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WORKSHOP

ON

INDUSTRIAL COMPETITIVENESS FOR EXPORT
EXPANSION IN AN IMPORT-SUBSTITUTING
LARGE ECONOMY

PHASE I - HISTORICAL PERSPECTIVE ON
SELECTED INDUSTRIES

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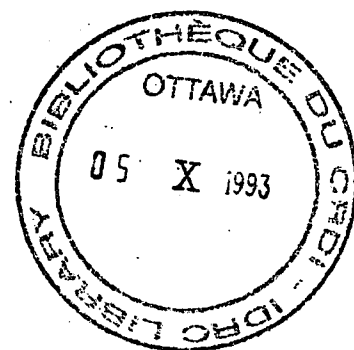
BICYCLES

K. PAUL ANTONY

INDUSTRIAL COMPETITIVENESS FOR EXPORT
EXPANSION : INDIAN BICYCLE INDUSTRY

PART I: The historical development of the Indian Bicycle Industry

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INTRODUCTION

1.1 The term 'competitiveness' has not yet found formal definition or analytical leverage in economic theory.¹ It is more often used to capture the intuitive concept, and is a popular term in advocacy literature in industrial economics and export promotion. The concept is robust even when simply translated as: 'characterised by success in competition'. The virtue that belongs to competition apart from the neo-classical allocative efficiency, is the efficiency in resource usage that it engenders and the consequent productivity gain and price restraint. This translates to a shift of the economy's production possibility frontier outward. In an open economy, this ushers in the possibility of increased exports, and increased import withstanding strength. 'Competitiveness' is a value neutral welfare goal, and as a policy objectives needs no defence.

1.2 In the sense of being successful in competition, competitiveness can be defined only in the specific context of the market of interest. In other words, competitiveness depends on the competition. It requires standing in favourable relation to the standards of cost and product specification which characterise the competition. In the market for a

* I am much indebted to Solomon Raj for the hard work he put in cheerfully.

1/ There is a family of literature around the concept, and some recent attempts to come to formal terms are notable. See for instance Love J. (1984).

product within an economy, competitiveness is the attribute of individual, successful firms. In the international market for a product, competitiveness could be attributed to the industry of a country if a significant proportion of its firms were characterised by the quality of competitiveness. Therefore, countries concerned with export expansion hold competitiveness as a primary domestic industrial policy goal. It is important to note that international competitiveness is a dynamic concept. The standards of cost and product specification to be aimed at are continuously on the move on account of advances in the productivity of the mature enterprises. Competitiveness is not only to be achieved but also sustained.

1.3 The increasing emphasis in policy, practitioner and research circles in India on the competitiveness question arises from two concerns. First, there is a growing realisation of the costs of remaining a high-cost economy. Second, the recent past and the immediate future are marked by an imperative need to expand exports. On balance, export expansion carries the greater urgency, because of the balance of payments² position. This is well documented and needs no further exposition.

1.4 Most Reviews of India's export performance come up with un-³exceptionable prescriptions. The first is the malady itself : that Indian exports need to be expanded. The second relates to the proper sources for such expansion. Further growth prospects for traditional exports are limited, and it follows that industry is the major source to be tapped. Further, Industry is not demand constrained in India.

2/ See for instance, Economic Survey 1985-86, p. 96, Seventh Five Year Plan 1985-1990 Vol. I, p-63.

3/ For instance Adiseshiah, M.S., (1986)

and promoting industrial exports is unexceptionable as strategy. Other advantages of industry based exports are, first, that to the extent that such exports have been not significant so far they are characterised by small economy attributes and therefore are not constrained by international demand, and second, that diversification reduces the risk of instability in exports.

1.5 Economy wide attributes indicate India's advantage in this sector. The following points are noteworthy. India's experience with industrialisation spans four decades. Over this period the industrial sector has grown remarkably in extent and diversity of products and technologies. The economy is also characterised by large endowments of physical and human resources. Apriori, Indian industrial sector appears to be strong on the attributes that make for export expansion.

1.6 However, actual export performance does not yield evidence of the industrial sectors' competitiveness. Consider the averages over the five years ending 1983; India's shares, in total world exports was 0.45%, in world manufactures exports was 0.38%, and in world engineering exports was 1.00%. Year to year, over the period these shares have been indeterminate in the case of the first two and have sharply declined (from 0.13% to 0.07%) in the case of engineering exports.

1.7 If, despite the attributes of comparative advantage, Indian industry has performed so poorly against the competition, it would be logical to suspect policy failure. There have indeed been a number of studies

examining the impact of government policies on Indian industrial performance.⁴ For the most part these studies have confined themselves to macro issues which have a bearing on the relative profitability of exports vis-a-vis production for the domestic market. ICRIER studies under the programme of Foreign Exchange Earnings and Employment Generation, have come to the strong conclusion that institutional and policy measures hitherto pursued, which worked on the margin to increase export profitability are not sufficient for sustained exports growth. Other studies have held that⁵ factors of non-competitiveness are more fundamental.

1.7 By implication, the policy failure also needs to be examined at fundamental levels. Policies relating to industrial control, fiscal, trade, technology and other policies, acting in concert have over time, fostered certain patterns in the variables and parameters of industrial performance, both at the firm and at the industry level. These relate to both the capacity to be competitive and the incentive to be competitive. Individually and in linkage, these have, in sum, determined the competitiveness of Indian industries. The pattern of causal relations between elements of policy and the behaviour of these determinants of competitiveness is the subject of analysis. The specific questions are: why are the majority of Indian firms in the manufacturing sector unable to achieve and sustain international competitiveness? It is important to note that a few firms have proved themselves to be competitive. What remedial measures need to be taken to infuse competitiveness in Indian Industry?

^{4/} Bhagwati, J. and Desai, P., 1979; Panchamukhi, V.R., 1978; ICRIER, 1985.

^{5/} Ahluwalia, I., 1985; Desai, A., 1982.

1.8 To conclusively answer these rather basic questions evidence needs to be derived from firm level and industrywide performance. Inter firm comparisons would yield much insight. The indicated method is an industry study. Since final purpose is to generalise for the industrial sector, the choice of the industry is crucial. It must be fairly ~~reflective~~ of the industrial sector, and must be so chosen as to illumine as many of the research issues of environment, structure, conduct and performance as possible. Thus the industry must be a mature one in the sense of having a reasonable history in the country. For the purpose of generalisation, it must be a significant industry in the domestic economy, but must not be a priority or core industry subject to special features. It must have significant exports, but must be characterised by the absence of international competitiveness.

1.9 The industry we have chosen, with a view to the above considerations is the bicycle industry. It has a history in India spanning close to half-a-century, and qualifies as a mature industry. The export history of the industry began as early as 1957. Indian bicycle industry is one of the largest in the world, ranking behind only those of USA, Japan and China in output. However, in world bicycle exports India ranks fifteenth. In 1983 Indian bicycles production amounted 8% of world production while Indian bicycle exports amounted to only 1% of world exports. Clearly, international competitiveness is not a feature of the Indian industry. However, among the Indian industries, the bicycle industry is one of the most competitive. In 1981-82, the latest year for which data is

available, the output of the Indian bicycle industry amounted to 0.5% of Indian industrial output, whereas the exports of the industry constituted 1.0% of industrial exports. Such an industry which is a front runner among the Indian industries and a poor performer in the International market should particularly facilitate the study of determinants of competitiveness.

2. THE PRODUCT

2.1 The development of the bicycle over the 19th Century followed closely the advances in mechanical and engineering technology. While primitive versions of the bicycle date from the second half of the eighteenth century, the recognisable design evolved by the middle of the 19th century and the product found a measure popular acceptance at the Paris exposition in 1865. By the turn of the century, the bicycle had come to have the basic design that is now current. Innovations over this century have had much less to do with basic design as with materials and production techniques.

2.2 The bicycle is described, if a description is necessary, as a⁶ 'two wheeled light steerable vehicle propelled by human power'. The product category has over time come to accommodate widely different usages. The primary among these are: use as a transportation mode, and use as a leisure instrument. The features of design which orient the bicycle towards either of these far different purposes and which thus specify the models are chiefly, the weight and the finish. While there is no precise system defining the models, the trade distinguishes between the Roadster which serves the transportation function and the Sports light weight bicycle, the Racing bicycle and Children's bicycles which serve the leisure function.

2.3 The feature of the bicycle which determines much of its production economics is that it is an assembled product. A complete bicycle is assembled out of two hundred and **fifty** to three hundred components, and the process of manufacture involves over a thousand operations. So, it is the components industry which in major part, constitutes the

bicycle industry.⁷ Components are put together in sub-assemblies, which are finally assembled into the complete bicycle.

2.4 Steel is the major raw material for the manufacture of most components.⁷ The types of steel needed for different components vary over a wide range as also the variety of other raw materials required. While general purpose machines are used in common for many components, dedicated machinery and tools are also needed for different components.⁸ Thus production of larger range of components in an integrated fashion increases considerably the unit's capital intensity, and robs it of the economies of specialisation, affecting finally the price of the product. For these reasons bicycle production, internationally, is not marked by vertical integration.⁹

2.5 The natural consequence of the broad tendency toward specialised production of components is that the industry is characterised by considerable intra-industry trade both within and across national borders. As manufacturing facilities develop(ed) in more and more countries, the

7/ The new materials which are finding popular use are alloys, particularly Aluminium alloy and fibre glass.

8/ Please see Appendix 1, for a more detailed presentation.

9/ Thus a bicycle manufacturer is not defined to be the one who manufactures all components, but the one who manufactures own frames. Units that do not produce frames, even if engaged in assembly of bicycles apart from manufacture of other components, are not considered to be bicycle manufacturers.

It may be noted that the frame, the most important part of the bicycle, is also the least amenable to the techniques of mass production. The tube joining processes are labour intensive and the assembly content of the production process makes bicycle a labour intensive product. This, however, is not true of all other individual components.

inevitable result is, as it has been, the growing relative importance of trade in components against trade in bicycles.

2.6 An introduction to the important sub-assemblies, the principal raw materials and the major processes of production of the bicycle is important for an appreciation of the nature of the final product. A brief catalogue is as follows. The major sub-assemblies/components/accessories are: frame, fork, control unit (handle), mudguard, chain wheel and crank, brake, hub, pedal, gear, freewheel, wheel (rim, spokes, nipples), chain, chaincover, tyre, tube, bell, carrier, stand, lighting system, saddle and reflector. The important raw materials used are: steel (tubes, strips, bars, wires, sheets, forings and castings), brass, copper, nickel, chromium, rubber, plastics, leather, and chemicals for polishing, braxing, electroplating and heat treatment. The major processes of manufacture are cold and hot forming (drawing, rolling, forging, pressing), metal cutting (shearing, trimming, drilling, reaming, slitting, grinding, turning), surface cleaning and finishing (buffing, debrassing, electroplating, painting, stove enamelling), metal joining (brazing, welding), heat treatment, fitting and assembling. Appendix 1 presents a more detailed analysis of the technical features of the product and production processes.

2.7 The features discussed so far has much to do with the pattern of demand for bicycles. Certain characteristic features arise from the fact that the product serves different purposes at different income levels. In general, at very low levels of income, the bicycle is an unaffordable product and thus is a luxury. At lower-middle income

levels the bicycle serves the transportation function for both people and goods and is a normal good.¹⁰ At higher levels of income it is a different type of bicycle that is demanded, (as an instrument of leisure) and again, is a normal good. In broad terms the above fact translates into three features of demand in developing countries. The first is that the major share of demand is for sturdy roadster models which serve the purposes of transportation.¹¹ Second, the bicycle ownership rates in these countries are low and growth overtime implies a continuing growth in new demand, and thus of the domestic market.¹² In other words, saturation of the market is not an immediate prospect. Third, the price elasticity of demand is higher in these countries since the major source of demand is the price conscious lower income population.

2.8 In developed market economies, the leisure function of the bicycle is dominant, by virtue of the higher average standards of living. In these economies, bicycle usage which slumped after the second World War on account of the spread of motorisation, picked up again in the seventies alongwith the growing public concern for the environment and physical

^{10/} At this income level, the bicycle serves as an investment good as well. For instance, bicycles are commonly used for vending goods by grocers, bakers, milkmen, newspaper vendors etc.

^{11/} This pattern of demand is reinforced by the quality of road surface. The uneven surface calls for a heavier and stronger model.

^{12/} The bicycle ownership in developed countries was generally more than 350 bicycles per thousand inhabitants in 1982. Among developing countries, Latin America had a rate of 100, Africa, a rate of 16, and Asia, a rate of 150.

fitness. The new demand which arose then was characterised by the leisure purpose, and was for light-weight sports models. The markets too were saturated more quickly and the nature of demand is replacement rather than new demand.

2.9 Even a cursory examination of world demand prospects yields some insights. Effective demand for bicycles and components at present is larger in developed countries than in developing countries. However, potential demand is greater in developing countries, for the following reasons. The bicycle is the cheapest transport vehicle; bicycle ownership rates are much lower in developing countries; about 75% of the world population live in these countries. In course of time, as this potential is increasingly realised, the pattern of demand will shift decisively in favour of developing countries.

2.10 The discussion of the product features in this Chapter had led to the following hypotheses. First, trade in components is increasingly more significant than trade in complete bicycles. Second, the market is expected to shift gradually but firmly to developing countries from developed countries. Third, the demand in developing countries is price elastic, and for robust models. Therefore, Indian industry would do well to concentrate on low priced (not of course, poor quality) components for sturdy models in developing country markets.

3. INDIAN BICYCLE INDUSTRY - ORIGINS

3.1 Bicycle imports into India began in a slender fashion in the late nineteenth century. It soon picked up into a steady flow and in 1937-38, the year which saw the highest pre-war imports, over 1.7 lakh bicycles were imported into the country. Along side, parts and accessories were also being imported, and the value of these imports invariably exceeded the value of bicycles imports.¹³ The main sources of imports were UK and Japan. Continental Europe, mainly Germany, contributed a smaller share. The imports served to develop a steady and growing domestic demand and also to establish the supply channels, thus paving the way for the birth of the domestic bicycle industry.

3.2 The price of the bicycle spurted during the first world war years. Fledgling efforts at setting up manufacturing units soon after the end of the war were abortive mainly on account of the depression which followed the war. In 1938, the first manufacturing plant was founded in Calcutta under the managing agency of Gupta brothers private limited. 'India Cycle Manufacturing Company Ltd.' was intended to manufacture complete bicycles, and had placed orders for cycle manufacturing machinery in Germany, but the second world war delayed their shipping. The firm went ahead with the manufacture of some bicycle components and accessories which were distributed by Sen and Pandit Private Ltd.¹⁴ Almost simultaneously, (in 1939) Birla Brothers registered Hind Cycles Ltd. in Bombay while a Patna entrepreneur

13/ Indian Tariff Board (1946)

14/ Bells, Camps, Carriers and pedals were the main items of manufacture.

K.N. Sahaya, founded Hindustan Bicycle Manufacturing and Industrial Corporation (Later Hindustan Vehicles Ltd.). These units which began production in the early forties, from the beginning manufactured all bicycle components except sophisticated friction parts: (chain, freewheel, hub, ball). It must be noted that these pioneer units were founded and functioned quite independently of official patronage or policy.

3.3 The second world war intervened with mixed blessings. Shipping was delayed because of unsafe lanes and the priority given to military merchandise. This meant that the flow of machinery, intermediate goods and raw materials necessary for production, was disrupted. In the climate of the time, the government also placed restrictions on the manufacture of machine tools under defence regulations.¹⁵ But at the same time, imports of complete bicycles was disrupted. In 1942-43, when the shipping situation turned critical, Indian bicycle industry gained a substantial measure of official recognition by undertaking to supply the requirements of the government. Fifty thousand bicycles were supplied by the Indian Industry for government use, apart from several other articles for defence.¹⁶ In return, the government assisted the industry with import of materials and components. Beyond doubt, the war years provided an opportunity which the Indian industry seized firmly. At the end of the war, conditions were ripe for the rebirth of the industry. Over the war years not only

^{15/} This led to some clandestine manufacture. Indian nationalist patriotic fervour combined well with entrepreneurship in this activity.

