

# ANALYSIS OF MARKETING MARGIN BEHAVIOUR USING ECONOMETRIC MODEL:

The Case of Groundnut in East Java

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## Abstrak

Pedagang sering dikritik sebagai pihak yang membuat harga komoditas pertanian di tingkat petani tetap rendah dan harga di tingkat konsumen tinggi serta cenderung memperbesar margin pemasaran. Studi ini bertujuan menganalisis perilaku margin pemasaran kacang tanah di Jawa Timur dan secara spesifik menguji hipotesa bahwa pedagang tidak mempraktekkan strategi *price levelling* dan bersikap netral terhadap risiko harga. Dengan menggunakan metoda ekonometrik, hasil analisis menunjukkan bahwa pedagang menerapkan strategi tersebut di atas dan bersikap netral terhadap risiko harga, dan margin pemasaran tidak meningkat dalam jangka panjang. Berdasarkan hasil penelitian ini, kebijaksanaan stabilisasi harga kacang tanah tidak dianjurkan.

## Abstract

Middlemen are often blamed as those practicing a behaviour which keeps price of agricultural commodities low at the farmgate and high at the consumer level and tend to widen the gap between these two price levels, i.e., the marketing margins. The present study aims to analyse the behaviour of marketing margins of groundnut in East Java. It specifically tests the hypotheses of the non-existence of price levelling behaviour and price-risk neutrality of the middlemen. Employing an econometric method, the present study found that middlemen practiced price levelling behaviour and did not respond to price risk and the marketing margins has not increased in the long-run. On the basis of these results, policies stabilising the price of groundnut are not suggested.

## INTRODUCTION

Middlemen are often criticized as those practicing a behaviour which results in considerable losses to both farmers and consumers. Such a criticism is probably based on a presumption that middlemen tend to depress farmgate prices and, at the same time, drive consumer prices up. Stating in another way, middlemen tend to widen the marketing margins of agricultural commodities.

The government, on the other hand, attempts to avoid farmers from low prices they receive as well as consumers from high prices they pay. Such an effort is often launched through establishment of price policies and improvement of marketing efficiency which could reduce both price instability and marketing margins. However, this would be unsuccessful unless the economic behaviour of

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middlemen (and processors), the main actor in agricultural marketing activities, has been completely understood.

Various studies on marketing margins of food commodities have been carried out by other researchers. For example, Anonymous (1980a) for cassava in East Java, Anonymous (1980b) for cassava in Lampung, Suryana and Daud (1981) for cassava in Lampung, and Anonymous (1988) for various secondary crops in different major producing areas. Despite their ability to show the components of marketing margins, these studies used one-year cross sectional data only and, of course, the movement of marketing margins and the marketing strategy exercised by middlemen have not been successfully assessed. In addition, these studies failed to correctly define the marketing margins in that prices at the different levels at the marketing channel were not stated in a weight-equivalent basis. This has led to overestimated values of marketing margins. Study of Simatupang (1988) attempts to identify the existence of vertical price integration and determines the ruling price. Again, this study has not shown the behaviour of middlemen in determining marketing margins.

The present study is aimed at to assess the behaviour of middlemen in the marketing process of agricultural commodities by employing time series data and econometric methods. More specifically, it measures the magnitude and direction of the effects of factors which are hypothesised to influence marketing margin variations.

Groundnut in East Java is preferable to be the commodity under study. This is primarily because groundnut is an important source of proteins and fats in the people diet and its price has not yet been intervened by price policy. Perhaps, middlemen could more liberally determine the marketing margins of this commodity. As well, East Java is the major groundnut-producing area which has the most complete and lengthy time series data on monthly prices of groundnut at three different levels, i.e., the farmgate, wholesale and retail. In addition, Surabaya, the capitol of this province, plays an important role in the marketing of *palawija* such as maize, cassava, and pulses in Indonesia (Anonymous, 1988).

