

CHAPTER 1

INTRODUCTION

1.1 Introduction

The International Natural Rubber Agreement (INRA) was first concluded in 1979 between producing and consuming countries with the primary objective of bringing greater stability to the prices of natural rubber. With the expiry of the first agreement in 1985, the second agreement was negotiated and concluded in 1988. When the second agreement expired again in 1993, it was extended to facilitate member countries to renegotiate the third agreement. It was reported that the final draft of the third agreement has been finalized and is now awaiting the ratification of member countries.

INRA is sometimes referred to as the most successful agreement with economic provisions. Such acclaim accrued to INRA is not without reason. In the past one decade, the commodity world has witnessed the crisis encountered by two commodity agreements i.e. the International Tin Agreement (ITA) and the International Cocoa Agreement (ICCA). In October 1985, the ITA collapsed when the International Tin Council (ITC) exhausted its financial resources to support tin prices. At about the same time, the ICCA too ran into problems. The buffer stock of the Cocoa Council had accumulated to the sizable level of 100,000 tonnes while the

price of cocoa remained low. While both the tin and the cocoa agreements were stuck with indisposed stock, the International Natural Rubber Organization (INRO) began to dispose of the rubber held in its buffer stock in 1987. By 1989, the entire stock of rubber purchased by INRO under the first agreement was all sold.

Despite INRO's successful operation under the first agreement, there was still scepticism about the feasibility of INRA. Sceptics generally attributed INRO's success under the first agreement to sheer fortuity. They argued that INRO was able to dispose of its buffer stock in 1989 because of the AIDS-scare in the mid-1980s that pushed rubber price to a very high level. But INRO again proved the critics wrong when in 1994 it managed to dispose of more than 220,000 tonnes of rubber that it purchased earlier. The success of INRO's buffer stock operation under both the agreements certainly cannot be conveniently described as "two times lucky". There must be underlying factors in the agreement which contributed to its success.

Nonetheless, one has to admit that INRA's success cannot be judged by virtue of the fact that the agreement has yet to suffer the same fate as that of the tin and cocoa agreements. INRO's buffer stock operation might be functioning under the two agreements, but whether the buffer stock operation has achieved INRA's objective of stabilizing the price of rubber is an entirely different matter. It is the intention of this paper to examine this aspect of INRA to see if INRO's buffer stock operation did bring price stability to the rubber market which has been considered a key factor in ensuring the steady development of rubber industries in producing countries. In this connection, it is noted that apart from stabilizing prices, the other important

objectives of INRA include efforts to ensure the steady development of rubber industries in producing countries. Judging from the production figures in major rubber producing countries in the past few years, it appears that while there have been steady expansion in countries such as Thailand and Indonesia, development in Malaysia has been less promising. In fact, in terms of production, the rubber industry of Malaysia has been suffering steady decline. Why did countries such as Thailand and Indonesia able to benefit from the stability in prices (if there was stability) while Malaysia could not is an interesting question. And is price stability a necessary and sufficient condition for the development of the commodity sector such as rubber? These are some of the questions that this paper intends to explore.

1.2 Background of the Study

Due to the price-inelasticity of demand for and supply of commodities, the export of primary commodities is characterized by price fluctuation and producers of these products have to face the trauma of uncertainty in earnings from their products. The World Development Report (1986) commented that at times, producers prefer stability in prices rather than high prices that can fall anytime. The fluctuation in commodity prices which adversely affect producers' earnings is the major factor that leads to the creation of price stabilization measures. But are stabilization schemes effective in tackling the problem of price instability? In his work that gives an outline on the historical development of commodity market control, Nappi (1979) noted that there is divergence in views among economists. Some economists believe that market control works while others do not. Those who oppose the creation of commodity market control argued that intervention in the market may cause a rise in production

