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Price Behavior of Rubber in Domestic and International Markets

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Abstract: Natural rubber production and productivity is indirectly related to the price and directly related to the production technology under rubber cultivation practice. A Price fluctuation is considered as one of the important problems faced by the marginal and small rubber cultivators in Kerala and Tripura. Hence the overall objective of the present article is demonstrating the utility of seasonal indices developed based domestic and international market price and validating with farm prices at Tripura for the year 2016 using the time series data from 2004 to 2017. The natural rubber prices ratio in the world markets and domestic market prices were similar. The price fluctuation of natural rubber at international market Bangkok, based on the seasonal index revealed that the highest price would prevail in the months of January, February, March, April, May, June and July. The Price of Rubber is declining from the month of May and it has come to the lowest in the month November and it regains momentum in December. It was found that market sheet rubber price was Rs 9600 per quintal in Mainama and it, was Rs 9200 per quintal in the case of Muhuripur. However the market prices realized by the rubber cultivators in both the villages were less than domestic and international market prices, which were Rs. 12242 per quintal and Rs. 11339 per quintal respectively.

INTRODUCTION

The Natural Rubber is a well-known low input consuming plantation crop with substantial contribution to Indian economy and is grown-up in an environmentally acceptable closed ecosystem with

a stable cycle of uptake and return of nutrients from the soil. Thus local cultivators saw great opportunities for rubber production and they planted small group of trees to supplement their own household income but they are unable to get remunerative prices. This

is due to vagaries of market arising from disequilibrium of supply and demand bear serious implications on the net income of the producers of rubber compared to field crops. An important factor contributing to price fluctuations of rubber crops is borne out of its relatively inelastic supply in the short run. Hence, present study concentrated on the price variability of rubber assumes added significance due to higher investment, gestation period, span of economic life, income generation from rubber cultivation and seasonal trend in rubber prices.

Natural rubber (NR) is the subjected to price stabilization schemes (Corea, 1992), under various historical contexts. According to K-J-Mathew, the Chairman of the Rubber Board, unless supply and demand is balanced, the price will not improve. However, he holds the view that price of natural rubber may go up by 2000s. So, for the time being, as he says, a quick and immediate solution is not possible. By adopting multiple cropping, additional income can be generated which will offset the loss from rubber (Mathew K.-J 1998). However, the political economy of change in the control over production, markets and consumption of NR and its implications on the international and country specific behavioral patterns of price movements is not subjected to detailed analysis both at the analytical and policy levels. Very few studies, available on NR prices are broadly confined to empirical analysis of the secular trend rather than examining in detail the contributing factors encompassing seasonal fluctuations in different grades of rubber price and growth rates of prices in domestic and international markets were analyzed and presented in the present paper.

RUBBER PRICE

Rubber production and productivity is indirectly related to the price and directly related to the production technology under rubber cultivation practice. The price fluctuation finally affects the rate

of production and production technology adopted by the cultivators, especially among marginal and small farmers. In the case of rubber, a monthly/seasonal change in the price is a common phenomenon. Similarly, during the peak production season of September to January i.e., five months, price may decline and it may be high during the lean season of March and April. The final price may increase or decrease based on the quality of the products. Thus the price may fluctuate, seasonally, cyclically on the basis of the quality of the rubber. A Price fluctuation is considered as one of the important problems faced by the marginal and small rubber cultivators in Kerala and Tripura with low quality product and lack of availability of scientific/improved processing technology.

RUBBER PRODUCTION AND CONSUMPTION SCENARIO

Thailand is the world's largest producer of natural rubber (36.80 per cent of the world's total production in the world followed by Indonesia 28.10 per cent, Vietnam 7.5 per cent and Malaysia 7.3 per cent during 2016. India is the fourth largest producer of natural rubber in the world. During 2018, India has produced 96000 thousand tonnes of natural rubber which accounted 9.5 per cent of the world natural rubber production. Other major producer is China, contributing 6 per cent of the world production. Natural rubber production (NR) in India rose 70,000 to 78,000 tons from 2016 to 2017 which constitute about 11.4 per cent. The rubber consumption in the country was slightly declined 3.6 per cent from 99600 to 96,000 tonne during 2017 to 2018 (Rubber board report 2018).

