FACTORS AFFECTING PRICE SPREAD OF RICE IN NEPAL

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ABSTRACT

Inefficient marketing service increases price spread, which is a common feature in developing countries. The study aimed to analyze factors affecting retail-price spread of rice in Nepal using the Relative Price Spread (RPS) model with cross section data collected from four districts namely Jhapa, Morang, Chitwan, and Rupandehi in 2008. The flow of the product was traced forward and backward from the selected wholesaler respondents for selecting the farmer and the retailor respondents randomly. The marketing margin is higher in the farm to wholesale market as compared to the wholesale to retail market. The result revealed that the marketing cost, wholesale price of rice, retail prices of rice, and market information to the farmer significantly influence the marketing margin. Reduction in the transportation cost, improving the market information system, and improving the role of farmer in price determination help reduce the marketing margin.

Key words: Rice marketing, marketing margin and relative price spread.

INTRODUCTION

Rice is the staple food crop that contributes about 50 percent to national food requirement in Nepal. It is produced 75 percent in the terai, 23 percent in the hill and 2 percent in the high hill (DOA, 2007). The terai region is suitable for its production in terms of agro-ecological factors. Surplus production in the terai is supplied to food deficit regions.

The difference between consumer's price and farmers' price is high in food commodities especially in the areas where inefficient marketing services and higher entrepreneurs profit exist. This food price dilemma, when the marketing margin is high, is inevitably given attention by the producer, consumer, and policy analyst (Timmer, 1983). Farmers are getting low price but consumers are paying high price of rice. The poor road infrastructure is likely an underlying cause of high transaction cost, thereby making arbitrage unprofitable for traders and isolating rice markets in Nepal (Pyakuryl, 2001). A widening of the marketing margin for rice could potentially discourage production and consumption making it a genuine concern for policy analyst. Rice marketing is an important issue affecting farm income, food security and poverty alleviation. Therefore, this study was designed to analyze the factors affecting farm-retail price spread of rice in Nepal

In developing countries where marketing system is inefficient, analysis on farm-retail price spread is useful in assessing unfair pricing practices on marketing services, determining influential factors on marketing margin and estimating economic profit of dominant merchants. The study aimed to analyze the factors affecting the farm - retail price spread using the Relative Price Spread (RPS) model with cross section data collected in 2008. It was hypothesized that marketing cost significantly influence marketing margin, good market information system significantly reduce marketing margin, marketing margin is higher in market with high share of traders, retail price significantly influence the marketing margin, and the higher the traded quantity, the lower is the marketing margin.

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METHODOLOGY

DATA AND METHODS

A cross sectional sample of 300 marketing units comprising of farmers (100), wholesalers[1] (100), and retailers (100) were used to collect market price information in 2008. Semi-structured questionnaires were used for collecting the information from four districts
 namely Jhapa, Morang, Chitwan and Rupandehi. The flow of the product was traced forward and backward from the selected wholesaler respondents for selecting the farmer and the retailer respondents randomly. Thus the sample respondents of farmers and retailers were selected from the identified wholesaler respondents by asking them to identify both suppliers and the purchasers. Besides, a rapid marketing appraisal (RMA) and key informant interviews were carried out to explore the issues on problems, policies and possible recommendations.

The primary data particularly the farm gate, wholesale, retail, transaction cost and quantity, and marketing behaviour were collected and processed. The price of paddy was adjusted by the milling recovery to get prices in rice equivalent to make price comparison consistent. The farm prices of paddy collected from each respondent were adjusted by multiplying with a certain factor of an average head rice recovery percentage[2] (63.7 percent). In 1972, Tomek and Robinson estimated the farm gate value of a pound of beef sold at a retail price. This was based on the average price received by the farmer multiplied by a factor of 2.4 since about 2.4 pounds of live animals are required to obtain one pound of retail weight.

ANALYTICAL APPROACH

The Relative Price Spread (RPS) model was adopted in analysing rice marketing margin in this study. To analyze the margin behaviour, the margin equation was decomposed into farm to wholesale, wholesale to retail, and farm to retail markets. Wolgenant and Mullen (1987), and Marsh and Brester, (2004) used this model and analyzed marketing margin on different agricultural commodities. The RPS model assumes that the profit maximizing firms provide marketing services up to the point at which the marketing value of the services is equal to the marginal cost.

$$MM = MC(Q, C) \quad .... (1)$$

Where; MM is the marketing margin, Q is the quantity of rice traded and C is the price vector of marketing inputs.

Marketing margin (MM) of rice was considered as the linear function of price (P), quantity traded (Q), marketing services cost (MC), market shares of traders (Mrs), and market information system (MIS). Marketing cost was computed of all marketing services cost such as transportation, storage, milling, packaging, handling, and marketing tax.

$$MM = f(P, Q, MC, Mrs, MIS) ....(2)$$

The farm to wholesale marketing margins (MMfw) of rice was estimated using wholesale prices (Pw), wholesale quantity traded (Qw), farm to wholesale marketing services cost (MCfw), market share of wholesaler (Mrsw), and market information to the farmer (MISf) to the farmers. Market share of the wholesaler in the wholesale market was used in the model in terms of percentage share by the sample wholesalers out of the summation of the total quantity traded by all sample wholesalers in the market. The market information availability was treated as dummy; it is defined as '1' if the farmer respondents are informed, and '0', otherwise.

