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INDUSTRY BRIEF ON THE AUTOMOBILE INDUSTRY

FOR U N I D O

by

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Introduction

Over the last four years, the world motor industry has recovered from the recession following the second oil shock in 1979. Worldwide motor vehicle production fell from 41.9 million units in 1979 to 36.5 million units in 1982, before rising again to 45.2 million units in 1986. The cutback in the early 1980s was most severe in North America, where output fell from 12.8 million units in 1978 to 6.9 million units in 1982, rising to 11.7 million units in 1985. Since then, output in North America has fallen off again. Brazil, Argentina and Mexico were also hit hard by the global recession and debt problems, production falling from 1.9 million units in 1980 to 1.3 million units in 1983, rising again to 1.5 million units in 1986. Production in South Korea fell sharply from 200,000 units in 1979 to 123,000 units in 1980, before rising dramatically to 600,000 in 1986 and is forecast to exceed one million units by 1990. Production in Western Europe only fell from 12.9 million units in 1979 to 11.2 million units in 1981, before reaching new record levels of 14.8 million units in 1986. The boom in demand in the Western European market since 1986 has not yet shown any signs of falling off, despite many predictions that a normal cyclical downturn would occur. Japanese production continued to rise from 11.2 million units in 1981 to 12.3 million units in 1986, despite the slowdown in exports as each major market imposed restrictions on Japanese imports. It is generally expected that production and demand will slow down in the years ahead in Europe and Japan in the wake of the decline in the US market.

In addition to the cyclicality of world auto markets, two other major factors have been shaping the industry worldwide in the 1980s. The first is a maturing of the major markets of Europe, North America and Japan. The second is the development by the Japanese of a new world best practice in automobile design and manufacturing, yielding significant advances in productivity over previous techniques. These two factors confronted the existing producers with the need to come to terms with modest growth prospects and to overhaul their entire production system to be able to compete with the Japanese producers. The competitive thrust of the Japanese was first felt through a dramatic increase in auto exports from Japan, rising in the space of a decade from 700,000 to 3.9 million in 1980 and to 4.4 million in 1985. This was followed by protectionist responses in Europe and North America, which was in turn followed by a wave of Japanese investment in North America. The full implications of the establishment of new plants by the Japanese in North America, and later in Europe, is now becoming clear.

During the 1980s a third factor also began to impact the world auto industry - new technology. New electronics and materials technologies are now coming on stream that have begun to change the product and the production system. While new technology has made the headlines, the size of the impact on jobs or the structure of the industry has hitherto been modest. However, new technology will probably become the major factor in transforming the industry in the 1990s.

The Automobile Market Matures

Over the postwar period most of the automobile markets in the OECD countries reached a level of saturation, with a majority of purchases being for replacement purposes. The growth of demand in these markets slowed down, first in the USA and Canada during the 1960s and subsequently in Western Europe (except Spain and Portugal) and Japan during the 1970s. For all these markets demand is only forecast to grow in volume terms at between 1.5 to 2 per cent on a trend basis for the next decade (see Table 1).

As replacement purchases are more readily postponable, these markets are also likely to become increasingly cyclical in nature, following the experience of the US market. With the growing interdependence of the economies of Europe, North America and Japan, there is also a possibility that the cycles in demand will become more syncronised in the future. This poses considerable problems for the world auto makers, whose ability to survive cyclical downturns becomes more critical for their long-term existence.

With the increasing affluence of the car buying population in these countries, plus the growth of two/three car households, the composition of demand has changed significantly in recent years. A simple segmentation based on size and luxury or sportiness has given way to a whole host of smaller market segments with differing demand characteristics. The single car per family purchase was a compromise between different uses. This gave way to a second small car for local use in addition to a larger car for longer distance mileage. This in turn has led to the second or third car being purchased for recreation and leisure use, also loaded with expensive options. Purchases are therefore made for much more specific requirements by different sections of the population. As a result, the average sales volume per model has steadily declined in the USA and there are now a greater number of different models on offer. Demand has therefore shifted away from an increasingly homogeneous commodity product sold on price to more differentiated products sold on the distinctive attributes of the vehicle. While this poses problems for traditional manufacturers seeking to maintain scale economies, it offers new opportunities for new producers seeking to enter the market.