Rubber cultivation in India has been traditionally confined to hinterlands of southwest coast, mainly in Kerala and Kanyakumari district of Tamil Nadu. Kerala and Tamil Nadu together constitute the traditional rubber growing regions in the country. Kerala alone contributes 91 per cent of

the total rubber produced in India. Tripura has emerged as the second largest producer of rubber in India accounting for about five percent of production. Tamil Nadu contributes another 2.89 per cent of the total natural rubber production. Non-traditionally rubber is cultivated in hinterlands of coastal Karnataka, Goa, Konkan Region of Maharashtra, hinterlands of coastal Andhra Pradesh and Orissa, the north-eastern states and Andaman and Nicobar Islands. Tripura is now heading towards the second stage of revolution by sliding from rubber producing to rubber manufacturing and bringing Rubber Park in the future. Even though the spread of rubber cultivation has been quite impressive in the state (Rubber board report 2018).

DATABASE AND METHODOLOGY

The present article makes use of secondary data to investigate the empirical contestations on rubber prices for different grades of domestic and international market. The rubber market price behavior analysis has been conducted for natural rubber for domestic and international markets. Monthly price prevailed in different markets were collected for the study. The natural rubber prices, from Kottayam and Bangkok market prices (which are the only recognized Indian rubber markets from where data was available) pertaining from January 2004-05 to December 2017-18 were collected from Indian Rubber statistics. The Bangkok market price data is collected to make a comparative study of the domestic and the international markets.

DEVELOPMENT OF SEASONAL INDICES FOR RUBBER PRICES

In the first step, 12 months' moving totals were generated for rubber prices. These totals were divided by 12 to compute 12 months' moving average. Then a series of centered moving averages were worked out. In the next step, original values were expressed as a percentage of corresponding centered moving

average. Further, the irregular component in the series was removed. Afterwards, these percentages were arranged in terms of monthly averages. Then the average index for each month was computed, finally these monthly average indices were adjusted in such a way that their sum becomes 1200. This can be done by working out a correction factor and multiplying the average for each month by this correction factor. The correction factor (K) is worked out as follows. $K = 1200/S$. Where, K is correction factor and S is sum of average indices for 12 months. By multiplying K with the percentage of moving average for each month, seasonal indices are obtained. The base value for indices is 100. This result is supported by Anil kumar *et al.* (2012), and jadhav *et al.* (2016) they developed seasonal indices in price and arrivals of cereal crops in major markets of Karnataka.

PRICE TREND OF NATURAL RUBBER

In order to understand the performance of natural rubber prices behavior, the study depends on 15 years of time series data published by Government of India Ministry of Commerce Rubber Board. Among the various grades of natural rubber like Ribbed Smoked Sheet (RSS 1), RSS2, RSS 3, RSS 4, RSS 5. This article focus on the price of RSS 4 grade that accounts for the bulk of domestic production and similar grades also used for study by (Varma, 2001). Kottayam market price for RSS 4 is taken as the domestic market price and Bangkok price for RSS4 is considered international market price. The natural rubber prices ratio in the world markets and domestic market prices were similar. It can be noticed from the table.1 that out of fifteen year rubber price movement, the domestic natural rubber market price ratio was less than the international market price, during the period of 2004 to 2008. After 2009 the domestic market price was more than the international market price. Except 2011, the domestic price was lower than the international market price

ratios. It can also be noted that during this period the NR price in India had been significantly higher than the international price in almost all the years. This is due to natural rubber prices had been statutorily controlled by the government and prices were revised regularly based on the cost of cultivation/production, yield per hectare. As a result, the Indian price of natural rubber has generally been higher than the international price.