## CONCEPTUAL FRAMEWORK AND HYPOTHESES

### Definition of Marketing Margins

From Tomek and Robinson (1981) and Campbell and Fisher (1982), a marketing margin may be defined as follows:

*"marketing margin is the difference between the price of an article at retail and the price of an equivalent amount of the product in the form in which it leaves the farmgate"*

The concept of marketing margins is best illustrated using Figure 1. The primary demand for a product ( $D_p$ ) is affected by the response of final consumers while the primary supply of a product ( $S_p$ ) is influenced by the response of producers. In the explanation of price formation and marketing margin establishment, two different situations are considered here, i.e., when producers directly meet consumers and when producers do not directly meet consumers.

In the first situation, E is the equilibrium point, at which equilibrium price and quantity are established at  $P_e$  and  $Q_e$  respectively. Since marketing and processing costs do not exist, implying no marketing margins,  $D_p$  is composed of the farm-base components only ( $Q_eE$ ).

In the second situation, the role of middlemen to market agricultural product from producers to consumers is crucially important. The costs of marketing would include costs of transportation, processing, storage, capital, etc. In providing marketing services, middlemen would generate profits. Marketing costs and middlemen profits altogether constitute marketing margins. Since marketing margins would be distributed to both producers and consumers, farmgate price would decrease and, at the same time, consumer price would increase. This, in effect, would reduce the equilibrium quantity produced and marketed. As illustrated in Figure 1 (a), the quantity moves from  $Q_e$  to  $Q_1$ , the farmgate price goes down from  $P_e$  to  $P_{f1}$ , and the consumer price goes up from  $P_e$  to  $P_{r1}$ .

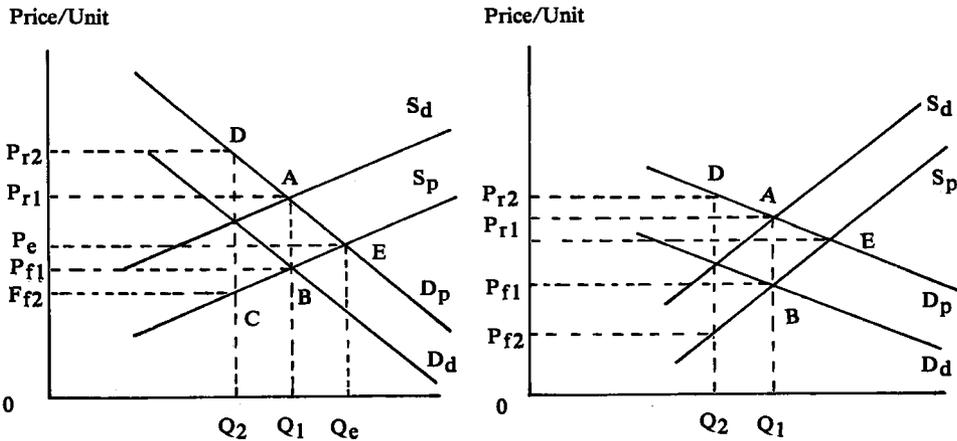


Figure 1. The concept of marketing margins illustrated.

The primary demand, hence, is composed of two components, i.e., the farm-base components ( $Q_B$ ) and the marketing-processing-base components (BA). The derived demand ( $D_D$ ) is the primary demand for the farm-base components. The difference between  $D_P$  and  $D_D$  is due to the existence of marketing and processing components, i.e., the marketing margins (BA). The derived supply ( $S_D$ ) at the consumer level can be obtained by adding marketing margins to  $S_P$ .

It is worth noting that in defining marketing margins, adjustments of farm-gate price is necessary. This enables to make valid comparisons of the two price levels because they will contain comparable components. This is an important implication of the term "the price of an equivalent amount" in the definition of marketing margins stated earlier.

