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Price Information and Market Integration of Grains Markets in Kazaure and Yankwashi Local Government Areas of Jigawa State

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Abstract: This study seeks to determine the degree of price association between retail and wholesale markets and also between one retail market and another. Ordinary Least square regression technique and correlation analysis were used to analyse the data. It was found that the grain markets were fairly integrated. The wholesale prices of rice and cowpea unlike that of Sorghum have an appreciable effect on the retail price of the commodities for all the markets.

Key words: Market Integration, price information, grains

INTRODUCTION

The emphasis of this study was on food marketing. This is justified by the high proportion of incomes spent on food by urban households. In Nigeria, more than half the population is engaged in agriculture (CBN, 2001), hence improvement on food marketing which would lower costs to both the producers and consumers without reducing the quality and variety of food available will have widespread effects on human welfare.

In a competitive structure, prices in different markets are expected to move together since all are influenced by the same set of forces and are tied together by transfer costs. Despite this however, price disparity does occur. This is because even though an individual trader may be unable to influence prices, the conditions of perfect homogeneity and perfect knowledge of products may not be satisfied in actual market transactions. Imperfect knowledge may therefore result in inadequate flow of goods and hence in price differences that are greater than costs of shipment.

This study therefore seeks to determine the degree of association between retail and wholesale markets and also between one retail market and another thereby shedding more light on the process of price determination. Damisa (1999) opines that it is in the short run that food prices can be expected to be determined at the farm and wholesale levels. According to him, consumer demand is in the long run the decisive and dominant variable. This implies that it is the retail price which determines the wholesale price in the long run. Two hypotheses were therefore tested as follows:

- In the short run retail prices of grains are determined by their wholesale prices
- The grain markets are in general integrated in that the price formation in one market is related to the prices in the other markets.

MATERIALS AND METHODS

Data

Primary data were drawn from field survey covering four markets lasting forty weeks. Both retail and wholesale prices of three grains: Rice, sorghum and cowpea were collected during the period. Retail prices were based on the tiya (2.5 kg) and wholesale prices on the bag (100 kg). Personal interviews were also carried out with the traders to determine their source of market information.

The Model

The linear regression model was employed in investigating the retail-wholesale price relationships and is represented as:

$$P_r = \alpha + \beta P_w \qquad (1)$$

Where

P_r = retail price

P_w = represents wholesale price

α and β are the regression coefficients

The extent to which changes in the retail prices of grain respond to changes in their wholesale price was determined by computing the elasticity of retail price of the grains with respect to their wholesale prices.

$$\frac{dP_r}{dP_w} = \frac{P_w}{P_r} \qquad (2)$$

where

$\frac{dP_r}{dP_r}$ is the derivative of (1)

RESULTS AND DISCUSSION

The regression results in Table 1 show very low R^2 except in Kazaure. This implies the wholesale and retail prices of sorghum do not move together. It can thus be deduced that the wholesale price of sorghum do not have appreciable influence on its retail price. This can probably be attributed to the fact that the area of study is a major producer of sorghum. As such retailers obtain their supplies, not only from wholesale distributors, but also from local farmers who take a fraction of their produce to the central markets for sale.

Empirical result on Table 2 shows that all the regression coefficients for rice are significantly different form zero implying that the retail price of rice is significantly affected by its wholesale price. This can be explained by the fact that unlike sorghum, rice is not major produced in the area.

Table 1: Regression results of retail-wholesale price of sorghum in kazaure and yankwashi local government areas

Market location	$P_r = \alpha + \beta P_w$ Constant	Coefficient	$\overline{R}^2$	T-ratio
Kazaure	9.276	0.428 (0.104)	0.51	4.121*
Dugunyawa	15.353	0.634 (0.169)	0.31	3.753*
Karkarna	18.729	0.455 (0.108)	0.43	4.219*
Firji	16.831	0.54 (0.158)	0.27	3.409*

Figures in parenthesis are the standard errors; *Significant at 0.01 level; Source: Survey data

Table 2: Regression results of retail-wholesale price of rice in four markets in kazaure and yankwashi local government area

Market location	$P_r = \alpha + \beta P_w$ Constant	Coefficient	$\overline{R}^2$	T-ratio
Kazaure	14.885	0.361 (0.103)	0.949	3.495*
Dugunyawa	55.737	0.733 (0.145)	0.871	5.051*
Karkarna	10.152	0.660 (0.189)	0.932	3.495*
Firji	36.037	0.632 (0.173)	0.853	3.656*

Figures in parenthesis are the standard errors; *Significant at 0.01 level; Source: Survey data

The regression results on Table 3 show a fairly high R^2. The implication is that wholesale and retail price of cowpea move fairly together. In other words, the wholesale price of cowpea exerts a fairly significant influence on its retail price. This is probably because during the on season the retailers source most of the commodity from the farmers, they however, turn to the wholesalers during the off season from where they obtain most of their commodity in the post-harvest period.

