CHAPTER IV

COMPETITION FROM SYNTHETIC RUBBER

The Rise of Synthetic Rubber

Prior to World War II natural rubber was virtually a unique material; when rubber was required it had to be natural rubber. There was no competition and the main concern of the industry was to keep balanced supply and demand and avoid as far as possible fluctuations in price. The well-being was thought of largely in terms of increasing and extending the market uptake.

The situation is different now. The event of Pearl Harbour changed all this. Natural rubber is no longer the unique product from the gum of a tree. It is now only one of the many members of the rubber family. All this started with the Japanese occupation when traditional sources of supply of natural rubber were cut off from the main consuming countries due to the difficulties of transport. This led to the large-scale development of synthetic rubber. The American government constituted a synthetic rubber industry with a capacity of over 800,000 tons. This amount far exceeds the peak pre-war consumption of rubber. Out of these 836,000 tons, 705,000 were of Buna GRS, 63,000 Butyl, 63,000 Neoprene. The construction of this war time synthetic rubber industry was a tremendous chemical engineering feat, one of the world's greatest.

Another event which goaded the synthetic rubber industry on, and helped to fashion this situation and thus provoking the problems facing natural rubber industry today was the Korean War. When Korea flared up there was a tremendous pressure particularly from the United States military, to build up the government stockpile. This chain of events which appeared at first to help natural rubber was in the end proved to be the cause of the chief problems of the rubber industry. Natural rubber prices skyrocket because of stockpiling in 1950. The price of rubber went up to as high as US 86¢ in 1950. Restrictions were placed on consumption and free trading of rubber. This led to a further development of the synthetic rubber industry and from that time onwards synthetic rubber became the rival of natural rubber. Taught by the war experience of rubber shortage, U.S.A. preferred to keep the synthetic plant in action even after the war as a safety measure against rubber shortage and price fluctuations.

From that time onwards too research and technological development in America has made many improvements in the synthetic field so much so that it has been the cause of the many headache spells to our Malayan rubber producers. Continuous improvements

have taken places in the quality of synthetic rubber and have made synthetic rubber more uniform and easier to handle than natural rubber.

Synthetic rubber is actually a generic term covering different products such as:

(1) Butadiene and Styrene (SBR)
(2) Neoprene
(3) Butyl
(4) Thiokol

Most of the rubber from the above classes possess properties of their own, which are suited for certain things. Their qualities make them more or less "tailor made" products for the production of goods. This is an important factor in determining the industrial producers' preferences between natural and synthetic rubber.

Neoprene, for example, which is very resistant to heat, oil and most chlorinated hydrocarbons and a large number of chemicals is best suited for uses like hoses, conveyor belts and automatic parts.

Butyl tyre which is highly impermeable to gases and retains air many times more than natural rubber is used for inner tubes and air sealant in tubeless tyres.

Butadiene styrene co-polymers is quantitatively the most important as well as the cheapest of synthetic rubber currently available on a commercial scale. Because of their 4 important properties; wear resistance, groove-cracking resistance, aging resistance and fast curing properties; they have now replaced natural rubber in almost all automobile tyres. However they fall short of all natural rubber resilience. This characteristic has made them unsuitable for use in heavy duty tyres.

Recent Development in Synthetics

The recent development in synthetic field indicates that the elasticity of substitution between natural and synthetic would become almost infinite. Synthetic rubber will become an almost complete substitute for natural rubber in all its uses. The synthesizing of stereo regular cis-polyisoprene and cis-butadiene on a commercial scale have added two significant polymers on the synthetic rubber list.[1] Polyisoprene is a more perfect substitute of natural rubber and it will prove to be a real threat to natural rubber. Hence competition will come not only in the form of price but also quality.

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1. Kondo, T.R. - "Competition between Synthetic & Natural Rubber" Malayan Economic Review.

Production of Synthetic Rubber

Synthetic rubber was first produced in significant quantities in 1939 when total world production was 10,000 tons. Most of which was produced in Germany. By 1,49 world production had increased to over 650,000 tons due to great expansion in the U.S.A. during the war.[2] After the war when natural rubber was again available, theproduction of synthetic rubber declined because mainly synthetic rubber was used for lack of anything better. In 1,49 production was at 140,000 tons level. In 1951 production of synthetic rubber reached 900,000 tons. The total world production of synthetic rubber for 1955 was in the vicinity of 1,650,000 long tons excluding the U.S.S.R. Of the total 103,400 long tons or 9.4% was produced by U.K.; 100,000 long tons was produced by Canada and 9,000 tons was produced by West Germany. The rate of growth of synthetic rubber production has far outstripped that of natural rubber since 1950.

In 1,64 production of synthetic rubber was 3.3 million tons while that of natural rubber was only 2.2 million tons. U.S.A. is responsible for about 1.7 million tons of the 3.3 tons produced by the world. Canada produced about 0.2 million tons. U.S. is by far still the world's largest producer of synthetic rubber. Next comes Canada which accounts for only about 3%. Synthetic rubber production in United Kingdom has increased rapidly from practically nothing in 1,5% to 0.15 million tons in 1,61 when it was the third largest producer of synthetic rubber. The predominant position held in Germany in 1940 as a major producer of synthetic rubber - 94% of the world's total output, dwindled as the United States began to gain the dominant world production position. In 1961 it produced even less than United Kingdom. Its production was 0.14 million tons.