^{16/} Articles such as "Strike gear clips (used in bombs), smoke box for containers and nine contact frames, bottom caps, fuse percussions, G.I. buttons, hospital and Red Cross equipment etc." Tariff Board (1946).

had imports declined, but the domestic production had been channeled to government use. There was considerable pentup demand in the economy.

3.4 It is important to note that the pioneer units were fairly sophisticated, large and integrated. The entrepreneurs were experienced business men and importers, and the units came up in urban areas proximate to ports. These manufacturers soon recognised the need for an organ to make an effective impression on the government, and to counter the well articulated interests of the importers and the cycle dealers. The Cycle Manufacturers Association of India was constituted in 1943 with the three original units as founder members, presided over by LN Birla. The association was affiliated to Indian Chamber of Commerce, Calcutta, FICCI and the All India organisation of industrial employers. The association professed the interests of the organised sector. When at the end of the war, the government liberalised imports to meet the pent up demand, CMAI was prompt, and successful, in appealing to the government for protection.

3.5 The end of the war marked a remarkable change of character and increase in scope of the industry. On the recommendation of the Tariff Board, the domestic industry was protected from foreign competition beginning from 1946. The two large units which were established in 1949 reflected these changed circumstances. Both were integrated units with foreign collaborations. In 1949, Sen Raleigh industries of India was set up in Asansol, West Bengal by Sudhir Sen of Sen and Pandit Pvt. Ltd. in technical and financial collaboration with Raleigh Industries,

Nottingham for the manufacture of all Raleigh products. The company also entered into technical collaboration with Union Sils, Vande Loo and Wittkopandco, both of West Germany, for the manufacture of various component parts and saddles respectively. The same year Murugappa Chettiar of the Murugappa group founded TI Cycles of India Ltd. at Ambattur, near Madras in similar collaboration with Tube Investments Ltd. Birmingham, for the manufacture of bicycles. In both these cases, the foreign collaborator was to make available to the Indian company technical knowledge for manufacture, subject to the following conditions: Import of new plant; progressive phased manufacturing, and shift to Indian sources of supply; and training of Indian personnel by the foreign company. The companies began production in the early fifties. These units soon came to dominate the organised sector of the Industry, and held sway till what may be called the Ludhiana phenomenon transformed the character of the industry.

3.6 The basis for this transformation, though concurrent with the more evident history, was quiet in developing. Small workshops had all along been finding fertile ground, particularly in Punjab, for the manufacture of bicycle components. Notable among these, Chakker and Co. was set up as early as in 1938, in partnership by Karam Singh and Chanan Singh, for the manufacture of BB axles and Hub cones. We have discussed briefly in section 2.4 the economies of specialisation which, *apriori*, characterise components production. This was perhaps the basic reason for the survival and spread of small production. In addition, the post partition refugees influx brought into Punjab a wealth of metal

working skills, an employers' labour market and much entrepreneurial energy. These, and the comprehensive development of the local machine tool industry, unabashedly native in style, apparantly accorded well with the factor requirements for components production. Furthermore the skill intensity of entrepreneurship in this category of products must have helped the industry to feed on itself and proliferate. The cost effectiveness of sub contracting, in the high density small unit environment, brought to Punjab, and particularly to Ludhiana, considerable external economies in components production.¹⁷

3.7 This slow but remarkable development cast the mould for the future development of the industry. The cost effectiveness of comprehensively imitated bicycle manufacturing machinery produced right in Ludhiana soon led to wide spread acceptance of indegenous plant and machinery. Three large units came up in quick succession, all in Punjab. In 1950, Atlas Cycles Ltd. was set up in Sonapat by J.D. Kapur, a major importer. In 1951, Munjal brothers expanded their cycle parts unit in Ludhiana into Hero Cycles Ltd. and in 1952, HR Pahwah established Avon Cycles Pvt. Ltd. again in Ludhiana. In the decades that followed, these original six firms (Hind, TI, Sen Raleigh, Atlas, Hero, Avon) continued to dominate the industry, but among themselves, the Punjab units and in particular the Ludhiana units, increased their shares consistently and decisively at the expense of the rest.

^{17/} There is considerable narrative evidence to the effect that the formidable 'Kanban' system works well in Ludhiana. In Japan, just as in Ludhiana, the 'just-intime' inventory system works well in large part because suppliers are clustered around their customers. Orders can be placed, shipped and received in a matter of hours.

4. HISTORY OF POLICY - INDIAN BICYCLE INDUSTRY

4.1 Well in accordance with our requirement of a representative, the bicycle industry has not been marked by exceptional treatment within the gamut of related policies that have influenced, and more often reacted to, the performance of the Indian industry over time. However, in its individual history, certain elements of policy were more binding and effective than others, and thus an interpretative rendering of policy history is required, against which to judge the industry's performance. The two natural categories into which industry related policies fall are the regulatory and the promotional. With particular reference to the bicycle industry the important instruments of regulatory policy exercised have been licensing for capacity control, reservation of production for the small scale sector, price control, and for a brief while export obligation. Promotional policies comprehensively defined the initial conditions of the industry's development: protection from foreign competition. The set of general policies directed towards the promotion of the small scale sector have had their general but important effect on the bicycle industry. Beyond this, within a strict definition (leaving aside the associate policies of infrastructure and basic industries development) they were largely confined to the export promotion genre. A feature of the policy formulation process in the context of the bicycle industry is the industry's role which often borders on participative. This has been so, by virtue of the strong lobbies, of the large and the small manufactures which have combined compellingly on common cause.

4.2 The first policy phase, that of protection, began in 1946 and ended in 1963. The policies of this period sowed the seeds of import substitution and thus of the growth of capacity and output of the industry. The government initiated protection on the basis of the recommendations of the Tariff Board, which took up the industry for examination on application by CMAI.¹⁸ The Tariff Board went about the enquiry by making estimates of domestic demand and domestic supply (on the basis of the reported production programmes of manufacturers), and then setting the tariff to meet the gap through imports.¹⁹ The Board recognised the widespread preference for foreign bicycles and included a 'prejudice allowance' in the rate. The first enquiry in 1946 resulted, defactor, in no more than the recognition of the concept of protection. The recommendations of the Board, accepted and implemented by the Government was that prevailing revenue duties (36% ad valorem standard, and 24% advalorem preferential) be converted into protective duties at the same rates.²⁰ This was effective for the three year period upto 1949. In the meanwhile import control through licencing was being operated on independent considerations. There was a complete ban on bicycle imports and restrictions on components imports in the last quarter of 1947.

18/ The general terms of reference of the Tariff Board was to enquire whether industry was; (i) established and conducted on sound business lines, (ii) having regard to the natural or economic advantages enjoyed by the industry and its actual or probable costs, it was likely to be able to carry on successfully without protection or state assistance within a reasonable period of time, and; (iii) whether it was an industry to which it is desirable in the national interest to grant protection such that the probable cost of such protection to the community is not excessive.

19/ The three lobbies at work at the Board/Commission hearings were those of importers, dealers and of course, manufacturers.

20/ Preferential duties applied to imports from UK, while standard duties applied to all other imports.

4.3 The second tariff enquiry in 1949, extended protection upto 1952 at substantially higher rates (70% advalorem preferential and 80% advalorem standard). The first enquiry had not specified protective rates for components since, the required cost data was unavailable. But this was made available to the Commission by Hind Cycles during the 1949 enquiry and the commission fixed duties on parts at the same rates as for bicycles. 21

The government extended the period of protection in consultation with the Tariff Commission, a year at a time, till 1954. In the meanwhile, with the enactment of the IDR Act, the government brought the industry under capacity regulation through licensing. In consonance with the further provisions of the Act the Development Council for the industry was constituted in 1951 to guide the policy processes for the industry's growth.

4.4 The enquiry in 1954, recommended a reduction of the rates of protection for complete bicycles: (to 47% advalorem or Rs. 60/- per bicycle whichever was higher, the standard rate being 10% higher than the preferential rate). The rates on components continued at the levels fixed in 1952. These rates were effective till 1957. Meanwhile on recommendation of the Bicycle Development Council a part of the total output of the industry (2,50,000 bicycles) was reserved for production in the small scale sector.

4.5 The 1957 enquiry revised the rates upward (60% advalorem preferential or Rs. 80/- per bicycle whichever higher, for complete bicycles; and 65% advalorem preferential for bicycle components;

21/ The Commission took a progressive view on the development of the industry. The 1946 enquiry stated "It should be made a condition of the grant of protection that the cycle industry should actually spend or set apart specified amounts for research and development. The 1949 enquiry recommended duties marginally lower than admittedly warranted as a measure of incentive to improve efficiency and lower costs.

the standard rates in both cases being 10% higher). The fifth enquiry extended protection upto 1963 without changing the rates. The sixth and last enquiry, in 1963, recommended the discontinuance of protection beyond the end of the year.

4.6 Tariff protection had become redundant since in the meantime import controls was being exercised heavily. Imports of complete bicycles was banned from July 1957. Restrictions on components imports began to be introduced from March 1960 with gradual restriction of import licences both in terms of value and in terms of the range of components. From October 1961, all component imports, but for actual user imports were also banned. Alongside, to monitor the import substitution process, the phased manufacturing programme was introduced. Each producer was required to submit a schedule of import substitution. A pack value of imported components in the nature of an import coefficient was assigned to him, and progressively reduced. According to the trade, by 1969-70 the import content of the Indian bicycle had fallen to 3% to 4% by value.

4.7 With the end of the first phase, by when the industry had found its feet, other elements of policy, particularly of the regulatory kind found increasing articulation. In its last enquiry in 1963, the Tariff Commission, after surveying the conditions of excess capacity prevalent, had recommended the freezing of bicycle prices allowing for a 15% margin of profit to the manufacturer. The industry with characteristic promptness entered a voluntary restraint agreement, which in effect lasted till 1974. Licensing powers of the government also found effective use

towards the end of alleviating the distress. The Government suspended further licensing in view of the excess capacity.

4.8 Bicycle exports had begun in 1957. This was duly noted by the Tariff Commission which lauded and exhorted the major manufacturers to do more.²² In response, the CMAI organised the cycle export pool, to assist the exporters financially. Members contributed to the pool a sum proportionate to their domestic sales (in practise, about 0.3% of sales value). Exporters were assisted from the pool to the extent of 20% of the domestic wholesale selling price of the product.

4.9 A revamped export policy was enunciated in 1963. In a period of poor capacity utilisation, the government saw in increased exports a source of alleviation. The earlier imprecise system of import entitlement was revised and improved. The government made a substantial gesture by joining the cycle export pool of the CMAI. The fruits of this entire set of policies was reaped by the organised sector.

4.10 1966 was watershed year for Indian economic policy. Devaluation was accompanied by the withdrawal of export incentives. The government also withdrew from the cycle exports pool. On balance, the export thrust of policy was weakened. This was soon realised, and in 1968-69, a new export policy for registered exporters was introduced. Among the new measures, an imaginative and popular scheme was the replenishment of

22/ The commission did its share. The 1954 enquiry took note of a manufacturer of component parts who claimed considerable scope for developing export trade in mudguards provided relief was granted in respect of import duty on raw materials used for the manufacture of mudguards. The Commission recommended Duty Drawback for raw materials.

Dunlop tyres, tubes and rims to manufacturer exporters of complete bicycles. The marked preference for Dunlop tyres in both domestic and export markets, made this a decisive scheme.²³

4.11 By 1966 the demand boosting and capacity restricting measures of previous years had worked well enough to raise capacity utilisation to satisfactory levels. The government delicensed the industry. In instinctive reaction, units gathered additional capacities in a hurry and soon dire shortages of raw materials resulted, driving down capacity utilisation again. As a consequence, licensing was reintroduced in 1970. Carry-on- business licenses (recognising capacity installed 1966-70 post-factor) went on till 1973. Earlier, in 1968, the government had reserved a set of the simpler components for exclusive production by the small scale sector.

4.12 By 1975, capacities had stabilised to meet demand, according to the DGTD. Further licensing was suspended except for specialised parts or on the condition of 50% export obligation. Bicycle prices, under restraint since 1963, thawed in 1974. The same year, there was a flutter on the export policy front when export assistance was withdrawn, and restored almost immediately on concerted protest from the industry. In 1978, the government made a major policy decision when all components except free wheels were reserved for exclusive production in the small scale sector. The gradual liberalisation of industrial control which began with the re-endorsement scheme in the early eighties has ofcourse applied to the bicycle industry as much as to the others.

23/ Mainly because these items were in short supply. Tyres and Tubes were controlled items under the Essential Commodities Act and their prices were pegged. The natural result was shortage.

5. INDIAN BICYCLE INDUSTRY : HISTORY OF PERFORMANCE

5.1 The two preceding chapters attempted to outline the context in which the Indian bicycle industry took birth and developed. The empirical evidence on the development itself now needs to be studied. The caveats are better made in the beginning. First, the analysis is severely limited by the nature of the secondary data available. Second, it is to the extent possible, pitched towards the question of competitiveness. Thus it is the variables and parameters of industrial structure and performance, which apriori have bearing on competitiveness, that are subjected to analysis. Patterns over time in the various measures of magnitude of the industry (particularly in production and exports); the patterns in the important production coefficients; partial productivities and patterns in variables of structure are sought to be analysed. The analysis is, in the main, with explanatory reference to the elements of environment and policy which appear to have had causal influence on the competitiveness of the industry. To anticipate, only conclusions of broad contours result.

5.2 The natural starting point for empirical analysis is the speed and effectiveness of protection in the import substitution process. The available data is presented in Table S.T.I. The II world war was the first episode of imports reduction. Imports declined from a peak of 1.7 lakh bicycles (1939) to a trough of 16,000 bicycles in 1942, after which it began to pickup again. Though protection began, in intent, in 1946, the revenue duties were not revised upward. The

Table:5.T.1 BICYCLE INDUSTRY IMPORTS;IMPORTS SUBSTITUTION

YEAR ENDG	Bicycles Imports ('000 No's)	Imp/Prodn (Ratio)	Bicycles Imports Val. (Rs.Lakhs)	Imp/Prodn (Ratio)	Bicycle Parts Imports Val. (Rs.Lakhs)	Imp/Prodn (Ratio)
1937	159.5		45.1		61.5	
1938	170.7		55.7		62.8	
1939	138.0		48.2		47.9	
1940	92.3		33.3		41.0	
1941	50.2		22.2		30.1	
1942	54.5		26.0		31.5	
1943	16.1		9.7		17.3	
1944	28.4		18.8		21.1	
1945	37.4		25.2		29.4	
1946	76.1		54.8		54.0	
1947	212.6		180.9		97.2	
1948	261.4		249.6		194.2	
1949	55.4		52.7		44.0	
1950	264.6		249.0		159.3	
1951	165.8	1.4544	146.8		96.4	
1952	283.1	1.4371	222.7		144.3	
1953	196.6	0.7447	209.4		134.5	1.478
1954	93.2	0.2505	96.3		102.8	0.871
1955	85.8	0.1747	87.9		156.1	1.143
1956	145.8	0.2196	137.4		185.2	1.018
1957	138.0	0.1725	141.7		181.6	0.865
1958	67.6	0.0741	73.9		166.6	0.712
1959	5.4	0.0051	7.3		90.3	0.326
1960	0.6	0.0006	1.0		101.6	0.278
1961	0.5	0.0005	0.8		171.4	0.420
1962	0.4	0.0004	0.7	0.0005	92.3	0.152
1963	0.5	0.0004	0.8	0.0005	20.5	0.033
1964	0.4	0.0003	0.8	0.0004	2.7	0.003
1965					2.0	0.002
1966					1.1	0.001
1967					1.5	0.001
1968					3.0	0.003
1969					8.2	0.006
1970					8.4	0.008
1971					2.2	0.002

Source: Imports-Tariff Commission reports, various issues
Production-Table:5.T.3

Tariff Board came to the conclusion that in the prevailing circumstances the existing revenue rates provided the required protection. So the pent up demand from the war years continued to suck in steeply increasing imports (3.6 lakhs in 1948). The steep increase in protective duties in 1949 had its effect. Over the subsequent period imports responded well to the realignments in duties. From 1957, when import control banning complete bicycle imports was made absolute, the tapering off of imports began. Figure 5 G.1 indicates the path of import substitution over the period, and testifies to the effectiveness of policy.

