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Choice of Marketing Channels by Rubber Small Traders in the Jambi Province, Indonesia

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Introduction

World rubber production is dominated by Asian countries, with Indonesia being the second largest producer after Thailand. With the third largest plantation area, the Jambi province is one of the largest contributors to Indonesia's rubber production (10.66%). In order to develop the Indonesian rubber industry further, the efficiency of the rubber marketing system needs to be taken into account which is strongly impacted by the choice of the marketing channels.

Many researchers have focused their study on the choice of marketing channels of different commodities. However, most of these studies focused on farmers, while the study of marketing channels on the traders' level is rare. Nevertheless, rubber traders are important stakeholders in distributing rubber from farmers to processors. Thus, study of marketing channel choice on traders' level is able to fill the gap and to contribute to the diversity of research.

Factories are expected to be the most beneficial buyers from the traders' perspective in order to optimise their trading business. However, there are many traders who select other channels. The questions addressed in this study are which factors determine the choice of marketing channels by rubber traders and why the village traders tend to sell the rubber to other channels than a factory.

Material and Methods

Data used in this study is part of the data collected by the research team of Collaborative Research Centre 990, Department of Agricultural Economic and Rural Development, University of Göttingen between September and November 2012 in the Jambi province, Indonesia. Regencies were selected purposively to visualize the rubber marketing channel conditions, while stratified random sampling was further applied in selecting districts and villages. The criteria used to select traders require them 1) to be active traders, 2) to have a minimum of five suppliers, and 3) to have purchased a minimum of 500 kg/month of raw rubber from suppliers. Primary data was derived from questionnaires completed by rubber traders in the aforementioned locations.

A Multinomial Logistic Regression (MLR) Model is employed to determine the factors affecting the channel choice. The model is used to analyze the probability of occurrence of a certain category in comparison to the chosen reference category. Based on the field data collected, there are 4 channels chosen by the traders (dependent variable); (1) Other Traders; (2) Warehouses; (3) Factories; and (4) Auction Markets (Figure 1). "Factories", was selected as the reference channel, as a simplification in elaborating and defining the result.

The independent variables are clustered into seven factors, which are trader characteristic, size of business, profitability aspect, information aspect, negotiation aspect, credit access, and location. Clustering is done based on studies presented on the previous chapter (Fertő and Szabó, 2002, Zúñiga-Arias, 2007, Bignebat et al., 2009, Chirwa, 2009, and Xaba and Masuku, 2013).
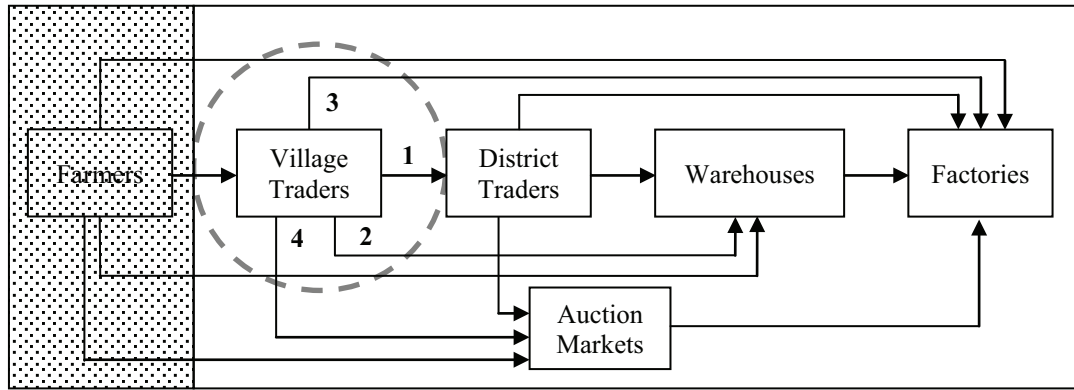
Source : *own observation* with figure based on Kopp, 2014

Figure 1. Choice of Marketing Channels of Village Traders in the Jambi Province

Trader characteristic factor consists of variable of age, education, ethnic similarity, household size, and trade experience, while size business factor is depicted by computer and storage ownership variable and share revenue variable. Quantity as a log value variable and quality variable represent profitability aspect factor. Price information index variable (knowledge in price determination and competitors' price) and information index variable (smart-phone usage, internet availability, and membership in farmer/trader organization) portray information aspect factor. Moreover, negotiation aspect factor includes negotiation index variable (agreement availability and dependency which represents potential problem during termination of business between traders and buyers), while credit access factor consists of variable of loan availability, obligation to sell and credit regulation. Lastly, location factor is directly represented by location similarities variable.