With a mature product, well known production technology and techniques of management and an integration of markets approaching saturation, it was expected that the concentration observed in the USA in the 1930s and in each European country during the 1950s and 1960s would now continue on a global scale. It was assumed that the US producers, being already present in many markets around the world and having the largest home market would be the best placed to survive this process of global concentration. In fact, during the 1970s this potential strength was dissipated as the three US producers had to embark on a huge programme to retool their plants and downsize their models to cope with the shift in the market after 1973, reinforced by US government regulations on fuel economy, and the need to comply with much tougher emission and safety regulations. While they were successful in integrating their European operations, they were not so successful in integrating their European and American operations, and many of the benefits of designing "world cars" were not realised.

The European producers, which had declined in number from 26 after the Second World War to 11, only 5 of which produced a full range of cars, responded to the perceived need to exploit economics of scale by expanding capacity and designing cars more suited to many markets and by seeking to establish production facilities in North America and elsewhere. This led VW and Renault to begin building cars in the USA and to Peugeot acquiring Citroen and Chrysler's European operations. The principle objectives of policymaking in Europe during the 1960s and 1970s were to open up the European market and at the same time to maintain a domestically owned firm, thereby hoping to secure a place in the new global oligopoly that was expected to emerge in the decades to come.

While some of the smaller auto producers in Europe, such as Seat and Alfa Romeo, were absorbed by larger firms, government ownership and family ownership prevented any of the expected mega-mergers between the main volume producers. Retrenchment rather than increased scale became the main preoccupation of the European industry in the 1980s and, with the exception of Renault, Governments have withdrawn from ownership. Renault and VW withdrew from production in the USA and Fiat withdrew from selling cars there. During the 1980s concentration did not increase either in Japan, as most of the Japanese producers are part of larger Zaibatsu groups. Therefore the emergence of a global oligopoly dominated by a few mega companies did not occur during the 1980s. Instead a few smaller companies were absorbed by larger companies, to be replaced by a number of new entrants from the developing countries, such as Hyundai, Daewoo and Kia in South Korea.

Another consequence of a maturing industry, and one that was highly labour intensive, was that it was expected to inevitably begin to drift offshore to low labour cost locations in countries like Spain and Brazil, followed later by South Korea, Mexico and a number of other newly industrialised countries. Over the years manufacturers in both the USA and Western Europe established production facilities in these countries. In almost every case however these plants were built to meet local demand, often having to meet high local content requirements. High component costs and in many cases old fashioned equipment and inadequate production volume per model led to higher finished vehicle prices than in unprotected markets. For these reasons the number of cars exported back to the OECD countries was negligible until the mid 1980s. A change in strategy by the multinational producers to transfer best practice techniques and to upgrade the local components industry was necessary for these low wage locations to compete on any scale in OECD markets.

In terms of structural adjustment, all these trends were expected to lead to a gradual reduction in output and employment in high wage locations. While employment did fall in Europe and North America, it did not do so because of the substitution of output there, or in Japan, by production in the newly industrialising countries. The dramatic improvements in productivity by the Japanese, plus the moves to catch up by the American and European producers, has eroded the labour cost advantages of newly industrialising countries. The Korean penetration of the US market exploited a window of opportunity opened up by the Japanese who, being quota constrained, were forced to move up-market. The establishment of new world class plants in the USA, rising wage costs in South Korea and changing exchange rates, are now constraining Korean sales in the USA. At the same time that the markets were becoming mature there was a gradual

opening up of the main markets following successive rounds of tariff reduction in the 1960s and early 1970s. By 1980 some 40 per cent of cars produced were traded between countries, compared with 20 per cent in 1960 - see Table 2. One major consequence of the opening up of markets was the increasing trade between European countries and between the USA and Canada. The second consequence was the rise in Japanese exports to all destinations. The rest of the 1980s and early 1990s looks like being marked by the consolidation of major regional trading blocks as the EEC completes the process of integration in 1992 and as the Mexican and Canadian industries become more closely integrated with the American auto industry. The growth in the Japanese penetration of these two blocks will be through their own production facilities in each of these regions rather than through increased direct exports. Indeed, the rise of the yen may curtail production in Japan and has made the Japanese producers more interested in integrating their operations with producers elsewhere in South East Asia. Component and finished vehicle imports from South East Asia to Japan are rising. In this world of regional trading blocks, integration into one of them appears to offer the best prospects to industries in the newly industrialising countries.

