

An Analysis of Price Behaviour of Wheat Crop in Major Indian Markets

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ABSTRACT

Wheat crop occupies an important place in Indian economy and it contributes significantly to the nation's food and nutritional security. The present study was carried out to analyze the price behaviour of wheat crop in India comprising the major wheat producing states of Punjab, Haryana, Uttar Pradesh, Madhya Pradesh, Rajasthan and Bihar. Annual and monthly time series data for six major markets from selected states were collected and analyzed for the period of thirteen years from January 2002 to December 2014. Price trends, growth rates, seasonal indices, instability indices and coefficient of variation were worked out for the analysis. Results of trend analysis showed that there has been continuous rise in wheat prices in majority of markets over the study period. The month-wise indices showed that prices of wheat in all the selected markets of major wheat producing states were seasonal. The price index of wheat was highest in the month from January to February and lowest during March to June. The difference between peak and trough prices was higher in Agra market and lowest in Patiala market. Coefficient of variation was also higher in Agra market and lowest in Patiala market. The study further concluded that there existed a negative relationship between growth rates and instability in prices of wheat for most of the markets. Market facilities such as warehousing, smooth and hassle free transportation, processing etc should be established to help the growers in storage of their produce in the glut season and then take advantage of off- season prices in order to eliminate the seasonality in market arrivals of wheat and to minimize the price volatility of wheat crop.

Key Words: Wheat, Price behavior, Price instability, Trend analysis

JEL Classifications: M0, M3, Q11

INTRODUCTION

Knowledge of relative price relationships and variability over seasons and around trends is important for understanding patterns of change and resource allocation in the agricultural sector. Therefore, it was felt that there is a need for studying the price behaviour of agricultural commodities. Several attempts

had been made in the past to analyze the price behavior of various commodities. Majority of the study focused on national level or at regional level (Asmatoddin et al., 2009, Dhakre and Bhattacharya, 2014, Khunt et al, 2006, Mishra and Kumar, 2012, More et al., 2014, Verma, 2014, Salam et al., 2012, Vekariya, 2006). Some studies focused on inter-state comparisons (Sharma, 2011, Planning Commission, 2001, Pandit et al., 2012, Kumar, 2005). Limited research had been undertaken to study the fluctuations of wheat prices in various

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markets of Indian states. Thus, the present investigation was carried out to study the price behavior of wheat crop in selected markets of major wheat producing states of India.

Wheat plays an important role in overall economy. It is one of the most important staple food grains of millions of Indians, particularly in the northern and north-western parts of the country. India has the second largest area under wheat accounting for around 13.57 per cent of the world wheat area. In terms of production, India is also second after China accounting for 13.11 per cent of the global wheat production (FAOSTAT, 2014). This crop contributes about 38.9 per cent to the total cereal production and about 36.2 per cent to the total food grains production of the country. The pre-dominant wheat growing states that contribute about 90.7 per cent to the total wheat production are Uttar Pradesh (31.5%), Punjab (17.7%), Madhya Pradesh (14.5%), Haryana (12.3%), Rajasthan (9.3%) and Bihar (5.3%) and these states jointly account 86 per cent area under wheat cultivation (Agricultural Statistics at a Glance, 2014). The present study was conducted in these major wheat producing states of India.

METHODOLOGY

The present study comprised the states of Bihar, Punjab, Rajasthan, Madhya Pradesh, Haryana and Uttar Pradesh. The wholesale wheat markets reported in these states were Sasaram, Jainagar and Patna markets of Bihar, Ambala, Karnal and Hisar markets of Haryana, Harda, Tikamgarh, Indore and Basoda markets of Madhya Pradesh, Amritsar, Jagraon, Jalandhar, Patiala and Bathinda markets of Punjab, Sangria, Udaipur and Jaipur markets of Rajasthan, Haipur, Kanpur, Agra and Varansi markets of Uttar Pradesh. One market was

selected from each state based on the regular availability of data on prices during whole study period. The selected markets were Patna of Bihar, Patiala of Punjab, Jaipur of Rajasthan, Harda of Madhya Pradesh, Karnal of Haryana and Agra of Uttar Pradesh. Data on area, production, yield and prices were collected from the office of the Directorate of Economics and Statistics, Ministry of Agriculture, Government of India and CACP reports of India. Monthly wholesale and farm harvest prices for different markets were collected from January 2002 to December 2014. Due to non-availability of monthly data, Harda was replaced by Basoda market in Madhya Pradesh for seasonal analysis.