and exports in non-member countries and the eventual replacement of commodities by substitutes. As such, commodity market control brings more harm than good to the producers in the long-run. The experience of producers of some commodity market control schemes in the early part of this century does seem to lend support to such argument. For instance, the Stevenson Plan instituted by rubber planters in Malaya (then) in the 1920s to support rubber prices did lead to increased production in the Dutch East Indies and culminated the abandonment of the plan later. The collapse of the tin agreement in 1985 was also partly attributed to the substantial increase in production of non-member countries such as Brazil who took advantage of high prices in the tin market to reap substantial profits. Regarding the question of substitution, it normally takes place when the price of a commodity is sustained at unrealistically high level which could be caused by an upward fluctuation. Apart from the above, Salant (1983) noted that previous attempts to stabilize prices of commodities such as gold, silver and tin have failed because of speculative activities that emerged following the establishment of price stabilization schemes. Salant added that a lot of simulation exercises carried out on price stabilization scheme using econometric models do not take into account the element of speculative demand which he considered has thwarted many a commodity agreement. There are also those who feel that stabilization schemes are not necessary as primary commodity price fluctuation do not have significant effects on the economies of developing countries (Behrman 1987). In his review of previous work on price instability, Behrman (1987) noted that the downswing in prices will be compensated by upswing in a rising market. So long as the downward and upward movements are

asymmetrical, their impact on prices is neutral and the adverse effect of price instability on earnings of producing countries will be insignificant.

However, not all economists share the view above. Smith (1976) in an article written ten years before the collapse of the tin agreement noted that the tin agreement had been successful in using buffer stock and export quota to secure fair and remunerative prices for tin for about two decades. In his assessment, Smith (1976) felt that the tin agreement is a qualified and respectable success by virtue of the fact that it had worked for twenty years. Ghosh, Gilbert and Hallett (1987) also felt that one cannot judge the feasibility of commodity agreements based on the collapse of one single agreement i.e. the tin agreement in 1985. They refuted the argument that the failure of the tin agreement is enough evidence to prove that commodity agreement cannot work. Regarding the question whether price instability has any adverse influence on earnings of producers, Avramovic commented that usually developing countries who do not have the financial resources to hold stock are compelled to sell their products at competitive prices in a falling market (Maizel 1987). The vulnerable position of developing countries is made worse of by developed countries who could delay purchases to dampen market sentiment further. Under such circumstances, the losses incurred by developing countries cannot be compensated by their gains from a rising market.

As prices of commodities move in both ways, upwards and downwards, they affect both producers and consumers. There is thus the question whether the effect of price instability has greater impact on producers or consumers. In 1944, Waugh

(1944) argued that with a negatively sloped demand curve, and assuming consumers to be price takers, consumers gain more from a price decline than they lose from a price rise. In short, consumers gain from price instability. However, Howell (1943) felt that Waugh's argument appeared too straight forward. Howell (1943) felt that the influence of price stabilization on the welfare of consumers depends upon the level at which price is stabilized. Price stabilization operation may give results varying all the way such as from increases in average consumer's surplus to increases in gross incomes to producers, depending on the point at which prices are stabilized. From the perspective of welfare for producers, Massell (1969) felt that price stability provides greater welfare to producers since it ensures greater income stability to them.

Among the earliest studies that examined the impact of buffer stock operation on natural rubber was made by Brown (1974). Amidst producing countries' endeavour in the early 1970s to institute a commodity agreement equipped with buffer stock and export quota to influence rubber prices, Brown (1974) published an article that illustrated the results of a simulation exercise on the possible effect of Malaysia's national buffer stock in 1967-1969 on the stability of export earnings, export tax revenue, producers' income and world price. Among the findings of Brown's study was the suggestion to internationalize the operation of the buffer stock. Brown (1974) contended that buffer stock would only be effective if it is sufficiently big. As such, the participation of other producing countries in the operation of the buffer stock was necessary. The question of the size of a buffer stock was also touched upon by Meyanathan (1980) in his evaluation of the then proposed INRA I. In his study, Meyanathan (1980) concluded that the buffer stock operation would end

up making frequent sales in the market and a large buffer stock of 700,000 tonnes was required to render it effective. In hind sight, the 700,000 tonnes suggested by Meyanathan was perhaps too excessive compared to the 400,000 tonnes normal stock plus 150,000 tonnes contingency stock stipulated under INRA I. The buffer stock held by INRO under INRA I & II had never exceeded the 550,000 tonnes proposed under INRA. In fact, the maximum buffer stock held by INRO was less than 370,000 tonnes in its fifteen years' operation.