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[1] In this study, 60 wholesaler respondents purchased rice from 100 farmer respondents and sold to 100 retailer respondents. Therefore, numbers of wholesaler respondents were considered 100.
[2] Adjusted farm gate price of rice = (1/head rice recovery percentage)*farm gate price of paddy.

$$MMfw = \alpha + \alpha_1 Pw + \alpha_2 Qw + \alpha_3 MCfw + \alpha_4 (MrsW) + \alpha_5 MISf + \mu \ldots\ldots\ldots(3)$$

The wholesale to retail marketing margin (MMwr) of rice was estimated using retail price (Pr), retail quantity traded (Qr), wholesale to retail marketing services cost (MCwr) and market shares of retailers (Mrsr) in retail market. The market share of retailer was estimated using the same procedure of wholesaler.

$$MMwr = \beta + \beta_1 Pr + \beta_2 Qr + \beta_3 MCwr + \beta_4 (Mrsr) + \mu \ldots\ldots\ldots\ldots\ldots(4)$$

The farm to retail marketing margin (MMfr) of rice was estimated using retail price (Pr), retail quantity traded (Qr), farm to retail marketing services cost (MCfr) and market shares of retailers (Mrsr) in retail market.

$$MMfr = \gamma + \gamma_1 Pr + \gamma_2 Qr + \gamma_3 MCfr + \gamma_4 (Mrsr) + \mu \ldots\ldots\ldots\ldots\ldots(5)$$

RESULT AND DISCUSSION

FACTORS AFFECTING MARKETING MARGIN FOR RICE

Ordinary Least Square (OLS) estimation was selected as the best margin response function for rice since it exhibited a higher coefficient of determination and was highly significant based on F- value in all marketing margin models in this study.

FARM TO WHOLESALE

The results of OLS estimation of equation (3) showed that three explanatory variables such as wholesale price, marketing cost and the market information to the farmer have significant effect on farm to wholesale marketing margin (Table 1). The coefficient of marketing cost (α_3) is 0.616 indicating that one rupee per kilogram of rice increases in the marketing cost increases the marketing margin by 0.616 rupees, holding other factors constant. The wholesale price is another factor that increases farm to wholesale marketing margin. As the wholesale price increases, the marketing margin also increases. The regression parameter of 0.455 for wholesale price indicates that if the wholesale price of rice increase by one rupee per kilogram, the marketing margin also increases by 0.455 rupees. This might be caused by the following: one is the higher marketing service cost in this market chain and the other is the entrepreneur profit for the wholesaler. The regression coefficient of MISf (-1.288) indicates that market information to the farmer have negative and significant effect on marketing margin. When the farmers have access to good marketing information, they could enhance marketing efficiency and possibly sell their product at higher prices.

Results also showed that the quantity of rice traded at the wholesale market, and market share of the wholesaler have insignificant influence on the marketing margin. However, the sign of regression coefficients of both independent variables are consistent and logical. The insignificant effect of wholesale quantity traded implies that the price per unit purchase of rice does not have significant relationship with the marketing margin. The market share of the wholesaler has no significant relationship with the marketing margin; the marketing margin will not increase as the wholesale market share increases.

WHOLESALE TO RETAIL

The results of OLS estimation of equation 4 showed that two explanatory variables such as the retail price and the wholesale to retail marketing cost have positive and significant influence on wholesale to retail marketing margin (Table 2). The regression coefficient of marketing cost (β_3) is 1.09 indicating that a one rupee per kilogram of rice increase in the marketing cost enhances the marketing margin by 1.09 rupees, holding other factors constant. The regression parameter of 0.20 for retail price indicates that if the retail price of rice increase by one rupee per kilogram the marketing margin will also increase by 0.20 rupees, ceteris paribus.

Table 1. Factors affecting farm-wholesale MM (respondent#=100).

Explanatory variables	Regression coefficient	Standard error
Wholesale price (Pw)	0.455***	0.063
Wholesale quantity (Qw)	-0.001 NS	0.000
Farm-wholesale marketing cost (MCfw)	0.616***	0.102
Market share of wholesaler (Mrsw)	3.016 NS	2.564
Market information to the farmer (MISf)	-1.288***	0.218
- Cons	-7.220***	1.411
Prob > F = 0.000		
R-squared = 0.752		

*** statistically significant at 1% level of probability
NS statistically non-significant.

Results also showed that the quantity of rice traded at the retail market and the market share of the retailer have insignificant influence on the marketing margin. However, the sign of regression coefficients of both independent variables are consistent and logical. These factors are insignificant indicating that there is not much influence on the marketing margin. The marketing margin will not significantly change as changes in the quantity traded in the retail market and the percentage change in the market share of retailer. This can be attributed to the presence of more retailers in the rice market. So, the retailers cannot manipulate the retail price through quantity traded and market share.

