CHANGES IN INDUSTRIAL ORGANIZATION OF THE MEXICAN AUTOMOBILE INDUSTRY BY ECONOMIC LIBERALIZATION

Clemente Ruiz Durán
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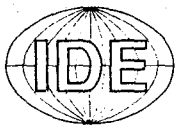

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Preface

This report presents an analytical view of how trade liberalization and the North American Free Trade Agreement (NAFTA) have changed the industrial organization of the Mexican automobile industry. It is a joint study between Taeko Taniura of the Institute of Developing Economies, Tokyo and Clemente Ruiz Durán and Enrique Dussel Peters of the Graduate School of the Faculty of Economics at the National Autonomous University of Mexico, with the collaboration of the research assistants of the project "Industrial Policy to Support Industrial Linkages in Mexico".[1] As framework and reference background for the study, the report analyzes the major characteristics of the Mexican economy between 1980-1996, in chapter I.

The second chapter is an analysis of the impact of liberalization on the Mexican automobile industry, supported by a data analysis of various sources and interviews with the major car assemblers. The third chapter is an analysis of the autoparts sector. Sources included a survey of autoparts manufacturers, the data base and report of the field study conducted by JICA and UNICO supported by a survey questionnaire, the Mexican Nacional Institute of Statistics, Geography and Data (INEGI) and the data bases of the Secretary of Trade and Industry Promotion (SECOFI), Mexico.

The field research and the support of the Mexican government allowed some new insights into the autoparts sector, that up to now has been unavailable. This allowed for an analysis of group formation in the autoparts sector, the subcontracting practices of the major assemblers, and domestic and regional (NAFTA) subcontracting networks. The analysis also provides insights in the utilization of technology in the autoparts sector, and what we have called the "learning process," that is, how technology transfers are being utilized by autoparts producers. Further research is required into the autoparts sector, which is undergoing the transition from a national entity to a regional autoparts sector under the NAFTA. The transition could last beyond 2004 when all domestic requirements regulating producers will vanish and the regional content requirements will assume premier importance. The industrial organization of Mexico's autoparts sector will continue to change, but the major trends as described in the report will remain, as long as the Mexican government's macroeconomic policy does not change radically. The outlook for the 21 century is an integrated automobile and autoparts industry that will operate regionally with associated firms in the NAFTA region.

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[1] Fatima Lopez Soto, Francisco Escalmilla Filio, Alfonso Mendieta, Josue A. Rodríguez Galán, Ariadna García Vega, Jorge Vera García, Javiar de la Rosa Arana, Sebastian Sombra Mendiola and Maxx-Phillippe Hollott. Javier Lozano coordinated the survey questionnaire.

Abreviation List

AAGR	Average annual growth rate
AAMA	American Automobile Manufacturers Association
ALTEX	Alta Exportadora
AMIA	Asociación Mexicana de la Industria Automotriz
ANPACT	Asociación Nacional de Productores de Autobuses, Camiones y Tractocamiones, A.C.
DGI	Dirección General de Industrias of SECOFI
EAP	Economic Active Population
ECEX	Empresa Comercio Exterior
INA	Industria Nacional de Autopartes
INEGI	Instituto Nacional de Estadística, Geografía e Informática
JICA	Japan International Cooperation Agency
NAFTA	North American Free Trade Agreement
PITEX	Programa de Importacion Temporal para Exportadores
SECOFI	Secretaría de Comercio y Fomento Industrial
TNC	Transnational corporation

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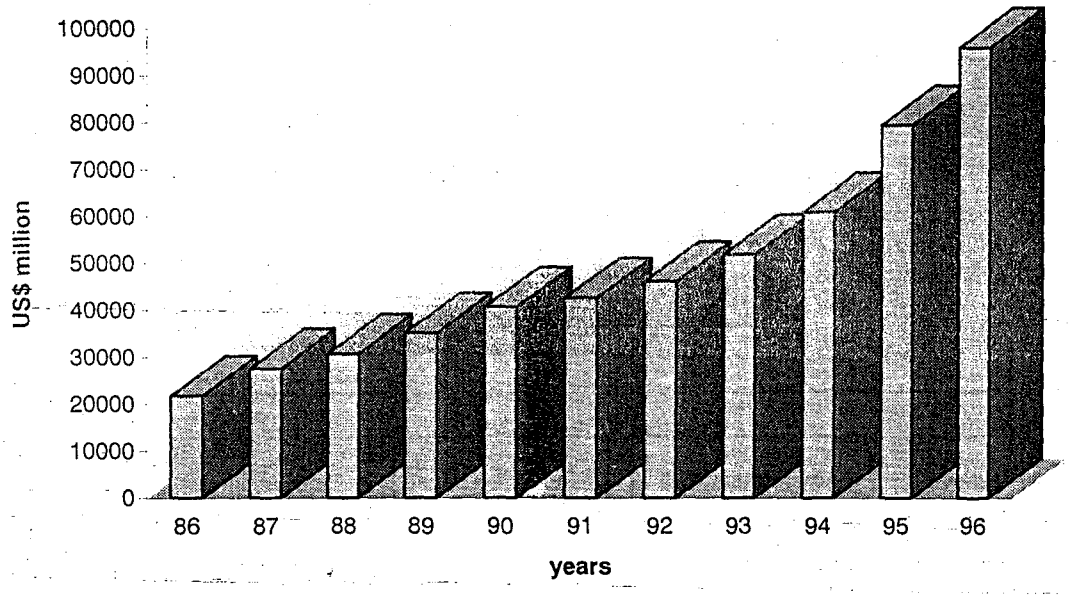
Chapter I
The Mexican Economy: Facing Globalization

