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AUTOMOTIVE INDUSTRIES IN DEVELOPING COUNTRIES[1/]

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INTERNATIONAL DEVELOPMENT ASSOCIATION

AUTOMOTIVE INDUSTRIES IN DEVELOPING COUNTRIES

May 31, 1968

Economics Department
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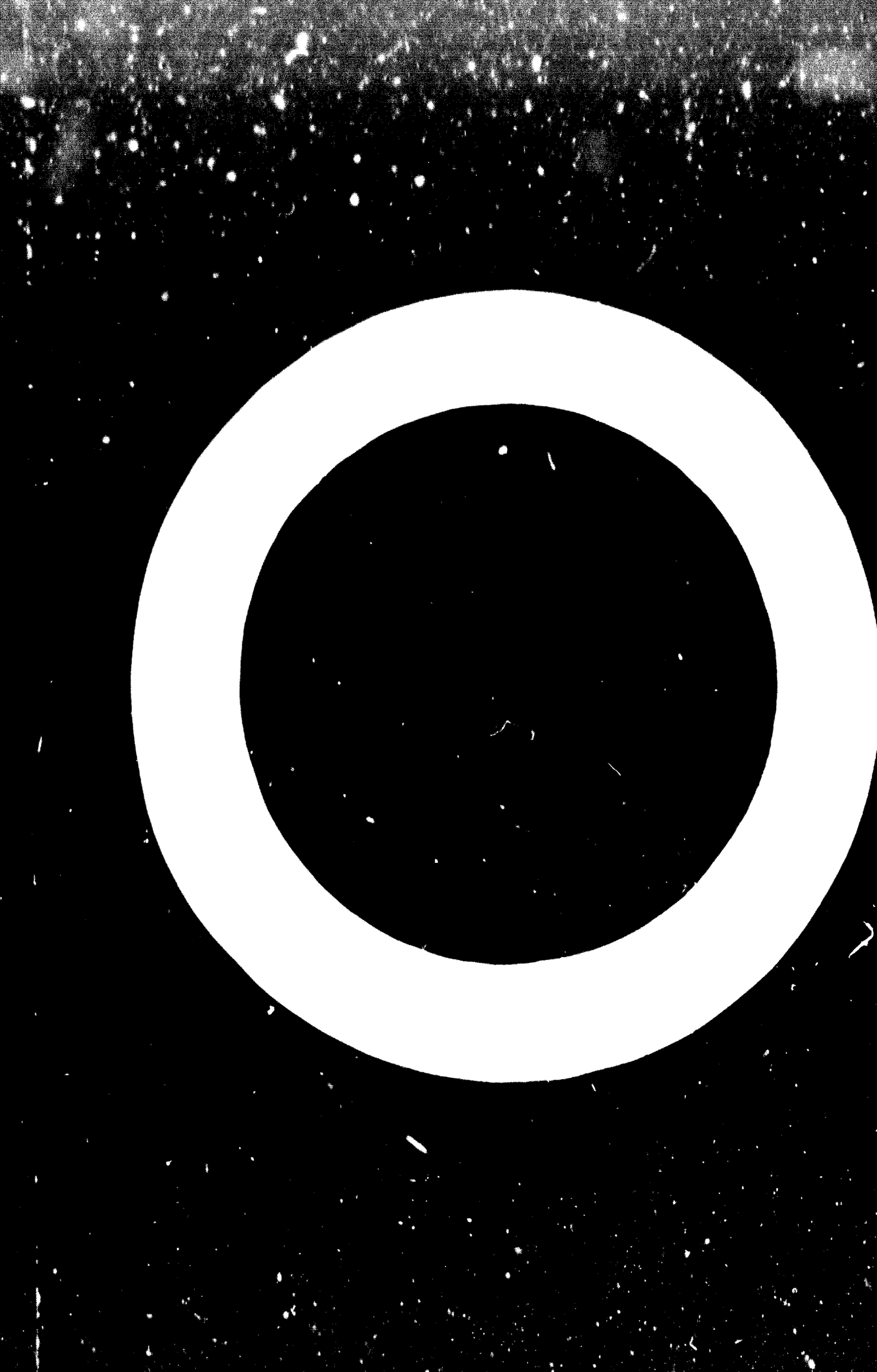

PREFACE

The study on the automotive industries is one of three case studies prepared as part of a broader research project dealing with the experience of developing countries with the establishment of capital goods industries. The other case studies deal with the heavy electrical equipment and the heavy mechanical equipment industries. A methodological paper and a more general paper focused on the protection of capital goods industries are also being prepared.

Problems of import substitution, industrial efficiency and export competitiveness need to be analyzed with the help of various types of specialists, including, among others, economists conversant with trade theory and industrial economists and engineers. Adequate analysis of the problems involved requires a treatment of methodological and theoretical questions involved, a systematic analysis of various policy instruments, as well as case studies of countries and industries.

In the course of the research project, the Bank staff had the benefit of contacts with several economists who are working elsewhere on similar and related problems. Close contact was maintained with two other research projects which supplemented the studies of the Bank team: a study on industrialization in developing countries by the OECD Development Centre under the direction of Professors Ian Little, Tibor Scitovsky and Maurice Scott, and a study on the structure of protection and its impact on resource allocation which Professor Bela Balassa, as a staff member of, and presently a consultant to, the Bank, is carrying out with the help of a number of economists. Other economists who were of help in various phases of the project include Michael Bruno, of the Israeli Planning Office, and Professors Edward S. Mason, Morris Adelman and Robert Mundell.

The research project was carried out during its formative stage under the direction of Barend A. de Vries. The case studies of industries, dealing with automotive, heavy electrical and mechanical equipment industries, were under the direction of Bertil Walstedt. Herman van der Tak reviewed the studies in their later phase.

The industries selected for case studies play a strategic role in the more advanced phases of industrial development. Their establishment takes up a substantial share of investment and is, therefore, often accompanied by strains on real and financial resources and poses difficult problems of domestic and external economic policies. In addition, these industries produce many items used in the construction of the kind of projects financed by the Bank.

The industry studies are designed to consider the following questions:

- What has been the experience thus far with the industry in countries with relatively small markets?

- What is the economics of the industry in more advanced industrial countries and what are the conditions of international markets for the products concerned? What aspects are

relevant for the growth of the industries in the developing countries?

- What are the costs and benefits of establishing these industries in developing countries? In particular, what is the cost of the saving of foreign exchange made possible by the industry?

- What can be said about the efficiency of the industry, at present and over time, and how is cost efficiency affected by such industrial factors as economies of scale, availability of supplier capabilities, skilled manpower, product design, access to new technology?

- What has been the impact upon the industry's cost efficiency of government policies - protection, exchange and import regulations, requirements as to domestic content of production, credit, etc. - as well as of the structure and the extent of monopoly of domestic industry?

- What general indications, if any, can be given on policies of developing countries, as well as industrialized countries, to foster the healthy growth of the industry?

- What contributions might reasonably be expected from large multinational firms in promoting manufacturing in developing countries?

- What is the future outlook for the industries in an international context and what might be the manufacturing role of developing countries?

Because of the nature of the problems to be analyzed, heavy reliance had to be placed on direct interviews with, and information provided by, manufacturing concerns in developing countries and associated or parent firms in advanced industrial countries. In the case of the automotive industry visits to developing countries were limited to Argentina and Yugoslavia, but interviews with multinational companies covered their operations in much of the developing world.

We are grateful to the various company representatives for their generous and invaluable assistance. They have shown great interest in the studies, have discussed the problems of the industry with frankness and made available information without which the study could not have been undertaken. They have supplied comments and criticisms on an earlier draft, permitting us to test the validity of the analysis and the accuracy of the factual information used.

The present study was carried out by Mr. Jack Baranson. His findings and recommendations are based on field work in Argentina and Yugoslavia, supplemented by interviews with vehicle and parts manufacturers in Europe and North America and documentation available in the Bank. The

author was also able to draw on his research work carried out prior to joining the Bank and published as Manufacturing Problems in India (Syracuse University Press, 1967) and Technology for Developing Economies (Pergamon Press, 1971). Mr. Sami El Darwis (of the International Finance Corporation) accompanied the author [illegible] several [illegible] Europe and drafted a technical background paper [illegible] assisted in preparing the tables and [illegible] appear in the study. The author gratefully acknowledges this assistance as well as the [illegible] comments and suggestions by a [illegible] manufacturers and by other experts both inside and outside the World Bank Group. The author alone is responsible for the facts and opinions presented, which should not be taken as necessarily representing the views of the Bank.

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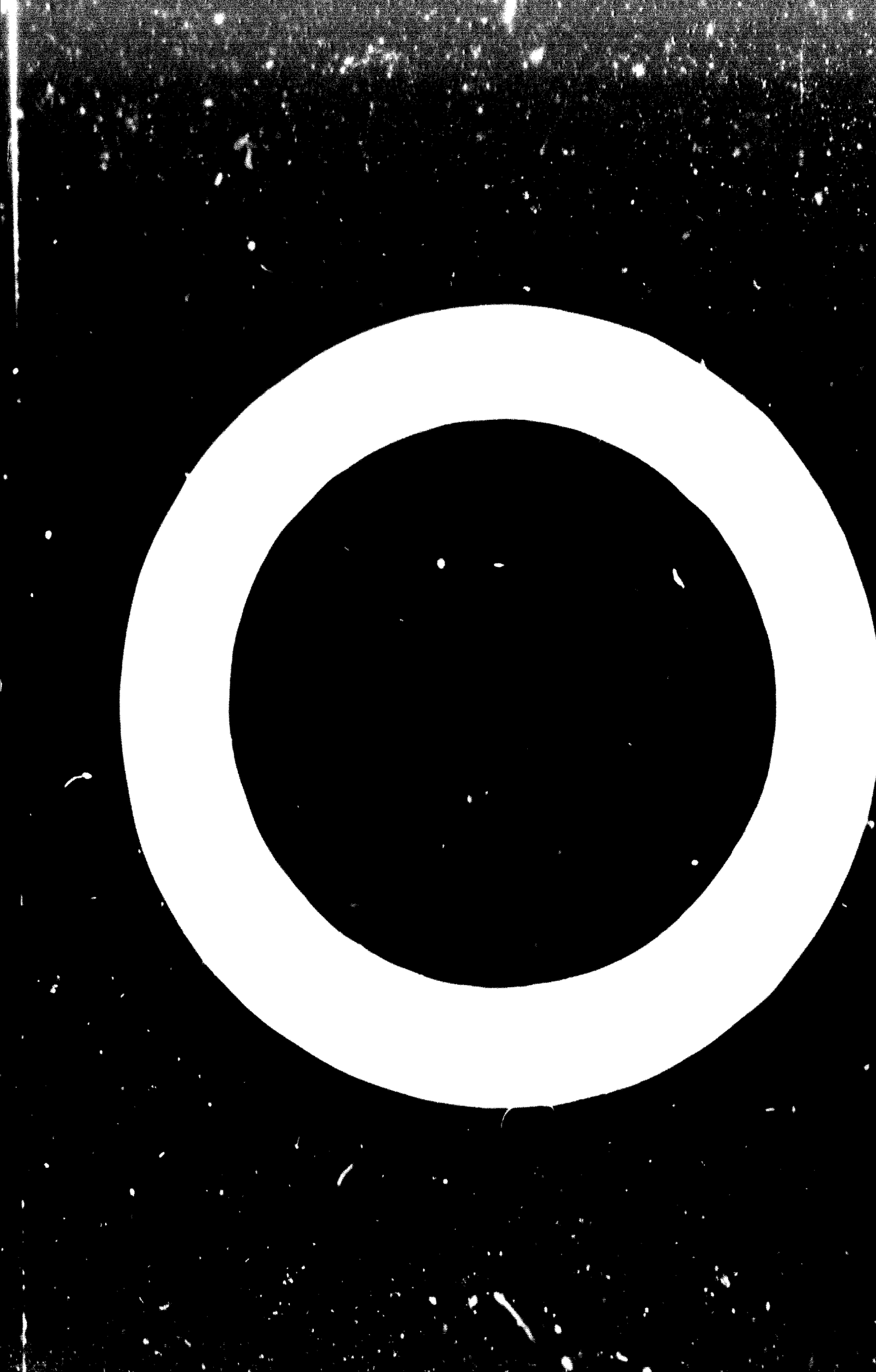

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AUTOMOTIVE INDUSTRIES IN DEVELOPING COUNTRIES

I. INTRODUCTION

1. This study is concerned with the relative cost and efficiency of manufacturing various types of transport and power equipment under the conditions that prevail in newly industrializing economies. The research was designed to obtain a global view of manufacturing and marketing automotive products in the world economy with attention focussed upon the manufacturing role and relative efficiency of plants located in developing economies. An effort was made in the present study to obtain a broad view of commercial strategies and operational models which could then be applied to the needs and conditions of newly industrializing countries.

2. Field work was carried out in some developing countries and among the major manufacturers in Europe and North America. The author spent a month in Argentina in late 1965 and visited Yugoslavia briefly in late 1966. Some cost data was obtained from India through direct correspondence with vehicle manufacturers there. In Argentina, both government and corporate officials were interviewed to get a balanced view of the impact of industrialization policies upon manufacturing operations. Each of the major firms in Argentina prepared a written response to a questionnaire outline. These written reports were supplemented by a series of interviews with the plant managers. A similar procedure was followed in Yugoslavia. Interviews with international firms were based upon a questionnaire outline which was distributed beforehand. More than 50 vehicle and parts manufacturers were visited in late 1966. Talks were held mainly with corporate executives concerned with both the financial and technical aspects of overseas manufacturing operations in developing countries.

3. The relative cost and efficiency of manufacturing industries in developing areas has received growing attention in recent years as evidenced by several studies now underway or nearing completion. Projects are headed by I.M.D. Little at the O.E.C.D. on industrialization, Joseph Grunwald at the Brookings Institution on comparative production costs, and Bela Balassa at the World Bank on the structure of effective tariff levels in several countries. Important work in the field has also been done by David Felix of Washington University and Stephen Lewis's group at Williams College on the effects of import substitution. Two published studies on the automotive industry (both doctoral theses from the Harvard Graduate School of Business Administration) also have special relevance to this study. One is by Guillermo S. Edelberg, The Procurement Practices of the Mexican Affiliates of Selected United States Automobile Firm (June 1963); and the other is by Sebastiaan J. Kleu, Import Substitution in the South African Automobile Industry, (June 1967).

Focus of Study

4. Specifically, the study concentrated on the following aspects of automotive sector development: 1) comparative costs of production, 2) adaptation problems of manufacturing affiliates, and 3) the impact of economic policy upon market structure. It became evident in the early stages of investigation that international corporations had played a vital role in the historical development of these industries and were an essential

element of future change. This was particularly true for economies that had exhausted growth opportunities based upon import substitution in domestic markets and were now anxious to reduce resource costs and possibly expand output for world markets. It is for this reason that marketing and manufacturing strategies of international corporations and their adjustment problems in developing economies has been examined in depth.

5. One of the significant insights that emerges from the study is that industrial progress is as much the result of sound economic and commercial policy as it is success in overcoming critical shortages or deficiencies in financial resources, production factors, managerial and engineering skills, and in supplier capabilities. A corollary to this conclusion is that the pattern generally followed by developing economies in establishing their automotive industries bears critical scrutiny. International firms in general reacted favorably to the analysis and recommendations contained in the report. Planning officials in several developing countries have received copies of an earlier draft in response to requests for guidelines on establishing or restructuring their own automotive industries.

6. For countries that have already established an automotive industry, some possibilities are suggested for new patterns of manufacturing and trade. For countries about to establish an automotive industry, the study indicates the limits of import substitution in terms of increased costs and foreign exchange burden. The analysis probes beyond the conventional framework of cost and feasibility at the plant level. It deals with the impact of market structure upon efficiency of resource utilization. The cost analysis and recommendations for reorganizing the automotive industry should have wider application to other industrial sectors.

Problems and Limitations

7. Most of what is presented in this study should be taken as empirical evidence rather than conclusive proof of the point being made. This is in part due to the very wide range of conditions and circumstances among plants, product mixes, and national environments, as compared to the narrow empirical base that was surveyed with the time and resources available. Field work in developing countries was limited to Argentina and Yugoslavia, and the substantial experience of Japanese firms in developing countries also has not been covered. Secondly, the automotive industry covers a very wide spectrum of vehicles ranging from small passenger cars to heavy commercial trucks. There are often considerable differences in engineering sophistication and in volume requirements which affect the economies of production by world standards. Automotive vehicle production is also often integrated with the manufacture of railroad and tractor equipment or lighter vehicles such as motorcycles - products generally excluded from this study, although incidental reference is made to them where relevant. Thirdly, the intricacies of cost analysis (described below) limit the conclusiveness of evidence.

8. Obtaining a satisfactory set of comprehensive cost data was a major problem. Fortunately a very fine set of data was finally obtained from an American manufacturer comparing actual production costs in Argentina,

Brazil, and Mexico to costs for a comparable vehicle manufactured and assembled in the United States. Costs were broken down in three ways for each of the four countries: a) by cost inputs, labor, material, and other categories, b) by successive stages of domestic content (from assembly through body stamping), and c) by actual resource cost and transfer (taxes and tariffs) costs. But only one set of such data was obtained.

9. Several other complexities and intricacies of the cost data are described and explained in the chapter on cost comparisons. Among the more prominent are the distorting effect upon cost comparisons of an overvalued exchange rate and indirect tariff and tax charges that are often difficult to trace and attribute accurately. (The calculation of additional resource costs to produce domestic value added is fundamental to a determination of actual or projected protection required; this is another way of referring to the frequently mentioned nominal versus effective tariff requirement.) Nor has it always been possible to distinguish among cost increases induced by disproportionately high protectionist profits, learning curve effects, technical inefficiencies induced by differences in scale or productivity, and the above mentioned distorting effects of price structure. Definitive appraisal of current levels of efficiency and the prospect of improved efficiency depend upon more precise estimates and weighting of each of these elements.

10. A major problem has been integrating the economic, commercial, and technical factors involved in vehicle production and national resource utilization. Economic policies influencing market structure and commercial strategies to earn a profit under protection are generally conceived and carried out in isolated contexts with the inevitable conflict of strategies and interests. Actually, at least three sets of decision makers are involved in policies and implementation strategies which affect the cost and efficiency of production. These include: governmental authorities issuing industrial licenses, controlling imports, and in other ways affecting price and market structure; international firms concerned with maximizing international profits; and manufacturing affiliates in the developing economy whose profits are realized in a protected and controlled economy.

11. It has also not always been possible to isolate national policies and measures having a narrow and exclusive impact upon the economics of manufacturing. The evidence in Argentina and Yugoslavia in particular indicates that the economics of manufacturing is inextricably meshed with broader national issues involving investment in transport and taxes that influence private consumption of automotive products. In Japan, it is evident that the industry was structured in accordance with national policies designed to discourage the consumption and production of private passenger cars (favoring instead the manufacture of commercial tractors) and thereby also deferring investments in road networks in favor of rail transport systems.1/

1/ See Katsuji Kawamata, "The Automobile Industry and Current Problems", Keidanren Review (Japan) (Vol. 2, No. 7, 1967), pp. 29-37; and "Japan: Special Survey: 2", The (London) Economist (June 9, 1967), pp. xxi-xxii.

12. The analysis in this study develops what economists would call a "secondbest" solution. The study starts with the question, given a determination to develop an automotive industry, how may sector efficiency be maximized at successive levels of resource commitment. Stated another way, manufacturing and marketing strategies are proposed to permit the industry to operate in the range of maximum comparative advantage. The study does not deal with the question of total costs of automobile consumption, which may include investments in roads and fuel imports, nor with the even broader issue of social investment in alternative means of transportation 1/. Nor does it deal with the question of alternative use of economic resources in other sectors or activities. For example, in the chapter on Argentina, the question is not whether the economy should concentrate on beef production and eliminate the automotive industry entirely. It is rather what are the limits of import substitution in Argentina's automotive sector, and how can production be restructured or rationalized so as to reduce resource costs for a given volume or international value of output in automotive products?

Outline of Chapters

13. The next chapter analyzes the quantitative aspects of supply and demand in automotive products by developing economies viewed in the larger context of world market structure. Chapter III analyzes recent changes in the market structure of developing economies and the problems incurred by international firms in adapting to the described changes. Chapter IV analyzes the relevant characteristics of automotive products and production techniques and the problems posed in establishing manufacturing affiliates in newly industrializing or small-scale economies. The heart of the analysis is contained in Chapter V on Comparative Costs. It demonstrates that inefficiency in automotive production is largely due to the inefficiency of small scale production of components and parts, and that average total costs increase proportional to the diseconomies of scale imposed by the domestic content requirement.

14. Chapters VI and VII provide country studies on Argentina and Yugoslavia. Argentina is a case study of the adverse effects of import substitution policies pursued to an unwarranted degree which has resulted in progressive increases in resource costs and an unmanageable foreign exchange burden (Chapter VI). Incidentally, the Kleu study mentioned above (paragraph 3) serves to isolate the scale factor in a high income economy. Yugoslavia is interesting as a newly industrializing economy that has itself become a transmitter of industrial technology in the automotive field and is now experimenting with programs to reorganize and nationalize industry along more efficient lines (Chapter VII).

15. The last two chapters contain the conclusions and recommendations to be drawn from the study. Chapter VIII begins with a critique of the effects of protection and then moves on to an evaluation of possible changes

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1/ Suggestions for further research are given in paragraph 138 below.

in market structure to improve the economic efficiency of automotive production. Chapter IX contains a brief summary of the major findings and recommendations along with suggestions for futher research.

II. WORLD DEMAND AND SUPPLY OF CARS AND TRUCKS

16. Automotive products consist of a wide array of passenger cars, trucks, and buses. Trucks range from lightweight pickups to multi-ton trailers and buses from small minibuses to large double deckers used for urban and interurban transportation. Motorcycles, threewheeled vehicles and farm tractors are not included in this study, even though they are often manufactured or marketed together, especially in developing countries due to the limited extent of the market. For example, in Argentina, Fiat manufactures passenger cars, diesel engines, farm tractors, and railroad equipment in a single industrial complex; in Sahagun, Mexico, passenger cars, buses, trucks, diesel engines, and railroad equipment are also manufactured in a single industrial complex. In analyzing demand, a distinction needs to be drawn between vehicles purchased for commercial use and for private consumption. On the production side, there are considerable differences in the production scales and unit costs of high volume passenger cars and light trucks and the much lower volume requirements for medium to heavy trucks, buses and other commercial vehicles. Differences in volume requirements and engineering sophistication have a bearing upon the potential comparative advantage range for developing or small-scale economies.

17. In 1965, developing countries accounted for only a small fraction (about 4 percent) of world production and consumption of automotive vehicles. The United States accounted for 44 percent of world production and 46 percent of world consumption of passenger cars and trucks. Five other countries (Germany, the United Kingdom, Japan, France, and Italy) manufactured another 39 percent and consumed 27 percent of the world totals. This left about 17 percent produced and 27 percent consumed in all other countries of the world.

	Produced	Consumed
United States	11.1 million (44.3%)	11.6 (46.2%)
Germany, United Kingdom, Japan, France, Italy	9.9 (39.1%)	6.8 (27.2%)
Developing Countries	1.0 (4.0%)	1.5* (5.9%)
All other countries	3.2 (12.6%)	5.1 (20.7%)

*Author's estimate
Source: Tables 1 [illegible]

World Demand

18. There were over 170 million cars and trucks registered in non-Communist countries as of 1966. About 12 percent were in the developing countries and the remaining 88 percent in industrialized countries. Vehicle population in developing countries has been growing at nearly double the rate of industrialized economies during the past 15 years. About half of the 25 million new vehicles manufactured in 1965 went to replace old cars and half to fill increased car consumption.

	Vehicle Population		Percent Distribution	Average Annual Rate of Growth
	1950	1966	1966	1950-66
Industrialized Countries (U.S., Canada, Western Europe, and Oceania)	56.1	152.3	88.0%	6.2%
Industrializing Countries (Africa, Asia, and Latin America)	3.5	20.8	12.0%	11.7%
Total	59.6	173.1	100.0%	6.9%

Source: Table 3.

19. Developing economies, low in per capita income, were rapidly increasing their per capita consumption of vehicles. In 1965, Argentina and Spain, among the developing economies, ranked high in vehicle density.

Country	Inhabitants per Vehicle
United States	2
Germany	6
Argentina	14
Japan	15
Spain	27
Mexico	38
Brazil	41
Yugoslavia	77
India	479

Source: Table 5.

The prices of the most popular cars are much more in line with the purchasing power of factory workers in Mexico than they are in Argentina or Brazil (Table 4).

Country	Most Popular Vehicle	Percent of Worker's Income Required
Italy	Fiat 500	30%
Germany	Volkswagen	43
Mexico	Volkswagen (Mexican)	63
Japan	Toyota Corona	72
Brazil	Volkswagen (Brazilian)	138
Argentina	Fiat 1500 (Argentine)	233

Source: Table 35.

World Production

20. World production of cars, trucks, and buses totaled 25.1 million in 1965 about 19.9 million passenger cars and 5.2 million trucks and buses (Table 2). Among the major commercial vehicle producers of the world, about 25 percent of their output is in the six-ton-and-over class or medium-to-heavy class (Table 6). Developing countries produced a larger share of total trucks and buses than of passenger car vehicles.

Production in 1965

	Passenger Cars	Trucks, Buses	Total
Developed Countries	18.9 million (94.7%)	4.3 (82.7%)	23.1 (2.2%)
Communist Countries	0.4 (2.2%)	0.5 (10.1%)	1.0 (3.8%)
Developing Countries	0.6 (3.1%)	0.4 (7.2%)	1.0 (4.0%)
All Countries	19.9 (100.0%)	5.2 (100.0%)	25.1 (100.0%)

Source: Table 2.

21. Automotive production in industrialized economies is concentrated among large firms. This is especially true of high-volume cars and trucks. Two American firms account for over a third of world production, 9 other firms for an additional third, and the remaining third is manufactured by over 300 additional companies located in 50 or more countries.

