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Analysis on Price Behaviour of Cotton in Guntur Market of Andhra Pradesh

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ABSTRACT

The present study is based on analysis of secondary data. Time series analysis was used to study the variations in monthly prices of cotton for a period of 17 years from 1999 to 2015. The data reveals that there are price fluctuations up to the year 2005, later the prices increased for the next seven years until 2012, after which it showed fluctuations during 2013 to 2015. The highest price of 4696 Rs/q was recorded in the year 2012 and lowest price of Rs 1885/q was recorded in the year 2005. The highest seasonal price index was found in the month of February, followed by July and March with 103.14, 103.05 and 101.90 respectively. The lowest seasonal price index was noticed in the months of August, September and November with 97.41, 98.32 and 98.78 respectively. The cyclical variations for prices are increasing until the year 2006, later it shows decreasing trend until the year 2012. Finally the cyclical variation for prices started increasing from 2013 to 2014.

Key words: *Cotton, Price behaviour.*

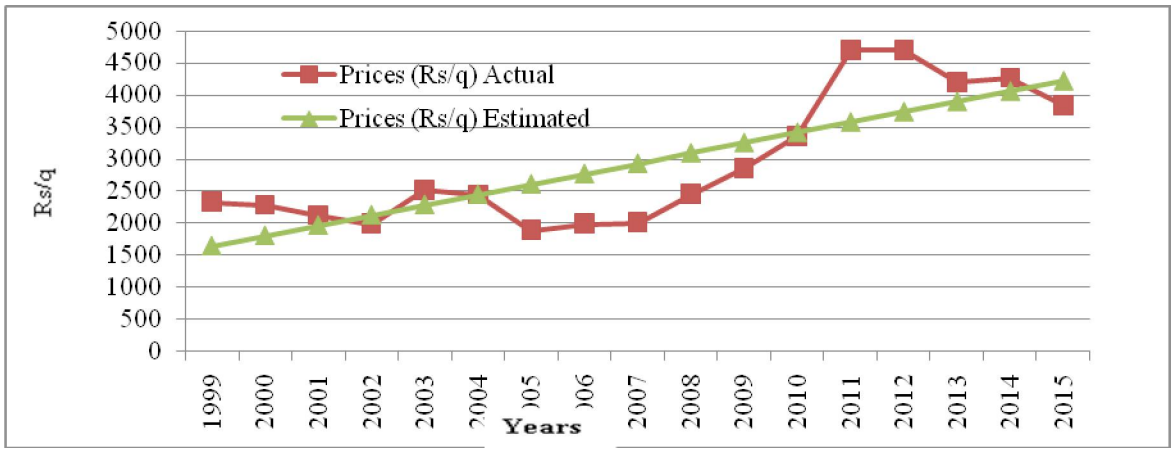
Commodity price behaviour has been the subject of numerous studies over the years. These studies have focused mainly on the question of price instability and their effects on both farmer and trader communities. Studies on speculation-induced instability, commodity export instability and commodity stabilization programs have widely addressed the question of price instability (Labys *et al*, 1998). The price variation plays a significant role in deciding the cropping pattern to withstand the instability of income of the farmers, particularly in commercial crops like cotton, chilies, etc. Cotton is popularly known as the 'white gold' for the high returns it promises to farmers and traders. Conversely, it is also called the '*safed naag'* or 'white cobra' for its potential to ruin the farmers as well as traders due to high fluctuation in its prices. The level of uncertainty in the domestic cotton prices has been increased due to the effects of instability in supply and demand, domestic and export policies, instability of prices in world fiber market, and the spillover effects of domestic policies in major cotton exporting and importing countries. As a result of ban on exports, the prices of cotton were crashed in major markets of Andhra Pradesh during the year 2011-2012 and the Cotton Corporation of India (CCI) came to the rescue of farmers by procuring cotton at minimum support price (MSP) of 3,300 Rs/q from Warangal, Guntur and Adilabad districts in Andhra Pradesh (The Economic Times March 7, 2012). In this context of wider price volatility a study on, "An Economic Analysis of Price behaviour of Cotton in Guntur Market of Andhra Pradesh" assumes greater significance.

MATERIAL AND METHODS

The present study is based on analysis of secondary data. Time series data on monthly prices were obtained from the registers maintained by the Agricultural Produce Market Committee (APMC) of Guntur and Cotton Corporation of India (CCI), which maintain data on daily, monthly and annual arrivals and prices of cotton. To know the nature and causes of price movement a systematic analysis of time element in prices should be done. Time series analysis was performed to study the variations in monthly prices of cotton for a period of 17 years from 1999 to 2015. A time series is a complex mixture of four components namely trend (T), seasonal variations (S), cyclical fluctuations (C) and irregular fluctuations (I). The relationship among these components was assumed by using multiplicative model, which can be represented as

Table 1. Trends in prices of cotton in Guntur market.