Mexico has become one of the world's largest exporters: in 1996 it is estimated that exports reached US$95 billion, higher than many OECD countries (Australia, Austria, Denmark, Finland, Greece, Iceland, Ireland, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland and Turkey) and close to those of Korea and Taiwan.[1] This outcome is even more surprising if it is considered that at the beginning of the 1990s, Mexico's exports level was only US$41 billion. It is one of the most successful export experiences in recent years.

Figure 1.1 Mexico: export performance, 1986-96[2]



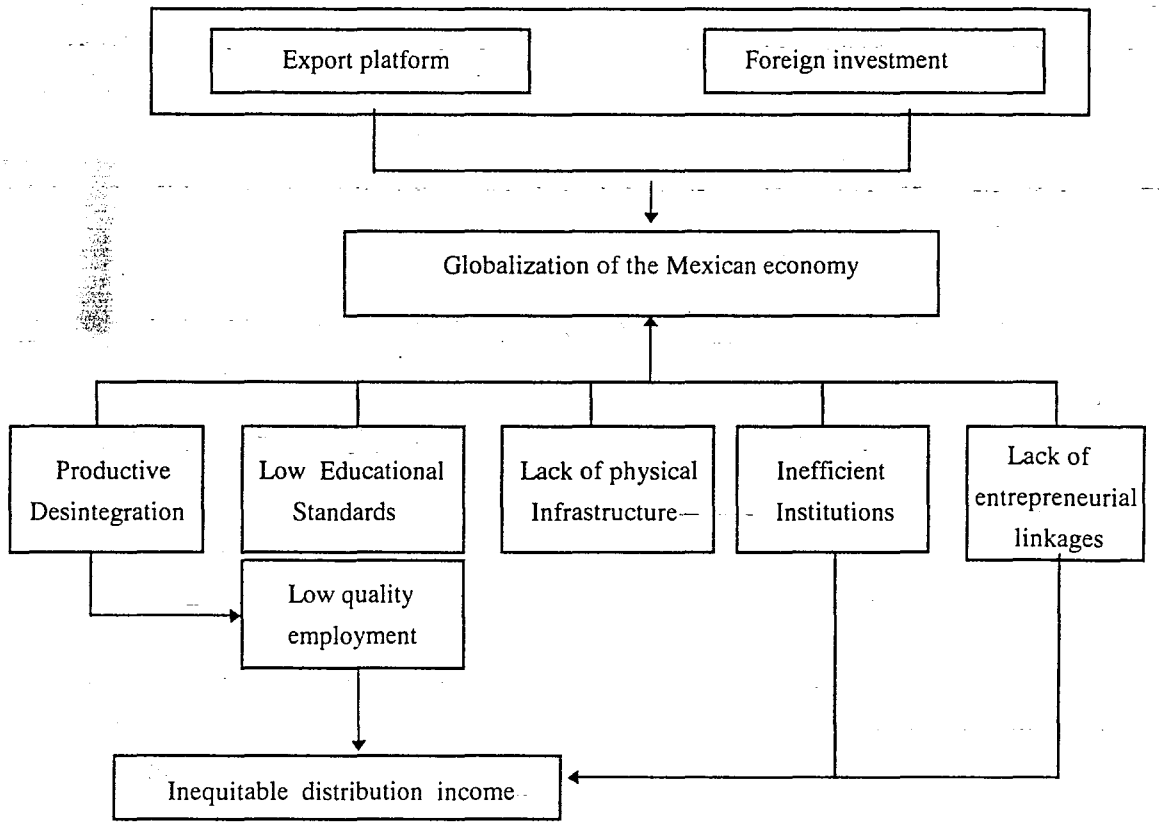
The outstanding performance of exports has been the driving force of economic activity since the collapse of the peso in 1994: the growth rate is about twice the rate in 1994, the year the NAFTA entered into force. Although slowing down in 1996, export growth has remained the main engine of activity. The fall in domestic demand, combined with the depreciation of the peso, has led many enterprises to re-orient their production towards external markets. As mentioned by the OECD (1997) "some diversion back to the domestic market is to be expected once domestic demand picks up,

[1] It should be noted that Mexican data before 1990 does not include exports or production figures for the maquilas. Nor is the data after 1990 disaggragated between the maquilas and non-maquilas sectors.

