



---

**E C L A C**

**Economic Commission for Latin America and the Caribbean**

High-level Symposium on the Contribution of Transnational  
Corporations to Growth and Development in Latin America  
and the Caribbean

Santiago, Chile, 19-21 October 1992

**A NEW INTERNATIONAL INDUSTRIAL ORDER III: \***

The automobile sector as epi-center of the  
transnational corporation shake-up

\* This publication was prepared by Mr. Michael Mortimore, staff member of the ECLAC/Department of Economic and Social Development (DESD) Joint Unit on Transnational Corporations and represents part of the general framework of the ECLAC/DESD project on Transnational Corporations and Industrial Restructuring in Latin America. This document has been reproduced without formal editing and the views expressed herein are those of the author and do not necessarily reflect the views of the Organization.



## CONTENTS

	<u>Page</u>
i) Background .....	1
ii) The Japanese challenge: its dimension .....	10
iii) The Japanese challenge: its principal elements .....	16
iv) Options and consequences for developing countries .....	26
a) Advances in Asia: piggybacking Japanese techniques .....	29
b) Flying geese or sitting ducks: restructuring the automotive industry in Latin America .....	34
c) Does the form of foreign participation influence local technological advance? .....	45
v) Summary and conclusions .....	48
Notes .....	55



The motor vehicle and directly-related industries<sup>1</sup> have been so important to the development process in most industrial countries--especially the United States--that it can be said that they represent a "style of industrialization", if not development.<sup>2</sup> It is a style of industrialization centered on a petroleum-motor vehicle axis. Governments have tended to view it as an important engine of growth and overall international competitiveness.<sup>3</sup> In the United States,<sup>4</sup> manufacturing motor vehicles employed over 1 million people (before General Motors' late-1991 cutbacks) in the design, fabrication and assembly of cars, trucks, buses and replacement parts. About 9 percent of US total consumer spending was directed at the sector, where about 14 million vehicles were purchased in 1991. World production was valued at about \$500 billion in the late 1980s and, if one included associated activities such as the sale of parts, used vehicles and repair work, it represents a trillion dollar industry.<sup>5</sup> A brief look at the history of the automobile industry in the twentieth century assists in appreciating its current importance as a war zone for some of the world's most powerful transnational corporations and a source of friction among governments of the US, Japan and the EEC. This situation holds significant consequences for developing countries.

#### i) Background

The internal combustion engine and the motor vehicle were European inventions of the late nineteenth century. From its custom-made and inefficient origins the motor vehicle industry was marked by three major transformations. The first major one occurred in the early twentieth century and came in the form the dramatic success of the US **mass production** system coupled with new

principles of scientific management.<sup>6</sup> Henry Ford perfected the moving assembly line which reorganized production techniques on the shop floor by simplifying the tasks performed by semi-skilled and unskilled labor. In this way great cost reductions from superior economies of scale were achieved by US industry in the production of 'standard' automobiles. Alfred Sloan of General Motors (GM) reorganized management to accommodate integrated production through a multidivisional structure for distinct automobiles. This was supplemented with economies of scale attained via in-house component production. This productive system and new organizational techniques provided US motor vehicle producers with an enormous initial competitive advantage, as can be appreciated in the information contained in Tables 1 and 2. The major US producers used this advantage to expand nationally (between 1905 and 1923 the number of automobile plants jumped from 121 to 2,471 making it the largest industry in the US)<sup>7</sup> and internationally, especially to Europe (for example, as early as 1929, Ford had assembly operations in 21 countries while GM operated in 16 countries).

The second major transformation of the motor vehicle industry was related to the way that European producers reacted to the US dominance of the industry, which took place in the 1950s and 1960s.<sup>8</sup> Many major manufacturers--series producers, such as Volkswagen, Renault and Fiat--succeeded in mastering the US production practices; however, the major innovation was the appearance of **specialty producers** offering highly differentiated multi-option vehicles rather than 'standard' ones. Important market niches were encountered in small car and, especially, luxury car production (i.e. Daimler-Benz, BMW, Volvo) where US competitive advantages were weakest. European motor vehicle production grew rapidly for 20 years and extra-regional exports exploded. Volkswagen (VW), in particular, challenged the dominant US producers not only at home but in North and South America as well. Both VW (with 36 percent of total production outside of its home country) and Renault (20 percent) acquired a significant degree of

Table 1

## WORLD MOTOR VEHICLE PRODUCTION, BY REGION, 1950-1988

		North America <u>b/</u>	Europe <u>c/</u>	Japan	All others <u>d/</u>	Total
In million of units: <u>a/</u>	1929	5.6	0.7	0	-	6.4
	1938	5.0	1.1	0	0.3	6.4
	1950	8.4	1.6	0	0.6	10.6
	1960	8.3	6.7	0.5	0.8	16.4
	1970	9.5	12.4	5.3	1.4	28.6
	1980	9.4	12.9	11.0	5.5	38.8
	1988	13.2	16.0	12.7	7.8	49.7
In percentage:	1929	88	12	0	-	100
	1938	79	18	0	3	100
	1950	79	16	0	5	100
	1960	51	41	30	5	100
	1970	33	43	19	5	100
	1980	24	33	28	15	100
	1988	26	32	25	17	100

Source: UNCTC, "Transnational Corporations in the International Auto Industry", ST/CTC/38, New York, 1983, and Karmokalias, Y., "Automobile Industry trends and prospects for investments in developing countries", IFC Discussion Paper, No. 7, The World Bank, Washington D.C., 1990; Hoffman, K and R. Kaplinsky, Driving Force, Westview Press, Boulder, 1988, p. 80.

a/ Passenger cars and commercial vehicles excluding assembly operations.

b/ United States and Canada.

c/ Excludes Eastern Europe.

d/ Essentially centrally-planned economies and developing countries.

Table 2  
EXTRAREGIONAL AUTOMOBILE EXPORTS, 1929-1990  
(millions of units)

	North America	Europe	Japan
1929	0.4	-	0
1938	0.1	0.1	0
1950	0.1	0.4	0
1960	0.1	1.2	-
1970	-	1.9	0.7
1980	0.2	1.3	3.9
1985	-	1.7	4.4
1990	na	na	na

Source: Hoffman, K. and R. Kaplinsky, Driving Force, Westview Press, Boulder, 1988, p. 76.

international expansion by 1980 including production facilities in the US; however, US producers, such as Ford (55 percent) and GM (29 percent) were still the principal international motor vehicle manufacturers, most notably in absolute terms (even though their share of world motor vehicle production had fallen below that of European producers by 1970). The second major transformation of the global motor vehicle industry, then, was the relative success of some European producers in meeting the American challenge, particularly those which specialized in certain market niches.

The third major transformation of the motor vehicle industry came in the form of the **Japanese challenge** beginning in the 1970s to US and European dominance of that industry. Its principal manifestation was the export penetration of their national markets. In this case it was not simply an attempt to improve upon existing US techniques or encounter market niches but a complete revolution in technical and organizational aspects of motor vehicle production. This revolution was based on flexible and specialized production which achieved shorter production runs without sacrificing efficiency and while improving upon quality. Toyota led



the way with innovative organizational techniques such as "just-in-time" supply, a zero defects policy combined with quality circles in the production line, person-related not job-related wages, etc. Nissan took the lead in applying automation technology (robots) to motor vehicle production. Honda demonstrated marketing know-how in conquering the US market. The results of this multifaceted revolution in motor vehicle production and marketing was evident in the jump in Japanese-produced vehicles, from less than 1 to over 11 million units during a 20 year span from the 1960s to the 1980s, and an explosion of exports, from less than 1 to over 4 million units during the 1970-85 interim. Trade restrictions stalled but did not defeat the Japanese onslaught, as it was transformed from export penetration to the installation of foreign-owned plants in the US itself.<sup>9</sup> By the early 1990s, for example, the new plants in the US of Japanese automobile TNCs accounted for about one quarter of total North American automotive production. In this sense, the Japanese challenge was directed at one of the key industries of the Western capitalist system, a style of industrialization as it were, and therein lies a central aspect of the importance of the transformation of the motor vehicle sector.

The industry is important also because it was the gestor of some of the biggest transnational corporations in the world and it is one of the most 'globalized' of markets, characterized by exceptionally fierce global competition of the recent period. There is little doubt that the most successful industrial economy of the twentieth century-- the United States-- had a clear petroleum/motor vehicle axis to its process of industrialization. That is evident in even a cursory examination of the characteristics of the principal US corporations, as Table 3 suggests. Petroleum refining, about 25 percent of which goes to make gasoline,<sup>10</sup> and motor vehicles and their parts account for almost one third of the total sales of the 500 largest US corporations. More notably, three petroleum refiners and three motor vehicle manufacturers account for 69 percent of the total sales of the largest 10 US industrial corporations and almost 20 percent of the sales of the 500 largest

Table 3

CHARACTERISTICS OF THE TEN LARGEST US CORPORATIONS  
BY SALES, 1989  
(Billions of US dollars)

Rank sales	Corporation	Sales	Industry	Rank exports	Exports as % of sales
1	General Motors	127.0	Motor vehicles	2	8.0
2	Ford Motor	96.9	Motor vehicles	3	8.9
3	Exxon	86.7	Petroleum refining	32	1.2
4	Int'l Business Machines	63.4	Computers	5	8.6
5	General Electric	55.3	Electronics	4	13.2
6	Mobil	51.0	Petroleum refining	-	-
7	Philip Morris	39.1	Food	15	5.9
8	Chrysler	36.2	Motor vehicles	7	12.9
9	E.I. Du Pont	35.2	Chemicals	6	13.8
10	Texaco	32.4	Petroleum refining	-	-
	Total top 10	623.2	28.8%		
	Total top 500	2 164.3			
	<u>Industry totals</u>				
1	Petroleum refining	359.9	16.6%		
2	Motor vehicles and parts	295.1	13.6%		

Source: Fortune, "500 largest US industrial corporations", 23 April 1990 and Fortune, "America's 50 biggest exporters", July 16, 1990.

US industrial corporations. And, although they are not very propense to export, as measured by the proportion of exports to total sales, the three motor vehicle manufacturers are among the major US industrial exporters, occupying second, third and seventh spots on the 1989 Fortune list of major US industrial exporters by sales. This no doubt reflects the automotive pact with Canada.

This petroleum/motor vehicle axis to industrial development was, to a certain extent, imprinted on the rest of the industrial world. A look at the 25 largest industrial corporations in the world (Table 4) suggests similar characteristics. The petroleum refining and motor vehicle and parts industries represent over one-third of the overall sales of the 500 largest industrial corporations. Seven petroleum refiners and seven motor vehicle manufacturers account for 64 per cent of the total sales of the 25 largest industrial corporations and 18 per cent of those for the 500 largest ones. Thus, the petroleum/motor vehicle axis to the industrialization process generated some of the largest TNCs not only in the United States but in the entire world.

Table 5 offers a closer appreciation of aspects of the 20 principal automobile-producing TNCs over the 1973-89 period. These data demonstrate that, in general, the changes taking place in this group of TNCs consists of an increase of market shares on the part of the 8 Japanese (especially Honda and Toyota) and 1 South Korean producers, a decrease in markets shares for the 3 US manufacturers (especially Chrysler), and a mixed and unexciting situation for the 8 European producers (that of Peugeot resulted from acquisitions more than internally-generated growth). While the two dominant and most international of US producers still head the ranking by sales, the more automotive-focussed Japanese producers are closing the gap both in terms of sales as well as their networks of foreign manufacturing facilities, particularly those in the US itself. In this sense, the automobile industry is important not only as a source of some of the world's largest and most international TNCs but also because it represents one of the principal sectors where

Table 4

**CHARACTERISTICS OF THE 25 LARGEST TRANSNATIONAL CORPORATIONS  
BY SALES, 1990**  
(Billions of US dollars)

Rank	Transnational Corporations	Country	Sales	Industry
1	General Motors	United States	125.1	Motor vehicle
2	Royal Dutch Shell Group	U.Kingdom/Netherlands	107.2	Petroleum refining
3	Exxon	United States	105.9	Petroleum refining
4	Ford Motor	United States	98.3	Motor vehicle
5	International Business Machines	United States	69.0	Computers
6	Toyota Motor	Japan	64.5	Motor vehicle
7	IRI Group	Italy	61.4	Metals
8	British Petroleum	United Kingdom	59.5	Petroleum refining
9	Mobil	United States	58.8	Petroleum refining
10	General Electric	United States	58.4	Electronics
11	Daimler Benz	Germany	54.3	Motor vehicle
12	Hitachi	Japan	50.7	Electronics
13	Fiat	Italy	47.8	Motor vehicle
14	Samsung	South Korea	45.0	Electronics
15	Philip Morris	United States	44.3	Food
16	Volkswagen	Germany	43.7	Motor vehicle
17	Matsushita Electric	Japan	43.5	Electronics
18	ENI Group	Italy	41.8	Petroleum refining
19	Texaco	United States	41.2	Petroleum refining
20	Nissan Motor	Japan	40.2	Motor vehicle
21	Unilever	U.Kingdom/Netherlands	40.0	Food
22	E.I. Du Pont	United States	39.8	Chemicals
23	Chevron	United States	39.3	Petroleum refining
24	Siemens	Germany	39.2	Electronics
25	Nestle	Switzerland	33.4	Food
	Total top 25		1 452.3	28.6%
	Total top 500		5 062.3	
	<u>Industry totals</u>			
1	Petroleum refining	941.8	18.6 %	
2	Motor vehicles and parts	796.1	15.7 %	

Source: Fortune, "The global 500: world's biggest industrial firms", 20 July 1991.

