Market Integration Analysis of Indonesian Natural Rubber in the World Market

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Abstract: The integration of the export and import market scan be reflected not only by the relationship between the market price and its imports, but it also can be reflected by the relationship between the market prices of imports and exports. The objective of this study is to analyze the degree of integration of Indonesia's natural rubber prices in the international market. The data used in this research is secondary time series data in 1980-2013 from IRSG, BPS, FAO, Gapkindo, UN Comtrade, BI, and the World Bank. The method of analysis using the index of Market Connection(IMC) to measure the index of market integration between the price of natural rubber in China, Japan, Singapore, and South Korea as a follower market and the price of natural rubber in the reference market(market leader) in this case is the United States. The results showed that Indonesia's natural rubber prices in the international market is not integrated with China, Japan, and South Korea for the short term but it may be integrated in the long-term. The result seem to different to the Singapore that it market being integrated with the international market both for short term and long term periods.

1. Introduction

Indonesia is the second largest producer of natural rubber in the world after Thailand, where in 2012 Indonesia's natural rubber production reached 3.27million ton sand together with Thailand each producer ±27% and ±30% of the world's natural rub-
ber. Between Currently Indonesian rubber products almost 100% in the form of semi-finished products of up stream industries such as Ribbed Smoked Sheet (RSS), crum-brubber, Standard Indonesian Rubber (SIR), sheet wind, concentrated latex; while the the down stream products is still very limited.

Table 1. Indonesia Natural Rubber Export to Destination Countries 2008-2012 (in metric tons)

The Country	Year					Growth (%)
	2008	2009	2010	2011	2012	
Japan	400,693	272,878	313,242	387,655	389,234	-3.58
South Korea	106,240	99,548	91,810	120,059	142,691	6.06
China	318,841	457,118	418,098	409,377	437,750	6.32
Singapore	151,260	100,165	117,592	104,262	63,460	-28.32
USA	622,167	394,307	546,548	607,870	572,278	-6.52
Canada	59,163	51,210	69,546	77,262	76,701	5.02
Brazil	77,066	58,507	110,079	94,426	71,086	-8.57
France	46,380	30,083	47,779	65,642	49,062	-5.93
Germany	57,705	36,639	57,492	60,757	59,764	-4.38
Spanish	41,885	25,299	43,061	59,065	39,562	-11.63
Total	1,881,346	1,525,754	1,815,247	1,986,375	1,901,588	-0.80

As an export commodity, the development of Indonesia's natural rubber export volume is quite good (Table 1), it can be seen that the volume of Indonesia's natural rubber export sincreased from year to year.

The main destination countries of Indonesian rubber exportsare the United States, Japan, and China. In addition to these three countries, Indonesia also exports to South Korea and Singapore as well as European countries. Indonesia's natural rubber exports to the United States is used for radial tire industry especially where the greater the size of the tires produced thegreater theneed for natural rubber as well, because natural rubber has a high resistance to cracking and the eruption and has resistance to high temperatures.

Natural rubber price formation process in each country importers (Japan, China, Singapore, and South Korea) varies greatly depending on the demand and supply. The integration market is one indicator of the efficiency of marketing, especially the efficiency of the price, or in other words the integration of markets is a measure that indicates how far the changes in the market price of reference (in this study the United States as a market benchmark) will lead to changes in the market followers namely in the study are Chinese State, the State of Japan, the State of Singapore, and South Korea.

The integration market is very closely related to the analysis of market structure. The integration of the natural rubber market is analyzed by using the Index of Market Connection (IMC), which is to measure the index of market integration between the price of natural rubber in the State of China, the State of Japan, the State of Singapore, and South Korea as a market follower and the price of natural rubber in the United States as the reference market (market leader). Integration of natural rubber market indices in the United States as a market leader with natural rubber market in China's State, the State of Japan, the State of Singapore, and

South Korea as a market follower

Fluctuations in the price of natural rubber in the international market, are likely to give rise to pessimism exports, mainly because exports are the mainstay of primary commodities, which in reality is always undermined by market price volatility, especially in the short term. While in the long term, primary commodities face a circular trend prices tend to decline. Whereas in the same commodity competition in the international market, Indonesia must compete with other natural rubber producing countries have the same comparative advantage.

