are in the form of end-product with high added values. The third is to take a critical role in marketing products produced for the company, shareholders, and cinnamon farmers.

[2]. **CTC.** As explained above, most of the cinnamon farmers who live in Kabupaten Kerinci and Kota Sungai Penuh were found that on average of less technical knowledge besides the lack of equipment they have. The abundance of plantation resources is owned but cannot be fully utilized to benefit cinnamon's farmers who live in the plantation area of cinnamon. Therefore, it is crucial to create cinnamon farmers' motivation and improve their technical know-how and overall skills. In this context, it is necessary to transform their traditional mindset, which is considered less productive, less innovative, and less creative, to be more productive, innovative, and creative. These are not an easy job if it is done partially and individually. Therefore, a particular institution is needed to handle these missions. It is very relevant to establish a Cinnamon's farmers Training and Guidance Center, which is inseparable from the management system of CSZ. CTC can be in the form of a public service body and focus on activities of training, assistance, including helping in promotion and financing.

[3]. **CVC. Cinnamon's**farmers Venture Capital Company or Cinnamon Venture Capital (CVC) are alternative financial enterprises outside of conventional banking. CVC is very relevant in financing start-up enterprises, entrepreneurs who have potential solid human resources, high motivation but lack start-up funding while the business projects planned are the potential and expected market. The primary mission of "CVC" is to invest in the form of equity participation. The concept of CVC is quite different from banking institutions and other financial institutions. It runs the business based on "risk sharing," but things like that cannot be found in the other financial sources and conventional banks. Therefore, to make investment risk as small as possible, CVC should participate in the management of investee companies and provide related services for mentoring and consulting.

VI. CONCLUSION

1) The condition of the daily economic life of cinnamon farmers, in general, is relatively not favorable due to the low buying price of raw cinnamon bark produced by them. The problems are mainly related to exporters' behavior in setting pricing to buy raw cinnamon from middlemen traders or directly to cinnamon farmers. It tends to practice at least oligopsonistic market power if not the monopsonistic market power. Besides, that is also caused by the low quantity supplied and

quality of production and less alternative financing non-bank to support farmers in developing cinnamon plantation. Meanwhile, natural resource availability is still abundant, meaning that the opportunity opened to enlarge the areas of the cinnamon plantation. Therefore, it can be concluded that inefficiency occurred when exporters set the buying price of raw cinnamon produced by farmers in the domestic marketing system in Kerinci. It implies that the increase in the price of cinnamon in the world market during 2015-2020 was not transmitted proportionally to the buying price of raw cinnamon at the farmer level.

2) Local government intervention policies are critical and urgently required. The research found that the government of district and province do not have clear and concrete program policies to increase the inefficiency of buying prices imposed by exporters when they buy raw cinnamon from middlemen traders directly to cinnamon's farmers Kerinci regions.

3) The present research results succeed in formulating the ideas to stimulate the policymakers at the district government to be courageous to create breakthrough policies to improve raw the buying prices of raw cinnamon at the farmer's level and their economic condition. There are two suggested grand policies: institutional innovation and entrepreneurial innovation, supported by these policies' six strategic programs (see Table 9).

Table. 9. Matrix of Relationship between Policies and Strategic Programs

		Two Grand Policies		
		Institutional Innovation	Entrepreneurial Innovation	
Six Strategic Programs	1	Setting a certain number of areas to be the Cinnamon Special Zones (CSZ). For objective to provide service supports close and centered to cinnamon community.		
	2	Establishing a Cinnamon Training Center (CTC) as a strategic instrument of CSZ management to empower and to improve the skill and technical know-how of cinnamon's farmer human resources.		
	3	Providing the alternative financing sources non-bank. One of that is to establish a Cinnamon Venture Capital (CVC) to support the financing required to accelerate the development of cinnamon plantation and processing.		
			4	Transforming traditional mindset to become entrepreneurship and industrial way of thinking
			5	Transforming traditional production pattern into agro-industry and agri-business model of production.
			6	Transforming the pattern of traditional organization into a legal entity of business organization

4) **Implementing these two grand policies** (3) will be very efficient and effective if supported by the solid cooperation between the local government and universities and research institutions supported by regional government-owned financial institutions.

5) **For further research** is required to arrange the action plan of these two grand policies.