### Distribution of Marketing Margins

It is found in various standard literature that marketing margins of agricultural commodities, particularly foods, tend to fluctuate in the short-run and widen in the long-run (see, e.g., Tomek and Robinson, 1981; Campbell and Fisher, 1982). Any changes in marketing margins (either increases or decreases) would be distributed to farmers and consumers. The farmers' share is determined by supply and demand elasticities of the commodity. Fisher (1981) provides the following formula of farmers' share:

$$I_f = \frac{1}{1 + \epsilon_s / \alpha \epsilon_d} \times 100\% \quad (1)$$

where  $I_f$  is the farmers' share,  $\epsilon_s$  is the supply elasticity (slope of supply curve in Figure 1),  $\epsilon_d$  is the demand elasticity, (slope of demand curve in Figure 1) and  $\alpha$  is the ratio of consumer to farmgate price before margins change (i.e.,  $P_{f1}/P_{r1}$  in Figure 1).

The expression (1) tells us that farmers' share will decrease (or increase) as the relative supply to demand elasticities becomes higher (or lower), i.e., lower (or higher) ratio of  $\epsilon_s / \epsilon_d$ . Illustration depicted in Figure 1 clarifies this.

In the first case, supply elasticities are higher than demand elasticities (see Figure a), whereas in the second case, the reverse situation prevails (see Figure b). Both figures show equal initial marketing margins AB and equal increased marketing margins CD but the producers' share of marketing margins in the first case is lower than in the second one. In the later situation where marketing margins have increased, the consumer price increase is higher than the farmgate price reduction in the first case (compare  $P_{r1}P_{r2}$  to  $P_{f1}P_{f2}$  in Figure a), On the other hand, the reverse situation prevails in the second case (Figure b). It can be seen from this illustration that in the case of increased marketing margins, losses to

farmers would become relatively smaller (or higher) than those to consumers as the relative elasticities of supply to demand increase (or decrease).

Probably, supply and demand elasticities would have never reached zero (i.e., perfect inelastic) or unlimited value (i.e., perfect elastic). Hence, any increases (or decreases) in marketing margins would always reduce (or increase) farmgate price and, at the same time, increase (or reduce) consumer price. If this is true in the real world, then attempts to reduce marketing margins is absolutely necessary so as to increase the economic welfare of farmers as well as consumers. Knowledge on the factors affecting marketing margins, therefore, is essential.

### **Factors Affecting Marketing Margins**

Factors which affect marketing margin variations would include, among other things, marketing costs, competition level between middlemen, strategies fashioned by middlemen, and risk attitude of middlemen.

Marketing margins would have positive relationships with marketing costs. Increased marketing costs could be due to increased transportation, labour, storage and capital costs, and the tendency of consumers preference to more shopping convenience (Campbell and Fisher, 1982). On the other hand, marketing costs could decrease because of the prevalence of economies of scale (Tomek and Robinson, 1981), innovation of new techniques in marketing and processing, and improvement of transportation facilities.

Level of competition between middlemen could affect margin variations. Perhaps, an individual middleman is willing to accept lower profits as competition increases which could, in effect, reduce marketing margins. In the reversed situation, he would make efforts to generate higher profits which would increase marketing margins.

Strategies adopted by middlemen could influence marketing margins. Both price levelling and price averaging are those commonly practiced so as to stabilise selling price in the highly fluctuated buying price in the short-run (Griffith, 1974). In determining marketing margins, wholesalers probably consider also retailers' marketing margins and, similarly, retailers consider wholesalers' marketing margins. In other words, wholesale and retail marketing margins are interdependent to each other. In addition, middlemen might consider their own previous marketing margins.

Different risk attitude of middlemen could also result in different marketing margin variations. An a priori assumption would have stated that a man tends to avoid risks (i.e., risk aversion) implying that marketing margins would increase (or decrease) as risks increase (or decrease).

## **Hypotheses**

The hypotheses which are specifically tested in the present study are as follows:

- (1) Price levelling behaviour does not exist in the marketing of groundnut by wholesalers and retailers.
- (2) Groundnut wholesalers and retailers are risk neutral.

Other factors which probably affect marketing margins, even though not specifically tested, will be included in the model since they are integral parts of an influencing economic environment.

## **METHODOLOGY**

### **Approaches to Marketing Margin Analysis**

Analysis of marketing margin behaviour may involve two approaches (Digby, 1989). The first approach includes analysis of the short-run behaviour of margin. It focuses on the unequilibrium behaviour of middlemen and dynamics in price formation and transmission. The tested hypotheses are (i) the existence of price levelling and price averaging, (ii) short-run effects of risk, (iii) pattern of asymmetric behaviour, and (iv) short-run effects of quantity marketed.