5.3 The picture is substantially the same in the case of the bicycle components industry. Figure 5 G.2 illustrates the progress in the import substitution process. The data, however is less reliable in this case since a considerable and increasing (overtime) proportion of production was in the small scale, unorganised sector which is not covered in the statistical reportage. The tariff protection was stronger for components from 1954 till its discontinuance and therefore the pattern of import substitution must have, if anything, been stronger than in the case of complete bicycles.

5.4 The period of growth of the industry began after 1953. There were 6 firms in the organised sector in 1953 with a combined installed capacity of 4.38 lakh bicycles. Between 1954 and 1962, 14 more units came up and the total installed capacity at the beginning of 1963 stood at 14.4 lakhs. Average production per unit over the period remained at a steady 50,000 bicycles per year. Census of Indian manufactures

Fig. 5.G.1 Bicycle Imports/Dom. Prod'n.
(Quantity)

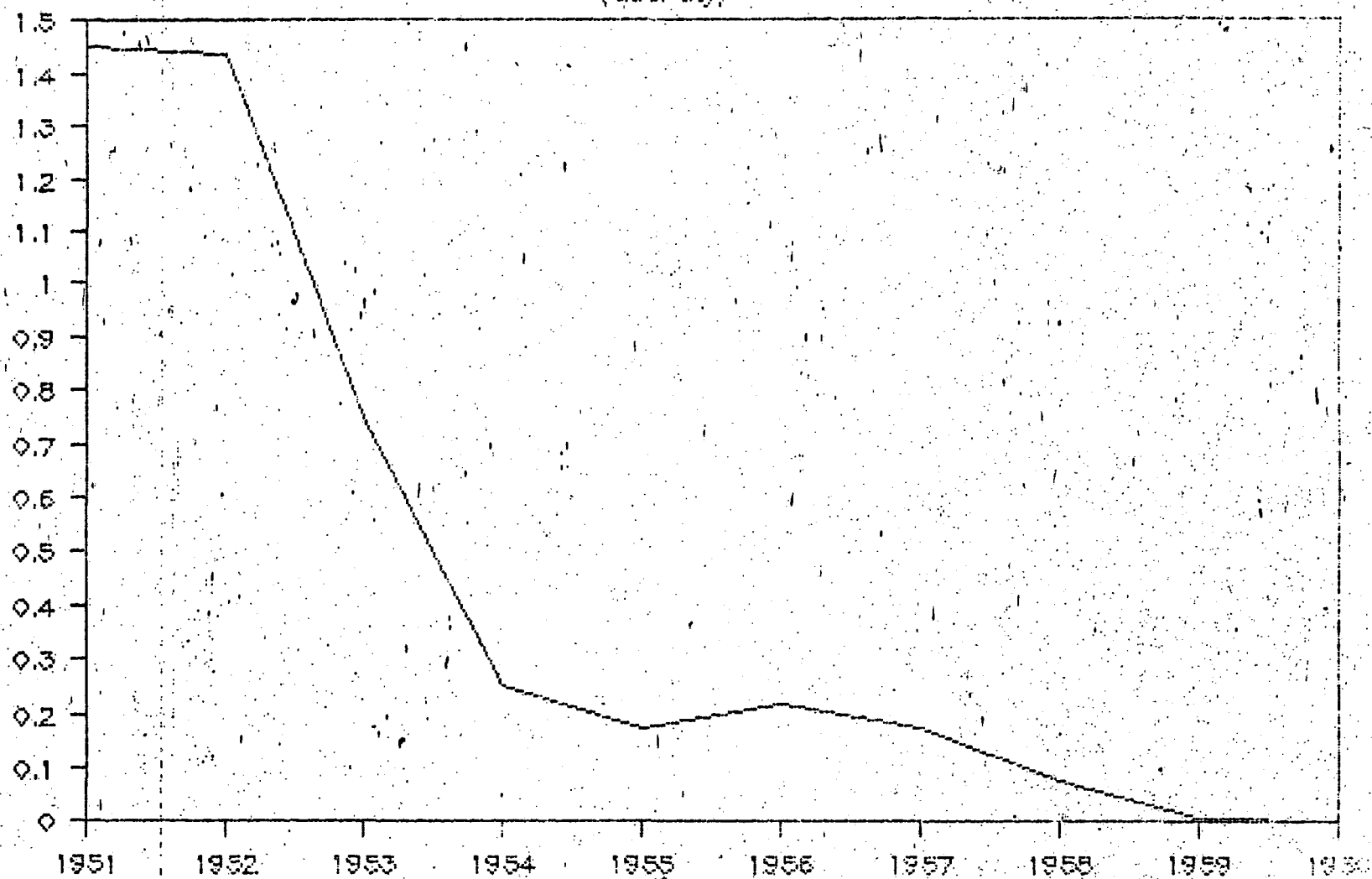
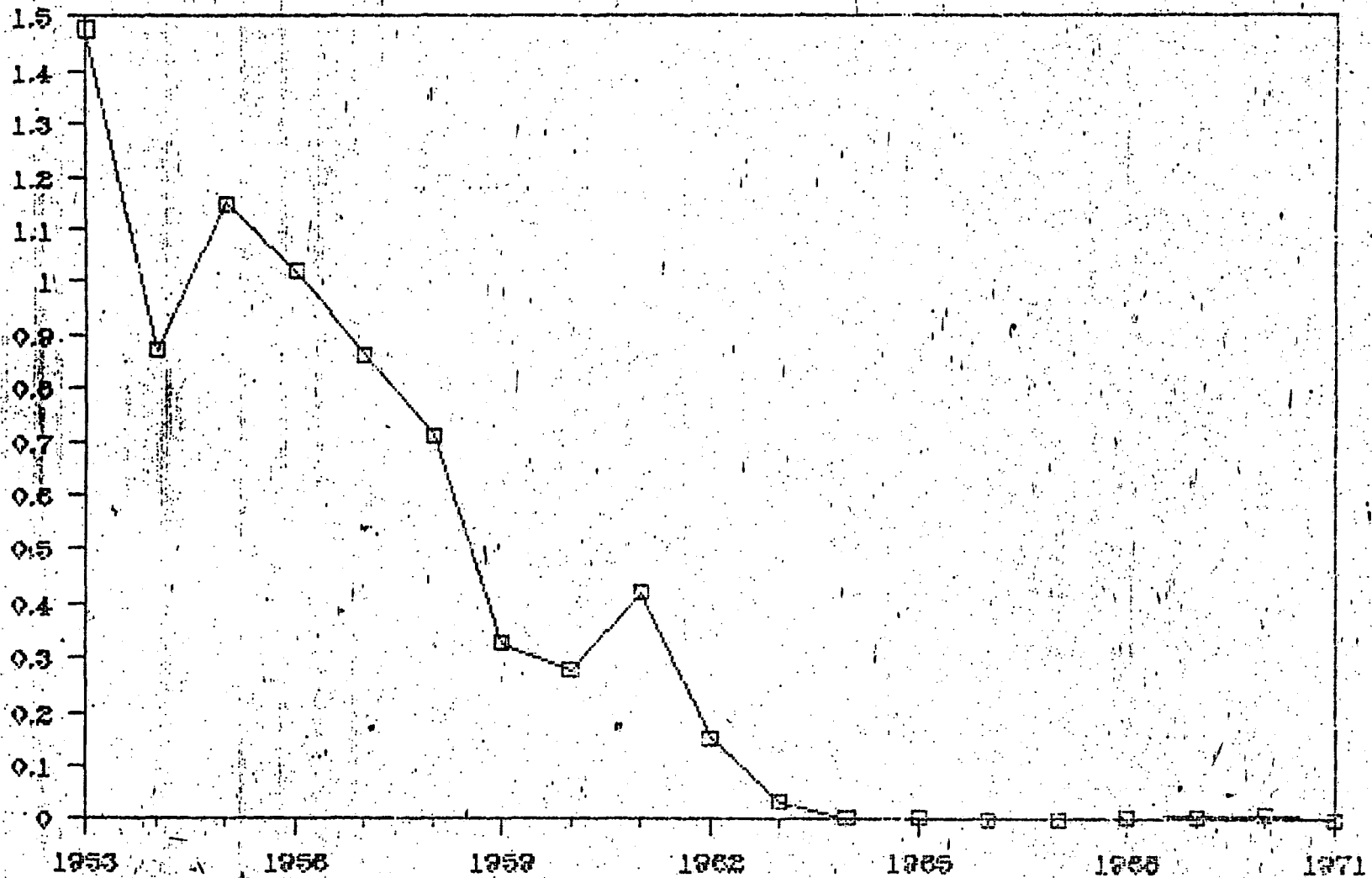


Fig.5.G.2:Bicycle Parts Imports/Dom.Prn



data covers the bicycle industry over much of this period (1946-1958). CMI data (Table 5 T.2) shows steady growth over the period (except for a lull 1950-53) in terms of number of firms, fixed capital, employment and output. The trend in average fixed capital was upward and in average employment downward.²⁴ In consequence the labour intensity declined over the period. It would appear that the growth in the organised sector was through the increase in the number of smaller units, evident from the falling average employment. However, these units were characterised by higher capital intensity.

5.5 The same source also gives us some clue about the behaviour of productivity over the period. It is important to study productivity changes over time, since it gives us an indication about the industry's approach to competitiveness. It may be noted that productivity changes in industry-aggregate data can be due to: (i) established (excess) capacity finding changed utilisation rates as demand changes; (ii) shifts in composition of output among firms with different productivities and; (iii) shifts in the composition of output among items of production. To arrive at meaningful conclusions one would have to disentangle these effects. This is particularly so for analysing the effects of policy, since the policies affecting these different dimensions of productivity growth could well be very different. However, at this stage we can do little more than acknowledge these considerations, given the limitations of data. The trends in partial productivities reveal that in the period 1947 to

^{24/} Averages per factory.

Table:5.T.2 BICYCLE INDUSTRY:1946-58

Year	Factories No's	Fixed Cap Rs. '000	Workers No's	ValAdded Rs. '000	FixK/#Fact Rs/lks	Wkrs/#Fact No's	Wkrs/FixK PerRsLk
1946	5	2502	1551	344	5.00	310.20	61.99
1947	11	3117	1659	3165	2.83	150.82	53.22
1948	11	4238	1798	4513	3.85	163.45	42.43
1949	15	5455	1837	6086	3.64	122.47	33.62
1950	26	6921	2478	9358	2.66	95.31	35.80
1951	31	9531	2833	9923	3.07	91.39	29.72
1952	43	16754	3683	10888	3.90	85.65	21.98
1953	49	23223	4311	14207	4.74	87.98	18.56
1954	54	28729	5596	22522	5.32	103.63	19.48
1955	67	30433	6940	30921	4.54	103.58	22.80
1956	72	35816	8335	36470	4.97	115.76	23.27
1957	85	41315	9125	42330	4.86	107.35	22.09
1958	93	49918	9712	48025	5.37	104.43	19.46

Source: Census of Manufacturing Industries, CSO, various issues

1958 capital productivity was relatively stagnant, while labour productivity increased steadily. (Please see Table 5. T. 2A).

5.6 Over a longer period; licensing policy appears to have held determining, if contrary, sway over production. The history of licensing, began with the enactment of IDRA and follow stop-go pattern. In 1962, licensing was suspended on evidence of excess capacity; in 1966, the industry was delicensed in view of self-sufficiency. In 1970, the industry was brought back into the fold of licensing because of the shortage of raw materials etc. In 1985, the industry was delicensed again in a measure of liberalisation. These phases are naturally reflected in the data on installed capacity. (Please see comprehensive table 5.T.3). It is evident that during the delicensed period (1966-70) firms scrambled to increase capacity and new firms sprang up. For much of the sudden spurt in capacity and in the number of firms evident after 1970 credit is due to bunched recognition accorded to already established capacities when licensing was reintroduced. Production however remained steady till 1975 and spurted between 1975 and 1980. This was mainly through improvement in the utilisation of capacities gathered precipitately: 1966-1970, rather than due to further additions to capacity. A growth trend in exports, which began around then, certainly helped. In retrospect, the delicensing phase proved fortuitious for subsequent production growth, though the basis for the policy was the view that capacity was sufficient to meet demand; the industry was mature, and that it would be mature in its investment decisions.

Table:5.T.2A Productivity in Bicycle Industry

Year	ValAdd/FixK Ratio	ValAdd/Wkrs RsThous
1946	0.14	0.22
1947	1.02	1.91
1948	1.06	2.51
1949	1.12	3.31
1950	1.35	3.78
1951	1.04	3.50
1952	0.65	2.96
1953	0.61	3.30
1954	0.78	4.02
1955	1.02	4.46
1956	1.02	4.38
1957	1.02	4.64
1958	0.96	4.94
1974	1.10	7.48
1975	1.30	9.30
1976	1.10	10.18
1977	1.16	10.69
1978	1.24	11.68
1979	1.08	10.48
1980	1.60	14.45
1981	1.47	15.38
1982	1.74	20.75

Source: CMI Data on Bicycle Industry, 1946-58
 ASI Data on Bicycle Industry, 1974-82.

Table 5.T.3

COMPLETE BICYCLES :1951-83

YEAR	FIRMS # LICS	INSTCAP THOUS #	PRODN THOUS #	VALUE RS.LAKS	STOCKS THOUS #	WPI-BIC
1951	2	120	114			
1952	6	418	197			
1953	6	418	264			72.8
1954	6	438	372			73.0
1955	10	492	491			69.7
1956	14	653	664			68.2
1957	18	725	800			69.9
1958	20	926	912			69.6
1959	19	1051	1068			76.9
1960	19	1066	1014			78.5
1961	20	1218	1049			83.8
1962	21	1444	1116	1601		84.1
1963	21	1444	1139	1636		88.6
1964	20	1679	1420	1934		89.2
1965	20	1679	1539	2153		88.9
1966	20	1679	1599	2347		86.5
1967	18	1640	1766	2826	1224	91.8
1968	12	2175	1865	3146	1356	95.2
1969	12	2175	1950	3114	1320	94.1
1970	9	2105	2094	3518	1368	96.1
1971	10	3332	1864	2999	1824	100.0
1972	11	3654	2273	3830	2217	106.1
1973	13	3849	2500		1080	122.3
1974	15	4019	2483	5366	2088	128.9
1975	15	4019	2000	5073	1260	163.4
1976	11	3701	2643	6417	1058	176.0
1977	11	3701	3000	8000	1199	149.4
1978	13	3801	3200	8500	1092	148.8
1979	10	4759	3972	10945	1478	157.1
1980	10	4759	3830	11029	1860	174.0
1981	10	4759	3827	14633		184.4
1982	10	6259	4566			198.4
1983	10	7159	5777			206.6

Source: DGTD Annual Reports, Office of the Economic Adviser, GOI, MPSCI, C

Table 5. T. 3A BICYCLE PARTS : 1953-78

9

YEAR	PART FIRMS - NO'S	PRDN. VAL RS. LAKS
1952	23	91
1953	24	118
1954	22	136
1955	23	182
1956	22	210
1957	22	234
1958	22	277
1959	27	366
1960	29	408
1961	34	606
1962	51	630
1963	51	880
1964	55	923
1965	55	892
1966	55	1100
1967	22	1060
1968	31	1469
1969	31	1024
1970	33	1057
1971	37	1421
1972	40	1500
1973	56	2225
1974	56	2356
1975	44	2646
1976		3004
1977		3408

Source: DGTD Annual Reports, Office
of the Economic Adviser, GOI, MPSCI, CSO

5.7 Production of bicycle parts in the organised sector is marked by two sharp breaks in trends. First, the period between 1959 and 1964 saw more than doubling of the number of units from 22 to 55. With daunting symmetry, the number of firms fell from 55 to 22 in 1967. This is conceivably on account of the delicensing of the industry in 1966, when the numbers reporting fell. While the growth in the no. of firms was reflected in a like growth in the value of production, the fall in 1967 was not. The production fell only from Rs. 11 crores to Rs. 10.6 crores. This could be an indication of the degree of concentration in the components industry. A small number of firms account for the major part of output.

