The Role of Peasant Marketing Institutions in Market Access for Smallholders: A Micro-evidence from Rural Java

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Backgrounds & Objectives

Backgrouds

- Rural smallholders face market access to High Value Chain (HVC) like Supermarket in developing countries. A lot of research focused on how HVC change marketing system in developing countries and how traditional marketing in urban area is transformed by emerging HVC.
- However, there are little empirical studies about how smallholders in rural area change their traditional marketing institutions, resulted from emerging supermarket (Reardon and Timmer, 2007). The traditional marketing system is recognized to complement the incompleteness of market by reducing transaction costs.

Motivation from peasant marketing institutions "Tebasan" in rural Java

A common marketing institution in rural Java is "Tebasn". It is standing crop selling before harvesting.."Tebasan" improve market access by reducing monitoring cost of harvesting and avoid cream skimming by middlemen (Hayami and Kawagoe, 1993)

Objectives

We investigate how local marketing practice between farmers and middlemen change under pressure of high quality products. Thus, we clarify fundamental properties of "Tebasan" and how market condition influence the modes of "Tebasan" by comparing West and East Java.

Model of marketing contracts

Based on Leffeler and Rucker (1991), we consider two types of standing crop selling contract; lump-sum (typical "Tebasan") and per unit payment contract.

- In **lump-sum contracts** total payment amount is determined at the time the contract is signed. The model is a sealed-bid auction with common-values.
- In **per unit contracts** a payment schedule and the value is determined by actual volume. And it is modeled as

$$\max_{P,q} Pq - C_E[q - q_b(P)] - cq \quad s.t.(P_{marekt} - P)q - C_{harvest}(q) \geq 0$$

where $P, P_{marekt}, q, q_b, C_E, c, c_{harvest}$ is selling price of farmer, market price, quantity sold, optimal quantity for middlemen, enforcement cost for farmers, production cost and harvesting cost respectively.

- We assume middlemen don't binding zero-profit constraint, though middlemen compete heavily. This model expects that increasing maket price decrease farmer's revenue from this contracts toward others.

Type of contracts and transaction costs

	Tebasan		Market oriented transaction
	Lump-sum payment	Per unit payment	
Timing of payment	before harvest	before and after harvest	after harvest
Harvest crops by	middlemen	middlemen	farmers
Transport crops by	middlemen	middlmen	farmers/ middlemen
Competition among middlemen	free entry	restricted by farmers	restricted
Related transaction costs			
Pre-measurement for estimating expected value	farmers give information about quality of growing crops for bidding by middlemen	very low	—
Monitoring harvest	—	farmers monitor harvesting work to avoid cream skimming	farmers monitor harvesting work to avoid cream skimming
Quantity negotiation	—	farmers enforce to rise quantity traded for maximizing their profit	farmers face high enforcement costs. Quantity is decided by middlemen

Hypothesis: *"Tebasn" vs market-oriented*

1. If "Tebasn" is lump-sum contract, then decreasing of pre-measurement costs for each middlemen increase probability of selecting the contract.
2. If "Tebasan" is per unit contract, then decreasing of enforcement costs increasing the probability. e.g. the cost increase with market price and value of crop increased
3. Increasing unit harvesting cost and transporting cost increase probability of contract

Hypothesis: *Lump-sum vs per unit*

1. Decreasing of private information costs for each middlemen increase probability of lump-sum contract.
2. Decreasing of enforcement costs increase probability of per unit contract.

Methods

Data

- Plot-level transaction data were collected from two hamlets in Summer 2012, a hamlet from Cianjur District, West Java and the other from Malang District, East Java. We choose 774 transaction data completed in one year before July 2012.
- We carefully select the hamlets. In both of hamlets, infrastructure of market places is improved, main crops are vegetables, farmers' plots are on up land area and geographical distance to urban area (Jakarta, Surabaya) is nearly same. However, the hamlet in West Java is closer to a market place than the other hamlet in East Java. We assume that it captures potential difference on market access in Java.
- After omitting the data which relate minor crops and has deficit, we construct 443 sample.

Descriptions about marketing situation in sampled hamlets

- The case in West Java represent more pressure from Supermarkets than East Java. Although we select farmers trading with traditional marketing channel, some farmer's association, private companies and itinerant traders trade with Supermarkets.
- In both of cases, farmers usually prefer to utilize "Tebasan", otherwise farmers sell harvested crops mainly on farm gate.

