

Market arrivals and price behaviour of wheat in Karnataka

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ABSTRACT

Location of the present study was Bagalkot, Bijapur, Belgaum, Dharwad and Gadag districts of Karnataka state. These districts were selected purposively as they are the major production and marketing areas of Karnataka. The study utilized time series data to compute trend and seasonal variations. Monthly data on arrivals and prices for the years of 1989-90 to 2009-10 were taken from the records maintained by the market committees of Bagalkot, Bijapur, Belgaum, Dharwad and Gadag districts of Karnataka state. The time series data indicated a raising trend and trend coefficients of arrivals and prices were found to be significant. The results of analysis of long-term movements of arrivals showed that it was significant in Belgaum and Bijapur markets, while non significant in Dharwad, Bagalkot and Gadag. In selected markets, prices were established which were significant. Analysis of seasonal fluctuation revealed that during January there were lowest arrivals in the market and prices were highest in February.

Key words : Time series, Arrivals, Fluctuations, Wheat

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Wheat is the second most important cereal crop after rice, grown under diverse agro-climatic conditions. The resilience of wheat production in the country mainly came from the technological breakthrough since late sixties, the beginning of green revolution year. Green revolution technology has been most effective not only in expanding area under this crop but also in increasing its production and productivity.

About 90 per cent of the total wheat production in the country is contributed in seven states like Uttar Pradesh, Punjab, Haryana, Madhya Pradesh, Rajasthan, Bihar and Karnataka. Moreover, there exists a definite opportunity for

increasing the overall wheat production by reducing the existing yield gap (1.5 to 2.0 t/ha) in different parts of the country.

The spatial price variations are the variations in prices observed over different markets. They occur due to differences in location of production and consumption of commodities. In theory, in a perfect market, the price of a good at one market is not expected to exceed the price at other markets by more than the transport cost and nominal profit. The degree to which wholesale prices of a commodity in different markets are related to one another is an important consideration in determining the efficiency of the marketing system. The interrelation between the price movements in different markets mostly depends upon the nature and extent of competition.

METHODOLOGY

In view of specific objectives of the study, five major markets of wheat in Karnataka state were selected. The selection of markets was done on the basis of maximum quantity of arrivals of wheat in the selected market. The markets thus selected were Gadag, Bagalkot, Bijapur, Belgaum, and Dharwad (Table A).

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Table A : Annual market arrivals of wheat in major markets in Karnataka

Markets	Annual arrivals	Rank	% share	Cumulative %
Belgaum	67586	1	29.74	29.74
Bijapur	51684	2	22.74	52.48
Bagalkot	38767	3	17.06	69.54
Gadga	23447	4	10.32	79.85
Dharwad	17662	5	7.77	87.62
Gulbarga	14617		6.43	94.05
Bidar	5894		2.59	96.64
Koppal	2507		1.10	97.74
Bellary	1471		0.64	98.38
Raichur	1175		0.51	98.89
Chitradurga	1170		0.51	99.40
Haveri	715		0.31	99.71
Davanagere	555		0.24	99.95
Chikamanglore	34		0.01	99.96

This study was based on secondary data. The time series data on monthly arrivals and price of wheat required for the study were collected from the registers maintained in the respective APMCs. These markets maintain data on daily, monthly and yearly arrivals and prices of agricultural commodities. The data on arrivals refer to the total arrivals during the month in quintals in the market. The data on prices refer to modal prices in a month. Modal price was considered superior to the monthly average price as it represented the major proportion of the commodity marketed during the month in a particular market.

For the prices of wheat, monthly secondary data were collected from the selected markets for a period of 20 years depending upon data availability. Information on arrivals and price was collected for the period 1989-1990 to 2009-2010.

Analytical techniques:

In this section, a brief description of various statistical tools employed for the study has been presented.

Time series analysis:

Time series analysis was done to study the variations in monthly prices and arrivals of wheat for the period of 21 years. A time series is a complex mixture of four components namely, Trend (T), Seasonal (S), Cyclical (C) and Irregular (I) variations. These four types of movements are frequently found either separately or in combination in a time series. The relationship among these components is assumed to be additive or multiplicative, but the multiplicative model is the most commonly used method in economic analysis, which can be represented as:

$$O_t = T \times C \times S \times I$$

where,

O_t = Original observation at time 't'

T = Trend component

S = Seasonal variations

C = Cyclical element

I = Irregular fluctuations

Linear trend (T):

There are different types of trends, some of them are linear and some are nonlinear in their form. For shorter period of time, in most of the situations the straight line provides the best description of trend and for longer period of time, the non-linear form generally provides a good description of the trend. Often, it may be possible to describe such movements with a structured mathematical model.

Estimation of seasonal indices of monthly data:

To measure the seasonal variations in prices and arrivals, seasonal indices were calculated employing twelve months ratio to moving average method.

Calculation of seasonal indices:

In the first step, 12 months moving totals were generated. These totals were divided by 12 to compute 12 months moving average. Then a series of centred moving averages were worked out. For calculating the seasonal indices, 20 years data were considered.

Analysis of long-term movements (trend):

For estimating the long-run trend of arrivals and prices, the method of least squares estimate was employed. This method of ascertaining the trend in a series of annual arrivals and prices involves estimating the coefficient of intercept (a) and slope (b) in the linear functional form. The equation adopted for this purpose was specified as follows:

$$Y_t = a + bX + e$$

Y_t = Trend values at time t

X = Period

a = Intercept parameter

b = Slope parameter

e = Error

Annual trends of prices and arrivals for the selected markets were computed and compared. The goodness of fit of trend line to the data was tested by computing the coefficient of multiple determinations which is denoted by R^2 .