Table 1
Domestic and World markets Natural Rubber prices (Average price per 100 kg)

Year	Domestic (Kottayam)	World (Bangkok)	Price ratio (India/world)
2004	5,571	5,834	95.49
2005	6,068	6,597	91.99
2006	8,783	9,517	92.29
2007	9,006	9,481	95.00
2008	10,775	11,601	92.88
2009	9,756	9,198	106.07
2010	16,908	16,592	101.90
2011	21,668	22,226	97.49
2012	18,440	18,203	101.30
2013	16,880	16,219	104.08
2014	13,658	11,873	115.04
2015	12,141	10,288	118.01
2016	12,242	11,339	107.97
2017	13,650	12,980	105.16

Source: Rubber Board data 2018

VARIABILITY IN NATURAL RUBBER PRICES

The movement of natural rubber prices in 1970's shows an entirely different picture i.e., the 1970's are considered as a period characterized by wide fluctuations in natural rubber prices. These fluctuations are mainly of an intra year in nature i.e., month to month in a year or season to season variations in prices. As a result, investments in new plantings and replanting came down drastically. This

poor rate of growth in production during 1970's caused more shortages of natural rubber in the country, which led to an increase in rubber prices. But with the beginning of 1997-98, the situation completely changed and the rubber plantation industry started facing a crisis similar to the one experienced during 1970's (Opcit, Indian Rubber Statistics, '1997).

The natural rubber price noticed different results in seasonal variation for different grades. From the table 2, we can observe that during the fifteen year period from 2004-05 to 2017-18 with the base value as 100. The price of natural rubber at international market is varying at a different rate during seasons for different grades. The price fluctuation of natural rubber at international market Bangkok, based on the seasonal index revealed that the highest price would prevail in the months of January, February, March, April, May, June and July. The Price of Rubber is declining from the month of May and it has come to the lowest in the month November and it regains momentum in December (Table 2 and Figure 1). Among the different grades

Table 2
Price Variability of Natural Rubber in International Market at Bangkok period from 2004 to 2017

Month	RSS1	RSS2	RSS3	RSS4	RSS5
January	102	103	103	102	102
February	103	104	104	103	103
March	102	103	103	102	102
April	104	104	104	104	104
May	106	106	106	106	106
June	103	103	103	106	106
July	101	101	102	102	102
August	97	97	97	97	97
September	97	94	94	94	94
October	94	94	94	94	94
November	92	92	92	91	91
December	98	99	98	98	98

Note: base value is 100, RSS=Ribbed Smoked Sheet

Source: Rubber Board data 2018.