S. No.	Year	Prices (Rs/q)		Per cent deviation of prices over previous year	
		Actual	Estimated	Actual	Estimated
1	1999	2329	1646.53	-	-
2	2000	2282	1807.60	-2.02	9.78
3	2001	2121	1968.66	-7.07	8.91
4	2002	1985	2129.72	-6.39	8.18
5	2003	2515	2290.78	26.65	7.56
6	2004	2442	2451.85	-2.90	7.03
7	2005	1885	2612.91	-22.80	6.57
8	2006	1994	2773.97	5.77	6.16
9	2007	2009	2935.03	0.76	5.81
10	2008	2453	3096.09	22.10	5.49
11	2009	2853	3257.16	16.30	5.20
12	2010	3354	3418.22	17.57	4.94
13	2011	4692	3579.28	39.88	4.71
14	2012	4696	3740.34	0.09	4.50
15	2013	4188	3901.41	-10.83	4.31
16	2014	4263	4062.47	1.80	4.13
17	2015	3836	4223.53	-10.01	3.96



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

Where,

Y_t = Time series data on price

T = Trend component

S = Seasonal variations

C = Cyclical component

I = Irregular fluctuations

Analysis of long-term movements (Trend)

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

$$Y_t = a + bt$$

Where, Y_t = Trend values at time t

t = Period from 1999-2015

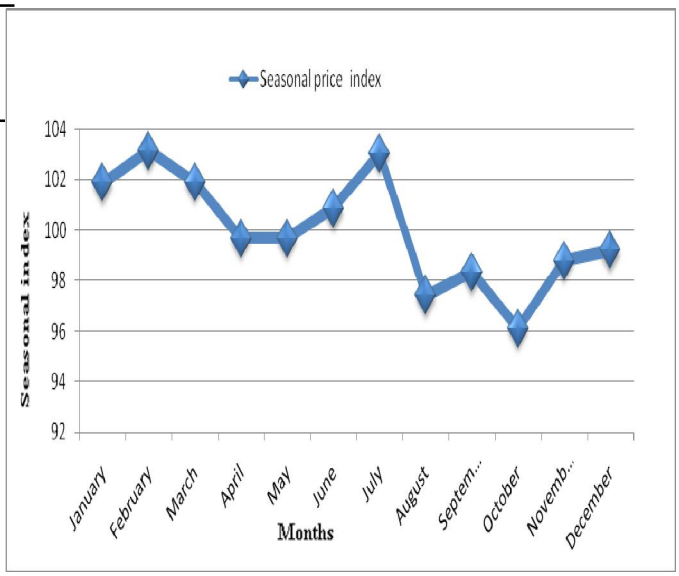
a = Intercept parameter

b = Slope parameter

Table 2. Seasonal variation in prices of Cotton in Guntur market.

S. No	Month	Seasonal price index	Per cent change over previous month
1	January	101.87	-
2	February	103.14	1.25
3	March	101.90	-1.20
4	April	99.68	-2.18
5	May	99.68	0.00
6	June	100.85	1.17
7	July	103.05	2.18
8	August	97.41	-5.48
9	September	98.32	0.93
10	October	96.11	-2.24
11	November	98.78	2.77
12	December	99.20	0.43

Fig. 2 Seasonal variation in prices of Cotton in Guntur market.



The trend value for each year was calculated by putting the value of x in the estimated trend equation. Then the trend equation was plotted. Whether or not the slope of trend line was significantly different from zero was statistically tested by using student's 't' test.

$$\text{'t' value} = \frac{b}{S.E\ (b)}$$

This calculated t value was compared with the table value from student t table with (n-2) d.f. at 5 per cent and 1 per cent level of significance. If the calculated t value was more than the table value, the null hypothesis that â = zero will be rejected. Another test for assessing the goodness of fit of trend line to the data was testing the co-efficient of multiple determination which was denoted by R^2.

The value of R^2 was calculated as:

$$R^2 = \frac{\text{Regression Sum of square}}{\text{Total sum of squares}}$$

The value of R^2 obtained indicated the per cent of the variation in the prices of the commodity which was explained by or accounted for by the trend line.

Tweleve months moving average method was used to construct the seasonal indices of prices of cotton. The most commonly used method for estimating the cyclical component was done by the linear trend method using multiplicative hypothesis. The irregular component was removed by taking the weighted three years moving average of (C ×I) series obtained. Then the cyclical component obtained by this method was plotted to observe the cycles. (Acharya and Agarwal, 1994).