With regard to INRO's buffer stock operation on price stability, according to the study by Burger and Smith (1991), INRO's buffer stock operation did bring price stability albeit not as significant as some member countries might have wished. Burger and Smith (1991) was also known to have commented the ill-effect of INRO's buffer stock operation. According to Burger and Smith (1991), although INRO had been successful in bringing greater price stability, its activities had also brought about the undesirable effect of lower prices. It is interesting to note that Burger and Smith's conclusion was made on the basis of the difference between prices of natural rubber under INRO's influence and a set of simulated prices. The basis used by Burger and Smith is debatable since there is no way to find out whether their simulated prices would be "the prices" without the influence of INRO's activities.

1.3 Methodology

First and foremost, the principle of INRO's buffer stock operation will be examined from the perspective of economics. Some comparison will be made between the market trend concept of INRO's buffer stock operation and the tin

agreement's buffer stock operation which is not equipped with an automatic revision mechanism. In this connection, it should be noted that the market trend concept of INRA enables the fundamentals in the market to dictate price movement while the buffer stock operation of INRO only serves to minimize fluctuation within a certain price range.

To assess INRO's intervention in the market on price stability, statistical techniques will be used to examine the variation in prices of natural rubber before and after the implementation of INRA's stabilization scheme. A comparison will then be made between the variation in prices before and after the implementation of the price stabilization scheme to see if there is significant difference between the two. The hypothesis is that if there is significant difference between the variation in prices, there is reason to believe that INRO's buffer stock operation brings about price stability. However, if there is no significant difference between the two, there is then insufficient evidence to substantiate the claim that the intervention of INRO in the rubber market brings about stability to rubber prices. Apart from that, an assessment on the reaction of natural rubber prices to the Buffer Stock Manager's activities in the market will also be made. The objective of this second approach is to examine the short-term variability of natural rubber prices when the Buffer Stock Manager was active in the market.

1.4 Primary Commodities and Price Fluctuation

The export of primary commodities is usually associated with the developing countries. In mid-1970s, it has been estimated that more than half of the developing

countries derived at least 50 percent of their export earnings from three or fewer commodities, and only eighteen of the one hundred and fourteen developing countries obtained less than 10 percent of their export earnings from three commodities (McNicol 1978). Although some developing countries have been able to reduce their dependence on the primary sector in the past two decades, the vast majority is still dependent on the exports of primary products for foreign exchange earnings. Most of developing countries' commodities ended up in the international market and their major buyers are developed countries. As the bulk of these commodities is consumed by developed countries, the returns from the export of such commodities vary according to the economic conditions in the developed world. It has been said that the international commodity market acts as a mechanism which transmits inflation and recession in developed countries to developing countries. When there is a boom in developed countries which leads to increase in demand for industrial materials and price rally in the commodity markets, developing countries could expect to reap substantial returns from the sale of their primary products. However, when developed countries suffer from recession, the exports of developing countries will be equally hard hit. And since commodity exports account for a substantial portion of the export earnings of developing countries, variation in earnings from commodities would not only affect the foreign exchange earnings of these countries but their economic growth as well. In the light of the importance of commodity to developing countries, fluctuation in commodity prices is therefore a matter of prime concern.

