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Devendra Kumar Verma
Ph.D. Scholar, Department of Agricultural Economics and Management, Rajasthan College of Agriculture, MPUAT, Udaipur, Rajasthan, India

Jitendra Suman
Ph.D. Scholar, Department of Agricultural Economics. S.K.N College of Agriculture, Jobner. S.K.N.A.U. Jobner, Rajasthan, India

Pradeep Patil
Ph.D. Scholar, Department of Agricultural Economics and Management, Rajasthan College of Agriculture, MPUAT, Udaipur, Rajasthan, India

Ajit Singh
Ph.D. Scholar, Department of Agricultural Economics. S.K.N College of Agriculture, Jobner. S.K.N.A.U. Jobner, Rajasthan, India

Thanuja P
Ph.D. Scholar, Department of Agricultural Economics and Management, Rajasthan College of Agriculture, MPUAT, Udaipur, Rajasthan, India

Correspondence
Devendra Kumar Verma
Ph.D. Scholar, Department of Agricultural Economics and Management, Rajasthan College of Agriculture, MPUAT, Udaipur, Rajasthan, India

Trend in annual wholesale prices and arrivals of wheat in western Uttar Pradesh

Devendra Kumar Verma, Jitendra Suman, Pradeep Patil, Ajit Singh and Thanuja P

Abstract
The present investigation was conducted on trend in prices and arrivals of wheat selected district of western Uttar Pradesh. For workout the trend, secondary data was collected from 2006 to 2015 from publish government sources. Four markets were selected from four selected district namely Aligarh, Mathura, Meerut and Bulandshahr. Exponential model was found to be the best fit for all markets. The estimated coefficient of determination (R^2) for annual wholesale prices of wheat which indicates goodness of fit of the regression line to the given data, ranged from as low as 0.939 for Mathura market to as high as 0.968 for Bulandshahr market while estimated coefficient of determination (R^2) for market arrivals of wheat to the given data, ranged from as low as 0.694 for Aligarh market to as high as 0.792 for Mathurat market. The prices were found to rose significantly during the study period. The result of compound growth rates revealed that wholesale prices of wheat was found significant growth rates in selected market of Western Uttar Pradesh. The compound growth ranged from 5.50 per cent per annum in Meerut and 6.16 per cent annum in Aligarh market.

Keywords: Trend, wholesale prices, arrivals and wheat

Introduction
Wheat *(Triticum aestivum)* is one of the most important cereal crop of the world on account of its wide adaptability to different agro climatic zones and soil conditions. India ranks at second in the world with respect to wheat area and production, respectively (Agriculture Statistics, 2015). Uttar Pradesh is at the first position in area and production of wheat. It belongs to family Poaceae, sub-family Pooideae and genus Triticum. It is mainly grow in Rabi season. Among major cereal, wheat ranks first in area and production at the global level and it is the staple food of nearly 35 per cent of the world population. In India, wheat is second most important food crop, next to rice. It has been estimated that India will need at least 109 million tons of wheat by 2020 as against present production of 95.91 million tons from an area of 31.34 million hectare with productivity of 30.61 q/ha (DWR, 2015). Uttar Pradesh occupied an area of 96.37 lakh hectares with the production of 300.01 lakh metric tones during Rabi 2015 and productivity was 3113 kg/ha (Agriculture Statistics, 2015). Wheat is a major cereal crop cultivated in Western Uttar Pradesh.

In order to device appropriate ways and means for reducing price fluctuations of agricultural commodities, there is a need to have a thorough understanding of price behaviour over time and over space. Such an analysis is also useful to farmers in order to decide the optimum time for disposing off their produce to their best advantage.