5.8 After the CMI was replaced by the Annual survey of Industries, the bicycle industry was covered only from 1973-74. Only summary statistics have been published since that year. This data, presented in table 5.T.4; yields limited in sights, because of the wide fluctuations. It is evident that the industry continued to grow in terms of no. of firms, fixed capital and employment. However, average fixed capital and average employment remained more or less steady and the labour intensity continued its decline over the period. Capital productivity was subject to modest growth over the period. Labour productivity growth has been very high around the turn of the eighties.

5.9 Indian bicycle industry began exporting in 1957.²⁵ Complete Bicycle exports grew vigorously from the sixties to mid seventies. Over that period, bicycle exports grew considerably faster than engineering exports as a whole, and by the early seventies the bicycle was considered

25/ Nineteen bicycles were exported in 1957, worth about Rs. 2000/-.

Table:5.T.4 : BICYCLE INDUSTRY 1973/74-1981/82

YEAR	ENDG Factories Nos	Fixd Cap Rs Lks	Workrs No	NVA Rs Lks	FixK/#Fact RsLks	Wkrs/#Fact No's	Wkrs/FixK PerLks
Mar 1974	464	1466	21483	1608	3.16	46.30	14.65
Mar 1975	498	1468	20571	1913	2.95	41.31	14.01
Mar 1976	581	1862	20204	2056	3.20	34.77	10.85
Mar 1977	600	1763	19179	2050	2.94	31.97	10.88
Mar 1978	598	1999	21244	2481	3.34	35.53	10.63
Mar 1979	643	1966	20270	2125	3.06	31.52	10.31
Mar 1980	694	2252	24865	3593	3.24	35.83	11.04
Mar 1981	676	2137	20377	3134	3.16	30.14	9.54
Mar 1982	748	2869	24004	4982	3.84	32.09	8.27

Source: Annual Survey of Industries, CSO, GOI, various issues

one of the most promising items among India's engineering exports. From mid-seventies the export performance began to slacken. By and large component exports also followed a similar pattern. Export Growth over the sixties coincided with the excess capacity which characterised the industry during the early years, and the export policies that were unleashed in alleviation. It is however to be noted that the net effect of devaluation and its attendant measures, was to depress exports. Exports growth over the seventies appear to have been a lagged and tardy response to growth in international demand. Over the long period, India's bicycle exports has not been aligned to the market, in the sense of being pro-cyclical, as for instance the exports of Hongkong, Singapore and South Korea have been.

5.10 Tables at S.T.5 present the trends in the direction of India's bicycle exports. The pattern has not changed much over the years.

Developed countries, which account for 90% of the world imports, account for under 10% of India's exports. Indian industries concentrated on those countries which demand the same heavy roadster models that are demanded domestically. The earliest export markets were near neighbour countries.

In the sixties new markets were found in Africa (principally Nigeria) South East Asia (Indonesia, Malaysia) and the Middle-East (Iran, Iraq).

Centrally planned economics never had more than a negligible share.

However, even from the end of India's major export markets, Indian exports account for only a small share of (their) total imports. Developing countries account for 90% of Indian exports, but their imports from India account for only under 10% of their total imports of bicycle products.

Table 5.1.5(a) Indian Bicycle Exports: Shares of Developed and Developing Regions, 1957-1978 (US \$m)

	1957	1963	1969	1970	1971	1972	1973	1974	1975	1976	1977
Total Exports	2.40	4.63	5.34	8.99	10.1	12.9	14.9	25.7	29.6	23.3	37.3
Exports to DCs	0.14	0.33	0.62	0.76	0.85	1.33	1.73	2.97	1.41	1.80	3.35
% share of DCs	5.7	7.2	11.7	8.5	8.4	10.3	11.7	11.5	4.8	7.8	9.0
Exports to LDCs	2.25	4.28	4.64	9.23	9.28	11.3	12.9	22.4	27.9	21.3	33.3
% share of LDCs	93.7	92.4	86.9	91.5	91.6	87.6	87.0	87.3	94.4	91.8	89.1

Source: UN 'Commodity Trade Statistics', Series 'D' - various issues.

Table 5.T.5(b) Direction of Indian Bicycle Exports (SITC 733.1) ('000)

Exports to	1963	1966	1970	1974	1977
Total	641	2002	8989	25662	37310
DCs	-	-	761 (8.5)	2976 (12.0)	3361 (9.0)
LDCs	512 (95.0)	1997 (99.0)	8225 (91.5)	22408 (97.0)	33256 (89.1)
CPEs	-	-	-	284 (1.0)	692 (1.9)
EEC (9)	neg.	neg.	106 (1.2)	1759 (6.9)	2363 (5.3)
USA	neg.	neg.	290 (3.2)	596 (2.2)	324 (0.9)
M East	304 (47.4)	576 (28.8)	1950 (21.7)	3929 (15.3)	5217 (14.0)
Dev Africa	154 (24.0)	1217 (60.8)	4299 (47.8)	9405 (36.6)	15368 (41.2)
Dev Asia	155 (24.2)	254 (12.7)	1935 (21.5)	8677 (33.8)	16023 (42.9)

Notes: Figures in parentheses denote percentage shares in total bicycle exports in that year.

Source: UN Statistical Series 'D'; Commodity Trade Statistics

Table 5.T.5(c) Direction of Exports of Bicycles^a and Selected Components from India (%)

	1980				1975			
	Item Shares	% to DCs	% to LDCs	% to CPEs	Item Shares	% to DCs	% to LDCs	% to CPEs
Total	100.0	14.6	85.4	0.2	100.0	9.4	88.8	1.8
Bicycles	23.7	1.3 (2.1)	98.7	0.7	17.1	5.1 (0.2)	94.3	0.6
Components	76.3	19.5 (97.9)	80.5	neg.	82.9	10.3 (90.8)	87.7	2.0
Chains	2.3	44.3 (6.9)	54.8	0.9	3.5	52.0 (19.3)	37.8	10.2
Freewheels	12.0	57.9 (47.3)	42.1	0.0	3.6	39.3 (15.0)	58	2.7
Rims	1.3	2.8	95.1	2.1	1.2	1.5	90.6	7.9
Hubs	1.4	3.9 (3.0)	95.9	0.0	0.4	1.1	98.9	0.0
Saddles	1.1	4.1	95.9	0.0	0.4	11.9	83.1	0.0
Spokes	0.3	0.1	99.9	0.0	1.2	7.4	92.6	0.0
Misc.	57.7	10.1 (39.7)			72.6	7.1 (54.8)	92.9	1.6

Notes (1) Percentages of the bicycle imports of a given region which consist of these items are given in parentheses, for some entries

Sources: 1980: HSFTI, March 1979-80, Vol.I, DGCIS;
1975: 'Indian Bicycle Ambassador', various issues

5.11 The composition of Indian exports has, overtime, shown a pattern favouring components imports. Components accounted for 14.3% of exports in 1959, 60% in 1964-65 and 87.1% in 1980. Since 1980, the proportion has declined, and in 1982 stood at around 67%. The six specific components covered by DGCIS data are, Chains, freewheels, hubs, rims, saddles and spokes. These accounted for 48.8% of total components exports in 1971-72, and 42.3% in 1979-80. The Miscellaneous category has been increasing its share. Indian components are reportedly the cheapest available in the world market.^{26/} Components exports are relatively more diversified. Exports are directed towards a largenumber of countries and are less concentrated in terms of geographical areas. In 1980, developed countries accounted for 1.3% of Indian complete bicycle exports, but 19.5% of components exports. From the other end, 97.9% of the imports of developed countries from India was on account of components.

26/ ITC, UNCTAD/GATT, 1985.

APPENDIX 1

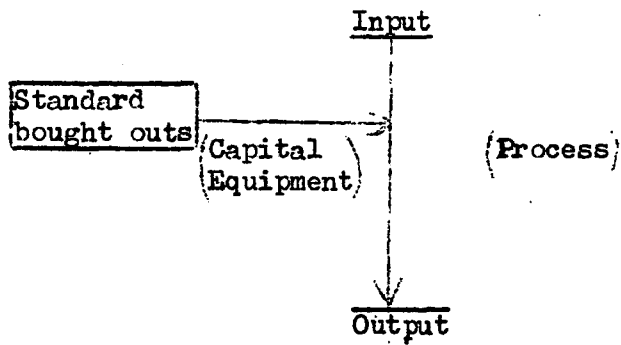
BICYCLE COMPONENTS

:

MANUFACTURE PROCESS CHARTS

*

Key



* I gratefully acknowledge the efforts of Solomon Raj who compiled these charts.

FRAMESERW TUBES

(Circular Saw)

(Cut to size)

Lugs, Bottom bracket →Fixtures →

(Clamped Frames)

Chain Stays Seat Stays →

(Radial Drilling Machine)

(Holes drilled through lugs)

(Riveted)

(Brass Sheets inserted between
lugs and tubes)

(Oxy-Acetylene Lamp)

(Welded)

Forks →

(Polished)

Frame Collar →Frame

FRAME COLLARSMild Steel Sheet (Extra deep drawing Qlty)

(Guillotine Shearing Machine)	(Strip Cutting)
(Power Press)	(Blanking)
"	(First Draw)
"	(Piercing Centre Hole)
"	(2nd Draw & Bending)
(Small Turning Machine)	(End facing)
(Buffing Machine)	(Buffing)
(Electroplating Plant)	(Nickel Plating)

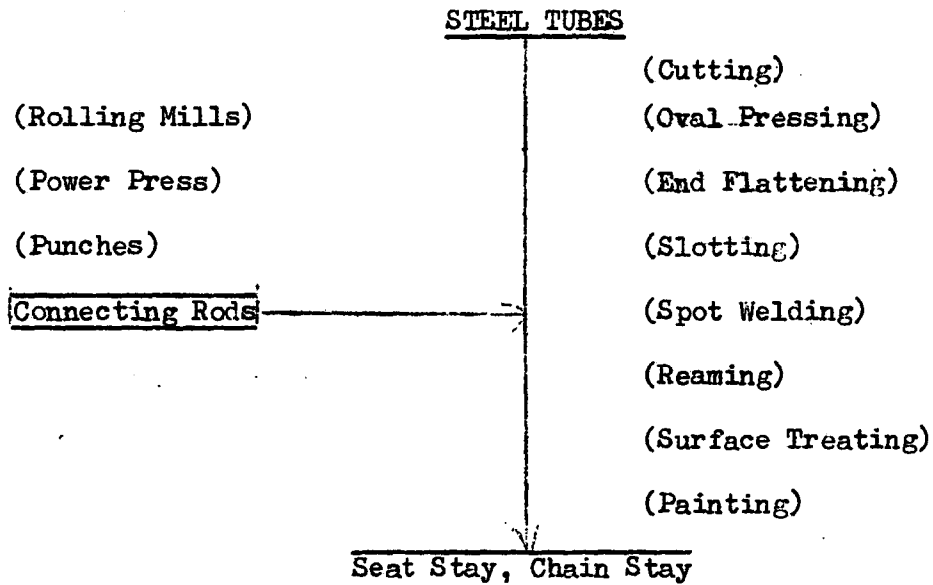
↓
Frame Collar

LUGSCRCA SHEETS

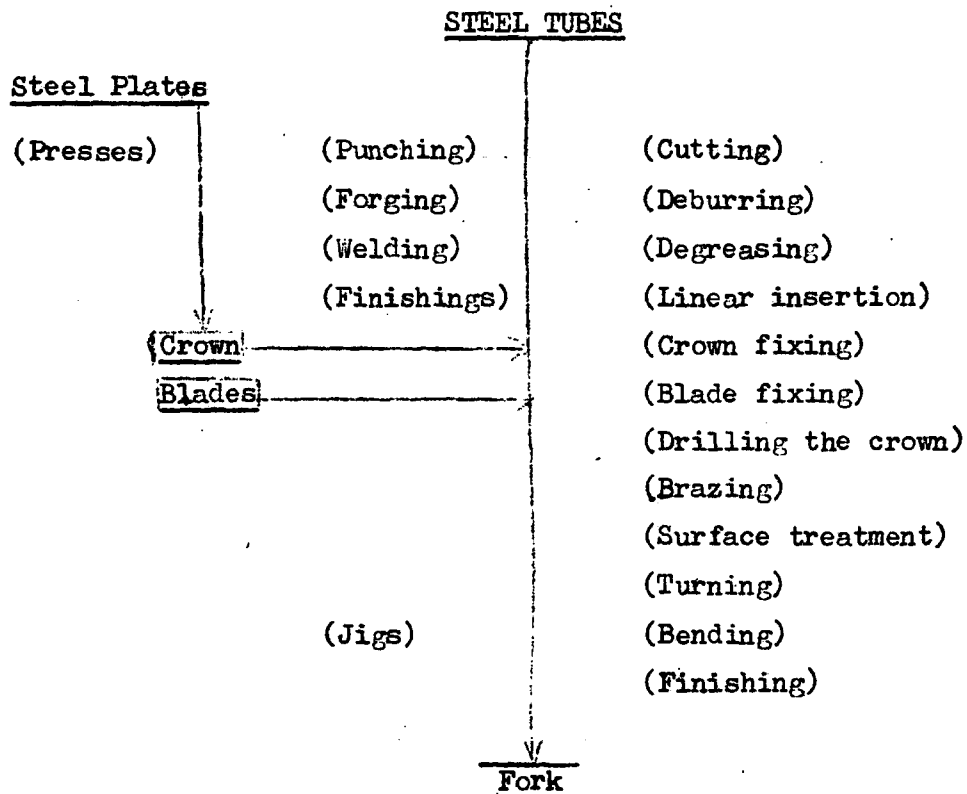
(Guillotine Shearing Machine)	(Cutting)
(Power Press)	(Blanking, Punching)
(Press)	(Bending)
(Gas Welding Eqpt.)	(Welding)
(Drilling Machine)	(Reaming)
(Pickling & Cleaning Tanks)	(Cleaning)