Although price instability is an undesirable element in commodity trade, it is an inherent weakness in the commodity sector. Table 1.1 provides an overview of the

variation in commodity prices in comparison to manufactured products. It could be seen that unlike the coefficients of variation of manufactured goods which range from 0.06 to 0.13 only, those of commodities range from 0.14 to 0.61. The major factors that account for the higher fluctuation in prices of commodities are the income and price inelasticity of primary products. Because the short-run supply of and demand for most commodities are income and price inelastic, small variation in either the quantity supplied or demanded will give rise to relatively larger changes in price. For minerals and metals, supply may be adjusted to some extent to price changes over the short term, but for agricultural products, adjustment to supply is hampered by a number of factors. First and foremost is the influence of climatic conditions on the output of agricultural products. Drought, rainfall and other weather conditions have significant impact on the output of agriculture. For rubber, the pattern of rainfall is particularly important as it determines the number of tapping days which directly affects the rubber industry's output. During rainy season, even if the price of rubber is high, output remains low simply because the number of tapping days is drastically reduced. Secondly, the difficulty in altering land use too lead to inelastic supply of agricultural products. Once cultivated, a piece of land is usually stuck with a particular type of crop for some time. Switching to other crops is not only hampered by climatic conditions and soil suitability but also by the lack of new skills required to plant new crops. In the case of perennial crops like rubber and oil palm, the difficulty of switching from one crop to another is even more pronounced. Rubber trees have an economic lifespan of twenty-five to thirty years. When the young trees are ready for tapping, they become a capital asset to the planters and are expected to continually producing latex until they are no longer productive. Unless and until the

Table 1.1
Variation in Commodity Prices, 1971-1975

Commodity	High (1975 = 100)	Low	Coefficient of Variation
Cocoa	190.7	54.9	0.29
Coffee	288.2	100.0	0.25
Tea	274.2	100.0	0.26
Sugar	128.7	16.9	0.61
Cotton	227.1	-	0.22
Jute	166.7	77.4	0.21
Sisal	144.5	41.4	0.38
Rubber	531.6	100.0	0.38
Copper	285.3	100.0	0.33
Tin	129.0	67.9	0.20
Bananas	214.1	100.0	0.18
Beef	129.4	26.8	0.55
Rice	153.5	69.2	0.21
Wheat	125.6	72.9	0.14
Wool	324.7	100.0	0.29
Electrical machinery and equipment	127.0	100.0	0.06
Mechanical power and transmission equipment	103.0	74.3	0.10
New cars	153.2	100.0	0.13
Women's and girls' apparel	140.8	100.0	0.08

Source: International Bank for reconstruction and development, Commodity Trade and Price Trends (1975); United Nations, FAO, trade Yearbook (1974); United Nations, Monthly Bulletin of Statistics, March, 1976; US Department of Labor, Bureau of Labor Statistics, Consumer Prices and price indices (various issues); Bureau of Labor Statistics, Wholesale Prices and price Indexes (various issues).

Note: Commodity prices were deflated by the U.N. world price index for all commodities. The prices of electrical machinery and equipment and mechanical power and transmission equipment were deflated by the U.S. wholesale price index of durable manufactures. The prices of new cars and women's and girls' apparel were deflated by the U.S. consumer price index.

Source: McNicol David L (1978)
Commodity Agreement and Price Stabilization, Table 2-3, pp18

maintenance of old trees is no longer viable, planters and smallholders are reluctant to replant or replace the trees with new crops. The long gestation period of rubber trees further compounds the problem of adjusting rubber output to prices. The gestation period of rubber is normally six to seven years. Even new clones bred by the Rubber Research Institute of Malaysia (RRIM) which reportedly have much shorter gestation period still take more than five years to mature. The time lag between planting and harvesting therefore makes adjustment of output according to market conditions extremely difficult. The longer gestation period for rubber also means that planters of rubber require longer time to recover the cost invested in the planting of rubber. Prior to the maturity of young trees, substantial cost is incurred in land clearing, planting and upkeeping such as weeding, manuring and the control of pest. It has been estimated that it takes about seven to eight years of harvest to recover the amount of investment put into rubber planting. In other words, if rubber trees are removed before reaching thirteen or fourteen years old, the investment in rubber planting will be considered a failure.