Methodology
The present investigation based on wheat which is major cereal crop cultivated in Western Uttar Pradesh. Western Uttar Pradesh has twenty-six districts and six divisions. Out of twenty-six district, four districts were selected purposively based on highest area under wheat crop. One regulated market from each district having the highest arrivals of wheat consider for the study. These markets were Aligarh, Mathura, Meerut and Bulandshahr. Four leading producers Aligarh, Mathura, Meerut and Bulandshahr together supply 18.5 percent of the state's wheat output. Secondary data on annual wholesale prices and arrivals of wheat in Western Uttar Pradesh were collected from the year 2006 to 2015, from the published records and reports of the Directorate of Economics and Statistics (DES), Directorate of Agriculture (DOA) and Department of Agriculture, Uttar Pradesh. Time series data on monthly arrivals and wholesale prices of wheat obtained from the offices of the respective regulated markets.

Analysis of data
The collected data analyzed by using the following tools and techniques to achieve the stated objectives.

Trend in annual prices and arrivals
The trend in annual wholesale prices and arrivals was worked out using Exponential as well as compound growth rates.

Exponential Model
$P_t = ae^{bt}$ (i)
$A_t = ae^{bt}$ (2)

where,
P_t = Annual wholesale prices of wheat in year't', where t = 1…...10
A_t = Annual arrivals of wheat in year't', where t = 1…...10
T_t = Time (year) which takes the value 1, 2, 3, 4……...10.
U_t = Disturbance term with usual assumptions
a and b are regression coefficients to be estimated.

Compound Growth Model
$P_t = \beta_0 \beta_1^T U_t$ (ii)
where,
P_t = Annual wholesale prices of wheat in year't', where t = 1…...10
T = Time (year) which takes the value 1, 2, 3, 4…….. 10
U_t = Disturbance term with usual assumptions.
β_0 and β_1 are regression coefficients to be estimated.
On taking logarithms of both the sides, the equation takes the form
$\log P_t = \log \beta_0 + T \log \beta_1 + \log U_t$ (iii)

This equation was estimated by the ordinary least squares technique. The compound growth rate (g) was estimated as:
$g = (\text{Antilog } \beta_1 - 1) \times 100$ (iv)
't' test was used to test the significance of the estimated compound growth rate.

Results and Discussion
Trend in annual wholesale prices and arrivals of wheat in Western Uttar Pradesh
In all the four regulated markets, based on the significance of the coefficient, value of R^2 and shape of the function, exponential trend function was better fit over linear function for the annual wholesale prices and arrivals of wheat.

Exponential trend in wholesale prices of wheat in western Uttar Pradesh
The estimates of exponential trend in wholesale prices of wheat in regulated markets of selected districts of Western Uttar Pradesh are presented in Table 1 and panel of graphs are depicted in Fig. 1 to 4. It is obvious from the table 1 according to Handiganur and Kunal (1999) regression coefficients associated with the time element was positive and highly significant at 1 per cent level of significance for all the regulated markets. The value of regression coefficients for the time was estimated to be highest in regulated market of Aligarh district (0.0598) followed by Bulandshahr (0.0596), Mathura (0.0592) and Meerut (0.0535).
The estimated coefficient of determination(R^2), a measure of goodness of fit of the regression line to the given data, ranged from as low as 0.939 for Mathura market to as high as 0.968 for Bulandshahr market indicating that time element alone explained 93.9 per cent to 96.8 per cent variation in wholesale prices of wheat in the markets during the study period.

Table 1: Estimates of Exponential Trend in Wholesale Prices of Wheat in Uttar Pradesh (2006 to 2015)

S. No.	District	Regulated Markets	Estimated Exponential Trend Function	R^2
1	Aligarh	Aligarh	$P_t = 844.52 \times 0.0598^{T**}$ (6.61)	0.946
2	Mathura	Mathura	$P_t = 853.74 \times 0.0592^{T**}$ (6.85)	0.939
3	Meerut	Meerut	$P_t = 904.03 \times 0.0535^{T**}$ (5.59)	0.953
4	Bulandshahr	Bulandshahr	$P_t = 859.77 \times 0.0596^{T**}$ (5.13)	0.968

Figures in parentheses are the standard errors.
**Significant at the 0.01 level of significance.

In all the four regulated markets, based on the significance of the coefficient, value of R^2 and shape of the function, exponential trend function was better fit over linear function for the wholesale prices of wheat.