Number of Firms	Volume range per firm	Average volume per firm
2	3,100,000 - 5,700,000	4,400,000
9	500,000 - 1,600,000	856,000
14	200,000 - 400,000	257,000
293	below 200,000	14,000
318	-	76,000

Source: Table 7.

Production volumes range between 100,000 and 1,500,000 per annum among the 23 medium-size passenger car manufacturers, and between 13,000 and 150,000 among the 42 medium-size truck and bus manufacturers (Table 8). The largest two-passenger car manufacturers average 3,800,000 as compared to 650,000 for the 2 largest commercial vehicle producers. It is of interest to note that 4 firms in developing countries appear in the rank listing of

the 44 leading truck manufacturers of the world: Willys of Brazil (32), 1/ Citroen of Spain (35), Kaiser of Argentina (37) 1/, and Tata Mercedes of India (30).

22. European firms are much more dependent upon exports than American or Japanese firms, with Sweden and Germany leading in percentages exported (Table 9). France is much more competitive in passenger cars (39 percent exported) than in trucks (3 percent). It is of special interest to note that Belgium and the Netherlands have become important assembly areas for the European car market - turning out over half a million vehicles in 1965 - 480,000 passenger cars and 30,000 commercial vehicles - mostly for the European Common Market. At one time, Spain was considered by a major U.S. manufacturer for this role, but the Government offer proved unacceptable to the potential investor.

	National Production	As % World Production	Vehicles Exported	As % National Production
Germany	3,055,700	(12.2%)	1,527,300	(50.0%)
United Kingdom	2,134,900	(8.5%)	793,800	(37.2%)
France	1,581,600	(6.3%)	613,000	(38.8%)
Italy	1,158,200	(4.6%)	326,000	(28.2%)
Japan	1,870,500	(7.5%)	194,700	(10.4%)
U.S.A.	11,112,000	(44.3%)	167,700	(1.5%)
Sweden	204,000	(0.8%)	108,100	(53.0%)

Source: Table 9.

23. In 1966, the 7 major producing countries had 387 vehicle assembly lines in 55 countries (Table 10), as compared to only 170 assembly lines in 42 countries 6 years earlier. The Japanese (especially Toyota and Nissan) have been especially aggressive in this field: they increased from 7 overseas assembly lines in 6 countries in 1962 to 49 lines in 22 countries in 1966.

Production in Developing Countries

24. Among the developing countries, the 5 leading producers in 1965 were Spain, Argentina, Brazil, Mexico and India. Together they accounted for 80 percent of the near million vehicles manufactured and assembled in varying degrees by developing economies. Another 83,500 vehicles were assembled and partially manufactured in 18 other developing countries, with some countries turning out as few as 1,000 vehicles a year. At least 200 firms in over 25 countries were engaged in vehicle production (Table 2). Spain, Argentina, and Brazil have been increasing domestic product at particularly high annual rates of growth.

1/ Both WOB and IKA have merged with Ford and Renault (paragraph 35).

	Units Manufactured	Annual Production Growth Rate 1955-65
Spain	229,000	29%
Argentina	194,000	35%
Brazil	186,000	25%
Mexico	97,000	11%
India	70,000	9%
Japan	1,876,000	39%
Germany	2,976,000	13%
United States	11,137,830	2%

Source: Table 11.

25. Average production volumes of firms accounting for the large part of output in developing economies is quite low by European and Japanese standards to say nothing of U.S. volumes. These averages have special relevance for economies of scale in the manufacture of passenger cars and light trucks. Averages cited in the table below include a small percentage of the heavier vehicles, where economies of scale are at a much lower threshold.

	Number of firms accounting for 80-90% of national production in 1965	Average units per firm
Italy	1	988,000
France	4	333,000
Japan	8	211,000
Spain	3	60,000
Brazil	3	54,000
Argentina	6	28,000
Mexico	6	19,000
India	5	11,000
Venezuela	6	3,000

Source: Table 13.

III. ADAPTATION PROBLEMS OF INTERNATIONAL CORPORATIONS

26. Since 1950, there has been a significant trend toward the manufacture and assembly of automotive products by the developing countries themselves to satisfy their own needs, largely because of the insistence of the developing countries to reduce import requirements. The tendency toward the spread of production facilities throughout the world is dramatic. As a result, one major European vehicle manufacturer reported that about 94 percent of its export earnings came from about 20 countries (mostly industrialized); the remaining 6 percent was earned in over 100 countries (mostly developing areas). 1/ For most international firms, corporate earnings from developing countries account for only a small percentage of total earnings. But a manufacturing affiliate in a developing country represents a sizable customer for components and parts even for a large international firm, and all the bits and pieces add up. 2/

Changes in Supply Structure for LDC Markets

27. International firms have gone through two phases in their market relations with developing countries and are now entering a third phase in the more advanced areas. Prior to World War II, international firms for the most part manufactured automotive products in the home country and exported them to overseas markets. Where market conditions warranted, assembly operations were undertaken in selected countries by major manufacturers following World War I. General Motors built assembly plants in Argentina, Brazil, and India during the 1920's and in Egypt, Mexico and Spain during the 1930's. In the second phase, which began in the mid-50's, automotive manufacturers were forced by developing countries either to expand local manufacturing or lose the domestic market. In the past year or two, foreign firms found themselves being urged into "Phase III". Certain developing countries have been bargaining for export capabilities built into the manufacturing operations to help pay for continuing import requirements. In taking this stand, countries like Mexico and Yugoslavia have in effect followed the lead of Canada whose trade agreement with the United States has resulted in a substantial increase in Canadian parts manufacture for the U.S. market (paragraph 115).

1/ See Table 19 on "Automotive Assembly Lines in Operation Throughout the World" and Table 1, footnote 5 on an approximation of the percent of vehicles exported in an unassembled form.

2/ The value of sales of U.S. overseas manufacturing subsidiaries was estimated at $150 billion in 1966. Of this amount as much as $15 billion or more - out of $30 billion total U.S. exports in 1967 - may represent the sales value of components, parts, and manufacturing equipment sold to overseas industrial affiliates (based upon estimate that 11 percent of sales by Latin American affiliates represent imports from the United States). (See Judd Polk, U.S. Exports and U.S. Production Abroad, staff memo prepared for the United States Council of the International Chamber of Commerce, August 11, 1967.)

28. The requirement to develop overseas manufacturing capabilities has posed some basic dilemmas for international firms. One dilemma stems from the need to duplicate small-scale production facilities throughout the world at a time when competitive conditions and technology are moving firms toward corporate mergers and concentration of production facilities. Among industrialized economies, rising wages and technological progress have forced corporate mergers and the adaptation of high-volume production techniques in most parts of the world. At the same time, developing countries have insisted upon the creation of a national automotive industry which has led to an atomization of production facilities throughout the world requiring small-scale assembly and parts plants using labor-intensive techniques. A second dilemma relates to the need to redesign products and techniques to fill specialized demands in small-scale markets. But the size of markets is too small to warrant the additional expenditures to adapt product designs or production techniques and to amortize special tooling costs on low-volume production runs. The magnitude of adjustment has largely been a function of the size and complexity of the transplant, scale differences, and the gap in supplier capabilities.

29. In adjusting to the demand for overseas manufacturing and re-export as a necessary marketing condition, the international firms have had to increase their commitments of financial and human resources, develop new capabilities for transplanting industrial systems, and adjust their attitude toward ownership and control of overseas affiliates. They have also been faced with the problem of developing local suppliers, providing technical and managerial skills, and upgrading quality control systems to meet international standards. They have had to increase investments in the face of the added risk and uncertainty of doing business in a developing country. Different firms have met this challenge in different ways and with varying degrees of success. Corporate response to these new conditions has depended upon a) alternative investment and growth opportunities in traditional or home markets and b) willingness on the part of international firms to take risks and develop new corporate capabilities to manufacture in difficult industrial environments.

Conditions in Home Markets

30. Among European producers, rising costs (the result of varying combinations of reduced production volumes and increased labor costs) combined with prices that are held down under intensified competition has resulted in a narrowing of profits. Many firms have felt a compelling need to maintain production volumes through exports in order to keep unit costs down. An inadequate domestic market coupled with low levels of protection (the case of Volvo in Sweden) provides the strongest push into international markets. Passenger car manufacturers have felt the effects of competition for some years now; it is only recently that the cost-profit squeeze induced by increased competition has been felt by truck and tractor producers. In Great Britain and France, the narrowing of profits for some firms is in part due to the widening technological gap relative to other producers in the world economy. In both countries, a number of firms have been unable to replace obsolete equipment and to finance the development of

new models. The trend toward national and international mergers is part of the effort to reinforce competitive positions at home and abroad. The major reasons for mergers are: a) to economize on joint production, distribution, and servicing facilities; b) to share research and development costs, and c) to widen access to financial resources. 1/ There has been a growing awareness among European producers of the need to develop marketing capabilities, which includes the ability to forecast market trends and adapt corporate capabilities and production specialization to shifts in consumer demand and changes in competitive position.

31. Pricing in a particular market is based upon the market structure of tariffs, taxes, and competition (not production costs by international standards.) An analysis by The Economist dramatizes this point (Table 34). A firm may cut profit margins and absorb additional distribution costs to just above marginal costs in order to maintain production volumes at home and thereby help pay for fixed costs. Thus, Volvo's cars in Germany sell for as little as 59 percent of the home country price and Fiats for 82 percent. Protection has a pronounced influence in the opposite direction. In Japan, American Mustangs sell for 3.2 times the U.S. price, Fiats for 1.8 times the Italian price. The effects of protection are also indicated in the set of pricing information provided by a French vehicle manufacturer (Table 4)

32. Tight capital markets and/or restrictions on private foreign investments have inhibited many firms from making the financial investments in manufacturing facilities or distribution and servicing systems necessary to defend overseas markets. International firms encounter difficulties in financing overseas investments because of structural constraints in capital markets, "inadequate" corporate earnings, or restrictions imposed by the government as a result of balance-of-payments problems or political ideology that opposes government support of private enterprise. In Germany, the government supports overseas private investment through long-term capital loans, supplier credits, investment guarantees, and deferred tax payments. In France, limited guarantees of overseas investments linked to exports were introduced in April 1967. In Sweden, the government is opposed in principle to public support of private overseas investment. Balance-of-payment difficulties in the United Kingdom have led to restrictions in private capital transfers, especially outside the British Commonwealth.

33. Labor conditions in the home country is another factor which may influence the willingness to locate production facilities abroad. Sweden and Germany are short of industrial labor and have a mild interest in locating production facilities where labor is more plentiful, provided

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1/ Rootes in Great Britain and Simca in France have merged with Chrysler. At national levels, Leyland merged first with Rover and then with B.M.C. in the U.K.; and Peugeot, SAVIEM, and Renault have combined operations in France. Mercedes-Benz and Volkswagen have agreed to consider joint ventures in research and distribution.

the disadvantages of overseas locations do not offset the labor advantage. Labor-surplus countries such as Finland (7 percent of the labor force is employed in Sweden and elsewhere) and Yugoslavia (large numbers are employed in Germany and Italy) have an interest in the expansion of overseas operations which increase the demand for export of industrial components and parts. Thus, Yugoslavia could increase home production and export sales to India, Indonesia, and the U.A.R., and Finland is able to expand its sales to countries like Brazil and Portugal.

Corporate Attitudes Toward Overseas Commitments

34. The development of an international viewpoint and commitment are critical elements of success or failure in overseas ventures. Many firms, eminently successful in home markets, have been bitterly disappointed abroad. Timing on when to enter a market is critical. Sufficient resources and capable personnel must be committed to assure the success of the industrial transplant. Smaller firms are least able to man overseas operations. 1/ Some firms have tried to pass off a second-rate product on developing countries; others have failed to devote sufficient resources and personnel for an effective industrial transplant. In many cases, the basic cause of failure has been an inbred orientation toward production requirements rather than market opportunities. 2/ A dominant corporate attitude which is unreceptive to innovation is also a basic deterrent. 3/

35. The trend toward overseas manufacturing has increased the capital investment required to maintain or expand a firm's share of the world market. This includes investments in marketing and distribution systems, engineering and design capabilities, and in overseas physical plant. A basic dilemma is that in order to be competitive, it is necessary to maintain a diversified product line, which increases capital requirements and

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1/ A Swedish manufacture estimated it required 17 people from the home office to run a truck manufacturing plant in Brazil, and they had great difficulty in recruiting for these critical positions (see also paragraph 51).

2/ Many firms have chosen to give up overseas markets rather than disrupt the home operation. See, for example, reference to British firms' attitudes in "British Motor Corporation: The Commercial Crunch", The Economist (November 26, 1966). See also Igor Ansoff, Corporate Strategy: An Analytic Approach to Business Policy for Growth and Expansion (New York, 1965), pp. 41, 104-108.

3/ Richard N. Farmer and Barry M. Richman, Comparative Management and Economic Progress (Homewood, Illinois, 1965), pp. 208 ff.

undermines efforts to maintain volume in production runs. 1/ Financial constraints imposed by narrow profits and financial conservatism have undermined the competitive position of many French and British firms. For example, family firms such as Peugeot and Citroen are reluctant to accept outside capital. Simca, another small family firm, was forced to merge because of capital deficiencies and the need to combine production facilities domestically and abroad into larger, more economic units. In some cases, capital deficiency and a dearth of technical personnel have forced French firms into minority positions with larger foreign firms. Until recently, Renault cars were assembled by Willys-Overland in Brazil and by Industrias Kaiser in Argentina. Renault has now joined forces with Ford in Argentina and Brazil and together they have bought out both Kaiser of Argentina and Willys Overland of Brazil.2/ Together, Renault and Ford now hope to compete with new model lines for the Brazilian and Argentine markets.

36. In those overseas markets where manufacturing has become a requirement, the most successful firms have been those that have been willing to adjust operations and develop the necessary capabilities to effect transplants. For example, Massey-Ferguson, one of the world's leading tractor manufacturers, completely reorganized its management system to handle overseas plants in the "nursery stage". They have developed this type of business to the point where 15 percent of company earnings is derived from developing countries, as compared to 2 to 3 percent for other international firms. At Fiat, a separate division now handles the shipment of knocked-down units to overseas manufacturing affiliates, which now account for 10 percent of total sales.

37. Firms anxious to secure overseas contracts have often ended up in a cost-profit squeeze, especially where price ceilings have prevailed or demand has fallen short of expectations. The latter was the case of Berliet in Algeria, and it contributed to Fiat's demise in Mexico. Citroen lost money in Argentina until it was able to cut prices to the point where increased demand allowed them to bring production to a profitable level. At the same time, royalties must be kept to a minimum due to

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1/ Berliet, the largest truck manufacturer in France (18,000 a year), was forced into marginal pricing of trucks and sub-assemblies in order to maintain production volume at home. (See also paragraph 47-D). A small producer such as FSA (Fiat-France, formerly a part of Simca), which now manufactures 6,000 trucks and 12,000 tractors annually, must maintain 30 variations in truck models based upon four different engines and five combinations of axle and gear systems. Engines are supplied by Fiat from Italy. In the passenger car field, Volkswagen and Volvo have managed to do well with a much narrower product range.

2/ In July 1967, Renault took over Kaiser's one-third interest in I.K.A. and Ford purchased Transax, I.K.A.'s Argentine axle manufacturing subsidiary. Ford acquired controlling interest in W.O.B. from Kaiser and Renault. See Wall Street Journal, 28 July 1967, p. 13.

political considerations and remittance problems. Prices on knocked-down vehicles and parts often are set high to offset the possibility of future restrictions on royalties or in the event of unforeseen increases in production costs. For example, one firm had to run special body panels for hand-welding in the overseas assembly plant. Underestimation of technical service costs in combination with low prices on imported components and parts may also lead to losses by the international firm.

38. Manufacturing firms plan operations from a global viewpoint, often earning low returns or even incurring losses on one operation or during an interim period, in order to realize compensating returns from other sources or during subsequent periods. Substantial portions of an international firm's earnings comes from the sale of components and parts to original equipment manufacturers and to the replacement market. Their investments in overseas manufacturing facilities are in a sense an investment in future demand for components and parts. For example, Leyland can afford to earn a small return on buses, because these earnings are offset by profitable returns on an expanding demand for Leyland engines and spare parts. Some firms (Renault and Fiat) also earn substantial amounts from technical services and on the sale of specialized equipment for parts manufacture. 1/

Investment Risks and "Adequate" Earnings

39. International firms become involved in overseas ventures in different forms and with varying degrees of resource commitment. These forms range from licensing arrangements to full ownership and control of an overseas manufacturing affiliate. Resource commitment may range from a few technical experts on a reimbursable fee basis to substantial commitments of financial and other corporate resources. Where resource commitment is involved, the international firm must take into account: a) the long-term prospect for earning a return, b) the availability of financial and other resources, c) the relative risk and uncertainty in a particular venture, and d) alternative opportunities to earn profits. Added risk and uncertainty are weighed against the chance of a quick return and the prospect of being shut out of future market opportunities.

1/ For some insights on the "irrationality" of foreign investment decisions, see Yair Aharoni, The Foreign Investment Decision Process, 1966, pp. 49-73. Among the reasons cited for looking abroad are: fear of losing the market; the bandwagon effect; strong competition from abroad in the home market; and creation of a market for sale of components or other return on know-how and research. Organizational evolution at the top management level from a firm basically oriented to domestic markets and indigenous manufacturing operations to a multinational firm is a critical element of the firm's operational efficiency overseas. This reorientation profoundly affects the firms attitude toward risk-taking in unfamiliar areas, op.cit., pp. 173-198.

40. International corporations earn a return on overseas ventures from: a) royalty and licensing fees, b) return on equity, and c) sale of sub-assemblies and equipment, which include replacement components and parts. Some firms prefer equity participation in order to maximize returns and assure adequate managerial control. Others are less inclined and less able to risk capital and prefer licensing arrangements, which often yield substantial returns in the form of royalties and profits on sale of sub-assemblies. Inflation and exchange fluctuation are the two major factors that intensify the risk and uncertainty of realizing an adequate return, maintaining the value of investments, and remitting profits. Investment requirements depend in part upon existing supplier capability and the degree of autarky imposed by the government. Most firms try to minimize capital commitments. In some countries, they are able to hedge on devalued currencies through forward speculation and borrowing (but this increases operational costs). 1/

41. Many firms expect a higher-than-normal return in developing countries where the political or economic risks are higher. The risks they are willing to take are in part determined by how satisfactorily they are doing in traditional markets and whether the firm is making a special effort to extend its share of world markets. Much also depends upon the size of the firm and its ability to commit resources to relatively small earnings bases scattered throughout the world. Most firms count on a quick return in the first 2 to 4 years, before domestic manufacturing requirements and intensified foreign exchange restrictions imposed in the developing country begin to narrow profits. Some firms have been over-optimistic in their evaluations and have encountered a variety of difficulties either in realizing an adequate return or in remitting their profits.

Ownership and Control of Overseas Affiliates

42. Issues over ownership and control depend upon: a) the nature of arrangements with the manufacturing affiliate, b) corporate policy, and c) the host government's attitude toward foreign investment. In the case of joint ventures, ownership has a bearing upon profits and technical control of the manufacturing operation. Majority control assures wider latitude and flexibility on: a) inter-company pricing, b) re-investment of profits for future growth, and c) managerial control over manufacturing operations to maintain international standards on product and trade names. Technical control is a critical element in any future plans for an international manufacture and interchange system. Under licensing arrangements, the return is structured on the licensing fee and profits from the sale of parts.

43. In the case of joint ventures, attitudes of the host government toward majority participation of the foreign partner are critical. Fundamentally, it is a matter of political ideology, particularly in the early process of national development. Mexico and India have been

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1/ See Table 17, line item 9, "Interest and Other Income Expenses".

especially insistent upon majority control by nationals. 1/ Both governments recognize the benefits derived from foreign capital and know-how, but they have insisted on majority control in most cases. For one thing, most governments realize that exchange costs for foreign equity participation may be more costly in the long-run. More basically, it is an understandable matter of national pride to keep domestic industry in the hands of nationals. But this does not resolve the basic conflict of interests between managerial systems from vastly different socio-economic environments. Aside from trade name considerations, the licensor without equity investment has a limited interest in the commercial viability of the overseas venture.

44. Attitudes toward ownership and control vary from one corporation to another. Ford and General Motors have insisted upon 100 percent ownership; Chrysler, a newcomer, has been much more flexible and willing even to accept minority interest. Chrysler's acceptance in countries like Mexico and India is in part a reflection of their willingness to hold a minority interest. Permissiveness in licensing arrangements depends in part upon the relative technological lead a firm has over its affiliate. For example, Massey-Ferguson and Cummins Engine both invest considerable resources in research and development of products and techniques and are not too concerned about a license in a developing country eventually gaining the upper hand as a market competitor. 2/ This would be less true of a licensor with a more stable, less sophisticated technology. Many governments would much prefer purchasing know-how outright, rather than accept foreign equity investment, but foreign partners often feel they will not be able to earn an adequate return on a license basis.

1/ On the difficulties of doing business in India, see Jack Baranson, Manufacturing Problems in India (Syracuse University Press, 1967), pp. 49-53. The detrimental economic effects of assimilation policies are pointed out in Harry G. Johnson, "A Theoretical Model of Economic Nationalism in New and Developing States", Political Science Quarterly, LXXX, No. 2 (June 1965), pp. 169-185.

2/ This, of course, is not the case in licensing arrangements with firms in industrially-advanced countries, where future marketing rights are more rigidly controlled. The Cummins case is documented in Baranson, Manufacturing Problems in India, p. 24.

IV. ADAPTATION PROBLEMS OF MANUFACTURING AFFILIATES

45. The problems of adjustment are, on the one hand, inherent in the production techniques associated with automotive products and on the other hand, with the differences in production environments encountered in small-scale or developing economies. The products themselves are often ill-suited to the consumer needs or physical environments. Among the major deficiencies in running manufacturing plants are underdeveloped supplier capabilities, inadequate quality control systems, and a dearth of qualified technicians and managers. By creating a "sellers' market", protection and import substitution tend to undermine quality and reliability. The systems of industrial licensing and resource allocation, which include import control, inevitably compound the difficulties of scheduling production and add to production costs. Delays of a year or more to obtain an import license and actual delivery of goods are not unusual. The acuteness of difficulties and magnitude of adjustment depend upon the stage of development of the industrial sector, the nature and degree of economic regulations in force, and the sophistication or complexity of the industrial transplant.

Relevant Characteristics of Automotive Production

46. The nature of automotive products and the associated production techniques provide some important insights on the economics of industrialization in developing economies. The following aspects are relevant:

A. Vast range of components and parts. 1/ There are literally thousands of elements that go into a single vehicle. A small British car averages 2,500 major parts and assemblies, or 20,000 parts if every nut and bolt is counted separately. A standard diesel engine consists of 750 parts provided by about 200 different plants. About 15,000 separate machining and treatment processes are required to turn steel shapes, forgings, and castings into finished engine components such as pistons and engine blocks. When one multiplies the requirements for a single vehicle by the number of vehicle models and configurations required by small economies, the burden upon component and part manufacturers becomes formidable.

B. Complexity of specifications and standards. Components and parts are manufactured from hundreds of different types of iron and steel and other industrial metals and materials including rubber, plastic and glass. Mass production of standardized components and parts demands a rigid uniformity in materials specifications and manufacturing tolerances. These technological requirements require high engineering and managerial skills to assure the required quality and reliability in components and parts.

1/ See George Maxcy and Aubrey Silberston, "Techniques of Production", The Motor Industry (London, 1959), pp. 53-61; and Baranson, Manufacturing Problems in India, p. 19.

C. Production techniques. Mechanization and automation are associated with the high-volume techniques that are used to manufacture all but a limited range of specialized vehicles and parts in plants producing for large domestic or world markets. Automated transfer lines (including rearrangeable standard machine elements) reduce operating and handling costs, increase the rate of utilization of expensive equipment, and reduce costs for machine tools, factory space, rejected parts, and machine maintenance. But in plants serving limited domestic markets, these more efficient techniques are precluded because of the low-volume requirements. It is the diseconomies of small scale production that is a major contribution to the high costs of local manufacture. Continuous-flow techniques associated with high-volume production also pose formidable problems involving manpower skills and industrial logistics problems for newly industrializing countries. 1/ This inevitably poses a dilemma in the choice of industrial techniques - between highly integrated and mechanized equipment requiring sophisticated engineering and managerial control and less mechanized or automated equipment requiring the higher machine skills and technical personnel to convert and adopt techniques. 2/

D. Minimum scale and optimum technique. Choices in techniques of production depend largely upon the vehicle series and the degree of autarky enforced in the economy. High volume, automated techniques are associated with standard model passenger cars and light trucks with inter-related production runs of anywhere between 100,000 and 500,000 a year or more. Volumes drop to from 20,000 to 40,000 on medium-size trucks (3 to 5 tons) and to 5,000 or less on more specialized medium and heavy trucks and buses. A medium truck manufacturer such as Berliet has to offer anywhere from 70 to 200 combinations of engine, transmission, chassis, and load-carrying frame to compete in its field. Economies of scale are more pronounced in metal stamping and in the forging or machining of parts where mechanized or automated equipment can be used, than in assembly or finishing operations requiring a minimum of machine tools or equipment.

1/ See David Granick, Soviet Metal-Fabricating and Economic Development (University of Wisconsin Press, 1967), pp. 25-27, 115-119.

2/ Japan has had considerable success in utilizing small scale parts manufacturers who employ labor at lower wages and use less sophisticated machine tools. But unlike India, Japan has the engineers and technicians to convert techniques and a skilled labor force to compensate for quality and control that is not built into the machine. See Baranson Manufacturing Problems in India, pp. 68-69. (See also paragraph 57.)