Data Availability Statement :

The data that support the research findings are available from the corresponding author upon request.

Acknowledgment

The authors would like to acknowledge the Directorate of Research and Community Service, Directorate-General for Research and Development, Ministry of Research, Technology and Higher Education of the Republic of Indonesia. The authors are grateful to Andalas University's financial support with contract number: T/4/UN.16.17/PP. Soshum-KRP1GB/LPPM/2020. Thank you very much and the local staff of the government of Kabupaten Kerinci and Kota Sungai Penuh, who have provided full support to smooth out a team of surveyors and data collectors during their survey of these two regions.

References

- [1] Acquah, H. de-G., & Acquah, J. D.-G. (2015). An application of the error correction model in analyzing the long-run equilibrium between Ghana's exports and imports. *Applied Studies in Agribusiness and Commerce*, 9(3), 57–62. <https://doi.org/10.19041/apstract/2015/3/8>
- [2] Anindita, R. (2017). *Agricultural Product Marketing*. Andi Publisher, Yogyakarta.
- [3] Asmarantaka, R. W., Atmakusuma, J., Muflikh, Y. N., & Rosiana, N. (2018). Agribusiness Marketing Concepts: Economic and Management Approach. *Jurnal Agribisnis Indonesia*, 5(2), 151. <https://doi.org/10.29244/jai.2017.5.2.151-172>
- [4] Conforti, P. (2004). *Price Transmission in Selected Agricultural Markets*. FAO Commodity and Trade Policy Research Paper No. 7 (Issue 7).
- [5] Cramon-taubadel, S. Von. (2017). Agricultural Economics Research, Policy and Practice in Southern Africa The analysis of market integration and price transmission – results and implications in an African context. *Agrekon*, 0(0), 1–14. <https://doi.org/10.1080/03031853.2017.1295655>
- [6] Damodar N. Gujarati, D. C. P. (2015). *Basic Econometrics* (Fifth edit, Vol. 2). McGraw-Hill Education.
- [7] Deb, L., Lee, Y., & Lee, S. H. (2020). Market Integration and Price Transmission in the Vertical Supply Chain of Rice: An Evidence from Bangladesh. *Agriculture*, 10(271). <https://doi.org/10.3390/agriculture10070271>
- [8] Dewi Alimah Hari. (2015). Pengusahaan Kayu Manis di Hulu Sungai Selatan, Kalimantan Selatan. *Galam*, 1(1), 9–19. https://www.academia.edu/36772385/Studi_Pengusahaan_Kayu_Manis_di_Hulu_Sungai_Selatan_Kalimantan_Selatan_2015_pdf
- [9] Elvina, E., Firdaus, M., & Fariyanti, A. (2018). Price Transmission And Sequential Bargaining Game Market Behavior Between Marketing Institutions Of Red Chili In Indonesia. *Jurnal Agribisnis Indonesia*, 5(2), 89. <https://doi.org/10.29244/jai.2017.5.2.89-110>
- [10] Firwan Tan(1994). "Industrialization based on technological innovation, role of technology transfer for business development in the regions", *A journal of Economic and Social Studies*, published by PT.Pustaka LP3ES PRISMA Indonesia, 23(1):3-12.
- [11] Firwan Tan (2005) *The price efficiency in Vertical Integrated Market of Natural Rubber Industry in Indonesia*, published by Management and Economic Development Journal, University of Jambi, Vol 4 No.1.
- [12] Firwan Tan (2005). "Industrialization to develop people's economy in the regions, the roles of SMTEs". *Industrial and Urban Journal* 9(16): 968-86. published by Riau University