For the analysis, the annual compound growth rates were calculated for the study period. The equation was used to calculate growth rate:

$$\log Y_t = a + bt \quad \dots (1)$$

Where Y_t = Acreage/production/productivity/ prices of wheat, a = Intercept of trend equation, b = Trend coefficient, t = Time variable.

The growth rate was then given by the formula

$$r = \text{antilog}(b^{\wedge} - 1) \cdot 100 \dots (2)$$

Where b^{\wedge} = estimated value of b .

The seasonal pattern of prices was studied by constructing seasonal indices (Pandit et al; 2012, Rao et al; 2003, Khunt et al; 2006, Sharma, 2011; Dhakre and Bhattacharya, 2014). The seasonal indices (for monthly data) were computed by using the method given by Acharya and Agarwal (1994).

There were a number of techniques available to measure the index of instability. Many researchers such as (Paul, 2013), Singh and Byerlee (1990), Weber and Sievers (1985), Cuddy-Della Valle (1978), Massel (1970), Mac-Bean (1966), Coppock (1962) and described different techniques

to measure the instability. In the present study, instability/variability in prices was measured in relative terms by Cuddy Della Valle index. Cuddy Della Valle Instability index (Cuddy and Della Valle, 1978 was Della Valle, 1979) was a modification of CV to accommodate for trend, which was commonly present in time series economic data. This method was superior over other scale dependent measures such as standard deviation or Root Mean Square of the residuals (RMSE) obtained from the fitted trend lines of the raw data, and hence suitable for cross comparisons. The Cuddy Della Index (I_x) was calculated as follows:

$$I_x = C.V. * (1-R^2)^{0.5}$$

$$C.V. = \text{Standard Deviation} / \text{Mean} * 100$$

Where, I_x = Instability index

C.V. = Coefficient of variation

R^2 = Coefficient of determination

RESULTS AND DISCUSSION

Compound Growth Rates of Wheat in Major Wheat Producing States of India

A striking difference in the growth performance of wheat had been observed between the decades of 1980s, 1990s and beyond (Table 1). The production growth during 1980s was positive across states and at the national level. It was achieved through

growth in both area and yield. During this period, wheat production increased at a much higher rate (above 4 per cent) in Punjab and Bihar followed by Uttar Pradesh (3.78 per cent) and Madhya Pradesh (3.29 per cent).

During 1990s, wheat production recorded accelerated growth in Haryana, Madhya Pradesh and Rajasthan and at national level. This was possible mainly through the expansion in area growth. On the other hand, Punjab, Uttar Pradesh and Bihar recorded deceleration in production growth due to low growth in both area and productivity.

However, a more worrisome trend was the universal decline in wheat production in all states (except Madhya Pradesh) in recent years. The decline had been caused by decelerated growth in both area and productivity. Accelerated growth in Madhya Pradesh was mainly due to increase in growth of productivity. The low growth in area of wheat had been due to its diversion towards other crops towards other crops like sugarcane, potato and vegetables in Uttar Pradesh, winter maize, onion and chillies in Madhya Pradesh and tomato, garlic and coriander in Rajasthan. The low growth in yield had been due to low quantity and

TABLE 1: COMPOUND GROWTH RATES OF AREA, PRODUCTION AND PRODUCTIVITY OF WHEAT

Year	Variables	Punjab	Haryana	Uttar Pradesh	Madhya Pradesh	Rajasthan	Bihar	All India
1980-81	Area	1.26	1.94	0.88	0.11	-1.09	2.26	1.85
to	Production	4.3	5.94	3.78	3.29	2.56	4.79	3.55
1989-90	Productivity	3	1.22	2.89	3.17	3.77	2.47	3.09
1990-91	Area	0.27	2.24	0.91	3.78	4.93	0.95	1.71
to	Production	2.26	3.78	3.17	5.55	6.47	3.53	3.56
1999-00	Productivity	1.98	1.51	2.24	2.47	1.47	2.56	1.68
2000-01	Area	0.29	0.83	0.61	3.16	2.76	0.18	1.39
to	Production	1.22	2.3	2	6.83	4.3	1.76	2.85
2013-14	Productivity	0.92	1.45	1.37	3.56	1.49	1.56	1.44
1980-81	Area	0.53	1.53	0.53	0.86	1.4	0.53	1.72
to	Production	2.02	3.83	1.65	3.07	3.66	1.77	2.61
2013-14	Productivity	1.47	2.1	1.79	2.21	2.02	1.23	1.74

Source: Various Reports on Area and Production of Principal Crops in India, Government of India, New Delhi

unwisely use of nutrients, poor knowledge of production technology, delay in sowing, inadequate capital and non-availability of inputs in time and scanty winter rainfall etc (Kumar, 2008). Thus, it was concluded from the above table that in majority of states, the production of wheat had declined, area under cultivation had shown decline overtime and productivity growth had increased but at a much lower rate.