The other approach includes analysis regarding the long-run behaviour of margin. It concentrates on the model of static equilibrium. The hypotheses tested are (i) effects of quantity and costs of marketing, (ii) risk response, and (iii) effects of market structure changes.

The quantitative models employed in these analyses vary from single to simultaneous equations. Models with a single equation, however, are frequently criticised, primarily because of its ignorance of inter-relationships between types of product and interdependence nature of middlemen. In effect, this can lead to specification errors (Theil, 1971).

### **Empirical Models and Specification of Variables**

The present study attempts to analyse the short-run behaviour of marketing margins of groundnut at the two different levels of middlemen, viz., wholesaler and retailer\*. The empirical models employed here are the modified version of those used by Griffith and Duff (1989). Expressions (2) and (3) respectively represent empirical models for wholesale and retail marketing margins.

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\*) In the present study, modification of the definition of marketing margins is necessary mainly because groundnut middlemen can be categorised into Wholesalers and Retailers. The corresponding margins are Wholesale Margins and Retail Margins respectively defined as the difference between farmgate and wholesale prices, and between wholesale and retail prices.

$$\text{WSM}(t) = \alpha_0 + \alpha_1 \text{FGP}(t) + \alpha_2 \text{LFG}(t) + \alpha_3 \text{RTM}(t) + \alpha_4 \text{LRTM}(t) + \alpha_5 \text{LWSM}(t) + \alpha_6 T + \alpha_7 \text{RWS}(t) \dots \dots \dots (2)$$

$$\text{RTM}(t) = \beta_0 + \beta_1 \text{WSP}(t) + \beta_2 \text{LWSP}(t) + \beta_3 \text{RTM}(t) + \beta_4 \text{LRTM}(t) + \beta_5 T + \beta_6 \text{RRT}(t) \dots \dots \dots (3)$$

where WSM is wholesale margins, RTM is retail margins, FGP is farmgate price, WSP is wholesale price, T is time, RWS is wholesale price risks, RRT is retail price risks, L stands for lagged variable,  $\alpha_i$  dan  $\beta_j$  are parameters to be estimated.

The variables included in the models are specified and justified as follows. WSM and RTM of groundnut are respectively defined as the difference between the price of per kilogram groundnut of 7 mm length at the wholesale and the farm levels and between the price at the retail and the wholesale levels.

The inclusion of lagged independent variables in both models is based on a partial-adjustment assumption. This, in effect, can also mitigate autocorrelation problems commonly exist in an autoregression analysis (Doran and Guise, 1984). The inclusion of lagged dependent variables is equally necessary to test the existence of price levelling behaviour of middlemen (Parish, 1967; Griffith and Duff, 1989). However, since problems of multicollinearity between lagged independent variables are often found in an autoregression analysis (e.g., between  $\text{LFG}_{(t-1)}$  and  $\text{LFG}_{(t-2)}$  in our case), then one tends to use structured lagged independent variables. For example, Griffith (1974) and Griffith and Duff (1989) respectively use the following formulae (4) and (5):

$$\text{LA}_t = 0.5A_{(t-1)} + 0.33A_{(t-2)} + 0.17A_{(t-3)} \dots \dots \dots (4)$$

$$\text{LA}_t = 0.8A_{(t-1)} + 0.2A_{(t-2)} \dots \dots \dots (5)$$

These expressions assume that most adjustment takes place in the subsequent period.

If multi-collinearity between lagged variables for the same independent variable prevails, then a lag structure will be formulated wherein the magnitude of parameters obtained from a simple regression of  $\text{WSM}_{(t)}$  and  $\text{RTM}_{(t)}$  on their respective lagged independent variables, i.e., lagged buying price and lagged marketing margins, is considered. Heretofore, the lag structure is defined as follows.

$$\text{LA}_t = c_1 A_{(t-1)} + c_2 A_{(t-2)} + \dots + c_n A_{(t-n)} \dots \dots \dots (6)$$

where A is lagged variable included in the models (2) and (3). The values of  $c_i$  in the structure (5) will be determined in such a way which results in the best-fitted function.