Econometric method

1. Probit regression for testing hypothesis on two type of "Tebasan".
2. Doubly-robust estimator for estimating causality effects of "Tebasan" to marketing performance after calculating propensity score using the probit model. Then we check the robustness by using minimum bias bias-corrected estimator (Millimet and Tchernis, 2012).

Results

1. Examine type of "Tebasan"

Selected Marginal Effect Estimates

Dependent variable: selecting "Tebasan "= 1	Description of variable	Expected sign		all sample	West Java subsample	East Java subsample
		Lump-sum	Per unit			
price	1=Above yearly average price		—	-0.111***	0.00686	-0.161***
moderncrop	1=Crop is high value crop for modern supply chain		—	0.209	-0.0413	
moderncrop × ln area			—	-0.0492	-0.0950	
handphone	1=Household has handphone	+		0.130*	0.245***	-0.0316
in hamlet	1=Household trade with middleman in same hamlet	+	+	-0.119**	-0.348***	0.0503
ln distance	Log of distance from home to his plot	—	—	-0.0440	-0.0204	-0.0706**
ln distance × in hamlet		—	—	0.0658	-0.0378*	0.186***
ln area	Log of plot size	—	—	0.126**	0.223***	0.0267
wage	1=Household emoloy wage worker before harvest			0.144**	0.141**	-0.0293
ln hhsize	Log of number of household members			-0.176**	-0.237***	0.0251
off farm job	1=Household head has off farm job			-0.0159	0.0392	0.0295
motorcycle	1=Household has motorcycle			-0.149**	-0.293***	0.0415
association	1=Household join agricultural association			0.0605	0.00437	0.169
location	1=East Java, 0=West Java		+	0.213**		
Pseudo R^2				0.3037	0.5138	0.3473
N				443	274	169

standard deviation in parentheses

* p<0.10 ** p<0.05 *** p<0.01

2. Differences between East and West Java

Variable[*1]	West Java mean (s.d.)	East Java mean (s.d.)	difference
Farmgate price (Rp/Kg)	3049 (2737)	1372 (1040)	1677***
Market price (Rp/Kg)	3252 (2288)	2224 (1313)	1028***
Distance to tract (km)	0.713 (0.999)	1.229 (0.907)	-0.515***
Quantity sold (Kg)	919 (760.9)	1009 (784.2)	-89.3
Land (m^2)	782 (516.9)	1612 (684.2)	-830.1***
Tebasan	0.649635 (0.478)	0.7869822 (0.411)	-0.1373***

[*1] All variable is transformed to Log

3. Effects of "Tebasan" to farmer's profit

Variable [*1]	All Sample		West Java		East Java	
	dr[*2]	mb-bc[*3]	dr	mb-bc	dr	mb-bc
Profit (Rp)	0.1236	-0.42	0.6156	-0.349	-0.113	—[*4]
Quantity sold (Kg)	0.3432	—	0.6261*	—	0.186	—
Farmgate price (Rp/Kg)	-0.2756*	—	-0.024	—	0.139	—
Sales value (Rp)	-0.2199	—	0.427	—	0.544**	—

[*1] All variable is transformed to Log format, [*2] doubly-robust estimator, [*3] minimum bias bias-corrected estimator,
[*4] samples on East Java is not enough to compute causality effects

Discussion and Conclusions

- Fundamental properties of "Tebasan" seems to be based on per unit contracts, in which farmers have incentive to restrict competition among middlemen by negotiating with a limited number of middlemen. And it doesn't affect market performance.
- A case in West Java revealed that the farmers avoid to select per unit contracts more than the other case in East Java. Because farmers may adopt lump sum sales to transact with more middlemen by using mobile phone. Their "Tebasan" ma allow trading with Supermarket.

Discussion

For popular kinds of vegetables in West Java, farmers could not trade with Supermarket directly, but do it through "Tebasan" contract with middlemen, assuming that direct trade with Supermarket require large land and trade volume to farmers. Because farmers who have large land prefer to "Tebasan" similar with per unit contracts though their average harvesting area is relatively smaller than the case in East Java.

Limitation

Mechanism of horizontal integration for direct trading with Supermarket couldn't be considered in this research. We need further investigation about it.

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