Exponential trend in annual arrivals of wheat in western Uttar Pradesh
The estimates of exponential trend in annual arrivals of wheat in regulated markets of selected districts of western Uttar Pradesh are presented in Table 2. It is obvious from the table that the regression coefficients associated with the time element was positive and highly significant at 1 per cent level of significance for all the regulated markets. The value of regression coefficients for the time was estimated to be highest in regulated market of Mathura district (0.147) followed by Meerut (0.145), Aligarh (0.114) and Bulandshahr (0.110).
The estimated coefficient of determination(R^2), a measure of goodness of fit of the regression line to the given data, ranged from as low as 0.694 for Aligarh market to as high as 0.792 for Mathura market indicating that time element alone explained 69.4 per cent to 79.2 per cent variation in annual arrivals of wheat in the markets during the study period.

Table 2: Estimates of exponential trend in annual arrivals of wheat in Uttar Pradesh (2006 to 2015)

S. No.	District	Regulated Markets	Estimated Exponential Trend Function	R^2
1	Aligarh	Aligarh	$A_t = 6884.11 \times 0.114^{T**}$ (384.42)	0.694
2	Mathura	Mathura	$A_t = 6870.74 \times 0.147^{T**}$ (382.85)	0.792
3	Meerut	Meerut	$A_t = 6646.22 \times 0.145^{T**}$ (476.76)	0.762
4	Bulandshar	Bulandshar	$A_t = 8431.77 \times 0.110^{T**}$ (491.23)	0.728

Figures in parentheses are the standard errors.
**Significant at the 0.01 level of significance.

In all the four regulated markets, based on the significance of the coefficient, value of R^2 and shape of the function, exponential trend function seems a better fit over linear function for the annual arrivals of wheat.

Compound growth rates of wholesale prices of wheat in western Uttar Pradesh

The estimated compound growth rates of wholesale prices of wheat in regulated markets of selected district in Western Uttar Pradesh are presented in Table 3. The estimates of growth rates represented to the period from 2006 to 2015. The compound growth rates varied from as low as 5.50 per cent per annum in regulated market of Meerut district to as high as 6.16 per cent per annum in regulated market of Aligarh district during the study period. All the estimated growth rates were significant at 1 per cent level of significance.

Table 3: Estimates of Compound Growth rates of Wholesale Prices of Wheat in Western Uttar Pradesh (2006-2015)

S. No.	District	Regulated markets	Compound Growth Rate	Coefficient of Determination (R^2)
1	Aligarh	Aligarh	6.16** (0.53)	0.945
2	Mathura	Mathura	6.08** (0.56)	0.939
3	Meerut	Meerut	5.50** (0.44)	0.951
4	Bulandshar	Bulandshar	6.14** (0.40)	0.968

Figures in parenthesis are the standard errors.
**Significant at the 0.01 level of significance

From above discussion, it may be concluded that wholesale prices of wheat recorded significant growth in all selected markets of western Uttar Pradesh.