↓
Lug

SEAT STAYS & CHAIN STAYS

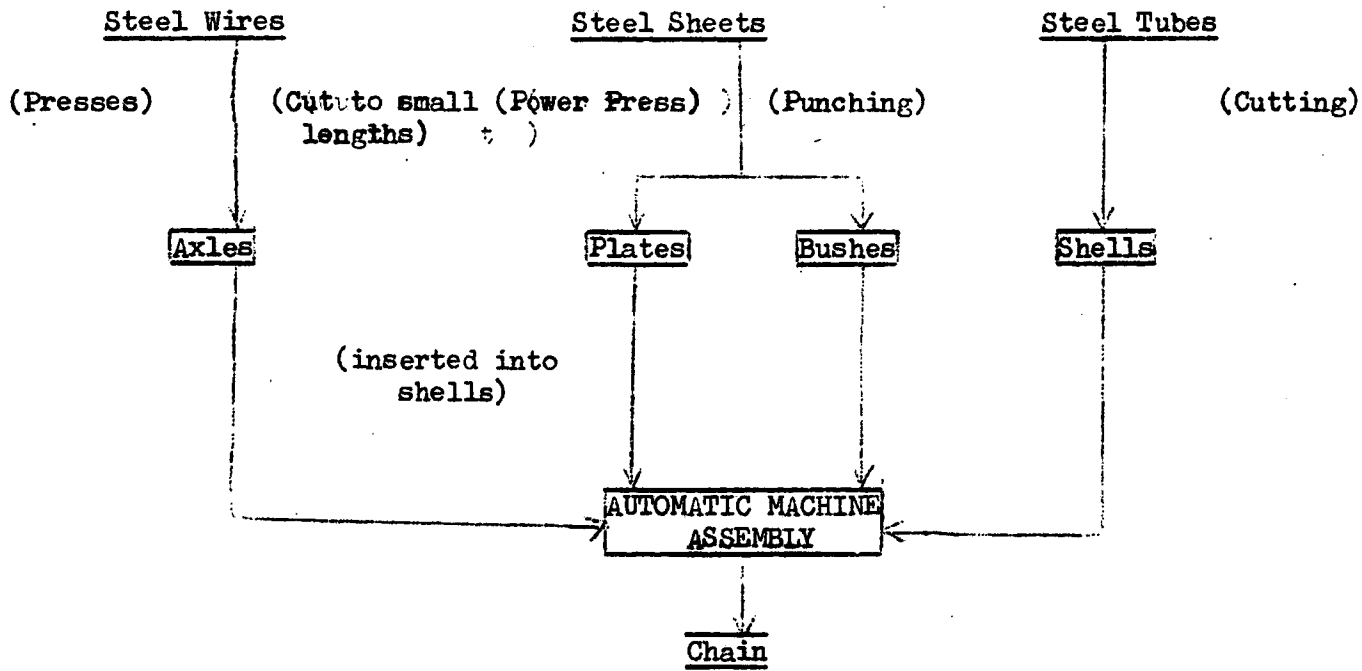


FORKS



A5

CHAINS



A6

B.B. AXLES

Forged blanks

(Mills)

(Spl, purpose copy turning Machine)

(Facing Machine)

(Milling Machine)

(FO fired furnance)

(Grinding Machine)

(Straightening)

(Copy turning)

(End facing)

(Milling)

(Heat Treatment)

(Grinding)

BB Axle

B.B. CUPS

Mild Steel Rounds

(Lathe)

(Lathe)

(Threading Machine & Die head)

(Bar drawing)

(Drilling & Cutting)

(Rough bore)

(Facing and O.S. Turning)

(Finish Bore)

(Threading)

(Drilling)

(Stamps)

(Heat treatment)

BB Cup

A7

B.B. SHELLS

Mild Steel Sheets

(Power Press)

(Power Press)

(Power Press)

(Furnace)

(Power Press)

(Spot Welding)

(SP Lathe)

(Blank Cutting)

(Punching holes)

(Drawing I & II operation large hole)

(Heating)

(Drawing in the Press I & II operation)

(Annealing)

(Drawing for Finishing)

(Bending for round shape)

(Welding)

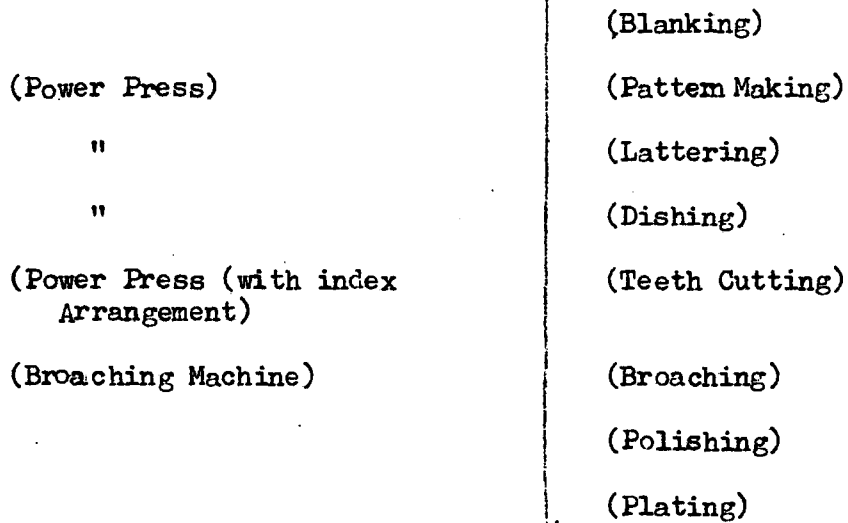
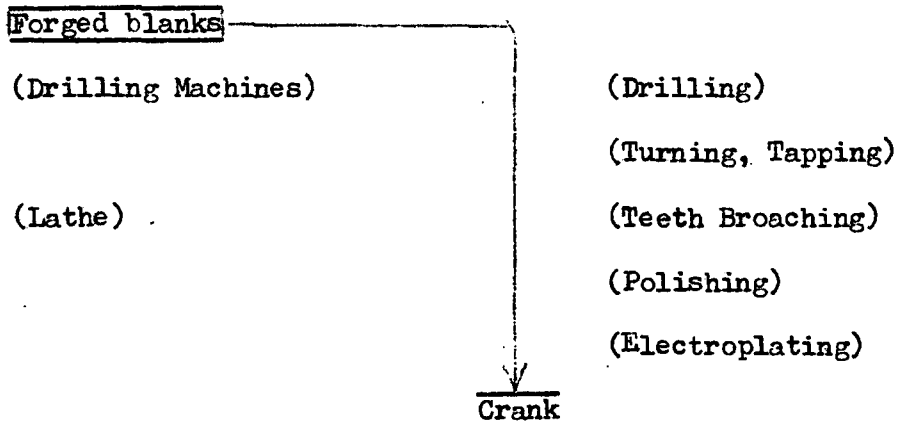
(Collar fitting)

(Collar reveting)

(Reaming)

(Facing the holes)

↓
BB Shell

CHAIN WHEELM.S. SheetChain WheelCRANKS

PEDALSTRETCHER BARM.S. BRIGHT BAR

(Lathe)

(Cutting)

(Lathe)

(End threading) (

StretcherbarHUB TUBE

(Cutting)

(End threading)

(Electroplating)

Hub tubePEDAL AXLEM.S. Bright Bar

(Lathe)

"

"

"

(Cutting to size)

(Heating)

(Upsetting)

(Fine Trimming)

(Drill Centring)

(Turning)

(Thread rolling)

(Milling)

(Stamping)

(Hardening)

Pedal AxlePedal Assembly

A10

RIMS

M.S. STRIP

(Power Press)

(Roller Mills)

(Welding Machine)

(Automatic Punching Machine)

(Press)

(Acid Tanks etc.)

(Electroplating Equipment)

(End Cutting)

(Forming)

(Seam & Butt Welding)

(Punching)

(Nipple Hole Making)

(Surface treatment)

(Nickel Plating)

Rim

SPOKES

Steel wire

(Cutting)

(Straightening)

(Automatic Machine)

(Head-upsetting) (Automatic Machine)

(Bending)

(Tail thread rolling)

Spoke

NIPPLES

Brass wire

Headed/upset

Roughing

Drilling

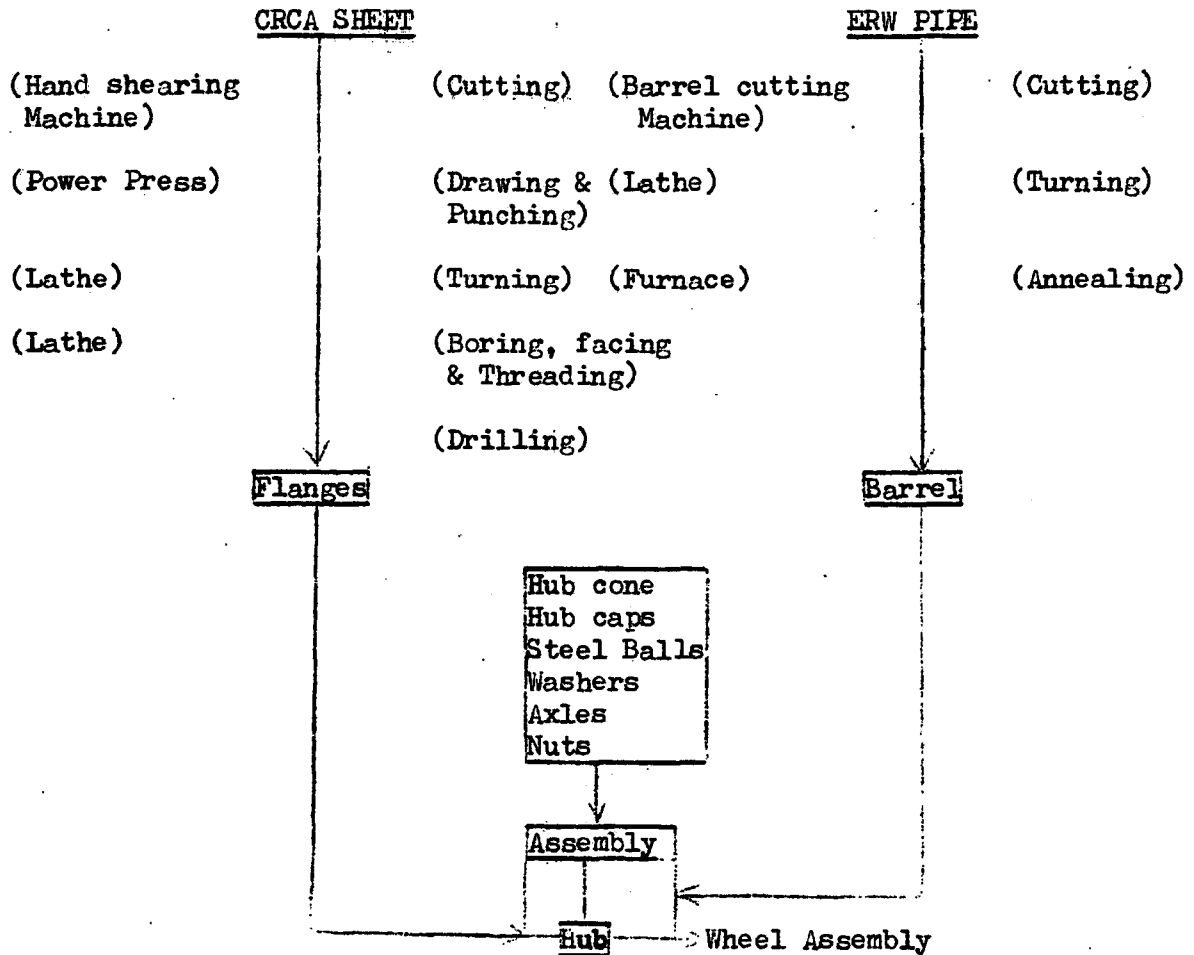
Finish Drilling

Seam milling

Slot milling

Tapping

Nipple

HUBS - ASSEMBLY

CHAIN COVERS

CRCA SHEET

(Guillotine Shearing
Machine)

(Straight Cutting)

(Power Press)

(Forming)

(Enamel Baking)

↓
Chain cover

MUDGUARDS

M.S./CRCA SHEETS

(Rotary Shearing Machine)

(Cutting)

(Automatic rolls)

(Forming)

"

(Ends folding)

"

(Reflector Sheet Forming)

(Power Press)

(Holes punching)

(Pointing)

(Polishing)

↓
Mudguard

A13

HANDLES

ERW PIPES

(Hydraulic Machine)

(Lever Rod)

(Stem Cutting)
(Socket fixing)
(Stem fixing)
(Brazing)
(Bending)
(Drilling)
(Polishing)
(Plating)

↓
Handle

BREAK LEVERL ROD

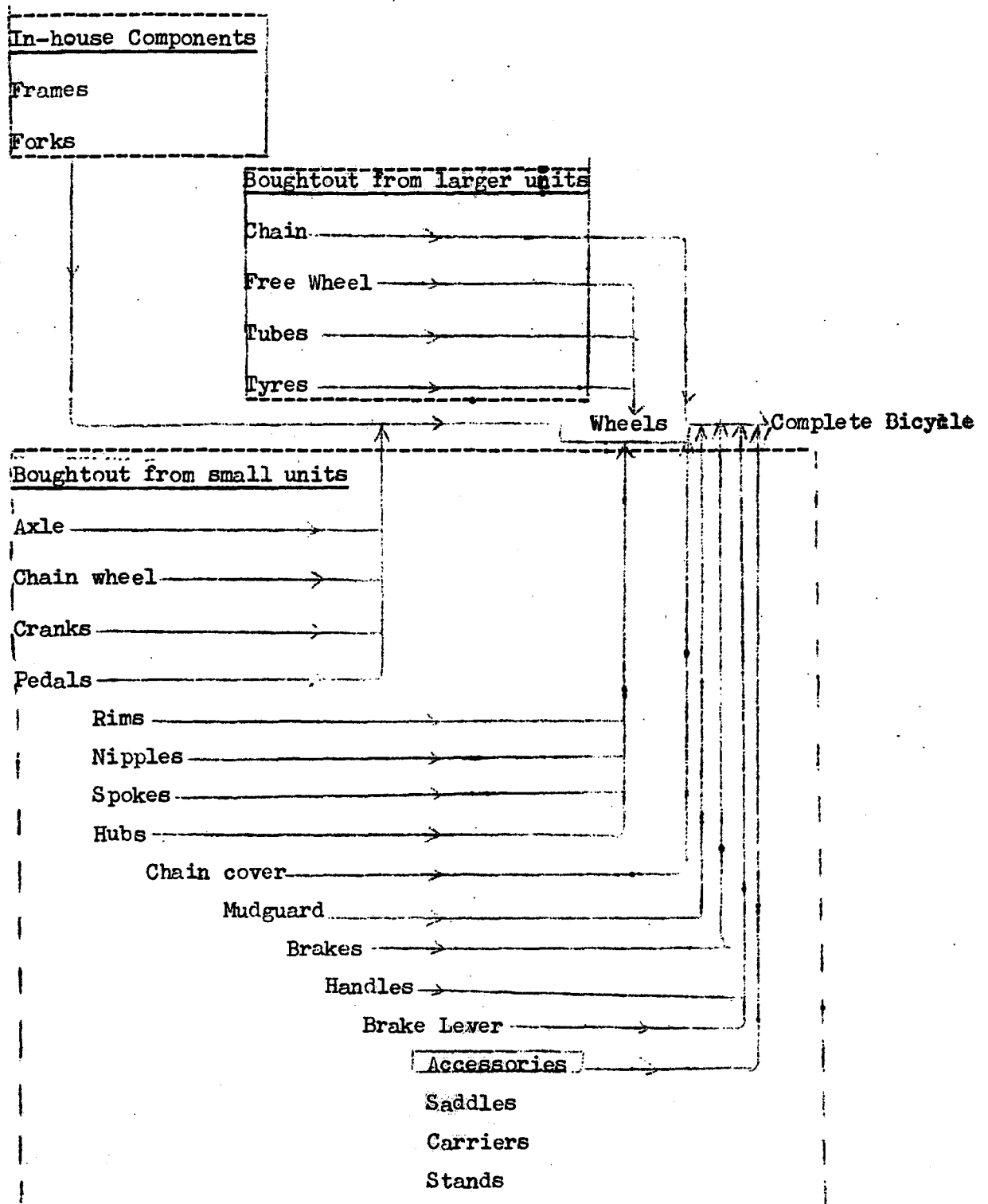
Mild Steel Rod

(Circular Saw Machine)

(Jigs)

