Marketing Channel Choice of Cocoa Farmers in Madiun Regency, East Java, Indonesia

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Abstract.

The cocoa value chain developments in Indonesia are still promising and challenging as there are continuing emerging market opportunities and grown largely by smallholder farmers. However, there is limited attention on cocoa value chain in term of smallholder farmers who potentially to be promoted with respect to their marketing channel choice. The objective of this study is to understand the types of beans preferred and the factors of buyers chosen by farmers. This study shows that farmers still prefer unfermented beans rather than fermented beans. Using multinomial logit analysis, the results indicate that age and farming experience influenced farmers in selling to sub-regency and regency traders compare to village traders. Meanwhile, number of trees and price is affecting the farmers to sell to regency level traders to village level traders. Understanding what farmers' preferences when they sell cocoa beans and why farmers choose certain selling channels help to design a better policy to improve farmers' livelihood and cocoa value chain development.

Keywords: cocoa value chain, marketing channel choice, multinomial logit

JEL codes: Q13

1. Introduction

Indonesia is the third largest producer of cocoa beans in the world with the estimated production of 450,000 tons in 2011/2012. The largest producer is Ivory Coast with 1.49 million tons of cocoa beans in 2011/2012 (Figure 1). In terms of growth during the period of 2005/2006 until 2011/2012, Indonesia's production suffered a decrease by an average of 3.16 percent; meanwhile Ivory Coast and Ghana have a positive production growth of 1.63 percent and 5.99 percent, respectively. In 2012/2013 it is forecasted that Indonesia's cocoa beans production will decrease to 430 thousand ton or decrease by 4.44 percent from the previous year.

In 2011, 94 percent of the cocoa area belongs to farmers and the rest belongs to private and government companies. The cocoa beans from farmers will ends up into exporter, which eventually will be exported, or to the processing companies which eventually will be processed into intermediate products such as cocoa paste, butter or powder. After the implementation of export tax in April 2010, the cocoa beans export decreased significantly (Figure 2). In 2011 cocoa beans export decrease by 48 percent and in 2012 the value keep on decreasing by 37 percent. In addition, the implementation of cocoa beans export tax also decrease Indonesia's cocoa product competitiveness (Rifin and Nauly, 2013).

On the other hand, the implementation of export tax increase the number of cocoa beans processed domestically from 190,000 tons in 2010/2011 to 270,000 tons in 2011/2012, a 42 percent increase (ICCO, 2013). This increased is also supported by the increase in cocoa processing companies capacities from 150,000 tons/year in 2010 to 280,000 tons/year in 2011 (Media Data Riset, 2012).

Meanwhile in the farmer's level, the implementation of export tax do not shift their marketing channel (Rifin, 2015), the shift occurred in the trader's level where they are going to sell their cocoa beans, to exporter or cocoa processing companies. Although in several cases, there are exporter or processing companies buy directly cocoa beans from farmers. Therefore how farmers choose to whom their cocoa beans are sold is interesting to be analyzed.

This article is arranged into several parts, the next part discuss the literature review regarding marketing channel choice in several commodities and

cocoa. After literature review, the methodology utilized in this research is discussed followed by the marketing channel discussion in Madiun Regency and lastly regarding the marketing channel choice.

2. Literature Review

Marketing is defined as a set of activities involved in moving a product from the producer to the consumer. In term of agricultural marketing, it is associated with the movement of agricultural products from the farmers to the final consumers. This includes marketing channels such as traders, wholesalers and retailers who help make agricultural products from farmers to become available for consumers (Kohls and Uhls, 2008).

Several article has analyzed the cocoa marketing channel, different location has relatively similar marketing institution involved also there are several differences. In South Sulawesi, one of the central production of cocoa in Indonesia, besides the traditional traders in the village, sub-regency and regency level, there are also multi-national companies buy directly from farmers. This multi-national companies usually buy in the form of wet or dried beans and exported the product to their own processing facilities abroad (USAID, 2006; Rifin, 2015)

Meanwhile in other places such as Central Sulawesi and Southeast Sulawesi, the traders and exporter play an important role in cocoa beans marketing channel (KPPU, 2009). In addition, other instituion such as cooperatives in Jayapura, Papua also involve in cocoa beans marketing (Wally, 2001).