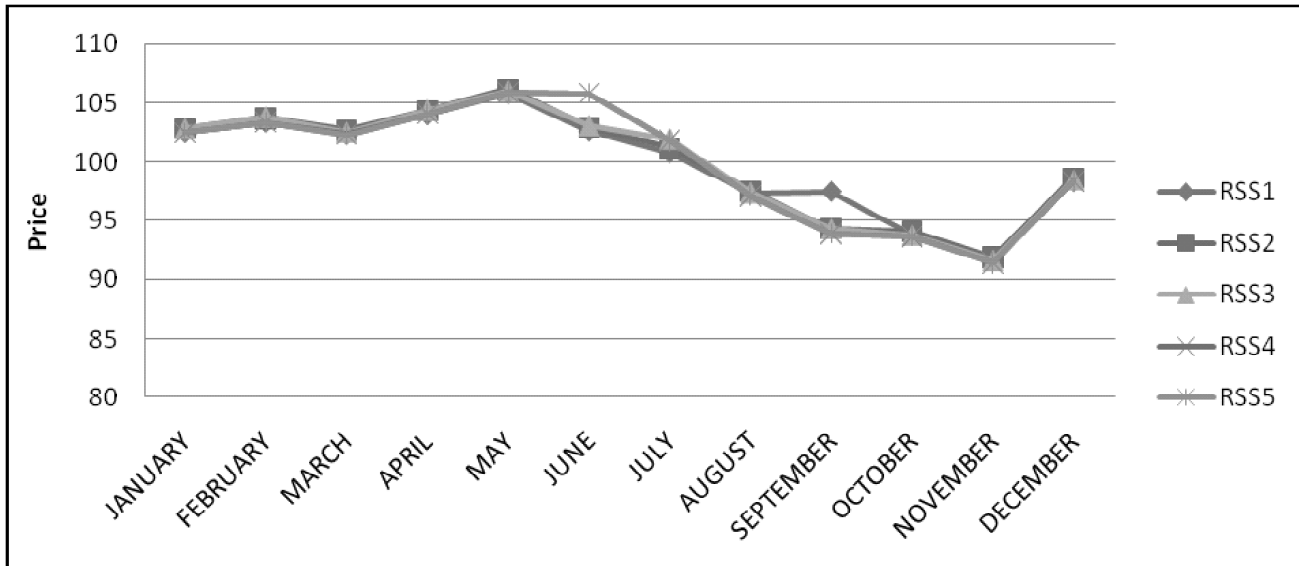


Figure 1: Different Grads of Rubber Price Variability in International Market Bangkok period from 2004 to 2017

Note: base value is 100, RSS=Ribbed Smoked Sheet

Source: Rubber Board data 2018.

of seasonal index showing more or less similar fluctuation in monthly prices of rubber except, RSS-1 grade indicating more variability in rubber prices. The varying nature of natural rubber price is presented here and it is changing seasonally, monthly and even daily. The past 15 years of seasonal indices on the price of natural rubber also noticed a similar movement in rubber price. Interestingly not much variation in different grades of prices was observed in the case of international market. The monthly change in price is also shown in the table 2 and figure 1.

PRICE VARIABILITY OF NATURAL RUBBER AT DOMESTIC MARKETS KOTTAYAM

The table 3, shows that domestic rubber, price actually declined from the month of January and February onwards, and it get back the upward momentum from March to till August. However, apparently the lowest price of rubber was observed in the month of November and December. The rubber prices of different grades at domestic market

Kottayam is more fluctuations and strongly pronounced as revealed by the figure-2. The movement of natural rubber prices, indicating wide fluctuations in natural rubber prices. These fluctuations in domestic markets are mainly seasonal variation, more arrivals in peak harvesting season and terrible situation is continued in the markets. Hence rubber growers were not getting remunerative prices. It is also strikingly visible that RSS-3 and RSS-5 grades of rubber prices were more volatility than the others grades (figure 2).

The seasonal indices explained, the seasonal variations in natural rubber prices were also showed a different result. As per the table (Table.3), we can observe that during the past fifteen year period from 2004-05 to 2017-18. The price of domestic natural rubber price was varying at a different rate during seasons. Within these periods, the price indices values are ranged from 93 to 97, which is considered as the lean season, i.e., in the months of January and February. During the peak season the indices values are above the 100, i.e., in the months of March onwards, and it declined in the month of September.

The past 15 years of experience on the domestic price of natural rubber also showed a similar result. The monthly change in price is also shown in the figure 2.

DOMESTIC AND INTERNATIONAL PRICES: A CORNPARISON OF RSS-4 GRADE

Kottayam market price for RSS-4 grade is taken as the domestic and Bangkok market price is considered international price. Because the average price of RSS-4 grade at Kottayam and Bangkok markets, which is the biggest natural rubber markets, since second half of 1980 to till date. Hence both markets are selected to study the price behavior of rubber. Price is the most important factor influencing exports of rubber. Price in the overseas markets must be attractive enough to stimulate or encourage exports. A study of the price behavior in Kottayam and bangkok for RSS-4 grades of natural rubber is a true indicator of the export opportunities.