Research of Asriani (2010) found that the long-term market integration occur between Indonesian cassava export prices to the import prices in Uni Eropa, South Korea, Malaysia, and Japan. It also occurred for Indonesian cassava export prices to the cassava import prices in Thailand, China, EU, Malaysia and Japan. The development of export and import prices of cassava in the domestic market is more volatile than in the world market. Nuraini (2012) also found that there was the long-term market integration between Indonesian pepper market to exporters and importers markets. The export demand of Indonesian pepper to the United States influenced positively by the international real price, the United State real import prices and and Indonesian pepper production. According to Soelistyo (1981) that the export of agricultural commodities is amajor trade commodities from developing countries because it has the advantage of commodities because of natural factor sand labor. An early form of international trade developed to take advantage of the price differences which are the absolute and comparative prices), which is an importing country and other countries if the price of goods is considered to becheaper than when it being produced in the country, and will export the goods if the goods are perceived less costly than other countries.

The process of formation of natural rubber prices in each importing country such as Japan, China, Singapore, and South Korea, varies greatly; it is depending on the demand and supply. The integration market is one indicator of the efficiency of marketing, especially the efficiency of the price, or in other words the integration of markets is a measure that indicates how far the changes that occur in the market price of the reference country (in this study the United States as a market benchmark) that will result in changes to the following markets. In this research the following markets including countries such as China, Japan, Singapore, and South Korea.

The integration ofthe marketis closely related to the analysis of market structure; therefore to study the integration of the natural rubber market, the Index of Market Connection (IMC) was used to analyze the data. The IMC is known as an index to measure the alignment between the market price of natural rubber in the countries such as China, Japan, Singapore, South Korea as a market follower and the price of natural rubber in the United States as market leader. The analysis used a model developed by Ravallion (1986).

The purpose of this research is to analyze the degree of integration of

Indonesia's natural rubber prices with the international market. The benefits of this research are: (1) to development knowledge, especially related to natural rubber issues and its international trade and export, (2) the findings of the research can be used as an input for government and the national export development agencies in improving and developing Indonesia rubber export policy programs, and (3) rubber related business may create job

2. Materials and Methods

2.1 Data Collection Technique

The data used in this research is the secondary data time series of 1980 -2013, obtained from various agencies dealing with research such as International Rubber Statistics Group (IRSG), Central Bureau of Statistics (BPS), Asosiation Natural Rubber Producing Countries (ANRPC), Food and Agricultural Organization (FAO),

Indonesian Rubber Asosiation, the Ministry of Agriculture, Ministry of Industry and Trade, Bank Indonesia, the World Bank, and UN Comtrade.

2.2 Analysis of Market Integration

The integration of the natural rubber market is analyzed by using Index of Market Connection (IMC), which is an index to measure the alignment between the market price of natural rubber in China, Japan, Singapore, and South Korea as a market follower and the price of natural rubber in the reference market (market leader) in this is the United States.

Market integration indices were analyzed using the model developed by Ravallion (1986). The model is based on a different relationship when (lag) auto regresif be spread between the prices in the local market and the price in the central market.

$$(P_{it} - P_{it\text{-}1}) = (\alpha_i - 1)(P_{it\text{-}1} - P_{t\text{-}1}) + \beta io(P_t - P_{t\text{-}1}) + (\alpha_i + \beta_{io} + \beta_{il\text{-}1})P_{t\text{-}1} + \gamma_i X + e_{it}$$

if $(\alpha_i\text{-}1)=b_i$, $\beta_{io}=b_2$, $(\alpha_i + \beta_{io} + \beta_{il\text{-}1})=b_3$, $\gamma_1=b_4$ and so on then:

$$P_{it} = (1 - b_1)P_{it} + b_2(P_t - P_{t-1}) + (b_3 - b_1)P_{t-1} + b_4$$

where is:
Pt = the real price of Indonesia's natural rubber in the international market (American States) at a time tot
$P_{t\text{-}1}$ = the real price of Indonesia's natural rubber in the international market (American States) in time tot-1
P_{it} = the real price of natural rubber Indonesian market importing countries (Japan, China, Singapore, and South Korea) in time tot
$P_{it\text{-}1}$ = the real price of natural rubber Indonesian market importing countries (Japan, China, Singapore, and South Korea) to time t-1
X_t = time trends

b_i (i=0,1,2,3,4) = regression coefficient (parameter estimation)
e_t = *error term*
where is:
$\beta_1 = (1+b_1)$
$\beta_2 = b_2$
$\beta_3 = (b_3\text{-}b_1)$
Index of market connection (IMC) can be calculated usingthe following equation:
$$IMC = \frac{(1+b_1)}{(b_3 - b_1)}$$
because $\beta_1 = (1 + b)$, dan$\beta_3 = (b_3\text{-}b_1)$, thenequation becomes
$$IMC = \frac{\beta_1}{\beta_3}$$