The situation slightly change after the implementation of cocoa beans exprot tax policy in April 2010. Previously, most of the cocoa beans ends up in the exporter but after the implementation of export tax, processing companies have taken the role in absorbing the beans to be processed into several products (Pradiptyo, 2010; Rifin, 2015).

Regarding factors influencing farmers marketing channel choice, there are two main approach in looking at the issue. First is using the transaction cost approach in analyzing marketing channel choice. Gong et.al (2006) analyze factors affecting the shift of marketing channel from spot market to direct

marketing of beef cattle farmers in China. The main reason of the shift is the transaction cost. The shift to direct marketing will minimize transaction cost especially negosiation cost and it will help improve the quality of product in the beef cattle supply chain and eventually will improve the safety of the meat products

Wijnands et.al (2006) analyze the marketing channel choice of Kenyan cut flower market in the Netherlands using transaction cost approach. The authors reveal that there are no differences between the channels in terms of uncertainty about prices, finding buyers or transparency of quality standards.

The second approach is by looking at the characteristics of the farmers. The characteristics can be personal characteristics or farming characteristics. Tsourgiannis et.al (2008) analyze factors influencing sheep and goat farmers in Greece to choose their marketing channel. Using multivariate analysis the results indicate that factors influencing marketing channel choice are production orientation, cost focus, profit orientation, differentiation and interpersonal relationships.

For cocoa beans, Ogunleye and Oladeji (2007) analyze the influence in choosing marketing channel in Nigeria. The study reveals that factors associated with the choice of each of these channels are the time of payment, mode of payment, price of product, distance from farm, transportation cost and grading of product. Higuchi et.al (2011) analyze why cocoa farmers sell their beans to intermediaries rather than cooperatives. The two has different marketing functions performed. The result shows that farmers with larger production have the tendency to sell to the intermediaries meanwhile small-scale farmers sell their beans to cooperative. In the case of Indonesia, Hendayana (2004) analyze factors influencing cocoa beans marketing channel choice in Papua using logistic regression. The results show there are three variable affecting the marketing channel choice, namely farmer's experience, education level and cocoa trader's behavior.

This article utilized the farmer's characteristic approach with similar variable used in Hendayana (2004). Different from Hendayana (2004), since the

dependent variable consists of three choices therefore multinomial logit is used rather than logistic regression.

3. Methodology

This research is conducted in Madiun Regency, East Java which is one of the cocoa producer area and the in the marketing activities have involved the processing and exporter. The research is conducted from May until November 2012.

The data collected consists of primary and secondary data. The primary data is collected from farmers, traders, processer and exporter but the emphasis will be on the relation between farmers and traders. The secondary data is collected from various sources including Statistics Office, website and other sources.

The respondent consists of 109 farmers in three sub-regency (Kare, Dagangan and Gemarang), Madiun Regency and they were asked using questionnaire. The farmers are seleceted purposively and the traders are traced from the farmers who they sold their beans. Additional information on the value chain is also collected therefore the product is traced until the processing companies or exporter. For the traders, a total of 20 traders are interviewed which can be classified into 9 village traders, 6 sub-regency traders, 3 regency traders and 2 wholesalers.

Two analyses are conducted. First the marketing margin analysis which calculated the margin received by each institution involved in the cocoa value chain. Second, the marketing channel choice analysis which analyzed factors that affecting farmers to whom they sold their cocoa beans.