Suitability of Product Design

47. In transferring automotive production to developing countries, international firms have kept adjustments in product design and production techniques to an absolute minimum. This is because such adjustments are both costly and disruptive to industrial transplant activities. But from the viewpoint of the developing economy, there is great potential advantage in automotive products that are more closely adapted to local market demands and operational environments. For example, in developing countries, where crop yields per acre are low, harvesting combines require "big mouths and small stomachs"; in agricultural sectors with higher crop yields, the need is for "small mouths and big stomachs". Climatic differences, terrain, and differences among crops also necessitate product design variations in the harvester's "pick-up" mechanism. Another example relates to commercial trucks operating in economies with acute capital scarcity. Small trucking companies in Japan that are short of working capital prefer to purchase equipment with a shorter operating life and higher operational costs, rather than incur high initial capital outlays. 1/

48. For products to be manufactured in the developing country, there is a further need to adapt product design and manufacturing techniques to the smaller market volumes and more limited production capabilities typically encountered in developing countries. Thus Chrysler found it necessary to build 25 percent more value into Turkish trucks (axles, shock absorbers, and differentials) in order to withstand local road conditions and driver usage. A British electrical automotive parts firm designed a high frequency horn for trucks sold in the Indian market because of differences in local traffic conditions. In Argentina, as in many other developing countries, bus bodies are built locally for truck chassis manufactured by Mercedes to cater to the variety of individual tastes and preferences.

Developing Quality Standards and Supplier Capabilities

49. It is important for the developing countries to achieve and maintain quality standards in the production of basic materials for the manufacture of intermediate components and the assembly of finished vehicles. This is an especially difficult task in economies sheltered from competitive forces, since inferior quality can undermine the entire fabric of production and indirectly contribute to even higher production costs than market prices indicate. Many basic materials that are considered standard stock in open economies often must be procured locally or specially ordered in small batches at considerably higher cost or at inferior quality. Moreover, reliability in product standards is a fundamental requirement for trading in

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1/ The economic costs of a truck engine will depend upon product characteristics of weight, horsepower, engine life, engine reliability, and fuel consumption. These characteristics in turn are relative to the regulations governing truck loads and highway speeds and the physical conditions of roads (including average grades and surfacing). See Baranson, Manufacturing Problems in India, pp. 27-33.

international markets, where major growth opportunities may lie. 1/ The foreign licensor has a major role in developing standards and specifications and in establishing quality control procedures, but ultimate success also depends upon the attitude and commitment of local management.

50. Obtaining basic materials according to required specifications is a major difficulty in economies that are only able to support a limited range of industrial activities. There are approximately 300 different materials of varying shapes and specifications in a standard diesel truck engine. Lack of uniformity in raw materials and semi-finished goods such as castings and forgings create special problems in milling and machining to required specifications. 2/ In high-volume production, precision and uniformity are built into automated equipment. Developing countries with limited markets are much more dependent upon the very machine labor skills in which they are deficient. They also lack the engineers and technicians to convert machine-intensive techniques to differences in factor costs and proficiencies.

51. Supplier industries are crucial in the development of an automotive industry. Outside plant procurement averages about 60 percent in industrially-advanced economies, as compared to only 40 percent in countries like Mexico and Brazil, where supplier industries are not as well developed. The higher percentage of in-plant production intensifies the diseconomies of small-scale production. Typical procurement items are forgings, castings, brakes, pistons, bearings, suspension springs, gaskets, bolts, and all types of electrical equipment and instruments. Given the foreign exchange constraints under which developing economies are attempting to industrialize, vehicle manufacturers are under relentless pressure to develop local suppliers of components and parts. The manufacturer-supplier relationship in developing economies is the exact reverse of what is typical of industrialized areas, where the manufacturer relies upon supplier know-how even to design required components and parts. In developing areas, it is the other way around; licensors have a heavy responsibility to help develop the supplier industry. Supplier industries,

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1/ A major ingredient of Japan's post-war success in supplying world markets with engineering products stems from the emphasis Japanese industrialists placed upon quality control. This emphasis stands in marked contrast to countries like India, where plant engineers will argue that an industrial product such as a diesel engine which falls substantially short of international standards is "good enough" for India. See Baranson, Manufacturing Problems in India, pp. 78-79.

2/ Porosity (air-bubbles in castings) is a typical problem which required 100 percent inspection procedures after milling to assure rejection of substandard parts. Rejection rates on defective parts in India have averaged three to four times those in the United States in certain cases. See Baranson, Manufacturing Problems in India pp. 78-79.

even in countries like Mexico and Brazil, typically lack engineering capability and foreign contacts to develop adequate supplier capabilities. 1/

52. Many of the larger automotive manufacturers in industrially advanced countries own subsidiaries to manufacture vital parts such as axles, crank shafts, bearings, and engines, because of their strategic importance and special manufacturing requirements. These subsidiaries specialize and sell to other manufacturers as well. But vertical integration is practiced to a much higher degree in developing countries than in industrialized economies. Kaiser reports that in the United States they depend upon outside suppliers for transmission and engine components, but this was not the case in Brazil and Argentina. Both Willys-Overland of Brazil (WOB) and Industrias Kaiser Argentina (IKA) are highly integrated companies with their own engine, axle and transmission plants, foundry and forge facilities, body stamping plants, and tool and die facilities. This degree of vertical integration was considered necessary to assure an adequate supply and acceptable quality of components in the newly developing automotive sectors.

Manpower Deficiencies

53. Plants in developing economies are especially short of managerial and supervisory personnel to implant transmitted technology and carry on plant operations. This includes engineering, financial, and marketing people to plan, organize, and carry out a production program. There is an even more acute shortage of "conversion" personnel to adapt product designs and production techniques to local environments and deficiencies. Organization and management is especially critical in automotive manufacturing operations involving tens of thousands of parts and hundreds of suppliers. Plant engineering, quality control, production and cost control (including the preparation of production standards and machine-load studies), and inventory control are among the many specialties in which experienced personnel are difficult to find. 2/ Volkswagen was especially outspoken on the shortage of such people ("fachleute"), complaining that engineers from developing countries often lacked the necessary

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1/ For a description of the role of vehicle manufacturers in developing local supplier capabilities, see Guillermo S. Edelberg, The Procurement Practices of the Mexican Affiliates of Selected United States Automobile Firms. (Doctoral Thesis, Harvard University, 1964).

2/ Important differences develop in joint ventures between foreign and local management over such vital matters as pricing, maintaining the international warranty, and performance standards including quality control. These differences are deeply embedded in psychological and attitudal differences between management systems that have developed under widely differing cultural and economic systems. (See Baranson, Manufacturing Problems in India, pp. 104-110; and Farmer and Richman, Comparative Management, Chapters VII and VIII.)

practical experience to take over plant responsibilities and are often unwilling to soil their hands in factory operations. Typically, there was an inadequate supply of the 20 to 30 middle-range managers, technical supervisors, and master mechanics necessary to set up initial procedures and improvise or make adjustments when things went wrong, especially during the first years of plant run-in.

V. COST COMPARISONS

54. There are considerable differences in the costs of production between developing and small scale economies operating under varying degrees of protection and in economies subject to international competition. The data analyzed in this chapter reveal costs averaging between 60 and 150 percent higher among the major automotive producers in Latin America (Brazil, Mexico, and Argentina) than they do in the United States. In India, ex-factory prices on passenger cars in a low volume series with an 85 percent domestic content, were 120 percent above the ex-factory price of a comparable vehicle manufactured in Europe under high volume conditions. High domestic content 1/ (60 to 90 percent) of components and parts produced at relatively low volumes (one-tenth or less) in small-scale plants is a major contributor to high costs. Cost differences may be accounted for in terms of factor price distortions, low-volume production, and excess profits. These in turn are traceable to a protected market structure and related tariff and exchange policies. 2/ Aside from these market structure limits, there is the factor of technical efficiency, which includes optimality in plant design and operation.

Analysis of Comparative Cost Data

55. Actual differences depend upon the nature and degree of technical and economic inefficiencies. The number of plants authorized to manufacture vehicles and the proliferation of models and makes both have a strong bearing upon the size of production runs and the relative diseconomies of scale. The scope and pace of industrialization also have an indirect effect upon sector efficiency. The drive toward autarky in a wide range of industrial activities has put unmanageable strain upon human resources and existing capabilities to organize and carry out production programs and maintain quality standards, thereby contributing indirectly to the increased costs of production.

1/ The definition of domestic content varies widely depending upon the country and the particular interpretation of regulations and administrative decrees. In most instances, domestic content is based upon vehicle value, but in some countries it is computed on the basis of weight. (One of the problems in negotiating interchange agreements in the Latin American Free Trade Area is reconciling value and weight systems.) Import authorizations under a value system are usually calculated from the c.i.f. price of an equivalent import without duty. Incentive provisions of automotive decrees are often stipulated in terms of meeting a minimum domestic content. Administrative interpretation varies over a) what may be included in value added by the firm, b) what percentage of purchased parts may be considered as domestic content, and c) the degree to which taxes or duties are included in direct or indirect domestic content. (See also footnote 2, paragraph 62.)

2/ Cost comparisons are based upon conversions at the official exchange rate at the time, unless otherwise noted. On the intricacy of exchange devaluations see paragraph 57 including footnote 1/.

56. In the material that follows, two sets of comparative domestic production cost data are presented for India and for Latin America. The cost curves for India (Chart 1) are for passenger cars. They show cost increments over time for a single firm with increases in domestic content and at varying output levels between 3,000 to 12,000 vehicles per year. The Latin American data (Chart 2 and related tables) provides inter-country comparisons for light vehicles manufactured in Argentina, Brazil and Mexico. In applying the sets of data presented in Charts 1 and 2, it should be remembered that the cost curves relate to a particular type of vehicle, a particular firm, a particular economy, and a particular point in time. The following should also be noted:

(i) Costs to the firm vary depending upon: a) percentage of in-plant production, b) scale of plant, and c) capacity utilization. The size of the industrial economy and the stage of development have a profound effect upon cost decisions to make or buy particular components or parts.

(ii) Data applies to a given number of model variations in an industrial complex turning out other series and models. Proliferation in the product mix, without proportional increases in overall volume, would shift the curves upward.

(iii) Domestic price structure, taxes, tariffs, and the exchange rate vary over time. Costs of domestic procurement, which loom large in the production bill, are influenced by obtainable profits of component and materials suppliers under non-competitive conditions and by their relative efficiency. Tax (or tariff) increases or a lagging exchange rate would shift cost curves upward. Devaluation, which was not offset by subsequent increases in domestic prices and production costs, would shift the curves downward.

(iv) Costs reflect a particular point on the firm's learning curve. Improvements in plant efficiency, other factors remaining unchanged, would result in a downward shift in the cost curves. The same applies to capacity utilization, which may vary over time. It has not been possible to separate cost differences attributable to diseconomies of small scale production and those due to learning, but it would be very useful and significant to do so. 1/

1/ There are several possibilities. One would be to use as a benchmark of efficiency a comparable plant in a more advanced stage of learning. Another approach would be to study a single plant over an extended learning period during which its production volume had remained stable. Learning curve concepts applied to an industrial sector are the basis of the infant industry argument first expounded by Friedrich List and Mihail Manoilesco. Both advocated protective tariffs to transfer labor from low-productivity agriculture to more productive industry. The classical infant industry argument refers largely to the development of external and internal economies of scale

India

57. In India, production costs for passenger cars ran about 2.2 times its European counterpart prior to the 1966 devaluation (see below). This was for a Fiat-type vehicle at very low volume (about 5,700 vehicles a year) and high national content (about 85 percent). The Indian plant also manufactured two models of small and medium trucks - with a total output of just over 12,000 units annually. The 2.2 cost comparison was as of April 1966, just before the rupee was devalued by about 60 percent (from Rs 4.76 = $1.00 to Rs 7.50 = $1.00). Ex-factory domestic prices increased 11 percent following devaluation. This meant that immediately following devaluation the Indian prices were 1.6 times the ex-factory European prices. It is difficult to foretell at this time what the net effect of devaluation will be. 1/

	India	Europe	Ratio
Before devaluation	Rs 11,320	Rs 5,118	2.2
After devaluation	Rs 12,664	Rs 8,064	1.6

(footnote continued from previous page)

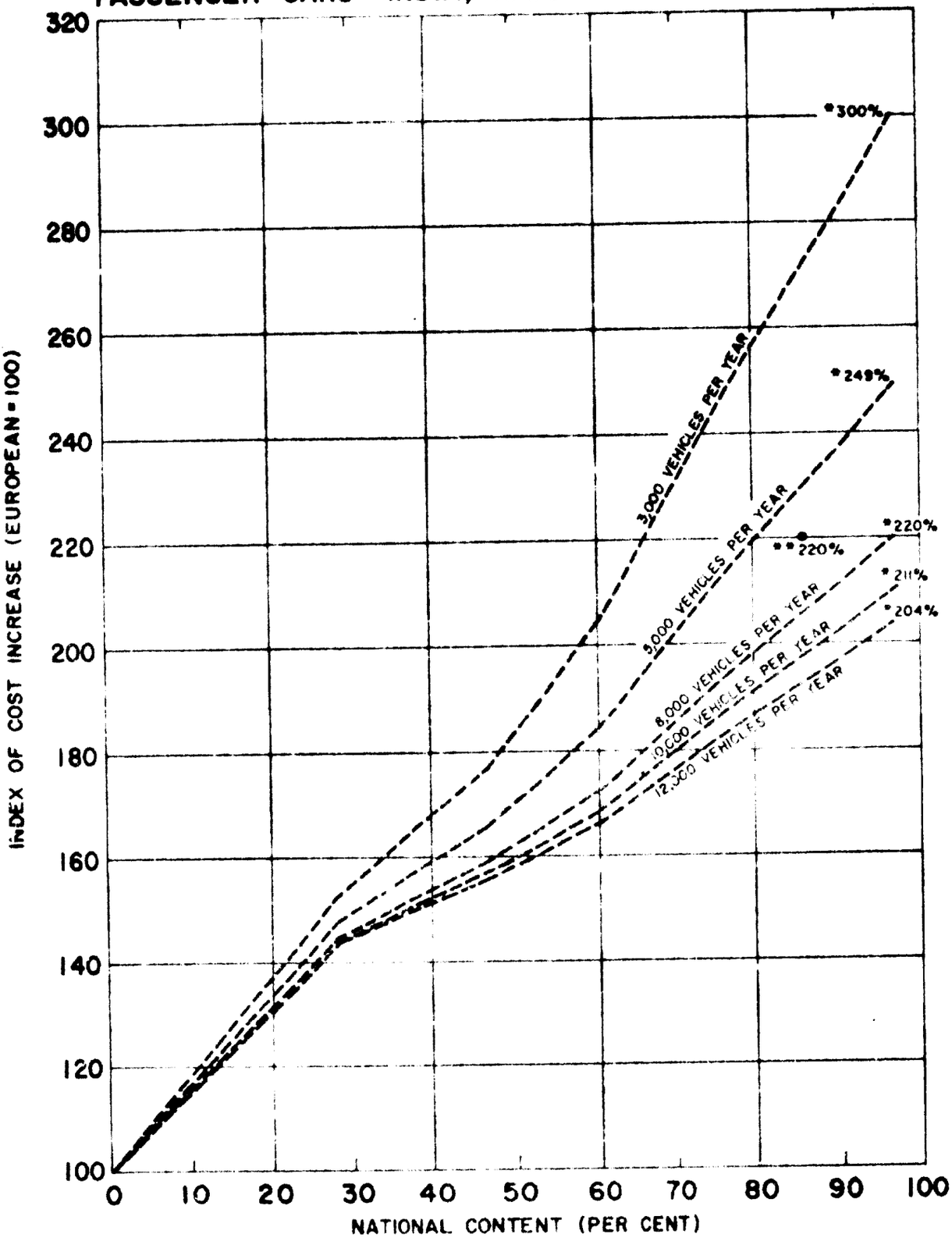
with market growth over time. Little has been added to the concept since it was last advanced more than 35 years ago. From an economic standpoint, infant industries are justifiable where the added costs of protection are eventually compensated by added national income, where market costs exceed social costs due to taxes or price distortions, or where the social returns exceed private returns, as is the case with decreasing costs during a running-in period to assimilate new techniques or to expand the rate of production.

1/ Actually, the full inflationary effect that one would normally expect as a result of devaluation has been considerably dampened by the recession that India has been undergoing. The average growth rate in the industrial sector has dropped from 8 percent to 2 percent - textiles and capital goods were particularly hard hit. Declines in the capital goods industry have resulted from a drop in the level of aggregate demand in both the public and private sectors. Budgetary constraints have forced cutbacks in equipment procurement contracts. Because of the recession, the demand for imports is lagging behind available foreign exchange at a time when, as a result of import liberalization, import licenses have become easier to get. Because of severe import restrictions prior to the devaluation, many firms are now importing in excess of their actual needs as a hedge against a recurring foreign exchange shortage. Once the recession is over, renewed demand for foreign exchange coupled with revived internal demand for goods may raise domestic prices and narrow the competitive price advantages initially gained from devaluation. (See Baranson, Manufacturing Problems in India, pp. 127-128.)

CHART I

INCREASE IN PRODUCTION COSTS AS A FUNCTION OF DOMESTIC CONTENT AND PRODUCTION VOLUME

PASSENGER CARS - INDIA, 1966



* At 97% national content

** Actual production, April 1966 (5,700 vehicles per year).

SOURCE: See Table 33.

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58. Another Indian manufacturer of heavy (eight-ton) trucks reported price competitiveness with the comparable European model. The Indian export price was actually 6 percent below the comparable European product immediately following devaluation, as compared to 23 percent above prior to devaluation. 1/ But this was on a series where volume was much closer to European standards - about 19,000 in India as compared to 30,000 in Europe.

	Ex-factory price (8-ton truck)		
	India	Europe	Ratio
Before devaluation	Rs 30,000	Rs 24,800	1.23
After devaluation	Rs 35,200/a	Rs 37,600/b	0.94

/a This is the Indian price excluding domestic sales tax, which amounts to Rs 10,000 on a vehicle of this type. The price does include about Rs 5,000 in custom duties and raw materials tax.

/b Allowances have been made for differences in the European and Indian model. Dealer's commission in India is about half (5.2 percent, or Rs 1,800, as compared to 12.5 percent, or Rs 4,700 in Europe).

59. An earlier study on diesel engine manufacture in India reveals two basic causes of high cost structure in that country: a) a much smaller scale of production relative to internationally competitive plants, and b) high procurement costs of materials and parts also produced in small scale plants under a protectionist regime. 2/ It cost nearly three times as much to produce a diesel engine in India as it did in the United States (Table 14). Although direct labor cost 0.6 as much, procured materials and parts, which constituted 75 percent of the engine value, cost 3.3 times U.S. equivalents (at Rs 4.75 to the dollar).

Latin America

60. In the analysis that follows, production costs of light vehicles in Argentina, Brazil and Mexico are compared to those in the United States. The same set of data is broken down in three ways: Table 15 compares domestic costs with import costs and then compares costs net of taxes to arrive at the difference in resource costs. Table 16 analyzes cost increments as a function of domestic content. Table 17 compares the cost elements of labor, materials, and indirect charges.

61. The cost of light truck manufacture runs 2.5 times U.S. costs in Argentina, 3/ 1.7 times in Brazil, and 1.6 times in Mexico (Table 15,

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1/ See footnote 1, p. 26 above.

2/ See Baranson, Manufacturing Problems in India, p. 88.

3/ See also cost comparison in Chapter VI on Argentina, paragraph 79.

Table 12

INTERNATIONAL COMPARISON OF COSTS:

ARGENTINA, BRAZIL, MEXICO, UNITED STATES, JANUARY, 1967

	LATIN AMERICAN COSTS[1]					U.S. COSTS				RATIOS		
	Domestic Value added	C.i.f. Value of Imported Content[2]	Ex-factory (2-1)	Taxes[3]	Cost Net of Taxes	Ex-factory[4]	Net of Taxes[5]	C.i.f. Latin America[6/]	Foreign Exchange Savings (6-2)	Ex-factory L.A. U.S. 3#	Cost of Domestic Value Added 4#	Resource Costs Net of Taxes L.A. U.S. 5#[7]
	(1)		(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
ARGENTINA:												
Car	$3,922	- [illegible]	$4,915	$1,640	$3,152	$1,775	$1,331	$1,[illegible]	$[illegible]	2.60	[illegible]	2.37
Trucks	3,092	[illegible]	4,[illegible]69	1,790	2,[illegible]79	1,634	1,226	2,456	1,[illegible]	2.60	[illegible]	[illegible]
BRAZIL:												
Trucks	2,816	180	2,996	1,[illegible]	1,[illegible]	1,752	1,314	2,597	1,[illegible]	1.[illegible]	1.27	1.[illegible]
MEXICO:												
Car (small)	1,440	1,440	2,880	[illegible]	[illegible],[illegible]9	1,756	1,317	1,956	[illegible]	1.[illegible]	[illegible].79	[illegible]
Car (large)	1,884	1,883	3,767	[illegible]	[illegible]	[illegible],[illegible]	1,723	[illegible],[illegible]	[illegible]	1.[illegible]	[illegible].[illegible]	[illegible]
Truck	1,315	1,315	[illegible],630	[illegible]	[illegible],[illegible]	[illegible]	[illegible]	1,[illegible]	[illegible]	1.[illegible]	[illegible].[illegible]	[illegible]

1/ Cost in local currency converted to dollars at official exchange rate at time of procurement. (In the case of Argentina, this was prior to devaluation in March 1967, at 350 pesos = US$1.00.) Figures are for annual production runs of [illegible],000 to 30,000 vehicles - which is 5 to 10 percent the size of product on runs for comparable vehicles in the U.S.

2/ These figures include allowances for import content of domestically supplied parts (estimated at 15% for Argentina, 30 percent for Mexico, and 20 percent for Brazil).

3/ See footnote 5, below.

4/ Cost estimate for a "reconstituted" vehicle equivalent to the overseas model.

5/ Based on estimated average of 25%. This includes all Federal, State and Local taxes, except for taxes on profits and income. A comparable concept is used in estimating tax component for the Latin American countries.

6/ Difference in "C.i.f. Latin America" (Column 8) and "U.S. ex-factory" (Column 6) costs represents ocean freight, insurance and port handling fees, but does not include import duties.

7/ This is generally referred to as the "Bruno Ratio."

Source: Calculated from data furnished by American vehicle manufacturers.

column 10). Cost differences for passenger cars are about the same; aside from obvious body differences, there is a close similarity in the production of light trucks and passenger cars both in terms of components and parts and length of production runs (paragraph 16). Column 11 gives domestic resource costs per dollar of foreign exchange savings - which is sometimes referred to as the "Bruno ratio" or the shadow rate of exchange. 1/ Thus, for Argentine cars, it cost $3,922 (pesos converted at official rate at time of procurement column 1) to produce foreign exchange savings of $1,782 (column 9) - a ratio of 2.20 (column 11). This means a peso valued at 250 to the U.S. dollar at the time of procurement would have to be valued at 550 to the U.S. dollar (250 times 2.20) to equate the difference in resource costs. For a comparison of relative resource costs, tax estimates have been netted out of ex-factory costs for the ratios shown in column 12. Since the incidence of taxes on automotive manufacture is higher in Latin America than in the United States, resource cost differences are somewhat lower than those shown in column 10.

62. Chart 2 and Table 16 show manufacturing cost increases for light trucks in Latin America as a function of domestic content 2/ for annual production runs of between 20,000 and 30,000 vehicles per year. Implicit in these cost indices are the increased costs of domestic manufacture in the numerator and the so-called deletion allowance given by the overseas suppliers. These deletion allowances characteristically are well below c.i.f. prices. 3/ Dramatic increases in production costs occur at the integration of engine and drivetrain components (particularly in Argentina). Sheet metal for vehicle bodies also involves substantial cost increases. Column 13 in Table 16 indicates the magnitude of investment in equipment for manufacture of components and parts at progressive phases of domestic content. They are the lowest for miscellaneous parts outside the "power train" (engine and transmission), which make up about 20 percent of vehicle value.

1/ For reference to shadow rate computations, see Michael Bruno, Interdependence, Resource Use and Structural Change in Trade (Jerusalem, 1967), pp. 104-113. This ratio is closely related to the concept of effective protection, which is defined as the extent by which domestic value added (measured in domestic prices) exceeds value added at world prices.

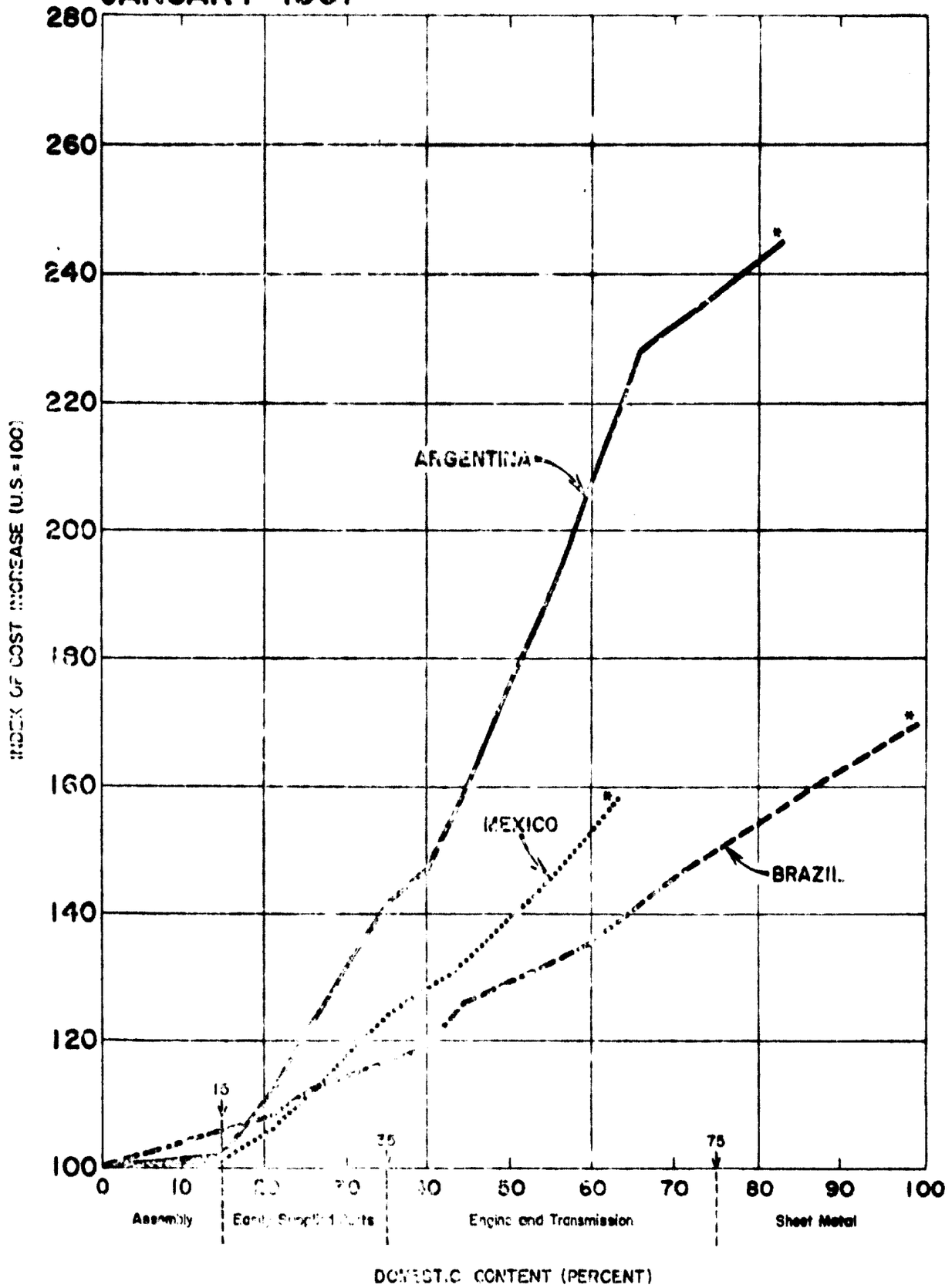
2/ Domestic content value is derived from local prices as a percent of total vehicle cost, which give indices of value (columns 4, 8 and 12, weighted according to the domestic price base in columns 2, 6 and 8). Thus, high cost or highly protected components in the various stages contribute to overstating local content shares in terms of international (c.i.f.) prices.