The other major producers of synthetic rubber, apart from the Communist blocks, are Italy, France and Japan and Australia. Production in the Central Planned Economy is certainly much larger than the total of all other countries outside United States put together but because of lack of statistical data we can only estimate their production.

At the present moment there are many new countries constructing synthetic rubber plants and most countries currently in production are planning to expand their production. World production by 1966 is estimated to be 5.4 million tons.

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[2]The Rubber Trade. T.P.I. Report No. 2, 1963.

TABLE 15

PRODUCTION OF SYNTHETIC RUBBER
('000 tons)

	1957	1958	1959	1960	1961
Canada	132.1	135.0	160.7	152.7	164.5
France	-	-	5.9	17.2	40.3
Federation Republic of Germany	11.6	22.6	49.1	79.3	85.6
Italy[1]	-	20.0	47.0	72.0	87.0
Japan	-	-	1.2	14.8	58.3
Netherlands[2]	-	-	1.0	12.0	40.0
United Kingdom	0.8	11.3	56.3	99.4	105.1
United States of America	1,113.2	1,054.6	1,379.7	1,436.4	1,404.9
Total[3]	1,262.7	1,242.5	1,540.0	1,835.0	1,792.5

Source: Rubber tatistical Bulletin

1 & 2 Italy and Netherlands production figures are largely estimated.

3 The total, because of estimate, does not balance.

TABLE 16

CONSUMPTION OF SYNTHETIC RUBBER II

Year	United States of America	Germany	United Kingdom	Total
1954	6.2,352	6,955	-	716,360
1955	970,400	10,900	-	1,035,266
1956	1,070,574	10,706	-	1,210,901
1957	1,11 ,173	11,602	750	1,262,606
1958	1,11 ,6 5	22,70.	11,300	1,243,363
1959	1,7 ,6 1	4 ,106	56,300	1,632,500
1960	1,3 5,142	6,79-	90,400	1,880,000
1961	1,4 1,009	5,500	105,500	1,975,000
1962	1,7 ,104	33,103	116,900	2,240,000
1963	1,9 ,153	106,471	125,316	2,437,500
1964	1,7 ,2 1	135,655	153,105	2,802,500
1965	-	-	-	-

Source:- Rubber Statistical Bulletin

Competition between Synthetic Rubber and Natural Rubber

Even as early as 1951 it was estimated that synthetic rubber was preferred to natural rubber in many uses, accounting to about 30% of the total rubber market. This percentage has been increasing steadily over time and now with the development of the 2 stereo-regulars this percentage will rise at a faster rate. It is in this region that you find neoprene, butyl and butadiene-styrene. With their special properties suitable for certain uses they can be said to be more superior to natural rubber. Here as special purpose synthetic their dominance over the market cannot be questioned. For example, polybutadiene rubber has already begun to substitute natural rubber in the field of heavy trucks. SBR replaced natural rubber to such an extent that natural rubber is no longer sure of its position in the passenger car tyre market.

The other zone where natural rubber used to enjoy a priority accounting for 30% of the market is the natural rubber zone. It is in this zone that polyisoprene threatens to eliminate with time and progress in the synthetic rubber industry. Here rubber was largely used for the production of tyre for trucks and air-crafts.

The other 40% lies in the competition zone. Here both synthetic and natural rubber enjoy a compotition situation. Preference for either one will depend on price, comparative cost, quality, availability and aggressive sales promotion.

Recently with the development of the 2 stereo-regulars, which may be considered narrowing up as elasticity of substitution between synthetic and natural rubber will, with time, become infinite. So there will exist only 2 zones,-the synthetic and the competitive zone. It was not very long ago that natural rubber was noted for its unique qualities of high resistance and low hysterics. Because of these 2 qualities inherent in natural rubber, heavy duty trucks and aeroplanes and many other mechanical tools are the main outlets for natural rubber. But now with the "stero-regular" synthetic rubber in the market the position of natural rubber in the world market is insecure.

In another area where natural rubber used to enjoy a significant technological advantage over synthetic rubber was in the latex field. The foam rubber industry, a rapidly growing one, is the main outlet for latex and in this industry natural rubber latex used to enjoy a prominent position. But the situation no longer holds. So practically all the areas where natural rubber enjoys superior positions are now thrown open to competition.

Price is an important factor in determining competition. For a manufacture planning on production over a long period of time it is obvious that it will be a considerable advantage if price of raw materials is stable and there is no doubt that the greater stability of synthetic rubber prices is an important competition

