Original Research Article

Market arrivals and Price behavior of Wheat grain in Major markets of India

ABSTRACT

The price behaviour of different agricultural commodities and the responsiveness of market arrivals to the price movement to reduce the gap in market arrival mark and the need for analyzing the market arrivals and prices. This study is based on the secondary data of 15 years from 2007-08 to 2021-22 which was collected from www.agmarknet.gov.in. For the analytical framework, the Exponential Regression Equation was used to study the trend in arrivals and prices. During the study period, the pattern of trend in arrivals and prices was differed across the selected markets. All the selected market for wheat showed increasing trend in arrivals and prices over the years. The increasing trend in arrivals and prices varied from one market to other market. The highest per annum increase in arrivals was registered in Lakhimpur market whereas highest per annum prices was recorded in Vidisha market. In terms of arrivals of wheat, there is presence of seasonality within a year in selected markets. Seasonal indices of arrivals and prices of wheat in selected markets revealed that when the arrivals of wheat to the market were high, the prices were found to be low i.e., March to June.

Key words: Arrivals and prices, Time series analysis, Wheat crop, Seasonality.

I. INTRODUCTION

The world's population, particularly among emerging countries, is growing at an alarming rate. Feeding the world's growing population is a difficult task for developing-country planners as well as global bodies. Agriculture is critical to the Indian economy. Over the years, India's agricultural sector has transformed from a position of severe food crisis to self-sufficiency in food grain production. Cereals are high in vitamins, minerals, carbohydrates, fats, oils, and protein. When the bran and germ are removed, the remaining endosperm contains mainly carbohydrate. Grain, such as rice, wheat, millet, or maize, provides the majority of daily nutrition in several poor countries. Wheat is a cereal grain that belongs to the grass genus *Triticum*. The durum wheats most likely originated in Abyssinia, whereas the entire group of soft wheats, which includes bread wheats, most likely originated in Pakistan, specifically in the South Western and Southern regions of mountainous Bokhara. It is mostly grown in temperate and subtropical climates around the world. Although there are several wheat species recognized around the world, only three are commercially cultivated in India: *Triticum aestivum* (Bread wheat), *Triticum durum* (Macaroni wheat), and *Triticum dicoccum* (Emmer wheat). Wheat is globally the leading source of carbohydrate in human food, with content of about 71 per cent, apart from this, it also contains 13 per cent proteins

which is very high as considered to cereals and hence is also a major source of proteins around the world.

Wheat's health advantages are highly dependent on how it is ingested. While whole wheat is incredibly nutritious, the advantages of wheat are diminished when consumed as white flour, which is created by processing after just 90 per cent of the grain is extracted in Indian conditions. According to several studies and researches, wheat and wheat flour are becoming increasingly significant in the administration of India's food economy. With the second greatest population, it is also the second largest consumer of wheat after China, with a massive and expanding wheat demand. Uttar Pradesh is the largest producer of wheat contributing for about 32 per cent. Madhya Pradesh accounting for about 18 per cent followed by Punjab for about 16 per cent, Haryana for about 11 per cent and Rajasthan for about 10 per cent of the total wheat output in the country.

Prices determine what is supplied as well as how much is generated. The price framework is an excellent tool for communicating basic financial information and fostering proper decision-making by producers and buyers. Furthermore, price is the most crucial profit or loss aspect in an agricultural operation. Because crops are sown in one season and harvested in another, time is critical in an agricultural operation. This extended era of expansion has had a substantial impact on value assurance. As a result, the prices won throughout the showcasing period are of exceptional quality. Huge production and a large number of arrivals have a negative impact on costs, causing prices to fall. However, in a mixed economy, market forces are given a special weight, therefore this law may not be universally applicable. This market impact control system may seek to manage market supplies, utilization, or both, especially when products elicit a rapid response from merchants and customers, the effects of which are reflected in supply and value position. With this backdrop, the present paper highlighted market arrivals and price behaviour of wheat grain in major markets of India.

II. OBJECTIVE OF THE STUDY

- To analyze the market arrivals and price behaviour of wheat grain in major markets of India.