Trend Analysis

Analysis of trend component in price series involved ascertaining the general direction of the movement of prices over a period of several years. To analyze the behavior of agricultural prices, widely used indicators were: (i) Minimum support prices (MSP) (ii) Farm harvest prices and (iii) Whole sale prices. The Government policy of procurement of food grains has the broad objective of ensuring MSP to the farmers and also ensuring availability of good grains to the weaker sections at affordable prices. Before the harvest during each *Rabi/Kharif* crop season the Government of India announces the minimum support prices for procurement on the basis of the Commission of Agricultural Cost and Prices (CACP).

Trends in Minimum Support Prices

It was found that there had been substantial rise in the MSP of wheat over the period of time (Table 2). The MSP of Wheat rose from ₹ 130 per quintal during 1980-81 to ₹ 1400 per quintal in 2013-14. The highest growth in the MSP was noticed at 10.53 per cent per annum during 1990-91 to 1999-00. During 1980-81 to 1989-90, MSP increased at 4.37 per cent per annum and it was increased at 7.85 per cent per annum in 2000-01 to 2013-14. The rise in MSP might not have been above the inflation rate during all the years but the extent of rise coupled with effective

procurement made it the most remunerative and least risky (production and marketing risk) crop of the winter season.

Farm Harvest versus Wholesale Prices

It was observed that farm harvest prices of wheat in Patna, Karnal and Patiala market shown a continuous increasing trend, while the prices in remaining markets were fluctuating during the whole study period (Table 3). Farm harvest price of wheat declined in 2009 and 2011 in Agra and Jaipur market respectively, while in Harda market price declined by two times in 2004 and 2011. In the year 2007, Patna and Harda markets had shown a highest price rise in Farm harvest prices of wheat. During 2008, the percentage variations in price rise were very high in case of Karnal, Patiala and Agra markets. Jaipur market has shown a highest price rise during 2013. Wholesale prices of wheat registered upward trend from 2002 to 2010 in Patna, Patiala, Karnal and Agra market whereas, Harda and Jaipur markets showed mixed trend during the whole study period. The sharpest price rise in wholesale prices was found during 2006 in all the markets. The relationship between farm harvest and whole sale prices seems to be quite strong in majority of markets as these two prices move in the same direction. Though, there were some years in between when the wholesale prices had fallen below farm harvest prices, on an average the kind of pattern observed in all markets was farm harvest prices were lower than wholesale prices and margin between farm harvest and whole sale prices had tended to be narrowed down considerably in recent years. Thus, wholesale price acted as a leader price, which set stage for the farm harvest price of wheat.

Seasonality in Prices of Wheat

The seasonality in prices in agricultural crops occurs regularly every year. These

TABLE 2: TRENDS IN MSP FOR WHEAT, 1980-2014

				(₹/Quintal)	
Crop year	MSP	Crop year	MSP	Crop year	MSP
1980-81	130	1990-91	225	2000-01	610
1981-82	142	1991-92	275	2001-02	620
1982-83	151	1992-93	330	2002-03	630
1983-84	152	1993-94	350	2003-04	630
1984-85	157	1994-95	360	2004-05	640
1985-86	162	1995-96	380	2005-06	700
1986-87	166	1996-97	475	2006-07	750
1987-88	173	1997-98	510	2007-08	1000
1988-89	183	1998-99	550	2008-09	1080
1989-90	215	1999-00	580	2009-10	1100
				2010-11	1170
				2011-12	1285
				2012-13	1350
				2013-14	1400
Compound Growth Rate (per cent per annum)					
Period	CGR	Period	CGR		
1980-81 to 1989-90	4.37	2000-01 to 2009-10	6.86		
1990-91 to 1999-00	10.53	2000-01 to 2013-14	7.85		

Source: CACP Reports.

variations may be due to the seasonality in production, poor storage facilities, early harvesting, lack of retention powers of growers and lack of speedy transportation facilities (Pandit et al, 2012). In general, the prices of commodities whose supply was seasonal touch the lowest level immediately after the harvest when the marketing season reaches its peak and the maximum level is recorded during the off season (Planning Commission, 2001). Thus keeping above in mind, the seasonality of wheat prices was analyzed for different markets for a period from 2002 up to latest month for which data was available in 2014.