(Cutting)
(Turning)
(Threading)
(Facing)
(Hot-end Spooning)
(Centreless Polishing)
(Bending)
(Square milling)
(Polishing)
(Plating)

↓
Break Lever Rod

FINAL ASSEMBLY

A-15
COMMON PROCESSES

<u>PRODUCTS/PROCESS</u>	Bending	Blanking	Boring	Brazing	Breaching	Buffing	Cutting	Cutting with Saw	Drawing	Drilling	Enamelling	Facing	Forging	Ferrous	Grinding	Heat Treatment	Jig Jobs	Milling	Plating	Polishing	Punching	Reaming	Slotting	Stamping	Surface Treat	Tapping	Teeth Cutting	Threading	Turning	Welding
1. Frames										X	X									X										X
2. B.B. Axles							X					X			X	X		X											X	
3. B.B. Cups			X							X		X				X	X							X			X			
4. Chainwheel		X	X		X			X	X											X							X			
5. Granks		X			X					X									X	X									X	
6. Chains					X														X							X		X		
7. Pedal Stretcher Bar							X						X						X						X		X			
8. Hub Tube							X																				X			
9. Pedal Axle							X			X						X		X	X										X	
10. Seat & Chain Stay							X															X		X					X	X
11. Forks	X						X																	X		X		X		X
12. B.B. Shells	X	X		X			X			X		X	X			X					X	X			X					X
13. Hubs			X						X	X		X				X	X				X						X	X	X	
14. Chain Covers							X				X			X							X									
15. Mudguards	X				X				X											X										
16. Frame Collars	X	X			X	X					X								X			X								
17. Lugs	X						X														X									
18. Handles				X			X			X							X		X	X									X	
19. Brake Lever Rod							X				X							X	X	X							X			
20. Rims							X						X						X	X					X					X
21. Spokes							X													X							X			

APPENDIX - 2

INDIAN BICYCLE INDUSTRY - CHRONOLOGY

- 1890 First bicycles imported into India.
- 1905 Regular imports of bicycles began.
- 1914-1918 I world war.
- 1920 SK Sen founded Cycle Productions Ltd. with imported plant and machinery. Project was abandoned, suffering from the depression in the wake of the I world war.
- 1930's Government of India set curbson the manufacture of machine tools under Defence restrictions. Production was permitted only under licenses.
- 1938-39 Karam Singh and Charan Singh founded Chakker and Co. at Ludhiana for the manufacture of BB Axles and HUB cones.
- 1939 LN Birla (Birla Brothers) founded Hind Cycles Ltd. at Bombay, manufacturing all components except friction parts. KN Sahaya founded Hindustan Bicycle Manufacturing and Industrial Corporation (later Hindustan Vehicles Ltd.) at Patna, manufacturing bicycles and components.
- 1939-1945 II world war years, attendant shipping problems. Domestic industry faced increasing demand. Hind Cycles and Hindustan Bicycle Corporation changed over to war production. The Indian industry supplied 50,000 bicycles to the war department. Small manufacturers (components) came up in Punjab (Ludhiana and Jallundhar) Delhi and Calcutta.
- 1943 The Cycle Manufacturers Association of India was formed to protect the interests of organised sector bicycle and parts manufacturers.
- 1946 On application by CMAI, the Tariff Board took up for enquiry the Indian bicycle industry. The existing revenue duties were converted without change into protective duties. @ 36% ad valorem standard and 24% ad valorem preferential. Protection was granted upto 1949.
- 1947 Indian independence, and partitition. Influx of skilled refugees into Punjab.

- 1949 SK Sen of Sen and Pandit Ltd., an import-cum-agency house set up Sen-Raleigh Industries of India Ltd. at Asansol in technical and financial collaboration with the Raleigh group of UK.
- The Second Tariff Enquiry recommended the continuation of protection upto 1952 with rates 70% ad valorem preferential and 80% ad valorem standard. Cycle parts and accessories were also brought under the ambit of protection.
- Murugappa Chettiar of the Murugappa group founded TI cycles of India at Ambattur (Tamil Nadu) in collaboration with Tube Investments, UK.
- 1950 JD Kapur, bicycle importer and president of North India Bicycle Importers' Association founded Atlas Cycle Industries Ltd. at Sonapat, using indigenous technology for manufacture bicycles.
- 1951 The planning era. The first five year plan set a target for the production of the initial six units.
- Munjal brothers set-up Hero Cycle industries at Ludhiana, expanding their cycle parts factory for complete bicycle production, using indigenous technology.
- Protection was extended by the government, after duly consulting the Tariff Commission, an year at a time, till 1954.
- 1952 Hans Raj Pahwa set up Avon cycles pvt. Ltd. at Ludhiana for the manufacture of complete bicycles using indigenous technology.
- 1953 Government finishing and testing centre was set up in Ludhiana to assist the estimated 400 small units in Punjab.
- United Cycle Parts Manufacturers Association took birth in Ludhiana with a membership of about forty units.
- 1954 Third tariff enquiry recommended the extension of protection till 1956; at the rates 47 1/4% ad valorem or Rs. 60/- per bicycle whichever was higher, preferential; the standard rate being 10% higher. Rates on components continued at the levels fixed in 1952.

Road Master Industries of India was founded at Rajpura for the manufacture of complete bicycles.

Development Council for the Industry was set up under the provisions of IDRA by the Ministry of Industry.

- 1955 On the recommendation of the Development Council, a part of the total output of the industry (2,50,000 bicycles) was reserved for production in the small scale sector.
- 1957 Tariff Commission recommended the continuation of protection upto 1960, at the rates: 60% advalorem preferential or Rs. 80/- per bicycle whichever higher, for complete bicycles and 65% advalorem preferential for bicycle components, the standard rates in both cases being 10% higher.
- Import controls were introduced: Government banned the import of complete bicycles.
- The industry began exports. 19 bicycles were exported for a value of Rs. 2000/-.
- 1958 The CMAI organised the Cycle Exports Pool to assist exporters financially. Members contributed to the pool a sum proportionate to their domestic sales and exporters were assisted in proportion to exports.
- 1959 As a part of the exports policy for manufacturer exporters the rates of import entitlement/replenishment were set at twice the imported raw material content of finished goods exported or 75% of the fob value of goods exported, whichever was less, subject to a minimum of 20% of the fob value of finished goods exported.
- 1960 Fifth Tariff enquiry: Protection was extended to end 1963, without change in the rates of duties.
- The rates of import entitlement were revised in that the minimum of 20% was revised to 40% depending on the rate of growth of exports. (The rate was calculated on the basis of the excess of actual exports over a base level, where the latter was a norm based on half the value of previous exports.
- 1961 Imports of bicycle components banned.
- 1962 War with China.
- Licensing suspended in view of the sufficiency of capacity.

Import of entitlements: different rates were introduced for different items; 40% for complete bicycles. Two categories of components were created. The sophisticated components were granted a rate of 40%. The simpler components, a rate of 20%. Not all components were, however, covered.

1963

Sixth tariff enquiry. Recommended the discontinuance of protection beyond 1963.

Prices of complete bicycles were frozen by voluntary agreement.

For import entitlement, a third category comprising sophisticated components was created with a replenishment rate of 75%. The complete bicycle replenishment rate was changed to Rs. 30 per bicycle.

1963-64

Units with fixed assets upto 25 lakhs was exempted from the provisions of IDRA. Bicycles were banned for further production under IDRA, since existing capacity was considered to be sufficient to meet demand.

The entitlement rate for simpler components was raised to 40%.

The cash assistance for complete bicycle exporters was set at Rs. 30. For bicycle parts, at 30% of fob value of exports.

1965

Pakistan War

Government joined the export pool of CMAI.

Recessionary trends took hold of the economy towards the end of 1965.

1966

Devaluation of the Rupee.

Government withdrew from the export pool of CMAI. The pool was wound up for lack of finances. Bicycle industry was delicensed, removed from the I schedule of IDRA, in view of the high degree of self sufficiency attained by the industry.

An year of stagnant growth, drought, poor power availability. Foreign exchange availability was low and imports of raw materials and components was affected. However, Bicycle Industry was included in a list of 59 priority industries for allocation of foreign exchange for import requirements.

Cash assistance for bicycles and bicycle parts was set at 25% of fob value of exports.

1968-69 Severe shortage of indigenous raw materials. New Policy for registered exporters. Cash assistance for bicycle industry exports placed at 30% of fob value of exports; (subject to increase in exports over previous year).

Import entitlement rates: complete bicycles - 20% of fob value of exports; and for bicycle components 30%. For special model bicycles import entitlement at 47% and cash assistance at 20% fob value of exports.

Market growth in exports.

1970 The exemption limit for licensing was raised to Rs. 1 crore.

The reject list for licensing was discontinued; applications considered on merits. Licenses were granted for export production. An export obligation (5% of production) was brought into effect, with a penalty for non compliance - 20% cut in raw material allocation.

Special model bicycles exporters were granted cash assistance of 20% of fob value of exports and import entitlement at 30%.

1974 Voluntary price restraint, in effect since 1963, ended.

Cash incentives for export of complete bicycles removed, and on protest reinstituted at a lower level of 15% of fob value. So too, for components, reduced to 20% and for special model bicycles, to 10%. Import entitlement rates reduced for complete bicycles to 10% and for bicycle parts to 20%.

1976 All parts except bicycle free wheels reserved for the small scale sector.

	<u>Cash Assistance</u>			<u>Import Entitlement</u>		
	<u>Complete Bicycles</u>	<u>Bicycle Parts</u>	<u>Special Models</u>	<u>Complete Bicycles</u>	<u>Bicycle Parts</u>	<u>Special Models</u>
1977				20%		30%
1978				15%	15%	15%
1979	17.5%	17.5%	17.5%	20%	20%	20%
1980				22.5%	22.5%	22.5%
1981				25%	25%	25%
1981	Reendorsement Scheme:					
1985	Bicycle Industry delicensed.					

APPENDIX 3

OVERVIEW : INTERNATIONAL PRODUCTION AND TRADE - RECENT TRENDS *

A 3.1 PRODUCTION

World bicycle production has been marked by fairly strong growth in recent years. Between 1976 and 1983 (the latest year for which data is available) world production grew at an average annual rate of 7%. The main source of this growth was China, who contributed with an average annual growth rate of Analysis of the data available on world production (Table A 3T1) yields the following features:

a) There is strong and increasing concentration of production in a small number of countries. While 64 countries accounted for 95% of world production in 1983; 91% was on account of 13 countries, and 72% on account of just six countries (viz. China, Japan, USA, USSR, India and Taiwan). These shares had increased since 1976. The corresponding figures then were: 82% for the thirteen major producers and 55% for the six largest producers.

b) Bicycle production in developed market economies have been marked by stagnation. The groups share in world production steadily declined from 50% in 1976 to 34% in 1983.

c) In contrast, developing market economies have registered steady increase in production, and maintained their relatively modest share or 20% over the period. Production of this group increased from

* This section draws upon ITC UNCTAD/GATT (1985)

Table A371

World production of bicycles, 1976-1983
(in thousands of units)

Producing country/area	1976		1977		1978		1979		1980		1981		1982		1983	
	Q	%	Q	%	Q	%	Q	%	Q	%	Q	%	Q	%	Q	%
TOTAL WORLD PRODUCTION (ESTIMATED)	52,000		57,000		60,000		64,000		70,000		72,000		75,000		82,000	
WORLD PRODUCTION FROM AVAILABLE DATA of which:	49,937	100.0	54,605	100.0	57,482	100.0	61,917	100.0	67,494	100.0	69,269	100.0	71,632	100.0	78,934	100.0
Developed market economies	25,685	51.4	29,971	54.7	29,641	51.4	30,351	49.0	31,237	46.3	30,632	44.3	25,352	35.4	26,946	34.2
Developing market economies	9,493	19.0	10,198	18.7	12,136	21.1	13,016	21.0	14,876	22.0	14,956	21.6	14,300	19.8	15,413	19.5
Centrally planned economies	13,759	27.6	14,434	26.1	15,705	27.1	18,540	30.0	21,381	31.7	23,681	34.1	31,980	44.8	36,575	46.3
China	6,250	12.5	7,430		8,540		10,250		13,020		17,540		24,200		27,580	35.0
Japan	6,310	12.6	6,334		5,869		6,288		7,083		6,801		6,532		7,039	8.9
United States ^a	6,400	12.8	7,500		7,500		9,000		7,000		6,800		5,100		6,270	8.0
USSR	4,254	8.7	4,518		4,686		4,649		4,736		4,637		4,978		6,000	7.6
Taiwan Province (China)	1,673	3.4	2,002		2,289		2,483		3,103		3,476		3,173		5,254	6.7
India	2,643	5.3	3,098		3,480		3,594		3,893		4,732		4,840		(5,000)	6.3
Germany, Fed. Rep.	3,657	7.7	4,211		3,988		4,173		4,900		4,494		4,041		3,921	5.0
Italy	2,013	4.0	2,355		2,213		2,172		2,701		2,759		2,291		2,400	3.0
Spain	1,545	3.1	1,656		1,600		1,846		2,788		2,455		2,125		2,055	2.6
France	1,942	3.9	2,050		2,115		2,369		2,776		2,265		2,112		1,950	2.5
United Kingdom	1,638	3.7	1,725		2,078		1,733		1,686		1,225		1,377		1,550	2.0
Poland	1,469	3.0	1,571		1,625		1,681		1,637		1,323		1,192		1,300	1.6
Mexico	680	1.3	715		780		1,059		1,059		1,139		1,210		(1,270)	1.6
Spain	752	1.5	782		797		812		831		831		891		964	1.2
Netherlands	976	2.0	1,051		1,059		1,059		1,238		1,029		928		934	1.2
Korea, Rep. of	562	1.1	672		980		889		754		747		724		731	0.9
Czechoslovakia	537	1.0	552		530		574		637		637		665		(680)	0.9
German Democratic Republic	550	1.1	576		605		614		634		627		611		651	0.8
Yugoslavia	296	0.6	448		523		572		634		703		693		625	0.8
Canada	466	0.9	544		756		n.a.		n.a.		n.a.		n.a.		n.a.	-
Argentina	700	1.4	600		(580)		(540)		500		n.a.		n.a.		n.a.	-
Sweden	195	0.4	200		216		219		244		278		315		(300)	0.4
Pakistan	218	0.4	211		245		280		297		327		399		442	0.6
Austria	214	0.4	264		236		303		415		394		377		399	0.5
Indonesia	260	0.5	230		(200)		(200)		(400)		(350)		(350)		(350)	0.4
Romania	240	0.5	243		214		260		275		325		n.a.		n.a.	-
Norway	185	0.4	196		203		230		233		251		n.a.		n.a.	-
Belgium	368	0.7	383		279		288		327		385		n.a.		n.a.	-

Producing country/area	1976		1977		1978		1979		1980		1981		1982		1983	
	Q	%	Q	%	Q	%	Q	%	Q	%	Q	%	Q	%	Q	%
South Africa	190	0.4	160		165		260		300		n.a.		n.a.		n.a.	
Hungary	279	0.6	322		339		362		372		286		270		n.a.	
Denmark	255	0.5	289		285		301		308		307		241		260	0.3
Hong Kong	n.a.		n.a.		226		230		233		230		241		244	0.3
Finland	190	0.4	230		250		280		275		238		248		n.a.	
Malaysia	420	0.8	340		190		160		190		250		230		225	0.3
Nigeria	38	0.1	44		253		165		190		230		220		n.a.	
Colombia	130	0.3	130		125		125		150		170		200		n.a.	
Philippines	n.a.		n.a.		125		120		150		150		200		n.a.	
Thailand	n.a.		n.a.		120		120		150		150		200		n.a.	
Australia ^b	188	0.4	259		324		332		370		340		160		140	0.2
Venezuela	-		-		85		90		98		88		106		125	0.2
Egypt	n.a.		n.a.		n.a.		n.a.		80		80		106		n.a.	
Bulgaria	100	0.2	120		126		120		120		135		125		105	0.1
Portugal	151	0.3	64		66		70		120		124		131		104	0.1
Turkey	50	0.1	63		85		95		95		113		94		n.a.	
New Zealand	50	0.1	50		60		60		120		90		n.a.		n.a.	
Peru	118	0.2	37		33		48		60		54		46		n.a.	
Chile	50	0.1	36		45		n.a.		n.a.		n.a.		n.a.		n.a.	
Burkina Faso	38	0.1	44		49		44		47		44		n.a.		n.a.	
Ivory Coast	15	0.1	35		39		38		n.a.		n.a.		n.a.		n.a.	
Morocco	25	0.1	30		27		25		40		n.a.		n.a.		n.a.	
Bolivia	n.a.		n.a.		n.a.		n.a.		28		n.a.		n.a.		n.a.	
Algeria	9	-	10		15		17		20		15		n.a.		n.a.	
Tunisia	84	0.2	63		76		52		41		31		n.a.		33	
Central African Republic	4	-	5		4		4		4		4		23		n.a.	
Zimbabwe	n.a.		n.a.		n.a.		n.a.		n.a.		n.a.		20		25	
Mali	10	-	15		11		12		12		17		20		n.a.	
Guinea	n.a.		n.a.		20		20		20		20		20		n.a.	
Cameroon	14	-	13		10		9		10		15		n.a.		n.a.	
Senegal	n.a.		8		14		n.a.		17		n.a.		n.a.		n.a.	
Burkina Faso	29	0.1	40		41		43		45		28		30		13	
Niger	n.a.		n.a.		n.a.		21		5		11		n.a.		n.a.	
Sierra Leone	9	-	12		13		16		20		15		10		n.a.	
Togo	4	-	6		n.a.		n.a.		n.a.		n.a.		n.a.		n.a.	