Grain Price Elasticity

It is important to know the extent to which changes in the wholesale price of the grains reflect in the changes in the retail price, given the assumption that in the short run, the retail price of grain is a function of its wholesale price. Table 4 reveals that the estimated elasticities are below unity, implying that a unit change in the wholesale price of grain results in less than a proportionate unit change in the retail price. On the average, a percentage (1%) increase in sorghum, rice and cowpea wholesale prices, results in 0.39, 0.78 and 0.62% increase in their respective retail prices. The logical conclusion is that not all the increases in the wholesale price of grain are passed on to the consumer. The retailers as well bear a fraction of the cost resulting from any wholesale price increase. The price elasticity of rice is highest (0.782), signifying that rice retailers are able to pass a greater percentage of any wholesale price increase to the consumer. This is because rice unlike sorghum and cowpea is not farmed extensively in the area of study such that rice consumers unlike sorghum and cowpea consumers are mainly dependent on the traders for the commodity.

Market Integration

Lele (1967) defined market integration as the inter-relationship between price movements in two markets. Bivariate correlation coefficients of retail prices for each of the three grains of the study in every pair of markets were estimated so as to have an overall view of the degree to which the grain markets surveyed at retail level provide an integrated marketing system.

Table 3: Regression results of retail-wholesale price of cowpea in four markets in kazaure and yankwashi local government area

| Market location | $P_r = \alpha + \beta P_w$ | | | |
	Constant	Coefficient	$\overline{R}^2$	T-ratio
Kazaure	6.775	0.822 (0.27)	0.512	3.046
Dugunyawa	9.276	0.497 (0.15)	0.495	3.302
Karkarna	18.729	0.455 (0.144)	0.501	3.163
Firji	10.891	0.310 (0.105)	0.412	2.952

Figures in parenthesis are the standard errors; *Significant at 0.01 level; Source: Survey data

Table 4: Elasticity of retail-wholesale price of grain in kazaure and yankwashi local government areas

| Market location | Estimated elasticity | | |
	Sorghum	Rice	Cowpea
Kazaure	0.523	0.793	0.781
Dunguyawa	0.348	0.777	0.594
Karkarna	0.387	0.695	0.618
Firji	0.295	0.862	0.501
Average	0.388	0.782	0.624

Table 5: Correlation matrix for sorghum in kazaure and yankwashi local government areas

Market location	Kazaure	Dunguyawa	Karkarna	Firji
Kazaure	1.000	0.258	0.583	0.447
Dunguyawa	0.258	1.000	0.601	0.370
Karkarna	0.583	0.601	1.000	0.594
Firji	0.447	0.370	0.594	1.000

Table 6: Correlation matrix for rice in four markets in kazaure and yankwashi LGA

Market location	Kazaure	Dunguyawa	Karkarna	Firji
Kazaure	1.000	0.958		0.888
Dunguyawa	0.958	1.000	0.879	0.887
Karkarna	0.915	0.948	1.000	0.906
Firji	0.888	0.887	0.906	1.000

Table 7: Correlation matrix for cowpea in kazaure and yankwashi local government areas

Market location	Kazaure	Dunguyawa	Karkarna	Firji
Kazaure	1.000	0.831	0.735	0.815
Dunguyawa	0.831	1.000	0.638	0.774
Karkarna	0.733	0.638	1.000	0.445
Firji	0.815	0.774	0.445	1.000

Table 8: Percentage distribution of bivariate correlation for retail markets in kazaure and yankwashi local government areas

	Percentage of correlation coefficients in indicated ranges		
Correlation	Sorghum	Rice	Cowpea
0.8 and above	Nil	100	33.33
Less than 0.8	100	Nil	66.67

Source: Table 5-7

Table 5-7 show that out of the recorded correlation coefficients, no figure is 0.8 and above for sorghum. For cowpea, about 33% are between 0.8 and 0.89; for rice, all the correlation coefficients lie between 0.8 and above. Thus there is generally, high price correlation between the markets for rice and cowpea. Since the correlation coefficients are measure of integration, the marketing system for rice and cowpea appear to be well integrated. Therefore hypothesis (b) which states that the grain markets are integrated is only partially supported by empirical results since sorghum price has a poor correlation (Table 8).

Source of Market Information

Interviews with 30 retail and wholesale grain traders reveal the less importance of the mass media in relaying market information. Eighty percent of the retailers interviewed disclosed that they obtained market information from fellow traders, 20% obtained from friends and other sources. Seventy percent of the wholesale traders interviewed obtained their market information from fellow traders and 30% obtained their information from friends and other sources.

CONCLUSIONS

The retail-wholesale price relationships analysed show the retail prices of grains to be influenced to an extent by their wholesale prices. The wholesale markets therefore become very important in the food marketing system. They are thus a force to be reckoned with when formulating policy issues that have to do with price adjustments. The price correlations for the markets studied reveal a fairly integrated marketing system.

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