The month-wise indices were calculated and are presented in the Table 4. It can be observed from the table that the variations in indices were not violent, unlike perishable commodities like chilies (Khunt et al., 2006, Mishra and Kumar, 2012). The prices were higher during month from November to February as this is the lean season for the arrivals which keep the prices in upswing. The harvesting of wheat starts in the month

of March from when the prices fall drastically. The prices were generally low during March to July. Then from July onwards prices started increasing and reached peak during December to February. The markets of Punjab, Haryana, Uttar Pradesh and Bihar fetched highest price during December. Basoda market got highest price during November. For Karnal and Jaipur market, the price was lowest in the month of June. Agra market got lowest price in April, Patiala market in May and Patna market in the month of July. The difference between peak and trough prices was higher in Agra market and least in Patiala market. Coefficient of variation was also higher in Agra market and least in Patiala market.

Growth and Instability Analysis

Growth and instability in wheat prices in the different markets of India is examined in Table 5. The methodology suggested by Cuddy and Della (1978) was used in the present study to assess the degree of instability in wheat price. This is an

TABLE 3: TRENDS IN FARM HARVEST PRICES AND WHOLESALE PRICES OF WHEAT IN SELECTED MARKETS OF INDIA

Year	Bihar (Patna)		Haryana (Karnal)		Punjab (Patiala)		Rajasthan (Jaipur)		Uttar Pradesh (Agra)		Madhya Pradesh (Harda)	
	FHP	WSP	FHP	WSP	FHP	WSP	FHP	WSP	FHP	WSP	FHP	WSP
2002	540	719	550	609	620	605	644	688	606	631	619	752
2003	574.00 (6.20)	741.00 (3.10)	620.00 (12.70)	641.00 (5.25)	620.00 0.00	672.00 (11.00)	680.00 (5.50)	671.00 (-2)	630.00 (3.90)	668.00 (5.90)	645.00 (4.20)	741.00 (-1.4)
2004	594.00 (3.40)	795.00 (7.30)	660.00 (6.50)	702.00 (9.51)	630.00 (1.61)	687.00 (2.23)	739.00 (8.60)	687.00 (2.40)	640.00 (1.60)	704.00 (5.30)	632.00 (-2.1)	752.00 (1.50)
2005	603.00 (1.50)	814.00 (2.40)	780.00 (18.10)	696.00 (-0.9)	630.00 0.00	686.00 (-0.14)	813.00 (10.10)	733.00 (6.60)	662.00 (3.40)	736.00 (4.50)	650.00 (2.80)	779.00 (3.60)
2006	690.00 (14.40)	1013.00 (24.40)	805.00 (3.20)	872.00 (25.30)	640.00 (1.58)	815.00 (18.80)	897.00 (10.30)	891.00 (21.50)	720.00 (8.70)	950.00 (29.10)	741.00 (14.00)	1081.00 (38.70)
2007	817.00 (18.40)	1133.00 (11.80)	850.00 (5.59)	979.00 (12.30)	650.00 (1.56)	910.00 (11.60)	1011.00 (12.70)	969.00 (8.70)	838.00 (16.30)	958.00 (0.80)	897.00 (21.10)	1045.00 (-3.3)
2008	940.00 (15.10)	1179.00 (4.06)	1000.00 (17.60)	1073.00 (9.60)	850.00 (30.70)	998.00 (9.60)	1055.00 (4.30)	1135.00 (17.10)	1054.00 (25.70)	1035.00 (8.00)	1010.00 (12.60)	1174.00 (12.30)
2009	956.00 (1.70)	1349.00 (14.40)	1150.00 (15.00)	1110.00 (3.40)	1000.00 (17.60)	1108.00 (11.10)	1110.00 (5.20)	1322.00 (16.40)	1020.00 (-3.2)	1120.00 (8.20)	1121.00 (10.90)	1310.00 (11.50)
2010	1000.00 (4.60)	1377.00 (2.10)	1150.00 0.00	1157.00 (4.20)	1080.00 (8.00)	1145.00 (3.33)	1252.00 (12.70)	1395.00 (5.50)	1078.00 (5.60)	1181.00 (5.40)	1256.00 (12.40)	1450.00 (10.60)
2011	1000.00 0.00	1510.00 (9.60)	1150.00 0.00	1180.00 (1.90)	1100.00 (1.80)	1135.00 (-0.8)	1139.00 (-9)	1331.00 (-4)	1133.00 -5.1	1151.00 (-2)	1190.00 (-5.2)	1307.00 (-9)
2012	1100.00 (10.00)	1430.00 (-5.2)	1250.00 (8.69)	1297.00 (9.90)	1120.00 (1.80)	1244.00 (9.60)	1266.00 (11.20)	1468.00 (10.20)	1202.00 (6.10)	1303.00 (13.20)	1228.00 (3.10)	1363.00 (4.20)
2013	1267.00 (15.18)	1646.00 (15.10)	1350.00 (8.00)	1432.00 (10.40)	1285.00 (14.70)	1334.00 (7.23)	1477.00 (16.60)	1747.00 (19.00)	1394.00 (15.90)	1471.00 (12.80)	1495.00 (21.70)	1672.00 (22.60)
2014	1434.00 -13.18	1624.00 (-1.33)	1450.00 (7.40)	1420.00 (-0.8)	1330.00 (3.50)	1388.00 (4.00)	1688.00 (14.20)	1713.00 (-1.4)	1450.00 (4.10)	1539.00 (4.60)	1620.00 (8.30)	1850.00 (10.00)

