EFFECT OF SEASONAL AND CYCLICAL VARIATION IN PRICES OF NATURAL RUBBER IN INDIA

Tutan Sutradhar[1], Sujoy Hazari[2*] and S.C. Nagpure[3]
[1]Block Technology Manager, Department of Agriculture, Government of Tripura,
[2]Assistant Professor, Faculty of Management Studies, ICFAI University Tripura,
[3]Associate Professor, Department of Agricultural economics and statistics, Dr. PDKV
E-mail: sujoy.eco@gmail.com (*Corresponding Author)

Abstract: The trend and pattern of natural rubber price in India: an, exploratory analysis. Annual average price of natural rubber (NR) in India during the 18 year period from 2000-01 to 2017-18 was analyzed with the objectives of delineating the trend, identifying the different phases and direction of price movement and the contributing factors. Hence, the present study explores the seasonal and cyclical trend in domestic and international prices of natural rubber in India.The month wise seasonal index in domestic and international price of natural rubber was calculated by moving average method. It was lowest in the month of January and November and highest in the month of July and June in domestic and international market respectively. Thus, the farmer could not receive the better price by postponing the sale of produce during the month of September to February to later month of the year. The analysis of cyclical indices in both domestic and international price shows that there is an uneven cycle both in domestic and international market of natural rubber.The NR price in India did not show any significant pattern of consistent movement towards a particular direction in the long run.
Keywords: Price, Natural Rubber and Cyclical indices.

INTRODUCTION

Demand for Rubber is most evenly distributed over the years but due to abruption of production during monsoon, supply shrinkage occurs. During rain tapping of rubber trees disrupted and production falls, consequently prices would rise at that time, unless there is an acute economic depression or similar negative factors. Hence, the present study explores the seasonal and cyclical trend in domestic and international prices of natural rubber in India (from 2000-01 to 2017-18).Natural rubber price a host of factors have kept sentiments down in the international market throughout the year due to continued global uncertainty, economic slowdown in China, speculation on sharp fall in crude oil prices and possible substitution from NR to petroleum derived synthetic rubber and depreciation in the currencies of major natural rubber exporting countries have exerted downward pressure on international NR prices.

Scope of the study

According to Indian Rubber Board, the demand for natural rubber has been consistently exceeding supply. Still we are not able to exploit the full potential of this crop especially in view of low productivity in our country (CAGR= 0.28%, Rubber board of India, Kottayam 2015) compared to other producing countries. The NR is subjected to wide price fluctuations in the domestic as well as international markets.Hence, the analysis of seasonal and cyclical trend to effective forecast the future price and demand for NR in the emerging markets. Based on this area, current study concentrate on objective i.e. to work out the seasonal and cyclical trend of domestic and international prices of natural rubber.

METHODOLOGY

To analyses the seasonal and cyclical trend of domestic and international prices of natural rubber, 18 year of period (2000-01 to 2017-18) was selected for the study. And the data are collected from different secondary source.

Estimation of Seasonal Indices of Monthly Data

Most widely used method of measuring seasonal fluctuations i.e. method of moving average was used to calculate seasonal indices. To measure the seasonal variations, prices were calculated employing twelve months ratio to moving average method. The seasonal indices were calculated by adopting the following steps:

1.   Generate a series of 12 months moving totals.

2.   Generate a series of 12 months moving averages: A series of 12 months moving averages is generated by dividing 12 months moving totals by 12.

3.   Generate a series of centered 12 months moving averages. This step involves taking averages of pairs of two subsequent 12 months moving averages and entering between each pair. There are no corresponding moving averages for the first six and last six months.

4.   Express each original value as a percentage of corresponding centered moving average. The percentage of moving average represents indices of seasonal and irregular components combined.

5.   The next step involves removing the irregular component.

6.   Arrange the percentages of moving averages in the form of monthly arrays.

7.   Next, the average index for each month is calculated.

8.   These averages are to be adjusted in such a way that their sum becomes 1200. This can be done by working out of correction factor and multiplying the average for each month by this correction factor. The correction factor (K) is worked out as follows:

$$K = \frac{1200}{S}$$

Where, K is correction factor and S is sum of averages indices for 12 months, multiply K with the percentage of moving average for each month to obtain the seasonal indices.

Estimation of Cyclical Indices

The residual method of estimating cyclical movement in time series was used for estimating cyclical indices, after eliminating the seasonal variation and trend components. This is accomplished by dividing (Yt) by corresponding (S) for time 't' symbolically. These deseasonalized data contain cyclical and irregular components and are plotted against time for examining cyclical behaviour. If there is any existence of cycle, periodicity of cycle is noted.

Analysis of long-term movements (trend) for estimating the long run trend of domestic and international prices of NR, the method of least squares estimate was employed. This method of ascertaining the trend in a series of annual prices involves estimating the co-efficient of intercept (a) and slope (b) in the linear functional form. The equation adopted for this purpose was specified as follows.

Yt = a + bX+e

Where,

Yt = Trend values at time t

X = Period

a = intercept parameter

b = slope parameter

e = Error

Annual trends of domestic and international prices for the international 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 R2.