The marketing margin analysis consists of total margin which is the difference between price in farmer's level (producer) and price in consumer (or exporter) and margin in every institution in cocoa supply chain which is difference between selling price and buying price including cost during handling. The formula is as follows:

$$M_T = P_r - P_f \ or \ M_T = \sum_{i=1}^{n} M_i$$

$$M_i = P_i - P_{i-1} \ or \ M_i = B_i + \pi_i$$

Where

M_T	= Total marketing margin (Rp)
M_i	= Marketing margin in institution i, i=1,2,...n (Rp)
P_r	= Consumer's Price (Rp)
P_f	= Farmer's price (Rp)
P_i	= Price in institution i
P_{i-1}	= Purchasing price in institution i
B_i	= Marketing cost in institution i
π_i	= Profit in institution i

The marketing channel choice analysis is conducted in order to identify which channel choose in selling their beans. The decision in choosing the marketing channel is an important decision in supply chain management (Kotler, 2005). The marketing channel theory gives incentive to upstream actors (farmers) and downstream actors (exporter and processor) to build communication and relation in order to decrease market uncertainty and able to respond quickly to consumer's demand change.

The model used to analysis the marketing channel preference by farmers is the multinomial analysis since the dependent variable is in the form of dummy but it has more than two choices (Nachrowi and Usman, 2002). The model is as follows:

$$L_i = \alpha_0 + \alpha_1 AGE + \alpha_2 EXP + \alpha_3 EDU + \alpha_4 OCC + \alpha_5 TRE + \alpha_6 PRI + \varepsilon$$

Where:

L_i = choice of marketing channel (0 = village traders; 1=sub-regency traders; 2=regency traders)

AGE = farmer's age (years)

EXP = farming experience (years)

EDU = farmer's education (years)

OCC = main occupation (0 = farming is not main occupation; 1= farming is the main occupation)

TRE = number of cocoa trees (trees)

PRI   = price of cocoa beans (Rp/kg)

The hypothesis is that all of the coefficients will be positive. In solving the model, there will be two equations, the sub-regency and regency traders equation. Both equations will be compared to the village traders.

4.   Result and Discussion

About 84.4% of farmers show preferences for selling unfermented cacao beans, e.g. dried and wet beans, whereas only 15.6% prefer fermented cacao beans associated with better quality and price. It implies that fermentation practices are still low among farmers. The main reasons why farmers for not doing fermentation practices properly are economic constraints such as immediately cash needed and no price difference. Thus, a better policy to provide an incentive price for appropriately fermented cacao beans should be implemented to encourage farmers adopts the proper fermentation practices.

The marketing system of cocoa in Madiun Regency consists of three sub-regency, Dagangan, Kare and Gemarang. It begins from farmers (producers) until consumer which involves several marketing institutions. The marketing institution involved are farmers, village traders, sub-regency traders, regency traders, exporter and processing industry. Almost 90 percent of the beans produced in Madiun Regency ends up in wholesaler Guyub Santoso Farmer's Group in Blitar Regency which eventually ends up in processing industry or exporter and the rest goes to PT Pagilaran in Yogyakarta. The role of every marketing institutions are as follows:

Village traders

Village traders collect the cocoa beans from farmers and buy cocoa beans stock. The village traders usually have economic relation with farmers in the form of informal buying relation or credit relations. This village traders mostly lives in the similar village with the farmers or from nearby village.

Sub-regency traders

Sub-regency traders are traders which collect cocoa beans in several village but in the same sub-regency. Several sub-regency traders collect cocoa

beans from location near their house and have direct contact with the regency traders or exporter from outside the regency.

Regency traders

Regency traders are traders which collect cocoa beans in several sub-regencies of Madiun Regency. These traders also can receive cocoa beans directly from farmers. The regency traders have direct relation with the wholesaler or exporter outside the regency.

The marketing channel of cocoa beans in Madiun Regency is shown in Figure 3.   Cocoa beans marketing in Madiun Regency has four marketing channel, which are:

Channel 1: Farmers – Village Traders – Sub-regency Traders – Wholesaler

Channel 2: Farmers – Village Traders – Regency Traders – Wholesaler

Channel 3: Farmers – Sub-regency Traders – Wholesaler

Channel 4: Farmers - Regency Traders – Wholesaler

The marketing margin analysis is conducted in order to analyze the efficiency of each marketing channel. Marketing margin is the sum of every marketing cost and profit obtain from every marketing institution. Marketing margin is calculated from subtracting selling and purchasing price or price difference between price received by farmers and price paid by consumers.