Table 5

**THE PRINCIPAL AUTOMOBILE PRODUCING TRANSNATIONAL CORPORATIONS,  
SELECTED YEARS, 1973-1989**

Rank global 500 1989	TNC	Home country	World production in millions of units <u>a/</u>			Percentage distribution			Percentage foreign production <u>b/</u>		Automotive revenues % of total revenues
			1989	1981	1973	1989	1981	1973	19..	1980	1989
1	General Motors	United States	5.9	5.5	8.1	18	21	24	na	29	79
2	Ford Motor	United States	4.4	2.9	5.3	13	11	16	na	55	80
6	Toyota	Japan	3.1	2.3	2.3	10	9	7	na	-	85
	Subtotal top 3		(13.4)	(10.7)	(15.7)	(41)	(40)	(47)	na	(39)	(80)
21	Volkswagen	Germany	2.7	2.1	2.4	8	8	7	na	36	100
17	Nissan Motor	Japan	2.3	2.0	2.1	7	8	6	na	-	96
	Subtotal top 5		(18.4)	(14.8)	(20.2)	(56)	(56)	(60)	na	(32)	(84)
15	Fiat	Italy	2.2	1.8	1.7	7	7	5	na	14	70
35	Peugeot	France	2.0	1.5	0.8	6	6	1	na	18	95
30	Honda Motor	Japan	1.7	0.9	0.4	5	3	1	na	-	95
27	Renault	France	1.6	1.5	1.4	5	6	4	na	20	97
16	Chrysler	United States	1.1	0.8	2.2	3	3	7	na	25	88
	Subtotal top 10		(27.0)	(21.3)	(26.7)	(83)	(80)	(80)	na	(27)	(85)
61	Mazda Motor	Japan	1.1	0.8	0.7	3	3	2	na	-	85
56	Mitsubishi Motors	Japan	0.7	0.6	0.6	2	2	2	na	-	100
222	Hyundai Motor	South Korea	0.7	na	na	2	na	na	na	-	70
13	Daimler Benz	Germany	0.5	0.5	0.5	2	2	2	na	11	74
74	BMW	Germany	0.5	0.3	0.2	2	1	1	na	-	100
-	Rover/British Leyland	United Kingdom	0.5	0.4	1.0	2	2	3	na	12	100
70	Volvo	Sweden	0.4	0.2	0.3	1	1	1	na	34	78
175	Suzuki Motor	Japan	0.3	0.1	0.2	1	<1	1	na	-	100
258	Fuji Heavy	Japan	0.3	0.3	na	1	1	na	na	-	93
234	Daihatsu Motor	Japan	0.2	0.2	na	1	1	na	na	-	93
	Subtotal top 20		32.2	24.7	30.2	(98)	(93)	(91)	na	na	(85)
	Others		0.5	1.8	3.0	2	7	9	na	na	85
	Total		32.7	26.5	33.2	100	100	100	na	19	85

Sources: Data from Motor Vehicle Manufacturers Association, Automotive News, UBS Philips and Drew Global Research Group as presented in UNCTC, "TNC's in the International Auto Industry", op.cit., Business week, "Global Auto Scoreboard", 7 May 1990; and Fortune, "Global 500", 20 July 1991.

a/ Passenger car production only, excludes trucks and buses and all assembly operations.

b/ Percent of total TNC production undertaken outside of home country.

the new international industrial order is taking shape as a result of intense competition.<sup>11</sup> The result has been the creation of severe **overcapacity** in the sector.

ii) The Japanese challenge: its dimension

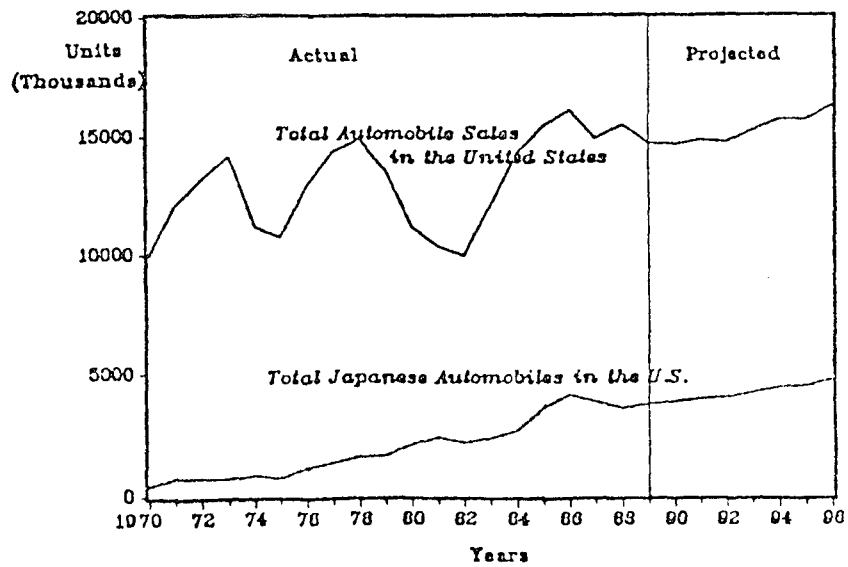
It is now relevant to indicate the dimension of the challenge being put by the Japanese automobile industry to the US and, in a less immediate sense, the European automobile manufacturers, before proceeding to examine the central features of that challenge. It is worth recalling that the decline in overall US competitiveness (effecting all exports not only automobiles and parts) since 1957, measured in terms of the share of US exports of manufactures in total world exports of manufactures, had been interpreted as a decline in the share of exports from the US during 1957-66 period followed by the stabilization of the export share of the US thereafter; a phenomenon thought to be compensated by a growth in US TNC export shares, during 1957-66, which also stabilized thereafter. It was felt that US TNC export shares were somehow isolated from major changes as they rested on solid comparative advantage of US TNCs in the chemicals, machinery and transport equipment sectors.<sup>12</sup> For this reason, one should emphasize the SHOCK factor produced not only by the loss of US competitiveness in manufactures in general but by the import penetration of those same US markets where US TNCs were supposed to have impregnable comparative advantages. While the weakened dollar has helped US exporters recover some terrain since 1985, the automobile producers have seen their competitive situation deteriorate even further. The experience of the automobile industry, in particular, was a rude awakening for US businessmen and policy makers. Their national champions were cowered.

Although physical production of US automobiles had peaked at 13 million units in 1978, it was still not uncommon to come across opinions suggesting that past US glory could be recaptured: "The

United States is expected to regain its market share, as a result of current restructuring and investment programs."<sup>13</sup> During the US recession at the end of the 1970s the volume of Japanese motor vehicle production definitively surpassed that of the US vehicle manufacturers. The three major Japanese producers (Toyota, Nissan and Honda) continued to gain market share in the US itself, rising to almost 30 percent of total sales of cars by 1990 and that was after stringent trade restrictions on Japanese automobile imports (euphemistically referred to as 'voluntary export restraints') were put into practice in 1981.<sup>14</sup> At an estimated initial cost of between \$10 and 16 billion,<sup>15</sup> the automobile voluntary export restraints eventually succeeded in reducing imports to the US of Japanese-made automobiles; however it resulted in an explosion of Japanese FDI in local automobile production, that is, Japanese automobiles made in the US by affiliates of Japanese manufacturers. Such production rose to 1.3 million passenger cars in 1990, equivalent to over 21 percent of passenger car output in the US.<sup>16</sup> Thus, US trade restrictions did not succeed in eliminating the trade deficit associated with automotive vehicles and their parts, as any decline in the former was to a large extent offset by a rise in the import of parts for local production.<sup>17</sup> By end-1990, the merchandise trade deficit for automotive vehicles and parts was still close to \$50 billion and the overall trade deficit with Japan was of a similar magnitude.<sup>18</sup>

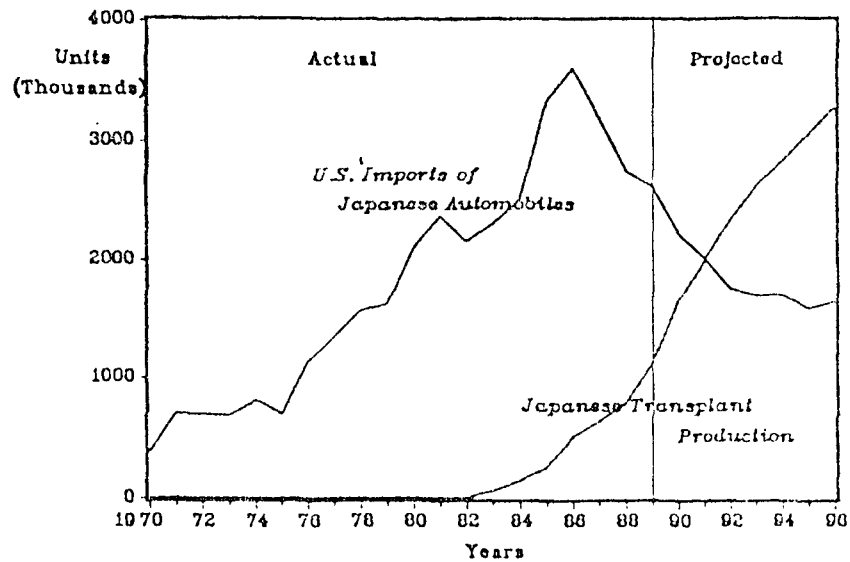
Figures 1 through 3 offer a more precise definition of the dimension of the penetration of the US automotive market by Japanese producers. Figure 1 demonstrates that during the late 1980s the situation in the US automobile market was one in which Japanese autos were slowly increasing their market share (around 25 percent) in a growing market and that the same situation was presumed to continue into the future. Figure 2 indicates that the Japanese penetration of the US automobile market since 1970 had in fact been rapid though from a very small base; never the less, the penetration appeared to accelerate in the 1980s, even after trade restrictions had been applied. The US policy of trade restriction in this sector did succeed in stimulating Japanese foreign direct

Figure 1



Japanese automobiles in the U.S. automobile market (1970-1996).

Figure 2



U.S. imports of Japanese automobiles and Japanese transplant production (1970-1996).

Cited in Shujiro Urata, "The Development of the Motor Vehicle Industry in Post-Second World War Japan", Industry and Development, No. 24, 1988.

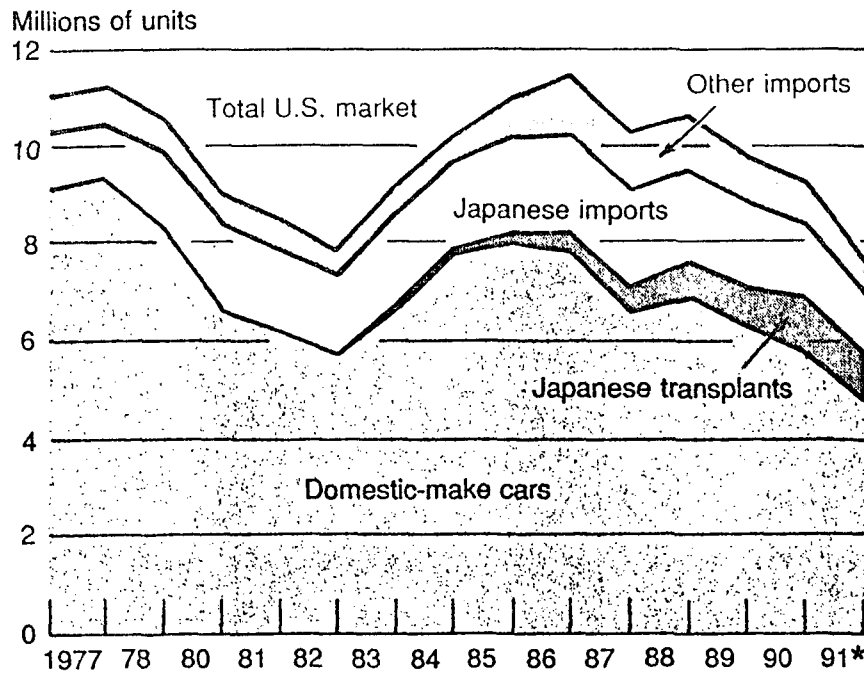


investment in the sector, which resulted in the fact that the absolute number of imported Japanese automobiles did begin to decline after 1986. The contemporaneous view was that the decline in imports would be more or less compensated for by local production by Japanese producers. Figure 3 points out that earlier projections proved optimistic. In the context of the recession taking place new car sales in the US nosedived, especially during the 1990s; however, the decline in car sales was primarily at the expense of the 3 US producers (particularly General Motors) as the Japanese market share, be it by import or local production, held firm. The excess capacity of the US market represented about 60 percent of total world automobile overcapacity.<sup>19</sup>

In 1991, the 3 principal US producers all registered significant losses, adding up to over \$7 billions, in spite of the 'streamlining' they had undergone during the previous decade. General Motors suffered the largest loss in its corporate history--\$4.5 billions, and represented a case in point of US stubbornness in the face of superior productive technique. It doggedly resisted outsourcing components in spite of the obvious advantages of such demonstrated by Japanese car makers. GM continued the in-house supply of about 50 percent of parts (70 percent according to one source)<sup>20</sup>, whereas the Japanese car makers did so for only 30 percent or less.<sup>21</sup> General Motors was clearly over-extended with 7 car and truck divisions, 19 body types and 65 different models,<sup>22</sup> and no amount of financial shenanigans<sup>23</sup> allowed it to avoid seriously initiating the restructuring or rationalization of its operations, which in early 1992 consisted in the programmed closure of 21 plants and the elimination of 74 thousand jobs.<sup>24</sup> Any loss in market share by US car manufacturers, especially GM, corresponded closely to a market share gain by Japanese producers. As Japanese automobile TNCs pummeled the US ones, the stage was set for a major confrontation between governments.