RESULTS AND DISCUSSION

Seasonal indices for domestic and international price of natural rubber

The pattern of variation in price within a year is revealed by seasonal indices, computed for each month from 2000-01 to 2017-18. In order to examine the extent of the seasonal variations in prices, the indices of seasonal variations for both domestic as well as international prices were worked out. To identify the long run seasonal variations, time series

data relating to monthly price of natural rubber were subjected to the percentage centred 12 months moving average method and it is presented in the below table.

Table 1: Seasonal indices in natural rubber for domestic and international market prices (Rs / kg)

Month	Seasonal indices for natural rubber	
	Domestic price	International price
January	95.23	99.06
February	96.15	103.02
March	97.49	101.26
April	101.33	103.84
May	102.99	105.01
June	104.86	105.48
July	104.98	100.75
August	102.42	97.73
September	100.75	97.50
October	99.05	95.47
November	96.83	94.36
December	97.84	96.44

The analytical Table 1 reveals that, the highest seasonal index was found in the month of July, followed by June and May as the seasonal indices were stood at 104.98, 104.86 and 102.99 respectively of every year in natural rubber due to monsoon and resultantly abruption in NR harvest and less arrival of NR. The lowest seasonal index of domestic price was noticed in the month of January with 95.23 which is closely followed by February with 96.15. The seasonal domestic price indices were above hundred from the month of April to September while below hundred was found in the month from October to March where the market arrivals are more in India.

The final estimate stabilize monthly seasonal indices of prices of natural rubber in international market are illustrated in the Table 4.8. In case of international price of natural rubber the result revealed that highest seasonal index was found in June (105.48) followed by May (105.01) and April (103.84). The seasonal index showed lowest in the month of November (94.36) followed by October (95.47) and December (96.44). The seasonal index

above hundred was found in the month of February to July and below hundred was found in the month of August to January.

Seasonal pattern of natural rubber in domestic and international market showed that the price declined from September to February and reached a lowest point in the month of January. After that they rose continuously and reached peak in July in domestic market and June in International market.

Cyclical trend in domestic and international prices of natural rubber

The Table 2 reveals that cyclical trend in domestic and international prices of natural rubber. Cyclical trend in domestic and international prices were analyzed to know the variation in prices over the years. In case of domestic prices, it can be observed that there was an uneven 5 years of cycle, also in case of prices in international market, 5 years of cycle were observed. Large fluctuations in the prices will lead to switching over in area of cultivation from one crop to another commercial crop. It is suggested that perfect cycle with regards to variation in prices could be observed if the time series data is for larger period.

Table 2: Cyclical trend in domestic and international prices of natural rubber

Sr. No.	Year	Cyclical indices	
		Domestic prices	International prices
1	2000-2001	131.31	110.42
2	2001-2002	90.83	82.99
3	2002-2003	81.08	77.59
4	2003-2004	87.36	86.00
5	2004-2005	85.01	85.51
6	2005-2006	79.88	81.09
7	2006-2007	101.65	110.79
8	2007-2008	93.005	99.28
9	2008-2009	100.44	107.69
10	2009-2010	82.88	81.84
11	2010-2011	131.94	135.51
12	2011-2012	156.36	169.92
13	2012-2013	123.74	128.18
14	2013-2014	105.86	107.47
15	2014-2015	80.40	74.71

16	2015-2016	68.18	60.90
17	2016-2017	72.31	65.30
18	2017-2018	88.65	78.25

CONCLUSION

Seasonal pattern of natural rubber in domestic and international market showed that the price declined from September to February and reach a lowest point in the month of January (95.23) in domestic market and November (94.36) in international market. After that they rose continuously and reach the peak in July (104.98) in domestic market and June (105.48) in International market. The analysis of cyclical indices in both domestic and international price shows that there is an uneven cycle both in domestic and international market of natural rubber.

SUGGESTION

The production of natural rubber in India is positively influenced by indigenous rubber prices. Therefore, the study suggests that the Government may increase the procurement price for natural rubber at an appropriate and reasonable rate as there is a good chance of increasing the price of natural rubber in international market.

REFERENCES

[1]   Rao G., G., K. Solmonrajupaul., D. Vishnu Sankarrao and G. Dayakar, 2014. Seasonal Variations and Forecasting in Wholesale Prices of Rice (Paddy) in Guntur District of Andhra Pradesh,*Int. J. of Dev. Res.* 4(11):2418-2422

[2]   Jadhav. M.C., D.H. UlemaleAnd A.N. Borkar. 2011. Trends and seasonal variation in arrivals and prices of soybean in Amravati district, *Internat. Res. J. agric. Eco. & Stat.,* 2(2): 232-235.

[3]   Lekshmi, S., S. Mohanakumar and K.T. George. 1996. The trend pattern of natural rubber price in India: An exploratory analysis. Indian Journal of Natural Rubber Research, 9(2): 82-92.

[4]   Mohan Naidu, G., V. Meena Kumari and V. Srikala. 2014. Behaviour of Market Arrivals and Prices of Red Chillies, 14(1): 511-519

[5]   Suppanunta, Romprasert. 2014. Market efficiency and forecasting of rubber futures. Global Journal of Marketing and Management 1(1):1-10.