Marketing cost is the cost spent by every marketing institution in delivering the product which includes processing, transportation, lapor, information and other costs. The marketing cost of cocoa beans in every marketing institution is shown in Table 1.

Marketing profit is the difference between selling and purchasing price plus cost for the marketing institution. The marketing margin consists of marketing costs and marketing profit (Table 2). The largest margin can be found in channel 2 which involves farmers, village traders, regency traders and wholesaler. The largest margin contribution is received by the wholasaler with Rp 1,159 per kg of dried cocoa beans. On the other hand, the most efficient is channel 4 since it has the lowest marketing margin but with the highest farmer's share with 94 percent. But only 17 percent of the volume is sold on channel 4 meanwhile the highest volume is sold through village traders (57 percent). In the

field, channel 4 is mostly used by large scale farmers which can directly contacted the regency traders. Then the regency traders will pick the cocoa beans by pick up.

The objective of marketing channel choice analysis is to analyze factors which influenced farmers to whom they sold their cocoa beans. There are three types of traders that can be chosen by farmers, namely village traders, sub-regency traders and regency traders. The factors that influenced the marketing channel choice of farmers consists of internal and external factors. The internal factors includes age, farming experience, education, main occupation and number of trees meanwhile the external factor is price.

Multinomial analysis is utilized instead of logit since there are three choices of dependent variables therefore there are two equation, sub-regency and regency traders equation. The estimation result is shown in Table 3.

In the sub-regency traders equation, there are three significant variables which is age (significant at 1 percent level), farming experience (5 percent level) and main occupation (10 percent level). The older the farmer and farmer which main occupation is cocoa farmers the higher the chance that the farmer sell their cocoa beans to village traders or choose channel 1 or 2. This is caused by the fact that the selling price to this traders is relatively small (Rp 13,897 per kg to village traders meanwhile Rp 13,906 per kg to sub-regency traders). On the other hand, more experience farmers have more chance to sell their beans to sub-regency traders rather than to village traders since they have experienced in selling to both traders.

Number of trees and price do not affect farmers selling to sub-regency traders compare to village traders. Price is not significant since there is only small price difference between selling to village and sub-regency traders. Meanwhile, number of trees is not significant since farmers sellling to both traders have relatively similar number of trees. In average, farmers selling to village traders have 236 cocoa trees meanwhile farmers selling to sub-regency traders have 227 cocoa trees.

In the regency traders equation, four variables are significant; age (10 percent level), farming experience (10 percent level), number of trees (1 percent

level) and price (5 percent level). Older farmers have more chance to sell to village traders compare to regency traders, this is similar to the sub-regency traders. Meanwhile more experience farmers have higher chance to sell to regency traders. This is also the same case as the sub-regency case. This can be caused that experienced farmers have experience selling to village traders also and they feel they gain more benefit selling to sub-regency or regency traders.

Farmers with higher number of cocoa trees will have more chance to sell to regency traders compare to village traders. Regency traders usually only deals with large number of purchase therefore only farmers with bigger land area have the chance to access to regency traders. According to the data, farmers selling to regency traders have the average of 503 trees much higher compare to farmers selling to village traders and sub-regency traders.

The last significant variable is price. The price variable also resembles the quality of cocoa beans. Regency traders demand higher quality of cocoa beans therefore farmers sellling to the regency traders must meet this qualification in an exchange with higher price. From the farmers side, since these farmers have more trees, they have hired labor to run their farmer and dried their beans to meet the standard that the regency traders demanded.

From the margin analysis, farmer selling to regency traders (channel 4) gain higher farmer's share (94 percent) although in terms of volume is only 17 percent. Therefore if farmers intend to gain more profit it is more profitable to sell directly to regency traders but they must sell in large numbers and good quality. In order to meet these requirements, farmers can formed groups and sell collectively and to control the quality demanded.