factor. It is perhaps the main factor in determining the switch from natural to synthetic and vice versa. If they are perfect substitutes for each other then the price the consumer is willing to pay for them would be roughly equal too. Besides the price factor, stability and continuity of supply is another factor. Unless consumers and potential consumers are able to purchase the raw material at a stable and assured of continuity of supply they will not risk the switch from one to the other. Synthetic rubber has a comparative advantage over natural rubber where stability of price and continuity of supply are concerned. The price of SBR has remained constant at US 23¢ for years. But with excess capacity from the plant every year the price of synthetic rubber can still be further reduced. Once a plant is built for a certain capacity then cost would be reduced if it could be used to full capacity. Unit cost will be lowered with increased output because whether the plant is working below or above capacity the overheads have to be met. As it is now, synthetic rubber is cheaper than natural rubber and unless the latter's price can fall sharply many economists think that the chances of our natural rubber industry surviving on anything like its present scale is problematic. But another problem crops up. What level of price should we aim at to put our rubber in the market? The most recent authorative discussion on the future price of natural rubber took place at a symposium organised by an International Rubber Study Group in 1962. At the meeting Mr. Bateman suggested that natural rubber producers should aim at a selling price for RSS1 at US 18¢. per lb. This is held to be well within the reach of efficient producers especially with the agronomic advances still to be extensively applied as the reduced profit per acre.[3] Undoubtedly the most promising method of reducing cost lies in increasing yields. Considerable research on this problem has been undertaken during the last 50 years and much progress made. In a recent paper it has been pointed out by Dr. Bateman[4] that whereas unselected stock yields at the rate of 400 lb per acre per year their pedigree clones develope in 20's raised this figure to 800 lb., those develope in the 30's 1100 lb and those available today yield as high as 2,500 lb have been claimed to be under test. With yield as high as theirs there is still a very good chance for Malaya to compete with synthetic rubber even when it lowers its price in the future. As it is Malaya is the only country with the lowest cost of production and recently returns made by a large number of estates show that for each 100 lb increase in yield per acre cost of production falls an average by 1 4/5 US cents per lb. There is therefore a considerable scope for estates to reduce their burden of their overhead costs.

In the natural rubber industry labour is a very important factor. It requires about 100 times more labour than that of

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[3] Bateman, L.C. "The competitive prospects of natural rubber over the next 10 years". Page 61. Proceeds of Symposium organised by Intl. [illegible]

[4] Natural Rubber and South East Asia.

synthetic rubber industry to produce the same amount of output. So to maintain future rubber competition the real cost that has got to be lowered is labour cost. This applies more to estate where labour is employed. Here the small holdings are in a better position than the estates, as labour is provided by the family. Labour cost would not offset any increase in efficiency in production. Smallholders acreage can therefore continue to be operated at prices considerably below the minimum required for profitable estate production.

Trend in Synthetic Rubber Consumption and Prospects

Until 1957 only the United States, Canada and Western Germany exported synthetic rubber; now the United Kingdom, Italy, France and the Netherlands are also exporters. This reflects the trend towards setting up plants in countries which previously had no facilities for synthetic rubber production. Since 1955 the United States took over the little of the main exporter of synthetic rubber. from Canada, and in 1960 she exported 3 times more than Canada.

A very significant feature of rubber consumption pattern is the extent to which synthetic rubber is claiming a steady increasing share of the expanding market of rubber. It has been estimated that in 1961, 48% of total rubber consumption went to synthetic rubber when it was only 25% in 1950. In United States alone synthetic rubber accounted for 70% of United States total rubber consumption in 1961.

In 1960 alone synthetic rubber consumption by the world was 1.8 million. Its growth rate was about 8% per annum. Natural rubber growth rate was only 5%.

In 1963 world consumption of all types of rubber was estimated to have been 4,517,000 tons as compared to 4,375,000 tons in 1962. But the proportion of natural rubber to world rubber usage has continued to show a decline over the past years. In the United States alone the natural rubber consumption dropped from 28% to 26% in 1961, 1963 respectively. Besides, world stock of synthetic rubber has been increasing steadily. The existence of excess capacity in synthetic rubber industry and the continued over-production and accumulation of stocks have been affecting the Malayan rubber prices. Between 1961 and 1963 although there was an excess of demand over supply the price of natural rubber was not increased. The difference being made up by synthetic rubber and release from government stockpiles. But in 1964 the increased production from synthetic rubber pushed down the price of natural rubber. In 1964 synthetic rubber accounted for 54.2% of the total world market, and the trend towards a larger proportion of the world's rubber consumption of synthetic rubber is expected to continue.

TABLE 17

CONSUMPTION OF NATURAL AND SYNTHETIC RUBBER 1952 TO 1962

Year	Natural		Synthetic		Total	
	Thousand Long Tons	Percent	Thousand Long Tons	Percent	Thousand Long Tons	Percent
1952	1,468	62	885	38	2,353	
1953	1,655	65	873	35	2,528	
1954	1,778	71	740	29	2,518	
1955	1,890	64	1,063	36	2,953	
1957	1,898	60	1,260	40	3,158	
1958	2,008	62	1,255	38	3,263	
1959	2,115	57	1,580	43	3,695	
1960	2,063	53	1,798	47	3,861	
1961	2,133	53	1,920	47	4,053	
1962	2,180	50	2,170	50	4,358	
1963	2,230	49	2,352.5	51	4,582.5	
1964	2,220	29	2,720	71	4,940	

Source: International Rubber Study Group.

TABLE 18

UNITED STATES 1953 TO 1963 NATURAL AND SYNTHETIC RUBBER PRICES

Year	Synthetic			Natural RSS1 New York		
	US cents per pound					
	S-type	Butyl	Neoprene	Average	High	Low
1953	23	22	40	24.23	32.00	19.75
1954	23	23	41	23.64	34.50	19.63
1955	23	23	41	39.14	52.00	29.25
1956	23	23	41	34.17	45.00	26.50
1957	23	23	41	31.15	37.25	26.50
1958	23	23	41	28.07	32.38	24.63
1959	23	23	41	36.55	48.75	29.75
1960	23	23	41	38.16	47.25	28.25
1961	23	23	41	29.50	32.75	27.13
1962	23	23	41	28.56	31.38	27.00
1963	23	25	41	26.26	29.25	23.00

Source: International Rubber Study Group

Although the United States share of total world consumption of rubber is not as great as it once was, owing to the expansion of consumption of other countries, she is still by far the largest consumer of both synthetic and natural rubbers. Her consumption of rubber can be shown in Table 19.