Taking into account all the statistical variables illustrated above, statistical model is developed (Equation 1):

$$\log \frac{\mathrm{P}\ (Y_i = channel\, r)}{\mathrm{P}\ (Y_i = channel\ 3)} = \beta_{r0} + \beta_{r1}\, age + \beta_{r2} education + \beta_{r3} ethnic\_similarities + \beta_{r4} householdsize$$
$$+ \beta_{r5} tradeexperience + \beta_{r6} comp\&Sto_{-index} + \beta_{r7} shrrevenue + \beta_{r8} quantitytotallog$$
$$+ \beta_{r9} quality + \beta_{r10} priceinformation_{index} + \beta_{r11} information_{index}$$
$$+ n\beta_{r12} negotiationaspects_{index} + \beta_{r13} loanavailabilitybuyer + \beta_{r14} obligationtosell$$
$$+ \beta_{r15} creditregulation + \beta_{r16} location\_similarities + e_r$$

$$... Equation1$$

where $\log \frac{\mathrm{P}\ (Y_i = channel\ r)}{\mathrm{P}\ (Y_i = channel\ 3)}$ is the log of the probability of choosing channel *r* in comparison to the reference channel.

Apart from this, Goodness of Fit in MLR is tested by Pseudo R2 measurement of McFadden (Cameron and Trivedi, 2005, p. 499), which is

$$R^2 = 1 - lnL_{fit}/lnL_0$$

where L_{fit}: fitted model and L_0 : intercept-only model. Likelihood value for any multinomial model is zero in maximum (Cameron and Trivedi, 2005, p. 499), which leads to negative values for both L_{fit} and L_0. The MLR model can be used if $L_{fit} > L_0$.

Noteworthy, the marginal effect is used to obtain a basic interpretation in the multinomial model (Cameron and Trivedi, 2005, p. 499). In the case of a linear regression model, the marginal effect can be directly implied from the coefficient (β) (Cameron and Trivedi, 2005, p. 122). Meanwhile, the marginal effect used in the multinomial logistic regression model is defined as

$$\frac{\partial \mathrm{E}[y|x]}{\partial x} = \exp(x_i' \beta_r) \beta_r$$

Results and Discussion

The result of the statistical model is presented in Table 1. The model converged in the log likelihood of -121.00407 indicating that the data fits into the distribution function, while its Pseudo R^2 is 0.4505 indicating that $L_{fit} > L_0$, showing the reliability of the model. Based on the result, several explanatory variables are responsible for the significant results although not every significant variable satisfied the theoretical explanations.

Table 1. Marginal Effect of the MLR Model in this Study (*significant only*)

VARIABLES	(Other Traders) 1	(Warehouse) 2	(Factories) 3	(Auction Market)[1] 4
Age	0.001528	0.001385	-0.00291	2.10E-27
	(0.174)	(0.79)	(0.581)	.
ethnic_similarities	0.086751	-0.22855*	0.141798	3.41E-27
	(0.243)	(0.076)	(0.332)	.
quantitytotallog	-0.02772*	-0.02754	0.055265	0
	(0.061)	(0.495)	(0.171)	.
information_index	-0.0071	0.134224*	-0.12712*	0
	(0.614)	(0.075)	(0.099)	.
loanavailabilitybuyer	0.131656*	0.04833	-0.17999*	-5.40E-32
	(0.054)	(0.637)	(0.074)	.
obligationtosell	-0.00783	-0.25575**	0.263583**	5.91E-36
	(0.596)	(0.015)	(0.014)	.
creditregulation	-0.01082	-0.20055**	0.211363**	1.29E-37
	(0.5)	(0.041)	(0.035)	.
location_similarities	-0.05333*	-0.32906***	0.382387***	0
	(0.065)	(0)	(0)	.