RESULTS AND DISCUSSIONS

The results of the actual trend for average annual prices of cotton in Guntur market are presented in Table 1 and Fig 1. The data reveals that there are price fluctuations up to the year 2005, later the prices increased for the next seven years until 2012, after which it showed fluctuations during 2013 to 2015. The highest price of 4696 Rs/q was recorded in the year 2012 and lowest price of Rs 1885/q was recorded in the year 2005.

The per cent deviation of prices were recorded negative during the years 2000, 2001, 2002, 2004, 2005, 2013 and 2015, which indicates that the prices were decreasing when compared to their previous year's prices. The highest price increase was observed during the year 2011 with 39.88 per cent deviation and the highest price decrease was observed during the year 2005 with -22.80 per cent deviation.

The estimated trend equation for average cotton prices in Guntur market is given as Y=1485.5+161.06X, where Y represents the dependent variable, prices of cotton in Rs/q and X represents the independent variable, time in years (1,2,3,…,17) with the R^2 value of 0.65 and t-

Table 3. Cyclical component in prices of cotton in Guntur market.

S. No.	Years	Actual prices [T*C* I]	Trend in prices (T)	(C*I)*100	MA of (C*I)
1	1999	1769	1646.53	93.05	-
2	2000	2055	1807.60	87.97	91.55
3	2001	2103	1968.66	93.63	100.81
4	2002	1763	2129.72	120.82	103.97
5	2003	2350	2290.78	97.47	108.12
6	2004	2312	2451.85	106.07	116.00
7	2005	1809	2612.91	144.48	130.09
8	2006	1985	2773.97	139.73	140.20
9	2007	2152	2935.03	136.41	129.56
10	2008	2751	3096.09	112.55	120.75
11	2009	2875	3257.16	113.29	108.30
12	2010	3451	3418.22	99.06	98.32
13	2011	4332	3579.28	82.62	95.00
14	2012	3621	3740.34	103.31	92.38
15	2013	4277	3901.41	91.22	96.01
16	2014	4345	4062.47	93.49	96.94
17	2015	3981	4223.53	106.10	-

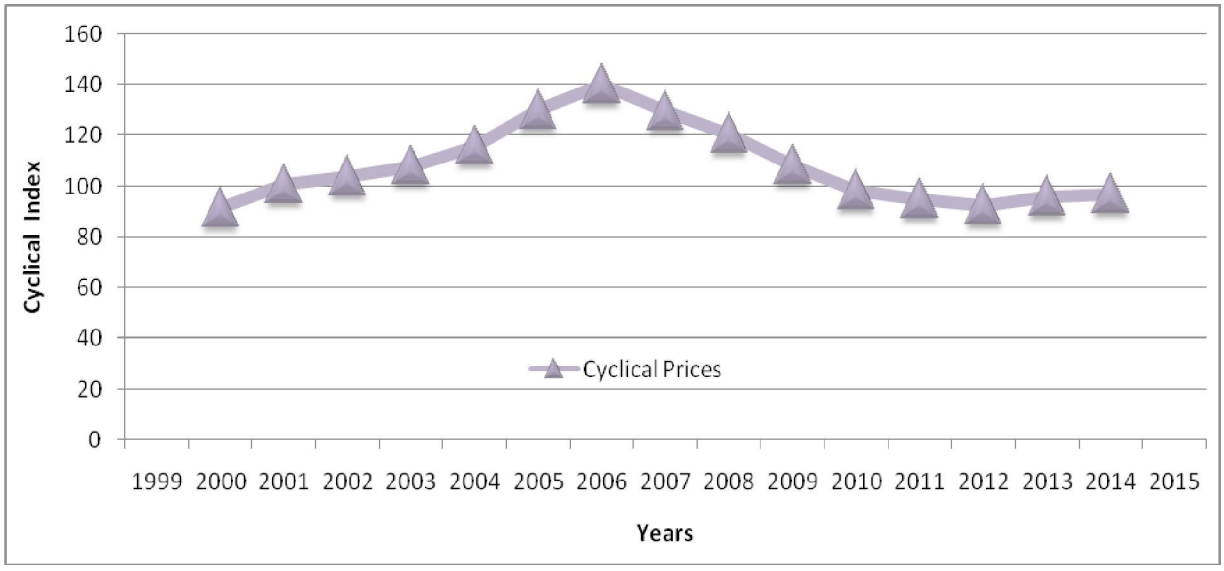


Fig 3. Cyclical variation in prices of cotton in Guntur market.

calculated value of 5.28, which is significant at 5% LOS.

The estimated trend reveals that the average prices of cotton in Guntur market was increasing significantly throughout the study period i.e., from the year 1999 to 2015

Seasonal variation.