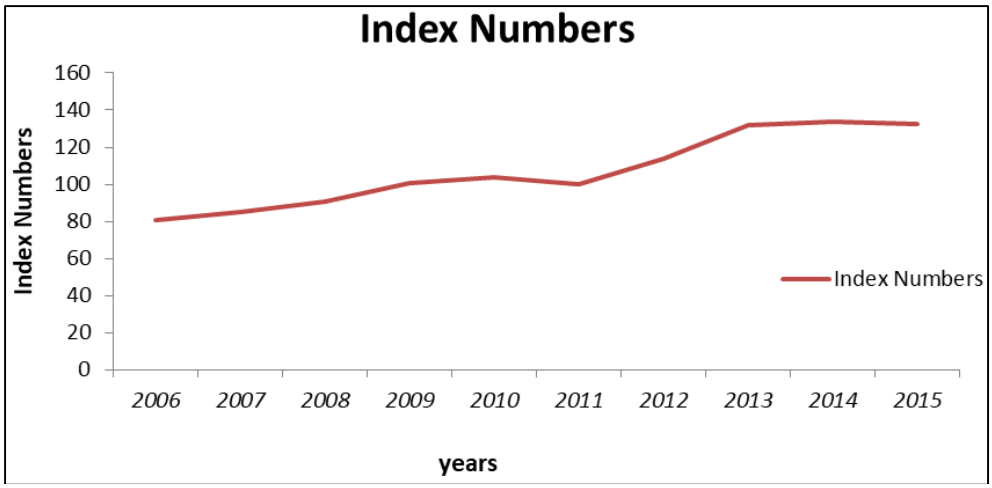

Fig 1: Exponential trend in wholesale prices of wheat in Aligarh market (2006 to 2014)

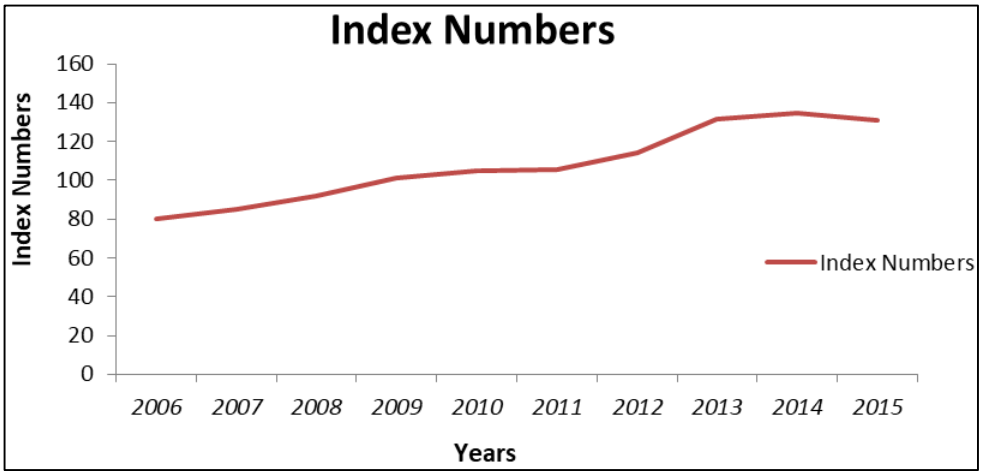

Fig 2: Exponential trend in wholesale prices of wheat in Mathura market (2006 to 2014)

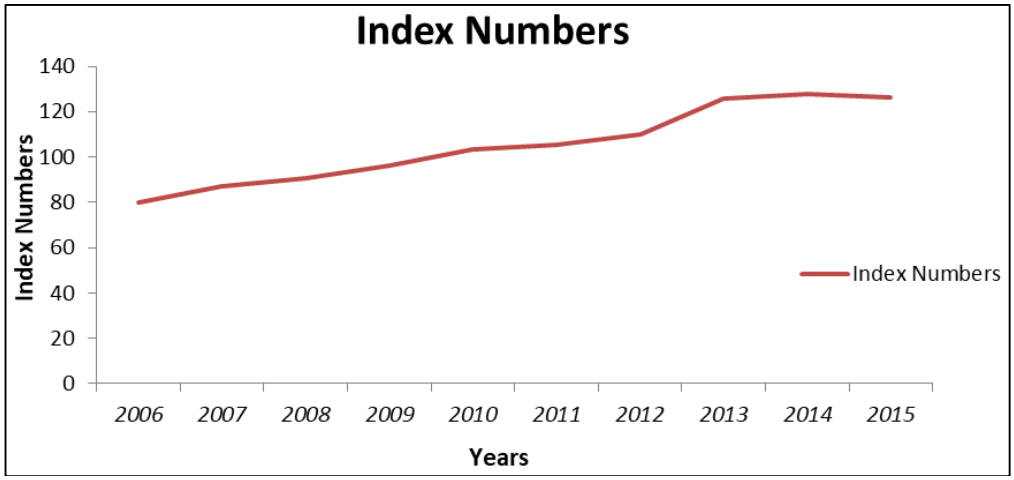

Fig 3: Exponential trend in wholesale prices of wheat in Meerut market (2006 to 2014)