5. Conclusion

Currently, the government of Indonesia has implemented an export tax policy on cocoa beans since April 2010 to promote development of a cocoa processing industry. By this policy, smallholder farmers are promoted to upgrade from producing bulk commodities for spot markets to producing preferred grades related to processes industry which is fermented beans.

The results of the farmer options when looking to sell their cocoa beans indicate that farmers still prefer unfermented beans rather than fermented beans. This finding is very important for policy makers to identify more what constraints farmers have and what incentives to encourage them to adopt fermentation practices.

The results of marketing channel choices, there are four marketing channel in Madiun Regency which involves village, sub-regency, regency and wholesalers. Comparing this four marketing channel, selling directly to regency traders has the highest farmer share. Age, farming experience and main occupation are variables which differentiate cocoa farmers from selling to sub-regency traders rather than to village traders. Meanwhile age, farming experience, number of trees and price differentiate cocoa bean farmers from selling to regency traders rather than village traders.

Understanding what farmers' preference when they sell cocoa beans and why farmers choose certain selling channels are important to be able to make a better policy and management decisions.

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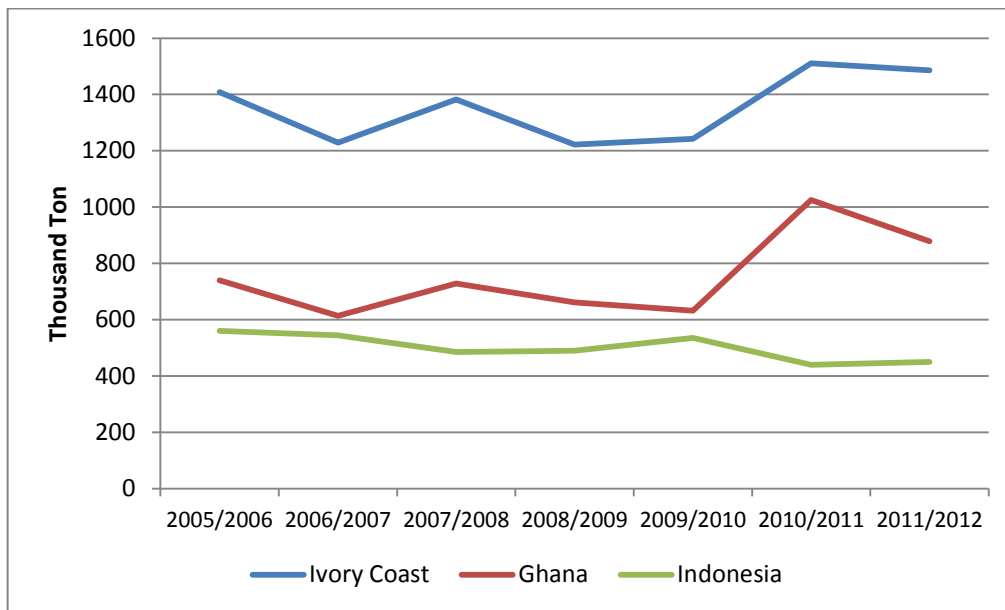
Appendices

