A study of seasonal price behaviour and market concentration of maize in Rajasthan

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ABSTRACT: The paper investigates the price behaviour of maize and market concentration in Nimbahera market of Rajasthan. In view of this the present study was undertaken by collecting monthly wholesale prices of maize in major maize markets of Rajasthan for a period of 12 years (2002 to 2013). The seasonal price index provides a measure of the month to month variation in maize prices. Price of maize was found to be highest during off season and lowest during harvest season. Since maize is a Kharif crop, the arrivals were high during October to January. The higher seasonal indices of prices were observed during April to August during which the arrivals were found to be low. The Lorenz ratio was less than 0.5 in Nimbahera market. It can be concluded that the moderate market competitiveness in markets as the arrivals were concentrated among few large traders. The Lorenz ratio 0.49 for maize in Nimbahera market showing moderate market concentration.

KEY WORDS: Price, Seasonal, Maize, Market, Arrivals


INTRODUCTION:

Agricultural marketing plays a significant role in the movement of commodity from the producer to the consumer and in stabilizing the prices. The planned increase in agricultural output must be co-ordinated with changes in the demand and supply for agricultural commodities and marketing. This can be fruitful only when producer’s share in consumer’s rupee increases considerably irrespective of the volume of the marketable surplus with the farmers. Therefore, marketing rightly considered as essential activity in addition to improved input like seed and fertilizer in modern agriculture. The study of relationship between market arrivals and prices is very useful. Larger production and larger arrivals affect adversely to the prices. As a results the prices usually go down. But in a mixed economy, a certain amount of direction is given to the market forces and this law may not always holds good. This controlled mechanism of the market forces may aim at regulating market supplies or consumption or both, particularly in the case of commodity in the short reaction among the sellers and buyers and effect of these reactions at once reflected in the supply and price position. Thus, in mixed economy, it would be necessary to study the market arrivals and prices and to know the factors influencing them. The market efficiency depends to a large extent on the structure and organization of the market. The structural characteristics of the market reflected in the relative degree of concentration of market power in favour of buyers or sellers which influence the market conduct and performance. The study of the market concentration and role of middlemen will be of greater relevance to the policy makers to assess the market performance and to remove the bottleneck if any, in the
system of marketing of agricultural commodities, to improve the income of the farmers.

Maize (*Zea mays* L.), queen of cereals, after wheat and rice is the most important cereal grain crop in the world, providing nutrients for human beings and animals and serving as a basic raw material for the production of starch, oil and protein, alcoholic beverages, food sweeteners and more recently, fuel. Maize grain contains about 10 per cent protein, 4 per cent oil, 70 per cent carbohydrate, 2.3 per cent crude fibre, 10.4 per cent albuminoides and 1.4 per cent ash. Maize grain also has sufficient quantities of vitamin A, nicotinic acid, riboflavin and vitamin E.

During the year 2012-13, maize was cultivated in 167 million hectares globally leading to a production of 833 million tonnes. USA, Argentina and Brazil are the top three maize producer and exporter countries in the world. The prominent importing countries include Japan, European Union, Malaysia, Taiwan, Korea etc. Maize is an important staple food in many countries and its acreage is increasing continuously at global level. India ranks among the top 10 producers and exports to Bangladesh, Nepal, Sri Lanka, Middle East and South East Asian countries.

India produces around 15 million tonnes of maize annually. This contributes to about two per cent of the total world production. Karnataka occupies the highest area with 12.4 lakh hectares followed by Rajasthan (10.97 lakh ha.), Madhya Pradesh (8.32 lakh ha.), Maharashtra (7.94 lakh ha.), Andhra Pradesh (7.83 lakh ha.), Uttar Pradesh (7.04 lakh ha.) and Bihar (6.32 lakh ha.).

Maize is transacted in almost all regulated markets of the Rajasthan. Therefore, it is worthwhile to study the price behaviour and market concentration of maize in Nimbheda market of Rajasthan.

**MATERIALS AND METHODS:**

Udaipur region was purposively selected for the price behaviour study as around 75 per cent wheat of Rajasthan is produced in this region. Nimbheda market had highest arrivals of maize. The data on market arrivals and wholesale prices of maize crop were collected from Nimbheda regulated market of Rajasthan for the present price behaviour study. The price behaviour of the maize in selected market over the period from Jan., 2002 to December 2013 was analysed in terms of mean value for each month and the co-efficient of variation. The study of market concentration helps us to know whether the maize markets are competitive or not. For this purpose, primary data were used.

**Computation of seasonal indices:**

The seasonal price indices were computed by taking 12 months moving average of the original data with the following multiplicative model of time series analysis:

\[ P = T \times S \times C \times I \]  

where,

\[ P = \text{Monthly price} \]
\[ T = \text{Trend value} \]
\[ C = \text{Cyclic component} \]
\[ S = \text{Seasonal component} \]
\[ I = \text{Irregular component} \]

The ratio to moving average method was used for the construction of the seasonal price indices. The effect of trend and cyclical variations were eliminated by twelve months centered moving averages. Thereafter, the ratios of original price indices to centered twelve months moving averages were worked out. These ratios were averaged and the sum of twelve months indices were equal to 1200.