Pickering and Cockerill (1984) introduce four types of risk which could influence one's decision making, viz., market risk, technological risk, political risk and factor-cost risk. The present study attempts to assess the effects of the last type of risk. It is the risk which arises from the situation where major part of inputs

is raw material, the price of which is influenced by unexpected variations that could result in financial problems.

It is found from various studies that risk specification varies from the simple method to the more complicated one. For instance, Brennan (1982) uses moving range and moving standard deviation of 3 to 4 periods, whereas Brorsen *et al.* (1985) use moving weighted average of absolute price change for 12 periods. The present study employs this later approach but with modified periods from 12 to 3 months. This is expressed in equation (6) which applies to both wholesale and retail models. P stands for farmgate price for the wholesale equation, and wholesale price for the retail equation.

$$R_t = \frac{\{3*|P_{(t-1)} - P_{(t)}| + \dots + 1*|P_{(t-3)} - P_{(t-2)}|\}}{3 \dots \dots \dots \{EP_{(t)}\}} \dots \dots \dots (6)$$

t = 1

The inclusion of retail marketing margin variable in model (2) and wholesale marketing margin variable in model (3) is necessary so as to enable a test of the inter-linkage between wholesale and retail margins.

Time variable is frequently used as a proxy of technology level in assessing technical change in agriculture (e.g., Duncan, 1972; Binswanger, 1974; McKay, Lawrence and Vlastuin, 1982). In the present study, the inclusion of time variable is aimed at capturing the effects of other variables not included in the models. Probably, it is composed of technology state, marketing volume, competition level, etc.

**Estimation Procedures**

Models (2) and (3) were estimated in three steps. Firstly, each model was estimated separately employing OLS. All the lagged variables  $FGP_{(t-1)}$ , ...,  $FGP_{(t-n)}$ ,  $WSM_{(t-1)}$ , ...,  $WSM_{(t-n)}$  and  $RTM_{(t-1)}$ , ...,  $RTM_{(t-n)}$  are treated as regressors in model (2). As well, all the lagged variables  $WSP_{(t-1)}$ , ...,  $WSP_{(t-n)}$  and  $RTM_{(t-1)}$ , ...,  $RTM_{(t-n)}$  are treated as regressors in model (3). In case multicollinearity problems exist in this step\*, then lagged variables need to be structured using equation (5).

Secondly, the two models containing structured lagged variables are re-estimated. The value of  $c_i$  is selected such so as to obtain a more appropriate function.

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\* According to Doran and Guise (1984), the existence of a multicollinearity is indicated by a high  $R^2$  but most variables are not significant.

Finally, in case wholesale and retail marketing margins are found to be interdependent to each other from the first step, then the two models are estimated simultaneously using 3SLS method (Johnston, 1984). Student-t test is used as an accept-reject criterium of a hypothesis at the 95 to 99 percent confidence level. Durbin-Watson (DW) test is carried out to identify the existence of autocorrelation problems (Doran and Guise, 1984).

## **D a t a**

The present study requires data on monthly price of groundnut at the farmgate, wholesale and retail levels on a continue time series basis as long as possible. Unfortunately, the data available are those from January 1982 to December 1989 only. They involve the price of dry shelled groundnut with 7 mm length at the farmgate, wholesale and retail levels. These data have been available at the ESCAP/CGPRT Centre Bogor.

Data on the farmgate price were collected from Tuban district, whereas data on the wholesale and retail price were obtained from the Surabaya city. The selection of Tuban district is based on the fact that it is the important groundnut producing area in East Java and the groundnut it produces has the best quality. The use of Surabaya price for wholesale and retail levels is because wholesalers in this city are also processors\* which have relatively large scale and market shares and, retail price at large city reflect the more realistic figures than those at district and village levels.