The situation in Europe was less dramatic as Japanese penetration was more minor (12 percent of the car market) and the

Figure 3

**New Car Sales in the United States**

Sources: Ward's Automotive Reports and Automotive Yearbook.

\*1991 figure is the annualized total for the first quarter.

Cited in Orr, J., "The Trade Balance Effects of Foreign Direct Investment in United States Manufacturing", Federal Reserve Bank of New York Quarterly Review, Summer 1991.

local economic situation was stronger. Furthermore, the operations of the most international US producers (General Motors and Ford) in Europe each held market shares more or less at par (12 percent) with the major European car makers: VW (16.7 percent), Fiat (13.3 percent), Peugeot (11.3 percent) and Renault (9.9 percent).<sup>25</sup> The European automobile industry experienced a kind of double whammy, having to face both the competition from the local production facilities of US auto TNCs operating in Europe<sup>26</sup> as well as Japanese imports.<sup>27</sup> The principal new challenge, none the less, came from the Japanese producers whose market share had blossomed from 7 percent in 1979 and was expected by some to rise to 19.5 percent by the year 2000 (10.5 percent via imports and 9 percent by way of new plants installed in Europe).<sup>28</sup> The Japanese initial penetration was doing more damage to series producers (for example, Fiat)<sup>29</sup> than to specialist manufacturers, as had happened in the United States, however, it was expected that they move upmarket once their penetration of the low-cost small car portion of the market was consolidated.<sup>30</sup> While the US was considered the automotive TNC battleground of the 1980s, Europe was billed for that role in the 1990s.<sup>31</sup>

Individual European governments reacted with trade restrictions to the import penetration by Japanese manufacturers. The most stringent were the French and Italian governments, which limited Japanese auto imports to 3 and almost zero percent of the national market, respectively, and undertook on local content grounds to have higher tariffs applied to the imports of Japanese autos produced in their new European plants and their existing US ones.<sup>32</sup> Eventually, even the European Economic Commission felt the need to establish an 'understanding' with the Japanese manufacturers which would leave them with a market share of 16 percent by 1999 thereafter import restrictions supposedly would be rescinded.<sup>33</sup>

One interesting sidelight of industrial country policy responses to the Japanese challenge is, for example, the confusion

demonstrated by the US government. On the one hand, in response to the European initiative to restrict imports to Europe of Japanese cars made in the United States, the US trade representative, Carla A. Hills, stated that "We would be remiss if we didn't stress how strongly we feel that a Japanese nameplate car made in our country is an American car".<sup>34</sup> On the other hand, the US Government was scrutinizing the content of Canadian-made Honda Civic imports into the US to see if they really qualify under the 1989 trade agreement and they eventually ruled that the US-made engines must be considered 'foreign' due to the level of Japanese parts used.<sup>35</sup>

One clear conclusion that can be drawn from this glance at the dimension of the Japanese challenge in the automobile sector is that the stakes are extremely high. Strategic mistakes by individual national-based TNCs could be fatal. Individual governments no longer possess the financial capacity to orchestrate grandiose rescues of national champions. In this context, it is unlikely that even the industrial countries' governments that are the most ardent defenders of liberal market policies will allow adjustment to take place solely via head-to-head price competition which, undoubtedly, would leave Japanese producers with huge market shares.<sup>36</sup> It is in this political economy context that one can comprehend more clearly the essence of the matter, that is, the specific technical nature of the Japanese challenge to the existing industrial order as it pertains to the situation of the automotive industry.

### iii) The Japanese challenge: its principal elements

It is a difficult task to summarize or even order the elements of the multifaceted challenge made by the dominant Japanese automobile producers. By lowering the minimum efficient scales of production,<sup>37</sup> they succeeded in beating the dominant US automobile TNCs at their own game, with the result that a tremendous excess capacity was created and the less competitive producers are being

forced to adjust to that situation by rationalizing operations and restructuring productive facilities. Undoubtedly, some national champions will falter and perhaps even disappear.

The Japanese challengers to a certain extent re-invented automotive manufacturing as is evident in the systematic and interrelated nature of the various elements of their new system of production. It was precisely in the automobile and components industry that the Japanese paradigm for a new industrial order was furthest advanced.<sup>38</sup> Perhaps the best way to examine this topic is to hone in on the central aspects of the Japanese challenge, on the one hand, and the US TNCs' failure to respond adequately to it, on the other, emphasizing firm-level aspects.

The three principal Japanese automobile manufacturers--Toyota, Nissan and Honda-- with 1990 Japanese market shares of 43, 25 and 10 percent, respectively,<sup>39</sup> each contributed specific elements to the Japanese success in this area. Toyota evolved a new mode of organization of production which can be described fairly as the 'best practice' in automobile manufacture. Eight aspects are pertinent:<sup>40</sup>

- the underlying philosophy of production has been altered; instead of producing to stock, goods are produced to order. That necessitates a demand-driven system capable of producing a variety of product types in much smaller volumes. Hence, lot sizes have been reduced dramatically.
- efficient production of different products in small lot sizes requires minimizing downtime. That has required quick line changeovers and tool setups. Machinery redesign has been necessary, but more importantly, production-line workers have been trained to do changeovers rather than having them done by separate teams as in mass production.
- production layouts have been restructured, and changes introduced in the use and management of machines in order to create a smooth flow of smaller lot sizes.
- inventories have been limited to a minimum 'just-in-time' level

rather than being stocked 'just-in-case', so that the increased number of different product types could be accommodated without large carrying costs.

- maintaining a smooth flow of production without defects requires that components have zero defects or to be of perfect quality, whether they come from suppliers or from in-house sources further back in the production line.

- the concern for quality inherent in 'just-in-time' highlights an important philosophical difference between the West and Japan. Western firms have viewed price and output as primary with quality a secondary consideration and costly to achieve; the Japanese have seen the pursuit of perfect quality as the source of continual gains in productivity.

- the Japanese have developed a philosophy of total quality control that contributed to achieving zero defects in components. This also implied establishing extensive and comprehensive preventive maintenance practices and vesting responsibility for quality control in production-line workers.

- skill and craft demarcations among workers have been eliminated and workers are trained to be multi-skilled; they are paid according to their skill level and the quality of their work.

Toyota is the best car maker in the world and, according to one notable US source, it just keeps getting better and better.<sup>41</sup>

Nissan's principal contribution was the application of automation technologies, especially automatically-guided vehicles and robots, to computer-integrated manufacturing. Computers are used to control all aspects of production, including the operation of flexible automation technologies, production scheduling, components ordering and in-plant 'just-in-time'.<sup>42</sup> The unique feature of this system of production control is that it involves extensive and intensive use of computer interfacing between assembly plants and suppliers, between the production plants and the head office host computer, and among the computer-based systems used within the plants themselves. The Nissan system is designed to

streamline production of computer-integrated manufacture and produce directly to orders from customers.<sup>43</sup>

Honda, the most successful of the independent manufacturers, that is, those outside of the six principal keiretsu, made its contributions in the technological and marketing areas. In the former, the design and production of the a new engine (referred to as the CVCC) which satisfied demands for fuel-efficiency and pollution control gave this manufacturer a significant competitive advantage.<sup>44</sup> That advantage was coupled with a diligent export effort and a well thought out foreign investment policy which made Honda the most international of the Japanese auto TNCs. As early as 1981, over 70 percent of its sales were made overseas.<sup>45</sup> In the all-important North American market the Honda Accord became the best selling automobile. As of 1991, Americans had purchased almost 2.5 million US-made Hondas since the production line began operation in 1982.<sup>46</sup>

These three dominant auto TNCs all added some significant element to the Japanese challenge in the automobile sector. Those elements combined to give Japanese producers (both in Japan and in their plants in the United States) a competitive advantage that was second to none. Table 6 offers several indicators of that competitive advantage by comparing Japanese automobile production in Japan to Japanese production located in the United States, to American production in the US and to European producers. The principal advantages are found in reduced stocks, greater productivity, teamwork, lower worker absenteeism, fewer assembly defects and more automation. It might be noted in passing that the Japanese had demonstrated that their 'system' was for the most part transferrable as can be seen by the indicators for the Japanese production in the US, where \$19 billion investments produced a very competitive 2 million car per year capacity (even considering that it carried a 60 percent level of local content).<sup>47</sup> Also noteworthy is the fact that the European producers trailed even the US producers by a significant margin indicating perhaps that

Table 6

INDICATORS OF THE COMPETITIVE ADVANTAGE OF JAPANESE  
AUTOMOBILE PRODUCERS, 1989, a/

	Japanese in Japan	Japanese in America	Americans in America	European producers
Productivity (hours per vehicle)	16.8	21.2	25.1	36.2
Assembly defects per 100 vehicles	60.0	65.0	82.0	97.0
Repair area (% of assembly space)	4.1	4.9	12.9	14.4
Stock (days) <u>b/</u>	0.2	1.6	2.9	2.0
Work-force in a team (%)	69.3	71.3	17.3	0.6
Number of job classifications	12	9	67	15
Training of new workers (hours)	380	370	46	173
Absenteeism (%)	5.0	4.8	11.7	12.1
<u>% of process automated:</u>				
Welding	86.2	85.0	76.2	76.6
Painting	54.6	40.7	33.6	38.2
Assembly	1.7	1.1	1.2	3.1

Source: M.I.T.; J.D. Power & Associates cited in The Economist, 10 August 1991, p. 63.

a/ Averages for plants in each regions, 1989.

b/ For eight sample parts.

industrial restructuring by the US auto TNCs had produced some positive results for them relative to European competitors. Other important advantages which have been ascribed to the Japanese producers is their "frankly superior" style of corporate management<sup>48</sup> and their financial depth to continue the global auto TNC combat, particularly by relying on their solid profit center in Asia.<sup>49</sup> The central point evidently is that the Japanese auto producers were victorious, more than elsewhere, **on the factory floor.**

The principal feature of the US auto producers failure to adequately face up to the Japanese challenge was also encountered primarily on the factory floor. On one hand, the US auto TNCs had



clearly lost the technological lead of a very important industry, one which, because of the use of electronics, new materials and new forms of organization in production, has once again become a pioneer.<sup>50</sup> On the other hand, and in spite of efforts to improve their system of production, US manufacturers are for the most part still wed to their obsolete mass production paradigm, that is, their efforts to increase productivity to best-practice Japanese standards have fallen short.<sup>51</sup> Three pertinent examples of the dominant US auto TNCs failure to meet the Japanese challenge are their combative but ineffective small car policies, their poor experience with automation and their inability to match the advantages of the Japanese supply network.

By way of combative small car policies confident US TNCs attempted to meet Japanese import competition head on. The most important projects which were implemented for small cars were Saturn, by General Motors, and the CT20, by Ford. GM's project was billed as an 'all-out, all-American effort to beat the Japanese in the small-car market'.<sup>52</sup> Ford's intention in 1981 was to make a new version of the Escort its 'world car'.<sup>53</sup> In terms of their original purpose, both projects failed miserably.

The GM project, named after the rocket which allowed the US space program to leapfrog an initial Soviet technological advantage, was conceived in 1982 after GM cancelled an existing small car project when it learned that its Japanese associate--Isuzu--was capable of building the same planned car for \$2,000 less than GM. Although it resulted in the largest single construction project ever undertaken by GM, the reality in the 1990s was far removed from the original concept. Rather than a \$5 billion investment to create a highly automated plant with an annual productive capacity 500,000 highly fuel efficient (45 miles per gallon in the city) subcompacts priced at \$6,000 each, the result was more like a \$3 billion investment in a not-so-automated facility capable of producing just 240,000 not-so-fuel-efficient (25 MPG in the city) compacts each carrying a price tag in the \$10-

12,000 range.<sup>54</sup> Moreover, in 1991 this smaller than planned facility produced only 50,000 cars.<sup>55</sup> Even if it is hugely successful in its competition with Honda's Civic, Nissan's Sentra, Mazda's 323 and Toyota's Corolla, most probably it will not prove profitable for many years to come, if ever.<sup>56</sup> Worst of all, this 'cossetted' pet project to meet Japanese competition in the small car market has not been able to equal Japanese levels of success in the implementation of the all-important cross-functional teams (Saturn's are too lightweight)<sup>57</sup> or the just-in-time inventory systems (strikes at associated metal-stamping plants crippled production schedules).<sup>58</sup> Likewise, recalls for defective seats and corrosive engine coolant have taken the initial shine off the initiative.

Ford's CT20 project was predicated on the redesign of its best-seller: the Escort. After Ford gave up its pretention to make it into a 'world car' and swallowed its pride, the \$2 billion investment proved less of a disappointment than GM's Saturn experience because Ford wisely allowed its Japanese associate Mazda to take the lead in the development of the new vehicle based on Mazda's own 323 model.<sup>59</sup> The Escort, like GM's Saturn, will undoubtedly be a money loser, but less than its predecessor. Ford's payoff comes from seeing how Mazda accomplished what it did.

The results of these efforts of both major US auto producers to do battle with Japanese small car imports in the US market proved to be rather poor. The principal consequence for US vehicle manufacturers was not simply the loss of that market segment, that was compensated to a certain extent by gains from meeting US fuel efficiency requirements and in attracting first-time buyers, the major cost was that the Japanese import drive only began with small cars, it was rapidly followed up by major incursions into the family sedan, near luxury and luxury market segments.<sup>60</sup> Thus, this failure to meet the Japanese challenge in the small car segment was to have dire upmarket consequences for the US auto industry.