Source: Industrial associations and other trade sources; national production statistics; Yearbook of Industrial Statistics (United Nations publication, Sales No. F. 80.XVII.9).^a Domestic shipments.^b Fiscal year from July of the preceding year to June.^c Fiscal year from 1 April of the preceding year to 31 March.

Note: Figures in round brackets are estimates.

A (III) 3

under 10 million units in 1976 to over 15 million units in 1983. India and Taiwan lead the group, followed by Brazil and Mexico. The four together contributed upto 90% of the group production in 1983. In the case of both India and Taiwan, increased domestic demand and export demand contributed to increase the production.

d) Centrally planned economies increased their production shares sharply, mainly on account of China.

e) There is a strong concentration of production in terms of geographical areas. Asia accounts for 60% of world production while Europe accounts for 25% and the Americas for 12%. Africa and Australia have negligible shares of 2% and 1% each.

f) There is an increasing internationalisation of production technology. Most of the transfer of technology is through licensing arrangements and jointventures. Director foreign investment has fallen in significance. In many countries bicycles and components are restricted for imports, in order to protect domestic industry, and partnering local entrepreneurship is increasingly the only strategy. Intra company trade could then be a major source of exports.

A 3.2 TRADE

In the aggregate, components account for 70% of the world trade in bicycles and components. Within the total, the structure of trade differs between developed and developing countries. During 1979-1983, components accounted for 77% of the exports of developed market economies. In developing market economies and CPEs, complete

bicycles had the greater share in exports, 54% and 60% respectively. In contrast, all groups import more components than bicycles, though developed market economies import a lesser share of components than the other groups.

The trade in complete bicycles is mainly in the CKD/SKD form. The reasons are: assembly is comparatively simple and freight costs for the built up product is considerably higher than for the knocked down varieties.

A 3.2 WORLD IMPORTS

Available data on world imports of the industry is given in Table A 3T2. The following features are of interest:

- a) World imports increased from about US \$ 1.6 bn in 1979 to about US \$ 2.0 bn in 1983 declining after the peak at US \$ 2.3 bn in 1980.
- b) Developed market economies constitute the principal import destination. The group accounted for about 77% of world imports in 1983 (up from 72% in 1979).
- c) Developing market economies held declining shares during the period. 22% in 1983, down from 28% in 1979.
- d) CPE's have negligible shares in imports.
- e) US is, by far, largest individual country market for bicycles and components and accounted for 24% of world imports in 1983. Its share has steadily increased over the period.

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TABLE A3T2(a)

World imports of bicycles and components, by destination, 1979-1983
(in millions of United States dollars)

Destination	1979		1980	1981	1982	1983	
	V	% of total	V	V	V	V	% of total
World of which:	1,601.78	100.00	2,293.39	2,212.93	1,779.38	2,017.51	100.0
Developed market economies of which:	1,147.86	71.7	1,787.29	1,658.25	1,324.71	1,562.17	77.4
United States	245.24	15.3	416.07	462.45	324.64	487.10	24.1
Germany, Fed. Rep.	181.31	11.3	272.25	238.94	181.82	194.51	9.6
Switzerland	28.56	1.8	72.60	51.17	78.78	127.67	6.3
United Kingdom	100.51	6.3	137.48	102.88	103.51	125.27	6.2
Canada	66.42	4.1	77.45	84.77	60.83	96.68	4.8
France	91.04	5.7	137.54	109.28	94.21	86.71	4.3
Netherlands	112.96	7.1	167.71	130.92	90.66	86.32	4.3
Belgium-Luxembourg	50.83	3.2	72.70	60.83	53.53	47.72	2.4
Australia	28.00	1.7	57.73	61.94	43.51	41.87	2.1
Austria	44.06	2.8	67.46	48.04	38.07	41.79	2.1
Developing market economies of which:	446.78	27.9	496.71	544.29	447.08	447.89	22.2
Taiwan Province (China) ^{b/}	66.06	4.1	63.89	70.24	48.70	64.50	3.2
Iran, Islamic Rep. of ^{b/}	29.89	1.9	39.01	35.89	30.99	59.24	2.9
Indonesia ^{b/}	16.11	1.0	35.94	64.30	64.23	55.41	2.7
Hong Kong	39.19	2.4	47.22	50.80	36.07	37.52	1.6
Singapore	15.67	1.0	22.53	22.04	18.99	22.67	1.1
Nigeria	101.19	6.3	71.80	75.82	74.33	21.96	1.1
Algeria	4.13	0.3	3.21	7.72	6.64	15.88	0.8
Colombia	5.86	0.4	6.70	0.38	9.37	15.47	0.8
Saudi Arabia	11.45	0.7	12.36	13.79	16.84	14.62	0.7
Egypt ^{c/}	4.85	0.3	1.86	4.36	6.53	12.00	0.6
Thailand ^{c/}	8.31	0.5	12.29	12.38	7.64	9.97	0.5
Korea, Rep. of	8.23	0.5	8.76	9.66	9.10	9.27	0.5
Pakistan	1.33	0.1	1.32	4.27	6.02	8.73	0.4
United Arab Emirates	2.10	0.1	3.85	5.47	4.90	6.00	0.3
Venezuela	2.96	0.2	3.04	5.58	11.04	7.85	0.4
Tunisia	5.12	0.3	6.77	5.54	7.46	7.46	0.4
Malaysia	4.95	0.3	6.54	7.15	4.60	5.60	0.3
Sri Lanka	3.36	0.2	16.60	6.95	4.71	5.30	0.3
Syrian Arab Republic	5.19	0.3	4.56	6.20	4.56	4.85	0.2
Chile	13.46	0.8	10.00	16.94	2.38	1.76	0.1
Centrally planned economies ^{b/}	7.14	0.4	9.39	10.39	7.59	7.45	0.4

Source: UNCTAD/ITC Comtrade Data Base System.

a/ Obtained from microfiches of the Organisation for Economic Co-operation and Development (OECD).

b/ Based on export statistics of trading partners.

c/ Official national statistics.

d/ Official national statistics (including parts of articles falling within headings 87.09, 87.10, 87.11, i.e. motor-cycles, cycles and invalid carriages).

e/ ITC estimate.

TABLE A3T2(b)

200/137-4 World imports of bicycles, by destination, 1979-1983
(in millions of United States dollars)

Destination	1979		1980	1981	1982	1983	
	V	% of total	V	V	V	V	% of total
World of which:	523.24	100.0	710.02	712.82	508.44	577.39	100.0
Developed market economies of which:	398.97	76.3	566.64	574.76	425.98	490.44	84.9
United States	117.38	22.4	162.89	195.96	128.04	206.96	35.8
Germany, Fed. Rep.	46.23	8.8	77.45	72.18	51.15	47.22	8.2
United Kingdom	38.35	7.3	51.61	38.91	35.42	45.18	7.8
France	28.52	5.5	41.17	35.79	31.98	28.40	4.9
Netherlands	34.19	6.5	49.72	36.25	26.99	24.99	4.2
Belgium-Luxembourg	19.34	3.7	27.43	21.04	18.85	17.88	3.1
Sweden	19.69	3.8	29.78	36.23	27.96	17.24	3.0
Denmark	18.14	3.5	26.93	22.07	15.60	15.86	2.7
Australia	6.92	1.3	13.01	20.49	16.32	14.50 ^{a/}	2.5
Canada	13.73	2.6	13.31	15.32	7.52	14.05	2.4
Developing market economies of which:	123.00	23.5	141.30	135.78	81.16	85.24	14.8
Saudi Arabia	5.29	1.2	7.75	8.83	12.59	9.71 ^{b/}	1.7
Singapore	3.58	0.7	6.42	6.20	6.81	9.46	1.6
Algeria	0.32	0.1	1.58	4.80	0.04	9.06	1.6
Indonesia	4.53	0.9	8.27	6.26	8.71	8.74	1.5
Hong Kong	5.04	1.0	9.14	14.49	11.18	7.85	1.4
United Arab Emirates	1.60 ^{c/}	0.3	3.08	3.94	3.87	4.50 ^{c/}	0.8
Egypt	1.19	0.2	0.72 ^{c/}	1.78	1.25 ^{b/}	3.74 ^{c/}	0.6
Syrian Arab Republic	3.46	0.7	3.37 ^{c/}	4.62 ^{c/}	3.51 ^{b/}	3.64 ^{b/}	0.6
Kuwait	3.32	0.6	3.77	2.90	2.45 ^{b/}	2.50 ^{c/}	0.4
Sudan	2.04	0.4	0.59	2.20	2.80 ^{c/}	2.50 ^{c/}	0.4
Trinidad and Tobago	0.93	0.2	1.21	1.06	1.78	2.44	0.4
Malaysia	0.47 ^{c/}	0.1	1.26 ^{c/}	1.97 ^{c/}	1.28 ^{b/}	2.00 ^{c/}	0.3
Panama (excluding Canal Zone)	1.47	0.3	1.47	1.13	1.19	1.50 ^{c/}	0.3
Nigeria	34.53	6.6	19.98 ^{d/}	9.95 ^{d/}	4.58 ^{d/}	1.10 ^{d/}	0.2
Sri Lanka	1.28	0.2	12.67	4.37	1.96	0.92	0.2
Chile	9.43	1.8	6.39	11.46	1.07 ^{d/}	0.78 ^{d/}	0.2
Iran, Islamic Rep. of ^{d/}	10.83	2.1	14.06	13.83	-	0.56	0.2
Libyan Arab Jamahiriya	1.52	0.3	1.25	3.19	0.78 ^{d/}	9.39 ^{d/}	0.2
Ghana	0.94	0.2	3.87	0.13 ^{c/}	0.55 ^{d/}	0.07 ^{d/}	-
Venezuela	2.95	0.6	3.04	5.55	0.46 ^{d/}	-	-
Centrally planned economies ^{d/}	1.27	0.2	2.08	2.28	1.30	1.71	0.3

Source: UNCTAD/ITC Comtrade Data Base System.

a/ Obtained from OECD microfiches.

b/ Official national statistics.

c/ ITC estimate.

d/ Based on export statistics of trading partners.

TABLE A3T2(c)

World imports of bicycle components, by destination, 1979-1983
(in millions of United States dollars)

Destination	1979		1980	1981	1982	1983	
	V	% of total	V	V	V	V	% of total
World of which:	1,072.93	100.0	1,562.40	1,499.00	1,259.45	1,431.11	100.0
Developed market economies of which:	748.65	69.8	1,220.47	1,083.31	898.47	1,071.59	74.9
United States	127.05	11.9	253.17	266.48	195.00	280.13	19.6
Germany, Fed. Rep.	135.08	12.6	294.80	166.75	130.66	147.29	10.3
Switzerland	22.84	2.1	64.64	42.54	72.19	120.66	8.4
Canada	52.68	4.9	64.14	69.45	53.30	82.62	5.8
United Kingdom	62.15	5.8	85.06	63.96	68.08	60.08	4.2
Netherlands	78.76	7.3	117.99	94.67	63.66	61.33	4.3
France	62.52	5.8	96.37	71.49	62.23	58.31	4.1
Austria	30.99	2.9	52.02	37.08	29.53	31.58	2.2
Belgium-Luxembourg	31.48	2.9	45.27	39.78	34.67	29.84	2.1
Australia	21.07	2.0	44.72	41.45	27.19	27.37 ^a	1.9
Developing market economies of which:	310.84	29.7	335.02	407.59	354.69	353.78	24.7
Taiwan Province (China) ^{b/}	64.47	6.0	63.26	70.20	48.52	64.46	4.5
Iran, Islamic Rep. of ^{c/}	15.50	1.4	15.94	22.06	30.99	58.67	4.1
Indonesia ^{d/}	11.57	1.1	17.67	58.03	55.51	46.66	3.3
Hong Kong	34.15	3.2	38.08	36.30	24.69	23.67	1.7
Nigeria	66.66	6.2	40.38 ^{e/}	65.86 ^{e/}	69.74 ^{e/}	20.85 ^{e/}	1.5
Colombia	5.37	0.5	6.29	-	9.27	15.31	1.1
Singapore	12.09	1.1	16.10	15.03	12.17	13.20	1.0
Thailand ^{e/}	7.36	0.7	10.65	11.16	6.92	9.40	0.7
Korea, Rep. of	7.79	0.7	8.48	9.64	9.66 ^{d/}	8.75	0.6
Pakistan	2.89 ^{b/}	0.3	3.41 ^{b/}	5.08 ^{b/}	6.02	8.71	0.6
Egypt	1.65	0.3	1.13 ^{e/}	2.57 ^{e/}	5.27 ^{e/}	8.26 ^{e/}	0.6
Tunisia	4.92	0.5	6.74	5.38	6.72 ^{e/}	7.02 ^{b/}	0.5
Algeria	1.81	0.4	1.63	2.92	6.59	6.82	0.5
Brazil	6.95	0.6	12.00	10.76	4.57	5.02 ^{e/}	0.4
Saudi Arabia	5.16	0.5	4.61	4.96	4.25	4.91 ^{e/}	0.3
Sri Lanka	2.08	0.2	3.92	2.57	2.74	4.38	0.3
Bangladesh	4.53	0.4	3.25	8.64	3.30	4.18	0.3
Burkina Faso	6.29	0.6	9.78	9.96	4.96	4.10	0.3
Malaysia	4.47 ^{e/}	0.4	5.27 ^{e/}	5.18 ^{e/}	3.31 ^{e/}	3.60 ^{d/}	0.3
Chile	4.02	0.4	3.60	5.48	1.30 ^{e/}	1.00 ^{e/}	0.1
Centrally planned economies ^{b/}	5.44	0.5	6.91	8.10	6.29	5.74	0.4

Source: Comtrade Data Base System, ITC/UNSO.

a/ Obtained from OECD microfiches.

b/ Based on export statistics of trading partners.

c/ Official national statistics.

d/ ITC estimate.

e/ Official national statistics (including parts of articles falling within headings 87.09, 87.10, 87.11, i.e. motor-cycles, cycles and invalid carriages).