To test statistically whether the real price of Indonesia's natural rubber in the international market (USA) as an independent variable that significantly have or do not have effect to the real price of Indonesian natural rubber in the market of the importing countries such as China, Japan, Singapore, and South Korea, being as the dependent variable can be tested statistical by using t-test. The t-test can be used to test the regression coefficients of each independent variable, to prove whether the real price individually has a significant effect on the dependent variable.

3. Results and Discussion

3.1 The United States with China

Result obtained based on the analysis using the model Ravallion coefficient of determination (R^2) is 0.4884, indicates that 48.84% of market integration with the real price fluctuation of Indonesian natural rubber in the international market (in the United States) can be explained by both the variable of real price of Indonesia's natural rubber in the international market, especially in US, a year before, and the real price of Indonesia's natural rubber in China's market of previous year. The remaining time which is equal to 51.16% is explained by other factors that are not included in the model.

To see the overall effect of independent variables (variables Indonesian real price of natural rubber in the international market (US) a year earlier, the real price of Indonesia's natural rubber in China's market, the real price of natural rubber in the market Indonesia China's of the previous year, and time) jointly against the real price of Indonesian natural rubber in the international market (in the United States) used the F-test test. Based on the analysis in Table 2 that the value of the F value equal to 6.922 and the value is far greater than the value of the F-table (1.750) at 1% error rate ($\alpha = 1\%$). This suggests that the real price of Indonesian natural rubber in the international (US) and China markets a year earlier indicates that the same significant effect on the real price of Indonesian natural rubber in the international market (in the United States) at theconfidence level of 99%. The results of the analysis of the integration of Indonesia's natural rubber prices in the international market (the United States) and in Chinese are presented in Table 2.

Table 2 shows that the real price of Indonesia's natural rubber in the international market (the United States) of the previous year is a statistically significant and have positive effect on the real price of Indonesia's natural rubber in the international market (in the United States) at the 99% confidence level. The value of the regression coefficient of the variable is equal to 0.4436. This means that if the real price of Indonesia's natural rubber in the international market (the United States) of the previous year increased by 1%, assuming other factors in a state cateris paribus (fixed), then the real price of Indonesia's natural rubber in the international market (USA) increased to 0.4436%.

Furthermore, the variable time shows that there is a statistically significant effect on the real price of Indonesian natural rubber in the international market (USA) at the 95% confidence level. The value of the regression

coefficient of the time variable is equal to -12.373. This means that the variable time has a negative effect on the real price of Indonesian natural rubber in the international market (USA) or in other words, there is a tendency during the period 1980 to 2013 the real price of Indonesia's natural rubber in the international market (USA) tends to decrease.

Market integration index of Indonesian natural rubber prices in the international market (the United States) as a market leader and a market price of natural rubber in China as a market follower to capture the model formulation developed by Ravallion (1986).

Table 3 shows that the coefficient β_1 showed a statistically significant difference of real price (significant) at the 99% confidence

Table 2. Results of Analysis of Indonesian Natural Rubber Price integration in the International Market (United States with Chinese State)

No.	Variable name	Regression coefficient	t-test	p-value
1.	The real price of Indonesia's natural rubber in the international market(US) a year earlier	0,4436***	2,923	0,007
2.	The real price of natural rubber in the market Indonesian Chinese State	0,0690[NS]	0,489	0,629
3.	The real price of natural rubber in the market Indonesia China's State of the previous year	0,1909[NS]	1,322	0,169
4.	Time	-12,3730**	-2,178	0,038
5.	Constants	352,8000***	2,575	0,015
	The coefficient of determination(R^2)	0,4884		
	F-count		6,922***	
	Durbin WatsonTest			1,9679

Source: secondary data, processed
Description:
*** = Significant at 1% error rate
** = Significant at the 5% error rate
* = Significant at the 10% error rate
NS = Non-significant

Table 3. Results of Analysis of Indonesian Natural Rubber Market Integration in the United States by the Chinese Using Ravallion Model