A second failure which bears recognition is the attempt by

General Motors to shortcut the Japanese lead in automation for automobile production. It has been estimated that General Motors invested around \$50 billion during the 1980s in order to modernize its operations and that about 20 percent of the spending on new technology was wasted.<sup>61</sup> One of the more spectacular disappointments was the new heavily-automated Hamtramck plant for manufacturing Cadillacs which ranked "among the least competitive plants in the United States".<sup>62</sup> It was equipped with 260 robots for welding and painting cars, 50 automatic guided vehicles, televisions, computers and laser-based measuring systems to check quality, yet a year after it opened in 1985 it still had not surpassed half its productive capacity, that is, 60 cars an hour.<sup>63</sup> Things eventually improved at the Hamtramck plant (it won a Malcolm Baldrige National Quality award in 1990),<sup>64</sup> however, not before it became the most-cited example of how not to face up to the Japanese challenge: by throwing truckloads of cash at new or untried technologies.

The inability of US car makers to match the advantages of the Japanese supply network stems from the difficulties they face in overcoming the original premises of their mass production system. Adversarial relations with outside suppliers resulted in the fact that multiple suppliers competed primarily on price criteria with the effect that quality factors tended to become secondary considerations. External suppliers which met the price targets of US car makers often came up short on quality which produced problems on the assembly line. Furthermore, in-house suppliers sometimes reached higher quality standards but they often accompanied that achievement with severe cost overruns, which produced problems in the show room.

The distinct premises of the Japanese TNCs, which gave them significant competitive advantages compared to US car makers, rested on a relationship of confidence and reliance for first tier suppliers, often in the context of the keiretsu system, and single sourcing which went hand in hand with broadened responsibility for

the supplier. Single sourcing in this context resulted in improved logistical efficiency, better quality control and increased economies of scale at the supplier level. Second and third tier suppliers were often outsiders which achieved long-term relationships by consistently meeting the price and quality demands made on them by first-tier suppliers. In the case of Toyota, for example, it has been stated that its system is fed by a network of suppliers whose competence and close ties to their parent are the envy of the world. Toyota owns two suppliers outright; 228 others produce everything from jigs to molds to general contracting services for new plants. The suppliers also perform more research and development than American ones. That fact, along with higher productivity, helps explain why Toyota's work force numbers 91,790 employees compared to 766,000 at General Motors.<sup>65</sup>

It is true that some US automobile producers have made great advances in adopting Japanese practices in their supplier network. For example, Ford apparently reduced the number of component suppliers from 20,000 to 6,000 over the 1985-9 period.<sup>66</sup> Even General Motors has begun to rationalize its antiquated supplier system;<sup>67</sup> however, its new PICOs system appears still to be based on squeezing suppliers, even abrogating existing contracts, and, as a result, it has not yet attained the all important element in, for example, Toyota's relationship with suppliers, that is, trust.<sup>68</sup> The problem is that US automobile manufacturers still have an incredibly difficult time overcoming their traditional adversarial practices with suppliers. It is hard to imagine that the US car manufacturers will soon catch up to their Japanese competitors in this respect.

Far more serious is the fact that US carmakers are trying to catch a moving target. Gains made at great expense and effort in approximating Japanese quality standards only makes more apparent how far US automakers have to go to catch up in the field of flexibility. A new era of manufacturing is being defined, mass lean production is replaced by **agile production**, where factories are

small and mobile and machinery is reprogrammable to make an infinite variety of new customized goods at low unit cost, according to Fortune. "In the flexible factory, scale and scope reinforce each other. No more vivid example exists than the auto industry. Japanese carmakers are rebuilding the heart of their factories to become even more versatile and labor-efficient--an effort that could give them fundamental cost advantages and protect their lead in the time and cost of bringing new cars to market."<sup>69</sup> Specific advances in the manufacturing operations of Toyota and Nissan are offered to back up this argument.

One could mention a host of other factors associated with the US failure to meet the Japanese challenge--slow responses, crippling bureaucracies, a penchant for quick fixes and fads, etc.--none the less the central point remains the same: in spite of the improvements made, after more than 10 years of adjustment time and something in the order of \$100 billions in new investments the US auto manufacturers are **not** closing the gap. As mentioned, in 1991, General Motors, facing North American operations' losses in the order of \$8 billion, announced plans to close six more assembly plants, eleven component factories and four engine plants and cut 74,000 jobs.<sup>70</sup> Previous to this, at the beginning of the 1990s, Time magazine referred to General Motors as "a paradigm of America's failure to compete with the Japanese".<sup>71</sup> Thus, not only were the Japanese auto makers intensely competitive, the US automobile manufacturers were particularly inept at meeting the challenge in the one industry which most closely personified the US. (if not Western) style of industrialization. Their present desperation is reflected in their growing interest in interventionist measures, such as lobbying the US Government to provide protection (against Japanese minivans, for example), funding for research and development projects (of the newly-established United States Council for Automotive Research -USCAR) and to require Japanese car producers in the US to buy more American-made parts (and to do so from American-owned suppliers),

and pressuring the Japanese Government to limit automobile exports to the US market and to purchase more components and parts in the US.<sup>72</sup>

The US Department of Commerce has suggested that the next several years probably will bring increased cooperative production and marketing agreements between firms in the United States, Europe and Asia as well as more cross-border mergers and takeovers. The first stage has been characterized principally by distinct kinds of strategic associations and alliances among carmakers (e.g. the NUMMI project between Toyota and GM, GM's associations with Isuzu and Suzuki, Ford's alliance with Mazda, and the collaboration witnessed between Chrysler and Mitsubishi, Nissan and Volkswagen, Daimler Benz and Mitsubishi, etc.). The recent stage is being characterized more by takeovers and mergers (e.g. Ford's purchase of Jaguar, Porsche was bought by Volkswagen, Renault's investment in part of American Motors, the merger of Ford and Volkswagen - Autolatina- in Brazil and Argentina, etc) in an effort to overcome the problem of overcapacity.<sup>73</sup> The result, undoubtedly, will be fewer, more equally matched global contestants which will compete primarily with locally based production in three major marketing areas: Europe, North America and the Asia Pacific Rim. Presently, Japanese auto producers are the only major producers in condition to compete strongly in all three regions. This phenomenon is at the heart of the TNC shake-up going on in terms of **the restructuring of the automotive industry**. The small group of surviving global combatants of the world automobile industry will probably include Toyota, Nissan, Honda, General Motors, Ford and, possibly, Fiat or VW. What consequences this auto TNC shake-up holds for developing countries is an open question.

#### iv) Options and consequences for developing countries

A final topic which must be faced up to in this examination of the automotive industry is what developing countries can do to

adapt to the altered situation of the automotive sector in the context of the new international industrial order. Even more than in the industrial countries, the automobile sector has traditionally been viewed by many developing countries' governments as synonymous with the industrialization process itself. Self-respecting developing countries often felt obliged to heavily promote the sector. The less ambitious and, for the most part, more realistic ones, were content to make inroads in the local manufacture of components, as they were more labor intensive, utilized simpler technologies and required lower initial capital outlays than motor vehicles production itself. It was generally assumed that developing country manufacturers with larger national markets would graduate from simpler assembly operations by incorporating increasing levels of local content into national automotive operations via import substituting industrialization and then go on to export such manufactures.<sup>74</sup>

An interesting current consideration is whether the productive and organizational revolution manifest in the Japanese challenge and the need for restructuring by other major automobile producers provides improved opportunities for developing countries to become better incorporated into rather than more marginal to the new international industrial order. It appears that in general the ability of developing countries, especially their governments, to influence that same process has been diminished, except for a few particular cases.<sup>75</sup>

Developing countries do not constitute an integral part of the global automobile industry. During the 1970s the major automobile TNCs on average had only around 5 percent of their productive capacity located in developing countries; only Volkswagen (17%) and Fiat (10%) were significantly above that average. While 25 developing countries assembled automobiles and 50 produced components of one kind or another, the automobile industry in developing countries was concentrated in a handful of countries--Brazil and Mexico, and to a much lesser extent, Korea and Taiwan--

those which had achieved what was then considered the minimum efficient scale (around 200,000 units per year) and which incorporated substantial levels of local content (over 60 percent). Most producers in developing countries achieved government-required export levels (usually a stipulated level of the value of automotive production) by exporting components or, in the case of Brazil, by shipping completely knocked down kits to Latin American and other third world markets. Before the Japanese challenge reached its recent epitome it was generally felt that the area of greatest potential growth in the developing world was Latin America, especially Brazil and Mexico, where most the major US and European auto TNCs were already operating and where a huge potential local demand was thought to be manifest in the relatively large (and heavily protected) national markets.<sup>76</sup>

In actual fact, it was the Asian auto industry, particularly that concentrated in Korea and Taiwan, which experienced the greatest growth during the last decade or so. The Latin American productive capacity for passenger and commercial vehicles rose from 0.9 million units in 1970 to 2.0 in 1980 before declining to 1.8 in 1990. That of Asian developing countries rose from 0.2 to 0.4 from 1970 to 1980 and rocketed to an incredible 2.6 million by 1988, (with Korea alone accounting for 1.1 million vehicles).<sup>77</sup> Over the 1977-89 period, the developing country share of world trade in transportation equipment rose from 3.4 to 7 percent; however, while the Asian share rose from 1.6 to 4.2 percent (Korea: 0.6 to 1.6 percent; Taiwan: 0.3 to 0.9 percent), that of Latin America only grew from 0.8 to 2.0 percent of the total (Brazil: 0.5 to 0.9 percent; Mexico 0.1 to 0.9 percent).<sup>78</sup> The debt crisis explains part of the situation in Latin America, none the less a more complete explanation can be encountered in the interrelationship of several principal factors, such as, the consistency and coherence of the official policy on the national automotive industry, the impact in developing countries of the global strategies of the auto TNCs, the relationships of auto TNCs and their local manufacturing



or assembly operations with local suppliers, and the degree of control exhibited over their manufacturing associates by the headquarters TNCs. In this respect, the Asian and Latin American experiences in the automotive sector have been considerably distinct, with quite different results. It is impossible to deal in depth with all these factors, however, it is illuminating to highlight a few relevant comparative aspects.

a) Advances in Asia: piggybacking Japanese techniques

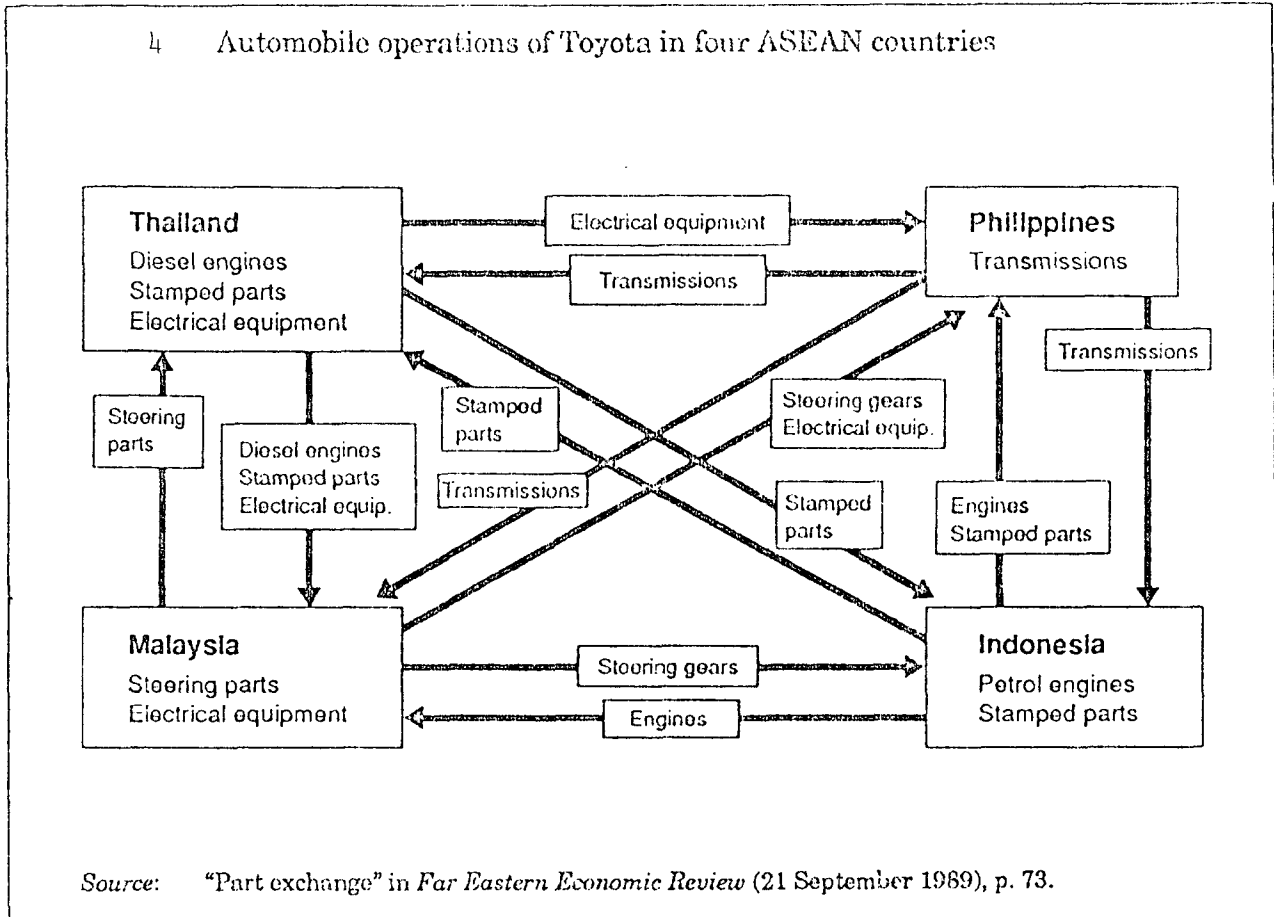
In Asia, Japanese auto TNC strategies to participate in foreign markets and create a regional supply network apparently dovetailed nicely with clear host government policies aimed at promoting an efficient automobile industry, especially in Korea, Taiwan and some members of the Association of South East Asian Nations (ASEAN). The major Asian producers imitated for the most part the Japanese model as illustrated by their sustained government guidance for the industry,<sup>79</sup> which inter alia often included restricting vehicle imports and limiting the level of foreign control of TNCs in local manufacturers. The result was a TNC-associated auto industry. It must be emphasized that several Japanese automobile producers were licensing in the 1950s what today would surely be considered second class technology (i.e. Nissan licensed Austin technology, Hino had an agreement with Renault, Isuzu used Roots techniques and what came to be known as Mitsubishi had an accord with Willys). Never the less, twenty years later, the Japanese challenge was steamrolling all competitors.