Figure 1. Production of Three Largest Cocoa Beans Producer, 2000-2012
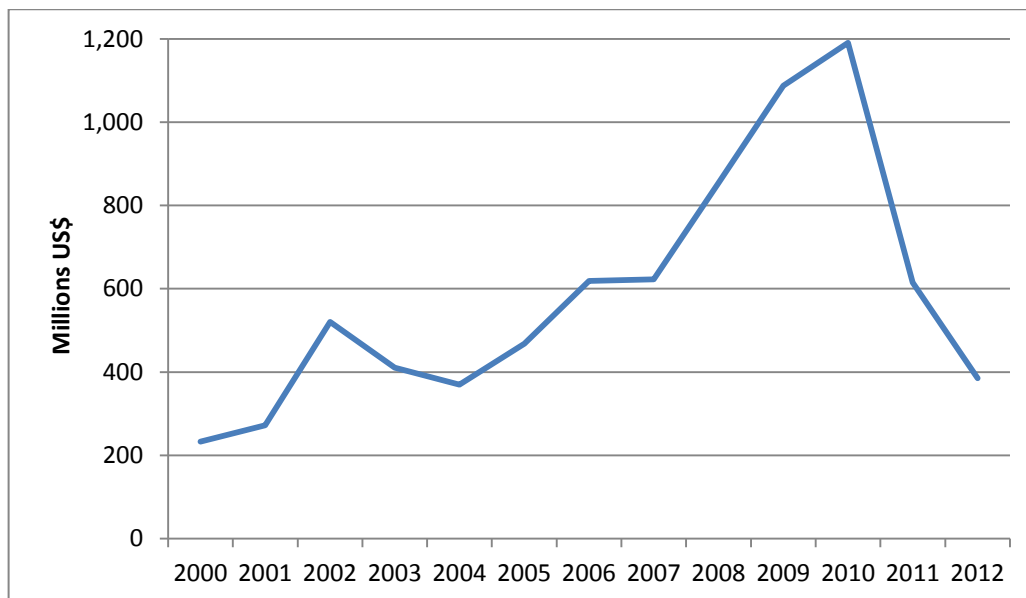
Source ICCO, 2013

Figure 2. Indonesia's Cocoa Beans Export Value, 2000-2012
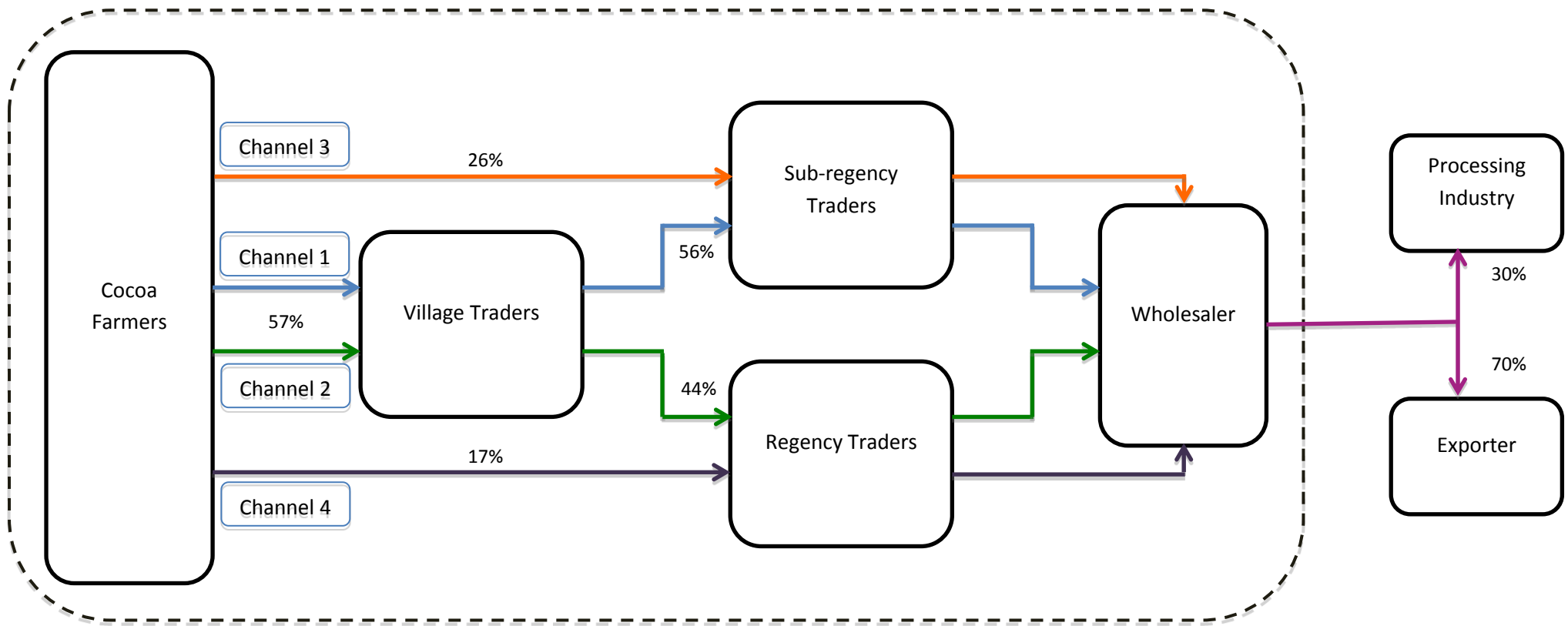Source: UN Comtrade, 2013