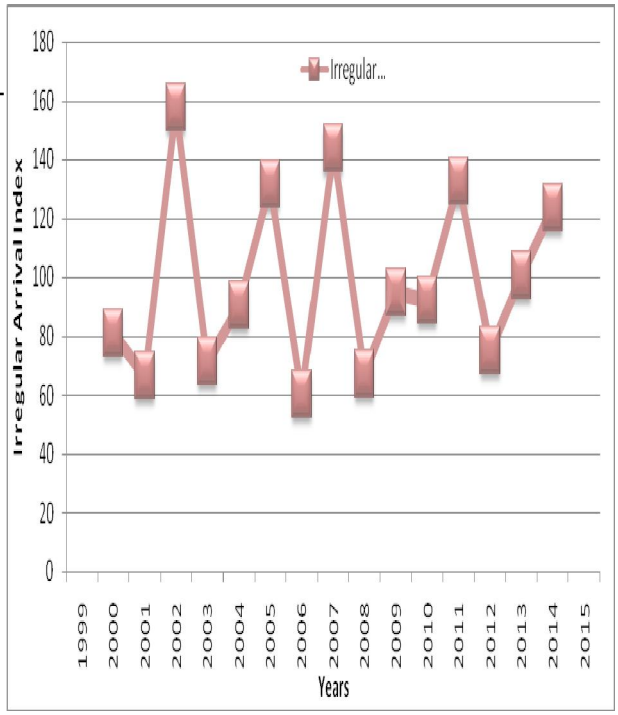
The seasonal indices of monthly prices of cotton in Guntur market are presented in Table 2 and Fig 2. The highest seasonal price index was found in the month of February (103.14), followed by July (103.05) and March (101.90). The lowest seasonal price index 97.41, 98.32 and 98.78 noticed in the months of August, September and November respectively.

The per cent change over previous month for the seasonal price index was found negative for the months of March, April, August and October as the price indices were decreasing in these

Table 4. Irregular component in prices of Cotton in Guntur market.

S. No.	Year	Prices (Rs/q)	(C*I)*100	MA (C*I)	Irregular Component
1	1999	1769	93.05	-	-
2	2000	2055	87.97	91.55	96.09
3	2001	2103	93.63	100.81	92.88
4	2002	1763	120.82	103.97	116.21
5	2003	2350	97.47	108.12	90.15
6	2004	2312	106.07	116.00	91.44
7	2005	1809	144.48	130.09	111.06
8	2006	1985	139.73	140.20	99.66
9	2007	2152	136.41	129.56	105.28
10	2008	2751	112.55	120.75	93.21
11	2009	2875	113.29	108.30	104.61
12	2010	3451	99.06	98.32	100.75
13	2011	4332	82.62	95.00	86.97
14	2012	3621	103.31	92.38	111.83
15	2013	4277	91.22	96.01	95.02
16	2014	4345	93.49	96.94	96.44
17	2015	3981	106.10	-	-

Fig.4. Irregular variation in prices of cotton in Guntur market.



months as compared to their previous months. The per cent change of prices were positive in the months of February, June, July, September, November and December as prices were increasing during these months when compared to their previous month prices. The highest increase in the price index was found in the month of November by 2.77 per cent and the highest decrease was found in the month of August by -5.48 per cent.

Cyclical variation

The results of analysis of cyclical variation in prices of cotton in Guntur market are presented in Table 3 and Fig 3. The cyclical variations for prices are increasing until the year 2006, later it shows decreasing trend until the year 2012. Finally the cyclical variation for prices started increasing from 2013 to 2014**.**

Irregular variation

The irregular variations in market arrivals and prices of cotton in Warangal market is presented in Table 4 and Fig 4. The irregular component in prices showed a decreasing and increasing trend from 2001 to 2004 alternatively, later followed an increasing and decreasing trend from the year 2004 to 2010 alternatively. The irregular component in the prices followed a decreasing and increasing trend alternatively from the year 2011 to 2015. The irregular component of prices recorded highest in the year 2002 and was lowest in the year 2003.

LITERATURE CITED

Acharya S S and Agarwal N L 2009 *Agriculture Marketing in India*. Oxford & IBH publishing company Pvt . Ltd., New Delhi. 134-135.

Chandrakala S K 2009 Spatial temporal behaviour of arrivals and prices of groundnut in Karnataka - An economic analysis. *M.Sc. Thesis*, University of Agricultural Sciences, Dharwad, India.

Labys W C, Badillo D and Lesourd J B 1998 The cyclical behavior of individual commodity price series. *Resources Policy.* 24: 147-155.

Rao G, Solmonrajupaul K, Vishnusankar Rao D and Dayakar G 2014 Seasonal variations and forecasting in wholesale prices of rice (paddy) in Guntur district of Andhra Pradesh. *International Journal of Development Research,* 4(11): 2418-2422.

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