In some other Asian countries, local manufacturers themselves were proving to be reliable subcontractors of inputs to automobile manufacturers and assemblers, especially Japanese ones. As had been case with the Japanese subcontracting system (Shitauke) these inputs increased in quality and in technological complexity over time. Vehicle assemblers, usually joint ventures, copied the new productive and organizational system of the Japanese auto TNCs. In

this manner a highly efficient industry was created which eventually graduated, in the cases of Korea and Taiwan, from being vehicle assemblers and complex component suppliers to the Japanese industry to become major exporters and, most importantly, motor vehicle producers, as the examples of the Pony and Excel models of Hyundai demonstrate. Korea has a productive capacity of 0.9 million vehicles, attains local content levels above 90 percent and exports over half of automotive production (mainly to the US).<sup>80</sup> Taiwan has a productive capacity of over 0.2 million vehicles and incorporates a 60 percent level of local content. These figures represent noteworthy successes of the major Asian developing country auto producers precisely because they stem primarily from efficiency and quality considerations.<sup>81</sup> They became strong competitors for Japanese auto TNCs at the low cost, fuel efficient end of the automobile spectrum. Some Asian automotive firms such as Kia, Lio Ho and Daewoo, for example, even developed the capability to enter into associations with major producers, such as Ford and General Motors, among others.

One might also mention that the ASEAN integration scheme has resulted in concerted regional car strategies by major auto TNCs, such as Toyota, something which did not take place, for example, under the government-designed automobile sectoral program of the Andean Pact integration scheme.<sup>82</sup> While US auto TNCs operating around the globe tended to give up on a world car strategy, some Japanese auto TNCs opted, as a first step, for a regional car strategy within the efficient Asian automotive industry. According to Fortune, Southeast Asia is a paradigm of how companies like Toyota would like to operate in the future- buying parts, building cars, and selling them around the world regardless of national boundaries.<sup>83</sup> Figure 4 indicates the of **country specialization** pursued by Toyota within the ASEAN integration scheme. This serves the purposes, simultaneously, of the Japanese auto TNCs (such as Toyota) which were being forced by new Asian competitors, such as Korea and Taiwan, to improve their production costs, in this case

Figure 4



Cited in UNCTC, World Investment Report, 1991.

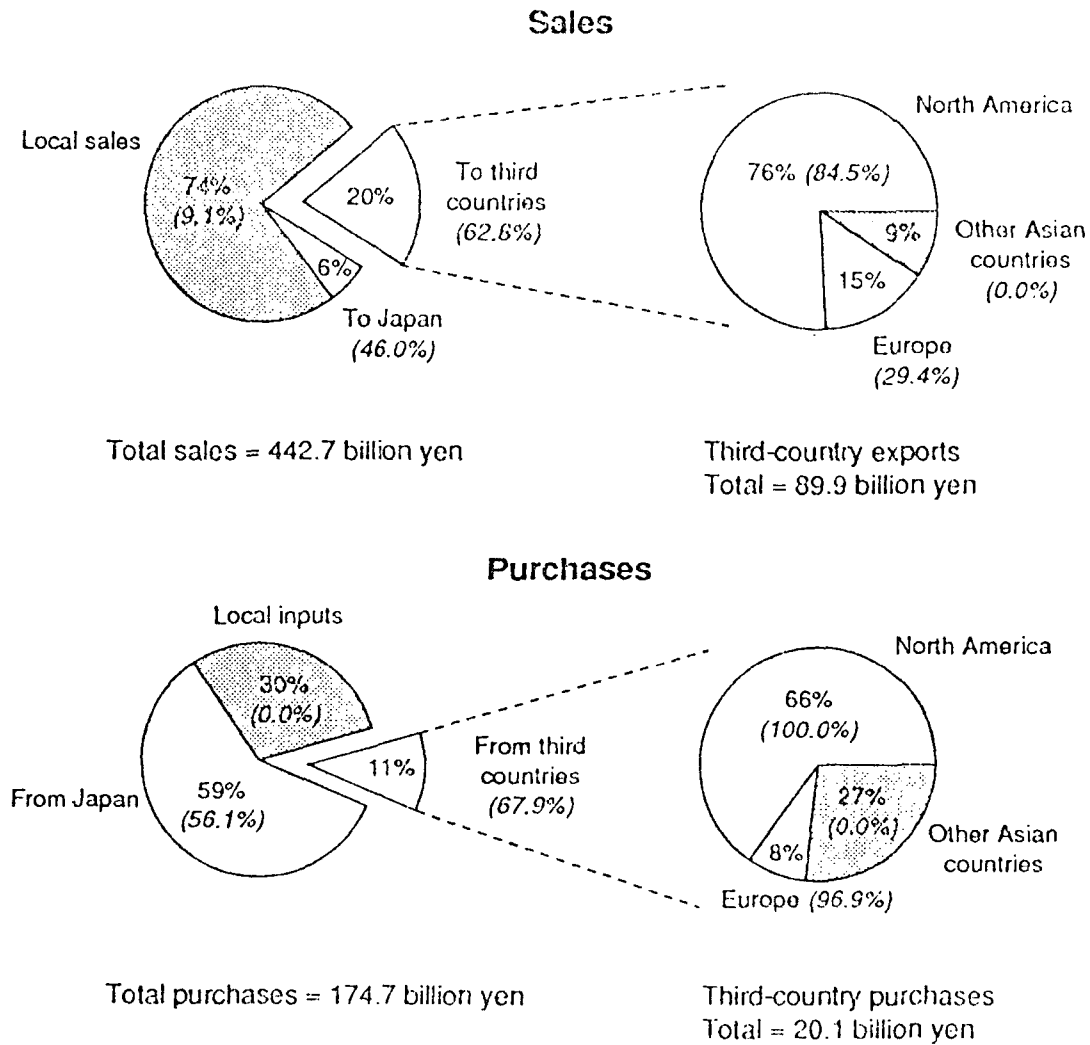
by way of ASEAN advantages, as well as the interests of the local industries by integrating them into a regional supply system, as local assemblers and component subcontractors. Such a corporate strategy obviously creates important opportunities for internationally-competitive national automotive industries.

Figure 5 suggests that there are two major advantages for national companies in tying into the supply network of Japanese auto TNCs. First, the system rewards excellence in the sense that internationally-competitive exports play an important role in these operations, averaging over 25 percent of sales. Secondly, about one third of all inputs were sourced from internationally-competitive independent firms in the local economy (30 percent) or other Asian economies (3 percent), that is, the regional network promotes healthy competition which provides significant rewards to selected suppliers. The Asian regional network of the Japanese auto TNCs does not appear to be disproportionately based on intra-firm trade, to the exclusion of local suppliers; rather it incentivates catching up on the part of the local supplier. It might be added that to the extent that the labour component in the final cost of a finished vehicle is tending to decline over time, this incentivates TNC decisionmakers and national policymakers to seek comparative advantage in the national automotive sector not only in low real wages but also in the increasing technical capacity of the skilled and semi-skilled work force. All these advantages impact favorably on the efficiency, technological progress and export possibilities of the local automobile industry.

This short examination of aspects of the automotive industry in Asia in the context of the global auto TNC shake-up taking place suggests that the Asian industry possesses several advantages which might assist it in becoming further incorporated into the new international industrial order in formation. To start with it is already interrelated in a regional network with the present leaders in the auto TNC shake-up. Many of the advantages which the Asian regional automotive industry holds for the Japanese auto TNCs have

Figure 5

Sales and purchases of Japanese affiliates in Asia:  
automobile industry, 1987  
(Billions of yen)



Note: Numbers in parentheses indicate percentage accounted for by intra-firm transactions.

Source: Ministry of International Trade and Industry (MITI), *Dai-sankai Kaigai Jigyo Katsudo Kihon Dhosan Kaigai Toshi Tokei Soran* (Tokyo, Keibun Shuppan, May 1989).

resulted from learning, copying or assimilating central aspects of what has been labelled 'the Japanese challenge'. Moreover, these Asian governments with the most dynamic automotive industries seem to have conscientiously implemented norms relating to foreign participation (shareholding, supplier and subcontracting relationships) in or with national companies which dovetailed well with the global strategies and customary practices of Japanese auto TNCs. As well as the general economic performance of the respective regional motor vehicle and parts industries, their manner of achieving increased incorporation into the international automotive industry-- a TNC-associated one-- contrasted rather sharply with the general Latin American experience with the US and European auto TNCs.

b) Flying geese or sitting ducks? restructuring  
the automotive industry in Latin America

Without entering into details and at the expense of simplifying a complex reality,<sup>84</sup> it may be reasonably maintained that in Latin America often the combination of incoherent official policies for national automotive industry and various inconvenient factors related to the original mass production-based strategies of US/European auto TNCs resulted in what, for the most part, could be classified as an inefficient and aimless local automobile industry, the technological progress of which was, with few exceptions, detained in the early 1980s. This regional industry is one in which the manufacture of all motor vehicles is carried out almost exclusively by subsidiaries or majority-owned affiliates of the major US and European auto TNCs. The Nissan plants in Mexico (and to a lesser extent, Toyota's assets in Brazil) are the only exceptions of note to that observation. Product technology and the organization of the production process have had a decidedly US and European auto TNC flavor. The Latin American automobile industry can be characterized as a **TNC-centric** one.

This manner of promoting automotive production in the region did produce some notable initial successes up until the debt crisis unleashed its anger on Latin America at the beginning of the 1980s. An explosion of productive capacity had resulted from TNC oligopolistic competition in these highly protected and segmented markets, in which auto TNCs attempted to carve out increasing market shares. Host government policy did result in relatively high (obligatory) levels of local content for local automobile manufacture and even achieved increased exports (usually via subsidies, such as Brazil's BEFIEX program). For example, Brazil then had a passenger car capacity of 0.8 million units, the local content of nationally manufactured vehicles reached over 90 percent and about 30 percent of the value of automotive production (including parts) was exported. Mexico had a productive capacity of more than 0.3 million units, local content of vehicles manufactures there had risen to about 60 percent and over 40 percent of its automotive production (including parts) was exported. The industry appeared strong.

With the aid of hindsight and an appreciation of the devastation caused by the debt crisis in the region, it is reasonable to suggest that the figures on production capacity, local content levels and even the export mechanisms utilized can be more correctly understood to represent **excesses** rather than **successes** of the automotive industry established in Latin America. This is so because the transition from import substituting industrialization to the export of automobiles from Latin America resulted moribund. The industry's apparent strength was not a consequence of efficient production coupled with the progressive incorporation of new techniques which led to improved international competitiveness, rather it was more a consequence of at times inappropriate host governments' obligations placed on TNC producers (some of which greatly complicated the already adversarial relations with local suppliers) together with poorly conceived schemes of export promotion by way of government-financed

compensation. The debt crisis starkly revealed the shaky technical foundations of the Latin American auto industry. In essence, the transition from import-substituting industrialization to the export of manufactures in the Latin American automotive industry had **not** been achieved in **an internationally-competitive manner**.

Tables 7 through 9 demonstrate aspects of the Latin American automotive industry during the difficult decade of the 1980s. The first table demonstrates that, in terms of passenger car production, only Brazil, Mexico and Argentina can be said to manufacture them to any significant degree; the others are essentially assembly operations. As the figures make manifest, the 1980s witnessed the collapse of physical production (measured in millions of units) which declined continually over this period. Aside from Chile, which virtually withdrew from the industry, the manufacturers saw their passenger car production nosedive throughout the 1980s. Brazil's production of almost 1 million units in 1980 fell by 37 percent the next year and struggled to recover thereafter. Mexico's physical production dropped off by 42 percent over the 1981-3 interim and did not regain the 1981 peak until 1988. Argentina saw its level of physical production plummet 51 percent during 1980-2 and their industry touched bottom in 1990. Although the perspectives for the industry improved for 1991-2, especially for the case of Mexico, generally speaking the existing automotive industry in Latin America was decimated by the crisis of the 1980s.

Table 8 offers some insight into the level of international competitiveness of the Latin American automotive industry in terms of the exports of the auto manufacturers in Brazil, Mexico and Argentina. A first observation is that the Argentine industry, at least in so far as one speaks of passenger car production, was not competitive and exports played no important role in the adjustment process of this evidently inefficient national automotive industry during the 1980s.<sup>85</sup> The same cannot be said for the Brazilian nor (after 1987) the Mexican automotive industries. Both attempted to better utilize national production capacities in recessionary national markets by way of expanding sales in external markets.