The behavior of price movement of RSS-4 grade of domestic and international markets are presented in Table-4. The seasonal variations in the price of RSS-4 grade of natural rubber also showed a different result. From the Table-4 and Figure-3, we can see that, price of domestic natural rubber is varying at a different rate during seasons. Interestingly, the price movement of domestic and

Table 3
Price Variability of Rubber in Domestic Market
Kottayam period from 2004-05 to 2017-18

Month	RSS1	RSS2	RSS3	RSS4	RSS5
January	96	96	108	97	111
February	97	98	109	97	89
March	100	100	74	99	91
April	104	103	116	103	120
May	106	104	117	104	97
June	108	105	79	105	98
July	108	105	125	105	122
August	103	107	114	107	96
September	98	98	74	98	91
October	96	96	108	96	111
November	93	94	105	94	87
December	93	94	71	94	87

Note: base value is 100, RSS=Ribbed Smoked Sheet

Source: Rubber Board data 2018.

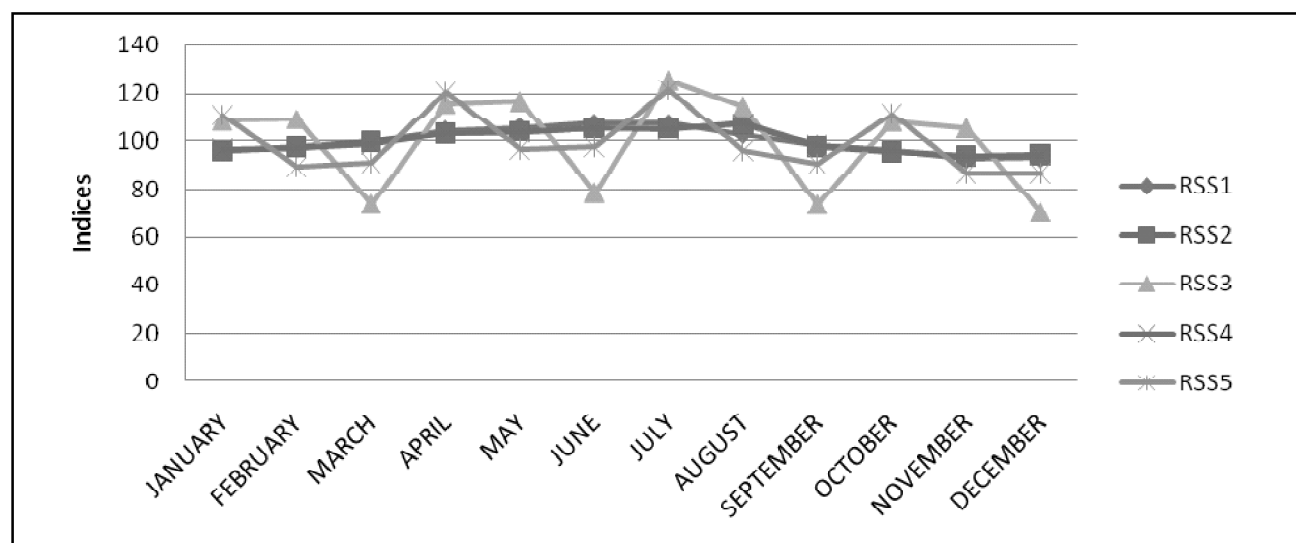


Figure 2: Different Grads of Rubber Price Variability in Domestic Market Kottayam period from 2004 to 2018

Note: base value is 100, RSS=Ribbed Smoked Sheet

Source: Rubber Board data 2018.

international markets are similar movement in the months i.e., January to June the international market price showing upward trend and during same period, a maximum price had also been imposed. Whereas, domestic market prices showing upward prices during the same months. However international market price is declining from the month of June and it has come to the lowest in the month November. During the same period the domestic market prices also come to the lowest but slightly lower rate.

