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Instability in Natural Rubber Prices in India: An Empirical Analysis

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***Abstract**: Commodity Prices are susceptible to instability in the international as well as in the domestic markets of countries. Natural rubber prices have shown high volatility in the last twenty years. Decline in oil prices and the subsequent decline in the prices of synthetic rubber were some of the factors that have contributed to the volatility and instability in natural rubber prices.*
***Keywords:**Natural Rubber, Instability, Crude oil prices, Synthetic Rubber, Open Trade Regime*

I. Introduction

Natural rubber price volatility can have a long run impact on the incomes of many producers and can make planning production more difficult. Increasing volatility is a concern for agricultural producers and for other agents (Anthony and Blanford, 1989). It has been argued that agricultural commodity prices are volatile because the short run supply and demand elasticities are low (Ardeni and Wright, 1990). High volatility in natural rubber prices is the result of international trade policies, fluctuations in demand and supply of natural rubber, fluctuations in oil prices and political changes. There is no adequate mechanism to reduce or manage risk to natural rubber producers in most of the producing countries including India (Dowling, 1977).From the beginning of industrial revolution, natural rubber has made a significant impact on the world economy. Natural rubber is a strategic raw material which caters to a wide range of industries manufacturing a variety of products. Rubber is a native of the Amazon Basin in South America and has spread to other countries such as Indonesia, Malaysia, Thailand and India. Rubber plantations mainly consist of only one species namely HeveaBrasiliensis. The price of rubber is tied to the production of rubber, the demand for the end products and the price of substitutes for natural rubber.

The area under rubber plantations has been increasing significantly during the last five decades. However the decline in prices of natural rubber has significantly affected the growth of area under production in the producing countries (Ipe, 1990). Thailand is the world's largest producer of natural rubber in 2015. The total production of natural rubber in Thailand stood at 44.7 lakh tones in 2015. Indonesia is the second largest producer with a production of 31.60 lakh tones in 2015. Other major producers are Vietnam, China, Malaysia and India.

Table1. Production of Natural Rubber in Various Countries

Country	Production(lakh Tonnes)		
	2011	2013	2015
Thailand	33.94	41.7	44.7
Indonesia	29.82	31.8	31.60
Malaysia	9.96	8.26	6.90
India	8.93	8.49	5.70
China	7.27	8.56	7.90
Vietnam	8.12	9.49	10.20
World	112.39	122.81	112.07

Source: Indian Rubber Statistics, Vol.33, Rubber Board, Government of India, 2014.

India is the sixth largest producer of natural rubber in the world. However the production of natural rubber in India has significantly reduced in the last couple of years. The major reason for the drastic decline in production is the reduction in prices of natural rubber.

Table 2. World Production of Natural Rubber and Synthetic Rubber 2000-2014

Year	**Rubber Production ('000 tonnes)**		
	Natural Rubber	**Synthetic Rubber**	**Total Rubber Production**
2000	6,811	10,870	17,681
2001	6,913	10,483	17,396
2002	7,317	10,906	18,223
2003	7,986	11,414	19,400
2004	8,726	11,979	20,705

2005	8,921	12,025	20,946
2006	9,850	12,700	22,550
2007	10,057	12,829	22,886
2008	10,098	12,285	22,383
2009	9,723	11,488	21,210
2010	10,403	13,277	23,680
2011	11,239	14,091	25,330
2012	11,658	14,042	25,700
2013	12,281	14,214	26,495
2014	12,103	14,205	26,308

Source: International Rubber Study Group, Singapore, 2015

Analysis of natural rubber production for the last 15 years has shown that natural rubber production increased significantly. From 68.11 lakh tones in 2000 global natural rubber production has increased to 121.03 lakh tones in 2014. Synthetic rubber is a close substitute of natural rubber. Both products are used to produce the desired properties needed in rubber end products and tires. In 2014 natural rubber constitutes 46 percent of the total global production of rubber.

Table 3. World Consumption of Natural Rubber and Synthetic Rubber 2000-2014

Year	**Rubber Consumption ('000 tonnes)**		
	Natural Rubber	**Synthetic Rubber**	**Total Rubber Consumption**
2000	7108	10830	17,938
2001	7039	10,253	17,292
2002	7515	10,679	18,194
2003	7797	11,177	18,973
2004	8562	11,693	20,255
2005	9049	11,731	20,780
2006	9513	12,434	21,947
2007	10138	12,576	22,714
2008	10187	12,173	22,360
2009	9289	11,228	20,517
2010	10792	13,225	24,017
2011	10997	13,856	24,853
2012	11013	13,915	24,927
2013	11430	14,136	25,566
2014	12125	14,252	26,377

Source: International Rubber Study Group, Singapore, 2015

Global consumption of rubber also has increased considerably in the last 15 years. From 71.08 lakh tones in 2000 global consumption of natural rubber has increased to 121.25 lakh tones in 2014. World consumption of Synthetic rubber also has increased substantially in the last 15 years. From 108.30 lakh tones in 2000 Synthetic rubber consumption has increased to 142.52 lakh tones in 2014. The share of synthetic rubber in the total consumption in 2014 stood at 54 percent.

Global demand and supply of natural and synthetic rubber has significantly increased in the last fifteen years. Supply of natural rubber from Thailand and Vietnam has increased significantly in the last couple of years. Vietnam has doubled its production in the last ten years. Decline in oil prices has boosted the production of synthetic rubber. Synthetic rubber is a byproduct of the oil industry. The producing and consuming industries are in general closely related and dominated by large and global enterprises. Synthetic rubber is a petroleum derived product and manufactured by polymerization process in chemical plants. Prices of synthetic rubber are influenced by the prices of crude oil.

Natural rubber is an agricultural commodity and is used as an industrial raw material. More than 80 percent of the production of natural rubber is by small and marginal farmers. Natural rubber is a social commodity where more than 30 million small farmers are at stake worldwide. Increase in production of natural rubber has also influenced the prices of natural rubber. One of the fundamental factors, which affect the natural rubber, is the stock of natural rubber. Total global stock of natural rubber in 2013 was 32.63 lakh tones. In 2014 it stood at 32.4 lakh tones. Global stock of Synthetic rubber in 2013 was 36.23 lakh tones. It decreased to 35.32 lakh tones in 2014.

II. Imports And Exports Of Natural Rubber

In 2014-15 consumption of natural rubber has significantly increased. Consumption increased to 10, 20, 910 tones in 2014-15. The major reasons are the relatively good performance of the Indian economy and the automobile sector. It is to be noted that automobile sector accounted for 66.70 percent of the natural rubber consumed in India in 2014-15. Another interesting thing to be noted is the significant increase in the import of

natural rubber to the country. Sharp decline in the domestic production of natural rubber in the country necessitated the import of natural rubber. The country imported 442,130 tones of natural rubber during 2014-15. . The import of natural rubber in 2013-14 was 360, 263 tones. Around 3.1 percent of the total import of natural rubber was from Indonesia. The other major countries from which India imported are Thailand, Vietnam and Malaysia.Around 70 percent of the imports was in the form of Block rubber. Around 27.7 percent was Ribbed smoked sheets. Latex occupies only 2.1 percent of the total import of natural rubber in 2014-15. Exports of natural rubber were very low because of the low relative prices. The total volume of export was only 1002 tones in 2014-15. It is to be noted that the exports were low even when the government of India was giving incentives for export.

III. Instability In Natural Rubber Prices

Production of natural rubber in the last couple of years especially was affected by unfavourable prices. Decrease in prices coupled with high labour cost and shortage of skilled labourers compelled farmers to minimize harvesting days, reduce application of fertilizers and other inputs and stay away from proper maintenance of trees. All the above-mentioned developments have reduced the productivity of rubber in India. As a result production of rubber drastically declined in 2014-15. In 2014-15 total area under rubber cultivation has increased. The total tapped area during 2014-15 in India was 447,000 hectares. The total production of natural rubber declined to 645,000 tones in 2014-15. In the previous year the production stood at 774,000 tones. This shows that the annual productivity declined from 1629kg/ha in the previous year to 1443 kg/ha in 2014-15. Thus it is evident that Rubber growers are going through a very difficult phase due to the fall in rubber prices.

Table 4. Natural Rubber Prices in India and international Markets

Year	Price (Rs/ Kg)		Oil Price($/bbl)
	Kottayam (RSS4)	Bangkok (RSS3)	
1995-96	52.04	50.16	28.5
2000-01	30.36	29.58	24.44
2001-02	32.28	27.93	25.02
2002-03	39.19	39.15	28.83
2003-04	50.40	52.78	38.27
2004-05	55.71	57.51	54.52
2005-06	66.99	74.32	65.14
2006-07	92.04	97.79	72.39
2007-08	90.85	96.75	97.26
2008-09	101.12	103.79	61.67
2009-10	119.98	111.13	79.5
2010-11	190.03	195.55	111.26
2011-12	208.05	209.15	111.67
2012-13	176.82	175.76	108.66
2013-14	166.02	155.25	96.22
2014-15	132.57	112.71	52.50

Source: Indian Rubber Statistics, Vol.33, Rubber Board, Government of India, 2014

Natural rubber prices have declined significantly in the last year both in the domestic market and the international market. A variety of factors have contributed to the instability in prices. The economic slowdown in the developed and developing countries, a sharp fall in crude oil prices and subsequent decline in synthetic rubber prices and depreciation in the currencies in natural rubber exporting countries have all contributed to the decline in natural rubber prices in the producing countries. During the period 2014-15 domestic natural rubber prices for RSS 4 came down to an average of Rs.132.6 per/Kg. It is to be mentioned that the average price in 2013-14 was Rs.166.0 per kilogram. Global production of synthetic rubber fell by 1.5 percent during the 12 months ended December 2014. Production of natural rubber in India and Malaysia has declined significantly during the last couple of years because of the uncertainty in rubber prices. However it is to be noted that global production of rubber rose 7.8 percent to 16.68 million tones in 2014. Global consumption of synthetic rubber has increased by 8.3 percent during 2014. The consumption stood at 16.73 million tones during 2014. Decline in crude oil prices has contributed for the decline in the cost of production.

Rubber prices have been declining in real terms, despite the high nominal price level achieved in recent years and a better performance than most other commodities. It is to be mentioned that NR prices has declined to a level that renders the NR sector unprofitable as a viable income generating activity, especially for smallholders. As a direct consequence, NR producers, especially smallholders, have switched to other more profitable alternatives. Like other commodities, the decline in NR prices, at least in the past, was partly a result of a decline in oil prices and the consequent decline in the cost of production of synthetic rubber. On the demand side, in addition to slow economic growth in industrial countries and China, the demand for commodities, particularly raw materials, is affected by the long-run tendency for the consumption of

commodities per unit of GDP to decrease. On the supply side, there is a tendency to increase production irrespective of market conditions and there have been increases in productivity in many producing countries like Vietnam. There is also a problem with price and export instability of NR, which can influence the economic performance of the exporting countries in many ways. Export of natural rubber from India has declined significantly in the last couple of years.The countries' ability to import capital and equipment goods essential to their development program is greatly influenced by export earnings. Investment may be affected because of higher levels of uncertainty, resulting in higher interest rates. Furthermore, export instability may result in balance-of-payments pressures, which may limit import capacity and therefore reduce investment. The growth rate may be affected by a reduction in the productivity of investment. To protect against instability, there may be more investment in inventories than in more directly productive things. Government revenue through taxation of exports is subject to fluctuation, which can slow down government projects such as infrastructure that are integral to the total development program (Sooi, 1992). Increases in income consequent upon upward changes in export earnings may exacerbate inflationary tendencies by raising demand for both domestically produced and imported consumer goods (Lai Ching ,Shih and Vey, 1996). Reduction in income may have opposite effects. As a consequence, individual producers and workers may suffer considerable hardship from instability.