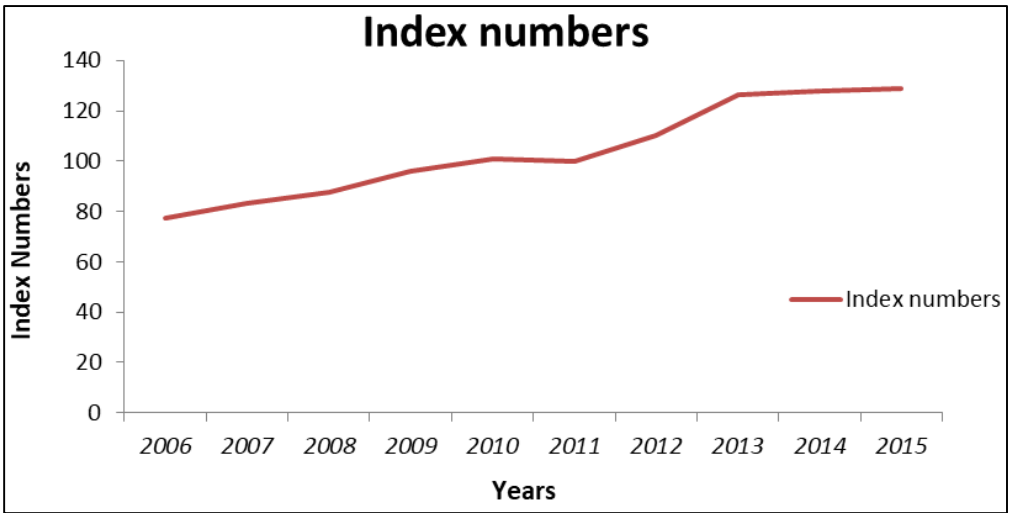

Fig 4: Exponential trend in wholesale prices of wheat in Bulandshahr market (2006 to 2014)

Conclusions

According to Pawar *et al.* (1999) [7] Annual wholesale prices of wheat increased significantly in all the selected markets of Western Uttar Pradesh during the study period. The rate of compound growth in annual wholesale prices ranged from 5.50 per cent to 6.16 per cent in the four selected markets of Western Uttar Pradesh. Annual wholesale prices of the wheat exhibited significant exponential trend over time in all the selected markets. The time element alone explained 93.9 per cent to 96.8 per cent variations in annual wholesale prices in the selected markets. Annual arrivals of the wheat exhibited significant exponential trend over time in all the selected markets. The time element alone explained 69.4 per cent to 79.2 per cent variations in annual wholesale prices in the selected markets.

References

1. Directorate of Economics and Statistics (DES), 2014-15.
2. Directorate of Agriculture (DOA), 2014-15.
3. Dyakar Rao BKA, Kumar B, Mathew B. Trend in production, price and markets arrivals of sorghum vs. competing crops – A critical analysis. Indian Journal Agriricultural Marketing. 2003; 17(1):85-92.
4. Fearon J. Temporal price trends for selected non-tradable staples in Northern Ghana: the case of major cereal foods. Academia Journal of Agricultural Research. 2014; 2(1):16-22.
5. Handignur SS, Kunnal LB. An analysis of arrivals and prices of chickpea in regulated markets of Karnataka. Agricultural Marketing. 1999; 42(3):41-45.
6. Kolour A, Yeledhali RA, Patil SL, Patil C, Choudhry K. Market arrivals and price behaviour of wheat in Karnataka. International Journal of Agricultural and Statistical Sciences. 2012; 8(1):313-318.
7. Pawar BN, Shinde HR, Nawadkar DS. Pattern of Arrivals and Price Relised for green chilli in Wholesale Market. Indian Journal of agricultural Marketing. 1999; 13(2):48.
8. WWW.agmarknet.com