In Germany the consumption of synthetic rubber reached as high as 41.7% (1960) when it was only 4.1% in 1950.

The decline in natural rubber consumption in these countries as we earlier said can be attributed to the existence of excess capacity. By the end of 1964 the production capacity of SBR was nearly 2.4 million tons outside the Communist bloc, and consumption was only about 2.05 million tons. Even allowing for oil extension, the excess capacity was probably of the order of 30% and this ratio can be said to be true of all synthetic rubber industry. The main reason for the existence of excess capacity is the steady rise in the minimum size of the synthetic rubber plants. The plants are with capacities in excess of immediate consumption. This is due to the fact that the tyre companies own and control most of the synthetic rubber capacity in existence and they provide a guaranteed market for a large proportion of the output. Other synthetic rubber plants may be owned by petrochemical companies and provide an outlet for their petrochemical production. Because of this relation between producers and consumers, commercial sales of synthetic are of secondary importance.

Moreover, the price of synthetic rubber is always stable. Synthetic rubber producers operating under excess capacity need not raise their price during boom period, and any extra sales would tend to increase their economies of scale.

The uniform supply of synthetic rubber is another major important factor which will enhance the rising demand for synthetic rubber. One can almost see the continued reduction in the use of natural rubber in the car tyres field and its eventual elimination.

In the heavy duty tyre field the stereos will provide a direct and successful price competition with natural rubber. The stereo has accounted for about 100,000 tons by the heavy tyre industry in United States 1964.

TABLE 19

WORLD (EXCLUDING USSR) CONSUMPTION OF SYNTHETIC RUBBER (BUMA-S, NEOPRENE, BUTYL AND BUMA-N) (LONG TONS)

Year	U.S.A.	U.K.	France	Federal[1] Republic of Germany	Canada	World[2] excluding USSR
1954	636,727	9,400	14,437	16,999	30,071	740,000
1955	894,899	21,300	19,419	25,393	40,196	1,062,500
1956	874,394	41,100	31,618	36,000	48,405	1,135,000
1957	925,879	59,200	49,925	49,000	47,541	1,260,000
1958	879,912	65,000	55,111	54,375	46,715	1,247,500
1959	1,072,726	80,200	66,212	73,425	57,204	1,582,500
1960	1,079,245	115,800	90,776	104,400	55,856	1,797,500
1961	1,102,171	121,300	95,528	120,300	62,678	1,920,000
1962	1,255,936	127,900	108,316	129,328	73,009	2,170,000
1963	1,306,736	139,100	123,396	142,878	83,743	2,352,500
1964	1,451,513	160,600	139,192	174,298	92,987	2,720,000

Source: Rubber Study Group

[1]Up to 1964 the figures include consumption in the cable and plastics industries. A monthly allowance of 2,300 long tons is included in 1965.

[2]World total includes consumption in the named countries plus all remaining consuming countries. Since January 1961 including stereo-regular rubbers.