The direct impact of fluctuation in commodity prices is the uncertainty in returns to producing countries. In the case of rubber in Malaysia, the effect of price fluctuation could be seen from rubber's contribution to the country's export earnings in the past few years. As can be seen from Table 1.2, the export volumes of 1.131 million tonnes and 1.035 million tonnes of rubber in 1991 and 1992 respectively exceeded that of 1994 at 1.017 million tonnes. However, in terms of export value, both the export values of 1991 and 1992 at RM 2.689 billion and RM 2.357 billion respectively are lower than that of 1994 at RM 2.928 billion. The lower

Table 1.2
Malaysia: Export Volume and Value of Rubber, 1991 - 1994

	1991	1992	1993	1994
volume (‘000 tonnes)	1,131	1,035	937	1,017
value (RM billion)	2.689	2.357	2.132	2.928

Source: Department of Statistics

export value of 1991 and 1992 is attributable to the lower annual average prices of rubber in these two years. In 1991 and 1992, rubber prices hovered at the low levels of 226.73 sen/kg and 218.92 sen/kg respectively compared to the much higher price of rubber at 293.27 sen/kg in 1994.

Apart from its effects on export earnings of producing countries, fluctuation in prices also casts uncertainty on the investment in the commodity sector. Basically, the decision to invest in an industry is assessed based on the expected returns generated by such investment. When the prices of commodities fluctuate, forecasting the expected returns become extremely difficult. This acts as a disincentive to investment in long-term production, particularly in those agricultural products where the time lag between planting and harvesting is long. The instability in prices also undermines efforts to formulate realistic and achievable long-term development strategies for the products.

1.5 International Commodity Agreements

Price stabilization schemes are nothing new. They existed as early as the 19th Century. Many of these earlier measures to stabilize prices resembled cartels to support prices. Among the earliest effort at the beginning of this century to stabilize prices of commodities is the Brussels Convention of 1902 to regulate sugar beet and sugar production and their markets. In 1907, Brazil too instituted a control system to regulate the marketing of coffee. When the price of rubber declined after World War I, there was also effort on the part of producers to rationalize production by 25 percent of the total capacity in their bid to support prices. All these efforts were said to have brought certain degree of success because producers that instituted such rationalization programmes dominated substantial share of the commodities' markets. For example, Brazil dominated 80 percent of the world's coffee exports when it instituted its control system. In the case of rubber, crude rubber production before World War I was mostly concentrated in the Malay Peninsular (Ernst 1982).

The Great Depression which began in 1929 saw the collapse of prices of both manufactured goods and primary products. Following this world economic crisis, producers of primary products realized the need for some form of market measures which would assure them optimum profit in the medium and long-term rather than short-term profit maximization as expected in the measures earlier. The change in approach in intervening commodity markets also saw greater participation of governments of producing countries. One of the earliest agreements that was signed in the 1930s is the International Tea Agreement. Although it was basically a producers' agreement, the International Tea Agreement received blessing from the

governments of participating countries. Until the year 1964 when UNCTAD was formed, a number of other International Commodity Agreements (ICAs) were also concluded. Among the prominent ones include the International Tin Agreement (ITA), the International Sugar Agreement (ISA) and the International Coffee Agreement (ICoA). These are agreements equipped with market intervention instruments such as buffer stock, export quota and national stocks.

When UNCTAD was established in 1964, there was renewed interest in commodity issues which by then had become a major element in relations between the industrialized nations and developing countries. Developing countries saw the need of a new international economic order which would transfer resources and wealth from the developed world to developing countries. Getting better prices for their exports which consisted mainly of primary products was considered one of the means to achieve this goal. At the behest of developing countries, the 1974 United Nations General Assembly Special Session on Raw Materials and Development directed the UNCTAD Secretariat to design measures along the line set forth in the resolutions adopted at the assembly. In response, the Secretariat established the UNCTAD Integrated Programme for Commodities (IPC) with the primary objectives of stabilizing commodity prices, improving terms of trade and redistributing world income. The IPC was entrusted with the task of creating agreements for eighteen primary commodities and agricultural products identified. They are cocoa, coffee, tea, sugar, cotton, jute, sisal, rubber, copper and tin (the ten core commodities) and bananas, bauxite, iron ore, manganese, meat, phosphates, tropical timber and vegetable oils. Whenever possible, the mechanism of buffer stock operation would be