III. METHODOLOGY

The secondary data pertaining to the study of temporal and seasonal fluctuations in arrivals and prices of wheat crop, monthly data was collected from AGMARKNET website and the selected markets arrivals and prices of wheat were collected for minimum period of last 15 years (2008-2022). Depending upon the highest area under wheat and consistency of monthly arrivals data Utter Pradesh, Madhya Pradesh and Rajasthan states were selected for the completion of specific objectives of the study. Selection of markets for the study was done on the basis of maximum quantity of arrivals for different markets in selected states. For the selection of markets, data were collected from www.agmarknet.gov.in for each state and calculated average wheat arrivals during the last three years of the study (2019-2021). In the

second stage, looking into the average arrivals in different markets, the two major markets of wheat where arrivals were higher and based on the data availability were selected for the present study. Thus, the six major markets selected for the study were Lakhimpur and Agra markets from Utter Pradesh, Vidisha and Dewas markets from Madhya Pradesh and Kota and Baran markets from Rajasthan.

3.1 Trend equation:

Trend equations were computed by running the regression between the yearly average price 'Y' and the time't'. Thereby fitted equations were as follows.

Regression equation, $Y = a + b_t + e$

Where,

Y = Yearly average price

t = Time period in years (T=1, 2,…….,17)

a = Intercept

b = Regression coefficient

e = Error term

With the help of this trend equation, estimated Y values for the yearly average price were found out. These estimated values from the regression equation were used to fit the trend line.

3.2 Seasonal variation:

$$\text{Seasonal indices} = \frac{\text{Monthly average}}{\text{Average of all monthly averages}} \times 100$$

IV. RESULTS AND DISCUSSION

4.1 Trends in arrivals and prices of wheat in major markets of India (2008-2022)

The linear trend was computed in order to analyze the long run movement of arrivals and prices of wheat in Lakhimpur, Agra, Vidisha, Dewas, Kota and Baran markets, and the results have been given in the Table 1. The results revealed that overtime the arrivals of wheat had increased in all the selected markets. The per annum increase in the arrivals of wheat in Lakhimpur market was the highest at 1884.86 quintals followed by Vidisha, Baran, Dewas, Kota and Agra markets at 1394.74, 942.65, 782.61, 389.19 and 56.53 quintals respectively. However, annual increase was significant only in Lakhimpur, Vidisha and Baran markets. The results revealed that overtime the prices of wheat had increased in all the selected markets. The per annum increase in the prices of wheat in Vidisha market was the highest at 76.47 rupees per quintal followed by Agra, Baran, Lakhimpur, Dewas and Kota markets at 75.86, 75.17, 74.97, 72.05 and 68.50 rupees per quintal respectively. However, annual increase was significant in all the selected markets. The arrivals were found to be increasing in all the selected markets, but quantum of increase in arrivals varied from one market to another market. The per annum increase in the arrivals of wheat in Lakhimpur market was the highest

at 1884.86 quintals followed by Vidisha, Baran, Dewas, Kota and Agra markets at 1394.74, 942.65, 782.61, 389.19 and 56.53 quintals respectively.

Table 1 depicts that market arrivals registered lowest quantum of increase in Agra and Kota markets, whereas, arrivals registered highest quantum of increase in Lakhimpur, Vidisha, Baran and Dewas markets. The lowest quantum of increase in arrivals of wheat maybe due to increasing heat stress, other problems experienced by producers in production and shift in cropping pattern of the farmers towards other commercial crops in those regions. On the other hand highest quantum of increase in the arrivals of wheat may be due to the increased production in these regions. Increased productivity and arrivals was attributable to introduction of high yielding varieties, technological advancement, increased demand for wheat in the international market, prices lead to better productivity realization by farmers in the surrounding hinterlands of Lakhimpur, Vidisha, Baran and Dewas area and supplied to these markets.

4.2 Seasonal indices of arrivals and prices of wheat in major markets of India (2008-2022)

To ascertain the pattern of price variations in wheat during different months of the year, seasonal indices were computed and the results of seasonal indices of prices and arrivals were presented in Table 2 and Fig 1 and Fig 2. The Table 2 revealed that the seasonal indices were observed in prices of wheat in all the selected markets. It was observed that the prices of wheat (range 95.16 to 106.23) were not fluctuating much. These results may be attributable due to the nature of arrivals to the market. The higher seasonal indices of prices were observed during the arrivals were found to be low i.e., during November to February. When the arrivals of wheat to the market were high, the prices were found to be low i.e., during March to June, The variation in prices (as indicated by seasonal indices) may be due to the nature of production of wheat, availability of storage facilities and processing facilities. The reason of immediate cash requirement by the farmers also compelled them to go for sale immediately after harvest. The comparative study of seasonal variation of arrivals and prices showed the existence of a lower price at the time of higher arrivals in the market and vice versa. Hence prices and arrivals should be maintained in such a way that both the variables would benefit the producer as well as consumers. To analyze the arrivals pattern of wheat during different months of the year, seasonal indices were computed and seasonal variations were observed in arrivals of wheat in the selected markets.