TABLE 20

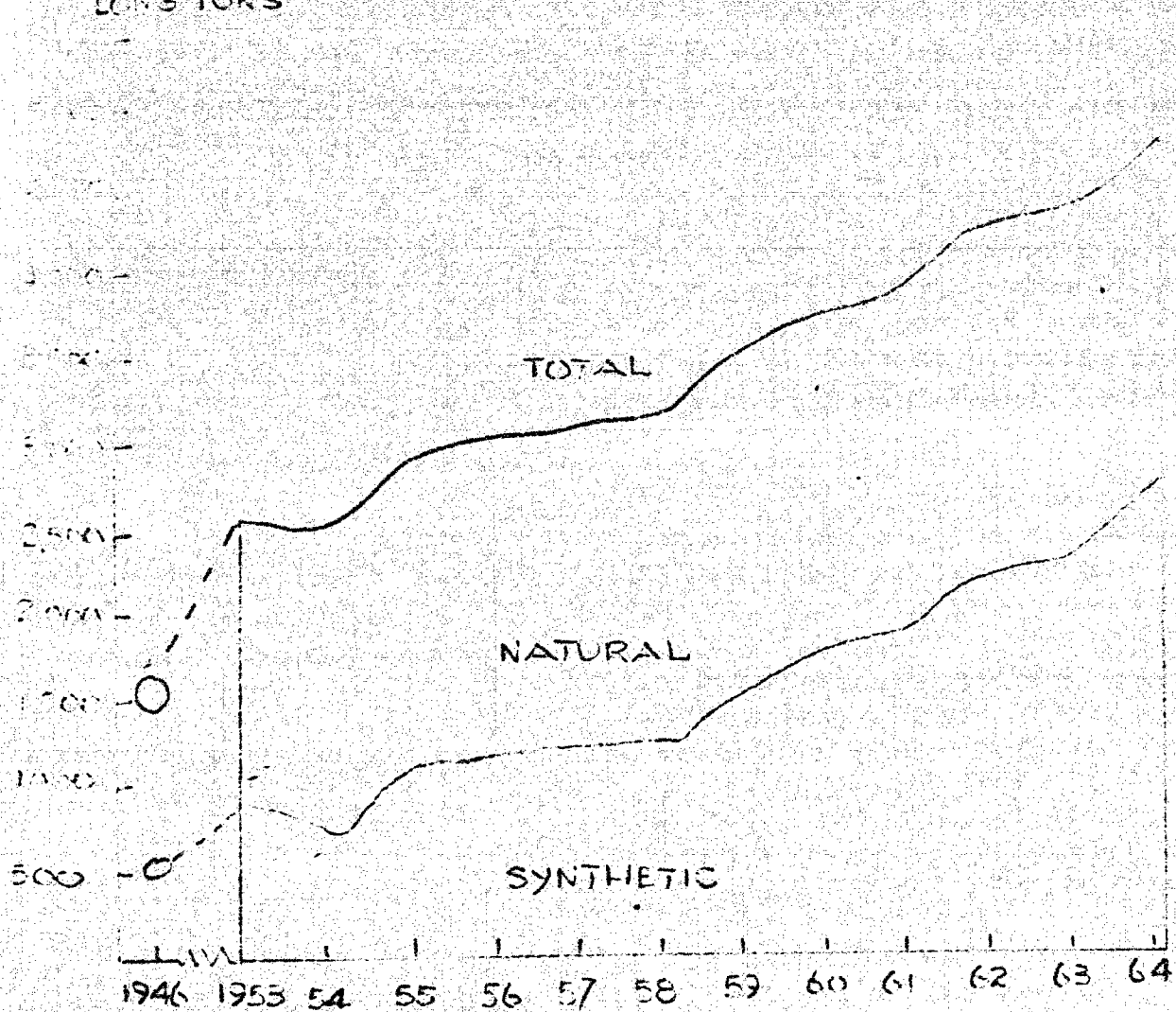
PRODUCTION AND CONSUMPTION OF NATURAL AND SYNTHETIC RUBBER (LONG TONS)

Year	Synthetic		Natural	
	Production	Consumption	Production	Consumption
1954	716,388	740,000	1,810,000	1,780,000
1955	1,085,266	1,062,500	1,917,500	1,890,000
1956	1,210,981	1,135,000	1,892,500	1,877,500
1957	1,262,666	1,260,000	1,905,000	1,900,000
1958	1,243,363	1,247,500	1,942,500	2,012,500
1959	1,632,500	1,582,500	2,024,500	2,117,500
1960	1,880,000	1,797,500	1,990,000	2,065,000
1961	1,975,000	1,920,000	2,095,000	2,137,500
1962	2,240,000	2,170,000	2,130,000	2,192,500
1963	2,437,500	2,352,500	2,067,500	2,230,000
1964	2,802,500	2,720,000	2,232,500	2,220,000

Source: Monthly Statistical Bulletin, February 1966

CHART 3

POST WAR WORLD PRODUCTION OF NATURAL & SYNTHETIC



* EXCLUDING PRODUCTION IN THE SOVIET BLOCK

SOURCE: RUBBER STATISTICAL BULLETIN 1965

CHAPTER V

PRICE INSTABILITY AND THE REGULATION SCHEMES

Price mechanism in the rubber industry works rather imperfectly in bringing about appropriate changes in supply and demand. With falling price, production fails to contract materially. Supply to a falling market is relatively unresponsive to price and so accelerated the downward trend in price. Response to a rising price is also sluggish and therefore fails to arrest sharp rising price in time. Expansion is confined in scope to the limits set up by the existing capacity, the quantity and quality of trees planted 6 years before. And if new rubber trees were planted during the boom period by the time they reach maturity the price of rubber would have fallen by then. This time-lag between planting and maturing of trees renders price a rather inadequate guide for investment, which itself is a very speculate affair[1] especially so for the estates because planting new areas means new lands have to be cleared, fixed capital and overhead tax to be incurred whether production reached a certain level or not.

But rubber consumption is responsive to changes in price of rubber. Variations in the volume of consumption are determined chiefly by changing level of industrial activity and by the growth trends in the different fields of rubber use. Because of the inability to adjust supply to quick change in demand we have instability. Because of price inelasticity of supply any shift in demand will result in great fluctuation in price. Since such a large proportion of the Malayan people is dependent on rubber, either directly or indirectly, for their livelihood, any fluctuation in the price of rubber will affect their income. Rubber tapping is an unskilled job and once workers are thrown out of job from rubber plantation it is very unlikely that they will get jobs in other industries.

The Malayan rubber price is of great significance to Malaya as the rubber industry is the lifeblood of the economy. Rubber is mainly produced for export so fluctuation in price will mean fluctuation in export earnings. The average percentage of Gross Export Proceeds to Real Gross Domestic Proceeds is 47,7%. The Table below illustrates the instability of Malayan rubber prices and the close relation between rubber prices and the RGDA. The fluctuation in export proceeds from rubber is the result of fluctuation in rubber price. The quantity of rubber changed very little.