Table 7

Latin America: passenger car production and assembly, 1980-90  
(thousands of units)

	Manufacturers			Subtotal (%)	Assemblers					Total
	Brazil	Mexico	Argentina		Venezuela	Colombia	Chile	Others	b/	
1980	933	303	218	1,454 (87)	155a/	43a/	25	29	1,663	
1981	586	356	139	1,081 (83)	154a/	24	22	28	1,309	
1982	673	301	107	1,081 (83)	155a/	27	9	24	1,296	
1983	748	207	129	1,084 (88)	110a/	21	3	11	1,229	
1984	679	245	137	1,061 (87)	110a/	34	4	13	1,222	
1985	759	297	114	1,170 (88)	115a/	33	5	14	1,337	
1986	815	209	138	1,162 (90)	94	35	2	18	1,293	
1987	683	277	159	1,119 (92)	74	41	2	23	1,222	
1988	782	354	136	1,272 (90)	68	44	4	23	1,411	
1989	731	439	108	1,278 (94)	16	36	7	22	1,357	
1990	663	598	81	1,342 (95)	22	31	3	22	1,420	
1991*	650	800	110	1,560 (94)	34	34	3	24	1,655	
1992*	712	1,000	137	1,849 (94)	55	36	4	20	1,964	

a/ total vehicle production, not only passenger cars

b/ Peru, Ecuador and Uruguay

\* forecasted production of passengers cars

Source: ECLAC/DESD Joint Unit based of information from associations of national automobile manufacturers.

Table 8

Latin America: exports of passenger cars by manufacturers, 1980-90  
(thousands of units)

	<u>Brazil</u>	<u>Mexico</u>	<u>Argentina a/</u>	<u>Total</u>
1980	113	nd	...	113
1981	157	nd	1	158
1982	120	nd	3	123
1983	133	nd	5	138
1984	152	nd	5	157
1985	161	50	1	212
1986	138	40	...	178
1987	280	135	...	415
1988	226	144	2	372
1989	165	165	2	332
1990	120	249	1	370
1991*	127	330	nd	457
1995*	215	550	nd	765
2000*	288	1,300	nd	1,588

a/ includes all vehicle exports, not only passenger cars.

\* forecasted exports of passenger cars.

Source: ECLAC/DESD Joint Unit based on information from national associations of automobile manufacturers.

Brazil had some relatively minor success, it raised the export coefficient (exports as a percentage of total sales) of passenger cars from 12 percent in 1980 to an average of 22 percent for the decade but prospects for the 1990s are fair, at best. The success of Mexico is dramatic: its export coefficient for passenger cars blossomed from 17 percent in 1985 to 42 percent in 1990, and the prospects for the 1990s are excellent. Mexico is clearly the

Table 9

Sales of Manufacturing Subsidiaries of Auto TNCs Operating in Latin America, 1990 (% and US\$ billions)				
TNC Home Country	Brasil	Mexico	Argentina	Total
United States	37.3	26.8	1.7	65.8
German	8.9	7.4		16.3
Japon	2.3	3.2		5.5
France		1.1	2.1	3.2
Others <u>a/</u>	9.2			9.2
Total %	57.7	38.5	3.8	100
US\$ billions	13.7	9.2	0.9	23.8
<u>a/</u> Italy, Sweden				

Source: ECLAC/DESD Joint Unit based on a special issue of America Economia, diciembre de 1991.

exception among Latin American passenger car producers.

Foreign direct investment, essentially by US and European TNCs, is a central element to the Latin American style of industrialization and the automotive industry is a core element of the presence of foreign direct investment in Latin America. As Table 9 indicates, the sales of the principal TNC vehicle manufacturers in the region accounted for almost \$24 billion in sales during 1990, equivalent to almost 28 percent of the value of the total sales of the fifty largest foreign firms operating in the region.<sup>86</sup> In other words, any major changes in the nature of the automobile industry in Latin America necessarily influences the nature of foreign participation in Latin American industry, and vice versa. The Latin American automobile industry is TNC-centric and very vulnerable to fall-out from the global auto TNC shake-up.

It is in this context that one must mention that the local operational results of the subsidiaries of Volkswagen and Ford in Brazil and Argentina got so bad that these erstwhile global competitors merged their manufacturing operations into what has been described as "one of the largest joint ventures in the world auto industry",<sup>87</sup> called Autolatina, in order to rationalize production. Autolatina was the fourth largest company in Latin America by sales in 1990, and the largest private sector one. Evidently, things were not well in the automobile sector in Latin America, nor concomitantly for an important component of the existing stock of FDI in Latin American industry.

Table 10 indicates the presence of automobile TNCs in the list of the 200 principal Latin American exporters during 1990-1. This table includes exporters from all sectors, not only exporters of manufactures. This information demonstrates with clarity that the listed automotive TNCs still represent an important element in the export performance Latin America (in spite of its natural resource-rich character), accounting for 12 percent of the value of exports of the 200 principal exporters. The list of the 25 most important

Table 10

Latin America: presence of automobile TNCs in the list of the 200 principal exporters, 1990-91

<u>Rank</u> <u>1991</u>	<u>Exp.</u> <u>1990</u>	<u>TNC (Home Country)</u>	<u>Location</u> <u>Subsidiary</u>	<u>Exports:</u> <u>(US\$Mill)</u>	<u>Export</u> <u>Destinations</u>
3	6	General Motors (US)	Mexico	2,332	N.Amer., Asia
5	4	Ford (US)	Mexico	1,400	N.America
7	-	Chrysler (US)	Mexico	1,176	N.America
15	20	Volkswagen (Germ)	Mexico	614	N.Amer., Eur.
24	16	Fiat Automoveis (It)	Brazil	449	L.Amer., Eur.
25	51	Ford New Holland(US)	Brazil	441	Mex., N.Amer.
36	38	Volkswagen a/ (Germ)	Brazil	319	Arg., N.Amer.
50	47	Renault (Fr)	Mexico	236	Eur., N.Amer.
52	56	General Motors (US)	Brazil	224	L.Amer, N.Amer.
117	-	Mercedes Benz(Germ)	Brazil	98	nd
124	-	Scania do Brasil	Brazil	90	nd
171	-	Renault (Fr)	Arg.	71	Eur., L.Amer.
179	-	Sevel (Fr)	Arg.	68	L.Amer., Eur.
Total				<u>7,518</u>	

i) by TNC home region:

United States (GM, Ford, Chrysler)	5,573	(74%)
Europe (Fiat, VW, Renault, etc.)	1,760	(26%)

ii) by host country:

Mexico	5,758	(76%)
Brazil	1,621	(22%)
Argentina	139	( 2%)

a/ division of Autolatina

Source: ECLAC/DESD Joint Unit based on information from "200 mayores exportadores de América Latina", América Economía, No. 65, september 1992.

foreign firm exporters operating in the region is dominated by nine subsidiaries of US and European auto TNCs, which account for over 62 percent of the total value of \$11.5 billion of the exports made by the group as a whole.<sup>88</sup> None the less, their individual situations are quite distinct.

Perhaps the most important features of Table 10, understood in the context of the preceding analysis, are that the four principal auto TNC exporters, 76 percent of the value of the exports of auto TNCs and most of the export success of the US auto TNCs come from one country-- Mexico -- and go to one market-- North America. This suggests that, distinct from the cases of Brazil and Argentina (and the assembly operations in other countries of the region), the automotive sector and its restructuring have formed an important part of the Mexico's adjustment process to the debt crisis and their adaptation and increased incorporation into the new international industrial order. It must be stressed that in this industry, the **Mexican experience is a notable exception** in Latin America. The automotive industry in the rest of the region continues to agonize, in the terms suggested by Table 7. Has Mexico's success in restructuring the automotive sector granted it the status of an Asian-style flying wild goose? Does the unfortunate situation of the automotive industry in the rest of Latin America condemn them to be sitting ducks? These considerations raise some interesting questions, which unfortunately can only be touched upon here.

With regard to the role of the automotive industry in providing Mexico with an Asian flying wild goose status, it cannot be denied that the level of new investment,<sup>89</sup> the export performance, and, in some instances, the technological and organizational aspects of the production process, have provided substantial improvement in growth rates and quality factors. The prospective NAFTA agreement and its promised permanent access to the huge North American market goes a step farther than even the success of the Mexican TNC-centric automobile industry in

undergoing restructuring is above and beyond all else a success of the US auto TNCs operating in that industry.<sup>90</sup> The final outcome of the restructuring of the Mexican automobile industry will depend on the US auto TNCs' overall ability to deal with the Japanese challenge.

The establishment of a competitive regional supplier network for US auto TNCs will be a requisite for meeting that challenge and, again, the Mexican automotive industry, in this case, autoparts, will play a very important role. To a certain extent, the US auto TNCs are attempting to meet the Japanese challenge (based on an Asian regional supply network) by elaborating a competitive Mexican supply network. Aside from the technological and organizational edge enjoyed by Japanese auto TNCs over their US rivals, serious doubts were raised in the course of the present analysis with regard to the ability of the US (and European) auto TNCs to modernize their existing and often adversarial relationships with suppliers. It is precisely in this area of the Mexican automotive production--autoparts-- that the industry can earn its (Asian wild flying geese) wings by way of the technological upgrading of local suppliers. This has not yet been determined.

Concerning the fear that the rest of the Latin American automotive industry is condemned to be sitting ducks in the framework of the worldwide auto TNC shake-up, the truth of the matter is that it appears to be the case. The future of the manufacture (not simply assembly) of automobiles in Latin America, excluding Mexico, seems to rest primarily on the success of the Mercosur integration scheme and, in particular, the performance of the Autolatina merger between Volkswagen and Ford. For the most part during the 1980s, auto TNCs in Brazil and Argentina were simply rationalizing local automotive production in a crisis atmosphere; little new investment was made. It bears mentioning that, according to the foreign investment register of the Banco Central do Brasil, the value of the stock of FDI of the automobile

Table 11

OPERATIONS OF AUTOMOBILE TNCs IN DEVELOPING COUNTRIES,  
BY FORM OF INVESTMENT, 1986  
(thousands of units)

Transnational corporation	Majority owned	Minority owned	Non equity	Total
Mitsubishi	6.7	483.9	27.9	518.5
Volkswagen	482.6	14.3	6.5	503.4
General Motors	374.8	63.0	13.7	451.5
Ford	355.6	4.1	2.9	342.5
Fiat	168.5	74.9	44.3	287.7
Nissan	78.2	66.7	47.7	192.5
Mazda	9.5	115.9	43.5	168.9
Suzuki	-	98.9	36.3	135.2
Daimler Benz	48.4	60.1	12.0	120.5
Renault	56.6	26.6	25.3	108.5
Toyota	29.3	13.2	52.7	95.2
Chrysler	87.3	4.8	0.3	92.6
All others	11.3	179.5	158.9	349.7
<u>Distribution by home region</u>				
Japan	125.5	841.2	304.8	1 271.5
Europe	763.3	234.8	137.1	1 135.2
United States	800.2	129.8	30.0	959.9
Total	1 689.0	1 205.8	471.8	3 366.6

Source: Calculated from OECD, "New Forms of Investment in Developing Country Industries", Paris, 1988, table 4.22, p. 201. See original table for definitions and explanatory notes.



manufacturers rose from \$1.7 to 3.6 billion between 1980 and 1987 and fell precipitously to around \$2.5 billion by 1991. The perilous state of the Autolatina and General Motors operations seem to have had a lot to do with this situation, as the level of production of Fiat has increased significantly during 1990-91.<sup>91</sup> In the context of the trade liberalizing schemes already in partial implementation in Brazil and Argentina it would seem difficult to characterize the competitive situation of subsidiaries of US and European auto TNCs operating in Brazil and Argentina as anything other than 'sitting ducks' due to their rather poor operational performance and the lack of new investment in the modernization of their existing facilities. The conclusion is evident: **if their headquarters corporations are not willing or able to invest in the fundamental restructuring of these operations, one can easily question their continued viability in the context of the global auto TNC shake-up.**

c) Does the form of foreign participation influence local technological advance?

Although it is certain that the degree of foreign participation is only one of several factors involved here, it is noteworthy that it is one of the most clear distinctions between the TNC-centric Latin American auto industry and the TNC-associated Asian one. Here, the analysis will be limited principally to capital shareholding as the more sinuous topics of subcontracting and other non-equity relations with suppliers simply escape the limits of the present article.

Tables 11 and 12 provide the available relevant information. These data are from 1986 and do not include substantial Japanese auto TNC investments in Asia which occurred after the date. Table 11 points out that only 12 major auto TNCs possessed about 90 percent of the total TNC productive capacity for automobiles in developing countries in 1986. About one-half of that productive capacity came in the form of subsidiaries or majority-owned

affiliates. The other half was minority-owned affiliates or non-equity forms of association. In round numbers, that productive capacity was distributed more or less equally among Japanese, European and US TNCs. The distinguishing feature is that the productive capacity of US and European TNC operating in developing countries was primarily in the form of subsidiaries or majority-owned affiliates, whereas the Japanese capacity was almost exclusively in the form of minority-owned associations or non-equity relationships.