## **RESULTS AND DISCUSSIONS**

The results of the separate estimation of models (2) and (3) employing Ordinary Least Square show that wholesale and retail marketing margins are interdependent to each other. Therefore, a simultaneous estimation of the two is necessary. The results are presented in Table 1.

The multi-colinearity which exist between lagged independent variables has been overcome by structuring them. The best lag structure has been found wherein the value of  $c_1$  dan  $c_2$  are 0.82 dan 0.27 respectively. This implies that most adjustment of marketing margins occurs in the following month. The value of  $c_1$  for  $LRTM_{(t)}$  in model (2) is 1, whereas the variable of  $LWSM_{(t)}$  is not significant which lead to exclude this variable from the model.

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\* Middlemen remove groundnut shells using machines.

In principle, the models employed on the present study is appropriate. In the first place, the coefficient of determination, the adjusted  $R^2$ , is 0.778 which means that almost 80 persen of the marketing margin variations has been explained by the model. Secondly, most regressors are significant at the 95 percent confidence level. Lastly, the DW statistics is 1.84 indicating the non-existence of autocorrelation. Further results and discussion are as follows.

Table 1. Parameter estimates of groundnut marketing margins (simultaneous equations).

Wholesale margins		Retail margins	
Variable	Coefficient	Variable	Coefficient
Constant	46.041** (4.52)	Constant	63.114** (5.87)
FGP	- 0.336** (2.91)	WSP	- 0.158 (1.19)
LFGP	0.284** (2.96)	LWSP	0.232 (1.92)
RTM	- 0.163* (2.13)	WSM	- 0.524* (2.38)
LRTM	- 0.157* (2.32)	T	0.815 (0.98)
T	0.912 (1.74)	RRT	-97.184 (1.47)
RWS	-71.316 (1.47)	LRTM	0.996** (9.16)
LWSM	0.573** (4.74)		

\*, \*\* : Respectively stands for 95 and 99 percent significance level.

( ) : t-ratios.

(a) *Price Levelling :*

At the wholesale level, the coefficient of farmgate price is negative and significant. This proves the existence of the short-run price-levelling behaviour fashioned by groundnut middlemen. Moreover, the negatively significant coefficient of lagged farmgate price reflects the prevalence of the long-term adjustment of wholesale margins with respect to farmgate prices. In other words, wholesale margins move in the opposite directions in the short-run but they move in the same directions in the long-run. All these prove the existence of the price-levelling behaviour practiced by middlemen. Such an exercise is aimed at stabilising wholesale prices in the highly fluctuated farmgate prices. It is also said as a strategy to reduce wholesalers' risks (Griffith and Duff, 1989).

Retailers, on the other hand, did not fashion price-levelling behaviour significantly. This is indicated by the in-significant coefficient of groundnut wholesale price and lagged wholesale price variables at the 90 percent confidence level. However, the negative signs of the two variables may show that retailer tend to exercise price-levelling behaviour.

A vast effect of the price-levelling behaviour employed by wholesalers and retailers would be a reduction in price instability at the consumer level despite a high fluctuated farmgate price. Various studies carried out in developed countries reach to similar conclusion.

**(b) Price risks:**

Both wholesalers and retailers are risk averters. This is indicated by the non-significant parameters of price-risk variable at the 90 percent convedence level in both wolesale and retail margin equations. It is worthnoting, however, that the negative sign of the parameter show that middlemen, probably, tend to be risk-seekers. This contradicts with the a priori assumption which says that a man or a firm is a risk averter. According to Wilson *et al.* (1980), risk aversion attitude plays an important role in decision making process.

From the table, it is also found that the t-ratio of the risk variable in the wholesale margin equation is greater than that in the retail margin equation. This also tells that risk-seeking behaviour of wholesalers is stronger than that of retailers.

**(c) Interdependence between Wholesale and Retail Margins:**

Wholesale and retail margins affect each other. This is shown by the significant parameter of wholesale margin variable in model (3) and that of retail margin variable in model (2). Negative sign of both parameters represents reverse relationship between these two margin variables. Perhaps, such relationships also contribute to reduce consumer price instability.