The Japanese Production System

The most fundamental shock to the established auto industry in the late 1970s was not new technology, but a new level of production efficiency and quality achieved by the Japanese auto industry. Spurred on by an intensely competitive domestic market and by repeated external shocks the Japanese successfully adapted and transformed American management techniques to their own cultural and economic circumstances. In the process they rethought the fundamentals of manufacturing organisation and turned many conventional ideas upside down. This led to a new pattern of product development, to new forms of production organisation within the plant and a new set of relationships with component suppliers.

The Japanese production system can be summarised as follows. A more efficient product development process has reduced the lead time for developing a new model from 5 to 3.5 years, using about one half the number of man hours in design and engineering. Models are replaced after only 4 years in Japan, instead of twice that time elsewhere. Whereas in the west the aim of mass production is to achieve the longest possible run of a standardised part the Japanese system is geared to producing very short runs "just in time" as they are required. Tooling can be changed very rapidly and inventories are removed, resulting in rapid incremental improvements, flexibility and a true continuous flow throughout the plant. The successful operation of this system also depends on the elimination of all defects at the point of manufacture and the return of responsibility for quality, routine maintenance and process improvements to the line worker. The operations of a multi-tiered structure of component suppliers are closely integrated with the final assembler. The interdependence of each link in the supply chain, built up over many years, serves to devolve the organisation of the system while at the same time mobilising all the resources of each firm to improve the total system performance. This contrasts with either in house vertical integration of component supply or arm's-length relationships with multiple suppliers common in the west.

The end result of this system, with its emphasis on the tight co-ordination of the factors of production, was that fewer labour hours were required to produce a car of much higher quality. By 1981 the Japanese had achieved a $2500 landed cost advantage in the USA and just under $1000 in Europe. This competitive advantage resulted in a rapid expansion of the Japanese industry and a flood of exports - see Table 2. Even after the industry came to fully understand what lay behind this competitive advantage it was clear that a complete overhaul of the Western auto production system would take many years to accomplish. By 1981 all the main Western countries had erected some form of restriction on the volume of Japanese car imports.

The Japanese responded to these restrictions by moving offshore and building 12 assembly and engine plants in North America with a capacity of 2.3 million units, with more to come in Western Europe and elsewhere. The initial successful operation of these Japanese plants in the USA demonstrated that it is quite possible to transfer Japanese management practices outside a Japanese cultural environment. These plants have set a new baseline of best practice productivity (using about 2/3 of the labour required in a traditional plant) and quality (with half the delivered defects). All the existing plants in the west will have no option but to meet these targets if they are to survive into the next decade. As the Japanese build up their supplier base abroad and increase the local content of their cars built outside Japan they will have a global production base less vulnerable to major exchange rate changes. As with the previous oil shocks the recent rise in the Yen is leading the Japanese to redouble their efforts to improve their productivity, through the use of new flexible assembly automation. Despite this, and the sourcing of some components from South East Asia, some manufacturers in Japan and now beginning to face pressures to reduce their capacity and employment in Japan.

Structural Adjustment

As the growth of demand slowed down and firms sought to expand output through increasing market share or by improving productivity and reaping economies of scale, the industry ran into periods of overcapacity. This was exacerbated by the dramatic productivity improvements achieved by the Japanese. The delay in retiring old plants displaced by the Japanese and the lag before the rest of the world began to catch up with them made the situation worse. Structural adjustment and overcapacity became endemic in the industry in the 1980s.