**Extent of intra year price rise:**

The difference between the lowest and the highest price within the year is termed as intra year price rise. The intra year price variation or rise was computed by using the following formula:

\[ \text{ASPV} = \frac{\text{HSPI} - \text{LSPI}}{\text{HSPI} + \text{LSPI}} \times 100 \]

where, ASPV = Average Seasonal Price Variation  
HSPI = Highest Seasonal Price Index  
LSPI = Lowest Seasonal Price Index  

This co-efficient has some advantages over IPR (Intra-Year Price Rise) and indicates the average variations in prices during the year.

**Co-efficient of variation:**

It expresses the variability of the price from its average. It indicates or measures the stability or instability of a given parameter. It was computed by using the formula:

\[ \text{C.V.} = \frac{\text{SD}}{\text{AM}} \times 100 \]
Lorenz ratio:

The study of market concentration helps us to know whether the wheat markets are competitive or not. For this purpose, Lorenz curve ratios were used as measures of inequality. Lorenz co-efficient of inequality was used to explain precisely the extent of inequality in the distribution of volume of business (Sujatha et al., 1989). The co-efficient of inequality is given by:

\[ L = \frac{1}{10000} \sum \frac{(X_i - X_{i-1})}{X_i + X_{i-1}} \]

where,

\[ L = \text{Lorenz co-efficient of inequality} \]

\[ X_i = \text{Cumulative percentage of number of firms upto and including ith class} \]

\[ Y_i = \text{Cumulative percentage of quantity handled or value of transaction by firms upto and including ith class} \]

\[ n = \text{Number of firms/size groups} \]

\[ i = \text{takes value 1, 2, 3, . . . . n size groups} \]

If \( L = 0 \), there is a perfect equality in the distribution

\[ L = 1 \], there is perfect inequality in the distribution

Results and Data Analysis:

To analyse the arrival pattern of maize during different months of the year and their impact on price, seasonal indices were computed adopting 12 months moving averages. The highest seasonal index (305.61) of arrivals of maize was observed during the month of December in Nimbahera market (Table 1 and Fig. 1). It can be observed that though the seasonal indices of arrivals of maize in Nimbahera market were more than 100 during October to January, the peak period of arrival was found during November (296.62) and December (305.61) and the lower arrival indices were observed during July (9.73) and August (5.14) month.

The values of highest price indices for maize were found in the month of July (108.55) and the lowest price index was found during October (91.66) in Nimbahera market. The price indices of maize were lower than 100 for only four months i.e., September to December.

Thus, maize crop can be grown under rainfed and irrigated conditions. Under rainfed conditions, the crop...
was sown in the month of June-July which marks the commencement of monsoon season in many parts of Rajasthan. It comes to harvest during September and/or October. It was apparent that the period from October to December has accounted maximum arrivals (more than 100 indices) in the selected markets.

The lower values of indices were observed during the period from January to September indicated lean period in Nimbaheda markets. Thus, the majority of the produce was sold soon after the harvest probably for want of cash or lack of storage facilities. However, farmers who are financially sound can store for longer time to look forward for advantageous period and higher prices. The results are in line with Nadaf (2002).

The price movement also demonstrates significant seasonal fluctuations in the selected markets. As a short term fluctuations, one will notice a general finding that the price is low when the arrivals were large and the price being high when the arrivals were low. The highest values of price indices were observed during lean arrivals months of June to August and in remaining months prices were moderate in Nimbaheda markets.

Co-efficients of average seasonal variation:

The extents of seasonal price variation were determined by using different measures of intra year price variations. With a view to ascertain the difference in the magnitude of the seasonal variations in the maize, the analysis was carried out in terms of IPR, ASPV and C.V. For this purpose, the magnitude of fluctuations in seasonal indices of maize was measured with the help of the co-efficient of average seasonal price index variation. The results obtained are presented in Table 2.

The difference between lowest and highest intra-year was 16.89 per cent in Nimbaheda market for wheat and the co-efficient of average seasonal price variation (ASPV) was recorded 29.63 per cent in the market. As the co-efficient of variation increased, the degree of stability of prices decreased. The variability in fresh arrivals, stock of the products in market and the demand affects the price to a great extent. Keeping such variations in demand in view, the growers can obtain better prices by matching supply to the market requirements during the period of high seasonal price index.

Market concentration:

Nimbahera is situated in Chittorgarh district of Rajasthan state. It is located around 40 km away from Chittorgarh, well connected with both rail and road and lies on the railway line connecting Ajmer to Ratlam. The city is also known for its big Krishi Upaj Mandi, as well as for major maize market of the state. In Nimbahera market, 26 traders deals with maize commodity. Table 3 indicated that in Nimbahera market, 26.92 per cent (7 traders) of the traders were in purchase size group of more than 10000 quintals and their share of purchase was 69.51 per cent of the total quantity handled, whereas 23.08 per cent (6 traders) of the traders were in the size group of 0-2500 quintals and their share of purchases was 4.09 per cent to the total purchases (Fig. 2). The lorenz ratio was found 0.49. This situation revealed the existence of moderate degree of competition for maize in Nimbahera market as the market concentration was moderate.
Thus, it can be concluded that the moderate market competitiveness in markets as the arrivals were concentrated among few large traders. The Lorenz ratio 0.49 for maize in Nimbahera market showing moderate market concentration. The reason might be due to the requirement of investment capacity and sound financial position exhibited by the traders. The results were in the line with Mundinamani et al. (1991).

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LITERATURE CITED:


