

## CHAPTER 5

### ANALYSIS ON PRICE STABILITY AND ITS EFFECTS

#### 5.1 Methodology

To analyze the variation in prices, the coefficient of variation (CV) which measures the relative variability of more than one set of data will be used here. The computation of CV is done according to the procedure below:-

Mean

$$\mu = \frac{\sum X}{N}$$

Standard deviation

$$SD = \sqrt{\frac{\sum (X - \mu)^2}{N}}$$

Coefficient of variation

$$CV = \frac{SD}{\mu} \times 100$$

where:  $X$  is the observations

$\sum X$  is the sum of values of all observations

$\mu$  is the mean

SD is the standard deviation

N is the number of observations

Two approaches will be used here to assess the variation in rubber prices, one long-term while the other short-term. The long-term approach entails the assessment of variation in prices before and after the implementation of INRA. If the CV of prices after October 1980 i.e. the date of inception of the agreement, is smaller than that of before October 1980, it can be postulated that the BSO of INRO brings about price stability. On the contrary, if the CV of prices after October 1980 is bigger than that of before this date, there is then insufficient evidence to suggest that INRO's BSO brings about price stability to the natural rubber market. The variation in prices under the two agreements will be separated for purpose of comparison. The idea is to examine the effectiveness of INRO's BSO under INRA I and INRA II.

The date of implementation and the date of expiry of the agreements will be used as the cut-off point for purpose of analysis. As such, for the computation of price variation before the implementation of INRA, the data before October 1980 ( i.e. January 1965 - September 1980) will be used. For the first agreement, price variation will be calculated based on the data obtained from October 1980 to October 1987. With regard to the assessment of price variation under the second agreement, the data used are based on the operational period of the second INRA i.e. from December 1988 to December 1995. The period November 1987 - November 1988

was the interim period during which negotiation of INRA II was underway. Since it was an interim period which does not come under either of the agreement, prices of rubber during this period will not be taken into account. For the period 1965 - 1980, prices in certain months will be removed as they were influenced by some form of government intervention in one way or another. It should be noted that in late 1960s and the early 1970s there were already government interventions in the rubber market to influence rubber prices. Such interventions took place in September 1967, March 1968, March 1971 and July 1974. The interventions were carried out via direct purchase of rubber by the Malaysian government. As prices during these periods came under the influence of government interventions, the data during these periods have to be removed. Apart from that, the data between the period of December 1974 to September 1975 will also be excluded from the computation of CV since prices of rubber during this time were affected by the Malaysian Crash Programme described in Chapter 3.

The second approach entails the comparison between the variation in prices when the BSM intervened in the market and variation in prices without intervention in the market. In this connection, it is noted that the BSM did not intervene in the market throughout the duration of the two agreements. Under the first agreement, the BSM was active during the periods of November 1981 - February 1983 and May 1985 - January 1986, whereas under the second agreement, the BSM intervened in the market during certain months only in the years 1991, 1992, 1993 and 1994. During the interim period between October 1987 and December 1988, the BSM was also active in the market to dispose of the buffer stock accumulated under the first

agreement. Although it was an interim period during which the BSM was not supposed to intervene in the market as the organization was in liquidation, the disposal of buffer stocks as required by the agreement did have some impact on the market. As the purpose of the analysis here is to examine the reaction of prices to factors other than market forces, the data during the interim period will be used for analysis. For the assessment of variation in prices under the influence of the BSM's intervention in the market, prices in the periods of November 1981 - February 1983, May 1985 - January 1986 and September 1987 - March 1989 will be used. With regard to the data for the assessment of prices not influenced by the BSM's action, data in the following periods will be used i.e. March 1983 - December 1984, April 1990 - July 1991 and November 1994 - October 1995.

## **5.2 Data**

The data used in the computation of CV of prices are the monthly average prices of three different grades of rubber in the Kuala Lumpur market. They are RSS 1, RSS 3 and SMR 20. The average prices of RSS 3 and SMR 20 were used as they constitute the bulk of the major grades of rubber traded in the international market. In the case of RSS 1, it actually accounts for a very small percentage of rubber traded in the rubber market. In 1994, the RSS 1 rubber exported by the three major producing countries i.e. Malaysia, Indonesia and Thailand amounted to 83,600 tonnes only compared to 908,400 tonnes of RSS 3 and 1.67 million tonnes of TSR 20. Despite its small percentage in the world rubber trade, it is however an important indicator of world rubber prices. In fact, prices of RSS 1 have been the traditional indicator of rubber prices. When prices of rubber are quoted without referring to their

grades, often than not, they refer to RSS 1. As an important indicator of rubber prices, the other grades of rubber usually move in sympathy with RSS 1 rubber. Another reason that makes RSS 1 prices important is its volatility. Compared to RSS 3 and SMR 20, prices of RSS 1 are more volatile and speculative. Fluctuation in RSS 1 prices is believed to be bigger and therefore should be included in the assessment of price fluctuation (the analysis later however produced some interesting results that seem to defy such assumption).

Since the prices used in the analysis of variability in RSS 1, RSS 3 and SMR 20 prices are prices quoted in the Kuala Lumpur market, one question arises. Does the price fluctuation in the Kuala Lumpur market reflects similar fluctuation in rubber prices in the other markets as well? There are four major markets in the world where rubber is traded i.e. the Kuala Lumpur market, the Singapore market, the London market and the New York market. A comparison between RSS 1 prices in the four different markets as in Fig. 5.1 indicates that generally prices in all the four markets move in tandem. The difference in the degree of fluctuation is due to the difference in currencies and the strength of the respective currencies from time to time. As such, the variation in rubber prices in the Kuala Lumpur market is a reflection of price variation in the other markets as well.

### **5.3 Variation in Rubber Prices before and after INRA**

In this section, a comparison between the long-term variation in rubber prices before and after the implementation of INRA will be made. As pointed out above, it

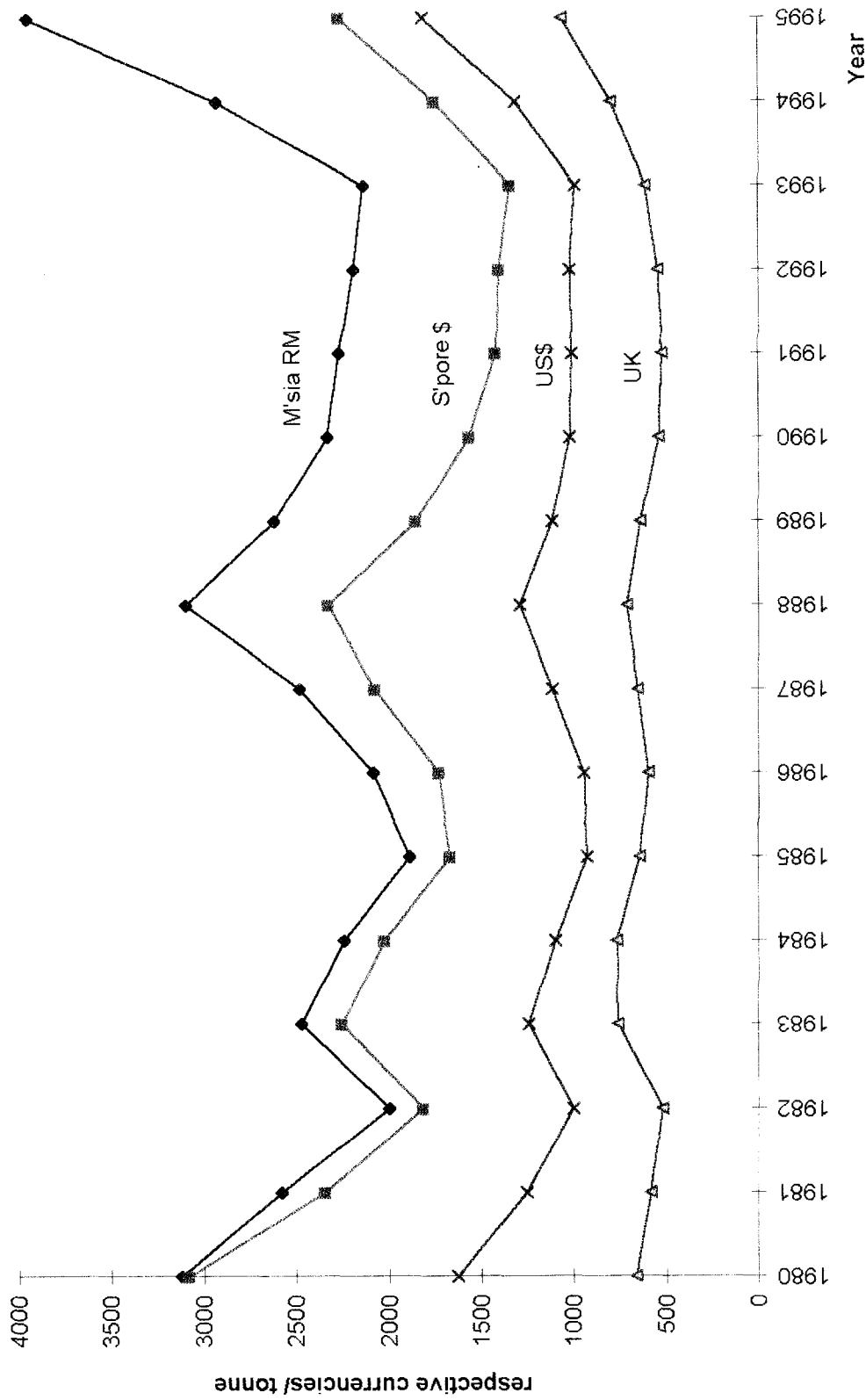


Fig. 5.1 RSS 1 Prices in the Kuala Lumpur, Singapore, New York and London Market

Source: Rubber Statistical Bulletin

is hypothesized that the variation in rubber prices before the implementation of the agreement i.e. for the period of 1965 to 1980 is larger than variation in prices under the influence of the first and second agreement.

The CV of prices of the three grades of rubber between January 1965 to September 1980 are calculated based on the procedure indicated in section 5.1 and summarized in Table 5.1

**Table.5.1**  
**Variation in Prices Before INRA,**  
**January 1965 - September 1980**

	Mean	SD	CV(%)
RSS 1	170.61	62.54	36.7
RSS 3	161.51	61.50	38.1
SMR 20	191.46	60.12	31.4**

\*\* Computation of CV of SMR 20 is based on data from Feb 1972 to Sept 1980

As can be seen from Table 5.1 above, the CV of the three grades of rubber RSS 1, RSS 3 and SMR 20 for the period of January 1965 - September 1980 are 36.7 percent, 38.1 percent and 31.4 percent respectively. Surprisingly, the CV of RSS 1 prices which is expected to be the largest (since prices of RSS 1 were believed to be more speculative) is smaller than that of RSS 3. The CV of SMR 20 of 31.4 percent

suggests that variation in SMR 20 is the smallest and therefore the most stable among the three.

The variation in prices during the period of October 1980 - October 1987 i.e. under the first INRA is summarized in Table 5.2.

**Table 5.2**  
**Variation in Prices Under INRA I,**  
**October 1980 - October 1987**

	Mean	SD	CV(%)
RSS 1	227.03	34.31	15.1
RSS 3	213.47	33.63	15.8
SMR 20	201.44	26.77	13.3

The figures in Table 5.2 show that the CV of prices of RSS 1, RSS 3 and SMR 20 are 15.1 percent, 15.8 percent and 13.3 percent respectively. It is evident that the variation in prices of these three grades of rubber under the influence of INRA I is much smaller compared to those during the period January 1965 - September 1980. The greater stability in rubber prices under the influence of the first INRA therefore suggests that the active intervention of INRO in the rubber market in the early 1980s did bring stability to rubber prices.



With regard to the variation in rubber prices under the second agreement, the CV of the three grades of rubber are as follows:-

**Table 5.3**  
**Variation in Prices Under INRA II,**  
**December 1988 - December 1995**

	Mean	SD	CV(%)
RSS 1	260.19	63.46	24.4
RSS 3	251.50	64.75	24.9
SMR 20	244.10	66.06	27.1

Evidently, the CV of the prices of RSS<sub>1</sub>, RSS 3 and SMR 20 under the second agreement are still lower than those before the implementation of INRA. However, comparing the CV of prices of the three grades of rubber to those under the first agreement, it is noted that the variation in prices of rubber under the second agreement is bigger than that under the first agreement.

From the three sets of results computed above, it is evident that variations in rubber prices during the period of January 1965 - September 1980 is bigger than those in the periods under the first and the second INRA. Based on the difference between the three sets of data, it is fair to conclude that both INRA I and II did bring stability to rubber prices via the intervention of its buffer stock operation. Nonetheless, the

stability between the prices under INRA I and INRA II is different. Prices of rubber under INRA I are certainly more stable than prices under INRA II.

The more volatile situation in the rubber market under the second agreement is not difficult to comprehend if we examine the movement of rubber prices in the past one decade. In the mid-1980s, the prices of rubber were given a tremendous push when the widespread AIDS-scare that caused the rapid expansion in the production of the condom and rubber gloves industries pushed rubber prices to a level never seen in years. However, the very high rubber prices came down drastically in 1989 and continued to decline in the following years until the end of 1993 before the declining trend was reversed. Since the beginning of 1994, prices of rubber have been maintaining a bullish trend. Apart from the middle of 1995 when prices came down temporarily, prices had been sustaining at rather high level until today. The ups and downs in rubber prices during this period are factors that have contributed to the bigger volatility in rubber prices under the second agreement. Nevertheless, despite the greater volatility in rubber prices under the second agreement, the fluctuation in prices is still smaller compared to that in the January 1965 - September 1980 period.

#### **5.4 Variation in Prices During BSM's Intervention**

The analysis above focused on the longer-term stability of rubber prices throughout the duration of INRA I and INRA II. All prices in the duration of the first and second agreement were used. No distinction was made between times when the BSM was active and those times when he refrained from intervening the market. In this section, another approach will be used to examine the effectiveness of INRO's

BSO in bringing price stability to the rubber market. The objective of the second approach is to examine the BSO's impact on the short-term variation in rubber prices. In this connection, it is noted that there is the question whether it is fair to compare prices in the 1970s, 1980s and 1990s since the world economy of the 1970s was badly affected by two oil shocks. As such, an alternative approach which entails the assessment of the reaction of prices to the BSM's intervention in the market is deemed necessary.

Under the first INRA, the BSM only intervened the rubber market actively in the period of November 1981 - February 1983, in the month of January 1985 and also in May 1985 - January 1986. The BSM was buying rubber during these periods in his attempt to support rubber prices that have dipped below the "may buy" level (see Fig. 4.4). From September 1987 onwards, the BSM was offering rubber for sales instead when drastic increase for demand caused a price rally in the rubber market. By October 1987, the first INRA expired and the BSM began to dispose of the buffer stock held by INRO pending negotiation for the second agreement. It was fortunate that the disposal of INRO's buffer stock coincided with the price rally in the rubber market in 1988 to 1989. By March 1989, all the buffer stocks accumulated under the first agreement had been sold by the BSM.

Between April 1989 and late 1991 there had been no intervention by the BSM in the market although the DMIP hovered around the "may buy" level. By late 1991 however, when the DMIP dipped towards the "must buy" level, the BSM began buying again. The purchase of rubber by the BSM continued in 1992 and 1993

although purchases during these two years were only scattered in a few months. Towards the end of 1993 however, rubber prices took a sudden turn and rallied to a very high level in the following two years. Due to the rapidity in price increase, the BSM disposed of the more than 220,000 tonnes of buffer stocks in just three months i.e. from August to October 1994.

Among the periods where there was intervention by the BSM described above, only three i.e. November 1981 - February 1983, May 1985 - January 1986 and September 1987 - March 1989 are long enough for the purpose of computation of price variability. The other periods are too short for the purpose of analysis. With regard to analysis on price variation which is not affected by INRO's intervention, the following periods were chosen i.e. March 1983 - December 1984, April 1990 - July 1991 and November 1994 - October 1995. The duration of these periods ranges from nine to twenty-two months

A summary of the variation in prices in the respective periods mentioned above is given in Table 5.4. The results in greater detail is given in Appendix V. From the coefficient of variation computed for prices of each of the three grades of rubber during the respective periods, it could be seen that the variation of prices of RSS 1, RSS 3 and SMR 20 under the influence of INRO's BSO intervention is relatively smaller than those not influenced by INRO's intervention except for the period of April 1990 - July 1991 where the CV of all the three grades of rubber are the smallest. Apart from that, it is also noted that the CV of prices of the three grades

**Table 5.4**  
**Variation in Prices With and Without INRO's Intervention**

CV of Prices not influenced by INRO's Intervention (%)			
	RSS 1	RSS 3	SMR 20
March 1983 - December 1984	11.05	11.65	7.89
April 1990 - July 1991	2.36	2.64	2.67
November 1994 - October 1995	13.47	13.61	16.7
CV of Prices influenced by INRO's Intervention (%)			
	RSS 1	RSS 3	SMR 20
November 1981 - February 1983	4.35	3.50	3.61
May 1985 - January 1986	3.97	5.39	6.15
September 1987 - March 1989	10.65	14.63	7.23

of rubber, particularly RSS 3 during the period September 1987 - March 1989 is relatively high despite INRO's intervention during this period. In this connection, it should be noted that the years 1987 to 1989 are a rather exceptional period for the rubber industry. As we have noted earlier, the grave concern over the spreading of AIDS in the mid-1980s had caused the proliferation of rubber glove industry in many parts of the world. The sudden increase in demand for latex, the raw material for the making of gloves, pushed both latex and dry rubber prices to a very high level. However, when the euphoria over the glove business subsided following the closing down of many glove factories, rubber prices came down rapidly. From the peak figure of 376.07 sen/kg in June 1988, it went down to 224.79 sen/kg in December 1989. The rapid increase and decline of prices are the major factors that have caused price fluctuations in this period. It is questionable whether the exceedingly volatile rubber prices in this period should be used to gauge the stability of rubber prices since the impact of the AIDS-scare to the rubber industry resembled some kind of a shock to the industry. With regard to the very small variation in prices during the period April 1990 - July 1991, it was at a time when market sentiment was dampened. In fact, even the Gulf Crisis that began in 1990 failed to revive market sentiment which had persisted for a long time.

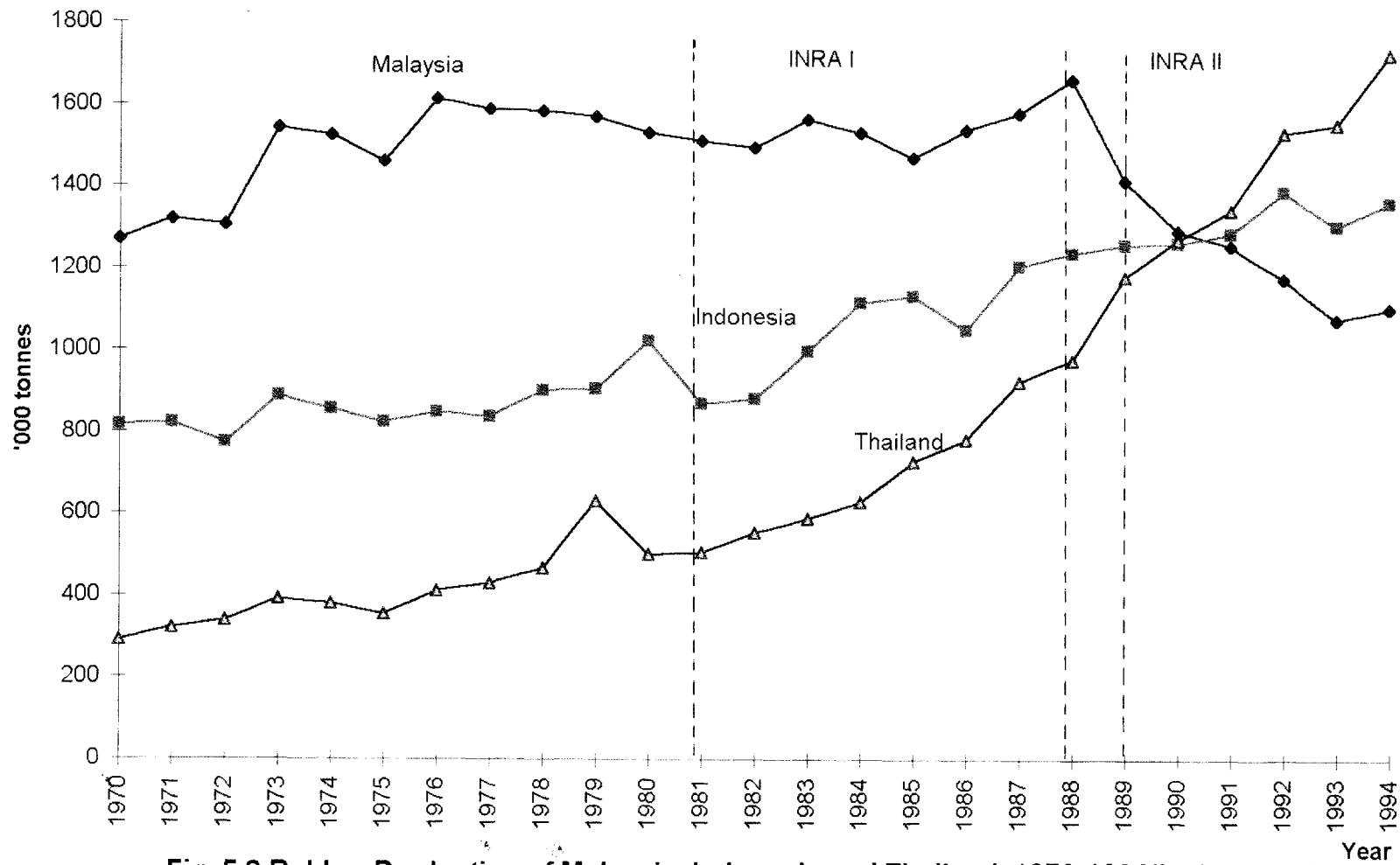
A comparison between the variation in prices of RSS 1 and RSS 3 also produced some interesting results. It could be seen from Table 5.4 that variation in prices of RSS 3 appeared to be greater than that of RSS 1. This seems to defy the assumption that prices of RSS 1 are more volatile and speculative. The greater

variation in prices of RSS 3 also confirmed the longer-term analysis done in section 5.3 where variation in RSS 3 prices was found to be greater than that of RSS 1.

### **5.5 Implications for the Natural Rubber Industry**

The assessment of the effects of price stability on the development of natural rubber industry is probably more complicated than the analysis on price stability itself. In the past two decades, there have been tremendous structural changes in Malaysia's economy. The various changes experienced by Malaysia have no doubt brought about substantial implications to the commodity sector including the natural rubber industry. In the presence of that many factors that influence the rubber industry, it is certainly difficult to identify the effects of price stability on rubber. However, we may still compare the rubber industry before and after the implementation of INRA to examine the trend of this industry's development since the inception of INRA. In addition, a comparison with the rubber industries of Thailand and Indonesia could be made in reference to the performance of Malaysia's rubber industry vis-à-vis its competitors. In this respect, Indonesia and Thailand share many similarities with Malaysia. All the three countries are major rubber producing countries in the world and at the same time enjoying buoyant economic growth in the past few years. Therefore, a comparison between the development in the natural rubber industries in Indonesia, Malaysia and Thailand should give us a better idea on the effects of price stability on the natural rubber industry.

The development of the natural rubber industries of Malaysia, Indonesia and Thailand is depicted graphically in Fig 5.2. Looking at the movement of Malaysia's



**Fig. 5.2 Rubber Production of Malaysia, Indonesia and Thailand, 1970-1994(in thousand tonnes)**

Source: Department of Statistics, Malaysia and International Rubber Study Group



rubber industry in the past twenty years, one notes that in the early 1970s, Malaysia's rubber industry showed an increasing trend. However, after 1976, production began to decline. The production of Malaysia's natural rubber continued to deteriorate until 1982 when it slightly picked up again. Throughout the duration of the first agreement, production fluctuated with the lowest level recorded at 1.47 million tonnes and the highest level at 1.58 million tonnes in 1987. Judging from the movement of the production trend under the first INRA, it is fair to say that the declining trend after the mid-1970s was halted during this period. Although production fluctuated downwards again in 1983 and 1984, it picked up in the following years and continued its increasing trend until the end of the first agreement. It should also be noted that the reversal of the declining trend in 1982 coincided with the active intervention of INRO's BSO in this year. Between the last quarter of 1981 and the first quarter of 1983, INRO intervened the market actively when prices of rubber declined steadily since 1980. By the end of 1982, it was estimated that more than 280,000 tonnes of rubber had been mopped up by the BSM. There is little doubt that the huge amount of rubber taken up by INRO must have brought a better balance between the supply of and demand for rubber and prevented rubber prices and rubber production from falling further. It is also interesting to note that the decline in production in 1983 and 1984 coincided with the absence of the BSM's intervention in the market in the greater part of 1983 and 1984. The active intervention by INRO was also believed to have saved rubber producers substantial amount of money following the halt in price decline. According to a study by Lim (1986), even with the defence of a ten-cent fall in prices in early 1980s, Malaysia was estimated to have saved a total of about RM 200 million. This saving does not include the profit recouped from the later sale of

the buffer stock at very profitable levels. The active intervention by INRO to prevent further price decline must have encouraged many rubber producers to stay with the rubber industry and helped to sustain Malaysia's rubber output.

While the first INRA appeared to have ensured continued development in the rubber industry, the same cannot be said about the second agreement. The second INRA was concluded in December 1988 and expired in December 1993 before it was extended twice to December 1995. Throughout the duration of the second agreement, the situation of Malaysia's natural rubber industry was characterized by declining trend most of the time until 1994 when the rally in rubber prices prevented further decline. The deterioration in production under the second agreement is in stark contrast to the situation under the first agreement. Is the decline in rubber output attributable to the greater fluctuation in prices under the second agreement? We have noted in the earlier part of this chapter that although the variation in rubber prices under the second agreement is bigger than that under the first, it is still relatively stable compared to prices before the implementation of INRA. However, for a pretty long period under the second agreement, prices stabilized at a low and unremunerative level for rubber producers. It could be seen from Fig 4.3 that between 1989 and 1993, INRO's DMIP hovered around the "may buy" level and even dipped beyond this level for some time. Such persistently low prices, although stable, must have prompted many rubber producers to leave the rubber industry for alternative source of income. As such, stability alone, although essential, is insufficient to guarantee continued development in the rubber industry, at least in the context of Malaysia.

With regard to the trend of development in Indonesia and Thailand, as can be seen in Fig 5.2 the rubber output in Indonesia fluctuated with an upward trend under the first INRA as in the case of Malaysia. Under the second INRA however, Indonesia's rubber production showed an increasing trend. Although its production declined slightly in 1993, it soon picked up again in the following years. In the case of Thailand, it is evident from Fig 5.2 that Thailand's rubber production maintained an upward trend since 1980. Thailand's production does not appear to be affected by the movement of rubber prices at all. Even during the period of 1989-1993 when prices remained low most of the time, Thailand's production still maintained its upward trend, pushing the production to higher levels year by year.

From the comparison between the three biggest rubber producing countries above, it is evident that the effect of INRA on these countries varies from one to another. While the stability brought about by INRA ensured steady expansion in Thailand's and Indonesia's rubber industry, its impact on the rubber industry of Malaysia is less important. As such, while price stability appears to be a necessary and sufficient conditions in Thailand and Indonesia in ensuring the growth of rubber, it is however only a necessary but an insufficient condition for Malaysia.