The overcapacity situation began in Western Europe as the result of a major wave of plant retooling by the volume manufacturers at the end of the 1970s, based on overoptimistic forecasts of demand and ambitions to reach volumes of 2 million cars a year, thought critical for survival in the "world car" era. The market in Western Europe collapsed after 1980 just as this capacity came on stream. This resulted in a period of intense competition between the European manufacturers, while the Japanese share was constrained by limits on their imports in most European markets. As a result those national industries which had fallen behind had to embark on ambitious programmes to cut capacity, improve productivity and introduce new models. Although this lead to some companies, such as Fiat, making impressive recoveries, some 180,000 and 85,000 people left the industry after 1979 in the UK and Italy respectively as a result, followed by 120,000 in France. The European overcapacity situation was not resolved

through major mergers or bankruptcies, although amongst the smaller manufacturers Seat was taken over by Volkswagen, Alfa Romeo by Fiat and Austin Rover formed closer links with Honda. The situation was ultimately resolved and the European industry returned to profitability when one million units of capacity was closed and break-even levels were reduced by 2 million units to close the gap between a slimmed down, more efficient capacity and record levels of demand.

The introduction of the voluntary export restraint agreement in 1981 limiting Japanese car imports to the USA marked a recognition that the restructuring of the US industry would take many years to accomplish. Ford and Chrysler, which was rescued from bankrupcy by US government guarantees, began to restructure their operations, though in General Motors, accounting for over half of US auto capacity, progress has been much slower. As prices rose and the demand for large cars returned the US market became very profitable for all concerned. The first thrust by the Japanese having been blunted, the Japanese responded by building their own greenfield plants in the USA and by moving upmarket into the larger car segments dominated by the US producers. The US manufacturers in turn sought their own low cost production sites and are selling or planning to sell cars made in Japan, South Korea, Taiwan, Thailand, Mexico and Brazil under their brand names throughout the North American market. The move upmarket by the Japanese also left a "window of opportunity" in the smaller car segments which encouraged independent manufacturers in South Korea and Yugoslavia to also enter the US market, with considerable success. Finally the success of the European specialist car manufacturers in dominating the luxury car market in the US has also led them to expand capacity targeted at the US market.

As a result of all these developments capacity is being installed around the world, including in North America itself, which will exceed total demand in North America by at least 4 million units in 1990. The US is already running a record trade deficit in motor vehicles of $55bn in 1986, some $29bn with Japan, and the motor vehicle deficit is one third of the total deficit of $170bn. Although the limit on Japanese built-up imports remains in place protectionist pressures are growing for more comprehensive restrictions against other countries also. It seems likely that progress by the US producers in turning round existing brownfield plants will not be fast enough, even with more protection, to prevent the displacement of some of their capacity by the new Japanese greenfield plants now opening up in the USA. Therefore the US will experience a growing overcapacity situation as the US manufacturers have to compete head on with Japanese manufacturers set to further increase their share of the US market. A new round of protectionism in the US would also have significant consequences elsewhere. It could shift some of the burden of overcapacity to Japan and to South East Asia, in particular South Korea, where capacity is set to increase by over a million units between 1986 and 1990, in large part intended for export to the US market.

The dramatic rise in the Yen and of further protectionism against Japanese exports has opened up the possibility of overcapacity in Japan. After years of steady progress some Japanese manufacturers have incurred record losses and have begun to pull back inhouse subcontract work and send surplus workers into their distribution networks in Japan. Component imports from South East Asia have also begun to increase. As the rest of the world catches up it may not be possible for the Japanese to sustain their current level of built up exports.

Even without running into trade barriers in the US market the South East Asian producers will face a tough competitive battle to maintain their competitiveness in export markets. They are still critically dependent on increasingly expensive components imported from Japan and it will take time to introduce automated equipment and to build an efficient components base producing high quality parts. The success of ambitious plans to more than double capacity over the next four years may ultimately depend on the growth of domestic demand in these countries.

New Technology

During the 1980s a whole range of electronics technologies began to diffuse through the auto industry, beginning to change both the product and the production equipment required to make it. The initial impact was in the automation of machining operations and the introduction of robotics into stamping, welding and painting. In the second half of this decade more sophisticated equipment is also being introduced to tackle the more difficult subassembly and assembly tasks. Apart from eliminating heavy, boring and dirty jobs in these areas they have been able to increase the consistency and accuracy of the operations leading to improvements in the quality of the final product.