Source: Directorate of Economics & Statistics, Ministry of Agriculture, New Delhi.

Note: Figures in parentheses are percentage changes in farm harvest and wholesale prices.

improved approach than the coefficient of variation methodology because the simple coefficient of variation over-estimates the level of instability in time series data characterized by long term trends whereas, the Cuddy- Della Valle -corrects the coefficient of variation. It can be observed from the table that the compound growth rate of both farm harvest prices and whole sale prices of wheat varied from 7 per cent to 9.50 per cent across the various markets. Highest growth rate in farm harvest prices of wheat was recorded by Harda market and lowest growth rate experienced in Jaipur market. On the other hand, maximum growth rate in whole sale prices recorded in Jaipur market and least growth rate found in Patiala market. Instability indices ranged

from 4 to 8 per cent in both farm harvest and whole sale prices of wheat. Comparatively farm harvest prices in Patiala market and wholesale prices in Harda market were most unstable, whereas, that of farm harvest prices in Karnal market and wholesale prices in Patiala and Agra market were least stable. The farm harvest prices of Jaipur, Agra and Harda market had exhibited similar instability. Similarly Patna and Karnal market also had similar instability in farm harvest prices. In case of wholesale prices, Patna and Jaipur market had exhibited similar instability.

As, can be seen from the table that there was a positive relationship between growth rates and coefficient of variation. But, there has been a controversy regarding the linkage

TABLE 4: SEASONAL INDICES OF PRICES OF WHEAT CROP IN MAJOR MARKETS OF INDIA, 2002 TO 2014

Month/Markets	Bihar (Patna)	Haryana (Karnal)	Punjab (Patiala)	Rajasthan (Jaipur)	Uttar Pradesh (Agra)	Madhya Pradesh (Basoda)
January	101.12	103.08	100.29	99.55	102.49	96.32
February	103.47	100.38	100.91	99.91	102.45	98.35
March	105.07	99.63	99.29	97.14	100.5	100.12
April	103.11	96.16	97.77	97.32	93.9	97.9
May	96.42	95.93	97.34	98.46	95.09	98.08
June	93.78	94.95	98.62	96.53	95.63	97.3
July	93.29	97.9	99.1	99.55	96.68	99.25
August	96.2	99.36	100.07	101.21	100.13	100.48
September	99.39	102.04	99.7	100.98	100.74	100.25
October	100.21	101.98	99.93	102.42	102.23	103.53
November	102.69	103.32	103.34	102.3	103.88	104.19
December	105.2	105.21	103.57	104.55	106.2	104.17
Peak	105.2	105.21	103.57	104.55	106.2	104.19
Trough	93.29	94.95	97.34	96.53	93.9	96.32
Percentage Spread	12.8	10.8	6.4	8.3	13.09	8.71
C.V.	4.2	3.27	1.91	2.42	3.84	2.69

Source: Own calculations by using data from various Reports of Agricultural Prices in India, Ministry of Agriculture, Government of India, New Delhi

between growth and instability in agricultural prices. Hazell (1982) argued that instability is a consequence of growth, due to a positive relationship between them. Contradicting this, Mahendradev (1987) reported a negative relationship between them for the major states of India. Chattopadhyaya (2001) had reported a positive as well as negative relationship between them. The results showed that there existed a negative relationship between growth rates and instability in majority of markets in the sense that markets with highest growth rate has lowest instability and markets with low growth rates have high instability in prices

of wheat except for farm harvest prices in Patiala and Jaipur market and wholesale prices in Harda and Patna market. Thus, this study supports the conclusion of Mahendradev (1987) and discards the hypothesis of high growth causing high instability, with some exceptions.