*** $p<0.01$, ** $p<0.05$, * $p<0.1$
Number of observations: 199 ; Log Likelihood: -121.00407 ; Pseudo R2: 0.4505

When examining the factors that lead to the choosing of auction market, all variables are not significant. The main reason the low of number of respondents who choose auction market as their main buyer. Although auction market has fewer requirements to be fulfilled in comparison to others, auction market offers a lower value (Fathoni, 2009). Nonetheless, the existence of an auction market in the Jambi province is not negligible, as it is able to facilitate both the traders and the buyers, facing distance constraints, to perform transactions.

Peculiarly, the similarity of ethnic between traders and buyers decreases the probability in choosing warehouse by about 23%. The admissible reason is that those traders may have more difficulties in negotiation in trading rubber to channels other than "warehouse" if their ethnic is not similar.

Quantitytotallog variable illustrates how many kilograms of total rubber were sold in the last month as a log value. The total quantity decreases the probability in choosing "other traders" by 0.028%. As expected, the higher the total quantity is, the less the probability to choose other traders becomes. Smaller traders with less quantity tend to distribute rubber to other traders.

By having higher information index, it is expected that the trader is more likely to choose "factory". However, based on the estimation, an increase in level of information index increases the probability in choosing warehouses by 13.42%, and decreases the probability in choosing factories by 12.71%. The plausible reason is that there are more warehouses found in comparison with factories, where competition among them leads to a difference in price level and volatility. At some point, the maximum buying price offered by warehouse may also exceed the buying price of the factory. Meanwhile, contract is often required by factory, which may prevent the traders to change to the more profitable buyer at will. Traders, who have better access in

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[1] The inclusion or exclusion of this category does not affect the significance of other estimators.

information about price changes and price difference among warehouses, are able to make the most of that opportunity. Thus, traders who have higher information access tend to choose warehouse in comparison to the factory, and vice versa.

The loan availability increases the probability in choosing other traders by 13.17% and decreases the probability in choosing factories by 18%. Bureaucratic procedure attached to the factory loan leads traders to find other loan sources, in this case "other traders".

The obligation to sell and regulation decreases the probability in choosing warehouse by 25.58% and 20.06% respectively, as well as increases the probability in choosing factories by 26.36% and 21.14% respectively. If both buyers apply an obligation to sell and require a written contract as credit regulation, the probability of trader in choosing warehouses is lower than factories, where factory is expected to offer higher profit.

At last, the location similarity decreases the probability in choosing "other traders" and "warehouse" by 5.33% and 32.91% respectively, while it increases the probability in choosing "factories" by 38.24%. Location is categorized as similar when both the buyer and the trader operate in the same village, district, regency or province; hence, the location difference roughly describes the distance between the buyer and the trader. Buyers of different regencies are considered to be farther away from traders than those of the same village. Therefore, the greater the amount of distance between buyer and trader is, the higher the probability of a trader to choose factory becomes which is in accordance with the result.

Conclusions and Outlook

Results show that factors significantly affecting the decision of channel choice include location, credit access, information access, profitability aspects, and trader characteristic. Traders tend to sell to other channels instead of factories if their location is far from the factory, if they have a relatively low quantity to sell, if there is better information access and if other channels have a more accessible bureaucratic procedure.

The high significance in the location variable in all channels, lead this variable to be taken into account. Better infrastructure plays an important role to reduce the transportation cost, since most of small traders spread all over in the remote area. Thus, the infrastructure need to be further developed. Telecommunication infrastructure also requires attention considering that traders need real time price information because of the frequent changes in price. Besides, in order to promote traders to sell directly to factories, it is needed to support loan access for traders. Moreover, it is necessary that traders are encouraged to increase their quantity traded. At last, by deliberating all factors influencing the choice of channels by rubber small traders, the policy makers and all parties related will be able to determine more precisely the policy and action required to enhance the development of rubber industry in the Jambi province, Indonesia.

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