Table 12, which compares the Latin American situation to that of Asia, demonstrates that the US and European auto TNC productive capacity in developing countries was very much concentrated (85 percent) in Latin America and that of the Japanese auto TNCs was even more concentrated (89 percent) in Asia. More pointedly, most (88 percent) of the US and European auto TNC capacity was manifest in subsidiaries or majority-owned affiliates, while that of the Japanese auto TNCs in Asia was almost exclusively via minority-owned associates or non-equity associations. These data reconfirm that the Latin American automobile industry can be categorized as **TNC-centric**, while that of developing Asia can be considered **TNC-associated** and that the difference apparently holds important consequences for the predominant automotive industries in developing countries from these respective regions.

It must be reiterated that the form of TNC participation in the automobile industry in developing countries is not the only factor explaining the relative success of regional experiences. Significant differences exist within the Latin American region. The successful restructuring of the Mexican automobile industry represents a clear exception to this generalization linking relative economic performance to the form, origin and level of foreign participation (subsidiaries of TNCs exported over a quarter million vehicles to the US in 1990 and the autoparts industry (primarily motors) supplied 12 percent of the imports of all automotive components to the US market in 1989).<sup>92</sup> At the same

Table 12  
 OPERATIONS OF AUTOMOBILE TNCs IN DEVELOPING COUNTRIES, BY REGION  
 OF HOST COUNTRY AND FORM OF INVESTMENT, 1986  
 (thousands of units)

Transnational Corporation	Latin America			Asian NICs		
	Majority owned	Minority or non equity	Total	Majority owned	Minority or non equity	Total
Mitsubishi	-	1.3	1.3	6.7	508.6	515.3
Volkswagen	482.6	5.3	487.9	-	8.5	8.5
General Motors	368.5	9.2	377.7	0.3	61.3	61.6
Ford	305.6	0.2	305.8	30.0	5.9	35.8
Fiat	168.0	71.4	239.4	-	29.4	29.4
Nissan	78.2	4.0	82.2	-	107.2	107.2
Mazda	-	13.7	13.7	9.5	144.9	154.4
Suzuki	-	1.0	1.0	-	133.4	133.4
Daimler Benz	48.4	1.5	49.9	-	69.6	69.6
Renault	54.1	26.2	80.3	-	8.9	8.9
Toyota	8.3	19.4	27.7	21.0	44.9	65.9
Chrysler	87.5	5.1	92.6	-	-	-
All others	8.2	52.9	61.1	2.5	226.5	229.0
<u>Distribution by home region</u>						
Japan	86.5	54.5	141.0	39.0	1 072.5	1 111.5
Europe	759.0	131.5	890.6	0.7	149.3	150.1
United States	763.9	25.0	788.9	30.3	127.4	157.6
Total	1 609.4	211.2	1 820.5	70.0	1 349.2	1 419.2

Source: Calculated from OECD, "New Forms of Investment in Developing Country Industries", Paris, 1988 table 4-23, pp. 202-203. See original table for definitions and explanatory notes.

time, never the less, one certain implication of this analysis is that the rest of the Latin American auto industry is in difficult shape apparently because it is a poor copy of the relatively less efficient US and European auto TNCs. It is in more dire need of restructuring than its own progenitors. Troubled manufacturer-supplier relations also seem to hamper their ability to compete internationally.<sup>93</sup>

As has been demonstrated from many angles, there exists a close interrelation among the Japanese auto TNC strategies, Asian host government policies (particularly those related to preferred forms and levels of foreign direct investment) and less adversarial relationships with suppliers and these have incentivated the creation of a highly efficient and internationally competitive automotive industry. Moreover, significant positive spillovers in the form of accelerated local processes of technological upgrading, which have culminated in the production of 'developing Asian cars' such as Hyundai, Kia, etc. have also been a positive outcome. Some developing Asia auto TNCs are even at the stage of investing in productive facilities in the North American and European markets in order to obtain an insider status in the global automotive industry. The Latin American automotive industry--excepting to a certain extent the Mexican component--does not appear to enjoy any such advantages and is in serious danger of being severely damaged by the auto TNC shake-up taking place at a global level.

#### v) Summary and conclusions

The world has changed in the sense that a new consensus has emerged in respect of the role of the market, of the precedence of economics over political and social concerns, and the modification of the TNC/State relationship to the benefit of the former. While this new state of affairs would seem to heavily favor those countries which are home base to the largest TNCs, that does not necessarily appear to be the case. Heightened competition in global markets have produced marked trends of globalization and

specialization in relation to international trade and globalization and regionalism in relation to foreign direct investment. A new international industrial order is taking form. Although the battle is concentrated in the hands of a few thousand large and innovative TNCs in a dozen high technology and/or trade intensive industries serving three principal markets--US, Europe and Japan--, it does offer opportunities to wily newcomers.

The major Japanese TNCs have frontally challenged blue ribbon US and European TNCs and have obliged many to restructure or perish, even in their own national markets. Taken to a higher level of analysis, it would appear that the Japanese system of cooperative managerial capitalism has shown itself superior to the US system of competitive managerial capitalism or the European system of cooperative managerial capitalism as is manifest in their specialization in dynamic "rising-star" industries, mainly internationally-competitive science-based, scale-based and specialized supplier ones, which has resulted in strong trade gains by Japanese TNCs and their international expansion via foreign direct investment to become "regional insiders" within the US and European markets. In scale-based industries, the Japanese TNCs have revolutionized production techniques and organizational practices. In science-based industries and specialized suppliers, they have closed the gap with other Triad core countries in terms of their proximity to the technological frontier and the magnitude of their expenditure on research and development. Imitation clearly gave way to innovation within the Japanese system of cooperative managerial capitalism and the core of its success is related to what can be considered the formation of the new international industrial order in which Japanese TNC productive techniques, organizational practices and technological advances become the new benchmarks against which success is measured.

What does this state of affairs mean for developing countries? The principal consequence would appear to be the possible incorporation into the new international industrial order of a few

well-prepared ones and the further marginality of the great majority of them. Evidently, a small group of **developing Asian "winners"**, for the most part imitating the Japanese system of cooperative managerial capitalism and following a **TNC-associated** industrial export model, have made very significant gains in world trade in science-based manufactures, especially research and development-intensive electronics, over the last few decades. Their ability to compete internationally creates the potential for **improved incorporation** into the new international industrial order. Moreover, while most developing countries became more marginal to international capital flows during the 1980s, the developing Asia region increased its share, mainly due to Japanese foreign direct investment made to consolidate a regional supply network and gain access to rapidly expanding national markets.

On the other hand, in **Latin America** the less dynamic **TNC-centric** inward-looking import substituting industrial model which became generalized in the region after the second world war was stifled during the 1980s by the debt crisis. Latin American industry experienced weak trade gains for manufactures due to its inability to compete internationally. The recessionary and unstable macroeconomic environment resulted in severe foreign direct investment shortfalls. In general, the Latin American countries seem to be **more marginal** to the new international industrial order, although there are several exceptions to this statement. They faced the triple whammy of having to implement new more open economic models in a crisis situation, to restructure both nationally- and TNC- owned industry and to compete not only with the major global TNCs from the industrial countries but also with the Asian NICs which possess advantages gained from years of coherent long-range industrial policies and more compatible strategies on the part of TNCs.

The example of **the automobile industry** captures the essence of the global changes taking shape and it demonstrates many of the central characteristics of specific countries and particular TNCs

in the new international industrial order. The automobile industry was the heart of the US mass production system which gave birth to many of the largest and most powerful US TNCs. It was the foundation of the US system of competitive managerial capitalism which was imprinted on the western world during the 20th century. Yet detailed information on comparative plant efficiencies, the import penetration of the US automotive market and the impact of foreign direct investment in 'transplant' automobile manufacturing facilities in the US itself indicate that it is precisely in the automobile industry that the Japanese challenge has been the most successful. The battle is being won on the factory floor and by way of amicable manufacturer-supplier relations. Toyota, Nissan and Honda have humbled General Motors, Ford and Chrysler by way of superior production technique, organizational practices and marketing knowhow. That situation might be considered one of the fundamental features of the new international industrial order.

The automobile industry also indicates the 'place' of several developing countries in the new international industrial order. Only a few developing countries--Brazil, Mexico, Korea and Taiwan--possessed the potential to be incorporated in a significant way in the industry. The majority of developing countries are marginal to that industry and its aftermarket. A number of Asian NICs, usually by way of imitating Japanese-style TNC-associated industrial models, are increasingly incorporated as suppliers of components or manufacturers of original equipment, as is the case for Korea, Taiwan and some ASEAN countries. For internationally-competitive and proven local producers and suppliers, Japanese manufacturing techniques and their regional supply network provide many opportunities to follow in the footsteps of Japanese success in the automobile sector--in flying wild geese fashion--and in a region which is slated to provide two-thirds of growth in future world automobile demand.<sup>94</sup> Automobile manufacturers in countries such as Korea (Hyundai, Kia) and Taiwan (Lio Ho) have been able to develop certain relatively independent automobiles and even export them to

developed country market. In this sense, the automotive industry in several developing Asian countries have achieved a closer incorporation into the new international industrial order by piggybacking on Japanese techniques and proving themselves able and competitive suppliers within the Japanese regional supply network. The principal effect is that the skills level of the local work force and the technological capacity of local companies (as well as the domestic economy as a whole) receive a definite and, at times, self-sustaining developmental impulse from its association with the Japanese example of cooperative managerial capitalism.

The few Latin American countries with the capability or potential to become more closely incorporated into the new international industrial order, via the automotive industry, presently seem to be divided into two very distinct categories: potential Latin American style flying wild geese or sitting ducks. As discussed in the body of this document, the Mexican automobile industry would be an example of the first category, while the Brazilian or Argentine automobile industry might be considered examples of the second. Both of these examples saw their automotive industry created following what can be labelled a US or European TNC-centric industrial model based on substituting industrial imports. The TNC subsidiaries involved, with rare exception, never developed a serious or self-sustaining internationally-competitive export component to their operations. Their behaviour could best be described as oligopolistic competition for domestic market share, paying scant attention to export markets, at least in terms of the proportion of their local production which they destined to foreign markets. The debt crisis of the 1980s revealed the severe weaknesses of Latin American industry and the result could be appreciated by the difficulties faced by Latin American manufacturers in placing a higher proportion of their production in foreign markets as recession set in to the domestic ones.

With regard to the automotive industry, it was exclusively in countries which implemented harsh macroeconomic stabilization



programs coupled with audacious liberalization schemes and industrial restructuring that the situation improved in any kind of permanent fashion. The Mexican automotive industry is the case in point. A radical reorientation of government policy facilitated a sharp shift in the corporate strategies of the major US auto TNCs. Those TNCs, in greater or lesser degree, began to restructure their manufacturing operations in Mexico and incorporate their Mexican facilities into their overall corporate response to the Japanese challenge they faced internationally and in their home market. Although the restructured automobile industry in Mexico continues to be TNC-centric and the 'reformed' relationship with local suppliers is not well-defined, there is no doubt that by way of their closer incorporation into the North American automotive industry, the Mexican automotive industry has also become more closely incorporated into the changing international one. It might be mentioned in passing, that with regard to any Latin American style flying wild goose status which may have been attained by the Mexican automobile industry, there exist at least two significant differences with the Asian species. One is that the Mexican auto industry is extremely dependent on one sole export market: North America. The other is the concern if similar benefits, in terms of improved skills of the national work force and advanced technological capacities of local companies, result from the TNC-centric variant to the local automotive industry in Mexico as compared to the TNC-associated one in developing Asia.

The other Latin American manufacturers of automobiles which have not experienced much success in stabilizing their macroeconomic situations, liberalizing their economies or restructuring specific globalizing industries, such as the automotive one, have been categorized as sitting ducks. They are not becoming more closely integrated into the global automotive industry due to the fact that the US and European TNCs, whose subsidiaries dominate the local automobile sector, have not included those Latin American operations in their corporate

strategy to face up to the auto TNC shake-up. The investment necessary to restructure the operations of those subsidiaries in order to make them internationally-competitive was not forthcoming to the extent needed. One could speculate that by way of their actions or lack of them, the major US and European auto TNCs have revealed that their subsidiaries manufacturing vehicles in these other Latin American countries are expendable or, at best, not among the most important corporate assets to be protected during the global auto TNC shake-up taking place.

Notes

1. Following what appears to be customary practice, the term automobile sector is used to refer to the manufacture of passenger cars, motor vehicle industry refers to the production of passenger cars and commercial vehicles (trucks and buses) and transport industry refers to the manufacture of all means of transportation for land, sea or air.
2. CEPAL, "Reestructuración de la industria automotriz mundial y perspectivas para América Latina", Estudios e Informes de la CEPAL, 67, LC/G.1484-P, Santiago, diciembre de 1987, pp. 27-8 y 207-212.
3. OECD, "Structural Adjustment in the Automobile Industry", STI Review, No. 3, April, 1988, p. 46.
4. Dertouzos, Michael L. et al., Made in America: regaining the productive edge, MIT Press, Cambridge, Mass., 1989, p. 174.
5. OECD, Development Centre Studies, New Forms of Investment in Developing Country Industries: mining, petrochemicals, automobiles, textiles and food, Paris, 1989, p. 137.
6. See Hoffman, K. and R. Kaplinsky, Driving Force: the global restructuring of technology, labor and investment in the automobile and components industries, Westview Press, Boulder, Co., 1988, pp. 48 and 61-2; OECD, New Forms..., op. cit., pp. 137-9; UNCTC, "New Approaches to Best-Practice Manufacturing: the role of transnational corporations and implications for developing countries", UNCTC Current Studies, No. 12, Series A, ST/CTC/SER.A/12, New York, October, 1990, pp. 5-6; and OECD, "Structural Adjustment in the Automobile Industry", op. cit., pp. 20-2.
7. Heilbroner, Robert, "How to Restore US Economic Momentum", Institutional Investor, May, 1992, p. 61.
8. Consult Hoffman and Kaplinsky, op. cit., p. 75; OECD, "New Forms...", op. cit., p. 141; CEPAL, Estudio e Informe, No. 67, op. cit., p. 68; and OECD, STI Review, op. cit., p. 17.
9. Urata, Shujiro, "The Development of the Motor Vehicle Industry in Post-Second World War Japan", Industry and Development, No. 24, 1988, pp. 17-19.
10. Calculated from United Nations, 1988 Energy Statistics Yearbook, New York, 1990, pp. 151 and 194.