A possible effect of exports would be an upward movement in price of the concerned grade. Therefore export can serve as a market mechanism to correct an imbalanced situation of the markets. The Indian rubber market is traditionally accustomed to the activities of encompassing successful transfer of rubber from the primary producers to the ultimate consumers within the country. The systems of hedging and future trading are integral features of a well developed rubber market which are practically non-existent in India.

Table 4
Price Variability of RSS-4 Grade in Domestic and International Markets

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
RSS4 D	97	97	99	103	104	105	105	107	98	96	94	94
RSS4 I	102	103	102	104	106	106	102	97	94	94	91	98

Note: D = Domestic Market and I= International market, Base is 100 RSS=Ribbed Smoked Sheet

Source: Rubber Board data 2018.

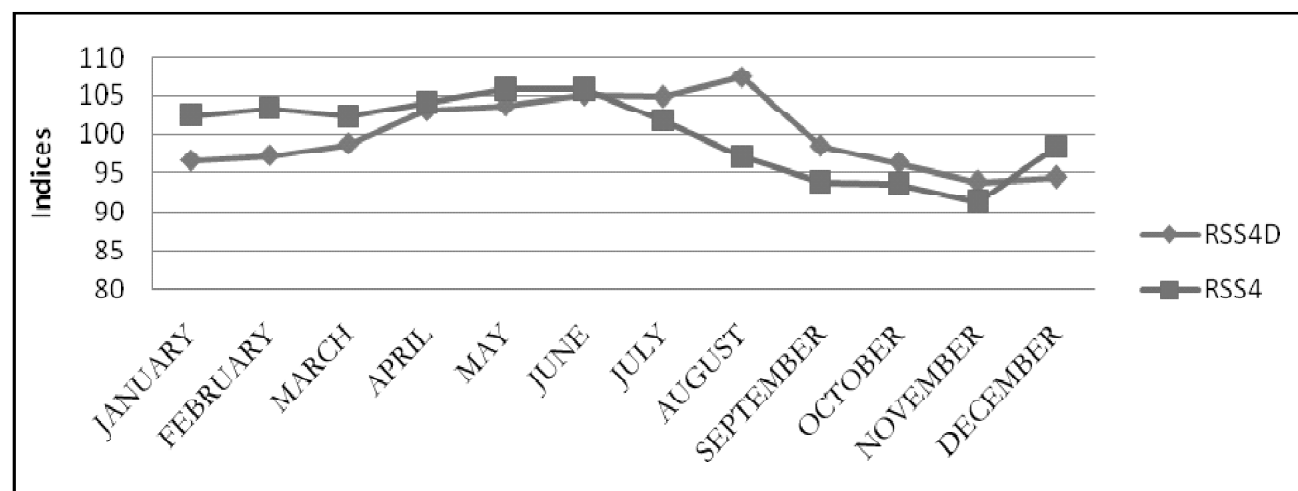


Figure 3: Price Variability of Rubber-RSS4 Grade in Domestic and International Market

Source: Rubber Board data 2018. Note: base value is 100, RSS=Ribbed Smoked Sheet

SUMMING UP

The present article attempted to analyze the price movement and developed empirical indices for different grades of natural rubber for domestic and international markets in the light of the economic

reforms. The natural rubber prices, from Kottayam and Bangkok market prices (which are the only recognized Indian rubber markets from where data was available) pertaining from January 2004-05 to December 2017-18 were collected from Indian

Rubber Board statistics. The Bangkok market price data was collected to make a comparative study of the domestic and the international markets prices.

The basic requirement for the development of the rubber industry, of which the marginal and small holding sector is an important and integral part, is to bring into existence a consistent rubber marketing price. Then only, the growers would get a profitable and steady price for the rubber they produce. The required organizational and institutional structure should be provided by the Central and State Governments especially to the marginal and small holders to achieve these objectives. Only in such a situation, the small growers could be expected to accept and utilize the achievements of scientific studies and researches and new technologies in the production processing and manufacturing of natural rubber.

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