No.	Symbols coefficient	Coefficient	t-test	p-value	Information
1.	β_1	0,4436***	2,923	0,007	Both markets are not integrated in the short term
2.	β_2	0,0690[NS]	0,489	0,629	Both integrated market in the long term
3.	β_3	0,1909[NS]	1,322	0,169	
4.	IMC	2,3237			

Source: secondary data, processed
Description:
*** = Significant at 1% error rate
** = Significant at the 5% error rate
* = Significant at the 10% error rate
NS = non-significant

level. This shows that Indonesia's natural rubber prices in the international market (the United States) and in China market are not unified in the short term.; however, Indonesia's natural rubber prices in the international markets (the United States) and in China's integrated in the long term, it is indicated by coefficient β2 that showed no statistically significant difference (non-significant).

3.2 United States by the State of Japan

Result obtained based on the analysis using the model Ravallion coefficient of determination (R2) of 0.5153, indicates that 51.53% market integration with real prices fluctuation of Indonesian natural rubber in the international market (in the United States) can be explained by variable of real price of Indonesia's natural rubber in the international market (US) a year earlier, the current real price of natural rubber in

Japan market, as well as the real price of Indonesia natural rubber in the Japan market in the previous year. The remaining time which is equal to 48.47% is explained by other factors that are not included in the model.

To see the overall effect of independent variables (variables Indonesian real price of natural rubber in the international market (US) a year earlier, the current real price of natural rubber in the Japan market, the real price in Japan market in the previous year and time to the real price of Indonesian natural rubber in the international market (the United States), F test was used to see the effect.

Based on the results in Table 4 that the value of the F value equal to 7.707 and the value is far greater than the value of the F-table (1.750) at 1% error rate (α =1%). This suggests that the real price variable Indonesian natural rubber in the

Table 4. Results of Analysis of Indonesian Natural Rubber Price integration in the International Market (United States) and Japan

No.	Variable Name	Regression Coefficient	t-test	p-value
1.	The real price of Indonesia's natural rubber in the international market (US) a year earlier	0,5731***	3,330	0,002
2.	The real price of natural rubber in the market Indonesia Country Japan	0,3381^{NS}	1,259	0,218
3.	The real price of natural rubber in the market Indonesia Japan State of the previous year	-0,2628^{NS}	-0,983	0,334
4.	Time	0,0143^{NS}	1,277	0,038
5.	Constants	0,4046*	1,842	0,076
	The coefficient of determination (R^2)	0,5153		
	F-count		7,707***	
	Durbin Watson Test			1,9665

Source: Secondary data, processed

Description:
*** = Significant at 1% error rate
** = Significant at the 5% error rate
* = Significant at the 10% error rate
NS = Non-significant

international market (US) a year earlier, the real price of natural rubber in the market State Indonesia Japan, the real price of natural rubber in the market State Indonesia Japan the previous year, and time in the model together-Same significant effect on the real price of Indonesian natural rubber in the international market (United States) at the 99% confidence level. The results of the analysis of the integration of Indonesia's natural rubber prices in the international market (the United States) with the Japan as shown in Table 4.

In Table 5 that the real price of Indonesia's natural rubber in the international market (the United States) of the previous year showed a statistically significant and positive effect on the real price of Indonesia's natural rubber in the international market (United States) at the 99% confidence level. The value of the regression coefficient of the variable is equal to 0.5731. This means that if the real price of Indonesia's natural rubber in the international market (the United States) of the previous year increased by 1%, assuming other factors in a state cateris paribus (fixed), then the real price of Indonesia's natural rubber in the international market(USA) increased amounted to 0.5731%. While the real price variable Indonesian natural rubber in the State of Japan market, the real price of natural rubber in the market Indonesia Japan State of the previous year, and the time did not show statistically significant effect on the real price of Indonesian natural rubber in the international market (USA) at the level of trust 95%.

Market integration index Indonesian natural rubber prices in the international market (the United States) as a market leader with a market price of natural rubber in the State of Japan as a market follower to capture the model formulation developed by Ravallion (1986) can be shown in Table 5.