11. Mortimore, Michael. "A New International Industrial Order: increased international competition in a TNC-centric world", CEPAL Review, No. 48, August, 1992.
12. Kravis, Irving B., and Robert E. Lipsey, "The Competitiveness and Comparative Advantage of US Multinationals 1957-1984", Banca Nazionale del Lavoro Review, No. , 1986.
13. UNCTC, TNCs in the International Auto Industry, ST/CTC/38, New York, 1983, p. 15.
14. Figures from Ward's Automotive Reports cited in Business Week, 21 October 1991, p. 42.
15. See de Melo, Jaime and David Tarr, "VERs Under Imperfect Competition and Foreign Direct Investment: a case study of the US-Japan Auto VER", Policy, Research and External Affairs Working Papers, The World Bank, WPS 667, May, 1991, and Collyns, C. and S. Dunaway, "The Cost of Trade Restraints", International Monetary Fund Staff Papers, Volume 34, Number 1, 1987.
16. Dalton, D.H., "Foreign Direct Investment in the US Automotive Industry", in US Department of Commerce, Foreign Direct Investment in the United States, August, 1991, p. 55.
17. Adams, F. Gerard et. al., "Impact of Japanese Investment in US Automobile Production", Journal of Policy Modeling, Volume 13, Number 4, 1991.
18. "Current International Trade Position of the United States", Business America, 9 September 1991, p. 16.
19. Bowring, A. "The US Automotive Aftermarket: opportunities and constraints for developing country suppliers", Industry Series Paper, No. 39, The World Bank, June, 1990, p.17.
20. "General Motors: Alas, poor Saturn", The Economist, 5 September 1992, p. 55.
21. Karmokolias, Y., "Automotive Industry Trends and Prospects for Investment in Developing Countries", IFC Discussion Paper, No. 7, The World Bank, Washington, D.C., 1990, p. 17. For an indication of GM's belated reply, consult "GM Tightens the Screws: only the fittest of its suppliers will survive", Business Week, 22 June 1992, pp. 30-1.
22. "The Road Ahead At General Motors", Fortune, 4 May 1992, pp. 94-5.
23. "Is Bob O'Connell too clever for GM", Institutional Investor, October, 1991, pp 202-206.

24. "General Motors: shake, rattle and roll", The Economist, 11 April 1992, pp. 76-7; and "Getting General Motors Going Again", The Economist, 2 May 1992, pp. 79-80.
25. "Europe: lining up for the world's biggest demolition derby", Business Week, 23 September 1991, p. 54.
26. Consult "Two Sides of a Giant: GM can learn a few lessons from its dynamic European offshoot", Time, 19 February, 1990, p. 36.
27. With the exception of Mazda, by mid-1991 all major Japanese auto producers had announced plans to establish production facilities in Europe. "The Battle for Europe: Japan muscles in on the West- and a shakeout begins", Business Week, 3 June 1991, p. 49.
28. "Europe: Getting Tough with the Japanese", Fortune, 20 April 1992, p.149; and "Business: ready, steady...", The Economist, 23 September 1989, p. 79.
29. "The Agnelli Group: basta", The Economist, 28 March 1992, p. 78.
30. "The Question Mark Hanging Over Germany's Car Makers", The Economist, 23 May 1992, pp. 69-70.
31. "Europe: Getting Tough with the Japanese", Fortune, 20 April 1992, p. 155.
32. See UNCTC, TNCs in the International Auto Industry, op. cit., p. 29 and "Why Toyota Keeps Getting Better and Better and Better", Fortune, 19 November 1990, p. 79.
33. "School's Brief: The business of Europe", The Economist, 7 December 1991, p. 42.
34. "Honda Blurs Line Between American and Foreign", The New York Times, 14 March 1991.
35. "Honda: is it an American car?", Business Week, 18 November 1991, p. 105.
36. OECD, STI Review, op. cit., pp. 50 and 61.
37. OECD, New Forms of Investment..., op. cit., p. 145.
38. UNCTC, "New Approaches to Best-Practice Manufacturing...", op. cit., p.47.
39. Figures from the Japan Automobile Dealers Association, as cited in Fortune, 19 November 1990, p. 68.

40. UNCTC, "New Approaches to Best-Practice Manufacturing...", op. cit., pp.12-3.
41. "Why Toyota Keeps Getting Better and Better and Better", Fortune, 19 November 1991.
42. UNCTC, "New Approaches to Best-Practice Manufacturing...", op. cit., p. 33.
43. Hoffman and Kaplinsky, op. cit., pp.146-7.
44. Urata, op. cit., p. 16.
45. Financial Times, 16 July 1981, p.29.
46. "Honda: is it an American car?", Business Week, 18 November 1991, p. 105.
47. Adams et. al., op. cit., p.468.
48. According to Shintaro Ishihara, joint author with Akio Morita of "The Japan That Can Say No", as quoted in "America and Japan: forget Pearl Harbor", The Economist, 30 November 1991, p. 26.
49. Urata demonstrates that the Japanese share of national automobile markets in Australia, New Zealand and Philippines is superior to 50 percent and it surpasses 80 percent in fast-growing Hong Kong, Singapore, Thailand, Malaysia and Indonesia, op. cit., p. 21.
50. OECD, New Forms..., op. cit., p. 137. Viewed from the perspective of the Japanese producers advantage, it has been stated that "the Japanese are not only very active at the frontier of automobile technology but also that the closer integration of R & D with design and manufacturing is leading to a more rapid transition from the lab to the marketplace in Japan", OECD, "Structural Adjustment in the Automobile Industry", STI Review, op. cit., p. 46.
51. See "America's Car Makers: general alarm", The Economist, 3 January 1992, pp.93-4; "Can American Cars Come Back?", Fortune, 26 February 1990, p.62; "Detroit's Big Three: are America's carmakers headed for the junkyard?", The Economist, 14 April 1991, pp. 87-90; "Autos: for Detroit, another 40 miles of bad road", Business Week, 13 January 1992, p.63; and "Manufacturing: miles traveled, more to go", Business Week, 25 October 1991, pp. 70-3.
52. "Here Comes GM's Saturn: more than a car, it is GM's hope for reinventing itself", Business Week, 9 April 1990, p. 56.
53. "How Ford and Mazda Shared the Driver's Seat", Business Week, 26 March 1990, p. 94.

54. "Here Comes GM's Saturn: more than a car, it is GM's hope for reinventing itself", Business Week, 9 April 1990, pp. 56-62.
55. "At Saturn, What Workers Want Is...Fewer Defects", Business Week, 2 December 1992, p. 117.
56. According to Business Week, ibid., (p. 118), Saturn accounted for \$500 million of GM's 1991 losses. Also consult "Can American Cars Come Back?", Fortune, 26 February 1990, p. 64.
57. Wheelwright, S. and K. Clark, Revolutionizing Product Development, Free Press, New York, as quoted in "The Team Dream", The Economist, 5 September 1992, p. 73.
58. "Saturn: GM finally has a real winner. But success is bringing a fresh batch of problems", Business Week, 17 August 1992, p. 89. "General Motors: Alas, poor Saturn", The Economist, 5 September 1992, p. 55.
59. "Detroit's Big Three: are America's carmakers headed for the junkyard?", The Economist, op. cit., p.87.
60. "Autos: Japanese Luxury, Without the Sticker Shock", Business Week, 19 December 1991, p. 112.
61. "Management Brief: when GM's robots ran amok", The Economist, 10 August 1991, p. 62.
62. "Detroit's Big Three...", The Economist, op. cit., p. 87.
63. "...when GM's robots ran amok", The Economist, op. cit., p. 63.
64. "It's Not All That Easy Having A Hit. Just Ask Caddy", Business Week, 29 June 1992, p. 88.
65. "Why Toyota Keeps Getting Better and Better and Better", Fortune, op. cit., p.72.
66. Karmokolias, op. cit., p.17.
67. "GM Tightens the Screws: only the fittest of its suppliers will survive", Business Week, 22 June 1992, p. 30; and "Detroit's Big Chance: can it regain business and respect it lost in the past 20 years?", Business Week, 29 June 1992, p. 85.
68. "The Lessons GM Could Learn For Its Supplier Shakeup", Business Week, 31 August 1992, p. 29.
69. "Managing: Brace for Japan's Hot New Strategy", Fortune, 21 September 1992, pp.62-74.

70. "America's Car Makers: general alarm", The Economist, 21 December 1991, p.93.
71. "Two Sides of a Giant...", Time, 19 February 1990, p. 34.
72. See, among others, "For Detroit, Another 40 Miles of Bad Road", Business Week, op. cit., p.63; "Free Trade: the US shouldn't play purist", Business Week, 8 June 1992, p. 28; "American Car Makers: lovey dovey", The Economist, 13 June 1992, p.69; "America's Car Makers; general alarm", The Economist, 21 December 1991, p. 94; "Greeting America's Salesman", The Economist, 4 January 1992, p.47; "Japan: A Big Bundle of Hot New Exports", Business Week, 1 July 1991, p. 42; and "Japanese Trade: import, or else", The Economist, 30 November 1991, p. 74.
73. U.S. Department of Commerce, International Trade Administration, U.S. Industrial Outlook '92: business forecasts for 350 industries, Washington, D.C., January, 1992, p. 36-8.
74. Bennett, D.C. and K.E. Sharpe, "The World Automobile Industry and Its Implications", in Newfarmer, R. (ed.), Profits, Progress and Poverty: case studies of international industries in Latin America, Notre Dame, 1985
75. These general themes have been dealt with in Mortimore, Michael, "A New International Industrial Order II: incorporation or marginality for developing countries?", mimeo, September, 1992; and Michael Mortimore, "A New International Industrial Order: increased international competition in a TNC-centric world", CEPAL Review, No. 48, August, 1992.
76. UNCTC, Transnational Corporations in the International Auto Industry, op. cit., pp. 100 and 149-50.
77. Karmokolias, Y., "Automotive Industry Trends...", op. cit., p.5.
78. Mortimore, Michael, "A New International Industrial Order: incorporation or marginality for developing countries?", mimeo, September, 1992, Table 4, p. 9.
79. Urata, Shujiro, "The Development of the Motor Vehicle Industry in Post-Second-World-War Japan", Industry and Development, No. 24, UNIDO, Vienna, 1988, p.7.
80. Korea placed 370,186 of their new car exports of 564,511 in the United States in 1988; that represented over 8 percent of the total for new automobile imports to the US that year. See Bowring, op. cit., pp. 7, 11 and 60.



81. A somewhat distinct, but equally interesting case of the evolution of an ASEAN automotive industry, in this case, Malaysia, is found in Torii, Takashi, "Changing the Manufacturing Sector, Reorganizing Automobile Assemblers, and Developing the Auto Component Industry Under the New Economic Policy", The Developing Economies, (Vol. XXIX, No. 4), December, 1991.
82. "Japan: The Pragmatic Colossus", International Investor, November, 1991, p. 105.
83. "Why Toyota Keeps Getting Better and Better and Better", op. cit., p. 79.
84. Consult CEPAL/ONUDI, "Reestructuración de la industria automotriz mundial y perspectivas para America latina", Estudios e Informes de la CEPAL, No. 67, LC/G.1484-P, diciembre de 1987.
85. Consult Kosacoff, B., J. Todesca y A. Vispo, "La transformación de la industria automotriz argentina. Su integracion con Brasil.", Documento de Trabajo No. 40, Oficina de la CEPAL en Buenos Aires, LC/BUE/L.122, julio 1991; and Kosacoff, B. y D. Azpiazu, La industria argentina: desarrollo y cambios estructurales, Bibliotecas Univeritarias y Oficina de la CEPAL en Buenos Aires, Buenos Aires, 1989.
86. Calderon, A., "Inversion extranjera directa en America Latina y el Caribe, 1970-90, Volumen I. Panorama Regional", CEPAL, DSC/1, octubre de 1992, Cuadro 19, p. 73.
87. Bowring, op. cit., p. 27.
88. Calderon, A., op. cit., Table 20, p. 75.
89. The five passenger car producers alone registered foreign investments totalling over \$2.3 billion during 1982-89, according to the Banco de Mexico.
90. One should not forget that government policy played a role; however, aside from attaining macroeconomic stability and generally accommodating the establishment of a Mexican component to the North American automobile industry by loosening restrictions, its other principal action was to permit auto TNCs to make heavy use of the original scheme to convert external debt into local investments. Auto TNCs accounted for 17 percent of the total value of all foreign investments made in that manner, 59 percent of those which were authorized in 1986. About 26 percent of the registered new FDI in the automobile sector during 1982-89 took place by way of the debt/equity conversion mechanism.
91. See Carta da ANFAVEA, No. 68, Janeiro de 1992.

92. Bowring, op. cit., p. 61.
93. Bowring, A., op. cit., Chapter III.
94. "Japan: the pragmatic colossus", op.cit., p.106