Before the introduction of flexible manufacturing systems and robotics the trend was towards ever more dedicated automation geared to high volume output of a standardised part. These new technologies began to introduce a new dimension of flexibility, enabling for instance the making of different parts and welding different bodies on the same equipment. The ability to reprogramme robotic equipment for the introduction of new models or variants reduces the tooling costs and enables them to be spread over a larger volume. Such tooling can also be updated piecemeal as new generations of equipment become available, instead of waiting for the introduction of a new model. This flexibility and the potential for incremental, less disruptive improvements have begun to reduce the economies of scale at the plant level in this industry. Ultimately, economies of scale per model may fall and a full range of cars may be produced in one or two plants at a much lower volume, but at a competitive cost with larger producers using single model dedicated plants.

In addition to changes in production equipment, design functions are being transformed by the move towards computer aided design and the electronic integration of design with production. The design process is becoming more modularised, with key suppliers playing a major part, and the product is designed right from the start for automated manufacture. This is leading to a new synergy between product and process technologies and the vehicle assemblers key role becomes to integrate all the systems of the vehicle and to integrate all the production steps. In the future this may lead to the major redesign of whole systems in the vehicle and with the introduction of new materials such as plastics, composites and ceramics the substitution of new production processes for old.

So far the introduction of these new technologies has not had a major impact on employment, having been overshadowed by the productivity advances made by the Japanese, using less labour and utilising and coordinating both labour and capital more effectively. Although new production technology has reduced direct labour in stamping, welding, painting and machining it

has so far hardly reduced the indirect labour required to run this more sophisticated equipment. It will not be until more experience is gained with this equipment and until labour intensive functions such as assembly are automated that the impact of technology on jobs will be significant. Some manufacturers in the West have sought to catch up with the Japanese by moving directly to highly automated plants. The results have been disappointing. It is now apparent that integrating all this high technology equipment will take some time and that the full benefits from this technology will only be achieved in the 1990s once the prior reorganisation and integration of the production process along Japanese lines has taken place.

The Prospects for New Entrant Countries

The growth of the automobile industry in the developing countries has been slow to take off - see Table 6. In 1985 the developing countries accounted for only 10 per cent of world auto sales, of which one third were imported built-up from the main auto producing countries. This represented a fall from 12 per cent in 1980, due to a falling off in production in Latin America and Africa not yet offset by rising production and demand in Asia. This trend should be reversed during the second half of the 1980s as the industry expands in South East Asia and if economic growth is sustained elsewhere. Forecasting the growth of demand in the developing countries is fraught with uncertainties, in 1982 the OECD forecast developing country demand would grow from 3.4 million in 1985 to 6.9 million in 1990, in 1984 MIT forecast 5.2 million and in 1986 DRI was forecasting only 4.9 million units. In addition to Brazil and Mexico, with long established industries, the main candidate countries set to join the international industry are South Korea and Taiwan followed possibly by Thailand and Malaysia.

The automobile industry in Latin America grew up behind high levels of protection and local content requirements. During the 1980s however government policies in Brazil and Mexico shifted towards trade balancing and export promotion policies as the debt situation worsened. As a result the multinational producers were encouraged to upgrade their facilities to enable them to produce export quality products. The most extreme example being the new Ford plant in Hermosillio in Mexico, which is a copy of a Mazda plant in Japan producing a Mazda engineered product with a limited number of employees and selling the product in Canada and the USA. This "island of best practice" has demonstrated that it is possible to transfer Japanese production techniques to a less developed country. Although all the US producers and Volkswagen are exporting cars from Brazil and Mexico to the USA the domestic markets of both countries have collapsed, placing a question-mark over further growth of the industry in Latin America. Ford and Volkswagen have as a result set up a joint company to consolidate their activities in Latin America.