Figure 3 . Cocoa Beans Marketing Channel in Madiun Regency

Table 1. Marketing Cost of Cocoa Beans Marketing by Every Marketing Institution

No	Marketing Cost	Total Cost in Marketing Institution (Rp/Kg)			
		Farmers	Village Traders	Sub-regency	Regency
1.	Storage	-	-	-	-
2.	Packaging/Processing	531	16	81	16
3.	Transportation	298	32	22	16
4.	Standarization/Grading	-	-	-	-
5.	Risk	-	-	-	19
6.	FInancing	-	163	59	34
7.	Market Information	602	29	33	6
	Total	**1.431**	**240**	**195**	**91**

Tabel 2. Cocoa Beans Marketing Margin Analysis in Madiun Regency

Margin Components	Channel 1		Channel 2		Channel 3		Channel 4	
	Rp/Kg	%	Rp/Kg	%	Rp/Kg	%	Rp/Kg	%
Cocoa Farmers								
Cost	1,431	8.6	1,431	8.5	1,431	8.6	1,431	8.4
Selling Price	13,897	83.6	13,897	83.0	13,906	83.3	15,750	94.0
Village Traders								
Purchasing Price	13,897	83.6	13,897	83.0	-	-	-	-
Marketing Cost	240	1.4	240	1.4	-	-	-	-
Profit	1,363	8.2	1,363	8.1	-	-	-	-
Selling Price	15,500	92.9	15,500	92.5	-	-	-	-
Margin	1,603	9.6	1,603	9.6	-	-	-	-
Sub-regency Traders								
Purchasing Price	15,500	92.9	-	-	13,906	83.3	-	-
Marketing Cost	195	1.2	-	-	195	1.2	-	-
Profit	993	6.9	-	-	2,587	15.5	-	-
Selling Price	**16,688**	100	-	-	**16,688**	100	-	-
Margin	1,188	7.1	-	-	2,782	16.7	-	-
Regency Traders								
Purchasing Price	-	-	15,500	92.9	-	-	15,750	94.0
Marketing Cost	-	-	91	0.6	-	-	91	0.5
Profit	-	-	1,159	6.9	-	-	909	5.4
Selling Price	-	-	**16,750**	100	-	-	**16,750**	100
Margin	-	-	1,250	7.5	-	-	1,000	5.9
Total Marketing Cost	435	2.6	331	2.0	195	1.2	91	0.5
Total Profit	2,356	14.1	2,522	15.0	2,587	15.5	909	5.4
Total Margin	2,791	16.7	2,853	17.1	2,782	16.7	1,000	5.9
Farmer's Share		83.2		82.9		83.3		94.0

Note: Percentage of margin components is compared to the selling price (in bold) of the last marketing institution.

Table 3. Estimation Results

Variable	Sub-regency Traders		Regency Traders	
	Odds Ratio	p-value	Odds Ratio	p-value
Constant	17.596	0.266	0.000	0.018
Age	0.918	0.001	0.933	0.093
Farming Experience	1.070	0.017	1.088	0.061
Education	1.008	0.927	1.054	0.722
Main Occupation (Dummy)	0.372	0.073	5.664	0.168
Number of Trees	1.000	0.667	1.003	0.003
Price	0.999	0.779	1.001	0.018
R^2	0.304			
χ^2	47.12			