Regression analysis:

This analysis was carried out to ascertain the response of arrivals to a given change in prices. The observations X and Y were converted to logarithmic form. The equation fitted

for the purpose was specified as follows:

$$Y = a + bX + e$$

where,

Y = arrivals

a = Intercept

b = Slope or regression coefficient

X = Prices

e = Error

As shown in the equation, Y was assumed to be the dependent variable while; X was taken as an independent variable.

ANALYSIS AND DISCUSSION

The findings of the present study as well as relevant discussion have been summarized under following heads:

Trends in market arrivals of wheat in selected markets:

The linear trend was computed in order to ascertain the long-run movement of market arrivals of wheat in the selected markets and the results are presented in the Table 1. In the long-run, there was an increase in the arrivals of wheat in Bijapur (1666.54), Belgaum(852.14) and Bagalkot (67.29) markets over the years. Whereas decreasing in Dharwad (-276.13) and Gadag (-102.76). Annual decrease in arrivals in both Dharwad and Gadag markets was found to be statistically non-significant. Further, it was found that 4.1 per cent and 0.13 per cent of change in arrivals, respectively and was governed by the independent variable, time, as indicated by 0.041 and 0.0013, R² values, respectively.

Market	Equation	R ²	t value
Bagalkot	Y = 5695.619+67.29t	0.0025	0.222 NS
Belgaum	Y = 20570.39+852.14t	0.5011	4.36**
Bijapur	Y =5809.56+1666.54t	0.58	5.15**
Dharwad	Y =21020.36+(-276.13)t	0.041	-0.9 NS
Gadag	Y =37163.52+(-102.76)t	0.0013	-0.162 NS

* and ** indicate significance of values at P=0.05 and 0.01, respectively
NS =Non-significant

Trends in market prices of wheat in selected markets:

There was an increasing trend in the prices of wheat in all the selected markets and were found to be highly significant (Table 2). The annual increase in prices of wheat was found to be highest in Belgaum market (Rs.649.75/q) whereas lowest in Bagalkot *i.e.* Rs.423.89/q and were found to be statistically significant at 1 per cent. In both these markets, the contribution of time to change in prices was to the extent of 93 and 51 per cent, respectively.

The increasing trend in prices varied from one market to

Table 2 : Trend in prices of wheat in the selected markets

Market	Equation	R ²	t value
Bagalkot	Y =3907.09+423.87t	0.514	4.49**
Belgaum	Y =3742.40+649.75t	0.931	16.11**
Bijapur	Y =3747.53+6195.58t	0.943	17.85**
Dharwad	Y =3137.59+540.04t	0.814	9.14**
Gadag	Y =3111.1+585.19t	0.910	13.93**

** indicates significance of value at P=0.01

another market *i.e.* the annual increase in prices observed in Bijapur, Gadag and Dharwad markets were Rs.619.58/ctl, Rs.585.19/q and Rs.540.04/q, respectively and were found to be highly significant. The contribution of independent variable, time, to the changes in the prices was found to be lowest in Bagalkot market (51%) and highest in Bijapur market (94%) (Table 2).

Seasonal indices of market arrivals of wheat in the selected markets:

Seasonal indices for arrivals were calculated by using 12 months moving averages. Table 3 reveals the existence of seasonal variations in the arrivals of wheat. In all the selected markets, the quantity of market arrivals was found to be more in the months of March, April and May which later decreased. In Dharwad market, the highest market arrivals was seen during the month of March (277.54), whereas in Gadag, the arrivals were found to be low in the month of December (34.62).

Table 3 : Seasonal indices in arrivals of wheat in selected markets

Month	Bagalkot	Belgaum	Bijapur	Dharwad	Gadag
January	101.2	71.98	65.26	32.34	27.84
February	100.62	97	86.36	56.26	76.27
March	102.53	156.19	195.4	277.54	234.46
April	101.26	155.3	143.03	211.64	236.22
May	98.26	94.16	138.38	139.78	166.84
June	97.1	90	104.17	100.06	131.73
July	100.31	83.4	90.7	89.79	75.14
August	100.46	85.58	68.2	66.28	65.16
September	101.75	89.58	96.45	66.72	51.62
October	99.71	79.95	79.24	60.77	54.66
November	97.92	102.43	75.58	52.36	44.89
December	98.82	94.67	57.18	46.44	34.62

Seasonal indices of prices of wheat in the selected markets:

Seasonal indices for prices were calculated by using 12 months moving averages. The Table 4 reveals the existence of seasonal variations in the prices of wheat. In all the selected markets, the highest prices were found to be more in the months of January, February and March which later decreased. In Bagalkot market, the highest market price was seen during

Table 4 : Seasonal indices in prices of wheat in selected markets

Months	Bagalkot	Belgaum	Bijapur	Dharwad	Gadag
January	99.11	102.51	98.3	102.7	105.74
February	135.92	104.57	96.16	101.54	104.56
March	101.13	98.7	101.45	119.03	101.65
April	95.41	99.39	105.69	92.57	100.59
May	95.26	99.57	107.06	95.97	100.21
June	98.5	97.28	103.61	96.13	98.22
July	96.98	98.79	100.84	98.59	99.9
August	96.29	99.39	97.58	99.36	96.61
September	93.71	100	96.98	96.72	97.65
October	95.41	98.37	96.15	97.92	95.34
November	95.73	101.37	97.47	99	99.17
December	96.5	100.03	98.64	100.42	100.71

the month of February (135.92), whereas in Dharwad, the price was found to be low in the month of April (92.57). In the past, some observations were made in respect to the present investigation. Birukal (2001) worked on the analysis of price

and arrivals of cotton in Karnataka, Mehta and Srivastava (2000) on analysis of seasonality in prices of agricultural commodities and Yogisha *et al.* (2007) on trends and seasonal variation in arrivals and prices of potato in Kolar district.

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