- [13] Firwan Tan (2018). "Small medium technological enterprises and local economic development to promote industrial and trade activities in Solok city, Indonesia". *International Journal of Sciences and Research*, 74(4): 1-12.
- [14] Firwan Tan, Endrizal Ridwan Lisa Nesti Dewi Sartika, he *Journal of Market Conduct and Derivative Product Development of CPO and PKO in Solok City, Indonesia* Social Sciences Research ISSN(e): 2411-9458, ISSN(p): 2413-6670 , Vol. 5, Issue. 11, pp: 1571-1586, 2019, URL: <https://arpgweb.com/journal/journal/7> DOI: <https://doi.org/10.32861/jssr.511.1571.1586>
- [15] Juliaviani, N., Sahara, S., & Winandi, R. (2017). Transmission Price of Gayo Arabica Coffee In Aceh Province. *Jurnal Agribisnis Indonesia*, 5(1), 39. <https://doi.org/10.29244/jai.2017.5.1.39-56>
- [16] Kustiari, R. (2017). Market Integration and Price Formation of Chili in Indonesia. *International Journal of Sciences: Basic and Applied Research*, 36(3), 301–319.
- [17] Lisa, N. and Firwan, T. (2017a). "The competitiveness crude palm oil of West Sumatra in domestic and word market". *Reports on Economics and Finance*, 3(1): 37–43. Available: www.mhikari.com. <https://doi.org/10.12988/ref.2017>
- [18] Lisa, N. and Firwan, T. (2017b). "Strategies for increasing the competitiveness of fresh fruit bunches farmers against the competitiveness of cpo export in west sumatera". *Internasional Journal Economics and Research*, 8(6): 01–15. Available: <http://ijeronline.com/indexing.php>
- [19] Lisa, N., Firwan, T. and Endrizal, R. (2018). "The efficiency of palm oil fresh fruit bunches in west pasaman (pasaman barat), indonesia (2009-2017)". *International Journal on advanced Science Engineering Information Technology*, 8(4): Available: http://www.ijaseit.insightsociety.org/index.php?Option=comco_ntent&view=article&id=9&itemid=4049
- [20] Menggala, S. R., & Damme, P. V. (2018). Improving Cinnamomum Burmannii Blume Value Chains for Farmer Livelihood in Kerinci, Indonesia. *European Journal of Medicine and Natural Sciences*, 2(1), 23. <https://doi.org/10.2478/ejmn-2018-0004>
- [22] Meyer, J., & Cramon-taubadel, S. Von. (2004). Asymmetric Price Transmission : A Survey. *Journal of Agricultural Economics*, 55(3), 581–611.
- [23] Minot, N. (2014). Food price volatility in sub-Saharan Africa: Has it really increased? *Food Policy*, 45, 45–56. <https://doi.org/10.1016/j.foodpol.2013.12.008>
- [24] Nurhayani, R. (2019). Price Shock and Market Share of Cinnamon Export Kerinci Regency. *Jurnal Sains Sosio Humaniora*, 53(9), 1689–1699. <https://doi.org/https://doi.org/10.22437/js.sh.v3i2.8420>
- [25] Okoh, R. N., & Egbon, P. C. (2005). *The integration of Nigeria 's rural and urban foodstuffs markets* (Issue November).
- [26] Pejman, N., Torkamani, J., & Mousavi, N. (2017). The Study of Transmission of Price from Farm to Retail Shops in Saffron Market (Case Study of Estahbanat). *American Scientific Research Journal for Engineering, Technology, and Sciences (ASRJETS)*, 32(1), 119–131. <http://asrjetsjournal.org/>
- [27] Rahmawati, D., Hidayat, W., & Susilowati, D. (2017). Analysis of the Effect of Bank Indonesia Certificate Interest Rate and Money Supply on Inflation Rate in Indonesia Period 2006-2015 (Error Correction Model Approach). *Jurnal Ilmu Ekonomi*, 1(2), 240–254.
- [28] ResearchAndMarkets.com's, The "Cinnamon Market - Growth, Trends, and Forecast (2019 - 2024)" report provided by Research and Markets Jul 09, 2019, 05:00 ET
- [29] Syamsurijal Tan and Firwan Tan. "Indonesian crude palm oil export performance during the period (1990Q1-2015Q4)", an article published by *Merit Research Journal of Agricultural Science and Soil Sciences*. ISSN: 2350-2274. Vol. 5(8) pp.152-165. August.2017
- [30] Yuniarti, D. (2018). Analysis of Market Integration and Price Transmission from Grain to Organic Rice of Boyolali. *Jurnal Pangan*, 7(2). <https://doi.org/https://doi.org/10.33964/jp>

- .v27i2.370
- [31] Zorya, S. (2014). *Price Transmission from World to Local Grain Markets in Developing Countries: Why It Matters, How It Works, and How It Should Be Enhanced*.
https://doi.org/https://doi.org/10.1596/978-1-4648-0305-5_ch3