Table 2 depicted that due to seasonality in production, arrivals of wheat were not uniform throughout the year in the selected markets. It is more in the peak season of production and lesser in lean season of the year. The seasonal indices exhibited that, there was mild variation in the seasonal pattern in different markets. In the Lakhimpur, Vidisha, Dewas, Kota and Baran markets, the quantity of arrivals were found to be high during March to June, but in Agra market during May to July, it may attribute to majority of farmers having wheat production in late rabi season and in anticipation of getting remunerative prices for the commodity during these months, moreover some extent of arrivals also from neighboring states, agreement between farmers and private processing industries in these area leads to shift in cropping pattern of wheat in this region. The seasonal pattern on market arrivals was the result of inadequacy of warehousing facilities and inability of the farmers to withhold stocks

in storage which incurs not only the additional cost on storage but also incurs price risk losses.

Table 1 Trends in arrivals and prices of wheat in major markets of India (2008-2022)

State	Market	Arrivals (qtl)	Prices (₹/qtl)
		Equation	Equation
Uttar Pradesh	Lakhimpur	Y= -2902.33 + 1884.86**t	Y= 898.19 + 74.97**t
	Agra	Y= 23282.17 + 56.53t	Y= 942.59 + 75.86 **t
Madhya Pradesh	Vidisha	Y= 1742.89 + 1394.74**t	Y= 1241.78 + 76.47**t
	Dewas	Y= 11410.24 + 782.61t	Y= 1050.05 + 72.05**t
Rajasthan	Kota	Y= 19603.33 + 389.19t	Y= 1045.45 + 68.50**t
	Baran	Y= 4006.95 + 942.65**t	Y= 960.35 + 75.17**t

Note: **Significant at 1 per cent probability level
*Significant at 5 per cent probability level

V. CONCLUSIONS

The present study in Uttar Pradesh state concluded that in Lakhimpur and Agra market, the highest arrivals and lowest prices of wheat were in the month of May and April, respectively for both the markets. The present study in Madhya Pradesh state concluded that in Vidisha and Dewas market, the highest arrivals of wheat were in the month of April and March, respectively whereas the lowest prices of wheat were in the month of February and April, respectively. The present study in Rajasthan state concluded that in Kota and Baran market, the highest arrivals of wheat were in the month of April for both the markets whereas

the lowest prices of wheat were in the month of June and April, respectively. Analysis of the growth rate of arrivals of wheat in the selected markets of the study area suggested that Lakhimpur, Vidisha and Baran market recorded positive and significant growth rate annually whereas Agra, Dewas and Kota market witnessed a non-significant growth during the study period. With respect to wheat prices, all the selected markets registered positive and significant growth rate during the overall study period.

Table 2 Seasonal indices of arrivals and prices of wheat in major markets of India (2008-2022)

(Per cent)

States	Uttar Pradesh				Madhya Pradesh				Rajasthan			
Markets	**Lakhimpur**		**Agra**		**Vidisha**		**Dewas**		**Kota**		**Baran**	
Months	**Arrivals**	**Prices**	**Arrivals**	**Prices**	**Arrivals**	**Prices**	**Arrivals**	**Prices**	**Arrivals**	**Prices**	**Arrivals**	**Prices**
January	46.42	99.85	78.82	99.94	34.68	99.60	24.65	103.27	34.17	101.05	18.76	100.51
February	45.52	101.68	71.99	101.81	31.18	**96.54**	74.42	98.82	27.32	99.82	14.26	98.44
March	47.18	102.05	86.25	99.78	94.88	100.01	**352.84**	95.61	94.36	99.83	172.23	97.75
April	222.20	**96.81**	99.55	**97.23**	**486.44**	98.87	217.72	**95.16**	**408.59**	96.77	**477.62**	**96.23**
May	**295.68**	97.83	**138.30**	97.31	300.15	98.42	175.41	96.12	245.06	97.05	237.86	97.22
June	155.15	98.19	130.93	97.68	63.07	99.22	84.61	96.69	112.04	**96.16**	105.33	96.64
July	73.64	97.07	111.64	96.85	31.07	99.01	59.46	99.22	53.03	97.73	35.56	99.22
August	62.16	98.12	105.39	99.45	25.81	98.71	45.24	101.00	39.34	99.75	23.70	100.90
September	60.35	99.76	99.32	100.52	29.81	101.91	45.15	101.01	48.37	99.93	30.62	100.65
October	60.26	101.72	92.21	100.66	29.54	101.01	33.94	101.45	47.79	101.30	26.82	101.67
November	67.76	103.21	91.74	103.58	35.92	103.40	39.01	106.23	44.53	105.47	27.35	105.72
December	63.68	103.70	93.85	105.18	37.43	103.31	47.53	105.43	45.39	105.14	29.90	105.03