In Table 5 shows that the coefficient β_1 showed a statistically significant difference (significant) at the 99% confidence level. This shows that Indonesia's natural rubber prices in the international market (the United States) with Indonesia's natural rubber prices

Table 5. Results of Analysis of Indonesian Natural Rubber Market Integration in the International Market (United States) with the State of Japan Model Ravallion

No.	Symbols coefficient	Coefficient	t-test	p-value	Information
1.	β_1	0,5731***	3,330	0,002	Both markets are not integrated in the short term
2.	β_2	0,3381^{NS}	1,259	0,218	Both integrated market in the long term
3.	β_3	-0,2628^{NS}	-0,983	0,334	
4.	IMC	-2,1807			

Source: secondary data, processed
Description:
*** = significant at 1% error rate
** = Significant at the 5% error rate
* = Significant at the 10% error rate
NS = non-significant

Table 6. Results of Analysis of Indonesian Natural Rubber Price integration in the International Market (United States) with the State of Singapore

No.	Variable Name	Symbols Coefficient	t-test	p-value
1.	The real price of Indonesia's natural rubber in the international market (US) a year earlier	$-0,0467^{NS}$	-0,257	0,779
2.	The real price of natural rubber Indonesia in the market of Singapore	$-0,1199^{NS}$	-0,817	0,421
3.	The real price of natural rubber in the markets of Singapore Indonesia the previous year	$-0,1754^{NS}$	-1,124	0,270
4.	The Time	-11,7790*	-2,085	0,046
5.	Constants	357,3900***	2,878	0,007
	The coefficient of determination(R^2)	0,1946		
	F-count		$1,752^{NS}$	
	Durbin Watson Test			2,0882

Source: secondary data, processed
Description:
*** = Significant at 1 % error rate
** = Significant at the 5% error rate
* = Significant at the 10% error rate
NS = Non-significant

Table 7. Results of Analysis of Indonesian Natural Rubber Market Integration in the International Market (United States) with the State of Singapore Model Ravallion

No.	Symbols Coefficient	Coefficient	t-test	p-value	Information
1.	β_1	$-0,0467^{NS}$	-0,257	0,779	Both integrated market in the short term
2.	β_2	$-0,1199^{NS}$	-0,817	0,421	Both integrated market in the long term
3.	β_3	$-0,1754^{NS}$	-1,124	0,270	
4.	IMC	2,3237			

Source: secondary data, processed
Description:
*** = Significant at 1% error rate
** = Significant at the 5% error rate
* = Significant at the 10% error rate
NS = Non-significant

in the State of Japan is not integrated in the short term. However, Indonesia's natural rubber prices in the international markets (United States) at the price of natural rubber in the State Indonesia Japan integrated in the long term indicated by coefficient β2 showed no statistically significant difference (non-significant).

3.3 United States by the State of Singapore

Result obtained based on the analysis using the model Ravallion coefficient of determination (R^2) of 0.1946, this indicates that19.46% market integration with the rising and falling real prices of Indonesian natural rubber in the international market (the United States) can be explained by jointly

by the variable real price of Indonesia's natural rubber in the international market (US) a year earlier, the real price of natural rubber Indonesia in the market of Singapore, Indonesia real price of natural rubber in the market of Singapore the previous year, and time while the remaining of 80.54% is explained by other factors that are not included in the model. The results ofthe analysis of the integration of Indonesia's natural rubber prices in the international market (the United States) with the State of Singapore as shown in Table 6.

In Table 7 shows that the coefficient β1 and β2 showed no statistically significant difference (non-significant) at the 90% confidence level. This shows that Indonesia's natural rubber prices in the international markets (United States) at the price of natural rubber in the State Singapore Indonesia integrated both in the short term and in the long term.

In Table 7 shows that the coefficient β1 showed no statistically significant difference (non-significant) at the 99% confidence level. This shows that Indonesia's natural rubber prices in the international markets (United States) at the price of natural rubber in the State Singapore Indonesia integrated in the short term and long term indicated by coefficient β2 showed no statistically significant difference (non-significant).

3.4 United States to South Korea

Result obtained based on the analysis using the model Ravallion coefficient of determination (R^2 of 0.5970, indicates that 59.70% market integration with fluctuation of real prices of Indonesian natural rubber in

the international market (the United States) can be explained by jointly by the variable real price of Indonesia's natural rubber in the international market (US) a year earlier, the real price of natural rubber Indonesia in the South Korea market, the real price of natural rubber in the market Indonesia South Korea the previous year, and time while the remainder, amounting to 40.30% is explained by other factors that are not included in the model. The results of the analysis of the integration of Indonesia's natural rubber prices in the international market (the United States) with South Korea as shown in Table 8.