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[1] Knorr: World Rubber and Its Regulation - California 1945

TABLE 22

RGDP FLUCTUATIONS IN MALAYA

Year	RGDP M $ Mil.	Average Price of Rubber	Annual Percentage Change of RGDP
1947	2,932	37.31	
1948	3,005	42.15	+ 0.8
1949	3,027	30.19	+ 0.7
1950	4,867	100.18	+60.8
1951	5,000	169.55	+ 2.7
1952	4,153	96.07	-16.9
1953	3,883	67.44	- 6.5
1954	3,949	67.30	+ 1.7
1955	5,032	114.16	+27.4
1956	5,049	96.76	+ 0.3
1957	4,852	88.75	- 3.9
1958	4,700	80.25	- 3.1
1959	5,411	101.56	+15.1
1960	5,921	103.03	+ 9.4

Source: Dr. Lim Chong Yah's post-war economic development of Malaya and various issues of Rubber Statistical Bulletin.

Rubber is the most unstable of all primary commodities. This effect of unstability in price of rubber has many repurcussions on the economy. An economy can only operate effectively when it is relatively free from elements of uncertainty. Development programmes have to be continuously and adequately financed to assure a moderate degree of efficiency. A country can only carry out a successful economic plan in a framework of stability. If national income is subjected to fluctuations planning becomes almost impossible - Reference article on Price Fluctuation.

Before the war it was thought that if efficient controls could be established over rubber production then prices could be maintained at a level which is profitable to the producers. This approach to the problem is now outdated by the arrival of synthetic rubber in the market, as a commercial substitute of natural rubber. Any effort to control price by restriction of output would only hasten the switch from natural to synthetic rubber.

The International Rubber Stabilization Schemes

Voluntary Restriction Scheme 1920-21

Even as early as 1920's restriction schemes were set to restrict supply, thereby raising the price of rubber. In 1920 rubber prices declined heavily. This was due to the increase supply taking the market. The trees that had been planted during the 1910's are now matured and tappable. Besides the introduction of the cord tyre reduced the amount of natural rubber required. Also with this threat and the piling up of rubber in Asia and South East Asia the Stevenson Committee recommended the restriction of supply. Estates cut down their production voluntarily but it did not work out as planned as it was only organised by the rubber growers' association. This was the first scheme in operation.

The Stevenson Scheme

The Stevenson Scheme was the first intergovernmental attempt to interfere with the normal trading pattern in rubber. It was adopted by British Malaya and Ceylon from 1922 to 1928. Prior to 1922 supplies of rubber poured into the market and caused depression in rubber prices to such low levels that producers demanded government intervention. By regulating the supply to the decreasing demand the restriction was expected to raise the price of rubber and hence protected the producers from losses. Under this Scheme each producer was assessed for a standard production with 1920 as the base year. For lack of data smallholders were assessed arbitrary according to the age of the trees. Duty was imposed on amount in excess of the quota[1]. Alienation of land for rubber replanting was officially banned and replanting by estates and smallholders alike were officially discouraged.

The pivotal price was established at 1sh. 3d. for a lb. of natural rubber in London. At this price 60% of the standard production was allowed for export at the minimum duty. A prohibitive scale of export duties was imposed on exporters who attempted to sell more than the percentage allocated to them. The mechanism was automatic.

The prices both in 1923 and 1924 was much higher than that of 1922. The restricted output coupled with the increased demand pushed prices up to as high as $1.20 per lb in 1925. At this time the increase in demand came from the spectacular increase in automobile production. World stocks dwindled rapidly and the market turned panicky. The inflexibility of the scheme was the main cause of the chaotic pattern of the rubber market. When the price got out of hand the mechanical rigidity of the scheme prevented extraordinary cure for an abnormal situation. The scheme did not command any degree

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[1] Allen and Dormithorne - Western enterprise in Indonesia and Malaya.

of monopoly power sufficient to render itself workable. The Americans who were at that time consuming 3/4 of natural rubber criticised the British for exploiting them. When the business recession set in, in 1927, the price dropped considerably and by 1929 it was only 20c a lb. because total production could not be curtailed. The non-controlled areas greatly increased their production by 1928.

For a scheme to be successful co-operation of all major producing countries is essential. But the Netherland East Indies, one of the major producers did not join the scheme. At that time Netherland East Indies controlled 23% of the total world output of natural rubber. It meant that the Netherland East Indies did not pay the price of joining while it reaped the advantages that came about because of the scheme. Within Malaya itself smallholders increased production. In 1921 the year before the restriction scheme Malaya and Ceylon both produced 70% of the world total production and the Netherland East Indies produced only 23%; Malaya alone produced 50.1% of the total production and by 1927 her share dropped down to 38%. In 1940 Malaya and Ceylon constituted only 45% of total production while Netherland East Indies share rose to 39%. This shift was due to the ill-conceived Stevenson Scheme and the Dutch policy of encouraging native production.

Equally significant impact was the slowing down of the rubber industry in Malaya. The non-British interest gained windfall earnings from the withdrawal of the current supplies of rubber and also gained and consolidated a long term position of leadership in rubber production e.g. in the Netherland East Indies. The smallholders' acreage doubled and trebled during the period of the scheme but expansion of rubber planting in Malaya and other protected areas was at the rate of only 1/4 of that.

The effect in the long run was also felt in many other ways.

(1) It encouraged the rubber reclaiming industry of America to expand and it stimulated the synthetic rubber research.

(2) The impetus caused by the increased price of rubber led to the increase in planting and production in Indonesia and this led to adverse effects in the 1930's; and Malayan development scheme was slowed down because of the operation of the Stevenson Scheme.