Problems Faced by Farmers and Wholesalers

Seasonal variations in agricultural prices occur every year. The price fall in post harvest month and increase in later part of the year. These variations may be due to seasonal production and lack of retention power particularly of small and marginal

TABLE 5: GROWTH RATES AND INSTABILITY INDICES OF WHEAT PRICE

State	Market	Growth Rates (%)		Coefficient of variation (%)		Instability Index (%)	
		FHP	WSP	FHP	WSP	FHP	WSP
Bihar	Patna	8.41	7.92	31.7	28.6	5.8	7.2
Haryana	Karnal	8.25	7.93	29.7	28.7	5.6	5.7
Punjab	Patiala	8.11	7.5	32.4	27.4	7.9	4.9
Rajasthan	Jaipur	7.75	9.36	29.4	34.3	6.1	7.4
Uttar Pradesh	Agra	8.51	7.81	32.6	28.8	6.2	4.9
Madhya Pradesh	Harda	9.02	8.12	33.9	30.8	6.9	8.2

Source: Own calculations by using data from various Reports of Agricultural Prices in India, Ministry of Agriculture, GOI, New Delhi

farmers. Thingalaya (1965) observed that the arrival in the post-harvest prices created glut in the market, resulting in lowering of the prices and considerably loss to farmers. The farming community would be benefitted only if the net returns per unit of cultivation were fairly remunerative. For this purpose, it has to be ensured that the produce of these commodities is appropriately disposed of in the market. Government of India has been fixing minimum support prices of wheat every year but it has not possible for the government to effectively intervene in the market by way of direct purchase of crop from the producers. Consequently prices keep on fluctuating from time to time (Deshpande and Naika, 2002). Due to inefficient storage capacity, poor road connectivity, lower yield, yield instability and other economic reasons farmers are unable to spread their sale over a period of months in lean period (Directorate of Wheat Research, 2013).

The wider and frequent fluctuations in wholesale prices affected the returns to the wheat growers. According to (Gandhi and Koshi, 2006), major problems faced by wholesalers were high marketing charges, poor infrastructure, restrictions in flow of commodities, weak relationship between wholesalers and commission agents, lack of proper knowledge regarding the number of regulated markets. The regulation of market helped the farmers to sell their produce efficiently. The studies conducted by (Deshpande and Gopalapa, 2003) has found that as regards to market infrastructure, some states like Punjab, Haryana, TamilNadu, Kerala and Gujarat had better infrastructural facilities whereas in states like Madhya Pradesh, Rajasthan, Bihar and West Bengal, a lot was to be done. Thus, from the above past studies it can be

concluded that Indian farmers and wholesalers are facing many problems such as poor storage capacity, low productivity, rising cost of production, poor transportation facilities, wider fluctuations in wholesale prices due to seasonal production of crops, lack of proper knowledge about the regulated markets etc.

CONCLUSION

The trend analysis indicated that there had been substantial rise in the MSP of wheat over the period of time. Farm harvest prices and whole sale prices showed a continuous rise in majority of markets over the study period. The month-wise indices showed that there existed a definite seasonality in prices of wheat in selected markets. Prices were highest during month from December to February, then it showed decreasing trends and prices were generally low during March to June. The difference between peak and trough period was higher in Agra market and lowest in Patiala market. Coefficient of variation was also higher in Agra market and lowest in Patiala market. The study further concluded that there existed a negative relationship between growth rates and instability in prices of wheat for most of the markets.

The Government should pay attention in building the improved market information system i.e. able to disseminate up to date and timely market information on the regular basis so as to make proper production and marketing decisions. Further market facilities such as warehousing, smooth and hassle free transportation, processing etc should be established to help the growers in storage of their produce in the glut season and then take advantage of off-season prices in order to eliminate the seasonality in market arrivals of wheat and this also minimize the price volatility of wheat crop.

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