3/ The "deletion allowance" is the amount deducted from the price of a c.k.d. kit for the parts no longer imported because they are to be reproduced domestically. For example, for a complete kit priced at $2,000, if 40 percent value normally priced at $800 were deleted only $500 might be credited as a deletion allowance. Thus, the residual price of a 60 percent kit would be $1,500 (in place of the $1,200 one would normally expect). Deletion-allowance amounts are often based on marginal production costs (which are well below average total costs plus profit).

Source: Calculated from data furnished by American vehicle manufacturers.

CHART 2

MANUFACTURING COSTS IN LATIN AMERICA AS A FUNCTION OF DOMESTIC CONTENT, JANUARY 1967



*National Content in 1965.

SOURCE: See Tables 5, 15 and 16.

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Table 14

COST INCREASES AT DIFFERENT STAGES OF VEHICLE MANUFACTURE IN SELECTED LATIN AMERICAN COUNTRIES, 1967

Vehicle Production Stages	ARGENTINA				BRAZIL				MEXICO				Relative Magnitude of Investments 2/
	Cost Index 1/ (U.S.=100)	Share of Local Content %	Index of Cost Increase (1)x(2)	Cumulative Index of Cost Increases	Cost Index 1/ (U.S.=100)	Share of Local Content %	Increase (1)x(2)	Cumulative Index of Cost Increases	Cost Index 1/ (U.S.=100)	Share of Local Content %	Increase (1)x(2)	Cumulative Index of Cost Increases	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Local Content													
1. Assembly	115	15	17	102	140	15	21	106	106	15	16	101	4
2. Mandatory Items	260	6	17	113	150	6	9	109	180	6	11	106	1
3. Easily Sourced Parts	320	4	13	122	160	4	7	112	225	4	9	111	2
4. Some Supplier Development Required	300	10	30	142	150	10	15	117	230	10	23	126	3
5. Engine & Driveline-Assembly and Machinery													
a. -Make	190	5	10	147	130	5	7	119	190	6	11	129	6	8
b. -Buy	400	3	12	156	270	4	11	126	240	1	2	138		
6. Engine & Driveline-Foundry														Low Cost
a. -Make					160	13	21	134						
b. -Buy	400	14	56	198	180	3	5	136	220	10	22	152	5	8
7. Specialized Investment for Parts Production	430	9	39	228	200	12	24	148	240	8	19	153	7	
8. Sheet Metal & Other Components	200	17	34	245	180	27	49	170	250	3	8	158	8	
9. Sub-total	272	83	227		172	99	169		192	63	121			
10. Import Content	161	17	27	254	160	1	2	171	115	37	43	166		
11. Total Vehicle		100	254			100	171			100	164			

1/ Compares manufacturing costs for light trucks (see Table 13, Column 8 and footnote 1.) Computation of indices explained in note below.

2/ Investments ranked from lowest (1) to highest (8)

Note: This table illustrates costs of vehicle production in selected Latin American countries as compared with production costs in the United States. Column (1) shows the index of increased costs at each production stage as compared with U.S. costs. Column (2) indicates the percentage value of local content to the total vehicle value for each production stage. Column (3) indicates the cost increase for each production stage. Column (4) shows [illegible] gives average total costs at each stage to show [illegible]. For example, on line 2 under Argentina, 15 percent total content [illegible] at 10 percent. Column [illegible] shows that [illegible] ex-factory costs from line 1), 6 percent costs for [illegible] produced locally at 15% percent. Column 4 [illegible] more than U.S. ex-factory costs [illegible] at the remaining [illegible] valued at U.S. ex-factory costs. The reason is [illegible] Column (4) are computed as follows: [illegible]. The cumulative cost index for the Argentine vehicle is [illegible], Column (4). In other words, a vehicle which costs $2,000 to manufacture in the U.S., would cost $5,080 to reproduce in Argentina.

Source: Calculated from [illegible]

63. Assembly of complete knocked down (c.k.d.) sets involves only moderate cost increases (Table 16, line 1). In fact, beyond a certain scale, decentralization of assembly plants close to consumer markets is often economically advantageous, but it must be realized that at the production runs required by even the largest firms now located in developing countries, vehicles assembled overseas from c.k.d. units are more costly (3 to 10 percent more) than completely built up units. There are 30 to 40 percent savings on shipping costs because of the smaller freight volume, but these savings are offset by added costs of rust proofing and packaging against damage in shipping. Assembly and painting generally cost slightly more overseas than allowed as a deletion factor by the manufacturer. For low-volume producers in Sweden, special handling and packaging costs more than offset slight savings in assembly costs. Firms like Fiat have specialized in c.k.d. operations and have managed to reduce costs to a minimum.

64. Tires, batteries, engine fluids, and flat glass are included under mandatory parts (in Table 16, category 1). These are generally items manufactured locally for the parts replacement market even before domestic manufacture of new vehicles is undertaken. Items such as shock absorbers and small stampings (category 3) can be supplied with minimum additional investment in production capability and are often produced by an established supplier manufacturing a similar item for refrigerators or other consumer goods. The forging or casting and machining of engine, axle or transmission parts (category 4 and 5) involves both substantial investment and manufacturing know-how. In the U.S. there is a narrow difference between supplier costs and what it would cost to manufacture the item oneself. In developing countries, in-plant costs, especially at competitive scale, tend to be much lower than supplier prices - the joint result of protectionist profits and technical inefficiency. 1/ In large scale, competitive economies with well-developed supplier capabilities, specialization among parts manufacturers is both feasible and advantageous (paragraph 52). The risk and uncertainty of markets and production in developing economies inhibit investments in parts manufacturing plants (when they are already manufactured locally, even if at a somewhat higher cost). It is generally necessary to persuade parts manufacturers in the home country (often with long-term contract assurances) to establish a manufacturing affiliate in the developing country, particularly in such items as wheel drums, brakes, and axles (category 7), areas in which domestic suppliers generally lack the required capital or technical capability. Sheet metal for vehicle bodies (category 8) involves the heaviest investment commitments by manufacturers.

65. Brazil is considered the best sourcing area from the point of view of price and quality of purchased materials and parts. The "closed-border" rule in Mexico, under which a manufacturer is forced to purchase

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1/ Volvo's success in manufacturing relatively low volume of passenger cars for the domestic and world markets is in large part attributable to corporate capabilities to design and engineer automotive parts, which are then sub-contracted to domestic suppliers on very narrow margins of profit. Volvo has followed this pattern for over 40 years.

from a local supplier once he is licensed and established, undermines efficient procurement. In Brazil, costs are lower relative to Argentina's because: a) the domestic market is larger; b) manufacturers have been operating longer and have in many cases already written off capital costs for equipment that is still in good working order; and c) Brazilian automobile manufacturers have had a longer period to develop suppliers, improve quality, and reduce costs. Price stabilization programs in Brazil and Mexico, in contrast to Argentina, have also been an important factor in keeping suppliers' profits (and end-product costs) down. In Argentina, the tendency is toward a further proliferation of vehicle models and parts manufacturers, in contrast to Mexican efforts to "rationalize" production by limiting the number of vehicle models and attempting to standardize components and parts production.

66. Chart 3 and Table 17 show that the major element contributing to high costs of vehicle manufacture in Latin America is local procurement of materials and parts, which are either protected or carry high import duties. In Argentina, materials and parts run average 3.3 times U.S. costs and they constitute about 75 percent of total costs. Administrative and selling costs (4 to 7 percent of total costs) are twice as high in Mexico and six times higher in Argentina. Interest charges (and exchange depreciation losses) average about $120 per vehicle in Brazil as compared to under $12 per vehicle in the United States. Special tooling and amortization are also nearly three times as much per vehicle in Brazil and Mexico (on considerably smaller production volumes) than they are in the United States.

67. Capital costs per unit manufactured increase considerably at lower volumes of production. A European firm reported the following investment costs for a small passenger car:

Annual Production (Units)	Investment (US$ million)	INDEX FACTORS		
		Production	Investment	Investment per Unit
180,000	$ 145.0	1.00	1.00	1.00
60,000	75.0	.33	.60	1.82
3,00	25.0	.02	.20	10.00

In most cases, firms have managed to keep capital charges down on short production runs by amortizing tooling dies on vehicle bodies over a 5 to 10 year period. This is less of a problem on designs with longer life cycles than it is on the more rapidly changing U.S. models. In order to minimize capital costs, Volkswagen in Brazil is continuing to manufacture the older body with smaller windows. Similarly, Volkswagen in Mexico will retain the 1963 design until 1968. For domestic markets, this is a small price to pay for the capital savings. Variations in capacity utilization make a relatively slight difference because of the small percentage that constitutes fixed costs. This is even more true of firms with a high percentage of outside procurement; their percentage of equipment and fixed costs are proportionately lower and variable material costs higher.

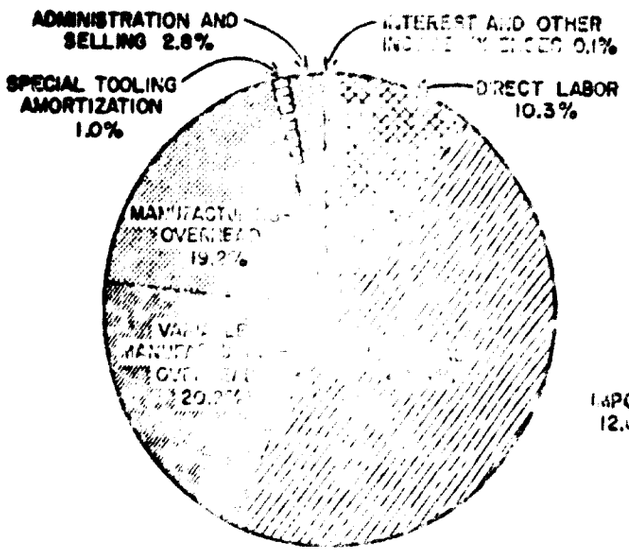
CHART 3

COMPARISON OF COST ELEMENTS IN MANUFACTURE OF LIGHT TRUCKS

U.S., ARGENTINA, BRAZIL AND MEXICO

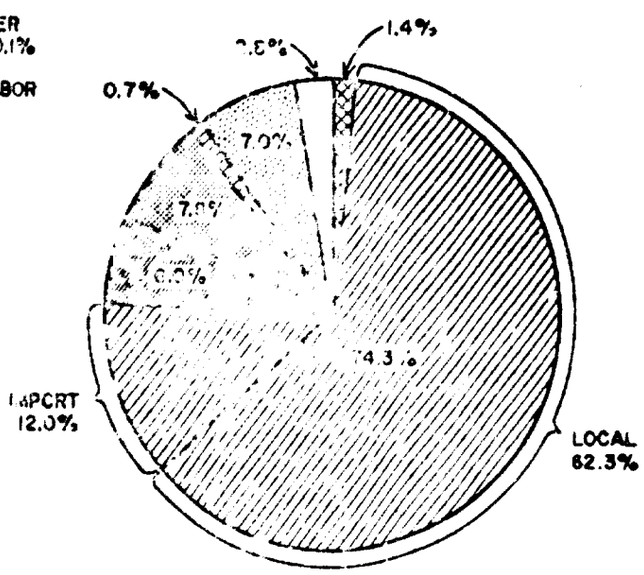
JANUARY 1967

U.S.



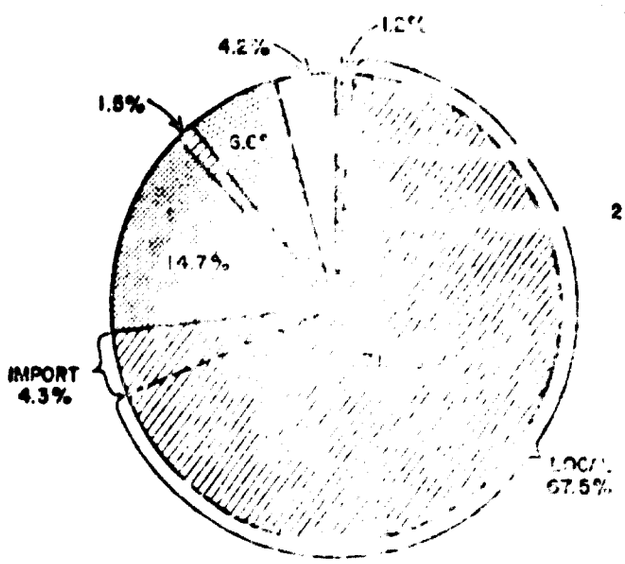
$1,650 PER VEHICLE

ARGENTINA



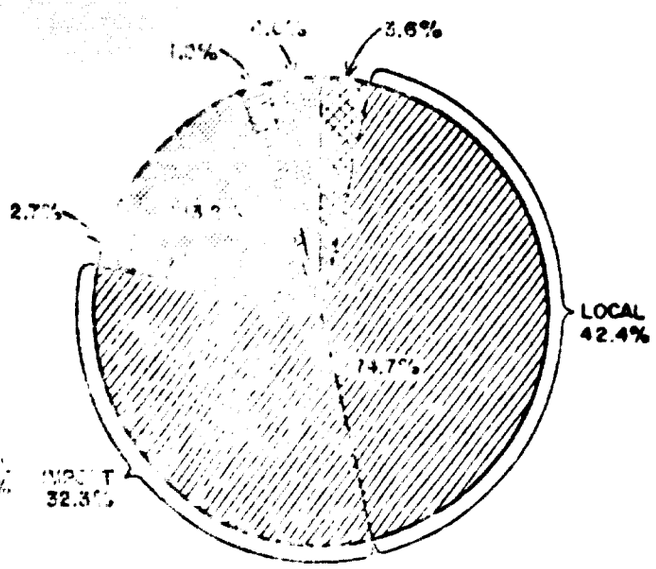
$4,003 PER VEHICLE

BRAZIL



$2,000 PER VEHICLE

MEXICO



$2,630 PER VEHICLE

SOURCE: See Table 17

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Table 17

COMPARATIVE ANALYSIS OF COST ELEMENTS IN THE MANUFACTURE OF LIGHT TRUCKS: U.S., BRAZIL, ARGENTINA, AND MEXICO, 1967

	DOLLAR COSTS[1]				PERCENTS				RATIOS		
	United States	Argentina	Brazil	Mexico	United States	Argentina	Brazil	Mexico	Argentina/U.S.	Brazil/U.S.	Mexico/U.S.
1. Direct Labor	$ [illegible]	$ 56.96	$ 35.95	$ 94.68	1. 10.3	[illegible]	1.2	3.6	1. 0.33	0.21	0.55
2. Material - Local	[illegible]	2,534.99	2,022.30	1,115.12	2. 46.4	82.3	67.5	42.4	2. 1.24	2.63	1.45
- Import	--	448.28	128.82	849.49	--	12.0	4.3	32.3	--	--	--
3. Variable Manufacturing - Overhead	335.32	224.14	--	71.01	3. 20.2	6.0	--	2.7	3. 0.73	--	0.21
4. Sub-total - Variable Cost	1,276.54	3,324.37	2,187.07	2,130.30	4. 76.9	91.7	74.0	81.0	4. 2.60	1.71	1.67
5. Manufacturing - Overhead	318.72	317.38	440.41	367.16	5. 19.2	7.8	14.7	13.2	5. 1.00	1.38	1.09
6. Special Tooling Amortization	16.60	28.48	[illegible]	[illegible]	6. 1.0	0.7	1.5	1.8	6. 1.72	2.71	2.85
7. Administration and Selling	46.48	284.83	197.74	105.20	7. 2.8	7.0	6.6	4.0	7. 6.13	4.25	2.26
8. Sub-total - Fixed Cost	381.80	630.69	638.09	[illegible]	8. [illegible]	15.5	22.8	19.0	8. 1.65	1.79	1.11
9. Interest and Other Income Expense[3]	1.66	113.96	125.84	--	9. [illegible]	[illegible]	4.2	--	9. 68.64	75.81	-
10. Totals and Averages[4]	$1,660.00[2]	$4,069.00	$2,996.00	$2,630.50	10. [illegible]	100.0	100.0	100.0	10. 2.45	1.80	1.58

1/ Dollar costs for Latin Countries converted at prevailing official exchange rate.

2/ U.S. vehicle represents an average cost ($1660) for the three slightly different models. See table 43, column 6, U.S1 f.o.b. prices for "trucks" Brazil ($1752), Mexico ($1626), and Argentina ($1631).

3/ Includes losses due to exchange depreciation.

4/ Ratios shown here differ slightly from those given in figure 43 because U.S. base vehicle not the same, see footnote 2 above.

Source: Calculated from data furnished by American Vehicle Manufacturer.

VI. THE AUTOMOTIVE INDUSTRY IN ARGENTINA

68. The Argentine industry has developed largely in the past decade under a regime of protection and progressive import substitution. Approximately 200,000 vehicles are now manufactured for the Argentine market. Prior to devaluation (1967), production costs were running about 2.5 times a comparable duty-free import from an American or European plant. The basic reason for high costs is a market structure about one-sixth the size of Italy, in plants that produce at about one-tenth the scale of most European plants. The proliferation of plants is further compounded by the wide range of models and makes, which throws a heavy burden upon supplier industries to furnish an extremely wide range of components and parts for a market of this size.

Development of the Domestic Industry

69. Before 1955, 75 percent of the motor vehicles consumed in Argentina were imported with foreign exchange earned from agricultural exports. Subsequent balance-of-payment difficulties restricted imports of commercial and passenger cars. Under the Peron regime, the import of motor vehicles was a licensed privilege. The provisional government that followed Peron allowed the public to import cars subject to moderate surcharges, but the Frondizi Government sharply increased duties and encouraged the development of a domestic industry. National production was given its major impetus by the Government decree of March 1959. Under its provisions, domestic production has expanded nearly six times to the point where it now supplies 99 percent of Argentine demands. The decree also provided for progressive increases in content of national components and parts (80 percent on trucks and 93 percent on passenger cars by the end of 1965). 1/

	1956	1965
Imported vehicles	17,700	1,100
Assembled in Argentina	5,900	194,500
Total vehicle consumption	23,600	195,600
Imports as a percent of total consumption	75%	1%

Source: Table 20.

70. Mercedes-Benz was the first major foreign firm to establish manufacturing operations in Argentina in 1952. Their production plan provided for the development of domestic suppliers of components and parts and the

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1/ Decree No. 3693, issued by the Ministry of Industry and Mining, later revised in August 1961 (Decree 6567) with subsequent amendments consolidated in the May 1965 Decree No. 3642.

progressive integration of national parts into final assemblies. Industrias Kaiser Argentina (IKA) began operations in 1955. They purchased used equipment from the Kaiser plant in the United States including their own forging facilities. In 1963, they built their own axle and transmission plants and began supplying these parts to other manufacturers as well. By acquiring their own production facilities, they were assured a continued supply of quality parts in these critical items. Following the 1959 decree, Fiat, Ford, General Motors, Chrysler, and seven smaller firms entered the field. In 1965, Siam di Tella was purchased by Kaiser and Chrysler purchased DKW. In July, 1967, Renault acquired the controlling interest in Kaiser (paragraph 35.)

Growth in Domestic Demand

71. The demand for automotive products in Argentina has been increasing well in advance of the growth of population and income in the past decade. Ownership density increased from one car for every 32 inhabitants in 1955 to one for every 14 in 1965.

	1955	1965	Average annual growth rate
Argentine population (millions)	19.1	22.4	1.5%
Registered vehicles (thousands)	60.2	154.2	9.9%
Population per vehicle	32	14	8.2%

Source: Asociacion de Fabricas de Automotores, Report No. 267.

Intensified demand for automotive products has doubled the car population in the eight-year period between 1955-1963. The decline in automotive prices since 1960 measured in constant pesos has also contributed to rising demand. 1/ Credit terms were also eased during this period (cash down payments were lowered and the length of the repayment period was extended). The subsequent increase in excise taxes on passenger cars in early 1966 was in line with Government efforts to reduce foreign exchange deficits and release industrial resources to other sectors.

72. In the six-year period 1959-65, there was a sixfold increase in the output of passenger cars and trucks, from about 33,000 in 1959 to 195,000 in 1965. This represented an average annual rate of growth of 35 percent, among the highest in the world in the past decade (Table 11). Measured in terms of value added, the rate of growth during this period was even higher - an average annual rate of 47 percent. Employment during this

1/ The wholesale price index rose 140 percent between 1960 and 1964, as compared to the automobile price index which increased by only 72 percent. This means that the relative price of cars at the end of 1964 measured at constant value was 28 percent below the 1960 level. The decline may be largely explained in terms of intensified competition among the 13 manufacturers that eventually entered the market. (Source: ADEFA, Informe Estadistics No. 163, April 28, 1965.)

same period rose only three times - largely due to increases in the scale of production along with some productivity gains. The average annual rate of investment in 1960-64 was nearly ten times what it had been in 1956-59.

	1956	1959	1965
Vehicles Assembled	5,900	32,800	195,000
Employment	3,700	11,600	34,600
Value added (million U.S.$)		46	465

Average annual investment (million U.S.$)	1956-59	1960-64
	5.5	54.1

Average Annual Growth Rates

	1956-59	1959-65	1956-65
Vehicles	75%	35%	46%
Employment	46%	17%	28%
Value added		47%	
		1956-64	
Investment		33%	

Source: Table 18.

Present Structure of the Industry

73. The Argentine automotive industry operates under severe diseconomies of scale. In 1965, Argentine production amounted to less than 2 percent of U.S. output. There were 13 manufacturers producing over 68 models of cars and trucks. 1/ The six major manufacturers turned out between 13,000 and 57,000 units; seven others totaled between 500 and 6,600 each (Table 19). There are several thousand component and parts manufacturers in Argentina, many operating out of small garage shops as sub-contractors to larger parts manufacturers. Chrysler alone reported 1500 supplier-vendors in 1965 (about one-third of these were dual supplier sources).

74. Intensified competition has lead to a proliferation of makes and styles and frequent model changeovers (Kaiser's line advanced from 4 models in 1956 to 22 in 1963). Little or no effort has been made to standardize vehicle elements on bodies, chassis, engines, transmission, electrical equipment, or brake and clutch systems, and this has compounded the basic difficulties of small-scale production. Each manufacturer has also insisted

1/ Aside from basic differences among passenger cars, trucks and buses, and a variety of other commercial-type vehicles, there are the differences in types of engines (horsepower, cylinders, gas/diesel, etc.), cooling systems, gear systems, electrical systems, wheel and tire sizes, chassis types, various body sizes and shapes (and number of doors) spring suspension systems, axle widths, brake systems, etc.

upon developing his own suppliers, so that there are often as many as half a dozen suppliers even for such parts as radiators and batteries. Model proliferation adds to plant tooling costs and increases the burden of technical assistance to parts suppliers (see paragraphs 108-110).

75. Production volumes in Argentina are low by world standards, which means that Argentine plants can only afford single pieces of expensive equipment that must then be used for a variety of purposes in order to minimize capital costs per unit of output. This results in considerable down-time on equipment. For example, heavy body dies for presses have to be changed on several successive short runs of the 20 to 30 body panels in each passenger car or truck model. Another approach to more effective use of installed equipment has been the extending of model cycles to as long as 7 years on engines and 3 years on body design. Low-volume equipment is used wherever possible for the manufacture of components and parts (single station, multi-purpose less-automated equipment). For example, portable welding equipment and riveting guns are used for body assembly, rather than the heavier automatic equipment used by assembly plants in Detroit. Almost always this means higher unit capital costs relative to mass production techniques in larger plants elsewhere in the world. Inefficient plant utilization is in part due to the economic recessions that have plagued the Argentine economy.1/ During periods of downturn, automotive firms are forced to carry underemployed labor and idle plant capacity, and this inevitably raises long term average unit costs. Firms estimate that utilization varies between 20 and 60 percent in "bad" years and 70 to 90 percent in "good" years (Table 20).2/

76. The production cutbacks ordered in early 1966 further undermined efficient plant utilization (see paragraph 71). Production dropped from

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1/ Economic downturns tend to occur more frequently (about every 3 years) and with greater intensity (-5.5 percent decrease in 1963 as compared with 8.6 percent growth in 1964) than they do in more advanced industrial economies. Physical output of automotive vehicles has varied from a 1.2 percent increase during the 1959-60 boom period to a 19 percent decline in 1962-63 (Table 21).