The combination of higher levels of automation and the development of a new best practice production organisation requiring less labour for a much higher quality product has seriously eroded the traditional comparative advantage of the developing countries in lower labour costs. In the future the developing countries will only be able to compete in export markets if they strive to meet world best practice levels of productivity and quality throughout their assembly and component operations, albeit at lower levels of production automation. From the early experience in transferring

Japanese production operations to Mexico and South Korea it is however not clear that starting from a relatively lower base is any more of a disadvantage than trying to turn around existing plants and decades of established practices in North America and Western Europe. Just-in-time systems to deliver components from nearbye plants, higher levels of quality required and the substitution of new component technologies for old labour intensive systems also limit the potential for developing countries to base their strategies on low labour cost component exports. The upgrading of the local component industry has to proceed hand in hand with the development of local assembly facilities.

There is no doubt that the potential growth of domestic demand in the developing countries is attractive to the multi-national producers. The Japanese and American producers, for long somewhat unwilling to transfer the latest techniques to developing countries, are now more keen to do so and to integrate their operations worldwide. A new division of labour is for instance beginning to develop in South East Asia as the Japanese producers seek to offset the disadvantages of a high Yen. The shift in emphasis away from high volume, single model plants using dedicated equipment to more flexible multi-model plants also favours developing country producers, allowing them to produce a range of models to supply domestic requirements ahead of domestic demand growth without significant cost penalties. With the right products they may successfully find niches in the more differentiated markets of the industrialised countries.

To capture some of these advantages governments in the developing countries are re-orienting their policies and bargaining in a different way with the multinational producers, opening up their industries to participate in a new division of labour in an increasingly integrated global industry. The potential growth of the industry in the developing countries may lie more in creating value through "islands of best practice" using only limited amounts of labour, that will subsequently generate employment as these techniques diffuse throughout the components industry and as volume increases. It will also be closely tied to the growth of the market in the developing countries, particularly in South East Asia and Latin America.

TABLE 1: AUTOMOBILE DEMAND

	Actual 1979 - 1985		OECD 1982 Forecast 1985 - 1990		DRI 1986 Forecast 1990
North America	11.6	12.2	12.4	12.5	12.7
Western Europe	10.3	10.6	11.2	11.8	11.5
Japan	3.0	3.1	4.4	4.3	3.4
Eastern Europe	2.0	2.1	2.1	2.6	2.5
Rest of World	3.6	4.0	5.1	6.9	4.9
Total	**30.5**	**32.0**	**35.2**	**38.1**	**35.0**

Source: OECD, Long term outlook for the world economy, pp 22 & 42 and Automotive News, 29 December 1986, p5

TABLE 2: WORLD AUTOMOBILE PRODUCTION AND EXPORTS 1960 - 1985

(million units)

World Production	1960	1970	1980	1985	1986
North America[3]	7.0	7.5	7.2	9.3	8.9
Western Europe	5.1	10.4	10.4	10.7	11.6
Japan	0.2	3.2	7.0	7.6	7.8
other OECD[1]	0.3	0.4	0.5	0.7	0.6
Centrally Planned	0.3	0.7	2.1	2.1	2.0
Developing Countries[4]	0.1	0.6	1.3	1.2	1.5
Total Production	**13.0**	**22.8**	**28.6**	**31.5**	**32.4**
World trade/exports					
intra N. American	-	0.9	1.1	1.8	
intra W. European	1.0	2.7	3.7	4.6	
from WE to other OECD	0.8	1.2	1.0	0.9	
from Japan to other OECD	-	0.5	3.4	3.8	
from WE to developing	0.4	0.6	0.3	0.4	
from Japan to developing	-	0.2	0.5	0.6	
Total Trade[2]	2.3	6.4	10.9	12.9	

Notes: (1) Australia, Yugoslavia and Turkey.

(2) Includes negligible exports from N America, intra Comecon trade and intra developing country trade.

(3) 1970 and 1980 were poor years for car production in N America, peak year output was achieved in 1965 (10.0), 1973 (10.9) and 1978 (10.3).

(4) Only production with over 80% local content.

Source: D T Jones and J P Womack, 'Developing Countries and the Future of the Automobile Industry' in World Development, Vol 13, No 3, 1985 and SMMT, JAMA and Automotive News.