[2] Source: INEGI, includes maquiladoras.

although a structural shift in the orientation of production may have occurred, to the extent that firms have developed their export networks. The surge in exports has been concentrated in a few industries (often very reliant on imported inputs), there is some evidence however, that the number of exporting firms has increased significantly." As reported by SECOFI, the main network of exporters is no more than 500 firms, but in 1996 the total number of exporting firms reached almost 32,000 firms, 20 percent more than in 1994 when the NAFTA came into effect.[3] However, export firm's reliance on imported inputs has meant a very heterogeneous recovery: the domestic market has not recovered yet, which is having a negative effect on national competitiveness and social welfare. This chapter presents an outline of how the drive towards globalization is restrained by unsolved structural factors that could pose an obstacle to stable growth.

Figure 1.2 Factors enhancing and hindering globalization in Mexico



[3] The Undersecretary of Commerce. Interviewed with Excelsior. Sunday, 26 January, 1997.

1.1 From Domestic to Export-led Growth

Since the beginning of the 1980s, and particularly since 1988, Mexico has embarked on a radically new economic development policy, abandoning its commitment to import substitution industrialization (ISI). Since then, economic policy has moved toward increasing reliance on market mechanisms and macro-economic policies to direct the evolution of the micro-economic structure and develop an export-oriented manufacturing sector. As part of this policy, Mexico liberalized imports, controlled inflation, reduced public expenditures and taxes and generated incentives to attract foreign investment. The above changes reduced the dynamic of the domestic market and as exports were unable to compensate for the decline, Mexico entered into a period slow growth.

Table 1.1 Mexico: from demand driven to export-led growth (as a % of GDP)

	1980	1988	1995	1996
Domestic demand	102.3	98.6	95.8	97.2
Private consumption	65.1	67.6	71.5	70.4
Government consumption	10.0	8.4	10.8	10.7
Gross fixed capital formation	24.8	18.5	16.0	15.9
Public sector	10.7	4.4	3.3	3.9
Private sector	14.1	14.1	11.3	12.0
Changes in stock	2.4	4.0	-1.9	
Exports of goods and services	10.7	19.9	24.9	27.5
Imports of goods and services	13.0	18.5	20.7	24.7
	1960-80	1981-88	1989-95	1989-96
Annual averarage growth of GDP.	6.7	1.2	1.6	2.5

Source: INEGI Macroasesoría, 1997.

Slow growth brought with it other economic illness to a country where high-growth had allowed improvements in welfare. Low growth have been insufficient to absorb economically active population to the labor market, resulting in an expansion of unemployment. Although the levels reached are not high by international standards, this is partly explained by the accelerated expansion of low quality employment, mostly in informal activities. Employment in the informal sector expanded at record levels; as estimated by Tokman (1996), 6.8 of 10 new jobs created in the last 15 years were informal. During this period, the public sector has reduced its contribution to employment creation as a result of adjustment and privatization. Wages, both minimum

and in manufacturing, have decreased during this period, to levels below the levels in 1982. The fall in employment and wages can be explained mainly as a result of the restructuring of the economy and its integration into the global economy. The push toward the globalization was carried out without attention to the domestic market that was the engine of growth during the long-term economic expansion between 1933 to 1981.

Government's assumption was that opening the economy would force domestic producers to become competitive, and that export promotion would bring increased welfare to the Mexican people. This is a conservative assumption, which disregards the lag time in factor allocation. If adjustment is instantaneous, one can modify microstructures immediately, moving capital stock and employment from one sector to the other, assuming malleable capital goods and a well-educated labor able to do any sort of new task. But reality is more complex: adjustment requires large investments to readapt capital stock and retrain labor to new activities. This task was not assumed by planners of the reform process. The state role of creating rents, developed in the period of high growth, was suddenly absent in the new approach. The administration of Miguel de la Madrid dismantled the bulk of the policies that were able to get a profit investment-nexus, drastically reducing the investment coefficient and with it, employment and wages. A paradox of this policy has been that as employment has decreased there has been an increase in productivity in the manufacturing sector, where the average productivity increased from 100 to 148 between 1987 and 1995. In this case, it could be argued that the increase in productivity is not real, but rather, due to the drastic fall in employment.