2/ Production at the Kaiser plant slumped from a peak of 170 vehicles a day in 1960-61 to 81 a day in 1963, then jumped back to 200 a day in 1964. Such variations are bound to increase average production costs. Utilization estimates depend upon whether equipment is normally used on a one-shift or multi-shift basis. Kaiser and, to a lesser degree, Fiat have equipped their plants for three-shift operations (Table 20). At the Ford Plant, which was equipped largely for a one-shift operation, utilization of installed capacity dropped to 16.8 percent for trucks and 23.7 percent for cars during the 1963 depression and climbed back to 74.4 percent and 76.2 percent respectively in 1965 (Table 22). Capital to output ratio rose to 5.4 in 1963 as compared to 2.8 in 1964; and there were 3.4 employees per 100,000 pesos of value added in 1963 as compared to only 1.5 in 1964 (Table 23). Differences were even more marked at Chrysler, Fiat, and Mercedes.

195,000 units in 1965 to 160,000 units in 1966. These cutbacks were inevitable in view of Argentina's deteriorating balance-of-payment difficulties toward the end of 1965, but the economy had to pay the additional price of reduced production efficiency. At least 2 years lead-time is needed to prepare a realistic production plan for adjusting to such drastic changes in production quotas or for integrating new components under a revised domestic-content regulation. Industry was informed in May, 1965, to plan on cutbacks in January, 1966, but no one realized how severe they would be. Considerable time and resources were spent in complying with Government regulations and report requirements - as much as 12 man-years per year according to one firm. The turnover in Government personnel issuing administrative orders further compounded the problems. Not the least of the difficulties was the inflexibility on the part of the industrialization authorities in allowing individual manufacturers to adjust to different sets of circumstances. For example, when Bendix Brakes went out of business in 1963, Chrysler was fined heavily because it was forced to import brakes.

Supplier Problems

77. Automotive manufacturers experience great difficulty in obtaining an adequate supply of required components and parts. Quality has been deficient on such items as electrical equipment (spark plugs, starters, ignition coils, distributors and various instruments). Difficulty has also been experienced with forgings and castings (especially aluminum castings and iron engine blocks), chrome-plated items (grill work and bumpers) and various plastics and vinyls (in some cases reverting to paper-covered wires has proven more practical and cheaper). Most body manufacturers have had to import sheet steel of the type produced in Argentina, because the local product had a high-rejection rate when used in the heavy-duty stamping presses due to substandard ductility.

Manpower Situation

78. Except for periodic shortages of critical skills (e.g., tool-die makers and skilled machinists), the recruitment and training of industrial labor has posed no major obstacle. Workers are considered very skillful with their hands (by international managers), and there is a good supply of technical people. There has been a turnover problem with the rise and fall of economic activity. Many of the technicians trained by the automotive industry are lost when work falls off; others have gone out and set up their own garage operations to produce components or parts for the industry. (There is a strong inclination among Argentinians to own their own business, regardless of the opportunity cost.)

Comparative Costs and Balance-of-Payment Effects

79. The analysis of Argentine costs appears in Chapter V. It shows that a light truck (or comparable passenger car), which can be produced for about $1,660 in the United States, costs about $4,100 to manufacture in Argentina (or 2.5 times as much). The basic contribution to high cost is the procurement of materials and parts that are produced in very short production runs or have a high mark-up due to protection. Procurement

costs average 3.3 times higher in Argentina. Understandably, price differentials are larger on components and parts that are typically high-volume in the United States; generally speaking the cost gap is proportional to the production volume gap. The cost differential is especially high on a part such as a camshaft, which has a good amount of intricate milling and is produced largely by automatic equipment in the United States, in contrast to hand-machining in Argentina for low volumes. Other high-cost items include pistons, starters, and clutches (Table 24).

80. The above figures on comparative costs are corroborated by another set of data obtained during the field mission to Argentina. Unit costs (ex-factory prices) of cars and trucks in Argentina averaged about 2.5 times those in the United States (Table 25). Kaiser reported a difference of 1.8 on the Jeep, which sold for $3,188 in Argentina as compared to $1,728 in the United States (Table 26). But on its higher priced passenger car, the delivered price was 2.9 times its U.S. counterpart. At subsidized export prices, which allow special drawbacks and a more favorable exchange rate, IKA was able to deliver a jeep to an adjacent Latin American market for $1,707, 1/ or slightly under the f.o.b. U.S. list price. It should be borne in mind that Argentine vehicle models are somewhat different from similar models in the United States. For example, 1965 Ford (Argentina) trucks have 1964 bodies and 1959 engines among other differences.

81. A major consideration in enacting the import substitution program was to conserve foreign exchange. The rationale behind the 1959 automotive decree was that substantial increases in domestic consumption of automotive vehicles would be realized without appreciable increases in foreign exchange expenditures. But the mounting foreign exchange burden forced the production cutbacks of 1966. The Government hoped to expand production from about 33,000 vehicles in 1959 to 200,000 in 1965, without increasing the foreign exchange burden much beyond the 1959 level (estimated at US $44 million). Actually, the burden rose to about US $250 million (which included $50 million for remittances of earnings).

		1959	1965
1.	Vehicles manufactured (number units)	32,000	195,000
2.	Value at c.i.f. cost (million)	$ 75 mm	$449 mm
3.	Value at Argentine costs (million)	$134 mm	$796 mm
4.	Import percent - Planned	34%	10%
5.	Foreign exchange costs (US$ million) (line 2 x line 4)	$ 26 mm	$ 45 mm
6.	Import percent - Actual	56%	29%
7.	Foreign exchange costs - Actual (US$ million) (Line 3 x line 4)	$ 42 mm	$250 mm

Source: Table 27.

1/ This is at an exchange rate of 225 pesos to the dollar in December 1965, which would have corrected for overvaluation as reflected in the [illegible] of domestic prices since 1958/59 as compared to percent changes in subsequent devaluation. At the official rate, the export price [illegible] (Table 2[illegible]).

Corporate Earnings

82. In the years immediately following the 1959 decree, firms were able to earn substantial profits on the allowed 40 percent imported content on which the duty averaged 30 percent, as compared to over 150 percent protection on assembled vehicles. The decline of consumer prices (netting out the inflationary trend), coupled with rising costs as a function of domestic content, has probably resulted in a narrowing of profits for successful firms. In 1964, which was a "good" year, profits after taxes ranged between 5 and 10 percent of sales and 20 to 30 percent on shareholder's equity (Table 28). This appears favorable when compared with reported earnings by U.S. automotive firms of 5 to 8 percent profits on sales after taxes in 1964/65 and 14 to 24 percent on shareholder's equity (Table 29).1/

83. Reported earnings varied widely among firms, from a high of 13.7 percent on sales after taxes reported by Fiat to a 2.5 percent loss reported by Mercedes Ben. (Table 28). Losses during bad years have been offset by tax write-offs, so that the net gains have been substantial. Kaiser probably did well until late 1965; they got an early start, developed essential parts production capability, and successfully diversified the vehicle line to meet competition without overtaxing production capabilities. Fiat managed to do well from the outset; they were especially astute in negotiating their agreement with the Argentine Government and in earning substantial profits from high percentages of imported content. During 1966, when most firms were forced to cut back production, Fiat managed to expand production by more than 30 percent (from about 26,000 to 34,000 units).

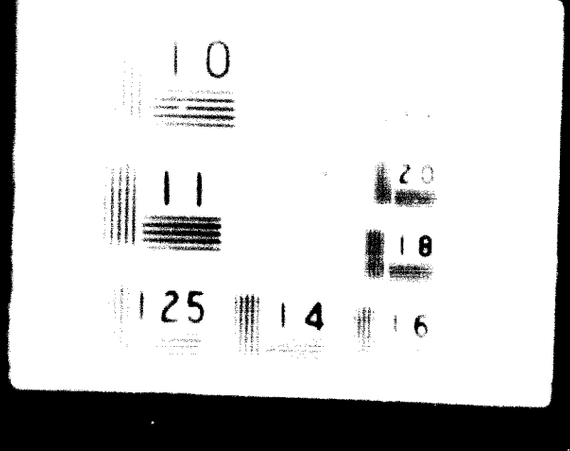
84. Ironically, the demise of IKA in mid-1967 was in part due to an over-extension made possible by its leading position in the industry. In absorbing Siam di Tella, IKA hoped to gain an additional 5,000 vehicle production authorization along with forging and casting facilities in the Buenos Aires area (IKA was located largely in Cordoba). They bought into a firm with underestimated liabilities just before the drastic cutbacks ordered by the Government in late 1965. IKA's production dropped by about one-third from about 54,000 units between November 1965 and November 1966.

Critique of Argentine Experience

85. The import substitution policies initiated by the Argentine government resulted in the rapid growth of an indigenous industry, but the price was high in terms of comparative costs of production and a mounting foreign exchange burden. The theory behind the industrialization program was that growth could be achieved within the constraint of foreign exchange shortages.

1/ Reported profits and international comparisons should be taken with several grains of salt. To begin with, Argentine profits on equity are overstated due to under-evaluation of assets as a result of the 20 to 35 percent annual rate of inflation. Secondly, in addition to corporate profits of the Argentine corporation, the international firm also realizes income from the sale of components and parts and from licensing and technical assistance fees (which would probably double reported earnings from each of these other sources).

4. 5. 72



Argentina planned for a sixfold expansion in the number of domestically manufactured vehicles between 1959-65 on the basis that there would be no appreciable increase in foreign exchange requirements. In fact, foreign exchange costs expanded nearly five times during this period. To this extent, the program of import substitution designed to save foreign exchange and increase output from available resources was self-defeating.

86. Industrialization policies have resulted in a large number of vehicles and parts manufacturers that are inefficient by world standards. There are too many plants and too many models and makes for a market the size of Argentina. Argentine consumption followed the general pattern of demand in more affluent societies that can afford product differentiation because of higher income levels and more efficient industrial organization. However even in France and Germany, in the post-World War II period, Citroen and Volkswagen mass-produced small cars with no model changes at all for years to take advantage of scale factors (see paragraph 109). Protection and import controls associated with Argentina's industrialization policy have raised the cost structure throughout the economy, distorted price mechanisms, and undermined future growth and expansion of industrial sectors. Commercially, the automotive industry suffered from a combination of erratic demand, adverse supply conditions, and periodic narrowing of profits in times of recession or cutback.

87. Rapid development of local content has added to internal inflationary pressures as new demands on domestic resources for materials, skills, and capital equipment outstripped the economy's supply capabilities. Costs also rose as less expensive imported materials and parts were replaced by domestically manufactured goods. In the indiscriminate pursuit of autarky, scarce engineering and managerial skills were spread too thin in too wide a range of components and parts manufactured for too many low-volume vehicle models. The system of import restrictions and a lagging exchange rate have distorted price mechanisms and resulted in the misallocation of critical resources such as foreign exchange and capital equipment.

88. Intensified competition from too many producers in a limited market, coupled with the emphasis upon styling and model proliferation as the major device for a firm to maintain its market share, has resulted in an inevitable cost-profit squeeze for many firms. This, added to increasing difficulties on remittances of earnings because of Argentina's balance-of-payment difficulties, has eroded the incentive to invest in Argentina. Most firms have also experienced difficulties in adjusting to abrupt changes in production schedules brought on by chronic balance-of-payment difficulties. Drastic cutbacks in late 1965 contributed to the liquidation of Argentina's largest vehicle manufacturer.

89. The high cost structure induced by protection undermined Argentina's future chances for entering and competing in larger regional or world markets, which are the major opportunities for future growth and more efficient production at larger scales. To enter such markets, plants must be cost competitive and maintain international quality and reliability standards. The system of protection also created vested interests representing inefficient managers and plants, which are difficult to phase out from a political standpoint. A lagging exchange rate, which in effect subsidized import substitution industries, is not compatible with industrialization strategies dependent upon export activities.

VII. CURRENT DEVELOPMENTS IN YUGOSLAVIA

90. Yugoslavia is an interesting and important case study in the development of the automotive industry. Their system of economic planning enabled them to control consumption patterns in terms of product range and quantities. They have also managed foreign exchange costs more effectively. But there has been an over-proliferation of plants and suppliers, and non-standardized models and parts have contributed to high costs. Foreign exchange shortages have forced domestic production of parts that are costly to reproduce in short series or expensive to stock pile until supplies are used up. The Yugoslavs have felt the need to liberalize international trading in 1965 in order to eliminate high cost items. Increased trading with soft currency areas has been one means for increased production volume through exports. Yugoslavia is also an interesting case of a country in the intermediate stage of industrial development that has now become a transmitter of technology to countries like Egypt and Indonesia partly as a result of barter trade arrangements and partly due to the fact that their product designs and production techniques are nearer to the income and scale requirements of these third countries.

Economic Policies

91. The Yugoslavs have been highly pragmatic in their drive toward economic efficiency under "market socialism". They realize that the next major step in economic development is to deal with the basic problem of ways and means to increase production volume. There is just so much that can be done internally to standardize parts, integrate plants, and increase complementary production among trading partners under barter arrangements. A new series of economic reforms 1/ is designed to liberalize controls over the management of Yugoslav firms and enable them to become part of the international division of labor. Under the proposed reform, Yugoslav firms will have even wider latitude in utilizing direct profits and exchange earnings for reinvestment and future growth. This not only puts production units on a more economic basis, it also exposes industrial sectors to international pricing standards and a more efficient use of national resources. The Yugoslavs realize that competition in world trade is intensifying, and the sooner Yugoslavia exposes its economy to competitive forces the better. Under the 1965 reforms, [illegible] decision making at the enterprise level in the fields of marketing, production, and investment were authorized - a major departure from the system of centralized planning that prevailed in the 1950's. Enterprises are free to choose suppliers, set prices on their products, and decide how to use profits for investments in future growth. The criterion of enterprise decision is income maximization "within the framework of social objectives". The new regulations provide for autonomy in negotiating cooperation with foreign partners including agreements on production specialization. Enterprises plan their foreign trade with a view toward

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1/ See Federal Institute of Economic Planning (Yugoslavia), Planning of Foreign Trade - the Yugoslav Experience (Belgrade: FIEP, March 1967), pp. 10-15.

maximising revenue and obtaining the best sources of supply. Reasonable rationalisation will also give Yugoslav enterprises wider latitude to negotiate partnerships with foreign affiliates 1/

Market Structure and Comparative Costs

92. In 1965, about 35,000 passenger cars and 10,000 trucks were being manufactured and assembled in Yugoslavia. There were 10 firms engaged in the manufacture of cars and trucks. The economy is attempting to improve production efficiency by extending their market range and rationalising models and parts. The major passenger car and truck manufacturers have been exploring ways and means to rationalise domestic production and enter into broader international arrangements to specialise and trade in components and assembled vehicles. Yugoslav firms have been inhibited in their efforts by capital and foreign exchange shortages and have been seeking ways to broaden relationships with foreign partners in order to more effectively absorb foreign techniques, enlarge market access, and expand the scale of production. The problem of entering into international arrangements that are compatible with the legal framework of socialist ownership has been virtually resolved.

93. Cost comparisons are somewhat deceptive in that they do not reflect relative efficiencies in terms of resource requirements at international prices. Under the exchange and tariff structures that prevail in Yugoslavia, 2/ the export price of a Fiat 600 manufactured by Crvena Zastava is $1,000, which is just below the ex-factory price in Italy ($1024). Production volume at CZ in Yugoslavia is of the order of 1/25 that of Fiat in Italy.

Production Strategies for Yugoslav Plants

94. The largest passenger car plant in Yugoslavia, Crvena Zastava, (CZ), operates under a Fiat license. They manufactured and assembled over 40,000 vehicles in 1966. Dealerships have been established in Greece, where Yugoslav "Fiats" are sold in competition with Italian Fiats. A substantial amount of Fiat replacement parts are also marketed in Greece. CZ dealers compete with Italian Fiat dealers by selling at a lower mark-up and providing wider choices to customers on accessories and trim not offered in the passenger cars and small trucks mass-produced in Italy. Fiat in Italy tolerates Yugoslav competition in Greece because of its long-term interest in Yugoslavia as a gateway to Eastern European markets.

1/ One of the first agreements along this line was announced in May 1967 between the Italian Government-controlled oil agency and the Yugoslav state oil company. The joint ventures will design and construct petroleum refineries and petrochemical plants for Yugoslavia and in newly-industrializing countries.

2/ The dinar was devalued in 1965 from 750 to 1,250 dinars to the dollar, and tariffs on imports adjusted downward so as not to increase supplier costs.

99. CZ is intensifying its efforts to reduce production costs by: a) maximizing the use of existing capacity, and b) increasing parts series volume through specialization and interchange among Fiat affiliates in other eastern European countries. But the major opportunities for future growth now lie in external markets. Volkswagen has been discussing plans to establish a production facility for [illegible] vehicles to be sold in Eastern European markets. Under an agreement signed early in 1966 with Fiat of Italy, production at the CZ plant (45,000 units in 1965) is to be increased to 75,000 vehicles by 1969 and 130,000 by 1971 1/. Such an extension would permit Yugoslavia to make the critical jump from production, limited to domestic consumption, to more efficient higher volumes for regional and world markets. It would also substantially improve economic efficiency of the automotive sector in terms of resource utilization and balance of payment effects. Under such an arrangement, Yugoslavia will earn sufficient foreign exchange to pay for an expanded foreign content on other models assembled locally, and thereby eliminate domestic procurement on items that are high cost or otherwise unsatisfactory. Equally important, the magnitude of the proposed change is large enough to move Yugoslavia's automotive industry to the next development plateau.

96. The largest commercial vehicle manufacturer in Yugoslavia is Teverna Automobilov in Motorjev (TAM). They manufactured about a third of national output - about 1,400 two to five-ton trucks and [illegible] buses in 1965 under a German license. About 11 percent of TAM's output was exported, since Yugoslav firms are required to cover import requirements with exchange earnings from exports. Fiat covered portions of its trade with its Yugoslav affiliate (CZ) through a trading company that procured non automotive items in Yugoslavia for sale abroad. In 1965, TAM exported about US$4.5 million in vehicles and parts, which more than paid for the $3.5 million in import requirements (see also Table 31).

97. The TAM factory has proposed expanding production from 3,900 trucks and buses in 1965 to 5,200 in 1968. This expansion is essentially designed to balance out utilization of installed equipment which is now underutilized. They hope to improve production efficiency in the following ways: a) widen cooperation among vehicle producers in Yugoslavia and in neighboring countries based upon specialization and interchange, b) standardize truck models and parts where possible; c) consolidate parts suppliers and weed out marginal producers in Yugoslavia; d) persuade German licensors to take Yugoslav parts

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1/ Under the agreement, Fiat has invested $10 million and has a ten percent share in the joint venture. Fiat has also agreed to upgrade the technical capabilities of its Yugoslav partner, including the establishment of a Zastava office in Torino, Italy. The Italian partner has also agreed to absorb into the international marketing and manufacturing system an average annual $5 million in Yugoslav vehicles and parts over the next ten years.

in exchange for required overseas imports 1/; and c) consolidate their holdings with developing countries, such as Indonesia which has licensing arrangements with Fiat.

98. The rationalization program outlined above may be quite sound as a limited adjustment program. But it does not resolve the larger issues of long-term economic viability. Production is still low volume by international standards and the diseconomies of small-scale are compounded by near-100 percent domestic content. Even if all the truck manufacturers in Yugoslavia were combined, their scale of operation would be small by European standards. The total Yugoslav truck market in 1985 was about 10,000. Several European firms manufacturing under 15,000 trucks a year are now running into the problem of survival (see references to Berliet in paragraph 35).

99. A basic problem in the industrial equipment field is keeping up with major innovations in product design. Retooling costs alone are prohibitive at low production volumes. The other problem relates to industrial design capabilities. Yugoslav industrialists have expressed an understandable desire to develop their own engineering and design capabilities. They realize they must do this eventually if they are to compete in international markets. But the difficulty is that it takes considerable capital and human resources to develop new products and to establish international marketing networks. The co-production and co-marketing arrangements with European vehicle and parts manufacturers represents a transitional period which could lead to financial and technical assistance in implanting design and marketing capabilities. (see Chapter VIII, paragraphs 126-128).

1/ TAM must deliver at about 20 percent below German supplier prices in order to absorb a 16 percent German tariff and five percent additional freight cost. At one time, TAM's exports to Germany reached US$2.5 million, but they are now down to about $0.5 million.

VIII. [illegible]

100. Major deficiencies in the supply structure of automotive sectors in protected infant economies are high costs, a continuing foreign exchange burden, a growing technological gap, and other forces that undermine future growth. Measures to improve the economic efficiency of this industry must deal with these deficiencies. The fundamental obstacle of economies of scale may be overcome in part by rationalizing production for internal markets. But the major gains are to be found in the direction of increasing economies of scale through specialized production for world markets. For this second alternative, participation in international industrial complexes manufacturing and marketing automotive products is indispensable.

Critique of Protection

101. The development of automotive industries under systems of protection and progressive autarky have had, to varying degrees, at least four major adverse effects. To begin with, relative costs of production have been high by international standards. A rough estimate of the added resource costs to manufacture automotive products in developing economies is somewhere in the neighborhood of $1.3 billion 1/. In effect, it costs developing countries about $2.1 billion in domestic resources to manufacture about $.8 billion of internationally valued goods 2/. This is based upon an estimated average of 40 percent import content and an average 80 percent

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1/ Average international cost per vehicle is estimated at approximately $1,910 (12 million US-type vehicles at $2,000 per vehicle plus 11 million European type vehicles at an estimated $1,800 per vehicle) plus $191 (10 percent f.o.b. price for freight and handling complete knocked-down units) equals an average $2,101 c.i.f. cost. (Average prices estimated from data in Automotive News 1967 Almanac.) Costs in developing countries average 80 percent above f.o.b. costs at an average 40 percent import content (Table 32), or an additional $1,528 per vehicle at a total cost of $3,438 per unit. This means an additional $1,337 per vehicle over c.i.f. cost ($2,101). For the one million vehicles manufactured and assembled in developing economies, this would mean $1.3 billion.

2/ From footnote 1, above, it cost on the average $3,438 to manufacture in a developing country a vehicle with a c.i.f. price of $2,101. Of this $3,438, import value is $1,375 (40 percent of $3,438) and $2,063 is domestic value. The international equivalent of domestic value added is $726 ($2,101 minus $1,375). This means that it cost $2,063 in domestic resources to manufacture $726 of internationally valued product, or $1,337 more per vehicle. For a million vehicles, this would amount to $1.34 billion. If increases in the value of national product from goods manufactured in developing countries were measured in international equivalents, growth rates might be found to be negative in many economies. Stated in terms of automotive product, each $2.84 of apparent national product was only worth $1.00 in international equivalents.

added manufacturing costs (Table 12). Over valuation of the currency, at the higher tax incidence (Table 13) would reduce somewhat this automotive cost premium to about $1.0 billion. 1/

102. Industrialization authorities often cite the social benefits of training an industrial labor force. But under a system of protection, in an industry producing at above international costs, the net gains from an upgrading of industrial skills may be more than offset by the net losses due to inefficient plant operations. Similarly, the backward linkage effects generated by assembly plants usually cited as beneficial, actually give rise to a high cost supply structure that is difficult to phase out at subsequent stages of industrialization. A second problem has been that, as production and consumption of automotive products have been allowed to expand, the foreign exchange burden has risen almost proportionately to the rate of sector expansion, even with the offsetting effect of progressive increases in domestic content. In Argentina, consumption of automotive products was allowed to expand under the illusion that import substitution would permit rapid growth while holding foreign exchange costs constant (paragraph 41).

103. A third major problem of adjustment relates to the "technological gap". Because of the high cost of tooling up for low volume production, developing countries usually end up with vehicle models and production techniques that lag behind latest developments. Because of the high costs of research and development, little or no effort is made to adapt product design and production techniques to low volume production. Nor is any effort being made to develop indigenous research and development capabilities. This pattern has important implications for future growth and development of the automotive industry, product proliferation associated with transplanted technology is not economic for domestic production, and obsolete products and techniques cannot compete in world markets.

104. A fourth major difficulty has been that once protection is built into a national economy, it is difficult to phase out because of vested interests. The windfall profits possible under systems of protection and import substitution encourage the mushroom growth of small-scale, inefficient plants until markets become saturated. The higher the tariff wall, the more extensive the inefficient growth, as the case of Chile demonstrates. 2/ As domestic markets are saturated and competition intensifies,

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1/ If allowances were made for overvaluation of the currency (say 10 per cent) and tax differentials (say 11 percent according to data shown for Argentina and Brazil in Table 15), the resource cost differential of $2.5 billion would amount to about $1.2 billion (1.5 x .59 x .90).

2/ There were 7,800 vehicles manufactured in Chile in 1964 by 22 firms. High tariffs are indicated by relative prices - which range between 3.5 and 4.0 times the c.i.f. cost. Domestic content requirements (25 to 50 percent) are relatively high for this small number of vehicles. Installed capacity (29,600) is estimated at more than three times average annual output. See Leland L. Johnson, "Problems of Import Substitution: The Chilean Automobile Industry", Economic Development and Cultural Change, Vol. 15, No. 2 (January 1967), pp. 202-216.

current become progressively precarious. Protection also builds forces in the economy that could help develop more economic industries.1/ The high cost structures induced under protection have tended to price most industrial goods from developing countries out of world markets, thereby undercutting any effort to solve the basic problem of scale through volume production for larger world markets. Protectionist interests are also a major block to the development of regional markets (paragraph 111).

Possible changes in Market Structure

101. The fundamental [illegible] to production efficiency is the discrepancy of scale economies with production oriented to internal markets of limited size. Adjustment models must seek to overcome the scale disadvantage either through enhancing the size of the market or rationalizing production so as to [illegible] larger production runs. The former may be achieved through [illegible] specialized production for world markets. The latter may be realized by reducing the number of models and plants serving domestic markets.