used to stabilize prices of the ten core commodities (McNicol 1978). However, despite the IPC's ambitious intention, only one agreement emerged under the programme i.e. INRA. As for the other commodities, apart from tin, coffee, cocoa and sugar which were already subject to price stabilization schemes, no other ICAs with economic provisions were concluded. The ICAs of the five commodities mentioned above are also the only ones that remain active currently and recently.

Table 1.3
Market Intervention Instruments of ICAs

	cocoa	coffee	rubber	sugar	tin
Export controls	no	yes	no	yes	yes
National stocks	no	no	no	yes	no
Buffer stocks (max. size in thousand tonnes)	yes 250	no	yes 550	no	yes 63.4

Source: Gilbert (1987)

There are basically three different market intervention instruments which are used in the five ICAs with economic provisions to stabilize prices. These instruments are buffer stock, export quota and national stocks. Table 1.3 provides a brief view of the instruments used by the five ICAs. As can be seen from the Table, out of the five ICAs, rubber and cocoa agreements are equipped with buffer stocks to stabilize prices. The coffee agreement uses export quota to control the supply of this commodity in the international market while the tin and sugar agreements use a

combination of buffer stock-cum-export quota and export quota-cum-national stocks respectively to influence prices.

Compared to the other market intervention instruments, the international buffer stock operation appeared to be favoured by most economists. The measure of export control received less acceptance as it was deemed to be a price support instrument rather than a price stabilization scheme. In basic economic theory, prices are the results of the interaction between supply and demand forces in the market. When the supply of a commodity is rationalized via export control, the price of the commodity will be pushed up. The drastic increase in oil prices in 1973 following OPEC's rationalization of export is a case in point. The export control measures undertaken by producers of some commodities such as coffee and rubber at the beginning of this century also attest to the effect of export controls on prices. Economists deem such measures to push up prices tantamount to disrupting market efficiency which is detrimental to the interest of both producers and consumers in the long-run.

The experience of some of the export control measures undertaken earlier also suggests that the implementation of export control measures is difficult. The effectiveness of export control is to a large extent dependent on the strict adherence of participating members to export quota. Unless participating member countries adhere strictly to the quota allocated, the rationalization of export is bound to fail. However, such cooperation is difficult to come by. Reports of squabbling among member countries over their commitment to export quota is not uncommon. In addition, sabotage by non-participating countries who take advantage of price hike to

reap excessive profits too frequently occur. For example, rubber producers in Malaya (then) and Ceylon were forced to call off their production rationalization programme in the 1920s when producers in the Dutch East Indies took advantage of the high prices to step up their production. The collapse of the tin agreement in 1985 is also partly attributable to the increased production of non-participating countries such as Brazil.

Compared to export controls, buffer stock operation appears to gain wider acceptance among economists. The operation of buffer stock is normally entrusted with professionals who intervene the market according to set of rules prescribed in ICAs. When the price of a commodity went beyond the ceiling or floor prices, the buffer stock manager will have to intervene in the market to either support or to depress the price. The buffer stock manager's ability to intervene the market is limited by his financial resources and the size of the buffer stock. Once the buffer stock reached its maximum level, or if the buffer stock manager ran out of financial resources, there is then very little that the buffer stock manager can do to influence price. As such, buffer stock operation is a price stabilization scheme that can only deal with a transient imbalance in the supply of and demand for a commodity. The movement of a commodity in the long-run is still determined by the fundamentals. As such, using buffer stock to support price at an unrealistic level though possible in the short-run, is not feasible in the long-run.