Table 2. Factors affecting wholesale-retail MM (respondent#=100).

Explanatory variables	Regression coefficient	Standard error
Retail price (Pr)	0.202***	0.036
Retail quantity (Qr)	-0.065 NS	2.263
Wholesale-retail marketing cost (MCwr)	1.092***	0.091
Market share of retailer (Mrsr)	0.980 NS	30.865
- Cons	-4.346***	1.072
Prob > F = 0.000		
R-squared = 0.725		

*** Statistically significant at 1% level of probability
NS statistically non-significant

FARM TO RETAIL

The results of OLS estimation of farm to retail marketing margin revealed that two explanatory variables like retail price and marketing cost have significant influence on marketing margin (Table 3). The regression coefficient of retail price ($\gamma 1$) is 0.47 indicating that with an increase of one rupee of retail price of rice, the marketing margin increases by 0.47 rupees per kilogram, holding other factors constant. The marketing cost in farm to retail market has positive influence on marketing margin. As the marketing cost increases, the farm to retail marketing margin also increases. The regression parameter of 0.84 for marketing cost indicates that if the farm to retail marketing cost increases by one rupee per kilogram, the marketing margin will also increase by 0.84 rupees per kilogram. This implies the need for better alternative policies to reduce the marketing service costs which reduce the marketing margin. There should be a well-established farm to market road network that makes marketing channel shorter, creates and competitive evironment to lower marketing cost and margin.

The results also showed that the quantity traded at the retail market and market share of the retailer have insignificant influence on the marketing margin. However, the sign of retail quantity traded is consistent and logical. Because of the large number of retailers involved in rice market, the retailers cannot manipulate the retail price level.

Table 3. Factors affecting farm-retail MM (respondent#=100

Explanatory variables	Regression coefficient	Standard error
Retail price (Pr)	0.472***	0.064
Retail quantity traded (Qr)	-.175 NS	3.479
Farm-retail marketing cost (MCfr)	0.847***	0.117
Market share of retailer (Mrsr)	2.560 NS	47.445
- Cons	-8.716***	1.669
Prob > F = 0.000		
R- squared = 0.727		

*** Statistically significant at 1% level of probability
NS Statistically non-significant

CONCLUSIONS AND POLICY RECOMMENDATIONS

The marketing cost in all the models is the most significant factor influencing the marketing margin of rice. Alternative policies should be focused especially on the farm to wholesale marketing services such as transportation, handling, packaging, and milling to reduce the marketing margin. It can be reduced by improving the road network from farm to the market. This could be useful in increasing the market competition especially for the paddy market, thus helps reduce the marketing cost. This type of road network can be developed through the public private partnership scheme with the help of the local government, NGOs, cooperatives, and local community.

The market information to the farmer significantly influences the marketing margin at farm to rice wholesale market. The establishment of relevant and regular market information to farmers could be useful to reduce the marketing margin. Different forms of media like radio, telephone, television and publications should help disseminate the market information regularly. This could possibly help the famers sell their products at higher prices which can eventually help decrease the marketing margin.

The wholesale price significantly influences the marketing margin in the farm to rice wholesale market. Appropriate policies should be formulated for making marketing services such as transportation, handling, packaging and milling more efficient especially in farm to wholesale market level that will help reduce the wholesale price level leading to reduce the marketing margin. The involvement of traders such as middlemen and assemblers who exercised more market power to determine the price of paddy can be reduced by encouraging the formation of farmers' cooperatives that would certainly reduce the marketing margin. The tax collected from local government agencies like Village Development Committee and District Development Committee should strictly implement the rule of the central government for not collecting the tax from the primary agriculture product when transferring from one place to another that helps to reduce the marketing margin.

The wholesale to retail marketing margin is significantly influenced by the retail price. This is mainly because of the loose and expensive plastic packaging materials resulting higher marketing cost. Thus, it is imperative to conduct additional research for the development of alternative packaging materials which would decrease the packaging cost leading to reduce marketing margin.

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Annex 1. Marketing costs at different levels

District	Farm to wholesale	Wholesale to retail	Farm to retail
Jhapa	4.81	1.16	5.97
Morang	4.89	1.45	6.34
Chitwan	4.49	1.45	5.94
Rupandehi	4.04	2.28	6.32
Mean	4.32	1.58	5.90

Annex 2. Market price of rice at different levels of market

District	Farm price (Rs./kg)	Wholesale price (Rs./kg)	Retail price (Rs./kg)
Jhapa	19.74	26.68	29.65
Morang	18.54	25.81	29.20
Chitwan	20.25	27.25	30.69
Rupandehi	19.44	26.86	31.38
Mean	19.49	26.65	30.23