The scheme was removed in 1928 and from that time onwards the price of rubber dropped with increasing frequency. Although the cost of production had been cut down, the profits obtained were very low. Production both from estates and smallholdings responded differently to the scheme. Production from estate remained stable throughout the period 1929-32. But production from smallholdings increased and with this increase in supply, came the great depression of the American rubber price. It fell to 5d per lb. By this time it was cheaper to buy rubber than to grow it.

The International Rubber Regulation Scheme

The year after scheme (Stevenson Scheme) ended, rubber prices rose. But this was not to last for long. The Great Economic Slump of 1929 soon set in. Rubber prices were hit hardest. The price elasticity of demand for rubber is more than suggested by the fact that physical consumption remained the same at the same time that price plummeted. As the slide gained momentum a voluntary scheme was tried.

In June 1934 the second regulation scheme came into force. The main participating countries were Malaya, Ceylon, India, Burma, North Borneo, Sarawak, The Netherland East Indies, Thailand and French Indo-China. All these countries produced about 98.7% of the world's rubber production at the time of the signing. In extent and coverage it gave far more promise than anything before it. It intended to eliminate normal competition and saved high cost plantation producer at the expense of the low cost smallholders. It can be said that it saved the plantation as a unit in South East Asia in its cherished aim of providing stabilisation to the industry. The results were unimpressive. The main object of the agreement was to reduce stock and to manipulate it in such a way that demand will adjust itself to supply so that equitable price can be achieved. The I.R.R.A. was reasonably flexible in adjusting the permissible exportable quotas to changes in demand condition. The exportable percentage could be altered at any time and to any extent as necessitated by the demand condition. The production capacity of each country was assessed and new planting and replanting was prohibited. Basic export quota was set for each country. In the early 1937 period of increasing demand the short term price rose to above US 25¢ per lb. This agreement operated during the years 1934-1938 and was further renewed for another four years. It was successful in so far as reducing world stock to the normal level. By restricting output the price of rubber rose to a high level. But by the later years price stabilisation was not achieved. As Knowle says, "the record of price movement suggest it was little better than the free market". Also the scheme failed to confine prices fluctuation to a moderate range. There was no buffer stock to iron out the short run fluctuations even the official report itself admitted that the hope of price stabilisation was not realised.

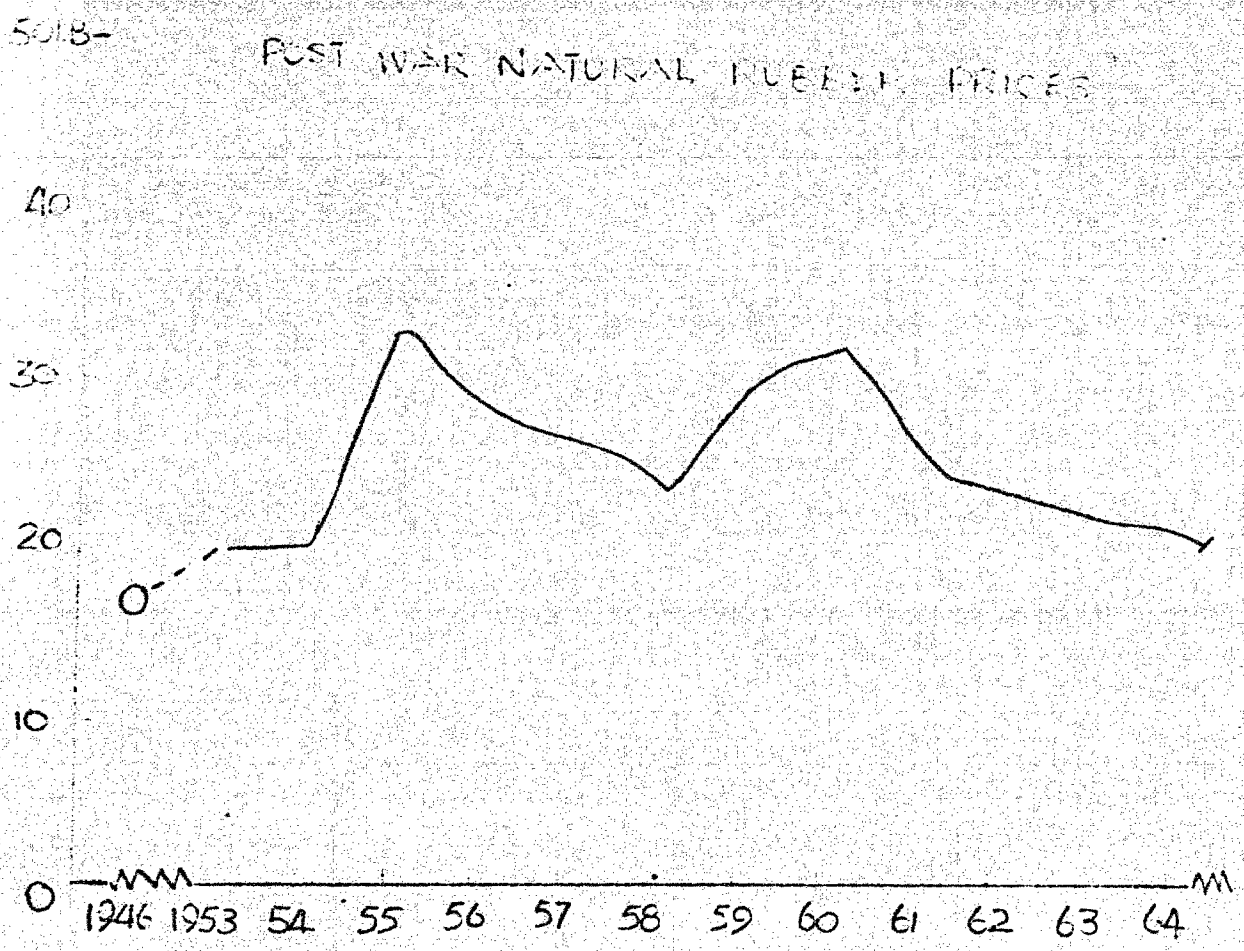
It can be said that the I.R.R.A. was a long term distabilizing force. Further it curtailed research and this seriously lessen the industry's competitive position especially when the synthetic rubber posed a threat to natural rubber.