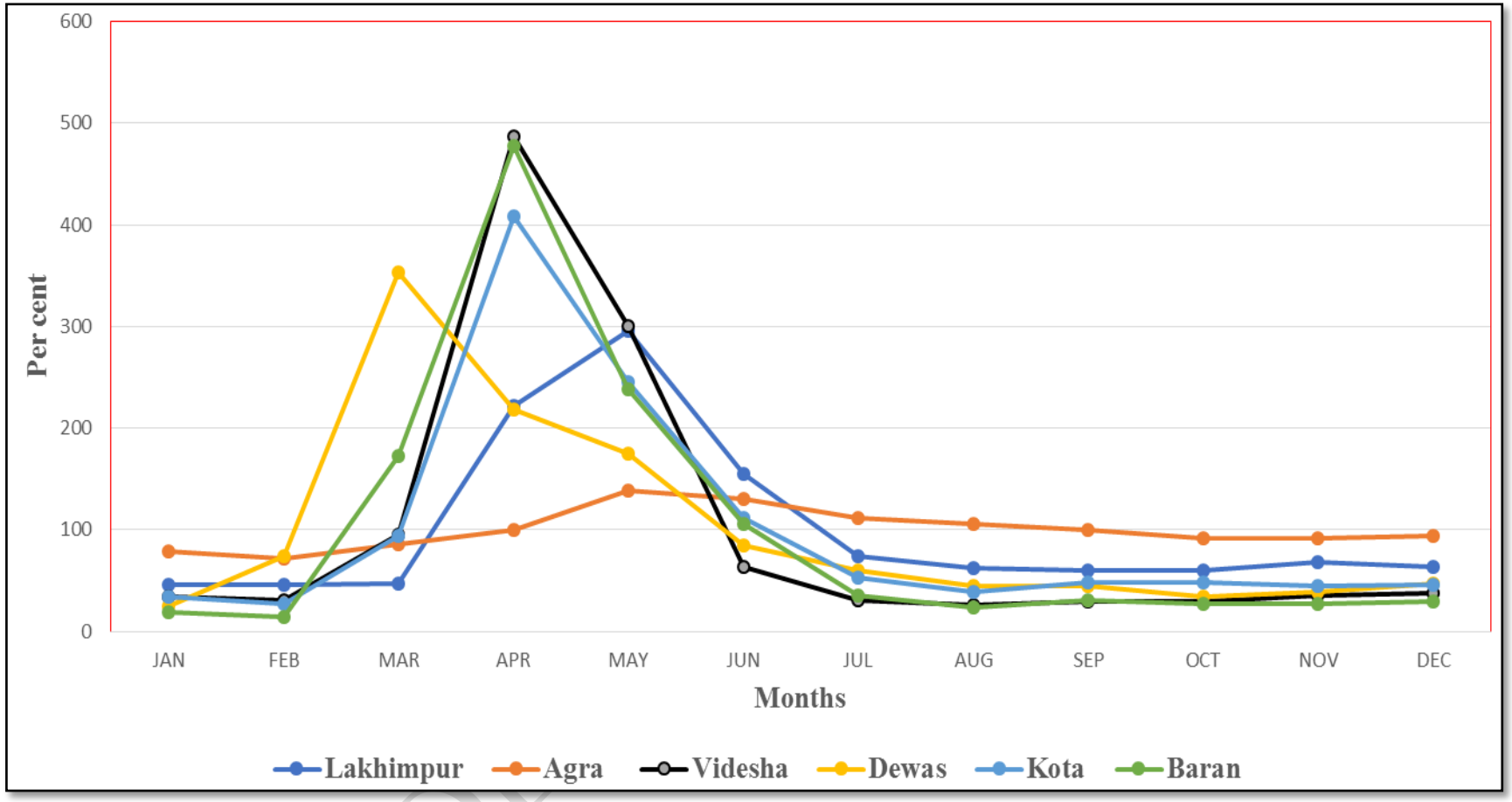

Fig 1. Seasonal Indices of Arrivals of wheat in selected markets

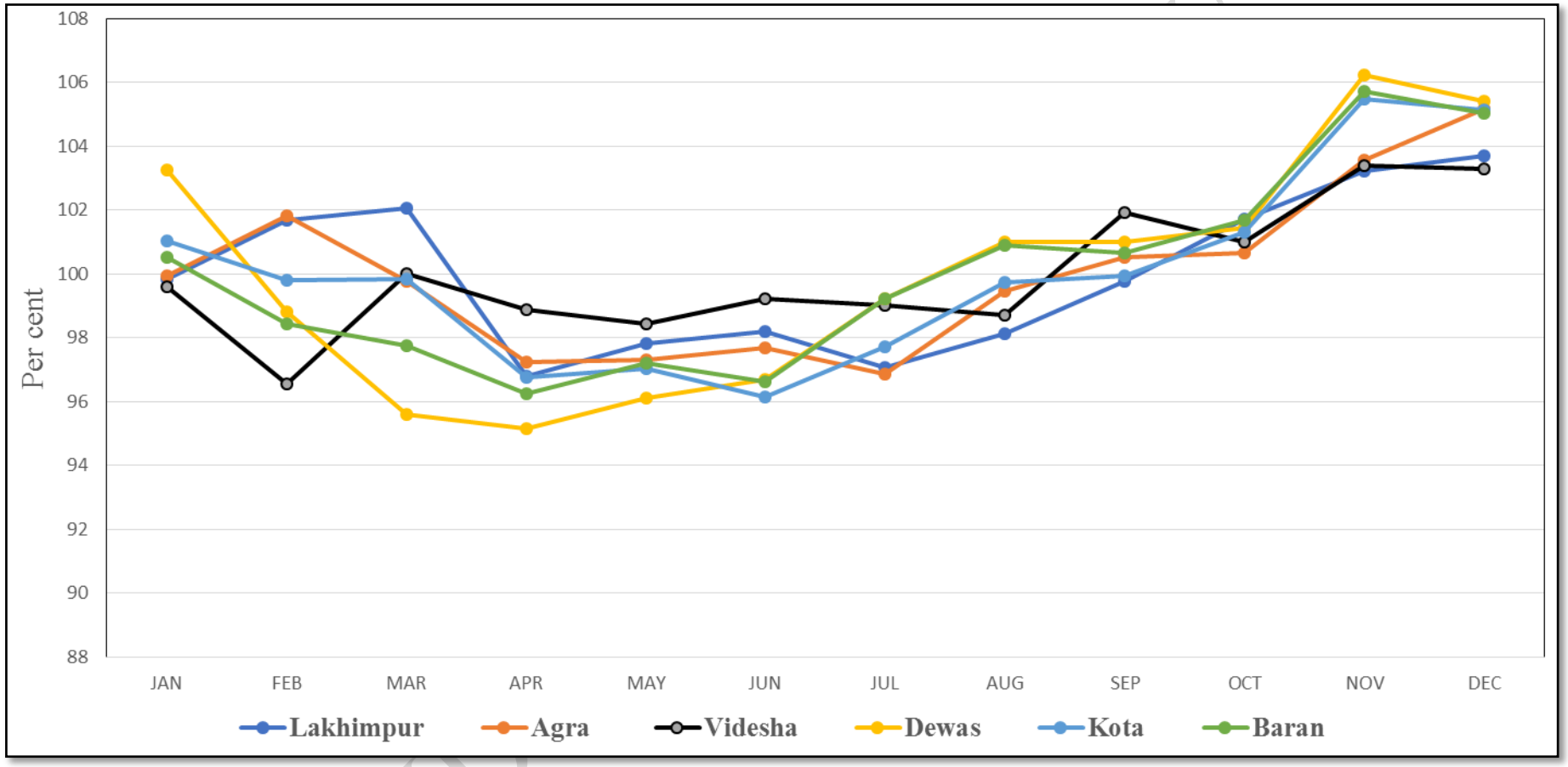

Fig 2. Seasonal Indices of Prices of wheat in selected markets

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