102. A second major consideration in adjustment models is the foreign exchange burden. Trends in improved sector efficiency should secure adequate growth of [illegible] exports [illegible] foreign exchange savings. This may be achieved by [illegible] premium [illegible] export capability [illegible] Brazil [illegible] the more expensive [illegible] value with [illegible] This may be achieved [illegible] outlined below.

103. Adjustment models should also include elements designed to narrow the technological gap, or at least observe that the gap is not widened.2/

1/ Latin American scholars have indicated [illegible] what might be termed an alliance for stagnation between governments that foster an uneconomic degree of domestic industrialization [illegible] economic inefficiency [illegible] Celso Furtado, Obstacles to Change in Latin America (London: Oxford Press, 1965).

2/ As indicated in Table 14, items 5 and 7 under columns 4 and 8, 11 + 24 = 35 percentage points for 5 + 17 per cent content.

3/ Discussions over the technological gap between the developing and developed countries have intensified in the past two years. In Latin America, a technological corollary to the Prebisch thesis has been emerging, arguing the need to develop indigenous research and development capabilities or suffer the consequences of subservience to "technicological imperialism from industrial societies." (See Victor L. Urquidi, "Latin American Development, Foreign Capital and the Transmittal of Technology," El Trimestre Economico, January-March 1967. See also Celso Furtado, Development and Underdevelopment, University of California Press, 1964, pp. 60-62, 108-109.)

More again, corporations have an essential role in developing export capability in selected items. Even more important, international corporations can help build long-term industrial design and engineering capability into their overseas affiliate. Some share of the component and parts line manufactured by a developing country should adhere to international standards in design and specifications in order to develop the firm's earning capability in the world economy. It may prove expedient to develop dual product lines, one to fill domestic needs and the other to meet international standards. Export items also serve as a bench-mark of quality and efficiency for industrial goods produced for the domestic market.

Rationalization of Production for Domestic Markets

101. National programs aimed at the standardization and interchangeability of components and parts can advance production efficiency through longer production runs. In some cases, more economic scales have been achieved through the use of consolidated assembly facilities for various models and makes of through the joint utilization of a parts manufacture plant to serve a greater range of equipment manufacturers. In Argentina, for example, an extensive [illegible] aircraft equipment manufacturers (Kaiser and Lockheed [illegible] joint ventures to manufacture axles and carburetors Kaiser operates [illegible] and casting facilities that also supply other equipment manufacturers. Some efforts have also been made to standardize major components (gear cases, rear shafts and transmissions) among Western equipment manufacturers (Deutz, Massey, Perkins and Chrysler), but with limited results. A rationalization program is much easier to build into an industrialization program from the outset than to implement after the industry is already established with its diversified product line.

102. Certain adjustments in vehicle designs would improve their functional utility under the different environmental conditions that prevail in developing countries 1/. The development by General Motors of the Holden for the Australian market is a case in point. There are, in fact, some revealing differences between American and European vehicle and engine design which have obvious applications to the functional needs of consumers in developing economies 2/. American vehicle manufacturers are

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1/ Adjustments are needed to accommodate road conditions, climate, and the dearth of maintenance facilities. For example, among the features that would enhance utility in frontier areas are higher ground clearance [illegible] in the front under protection for the gas tank, heavy duty air cleaner for drier or dustier climates, gasoline filter [illegible] maintain lubrication level at steeper [illegible] form [illegible] larger radiator with greater heat dissipating capacity for hot climate, additional insulation for electrical systems against dampness and water, [illegible] down screen wire mesh against insects at window openings, and lock on hood and gas tank against pilferage.

2/ See "Cars: The Continental Divide", The (London) Economist (July 9, 1966).

generally geared to diversity of, and rapid change in, product design (body sections redesigned annually with a complete change every 3 to 5 years and engine redesign every 7 years). Model changes among European car-makers occur much less frequently. In the extreme, a firm like Citroen comes out with a revolutionary car every 25 years, with little or no change in between. Volkswagen also has remained competitive by standardizing and stabilizing design and tooling over extended periods. American consumers are more interested in power and ease of driving and maintenance than they are in initial costs and thermal efficiencies; European cars are less costly to purchase and operate and designed to work for longer periods of time (Volvo is a good example). Differences in income and fuel taxes account in part for these basic differences in consumer preferences. Smaller European engines require more frequent overhaul and repair, particularly if overdriven, but service labor is cheaper in Europe.

110. A number of automotive manufacturers have designed truck bodies in order to decrease tooling costs for low-volume production. Substantial savings are possible through body designs that avoid contouring and require much less expensive equipment. Modular design principles based upon interchangeable body panels and the use of standardized mill forms for additional body and chassis elements also reduce production costs. 1/ Berliet also simplified the front end of truck bodies manufactured in Algeria in order to reduce tooling costs. Tooling costs for small presses to bend sheet metal run about 5 to 10 percent of the heavy die presses needed to contour sheet metal. British Motor Corporation is experimenting with fiber glass bodies for manufacturing passenger cars at low volume in Chile.

Regionalism and Barter Trade

111. Much hope had been placed upon the development of regional markets as a means for improving production efficiency. The basic difficulty in implementing the Latin American Free Trade Area (LAFTA) agreement is that trading partners are anxious to sell but unwilling to buy. There are several other obstacles to implementing LAFTA agreements. To begin with, national industries nurtured under a protectionist environment are opposed to a lowering of internal tariffs. Furthermore, some countries are further along than others in national integration and the proliferation of supplier industries. Surface freight charges alone loom large in countries like Argentina and Chile are a barrier. Differences in industrial development among member countries has been another major obstacle; for example, countries like Argentina and Chile are fearful of Brazilian competition.

112. Automotive manufacturers have been frustrated time and again, year after year, in their efforts to consolidate production facilities on

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1/ For example, Chrysler had designed the "LXV" for production in Turkey, Ford produces the "Bronco", and Kaiser the "KJCM" for this purpose. See write-up in Baranson, "Design for the Backwater", Machine Design (September 2, 1965), 108-15. U.S. Steel has designed a series of vehicles based upon the use of standard steel mill forms, which reduces tooling and machining costs.

a complementarity basis and trade in components and parts. There has been a permanent consultative group among Argentina, Brazil and Chile since 1963, but so far there have been little or no results. For example, Ford now manufactures cars in Mexico, Chile, Brazil and Argentina, and would like to develop supplier industries in selected countries based upon principles of comparative costs. But both Chile and Argentina raise objections to this approach. Chile will not let Ford produce the most advantageous industry, but would rather have Ford develop a metal-working industry that Chile does not already have. Chile also objects to "resource-intensive" production in glass windows, rubber tires or copper radiators. 1/ Argentina, on its side, does not want to allow Ford to phase out existing supply sources all at once, but rather 20 percent at a time. The result, if implemented, would be self-defeating, with two sources of supply and increased production costs in both Argentina and Chile.

113. Reference is made elsewhere to certain bilateral trading between Sweden and Portugal, and Germany and Egypt (paragraphs 96-105, 123-124). These arrangements were worked out to help pay for imported parts or as a device to remit earnings. This form of bilateral trade represents "second-best" solutions to trading in world markets. In most instances, a premium is paid for bartered goods either in increased cost or inferior quality.

International Specialization

114. For newly industrializing economies, there are obvious advantages in certain lines of specialization. Relevant considerations include the level of technical sophistication demanded in manufacturing, the related manpower requirements, and whether significant diseconomies of scale can be avoided. Such specialization might include the production of trucks and buses, which are characteristically low-volume items, or specialized production of less sophisticated parts that require disproportionate amounts of hand labor, such as bus assembly or the manufacture of low-volume sand castings. Economies of scale are more pronounced in metal stamping and the forging or machining of parts, where mechanized or automated equipment can be used, than in assembly or finishing operations requiring a minimum of machine tools or equipment. Diseconomies of small-scale production vary according to the industrial environment. Japan is a striking example of the ability to organize smaller-scale, labor-intensive activities at competitive costs. 2/

115. Precedents for reorganization along this line are to be found in Canada, and Mexico. The U.S.-Canadian Automotive Agreement provided for

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1/ Ford Argentina is now sending engines to Chile and is trying to find items such as copper radiators or certain castings that Chile can export advantageously in return. Certain foundry items cost as much as $5.50 in Chile, as compared to $1.60 in Argentina. With the high freight charges, a part supplied from Chile has to be priced substantially below Argentine costs.

2/ See Baranson, Manufacturing Problems in India, pp. 66-69.

the expansion of Canadian component and parts manufacture for the U.S. market as a pre-condition for U.S. firms continuing to sell assembled cars and trucks in Canada. 1/ In Mexico, an agreement was signed with Massey-Ferguson to manufacture tractors at 70 percent domestic content and cover the 30 percent import deficit with re-exports to the international firm's other overseas plants. Another program has been initiated by Chrysler to specialize and interchange engines between their Mexican affiliate and North American plants.

116. If developing countries are to move into more specialized production for world markets, industrialized countries will need to lower their trade barriers to permit two-way and multilateral trade. The U.S.-Canadian agreement provides a model for such arrangements. Trade access to the EEC and EFTA areas would be especially appropriate for countries like Spain, Portugal, and Yugoslavia. Trade unions in industrialized countries are bound to raise objections to the location of production facilities abroad, unless such arrangements are viewed in the larger context of world growth and development. A narrower, short-term view would focus erroneously upon the loss of jobs to the industrialized countries. Reallocation of the international division of labor along the lines indicated in this study will benefit greatly the developing countries. 2/

117. Technical and commercial requirements on export products are more stringent than on production for domestic markets. The marketing of a Brazilian Volkswagen is no small task, and the international manufacturer has his trade name to protect. The systems of tariffs and subsidies upon which manufacturing costs and sales prices are based are precarious ground on which to base an international manufacturing operation. Most firms also have basic policies to keep products and components at international standards. In many cases, original equipment manufacturers have either

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1/ Under the U.S.-Canadian Automotive Agreement, implemented in January 1965, the Canadian trade deficit in automotive trade has been reduced from $693 million to $486 million, and Canadian automotive exports have increased from $196 million to $800 million in the two-year period. See United States Senate, Committee on Finance, 90th Congress, 1st Session, Canadian Automobile Agreement (Washington, D. C.: U.S. Government Printing Office, March 1967), p. 37.

2/ For policy recommendations on accommodations to developing countries by industrialized nations, see Harry G. Johnson, Economic Policies Toward Less Developed Countries (Frederick A. Praeger, 1964). Professor Johnson outlines proposals for enlarging export opportunities within the GATT framework (pp. 129-135), details means to accord preferential entry of industrial products into the markets of industrialized countries (pp. 163-211), and recommends "maximum inducement to the less developed countries to modify their policies of currency overvaluation and import substitution to which they are addicted and to concentrate their efforts instead on economic development through trade with the rest of the world" (p. 245).

had difficulties in getting their home country suppliers to locate abroad, or their overseas supplier is unwilling to keep up with new component requirements for new vehicle models.

118. There is also the matter of reliability of the supplier source under an international manufacturing and marketing system. A capricious and hostile bureaucracy can very easily shatter any chances for development of a manufacturing specialization for an international market. In 1959, Volkswagen tried to market 300 passenger cars in the United States from its Brazilian subsidiary (in order to overcome a temporary production bottleneck in Germany and to earn foreign exchange to pay for parts imports into Brazil). The shipment was stopped by the customs authorities, on the grounds that "Brazilian plants were not established for the convenience of American markets". 1/ Similar incidents have been reported involving the levying of excise taxes and other procedural delays designed to thwart efforts to earn foreign exchange through the export of parts.

119. Economies operating under an import substitution regime have typically used a combination of tariff protection and exchange rate policies designed to subsidize domestic industry at the expense of the export sector (except for those "non-traditional" exports which are also subsidized). The general pattern has been to lag the exchange rate behind domestic price increases and to apply tariffs to inhibit "non-essential" imports under the overvalued rate. Through special exemptions from tariff charges, favored industries are subsidized as a result of the reduced cost of imported inputs (and the granting of special export bonuses) relative to other producers in the economy. Protection required to sustain domestic industries, coupled with overvaluation inhibits the expansion of exports by increasing the internal cost structure and the price of exports on world markets. The industrial reorientation proposed in this study calls for development of export capability and replacement of high-cost manufacture in order to compete in world markets. Once the opportunities for import substitution have been exhausted and domestic markets saturated, a revised exchange policy may be the sine qua non to moving on to the next growth plateau

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1/ See Claude McMillan and Richard F. Gonzalez, International Enterprise in a Developing Economy (Michigan State University, 1964), pp. 114-115. There was also considerable concern in Brazil about local reaction to the much lower than domestic price proposed for the export units.

based upon larger external markets. Devaluation accompanied by tariff reduction and the relaxation of restrictive controls will also help restore badly needed price mechanisms to assure efficient resource utilization. 1/

Potential Lines of Specialization

120. Specialization by developing countries in the manufacture of components or particular product lines for export to world markets merit consideration a) where production runs are small by international standards (such as in heavy trucks or specialized vehicles); b) where there is a low bulk-to-value ratio (such as in axles and transmissions) so that transport charges may be absorbed in the relatively high value of the traded part 2/; c) where there is a disproportionately high requirement for labor (such as in sand castings, bus body-building, or in the manufacture of machine tools); d) where a product or part is being phased out by the foreign partner and there is a need to maintain production of spare parts or a special type vehicle; or e) where the international firm has a production expansion problem in the home country (labor or capital shortages) matched by a production expansion capability in the manufacturing affiliate country (paragraphs 32-33).

1/ Devaluation is only effective to the degree that one or more of the following conditions prevail:

i) Internal price rises do not wipe out improvements in relative prices externally. Price rises may occur as a result of a) increased cost of imports, b) increased cost of domestic goods diverted to increased export demands (cost increases depending in part upon supply elasticities), and c) increases in wage demands in response to the rise in domestic prices.

ii) Productivity gains during adjustment period exceed price rises. These may occur as a result of a shift from less efficient protected industries serving domestic markets to more efficient export industries.

iii) Tariffs are adjusted downward in combination with devaluation in order to minimize increases in domestic prices induced by higher import costs and at the same time overall efficiency in the economy by weeding out marginal industries operating under high levels of protection.

iv) Fiscal and monetary policy compensate for inflationary and income distribution effects of devaluation and, along with measures to maintain or increase the new flow of external resources, manage to maintain a satisfactory level of foreign exchange reserves.

2/ Certain items may be more advantageous to make locally than others. For example, on automobile stampings, freight costs are quite high because it is not possible to "nest" most stamped body parts, which then have to be crated separately.

Export of Assembled Vehicles

121. Several firms have used overseas plants for regional sales. Chrysler consolidated its manufacturing of right-wheel drives in Australia for sale to the Commonwealth market. Daimler-Benz exports buses from India to South Vietnam, Laos and Malaysia. 1/ On a sales contract for 250 buses to Ceylon, the Indian affiliate of Daimler-Benz was able to bid only five percent above the German price (at the devalued rupee rate). This is the combined result of transport cost advantages and a devalued rupee. 2/ (India has long been competitive with the U.K. on bicycle tires sold to Burma or Japan.)

122. Several European truck manufacturers have considered transferring certain assembly and manufacturing lines to Latin America, to make room for newer models in home plants and at the same time provide an advantageous marketing wedge in Latin America. Bolinder Munktell of Sweden indicated a willingness to relocate certain agricultural equipment lines to developing countries for sale in world markets. In Algeria, for example, where quality and cost of metal work is favorable, bulky equipment requiring large amounts of hand-welding might be produced economically. Renault has designed a completely new car for manufacture in Brazil, and export outside Latin America. It is adapted to the rougher roads and poorer servicing facilities that characterize hinterland areas. Brazil has much to gain from an international logistic to design, manufacture, and market products internationally. Design parameters drawn from the home and regional market could be included in a global market strategy, and Brazil could be given a share in this marketing and manufacturing complex. For example, a light-weight diesel engine with fuel economy features and low-initial cost designed for the small truck and bus market in Latin America might also find wider application in the stop-and-go delivery truck markets of North America and in a new line of passenger cars in the U.K. (This is actually what Cummins Engine [US] has done on a new low-horsepower engine introduced into Mexico for use in light trucks and buses.)

Exports of Components and Parts

123. Automotive firms have done a limited amount of parts procurement in developing economies. In most cases, it has been a matter of providing

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1/ These sales were conditioned by U.S. AID procurement policies which require 90 percent American content. Special exemptions are granted to industrial goods manufactured in developing countries. Thus, Daimler-Benz can sell its "Indian" truck to Vietnam, but not the one manufactured in Germany.

2/ Prior to devaluation, the rupee was valued at 4.75 Rs to the dollar; after devaluation, 7.50 Rs to the dollar. Rupee prices have risen about 20 percent since devaluation. The net result is that a truck that sold for 16,740 Rs in the Indian market, or $3,600 at the old rate now sells for about 20,040 Rs, or $2,730 at the new rate.

a manufacturing affiliate with foreign exchange to help pay for needed imports. India furnishes fuel injector nozzels and pump elements to a German manufacturer. Housings for railroad car bearings are supplied by Egypt to the Fiat industrial complex in Italy on a barter basis; and injection pumps, spark plugs and insulators are procured in Brazil for assembly plants in India and Germany. Procurement of this kind has been prompted by supply shortages or production bottlenecks in the home market or by the advantage of phasing out low-volume items in Germany. In many cases, foreign procurement orders are placed in countries like India and Brazil as a device for earning foreign exchange for required imports (or as an indirect device for remitting profits through special pricing). For example, textiles and fibers have been purchased in India for use in European automotive parts manufacture. Up until now, such trading has been marginal and, as indicated, a device to circumvent foreign exchange constraints. But the items cited are indicative of industrial goods that can begin to meet international standards.

124. There are other examples of foreign procurement which have been an outgrowth of barter arrangements to overcome foreign exchange difficulties. Volvo signed an agreement in 1959 with the Norwegian Government to buy castings in Norway to pay for the import of 3,000 heavy trucks (about three million U.S. dollars worth). A Portuguese concessionaire, on his own initiative, persuaded Volvo to procure in Portugal certain castings, which were price competitive and of excellent quality. The concessionaire used exchange earnings from these exports to obtain additional import licenses for the purchase of Volvo cars and trucks. There is also now a two-way interchange of products and parts between Spain (Citroen) and Yugoslavia (TOMOS). Yugoslavia ships locks, cables and window rollers to Spain in return for Spanish-made Citroens. The Perkins affiliate in India imports bearings and pistons from Yugoslavia (to avoid hard currency expenditures in the U.K.). Scania Vabis has investigated the possibility of importing from Brazil wheel castings, instruments, and transmissions for assembly in Swedish trucks. They have also found that bus bodies are cheaper to manufacture in Brazil than in Sweden, because of lower labor costs on limited series. In Brazil, tooling dies for stamping truck body panels also cost one-fourth of the Swedish procurement price.

125. There are several other examples of efforts to develop manufactured goods for export. The Italian affiliate of an American diesel manufacturer requested permission to expand production of crankshafts for export. The small scale of production to meet local requirements (500 to 1000) meant a prohibitively high unit cost; but at the 10,000 volume level, to meet the global demand of the international manufacturer, costs would be competitive. The Indian plant is now producing at 70 percent domestic content, and the export of crankshafts would pay for a considerable portion of the remaining 30 percent import content. Another example is Volkswagen who indicated they had explored the idea of reconditioning used engines, for which there is a substantial world market, either in Spain or Mexico.

A New Role for International Corporations 1/

126. Competition in world markets requires a combination of resources and capability in manufacturing, marketing, and research and engineering. Firms in newly industrializing economies generally lack the resources and skills to develop competitive products, efficient techniques, and distribution and servicing systems necessary to market products abroad. Typically, developing countries encounter an overriding difficulty in gaining product acceptance in world markets, even after they have attained technical standards and are cost competitive. This is in part a problem of psychological acceptance, in part a question of scale and resources to invest in world-wide distribution system.

127. There are several potential advantages in partnerships with international firms. International firms are in a position to help developing countries redesign components and vehicles that are more suited to their own domestic and regional markets and production capabilities. Of even greater potential benefit, they possess the full range of resources and capabilities to enable the developing country to enter world markets. Many international firms are willing to incur the additional difficulties and costs of using the developing country as a manufacturing segment supplying the global market, provided they can thereby increase their world market share and net earnings. Most firms would prefer a realistic program in this direction as an alternative to further import substitution. Several firms have given serious consideration to the development of international manufacturing and interchange systems based upon national specializations in components or product lines. There are numerous possibilities: 1) manufacture of specialized components and parts, 2) responsibility for a particular vehicle line, 3) specialization in low-volume replacement parts for obsolete models, or 4) reconditioning of engines and parts. 2/

128. The economic interests of the developing country can best be served by the long-term commitment of industrial partners. International firms need to analyze product demands in developing countries and decide whether they want to stay in the market or not. If the decision is made to stay, most firms cannot afford to spread their capital and human resources too thinly in too many small and different marketing-manufacturing environments. It may be necessary to concentrate on the more promising markets and regions. For the chosen manufacturing affiliates, it is necessary to plan ahead to recruit and train personnel for overseas staffing. Too often these operations are treated as stepchildren. Production engineering, procurement, and corporate financing are among the basic capabilities that need to be transplanted to overseas facilities. Overseas

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1/ An expanded role for multi-national corporations is also stressed in Kleu, South African Automotive Industry, pp. 497-98.

2/ Replacement parts was a $9 billion business in the United States in 1964, with about 70 percent in the hands of independent manufacturers. 25 percent of this market was for "remanufactured" parts. See "Auto Parts Industry Gaining New Mileage", New York Times, 29 November 1964.

operations require the development of new capabilities such as the handling of knocked-down units for overseas assembly plants (see paragraph 36). As the need to re-export from the overseas plant develops, the demands become even more exacting.

IX. SUMMARY OF PRINCIPAL FINDINGS AND RECOMMENDATIONS

129. The findings that emerge from this study pertain largely to countries that have gone through substantial periods of industrialization under a system of protection and import substitution and are now seeking ways and means to phase out manufacturing activities that are uneconomic by competitive standards in world markets. Countries like Yugoslavia, Brazil and Mexico have saturated domestic markets and over-extended domestic content. The findings and recommendations may also be applied to countries that are now embarking upon industrialization programs and are interested in finding a more economic approach to import substitution. Small market economies should think twice before embarking upon even assembly operations, let alone the more ambitious parts manufacture in depth. Countries like Switzerland and Denmark have managed very well without automotive manufacturing sectors.

130. This study reveals a number of the more serious pitfalls in import-substitution strategies and provides some useful guidelines for a more economic approach to industrial sector development based upon a) a more manageable range of industries and products in terms of emerging levels of supplier capabilities, b) a scope and pace of introducing domestic content that entails reasonable cost premiums by international standards, and c) sector structure that can eventually be phased into more economic production for world markets.

131. Average vehicle costs increase progressively with increases in domestic content. Investment requirements are especially burdensome for sheet metal body work and engine and driveline components. A major contributor to high costs (aside from protectionist profits) are the diseconomies of scale imposed by market structure, especially in the manufacture of components and parts. Under a regime of protection and progressive domestic content coupled with industrialization policies that permit a proliferation of models and makes, widespread inefficiency of supplier industries is inevitable. Cost premiums are a function of the degree of autarky pursued under policies of protection and import substitution and the proliferation of vehicle models permitted under the industrial licensing system. The two consequences of these policies have been a) exhorbitant resource costs to save foreign exchange beyond a certain range and, in many cases, b) foreign exchange burdens that go well beyond planned levels of consumption due to the indirect high costs of component manufacture.1/

132. The evidence presented in this study related specifically to the automotive industry, but the analytical model used has wider application. From the viewpoint of industrialization strategies, the analysis suggests an approach to identifying the comparative advantage range for any manu-

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1/ This was the case in Argentina, see paragraph 76.

facturing or processing industry.1/ The strategy of international marketing and manufacturing arrangements to avoid or displace high-cost domestic value added with more efficient industrial exports is also applicable, for example, to iron and steel products or for pulp and paper manufacturing.

133. The duplication of small-scale vehicle and parts plants in developing economies stands in sharp contrast to the trend toward merger and consolidation of plant facilities and marketing operations in the rest of the world. The findings in this study point to an obvious need to reverse the trend toward indiscriminate autarky in the direction of more selective industrialization based upon the comparative costs of foreign exchange savings. Regulations governing the industry should be revised to give firms wider latitude in their procurement decisions and to encourage the development of export capabilities to help pay for required imports. Previous mention has also been made of the stultifying effect of protection upon manufacturers and suppliers nurtured under the system. Protection tends to favor firms adept at earning profits under an import-licensing system, providing little or no incentive to the firm willing and able to reduce costs and develop export markets.

134. Rationalization of automotive production for domestic consumption involves a) limiting the range of vehicle models and plants, b) standardizing components and parts and their interchangeability among models and makes, and c) selective adaptation of foreign design to local manufacturing capability and demand. To the extent feasible, regional arrangements to rationalize production and overcome the basic problem of scale should be pursued. Specialized manufacture for larger world markets is the principal alternative to further expansion of the high-cost range of import substitution. It may well be that the acceptance of industrial goods in world markets may give new impetus to LAFTA and similar regional arrangements. Export orientation should also help reverse the trend toward a widening technological gap which has characterized industrialization under import substitution. Product designs and production techniques for protected internal markets have lagged behind those associated with production for competitive markets. Developing countries should consider adjustments in the tariff structure and exchange rate as a concomitant of market reorientations designed to improve production efficiencies. Industrialized countries should review national policies toward developing countries with a view toward accommodating these shifts.

135. The comparative advantage of most industrialized nations lies in their engineering and design capabilities and their organizational ability to plan and carry out complex industrial operations. Many developing countries are now ready to take on the more ambitious manufacturing roles outlined in Chapter VIII. New agreements with foreign industrial groups should include arrangements to develop indigenous capabilities to design

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1/ See especially Chapter V on Cost Comparisons. Costs as a function of domestic content provide a guideline for the limits of the <u>depth</u> of industrialization. The analysis in Chapter VI on the Automotive Industry in Argentina (paragraphs 73-75 in particular) suggest a conceptual framework for considering the limits of product diversification, or the <u>breadth</u> of industrialization.

industrial products and systems that can participate in the world economy. Multi-national firms are in a position to provide the marketing, manufacturing, and design capabilities necessary to enter world markets. Many are willing to incur the additional difficulties and costs of using the developing country as a manufacturing segment supplying the global market, provided they can thereby increase their market shares and net earnings. Most international firms would prefer this alternative to further import substitution.