In Table 8 that the real price of Indonesia's natural rubber in the international market (the United States) of the previous year showed a statistically significant and positive effect on the real price of Indonesia's natural rubber in the international market (in the United States) at the 99% confidence level. The value of the regression coefficient of the variable is equal to 0.5550. This means that if the real price of Indonesia's natural rubber in the international market (the United States) of the previous year increased by 1%, assuming other factors in a state cateris paribus (fixed), then the real price of Indonesia's natural rubber in the international market (USA) increased amounted to 0.5550%.

Furthermore, the real price variable of Indonesian natural rubber in South Korea market the previous year shows that there is a statistically significant effect on the real price of Indonesian natural rubber in the international market (USA) at the rate of 90%. The value of the regression coefficient

Table 8. Results of Analysis of Indonesian Natural Rubber Price integration in the International Market (United States) with South Korea

No.	Variable Name	Regression Coefficient	t-test	p-value
1.	The real price of Indonesia's natural	0,5550***	3,408	0,002
2.	The real price of natural rubber in the market Indonesia South Korea	-0,1417^{NS}	-1,337	0,192
3.	The real price of natural rubber in the market Indonesia South Korea previous year	0,2485*	1,654	0,109
4.	The Time	2,6253^{NS}	0,654	0,518
5.	Constants	-20,4750^{NS}	-0,255	0,801
6.	The coefficient of determination (R^2)	0,5970		
	F-count		10,740**	
	Durbin WatsonTest			2,1522

Source: secondary data, processed
Description:
*** = Significant at 1% error rate
** = Significant at the 5% error rate
* = Significant at the 10% error rate
NS = Non-significant

Table 9. Results of Analysis of Indonesian Natural Rubber Market Integration in the International Market (United States) with South Korea Model Ravallion

No.	Symbols Coefficient	Coefficient	t-test	p-value	Information
1.	β_1	0,5550***	3,408	0,002	The second market is not integrated in the short term
2.	β_2	-0,1417NS	-1,337	0,192	The second market is not integrated in the short term
3.	β_3	0,2485*	1,654	0,109	
4.	IMC	2,2334			

Source: secondary data, processed
Description:
*** = significant at 1% error rate
** = Significant at the 5% error rate
* = Significant at the 10% error rate
NS = non-significant

of variables Indonesian real price of natural rubber in the South Korea market the previous year amounted to 0.2485. This means that if the real price of natural rubber in the market Indonesia South Korea the previous year increased by 1%, assuming other factors in a state cateris paribus (fixed), then the real price of Indonesia's natural rubber in the international market (USA) increased by 0,2485%.

Other variables included in the show no statistically significant effect on the real price of Indonesian natural rubber in the international market (USA) is the real price of natural rubber variable Indonesia in the South Korea market and time variables. This suggests that the rise and fall of the real price of Indonesia's natural rubber in the international market (USA) is not due to the influence of variables Indonesian real price

of natural rubber in the South Korea market and time variables.

Market integration index Indonesian natural rubber prices in the international market (the United States) as a market leader with a market price of natural rubber in South Korea as a market follower to capture the model formulation developed by Ravallion (1986) can be shown in Table 9.

In Table 9 shows that the coefficient β1 showed a statistically significant difference (significant) at the 99% confidence level. This indicates that Indonesia's natural rubber prices in the international market (the United States) and in South Korea are not integrated in the short term; however the prices are integrated in the long term that indicated by coefficient β2 that shows no statistically significant difference (non-significant).

4. Conclusion

Response of Indonesia's natural rubber prices to market integration in the international market are as follow: (1) China is not a unified country in the short term but it will be integrated in the long-term, (2) Japan is not integrated in the short term but in I will be integrated in the long-term, (3) Singapore is integrated both in the short term and in the long term, (4) South Korea is not integrated in the short term but it will integrated in long term. Analysis of market integration is closely associated with the analysis of market structure, so that the results of this study will be applicable to direct and to improve the structure of Indonesian natural rubber export market being effective and efficient in the international market. Policy implication to the development of Indonesia

natural rubber export can be applied through the following measures: (1) extensification and rejuvenation of rubber plantation that can be carried out by increasing the natural rubber productivity. In addition, the productivity may be increased through the use of the high productivity clones and the appropriate available production technologies, (2) the partnership relationship between the export destination countries and the importing countries of Indonesia natural rubber make possible importing countries to access the Indonesia natural rubber in the international market, so that the market become a reference market of Indonesia narural rubber and it can serve and provide various demand from imported partner.

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