**(d) Trend of Marketing Margins:**

Trend variable is not significant at the 90 percent confidence level. This means that both wholesale and retail marketing margins of groundnut have not increased in the long-run. Assuming that marketing cost is the major component of the margins, the margin trend proves that marketing cost increase has been successfully avoided. Probably, this is due to technology development in groundnut processing, the existence of economies of size and improved infrastructure. Most groundnut processing is done by wholesalers with sufficient capital and knowledge. Anonimus (1988) suggests that groundnut processing from unshelled to shelled

one should be done by higher level of middlemen in the marketing channel, i.e., the wholesalers, and not the farmers and the assembly middlemen.

(e) *Lag Marketing Margins:*

The positive sign and significant of lagged marketing margin variable in both models (2) and (3) prove that in determining current marketing margins, both wholesalers and retailers take their respective previous marketing margins into account. The larger (or smaller) the previous marketing margins, the larger (or smaller) the current marketing margins.

### CONCLUSIONS

From the statistical estimations and discussions provided earlier, conclusions may be drawn as follows. Groundnut middlemen in east Java tend to fashion a strategy which stabilises consumer price, to be risk neutral, and did not increase long-run marketing margins.

The strategy stabilizing consumer price in the highly fluctuated farmgate price prove that groundnut marketing margins are not sticky. They become higher (or lower) when farmgate price decreases (or increases). This situation emerges because consumer price has not been successfully transmitted to farmers by assuming that consumer price is the ruling price. The relevant question would be: "Are the middlemen strategy detrimental or favourable to farmers and consumers?"

Regarding the importance of consumer-price stability, there are two versions which diametrically oppose to each other. The first version favoured by, is Waugh (1961) and Houston (1962) do not support price stabilization. On the contrary, the second version favoured by, is Parish (1967) and Griffith (1974) do. As well, the Indonesian government employs price stabilisation scheme for food, particularly rice. Discussion on pros and cons regarding effects of price stabilisation policies is quite interesting, but it is beyond the scope of the present study.

Middlemen are price-risk neutral. Such an attitude opposes the a priori assumption stating that a man or manager is risk averter and takes risk into account in his decision making process. The present study does not elaborate this.

Marketing margins do not increased in the long-run, even though labour wage and other marketing costs increase due to inflation. Perhaps, this is the effects of other factors such as development of groundnut processing technology, the existence of economies of size, improved transportation facilities and price information services and increased middlemen competition. In the farmers and consumers point of view, such margin trends are favourable.

Even though the present study has found the marketing margin behaviour which is of importance to know, it is not free from limitations. First of all, the farmgate price data used are from Tuban area only. This area might not validly represent the whole groundnut producing areas in East Java.

Secondly, middlemen, retailers in particular, do not cover groundnut only, but also other commodities. The marketing margins of these commodities could affect the groundnut marketing margins.

Thirdly, the present study has not examined the effects of marketing volume on marketing margins. Probably, middlemen are willing to accept lower unit profit when marketing volume is sizeable and attempt to increase the unit profit in the reversed situation.

Finally, risk variable specifications may be false. There are various approaches to specify risk variable such as price risk, market risk, technology risk, etc. According to Brennan (1982), economists have not yet reaches to a similar approach in formulating price risk for econometric analysis purposes. However, various approaches employed by previous studies may be applied and modified for similar study in Indonesia.

On the basis of the above conclusions and study limitations, the present study offers some suggestions. In the first place, price stabilisation scheme for groundnut might not be necessary. This is primarily because groundnut middlemen exercise a strategy stabilising consumer price and do not respond to price risk.

Secondly, development of infrastructure and price information service is of importance to hinder marketing costs, hence marketing margins, from substantial increases.

Thirdly, similar studies can be employed for other agricultural commodities, whether or not their prices are controlled by the government. Independent variables may be extended with more precise specification so as to yield models with higher predictive power.

Finally, in connection with price stabilisation scheme, empirical studies on the response of farmers and consumers to price risks would be challenging. On the basis of their findings, price stabilisation policy could be formulated more appropriately in which both theoretical concepts and empirical findings are taken into account.

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