Suggestions for Further Research

136. Restructuring established automotive sectors. A study might usefully be undertaken for a country like Brazil, 1/ where the limits of import substitution have been reached in the automotive sector. The recommendations contained in Chapter VIII might serve as a point of departure for such a study. A major purpose of such a study would be to work out concrete adjustment plans designed to meet the following criteria: a) reduce production costs without increasing the foreign exchange burden, and b) upgrade Brazil's indigenous design and engineering capabilities and thereby decrease Brazil's technological dependence upon foreign partners (see paragraph 107). Cost reduction and exchange targets should be worked out in conjunction with corporate implementation plans. The aim would be to develop a sector plan that would be both economically advantageous and commercially viable, and that at the same time would provide income and employment in the more efficient range of automotive production.

137. Advice to countries on how to establish or expand their automotive industry. Further research might usefully be undertaken for countries either embarking upon programs to establish an automotive sector or considering a substantial expansion of present activities. This study provides an analytical framework for establishing cost parameters of domestic production and devising programs to keep production within economic limits. Such studies would be appropriate in countries like Colombia, Korea, or Turkey, where sector development or expansion programs are now being formulated. Recommendations might turn out to be in part a set of enjoinders on how not to proceed in developing the automotive industry. The approach to more efficient organization can serve as a model for other equipment sectors.

138. Japan's role in automotive sector development. Field work on Japan's potential role in assisting developing countries to enter world markets should prove advantageous. Japan now exports over 10 percent of

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1/ The Brazilian Government is now considering proposals to cut back domestic content requirements in order to reduce production costs. But this section will mean increased foreign exchange costs (as much as US$50 million for a 10 percentage point decrease in domestic content on 200,000 vehicles) and the equivalent loss of national income and employment, unless compensatory programs and market opportunities are worked out.

its output and has at least 50 vehicle manufacturing and assembly affiliates in more than 20 countries. Japan's success in adapting low-volume techniques among domestic suppliers in the home market and their reputation for designing low-cost functional vehicles should also have important application for developing countries. This might include a study of manpower requirements to adapt and absorb an industrial transplant, based upon the Japanese experience of technical assistance to supplier industries. Japan's decisions to emphasize truck production initially and hold back private consumption of passenger cars and public expenditures on roads (investing instead in rail transport for heavy passenger loads) are also worth studying.

[redacted]

[redacted]

[illegible]

[illegible] WORLD MOTOR VEHICLE[1] CONSUMPTION - 1965/66

	U.S.A.	JAPAN	W. GERMANY	FRANCE	ITALY	U.K.	CANADA	AUSTRALIA	SWEDEN	OTHER[2]	TOTAL
1965 vehicle registrations[3]	[illegible]	5,660,720	[illegible]	[illegible]	5,305,000	10,161,500	6,224,600	3,585,[illegible]	1,694,670	[illegible]	[illegible]
1966 vehicle population[3]	[illegible]	[illegible]	[illegible]	[illegible]	6,155,500	10,887,700	6,555,[illegible]	3,786,[illegible]	1,9[illegible]	[illegible]	[illegible]
New vehicle production[4]	11,11[illegible]	1,[illegible]	[illegible]	1,531,400	1,154,200	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	25,101,900
Plus imports	[illegible]	[illegible]	[illegible]	346,300	107,500	40,800	143,[illegible]	134,300	207,300	2,[illegible]	3,[illegible]
	11,7[illegible]	1,5[illegible]	[illegible]	1,727,900	1,165,700	2,1[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Minus exports[5]	267,700	[illegible]	[illegible]	413,200	326,700	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	11,5[illegible]	1,[illegible]	[illegible]	1,[illegible]	839,000	1,885,900	[illegible]	[illegible]	303,000	[illegible]	[illegible][5]
Minus vehicle scrappage[4]	7,[illegible]	[illegible]	[illegible]	128,400	98,500	664,700	565,[illegible]	262,[illegible]	[illegible]	[illegible]	[illegible]
Net increase in vehicle population	[illegible]	[illegible]	[illegible]	986,500	850,500	721,200	[illegible]	202,400	[illegible]	[illegible]	[illegible]

N.B. All figures are rounded up to the nearest hundred.

1/ Includes passenger cars, trucks, and buses.
2/ "Other" represents the residual difference between countries shown and total.
3/ Vehicle population covers all countries as listed in the McGraw-Hill source, plus Communist Bloc Countries (estimates projected at 6.5% rate of increase from 1964/65 data in AMA source). Exports cover the nine motor producing countries listed in the table (and imports from these nine countries) only; they do not reflect exports from Communist Bloc countries and other countries.
4/ Scrappage is the residual difference between net increases in new vehicles (new vehicle production plus imports minus exports) and the net increase in the 1966 vehicle population over the 1965 vehicle population.
5/ Figures include an indeterminable number of unassembled vehicles; to avoid double counting a very rough estimate of the required adjustment would reduce the export figure by 22% to 3,091,900 and total production to 24,329,000.

Source: Calculated from data in: McGraw-Hill, Inc. 1966 World Automotive Survey;
Automobile Manufacturers Association, Inc. World Motor Vehicle Data - 1965.

Table 2

WORLD AUTOMOTIVE PRODUCTION BY COUNTRY, 1965 1/

Developed Countries	Total	Cars	Trucks & Buses
United States	11,112,000	9,335,000	1,777,000
West Germany	3,055,700	2,794,800	260,900
United Kingdom	2,134,900	1,691,100	443,800
Japan	1,870,500	696,800	1,173,700
France	1,582,600	1,364,000	217,600
Italy	1,158,200	1,090,600	67,600
Canada	849,000	708,000	141,000
Belgium*	443,600	418,400	25,200
Australia	352,900	304,800	48,100
Sweden	204,000	178,500	25,500
South Africa*	176,200	129,000	47,200
Netherlands*	75,100	62,200	12,900
Ireland*	50,000	38,000	12,000
Denmark*	33,000	28,000	5,000
Other Countries 2/*	48,300	32,300	16,000
Sub-Total	23,145,000	18,871,500	4,273,500
Developing Countries			
Spain	212,500	142,300	70,200
Argentina	196,800	131,600	65,000
Brazil	180,800	101,500	79,300
Mexico	126,700	88,700	38,000
India	69,500	23,100	46,400
Venezuela*	53,500	37,700	15,800
Portugal	37,000	30,000	7,000
Malaysia	25,000	25,000	---
Iran	8,900	6,300	2,600
Other countries 3/*	84,500	38,400	46,100
Sub-Total	995,200	624,800	370,400
Communist Bloc Countries			
Soviet Union	616,000	196,000	420,000
East Germany	110,000	95,000	15,000
Czechoslovakia	99,700	77,700	22,000
Poland	60,600	26,400	34,200
Yugoslavia	45,500	35,900	9,600
Rumania	22,800	7,000	15,800
Hungary	7,100	---	7,100
Sub-Total	961,700	438,000	523,700
GRAND TOTAL	25,101,900 4/	19,934,300	5,167,600

Sources: McGraw-Hill, World Automotive Market Survey, 1966
Automotive Manufacturers Association, Inc., World Motor Vehicle Data, 1965
Chambre Syndicale des Constructeurs d'Automobiles-Reportoire Mondial des Usines d'Assemblage de Vehicules Automobiles - Vols. I & II, July 1966.

* Less than 50% domestic manufacture

1/ There are several discrepancies among production figures because of differences in sources used. In some cases, figures represent projected estimates rather than actual production.

2/ Includes: Austria, Finland, Greece, Israel, Switzerland, and Rhodesia.

3/ Includes: Latin America - Peru, Columbia, Costa Rica.
Asia - Thailand, Pakistan, Taiwan, Burma, South Korea
Middle East/Africa - United Arab Republic, Algeria, Morocco, Turkey, Nigeria, Ivory Coast, Malagasy.

4/ See footnote 5, Table 1.

Table 3

1/ MOTOR VEHICLE REGISTRATION - 1950-66

Registered Vehicles

	1950	1955	1960	1965	1966
Africa	1,114,700	1,699,600	2,423,500	3,170,500	3,395,000
Asia	703,200	2,008,000	3,452,700	8,675,400	10,201,600
Other Americas	1,722,500	2,828,900	4,087,000	6,651,100	7,189,000
Sub-total	3,540,400	6,536,500	9,963,200	18,497,000	20,785,600
U. S. A.	43,774,000	58,050,100	71,502,400	86,309,000	90,486,000
Canada	2,195,000	3,564,500	4,941,000	6,224,800	6,555,400
Western Europe	8,500,100	14,447,400	25,257,000	45,522,000	50,582,900
Oceania	1,617,000	2,566,500	3,325,900	4,471,700	4,716,200
Sub-total	56,086,100	78,628,500	105,026,300	142,527,500	152,340,500
Regional Totals 2/	59,626,500	85,165,000	114,989,500	161,024,500	173,126,100 3/

Average Annual Growth Rate

	1950-55	1955-60	1960-65	1965-66	1950-66
Africa	8.8%	7.5%	5.6%	7.0%	7.2%
Asia	23.0%	11.5%	20.0%	18.0%	18.2%
Other Americas	10.4%	7.8%	10.3%	8.0%	9.3%
Sub-Group average	13.1%	8.8%	13.3%	12.0%	11.7%
U. S. A.	5.9%	4.3%	3.0%	5.0%	4.7%
Canada	10.2%	6.9%	4.8%	5.0%	7.1%
Western Europe	11.2%	11.9%	12.5%	11.0%	11.8%
Oceania	9.8%	5.4%	6.2%	5.0%	6.9%
Sub-Group average	7.0%	6.1%	6.4%	2.0%	6.2%
Regional Totals 2/	7.5%	6.2%	7.0%	8.0%	6.9%

1/ Includes cars, trucks and buses.

2/ Does not include Communist Countries.

3/ This total differs from total in Table 1 by 6.4 mil. due to projection made for Communist countries.

Source:- Compiled and calculated from data in McGraw-Hill 1966 World Automotive Survey.

Table 4

PRICE COMPARISONS, PASSENGER VEHICLES, HOME COUNTRY AND ABROAD, 1966

Country	Annual Value	Domestic Content (%)	Price Index 1/ (France = 1.0)
Belgium	70,000	18-19	1.0
Spain	66,000	90-94	1.3
Algeria	8,000	19-23	1.3
Canada	5,500	22-23	1.5
Venezuela	2,600	30	1.6
Portugal	2,500	28-32	1.6
Ireland	2,000	15-20	1.6
South Africa	3,500	22-40	1.7
Argentina	24,000	97-99	2.0
Ivory Coast	2,500	16-18	2.0
Morocco	2,500	17-19	2.0
Madagascar	1,200	13-15	2.0
Brazil	15,000	100	2.3
Peru	1,200	10-14	3.0
Chile	600	45	4.0

Source:- Figures furnished by a French manufacturer.

1/ Converted at official exchange rates, December, 1966.

Table 5

VEHICLE DENSITY PER INHABITANT, 1965

Country	Inhabitants per vehicle
United States	2.2
Canada	3.0
Australia	3.0
Sweden	4.0
France	4.6
United Kingdom	5.0
West Germany	5.5
Belgium	6.1
Italy	8.4
Argentina	14.5
Japan	15.5
Venezuela	17.5
Spain	26.5
Portugal	28.0
Mexico	37.8
Brazil	41.1
Malaysia	50.5
Greece	58.0
Yugoslavia	77.3
India	479.3

Sources:- International Monetary Fund, International Financial Statistics, January 1967.
Automobile Manufacturers Assoc., World Motor Vehicle Data, 1965.
McGraw-Hill, 1966 World Automotive Market Survey.

Table 6

U.S. AND EUROPEAN COMMERCIAL VEHICLE PRODUCTION BY WEIGHT GROUPS, 1965

Region	Up to 6 tons (Units)	Over 6 tons (Units)	Over 6 tons (Percent Total)	Total (Units)
Europe				
United Kingdom	285,876	151,366	34.6%	437,242
France	154,933	30,966	16.7	185,899
Germany	170,030	72,715	30.0	242,745
Italy	49,887	21,729	30.3	71,616
Sub-Total	660,726	276,776	29.5	937,502
United States	1,352.389	399,416	22.8	1,751,805
Grand Total	2,013,115	676,192	25.1	2,689,307

Source:- Automobile, Manufacturers Association, World Motor Vehicle Data, 1965 The Economist, Commercial Vehicles, A Special Survey, July 14, 1967. Dana Corporation, Automotive News, 1966 Almanac.

1/ Includes buses and tractor-trailers.

Table 7

WORLD AUTOMOTIVE PRODUCTION by COMPANY SIZE - 1965 ALL TYPE VEHICLES 1/

TOTAL

Production Output (millions)	Number of firms	Total Output (millions)	Percent of World Production	Average Volume per firm (to nearest) thousand)
3.1 - 5.7	2	8.8	36.5%	4,400,000
0.5 - 1.6	9	7.7	32.0%	856,000
0.2 - 0.4	14	3.6	14.9%	257,000
Below 0.2	293	4.0	16.6%	14,000
Totals and averages	318 2/	24.1	100.0%	76,000

PASSENGER CARS

2.6 - 4.9	2	7.6	39.0%	3,800,000
0.5 - 1.5	7	6.1	31.3%	871,000
0.1 - 0.4	16	3.5	17.9%	219,000
Below 0.1	176 3/	2.3	11.8%	13,000
Sub-totals and averages	201	19.5	100.0%	97,000

TRUCKS & BUSES

0.5 - 0.8	2	1.3	27.7%	650,000
0.1 - 0.2	10	1.5	31.9%	150,000
0.013 - 0.1	32	1.2	25.5%	38,000
Below 13,000	206 3/	0.7	14.9%	3,000
Sub-totals and averages	250	4.7	100.0%	19,000

Source: - Calculated from data in McGraw-Hill, 1966 World Automotive Market Survey.

1/ Excluding USSR and Eastern Europe.

2/ Sub-totals add to more than total because some firms produce both cars and trucks.

3/ Estimated from source material available.

Table 8

WORLD AUTOMOTIVE PRODUCTION BY COUNTRY AND LEADING FIRMS, 1965

ALL - TYPE VEHICLES

U.S.A.	JAPAN	U.K.	GERMANY	FRANCE
(1) General Motors 5,706,000	(10) Toyota 477,700	(6) BMC 854,300	(4) V.W. 1,510,000	(9) Renault 542,000
(2) Ford Motors 3,113,000	(14) Nissan 345,900	(8) Ford 589,800	(7) Opel 631,100	(11) Citroen 465,000
(3) Chrysler Corp. 1,611,000	(18) Toyo Kogyo 273,500	(16) Vauxhall 333,200	(15) Ford 334,500	(17) Peugeot 293,000
(13) American Motors 346,000		(21) Rootes 212,600	(19) Daimler-Benz 236,900	(20) Simca 230,000

CANADA	ITALY	AUSTRALIA	BELGIUM
(12) General Motors 419,000	(5) Fiat 988,000	(23) General Motors 165,200	(24) Ford 161,700
(22) Ford 211,000			
(25) Chrysler 153,000			

C A R S

U.S.A.	JAPAN	U.K.	GERMANY	FRANCE	ITALY
(1) General Motors 4,949,000	(15) Toyota 236,900	(6) BMC 671,400	(4) V.W. 1,415,300	(9) Renault 470,000	(5) Fiat 947,000
(2) Ford Motors 2,566,000	(20) Nissan 170,200	(8) Ford 504,500	(7) Opel 615,600	(10) Citroen 380,000	
(3) Chrysler Corp. 1,468,000		(17) Vauxhall 220,800	(13) Ford 307,700	(14) Peugeot 270,000	
(12) American Motors 1,415,300		(18) Rootes 174,400	(19) Daimler-Benz 174,000	(16) Simca 230,000	
		(25) Standard Triumph 120,000			

CANADA	AUSTRALIA	SWEDEN
(11) General Motors 351,000	(22) General Motors 142,600	(24) Volvo 130,000
(21) Ford 168,000		
(23) Chrysler 136,000		

T R U C K S

U.S.A.	JAPAN	U.K.	GERMANY	DEVELOPING COUNTRIES
(1) General Motors 757,000	(3) Toyota 240,900	(5) BMC 183,200	(13) V.W. 94,700	Brazil (12) Willys 29,000
(2) Ford Motors 547,000	(4) Toyo Kogyo 192,200	(10) Vauxhall 112,400	(19) Daimler-Benz 62,900	Spain (35) Citroen 20,500
(7) International 171,000	(6) Nissan 175,700	(14) Ford 85,300	(28) Ford 26,800	Argentina (37) IKA 18,600
(8) Chrysler Corporation 143,000	(9) Daihatsu 137,500	(26) Rootes 38,200	(40) Opel 15,500	India (39) Tata Mercedes 17,000
(12) Kaiser 106,000	(11) Mitsubishi 110,500	(29) Leyland 25,000	(42) Rheinstahl-Hanomag 15,000	
(31) White 25,000	(18) Isuzu 57,700		(44) Magirus 13,000	
(36) Mack 20,000	(20) Fuji 54,600	FRANCE	CANADA	Other Countries
	(21) Honda 46,700	(15) Citroen 85,000	(17) General Motors 68,000	Italy (24) Fiat 41,000
	(22) Prince 44,600	(16) Renault 72,000	(21) Ford 44,000	Australia (34) General Motors
	(25) Suzuki 40,000	(34) Peugeot 23,000	(38) Chrysler 17,000	Sweden (43) Volvo 15,000
	(27) Aichi 31,400	(41) Berliet 15,500		
	(31) Hino 24,800			

Source: Compiled from data in McGraw-Hill, 1966 World Automotive Market Survey.

* World ranking in group.

Table 9

MAJOR WORLD EXPORTERS OF AUTOMOTIVE VEHICLES, 1965

Country	TOTAL Production	TOTAL Exports	TOTAL Exports as % Production	CARS Production	CARS Exports	CARS Exports as % Production	TRUCKS Production	TRUCKS Exports	TRUCKS Exports as % Production
West Germany	3,055,700	1,527,300	50.0	2,794,800	1,515,812	54.2	260,900	118,663	45.9
United Kingdom	2,134,900	793,800	37.2	1,691,100	625,728	37.0	443,800	165,456	37.3
France	1,581,600	613,000	38.8	1,364,000	535,867	39.3	217,600	18,428	8.5
Italy	1,158,200	326,700	28.2	1,090,600	301,768	27.7	67,600	23,864	35.3
Japan	1,870,500	194,200	10.4	696,300	100,791	14.5	1,173,700	93,385	8.0
U.S.A	11,112,000	167,700	1.5	9,335,000	106,722	1.1	1,777,000	51,396	3.5
Sweden	204,300	108,100	53.0	170,500	84,118	49.3	25,500	110,960	43.0
Australia 1/	352,900	12,383	3.5	304,800	11,434	3.8	48,100	949	2.0
Canada	849,000	96,200	11.3	708,000	77,879	11.0	141,000	10,882	7.7

Sources: McGraw-Hill, World Automotive Market Survey-1966
Automobile Manufacturers Association, Inc. World Motor Vehicle Data - 1965.

1/ Largely to New Zealand, New Caledonia, Malaysia, Thailand and other Asian countries.

Table 10

AUTOMOTIVE ASSEMBLY LINES IN OPERATION THROUGHOUT THE WORLD, JULY 1966

Country	Number of assembly lines in operation	Number of countries in which assembly lines are established.
United States*	122	26
Great Britain	64	27
France	62	26
West Germany	55	22
Japan	49	22
Italy	25	22
Sweden	10	1
Total	387	55

*Includes British, German and Australian affiliates.

Source: Chambre Syndicale des Constructeurs d'Automobiles, Repertoire Mondial des Usines d'Assemblage de Vehicules Automobiles, Vols. I & II, July 1966.

Table 11

GROWTH IN AUTOMOTIVE PRODUCTION

IN MAJOR PRODUCING COUNTRIES, 1955-65

	Production 1955*	Production 1965	Annual average rate of growth
Developed Countries			
(Excl. USSR and Eastern Europe)			
Japan	68,932	1,875,614	39.0%
Italy	208,766	1,175,518	16.0%
Sweden	56,209	205,737	15.2%
Netherlands	19,179	36,961	13.7%
West Germany	706,792	3,055,700	12.9%
France	776,083	1,616,153	8.3%
Canada	452,118	855,178	6.7%
Australia	218,[illegible]	407,596	6.7%
United Kingdom	1,237,[illegible]	2,177,[illegible]	6.1%
U. S. A.	9,204,049	11,137,830	1.9%
USSR and Eastern Europe			
Yugoslavia	15,[illegible]1/	45,452	19.5%
Czechoslovakia	26,103	90,713	14.3%
Poland	17,000	60,550	13.7%
East Germany	56,438	110,000	11.9%
U.S.S.R.	445,268	616,000	3.5%2/
Developing Countries			
Argentina	[illegible]3/	194,536	35.0%
Spain	[illegible]3/	226,935	29.0%
Brazil	[illegible]3/	185,645	25.0%
Mexico	[illegible]	96,654	11.7%
India	[illegible]	69,500	8.7%

*except as noted.

1/ 1957

2/ During the earlier period (1946-55), the rate of growth was 17.9%

3/ 1959

Source: Compiled and calculated from data in Automobile Manufacturers Association, World Motor Vehicle Data, 1965, McGraw-Hill, 1966 World Automotive Market Survey.

Table 12

MANUFACTURING AND ASSEMBLY OPERATION IN DEVELOPING COUNTRIES, BY REGIONS, 1965

	Number of firms	Domestic Content	Total 2/	Cars	Trucks and Buses
Latin America					
Argentina	12	72-90	133,000	131,800	65,200
Brazil	11	95-100	180,800	101,500	79,300
Mexico	12	60	126,700	88,700	38,000
Venezuela	16	5-14	53,500	37,700	15,800
Peru	7	30	3,000	1,700	1,300
Colombia	5	25-40	2,800	300	2,500
Costa Rica	11	A*	1,300	900	400
Uruguay	16	0-10	n.a.**	n.a.	n.a.
sub-total	90	-	564,900	362,600	202,300
Asia					
India	8	61-80	69,500	23,100	46,400
Malaysia	2	8-17	25,000	25,000	-
Thailand	7	A	15,900	6,900	9,000
Pakistan	4	A	9,800	1,800	8,000
Taiwan	3	A	3,900	2,400	1,500
Burma	2	A	1,800	1,200	600
South Korea 1/	1	A	1,500	-	1,500
Indonesia	4	n.a.	n.a.	n.a.	n.a.
sub-total	31	-	127,400	60,400	67,000
Europe					
Spain	21	90-100	212,500	142,300	70,200
Portugal	23	25	37,000	30,000	7,000
sub-total	44	-	249,500	172,300	77,200
Middle East/Africa					
United Arab Republic	2	30-45	12,200	8,500	3,700
Algeria	2	25	9,600	6,200	3,400
Iran	6	65	8,900	6,300	2,600
Morocco	5	30-50	7,500	6,200	1,300
Turkey	8	A	5,300	-	5,300
Nigeria	10	n.a.	5,000	-	5,000
Ivory Coast	1	A	2,200	1,100	1,100
Malagasy	2	A	1,700	1,200	500
sub-total	36	-	52,400	29,500	22,900
GRAND TOTAL	201		994,200	624,800	369,400

* assembly only
** not available

1/ Military vehicles only.

2/ Some of the "production" figures for the smaller countries including Malaysia actually represent planned capacity and should not be taken literally.

Source: Chambre Syndicale des Constructeurs d'Automobiles, Repertoire Mondial des Usines d'Assemblage de Vehicules Automobiles, Vols. I & II, July 1966.
McGraw-Hill, 1966 World Automotive Market Survey.
Automobile Manufacturers Association, World Motor Vehicle Data, 1965.

Table 11

CONCENTRATION IN PRODUCTION VOLUMES FOR EUROPEAN AND DEVELOPING COUNTRIES, 1965

	National Production	Percent World Production	Number of Firms Accounting for 80-90 Percent of Production	Average Production Per Firm (nearest 1,000)
Italy	1,158,200	4.6	1	988,000
Germany	3,055,700	12.2	4	649,000
France	1,581,600	6.3	4	383,000
U.K.	2,134,900	8.5	4	498,000
Japan	1,879,500	7.5	8	211,000
Spain	212,500	0.9	3	60,000
Brasil	180,800	0.7	3	54,000
Argentina	196,800	0.8	6	28,000
Mexico	126,700	0.5	6	19,000
India	69,500	0.3	5	11,000
Venezuela	53,500	0.2	6	8,000

Source: McGraw-Hill, 1966 World Automotive Market Survey

Table 14

COMPARATIVE PRODUCTION COSTS U.S./INDIA DIESEL ENGINE MANUFACTURE, 1964

	United States	United Kingdom	India
Engines per year 1/	14,000	3,000	1,200
	DOLLAR COSTS		
Labor	212	206	120
Materials	1,359	2,048	4,533
Overhead 2/	529	732	1,379
Total costs	$2,100	2,986	$6,032
Capital/output ratio	0.61	.79	3.02
Manufacturing/Direct Labor Ratio	2.47	3.55	11.25
	PERCENTS		
Direct Labor	10.1	6.9	2.0
Materials and Parts	64.7	68.6	75.1
Indirect Costs	25.2	24.5	22.9
Total costs	100.0	100.0	100.0
	INDICES		
Labor	1.0	0.97	0.57
Materials	1.0	1.51	3.34
Overhead	1.0	1.38	2.61
Total costs	1.0	1.42	2.87
Capital/output ratio	1.0	1.30	4.95
Manufacturing/Direct Labor Ratio	1.0	1.44	4.55

1/ This is for this engine series only--actually the scale difference factor based upon value added was about 3.7 percent (see p. 95 in source cited below).
2/ Includes all other variable manufacturing costs and capital charges.
3/ Converted at Rs. 4.75 = $1.00

Source: Jack Baranson, Manufacturing Problems in India, (Syracuse University Press, 1967), p.88.