The failure of the Stevenson Scheme can be said to be the erosion of monopoly power by the Netherland East Indies. But in the case of I.R.R.A. it was the difficulties in administrating controls over primary supplies with widely varying supply prices of smallholders and estates and the administrative protection against the efficient.

An important hidden fact of the control scheme was to protect

...rogen capital in plantation companies in ...laya, Borneo, and the Netherland East Indies from competition arising from the production of rubber by the natives.

CHART -1



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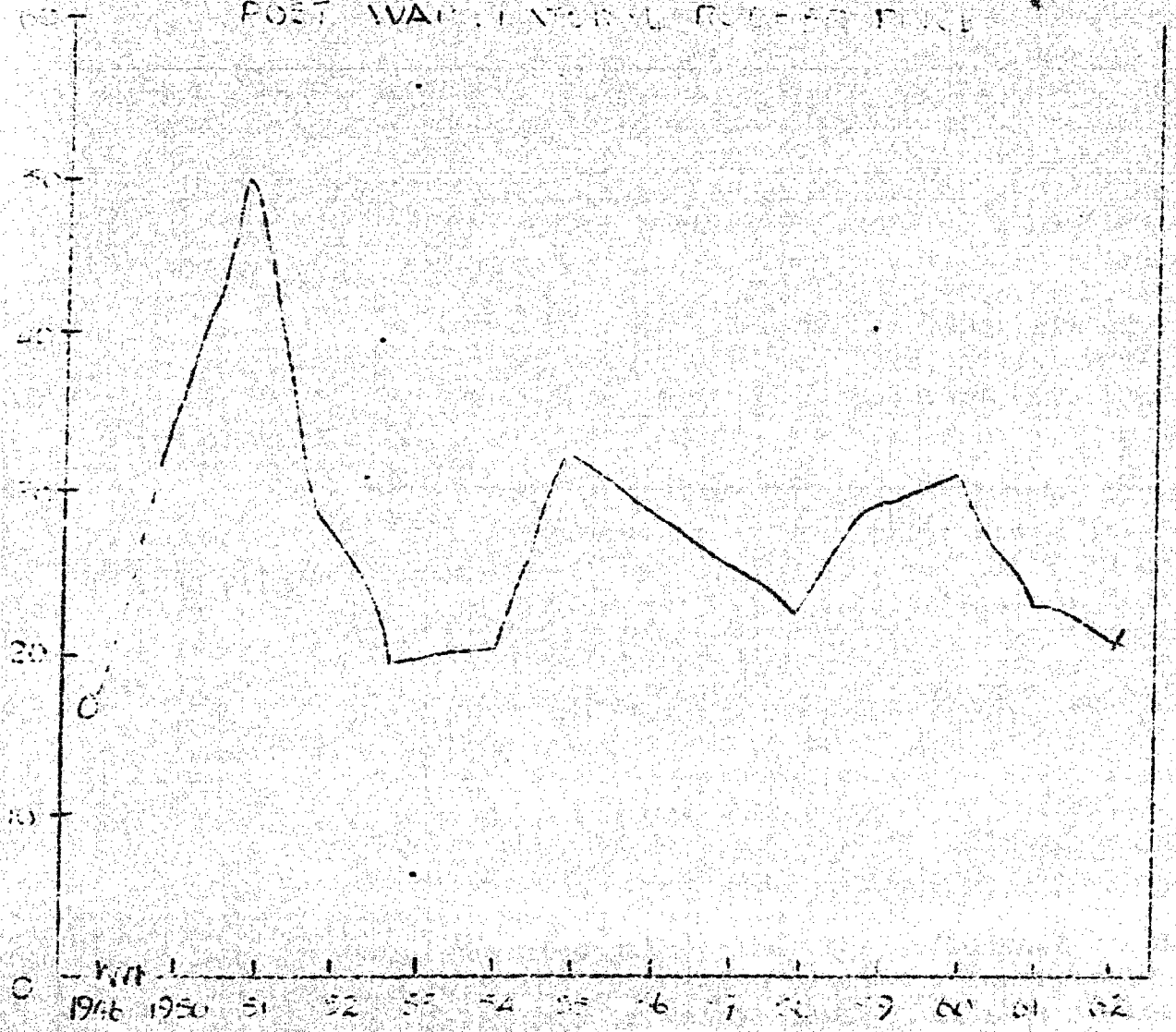
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