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f) A notable feature was the dramatic increase in the share of Switzerland. Swiss imports went up from US \$ 29 mn in 1979 to US \$ 128 mn in 1983.

g) The shares of FRG, France, Netherlands, Belgium, Luxemburg and Austria fell, while those of Australia, Canada and UK were steady.

h) Among developing market economies, (subject to the limited precision of data) the largest importer was Taiwan. However its share in world imports has declined overtime.

i) Iran, Indonesia, Egypt and Columbia increased their shares, while the major decline in share was recorded by Nigeria falling precipitately in 1983.

j) A comparison of data in Tables A3T2, A3T3 and A3T4 reveal that:

- World imports of components are significantly larger than world imports of bicycles, by a factor of 2.5.

- The share of developed market economies in world imports of bicycles is substantially higher (85% in 1983) than their share in world imports of components (75% in 1983).

- The markets which are more receptive to bicycles are Sweeden and Denmark; to components - FRG and Switzerland, and exclusively to components - Taiwan. The US market accepts both.

TABLE A3T3 (a)

World exports of bicycles and components, by origin, 1979-1983
(in millions of United States dollars)

Origin	1979		1980	1981	1982	1983	
	V	% of total	V	V	V	V	% of total
World of which:	1,719.15	100.0	2,466.86	2,407.07	1,961.52	2,115.52	100.0
Developed market economies of which:	1,415.06	82.3	2,039.23	1,938.45	1,591.24	1,755.63	83.0
Japan	532.35	31.0	793.86	911.95	728.79	927.21	43.8
Italy	259.78	15.1	363.80	305.61	261.56	277.85	13.1
France	165.61	9.6	243.69	193.06	150.57	154.88	7.3
Germany, Fed. Rep.	157.41	9.2	196.43	165.59	141.42	131.46	6.2
Netherlands	62.69	3.6	96.48	90.17	69.90	64.15	3.0
United Kingdom	109.50	6.4	132.76	81.54	62.90	56.57	2.7
United States	12.56	0.7	40.90	43.81	29.57	28.62	1.4
Austria	27.77	1.6	39.56	30.53	24.22	22.27	1.1
Switzerland	18.72	1.1	30.95	23.01	44.92	21.64	1.0
Belgium-Luxembourg	14.70	0.9	23.82	18.30	13.53	16.67	0.8
Developing market economies of which:	222.96	13.0	366.44	386.82	387.19	313.08	14.8
Taiwan Province (China) ^{a/}	137.51	8.0	202.42	254.54	209.86	269.38	12.7
India	40.10	2.3	73.99	68.57	62.37	12.00	0.6
Singapore	5.84	0.3	12.68	13.09	8.07	10.91	0.5
Korea, Rep. of	11.93	0.7	17.87	17.82	13.97	9.10	0.4
Brazil	11.93	0.7	13.74	12.59	1.60	2.23	0.1
Ivory Coast	2.35	0.1	2.06	1.92	1.16	1.87	0.1
Pakistan	0.06	-	-	0.03	0.83	1.41	0.1
Mexico	2.26	0.1	8.60	7.11	1.07	1.16	0.1
Hong Kong	1.61	0.1	4.17	5.44	2.60	1.04	-
Thailand	0.10	-	0.69	0.46	0.33	0.87	-
Malaysia	0.54	-	2.92	0.73	0.58	0.80	-
Saudi Arabia	1.20	0.1	1.37	0.53	0.88	0.55	-
Peru	2.02	0.1	2.40	0.79	0.43	0.40	-
Morocco	0.08	-	0.43	0.26	0.29	0.40	-
Philippines	0.74	-	0.52	0.33	0.29	0.35	-
Kenya	0.53	-	0.39	0.10	0.25	0.15	-
Indonesia	-	-	-	0.09	0.04	0.16	-
Burkina Faso	-0.16	-	0.02	0.03	0.02	0.06	-
Guatemala	-1.12	0.1	1.17	0.70	0.91	0.01	-
Bolivia	0.60	-	0.16	1.63	0.05	-	-
Centrally planned economies ^{a/} of which:	81.13	4.7	81.19	81.00	63.09	46.81	2.2
China	43.76	2.5	41.63	43.78	40.00	29.84	1.4
Czechoslovakia	15.02	0.9	16.24	17.87	15.54	11.08	0.5
Poland	14.80	0.9	15.42	13.45	5.13	4.36	0.2
German Democratic Republic	0.46	-	0.73	2.38	1.22	1.02	-
Hungary	6.61	0.4	6.31	3.36	0.63	0.43	-

Source: UNCTAD/ITC Comtrade Data Base System.

^{a/} Based on import statistics of trading partners.

^{b/} Official national statistics, fiscal year 1 April - 31 March starting the previous calendar year.

^{c/} Official national statistics.

^{d/} ITC estimate.

TABLE A 3T3(b)

World exports of bicycles, by origin, 1979-1983
(In millions of United States dollars)

Origin	1979		1980	1981	1982	1983	
	V	% of total	V	V	V	V	% of total
World of which:	518.79 ^a	100.0	725.52	710.55	527.06	344.35	100.0
Developed market economies of which:	348.58	67.2	511.26	450.80	334.62	346.26	63.6
Japan	46.39	8.9	104.08	123.25	65.34	91.25	16.6
Italy	58.62	11.3	76.00	59.26	56.58	60.02	11.0
France	52.80	10.2	87.73	76.18	54.63	51.40	9.4
Germany, Fed. Rep.	54.48	10.5	62.46	54.22	48.43	47.41	8.7
Netherlands	30.97	6.0	54.16	50.51	32.82	26.12	4.8
United Kingdom	55.04	10.6	57.34	30.42	22.99	23.24	4.3
Austria	19.12	3.7	27.51	21.40	17.84	14.75	2.7
Denmark	7.27	1.4	10.66	10.92	9.07	6.24	1.1
Norway	7.17	1.4	10.70	11.39	8.04	5.80	1.1
Switzerland	0.25	-	0.64	1.94	2.50	4.33	0.8
Developing market economies of which:	119.63	23.1	161.44	205.87	161.19	172.42	31.7
Taiwan Province (China) ^{a/}	79.88	15.4	110.08	145.62	120.56	157.32	28.9
Korea, Rep. of	10.27	2.0	16.39	16.12	13.36 ^{b/}	7.65	1.4
Singapore	0.61	0.1	3.43	1.70	1.42	2.42	0.4
Brazil	9.13	1.8	9.83	9.16	1.70	1.36	0.2
Pakistan	n.a.	n.a.	-	n.a.	0.34	1.25	0.2
Thailand	0.06	-	0.57	0.34	0.20	0.73	0.1
India	10.41 ^{c/}	2.0	12.01 ^{c/}	25.97 ^{c/}	20.37 ^{c/}	0.36 ^{a/}	0.1
Hong Kong	0.68	0.1	2.28	2.52	1.11	0.35	0.1
Mexico	1.28	0.2	1.73 ^{c/}	1.10 ^{c/}	0.16 ^{a/}	0.35 ^{a/}	0.1
Malaysia	0.42	0.1	1.65	0.33	0.17	0.20 ^{a/}	-
Peru	1.95	0.4	0.51	0.37	0.35	0.15 ^{a/}	-
Saudi Arabia	0.62	0.1	0.82	0.30	0.16	0.15 ^{a/}	-
Kuwait	0.48	0.1	0.27	0.06	0.17 ^{a/}	0.10 ^{a/}	-
Kenya	0.05	-	0.41	0.03	0.02	0.05 ^{a/}	-
Guatemala	1.11	0.2	1.12	0.62	0.88 ^{a/}	0.01 ^{a/}	-
Cameroon	0.17	-	-	n.a.	0.19	n.a.	n.a.
Bolivia	0.68	0.1	0.16 ^{a/}	1.63 ^{a/}	0.05 ^{a/}	- ^{a/}	-
Tanzania, United Rep. of	0.04	-	0.18	-	n.a.	n.a.	n.a.
Colombia	1.79	0.3	0.02	n.a.	n.a.	n.a.	n.a.
Centrally planned economies ^{a/} of which:	50.58	9.7	52.82	45.88	31.25	25.67	4.7
China	21.21	4.1	22.62	21.41	19.82	14.78	2.7
Czechoslovakia	8.59	1.7	9.24	9.07	6.10	6.35	1.2
Poland	14.57	2.8	15.26	11.36	4.47	3.84	0.7

Source: UNCTAD/ITC Comtrade Data Base System.

a/ Based on import statistics of trading partners.

b/ Official national statistics.

c/ Official national statistics, fiscal year 1 April - 31 March starting the previous calendar year.

d/ ITC estimate.

TABLE A 3T3(c)

World exports of bicycle components, by origin, 1979-1983
(in millions of United States dollars)

Origin	1979		1980	1981	1982	1983	
	V	% of total	V	V	V	V	% of total
World of which:	1,194.19	100.0	1,715.59	1,694.14	1,434.12	1,569.30	100.0
Developed market economies of which:	1,066.36	89.3	1,537.92	1,479.55	1,256.48	1,409.27	89.8
Japan	485.97	40.7	689.78	788.69	663.44	835.96	53.3
Italy	201.16	16.8	287.80	246.24	204.98	217.82	13.9
France	112.81	9.4	155.96	116.87	95.93	103.47	6.6
Germany, Fed. Rep.	102.92	8.6	133.96	111.37	92.98	84.04	5.3
Netherlands	31.71	2.6	42.32	39.66	37.07	38.03	2.4
United Kingdom	54.45	4.6	75.41	51.12	39.91	55.32	3.5
United States	13.54	1.0	39.29	42.34	28.75	28.15	1.8
Switzerland	18.46	1.5	30.30	21.07	42.42	17.31	1.1
Belgium-Luxembourg	12.66	1.1	19.16	15.01	11.52	15.18	1.0
Austria	8.64	0.7	12.05	9.13	6.38	7.52	0.5
Developing market economies of which:	98.70	8.3	160.47	179.88	145.85	160.30	9.9
Taiwan Province (China) ^{a/}	57.15	4.8	91.76	107.78	89.28	112.04	7.1
India	25.70 ^{b/}	2.1	38.74 ^{b/}	42.60 ^{b/}	42.01 ^{b/}	11.63 ^{a/}	0.7
Singapore	5.23	0.4	9.78	11.38	6.63	8.49	0.5
Ivory Coast	2.35	0.2	2.05 ^{c/}	1.91	1.16	1.86	0.1
Korea, Rep. of	1.66	0.1	1.48	1.70	0.61 ^{d/}	1.44	0.1
Brazil	2.80	0.2	3.30	3.43	1.29	0.86	0.1
Mexico	0.97	0.1	6.89 ^{d/}	5.95 ^{d/}	0.93 ^{d/}	0.80 ^{d/}	-
Hong Kong	0.92	0.1	1.88	2.92	1.68	0.68	-
Malaysia	0.12 ^{d/}	-	1.77 ^{d/}	0.35 ^{d/}	0.40 ^{d/}	0.60 ^{d/}	-
Saudi Arabia	0.57	-	0.55	0.23	0.64	0.40 ^{d/}	-
Morocco	0.08	-	0.43	0.26	0.29	0.40 ^{d/}	-
Philippines	0.74	0.1	0.52	0.33	0.29	0.35	-
Peru	0.07	-	1.89	0.41	0.08	0.25 ^{d/}	-
Pakistan	-	-	-	0.31 ^{d/}	0.49	0.16	-
Indonesia	-	-	-	0.09	0.04	0.14 ^{d/}	-
Thailand ^{d/}	0.03	-	0.12	0.11	0.12	0.13	-
Kuwait	0.05	-	0.11	0.03	0.08 ^{d/}	0.05	-
Burkina Faso	0.12	-	0.02	0.01	0.01	0.02	-
Tunisia	0.13	-	0.12	n.a.	n.a.	n.a.	-
Centrally planned economies ^{a/} of which:	29.13	2.4	27.20	34.71	31.79	19.73	1.3
China	20.73	1.7	17.88	21.19	20.13	15.05	1.0
Czechoslovakia	6.32	0.5	6.95	8.78	9.43	4.72	0.3
Poland	0.22	-	0.15	2.08	0.66	0.51	-

Source: UNCTAD/ITC Comtrade Data Base System.

a/ Based on import statistics of trading partners.
 Official national statistics, fiscal year 1 April - 31 March starting the previous calendar year.
 ITC estimate.
 Official national statistics.

A 3.2.2 WORLD EXPORTS

Available data is presented in Table A3T3. The following features are significant:

- a) Japan is the leading world supplier, and increased its exports from US \$ 532 mn in 1979 (31% of world total) to US \$ 927 mn in 1983 (44% of world total).
- b) Other leading exporters are Italy, Taiwan, France, FRG, Netherlands, UK and India.
- c) Excluding Japan, the exports of all leading developed market economy exporters peaked in 1980 and steadily declined thereafter. Their shares too fell over the period.
- d) Components account for the greater share of the exports of the developed marked economies. In 1983 this amounted to 90% for Japan, 78% for Italy, 67% for France and 64% for FRG. Among developing market economies, Taiwan exported more bicycles than components.

A 3.2.3 TRADE FLOWS

Table A3T4 constituted from available data, captures the patterns in trade flows among the three groups of economies. Conclusions on CPEs are rendered suspect because of the absence of official statistics. The following are the notable features:

- a) Developed market economies import mainly from other countries in the group. However the share of intra group trade declined over the period. The drop was mainly due to increasing

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Bicycles and components: world trade flows, 1979-1983
(in percentages of total)

	FROM TO	1979				1983			
		Developed market economies	Developing market economies	Centrally planned economies	Total	Developed market economies	Developing market economies	Centrally planned economies	Total
Bicycles	Developed market economies	73.7 (85.0)	19.0 (65.3)	7.3 (56.9)	100.0	63.7 (94.0)	33.3 (88.5)	3.0 (57.3)	100.0
	Developing market economies	43.3 (13.9)	36.8 (34.7)	19.9 (43.1)	100.0	37.8 (5.5)	39.8 (10.5)	22.7 (42.8)	100.0
	Centrally planned economies	92.3 (0.3)	7.7 (-)	n.a. (-)	100.0	48.5 (0.3)	51.5 (1.0)	n.a. (n.a.)	100.0
	Total	(100.0)	(100.0)	(100.0)		(100.0)	(100.0)	(100.0)	
Components	Developed market economies	89.6 (82.2)	11.4 (61.0)	3.0 (42.8)	100.0	80.6 (85.8)	18.1 (79.4)	1.3 (35.1)	100.0
	Developing market economies	62.4 (17.8)	24.3 (38.0)	13.3 (55.8)	100.0	65.4 (14.0)	22.5 (19.7)	12.1 (64.2)	100.0
	Centrally planned economies	47.6 (0.3)	34.9 (1.0)	17.5 (1.4)	100.0	49.2 (0.3)	50.8 (0.9)	(n.a.) (n.a.)	100.0
	Total	(100.0)	(100.0)	(100.0)		(100.0)	(100.0)	(100.0)	
Total	Developed market economies	91.5 (80.8)	7.4 (53.9)	0.7 (18.3)	100.0	88.4 (83.4)	11.1 (69.6)	0.5 (17.4)	100.0
	Developing market economies	71.6 (19.0)	18.3 (42.0)	10.1 (78.0)	100.0	70.8 (16.8)	19.1 (29.5)	10.1 (82.6)	100.0
	Centrally planned economies	92.3 (0.3)	7.7 (2.1)	n.a. (3.8)	100.0	48.5 (0.1)	51.5 (0.9)	n.a. (n.a.)	100.0
	Total	(100.0)	(100.0)	(100.0)		(100.0)	(100.0)	(100.0)	

Source: UNCTAD/ITC Comtrade data base system.

Note: The figures in round brackets add up vertically, and the others horizontally.