TABLE 3: LEADING WORLD AUTOMOBILE MANUFACTURERS(1)

('000)

	1973	1979	1985
General Motors(2)	6961.4	6967.3	7053.4
Ford	4339.6	4076.0	3723.3
Toyota(3)	1745.7	2244.9	2787.9
Nissan(4)	1618.1	1892.7	2211.2
VW Audi(5)	2136.1	2260.2	2160.4
Renault(6)	1308.5	1890.9	1697.6
Peugeot(7)	682.6	2118.7	1562.0
Fiat(8)	1619.6	1389.4	1371.5
Chrysler	2766.4	1130.7	1266.1
Honda	257.0	706.4	1101.7
Mazda	465.7	647.0	815.1
Mitsubishi	281.0	528.6	595.9
Daimler Benz	331.7	433.2	537.9
BL	951.1	503.8	465.1

(1) All companies building more than 500,000 autos in the above years

(2) Includes Opel, Vauxhall and Holden

(3) Includes Daihatsu

(4) Includes Subaru

(5) In 1986 VW acquired Seat (304.7)

(6) Including American Motors in 1979 and 1985

(7) Includes Citroen and Talbot in 1979 and 1985

(8) Includes Autobianchi, Lancia and Fiat, in 1986 Fiat acquired Alfa Romeo (157.6)

Source: L'Argus

TABLE 4: EMPLOYMENT IN SELECTED AUTOMOBILE COMPANIES

('000 employees)

	1979	1985
General Motors (US)	618	561
Ford (US)	239	172
Chrysler (US)	109	85
Toyota	45	62
Nissan	57	59
Honda	21	27
Mazda	27	29
VW Audi	240	259
Peugeot	265	177
Renault (cars)	164	144
Fiat (Auto)	164	100
Mercedes Benz	141	162
Volvo group	65	66
BL	168	102
Ford Germany	57	46
Ford UK	80	53
Opel	67	57

TABLE 5: MARKET SHARES IN THE US MARKET (%)

	1968	1978	1983	1986	1987	1990(5)
General Motors (1)	46.7	47.7	44.0	41.5	33.5)	
Other US Firms (1)	42.8	34.5	28.5	25.0	29.2)	52.0
Transplants (2)	-	-	-	5.0	6.6	18.0
Japanese Imports (3)	1.6	12.1	21.5	21.0	21.1	19.0
European Imports (3)	8.9	6.1	5.2	6.0	5.8	6.0
Other Imports (3)(4)	-	-	-	1.5	3.8	5.0

Notes

(1) Traditional North American production, excluding output from transplant and tied imports.

(2) Foreign owned assembly plants in the US.

(3) Includes tied imports marketed by GM, Ford and Chrysler.

(4) Imports from South Korea, Brazil, Mexico and Yugoslavia and, in the future, also from Taiwan, Malaysia and Thailand.

(5) Scenario developed by IMVP in May 1987.

Sources: Automotive News and IMVP Databases.

TABLE 6: PRODUCTION, ASSEMBLY & IMPORTS OF AUTOMOBILES IN DEVELOPING COUNTRIES 1960-85

(million units)

	1960	1970	1980	1985
Latin America				
production and assembly	0.1	0.7	1.7	1.2
built-up imports	0.2	0.2	0.3	0.3
Total	0.3	0.9	2.1	1.5
Asia				
production and assembly	-	0.1	0.5	0.7
built-up imports	0.1	0.4	0.4	0.5
Total	0.1	0.5	0.9	1.2
Africa				
production and assembly	0.1	0.3	0.4	0.2
built-up imports	0.2	0.2	0.1	0.2
Total	0.3	0.5	0.5	0.4
Developing Countries				
production and assembly	0.2	1.1	2.6	2.1
built-up imports	0.5	0.8	0.8	1.0
Total	0.7	1.9	3.4	3.1

Notes: (1) Production and assembly includes full production, assembly of kits (CKD) and sets of components (KD) with domestic content of 90-100%, 50-70% and 20-50% respectively.

Source: See Table 2