Table 18

ARGENTINA, IMPORTS AND TOTAL CONSUMPTION, 1956-66

Year	Imported Vehicles & Chassis 1/	Argentine Produced	Total Consumption	Imports as Percent of Consumption
1956	17,743	5,943	23,686	74.9
1957	47,187	15,635	62,822	75.1
1958	19,495	27,834	47,329	41.1
1959	6,915	32,830	39,745	17.4
1960	5,107	89,266	94,373	5.5
1961	4,947	136,266	141,213	3.5
1962	6,032	129,730	135,762	4.4
1963	1,686	105,155	106,841	1.6
1964	1,286	166,483	167,769	0.8
1965	1,107	194,465	195,572	0.6
1966	1,461	179,453	180,914	0.8

1/ Includes assembled vehicles, chassis, accessories and replacement parts

Source: Associacion de Fabricantes Argentinas (ADEFA)

Table 19

ARGENTINA, VEHICLE PRODUCTION AND AUTHORIZATIONS BY FIRMS, 1965

	Firm	Number Models	Authorized Production	Actual Production	Percent Distribution	Percent Production/ Authorization
1.	Industrias Kaiser	17	67,179	56,625	29.1	84.3
2.	Ford Motor	6	31,475	30,424	15.6	96.7
3.	Fiat Concord	5	28,985	28,866	14.8	99.6
4.	General Motors	5	27,740	25,212	13.0	90.9
5.	Chrysler	10	18,270	16,163	8.3	88.5
6.	Siam Di Tella 3/	4	13,744	13,120	6.7	95.5
7.	S.A.F.R.A.R.	2	8,490	6,647	3.4	78.3
8.	Industria Automotriz Santa Fe	4	6,273	5,494	2.8	87.6
9.	Citroen	3	8,279	4,687	2.4	56.6
10.	D.I.N.F.I.A.	2	3,465	3,136	1.6	90.5
11.	Mercedes-Benz	10	4,800	3,075	1.6	64.1
12.	Insard	-	4,167	536	0.3	12.9
13.	Metalmecanica	-	3,500 1/	478	0.2	13.7
	TOTALS	68	226,367	194,465	100.0	85.9

1/ Includes 1,000 units of Simca Ariane.

2. Merged with Industrias Kaiser Argentina in late 1965.

Source: Asociacion de Fabricantes Argentinas (ADEFA)

Table 20

ARGENTINA, PLANT CAPACITY AND UTILIZATION, 1965

Firm	Capacity		Annual Output (Cars & Trucks)	Percent Utilization
Kaiser	one shift	- 27,600	56,600	-
	two shifts	- 55,200 2/		-
	three shifts	- 92,800		61.0
Ford	one shift	- 40,300	30,400	75.4
Mercedes	one shift	- 4,800	3,100	64.6
	two shifts	- 7,200		43.1
Fiat 1/	one shift	- 19,200	28,900	-
	two shifts	- 38,400		75.3
	three shifts	- 57,600		50.2
Chrysler	one shift	- 19,000	16,200	85.3
Averages	one shift (5 firms)	- 22,180	27,040	121.9
	two shifts (3 firms)	- 33,600	29,500	87.9

1/ Some interchangeability among plant facilities for manufacturing vehicles, tractors and diesel motors.

2/ Author's estimate.

Source: Company reports.

Table 21

ARGENTINA, PRODUCTION OF CARS AND TRUCKS, 1956/66

Year	Passenger cars 1/	Commercial vehicles 2/	T O T A L	Percent change
1956	2.715	3.228	5.943	-
1957	11.743	3.892	15.635	163.1%
1958	21.531	6.303	27.834	78.0
1959	23.816	9.014	32.830	17.9
1960	45.172	43.988	89.160	171.6
1961	81.932	54.334	136.266	52.8
1962	92.257	37.473	129.730	- 4.8
1963	77.167	27.988	105.155	-18.9
1964	115.855	50.628	166.483	58.3
1965	135.000	60.000	194.465	16.8
1966	123.937	55.516	179.453	- 7.7

1/ Includes station wagons and jeeps.
2/ Includes pick-ups, delivery and other type trucks and chassis.

Source: Consejo Nacional de Desarrollo (CONADE); Association de Fabricantes Argentinas (ADEFA).

Table 22

ARGENTINA, PLANT UTILIZATION, 1960-65 1/

Year	Annual Days Worked 2/	Capacity 3/		Production		Percent Utilization	
		Cars	Trucks	Cars	Trucks	Cars	Trucks
1961	260	0	12,800	0	12,650	-	98.8
1962	261	10,560	10,560	5,009	7,459	47.4	70.6
1963	255	26,000	20,000	4,364	4,746	16.8	23.7
1964	257	23,000	19,600	13,247	13,578	57.6	69.3
1965	229	21,100	19,200	15,700	15,012	74.4	78.2
Average 1961/65	252.4	80,660	82,160	38,320	53,345	47.5	74.9

1/ Data are for a single firm.

2/ Refers to production only; annual workdays related to capacity are 240.

3/ Based on 3 shifts in press room and 1 shift in all other departments.

Source: Special report furnished World Bank Mission, December 1965.

Table 23

ARGENTINA, VALUE ADDED, FIXED ASSETS, AND EMPLOYMENT, 1963-64

Category Measured	COMPANY									
	Ford		Kaiser		Mercedes-Benz		Chrysler		Fiat Concord	
	1963	1964	1963	1964	1963	1964	1963	1964	1963	1964
1. Vehicle Output (Units)	9,333	25,264	20,274	50,042	1,648	2,222	8,291	12,776	18,229	24,093
2. Fixed Assets (Millions of Pesos)	6,181	5,795	3,351	3,718	1,823	2,052	2,595	2,890	2,814 1/	3,993
3. Value Added (Millions of pesos-constant prices)	877	2,296	4,580	6,409	543	753	1,588	1,577	3,101	3,045
4. Employment (Number employeed)	3,018	3,371	7,541	9,526	732	993	2,009	2,298	1,271	1,471
5. Employees/Value Added (Line 4÷Line 3)	3.411	1.468	1.647	1.482	1.347	1.319	1.264	1.457	0.410	0.483
6. Employees/Unit Output (Line 4÷Line 1)	0.323	0.133	0.372	0.190	0.444	0.447	0.242	0.180	0.070	0.061
7. Value Added/Unit Output (Line 3÷Line 1)	0.094	0.091	0.226	0.128	0.300	0.339	0.192	0.123	0.170	0.126
8. Fixed Assets/Value Added (Line 2÷Line 3)	5.434	2.762	0.732	0.580	3.357	2.725	1.633	1.833	0.907	1.311
9. Fixed Assets/Unit Output (Line 2÷Line 1)	0.511	0.251	0.165	0.074	1.106	0.923	0.313	0.226	0.154	0.166

1/ Estimate by author

Sources: Special reports furnished to World Bank Mission, December 1965; Annual Company Reports

Table 24

ARGENTINA, PRICE COMPARISONS, AUTOMOTIVE PARTS, 1/ SEPTEMBER 1965

Part	U. S. A. Purchase Price US$	U. S. A. Freight, etc. USA to Buenos Aires	U. S. A. C. I. F. Price Argentine	ARGENTINA Procurement M$N	ARGENTINA Price US$ (179.0 pesos US$ 100)	Argentine/USA Price Comparison (U.S. = 100.0)
Engine Assembly						
6 Cyl.	$330.20	$86.63	$419.83	143,222	$ 588.65	167.0
Transmission Assembly	57.35	30.40	87.75	17,823	99.57	173.6
Rear Axle	57.08	30.25	87.33	27,050	151.11	264.7
Starter Assembly	13.79	3.59	17.38	6,684	37.34	270.8
Generator (12 Volt)	14.12	3.67	17.79	5,641	31.51	223.2
Tire (15")	9.86	5.23	15.09	4,369	24.41	247.6
Wheel (15")	2.40	1.27	3.67	1,050	5.87	244.6
Piston	1.43	.37	1.80	714	3.99	279.0
Radiator	11.43	6.06	17.49	6,850	38.27	334.8
Cylinder Block	38.05	9.89	47.94	17,317	96.74	254.2
Crankshaft	12.07	3.14	15.21	9,582	53.53	443.5
Camshaft	3.52	.92	4.44	1,545	8.63	245.2
Steering Wheel	2.52	1.34	3.86	1,420	7.93	314.7
Distributor	7.61	1.98	9.59	2,400	13.41	176.2
Battery	7.75	4.11	11.86	4,215	23.55	303.9
Clutch	9.01	4.78	13.79	4,057	22.66	251.5
Fuel Pump	4.08	2.16	6.24	937	5.23	128.2
TOTAL	$585.27				$1,182.60	202.2

1/ For Rambler Custom 660

Source: Special report furnished to World Bank Mission, December, 1965.

Table 25

U.S./ARGENTINA PRODUCTION VOLUME AND AVERAGE UNIT COSTS, 1965

Vehicles	Output	Unit Price	Total Cost to Economy
		Argentina	
	Units	U$S [1/]	U$S [1/] Millions
Total	195,000	4,773 [2/]	930.8
Passenger Cars	135,000	4,642	626.7
Trucks & Buses	60,000	5,068	304.1
		United States	
	Units	U$S	U$S Millions
Total	11,114,000	1,934	21,500
Passenger Cars	9,329,000	1,919	17,900
Trucks & Buses	1,785,000	2,017	3,600
		Argentina/United States	
		Ratios (U.S. = 1.0)	
Total	1.8	2.5	4.3
Passenger Cars	1.4	2.4	3.5
Trucks & Buses	3.4	2.5	8.4

1/ U.S. dollar figures are based upon the 1965 pesos value deflated to 1960 pesos and converted at the 1960 official exchange rate of 82.7 pesos to the dollar.

2/ Converting 1965 pesos at the 1965 rate, the average price per vehicle is $4080.

Source: Automobile Manufacturers Association (USA), Automobile Facts and Figures, 1965; ADEFA; CONADE

Table 26

PRICE COMPETITION [illegible] ARGENTINA, 1965

	U.S.A.	Argentine domestic price 1/	Ratio Argentina/US (US = 100)	Argentine Export Price 1/	Ratio Argentina/US (US = 100)
Kaiser Jeep (JA-2PB)					
Advertised delivery price	$1,728	$3,188	184	$3,188	184
Tax deletion	(119)	(656)	-	(1,042)	-
Tax-free price	1,609	2,532	157	2,146	133
Freight USA-Argentina	450	-	-	-	-
	2,059	2,532	123	2,146	104
Kaiser Rambler Classic (Custom 660)					
ADF (advertised delivery price)	2,256	6,423	285	6,423	285
Tax deletion	(174)	(1,599)	-	(2,334)	-
Tax-free price	2,082	4,825	232	4,089	196
Freight USA-Argentina	550	-	-	-	-
	2,632	4,825	183	4,089	155

1/ Conversion rate 179 pesos = US$ 1.00

2/ See Tables 30, 31.

Source: Company Reports.

Table 27

ARGENTINA'S PLANNED AND ACTUAL FOREIGN EXCHANGE BURDEN OF AUTOMOTIVE INDUSTRY, 1959-65

	1959	1965
1. Vehicles produced (units)	32,800	195,000
2. Total cost to economy 1/ (US$ million)	134	796
3. CIF value (US$ million) 2/	75	449
4. Planned import allowances (percent) 3/	34%	10%
5. Planned foreign exchange costs (US$ million)	26	45
6. Actual import allowances (percent) 4/	56%	29% 5/
7. Actual cost to Argentine economy, at $2,300 per vehicle in (US$ million)	42	130
8. Cost to Argentine economy at $4,080, in US$ million	-	250 6/

1/ In 1959, 32,800 vehicles were produced valued at 11,078 million 1960 pesos at 82.7 pesos to the dollar, or 11,078 - (32,800 x 82.7).

2/ Average CIF price $2,300 for two Kaiser vehicles.

3/ In 1959, allowable import content was 30 percent on cars and 45 percent on trucks; cars comprised 72.5 percent of product and trucks 27.5 percent (Table 18). The weighted average is then .30 (.725) + .45 (.275) = .34.

4/ Using weighting factors in footnote 3 above, and adjusting for supplier import content (see footnote 7, below) .275 (.55) (1 - .14) + .725 (.70) (1 - .16) = .56.

5/ In 1965, 69 percent of production was in cars and 31 in commercial vehicles. Domestic content requirements were 91 percent for cars and 72 percent for trucks; which adjusting for supplier import content, became 76 percent and 62 percent respectively (see footnote 7 below). Thus:
.31 (.76) + .69 (.62) = .71 domestic content; .29 import content.

6/ Manufacturers' import allowances are based on c.i.f. prices (the $2,300 average), but the economy, from all indications is in effect utilizing imported resources based on Argentine manufacturing costs (the $4,080 average). The higher $250 million figure is what the Central Bank estimates as the foreign exchange burden currently imposed upon the Argentine economy by the automotive industry. According to CONADE input-output estimates, the import coefficient for automobiles and tractors was .2hh per dollar in 1960 (table 30). Applying the 1960 coefficient to 1965 output of $800 million, the import requirement would be $190 million.

7/ The percentages do not reflect the domestic content of "Argentine" components and parts. Adjusted for import content of locally procured items, the 1964 figures would be about 76 percent for cars and 62 percent for trucks. For a Falcon costing $3,777 to produce, $1,831 represents purchase components and parts--of which at least one-third may be estimated to represent foreign content--or $610. This would mean an adjusted 76 percent for an Argentine car ($.90 - \frac{610}{3777} \times .90$). For a F-100 truck, costs averaged $3,179 in 1964, of which $1,293 represented domestic components and parts--or 62 percent ($.72 - \frac{431}{3179} \times .72$). See footnotes 4 and 5.

Source: Tables 18 and 21.

Table 28

ARGENTINA, CORPORATE EARNINGS OF VEHICLE MANUFACTURERS, 1964

Firm	Million Pesos			Percents	
	Net Profits (Losses) 1/	Sales	Shareholders' Equity 3/	Profit/ Sales	Profit/ Shareholders' Equity
Kaiser 2/	1,203	26,706	5,427	4.5	22.1
Ford	1,031	16,779	3,756	6.1	27.4
Mercedes-Benz	(95)	3,766	(n.a.)	-2.5	(n.a.)
Fiat Concord	1,010	7,355	5,501	13.7	18.4
Averages - 4 firms	787	13,654	-	5.8	-
- 3 firms	1,081	-	4,895	-	22.1

(n.a.) = not available

1/ After all taxes and interest charges

2/ Kaiser averages for Fiscal Year ending June 1964/June 1965.

3/ Includes capital stock, earned surplus, and surplus reserves.

Source: Annual Company Reports.

Table 29

PROFITS AND OPERATIONAL RATIOS OF U.S. CORPORATIONS, 1964-65

Industry or Group	Before Taxes		After Taxes	
	4th 64	4th 65	4th 64	4th 65
Per Dollar of Sales	(Percents)			
Motor Vehicles and Equipment	11.1	13.8	6.4	7.3
All Manufacturing Corporations	8.8	9.5	5.4	5.7
Manufacturing Firms with Sales $10-25 million	7.9	8.8	4.4	5.0
Kaiser-Argentina (Fiscal 65)	8.4		5.2	
On Stockholder Equity	(Percents)			
Motor Vehicles and Equipment	27.0	40.7	15.5	21.4
All Manufacturing Corporations	20.2	22.9	12.4	13.7
Manufacturing Firms with Sales $10-25 Million	20.2	24.2	11.2	13.8
Kaiser-Argentina (Fiscal 65)	29.0		47.2	
	(Ratio)			
Asset/Liability Ratios	Current Assets/ Liabilities 1/		Stockholder Equity/Debt 2/	
Motor Vehicles and Equipment	2.04	1.89	9.05	8.31
All Manufacturing Corporations	2.39	2.27	3.88	3.54
Manufacturing Firms with Sales $10-25 Million	2.56	2.49	3.29	2.97
Kaiser-Argentina (Fiscal 65)	1.09		0.49	

1/ Current assets to current liabilities expresses the potential ability of a company to meet current obligations.

2/ Stockholders' equity includes capital stock, earned surplus, and surplus reserves; debt includes short-term loans, installments due in one year, and long-term debt due in more than one year. Ratio expresses number of times stockholder equity covers current debt obligation. Current debt amounted to 18 percent of total liabilities for the Motor Vehicles and Equipment industry in the fourth quarter of 1964.

Source: Federal Trade Commission (SEC), Quarterly Financial Reports, Fourth Quarter, 1965.

Table 30

ARGENTINA, IMPORT CONTENT ANALYSIS, AUTOMOTIVE INDUSTRY, 1960 1/

	(1)	(2)	(3)
	per million pesos		
Input Industry	Direct Inputs	Import Co-efficient	Indirect Import Inputs (col. 1 x col. 2)
Fuel and electric	8,367	.168	1,411
Textiles	5,814	.026	153
Paper and cardboard	4,431	.068	306
Printing and publishing	887	.143	128
Chemical products	24,655	.125	3,104
Rubber	48,179	.210	10,142
Leather	546	.003	2
Stone, glass, and ceramics	1,793	.045	81
Metal working	153,607	.212	32,745
Vehicles and machinery (including autos & tractors)	25,488	.160	4,098
Machinery and electrical apparatus	40,043	.134	5,403
Commerce	106,610	-	-
Transport	21,320	.001	25
Services	15,077	.001	19
Sub-total: national inputs	450,817	-	57,617
Imported inputs	147,151	-	147,151
Value added at market prices	396,032	100,000 2/	39,603
Total	1,000,000	-	244,370

1/ Includes tractors

2/ Estimate of foreign remittances for licensing fees, interest on debt, and profits.

Source: Consejo Nacional de Desarrollo (CONADE), Matrix of Co-efficients of National and Imported Inputs, 1960

Table 31

YUGOSLAV EXPORTS OF VEHICLES AND PARTS, 1965

	Total Import Value (US$ millions) 1/	Total Export Value (US$ millions) 1/	Export % of Import
Ambulances	$ 0.1	$ 0.4	461%
Trucks (1-3 tons)	0.4	1.2	305
Interurban & Tourist Buses	0.3	0.8	245
Crane Vehicles	0.6	0.7	117
Cars up to 1110 Cm^3	4.3	4.2	98
City Traffic Buses	0.5	0.4	77
Trucks (3-5 tons)	1.6	1.1	69
Motorcycle Vehicle & Parts	1.5	1.0	63
Truck & Bus Engines & **Engine Parts**	4.8	3.0	62
Motor Vehicle Parts 2/	7.2	3.5	49
Other Special Motor Vehicles	0.8	0.3	35
Trucks in Assembly Parts	3.8	1.1	29
Heavy Trucks (over 5 tons)	7.2	1.4	20
Car Engines & Engine Parts	1.4	0.1	9
Cars 1110 Cm^3 - 2500 Cm^3	9.5	0.7	8
Chassis with engines & bodies 3/	0.9	0.1	6
GRAND TOTAL	$44.9	$20.0	45

1/ Converted from dinar values at 1965 dinar rate of 300 to the US dollar.

2/ Gear boxes, differential and other transmission parts, wheels and axles, road tractor assembly parts and other motor vehicle parts.

3/ Including bus, trucks, and other motor vehicles.

Source: B.P.M.V. (Automotive Constructors Bureau), The Yugoslav Industry - 1965.

Table 32

COST PREMIUM FOR MANUFACTURING AUTOMOTIVE PRODUCTS IN DEVELOPING ECONOMIES, 1965

Country	Production Units 1965	Import Content (Percent) 2/	Cost Premium (f.o.b. world source = 1.0) 1/
Spain	212,500	19%	1.3*
Argentina	196,800	31	2.6
Brazil	180,800	18	1.7
Mexico	126,700	49	1.6
India	69,500	41	2.0
Venezuela	53,500	92	1.6*
All Other developing countries	154,400	79	2.0*
TOTAL	994,200		
WEIGHTED AVERAGES		40	1.8

1/ Ratios based upon conversions at official exchange rate. Figures marked with an asterisk (*) are estimates from pricing data.

2/ Percentages estimated from base figures for domestic content given in Table 12 and adjusted upward an additional 15 percent for the import component of "domestic content."

Source: Tables 12, 15 and 33.

Table 33

INCREASE IN PRODUCTION COSTS AS A FUNCTION OF DOMESTIC CONTENT AND PRODUCTION VOLUME, PASSENGER CARS - 1966

Volume of Production per annum	Percentage Domestic Content	Cost per Unit (Rupees) 1/	Index of Cost Increase 2/
3,000	28%	7,778	152%
	47	9,061	177
	60	10,444	204
	97	15,367	300
5,000	28	7,524	147
	47	8,477	166
	60	9,403	184
	97	12,750	249
5,700 3/	85	11,320	220
8,000	28	7,381	144
	47	8,149	159
	60	8,817	172
	97	11,278	220
10,000	28	7,333	143
	47	8,039	157
	60	8,622	168
	97	10,788	211
12,000	28	7,301	143
	47	7,966	156
	60	8,492	166
	97	10,460	204

1/ European f.o.b. factory cost, pre-devaluation, 1966 = Rs. 5,118

2/ Increased cost over European ex-factory cost.

3/ Actual production April, 1966.

Source: Computed from data furnished by Indian manufacturer.

Table 34

HOME MARKET VERSUS OVERSEAS PRICING 1/
1966

Home Country	U.K.	OVERSEAS MARKETS U.S.A.	France	Germany	Italy	Japan	Switzerland	Sweden	Netherlands	U.S.S.R.
1. **United Kingdom**										
BMC (MGB)	$ 2,436	106%	134%	127%	127%	188%	115%	-	-	-
BMC (Mini)	1,442	102	124	95	95	172	93	-	-	-
Ford Anglia	1,557	86	96	-	100	-	96	-	-	-
Ford Cortina	1,814	81	97	-	120	-	99	-	-	-
Vauxhall Viva	1,621	-	99	86	106	172	98	-	-	-
Vauxhall Cresta	2,965	-	129	103	126	224	104	-	-	-
Rootes Hillman (Imp)	1,509	99	108	94	110	178	97	-	-	-
Jaguar E-type Roadster	1,812	80	142	127	142	228	114	-	-	-
Aston Martin DB6 Manual	3,996	112	-	121	130	212	-	-	-	-
2. **United States**										
Ford Mustang	222%	$2,876	215%	-	198%	319%	172%	-	-	-
3. **France**										
Citroen DS21	153%	107%	$3,480	95%	120%	223%	117%	-	-	-
Renault 10	122%	-	1,595	94%	100%	199%	108%	-	-	-
4. **Germany**										
VW 1300	141%	123%	110%	$ 1,288	116%	210%	122%	-	-	-
Mercedes 200D	203%	188%	134%	2,878	144%	250%	135%	-	-	-
Mercedes 600	177%	156%	141%	14,137	135%	235%	122%	-	-	-
Opel Kadett 2-D	-	124%	118%	1,338	117%	-	122%	-	-	-
Taunus 12M*	162%	-	117%	1,422	112%	-	125%	-	-	-
5. **Italy**										
Fiat 500	138%	-	126%	101%	$ 829	241%	109%	-	-	-
Fiat 1500	118%	-	99%	82%	2,134	184%	102%	-	-	-
Alfa Romeo (Q907)	145%	115%	128%	109%	3,668	174%	107%	-	-	-
6. **Sweden**										
Volvo 122S	91%	76%	98%	77%	82%	119%	81%	$3,506	-	-
Saab Seden	83%	82%	91%	69%	85%	130%	81%	2,453	-	-
7. **Netherlands**										
Daf	112%	-	94%	78%	93%	-	93%	-	$1,495	-
8. **Japan**										
Toyota Corona	140%	120%	-	-	-	$1,552	-	-	-	-
9. **Soviet Union**										
Moskvitch (408 Saloon)	37%	--	33%	-	-	47%	36%	-	-	$4,991

N.B. Dash (-) indicates model not sold or price data not available.

1/ Home markets retail price in U.S. dollars; all others as a percent of home market price.

* Ford of Germany.

Source: The Economist, July 9, 1966, p. xxx.

Table 35

PERSONAL-INCOME/CAR-PRICE RATIOS IN SELECTED COUNTRIES, 1962/66

Country	New Passenger Car Registrations Thous. of Units		Average Annual Income of Hourly Rate Employee in Auto Industry - $US		Retail Purchase Price (Incl. All Taxes of Highest Sales Volume Pass. Car					
					Cars		Price		% of Income	
	1962	1966	1962	1966	1962	1966	1962	1966	1962	1966
Argentina	85.7	129.7	$1,722	$2,173	Renault Dauphine	Fiat-1500	$2,697	$5,067	157%	233%
Australia	265.5	393.8	2,868	3,097	Holden	Holden	2,355	2,427	82	78
Brazil	110.0	157.2	1,103	1,838	Volkswagen	Volkswagen	2,581	2,530	234	138
France	929.3	1,216.0	2,249	2,630	Renault-R4L	Citroen-Ami 6	1,131	1,478	50	56
Germany	1,217.6	1,506.7	2,223	2,980	Volkswagen	Volkswagen	1,185	1,288	53	43
Italy	634.6	1,014.9	1,877	2,542	Fiat-600D	Fiat-500D	1,048	766	56	30
Japan	258.5	740.9	1,754	2,189	Subara	Toyota Corona	1,083	1,567	62	72
Mexico	43.7	83.4	2,189	3,025	Renault Dauphine	Volkswagen	1,877	1,904	86	63
Sweden	195.7	208.0	3,303	4,842	Volvo	Volvo	2,882	3,105	87	64
United Kingdom	725.9	1,053.2	2,853	3,240	BMC-Mini	Ford-Cortina	1,383	1,845	48	57
United States	6,921.2	8,980.0	7,082	8,218	Chevrolet Impala	Chev. Impala	2,994	3,054	42	37
Venezuela	18.3	19.5	3,692	3,995	Chevrolet Impala	Volkswagen	3,583	2,362	97	59

Source: - Table furnished by U.S. manufacturer.

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