In the past, government purchases through a marketing board or purchasing agent were quite popular (Raju, 1990). However, there has been a trend to abolish this type of marketing channel and the effect is that producers are facing less stable prices and need good reliable prices for physical trade deals. In fact, recent events may have caused NR prices to become more volatile than ever before. The unprecedented levels of exchange rate variability as a result of the crisis caused sharp fluctuations in rubber prices. Furthermore, the introduction of on-line trading means news is readily accessible and prices tend to fluctuate sharply in response to this news. The collapse of the International Natural Rubber Agreement (INRA), which engaged in management of price risk at the international level, may also have contributed to the increase in price volatility. Natural rubber prices have also declined significantly during 2008-2009. The low prices were due to the economic slowdown in the global economies.

Table 5. Coefficient of Variation of Natural Rubber prices at Kottayam and Bangkok

Period	Kottayam (RSS4) Prices	Bangkok (RSS3) Prices
2000-05	26.76	32.3
2005-10	20.34	14.25
2010-15	16.19	22.28
2000-15	57.81	57.14

Source: Computed from Indian Rubber Statistics, Vol.33, Rubber Board, Government of India, 2014

The magnitude of the volatility is measured by using the coefficient of variation (Tansuan, 1984). The instability was particularly high during the first period 2000-05. An analysis of the coefficient of variation shows that both international prices and domestic prices are highly volatile during the period 2000-15. The instability was also high during the second period 2005-15. It is to be noted that the instability was as high as 57.81 percent during the period 2000-15. Instability analysis of domestic and international prices revealed that several factors like global recession and decline in crude prices have contributed to the volatility in prices during the second phase.

In the case of natural rubber one of the important factors that affect the replanting decisions of farmers is the price of natural rubber (Tharian, 1987). Natural rubber has been experiencing high volatility and instability in prices after the integration of the domestic and international markets. The establishment of WTO in 1995 was having a significant impact on the extent of integration of the domestic and global markets. The volatility and instability has particularly affected the small holders and marginal farmers (Burger and Smit, 1989). The demand and supply volatility in both markets also affects the prices. After the establishment of the WTO world trade has increased quite significantly (Gulati, Mehta and Narayanan, 1999). Growth of the world economy has given a boost to the automotive industry. Consequently demand for rubber products have also increased. However the recession during the period 2008-12 period had seriously affected the growth of the automotive sector and had resulted in the lack of demand for natural rubber. It is to be noted that low instability and volatility in natural rubber prices is important for the sustained production of natural rubber (Elsamma, 1981). Some of the factors that affect the natural rubber prices are crude oil prices, exchange rate fluctuations in currencies, fluctuations in demand from the automotive sector and climatic changes in the producing countries.

IV. Conclusion

Annual average price of natural rubber has shown high instability in the last fifteen years. In the case of natural rubber the domestic market is highly integrated with the international market. The instability in the prices in the international market has significantly affected the prices in the domestic market. The real prices of natural rubber have declined particularly in the last couple of years. The unremuneratiyeprices has affected the planting decisions and production in India. It is evident that the instability has increased in the open trade regime. The analysis of coefficient of variation has shown that the instability was very high during the last fifteen years. Governments price stabilization programmes have not succeeded in recent years. The decline in oil prices and the consequent decrease in the price of synthetic rubber was the major reason for the slump in natural rubber prices in the international market. Therefore a farm income stabilization programme is important for the longrun growth of the rubber plantation sector.

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