The government assumed that with the drop in the rent-profit-investment nexus, only the fittest producers would survive. In turn this would induce a new generation of entrepreneurs into the market, producers able to compete in the world market. It was a biased assumption, as the beneficiaries of the policy program as designed were large enterprises - mainly transnational corporations- which already had export capacity, such as the automobile and electronic industries. The underlying problem is that the large firms are a fraction of all firms, they have high import requirements and a rather small employment multiplier effect. Micro and small firms that represent more than 90 per cent of businesses in Mexico are for the most part low value added producers: their competitive edge is restricted and they require supporting policies to help them to overcome their deficiencies. Unfortunately under the policies implemented since 1982, there has only been a place for horizontal industrial promotion.

To avoid the crunch of the domestic market Mexican government could have approached the problem in a manner similar to that executed by certain East Asia states. As describe by UNCTAD (1996, 25):

"...governments would support a number of new industries at each stage of

development which were seen as most suitable given existing technological and managerial capabilities. This support was in the form of import protection, restrictions on domestic competition, subsidized finance, direct subsidies, and other forms of financial and administrative assistance regarding international marketing, finance and R&D, both to provide enough resources to enable substantial investment in physical and human capital and to ensure a long time enough time horizon for these investments to sustain productivity growth. Just as importantly, as these infant industries built technological and managerial capabilities and became internationally competitive, the protection and other supports accorded to them were gradually withdrawn, and the range of incentives and disciplines redesigned to push firms in these industries into the international markets as the new generations of exporters. The new generation of export industries would then provide the foreign exchange necessary to buy the capital goods needed for investment in the next generation of infant industries. Therefore at any point in time the East Asian economies combined high protection and support for infant industries with low protection and support for the mature industries, a phenomenon which is often misleadingly described as a "neutral incentive regime."

This sort of neutral incentive regime approach helps to sustain the domestic market, while at the same promoting exports. In contrast, the Mexican government's ideological approach to adjustment opened the economy as a way to promote export, while ignoring the development of the domestic market.

The opening of the economy presented domestic producers with external competition; most domestic producers were unable to adapt to the new business environment. In all areas, imports substituted for domestic production to a large extent, even in the traditional industries sector. The modern sectors, dominated by large enterprises, were able to take advantage of the opening but at the cost of increasing the import content of their production, thus reducing the impact of their activity on the domestic market. This horizontal industrial policy approach did not develop linkages among producers, with the result that there was a further segmentation among firms, those exporting and the ones focused on the domestic market.

Furthermore, slow growth has been a source of regional inequality. The poorest states and regions experienced absolute and relative declines during the period: the ratio between the highest income (DF) and the lowest (Chiapas) increased from 4.6 to 5.5 times, and twenty six states witnessed declines in the level of real GDP per capita in the period 1990 to 1995 (Ruiz Durán, 1996).

1.2 Liberalization: the Deepening of Productive Linkages

Import substitution strategy failed to integrate the Mexican economy. It was never able to promote efficiency among domestic producers: their competitiveness in relation to world levels was low and the costs for domestic consumers were high. In order to cope with these inefficiencies, the economy was liberalized. The process of import liberalization in Mexico began in 1985, when most official import prices and import licenses were replaced with tariffs. However, the elimination of import licenses were compensated for an increase in tariffs and a 22% devaluation of the peso. This process was required in order to join the GATT, which, in general, did not allow for tariffs exceeding 50 percent.

By the end of the 1980s Mexico's average tariff rate was approximately 12%, with 5 different rates, a floor of 0% and a ceiling of 20%. The pace of import liberalization was accelerated unilaterally in 1987, particularly in the manufacturing sector. Of 11,838 product items, 19% of were controlled in 1989 and only 6.2% in 1996 (SECOFI 1996). Overall tariffs rates were significantly reduced, depending on the sector. Parts of the agricultural, pharmaceutical, automobile, and microcomputer industries were initially exempted from trade liberalization in 1987 through the implementation of several development programs and subsidies equivalent to 100 percent of their imports of components and finished goods. Transnational corporations are the largest producers, exporters and importers in these sectors.

Moreover, in the 1990s, Mexico has negotiated free trade agreements with several Latin American nations, including Chile and Costa Rica, and began trade negotiations with the European Union in 1996. However, the implementation of NAFTA on January 1, 1994, overshadows all other accords and marks the final stage of Mexico's import liberalization and overall trade policy. NAFTA goes well beyond trade issues: intellectual property, investment, labor, and ecological aspects, among others, were included to enhance economic relations among Canada, Mexico, and the United States. NAFTA market access provisions allow a wide range of tariff and non-tariff barriers at the product level. In general, tariff and non-tariff barriers on commodities and services are to be phased out in a maximum of 15 years, beginning in 1994. Under the NAFTA, goods must follow specific rules of origin to be considered North American and receive preferential treatment. The tariffs on manufacturing and consumption goods will continue to fall, while (sub)sectors such as automobiles, computers, textiles and apparel, agriculture and financial services have certain market access provisions.

The liberalization of foreign trade has had some specific consequences as described below:

Table 1.2 Overview of certain NAFTA regulations

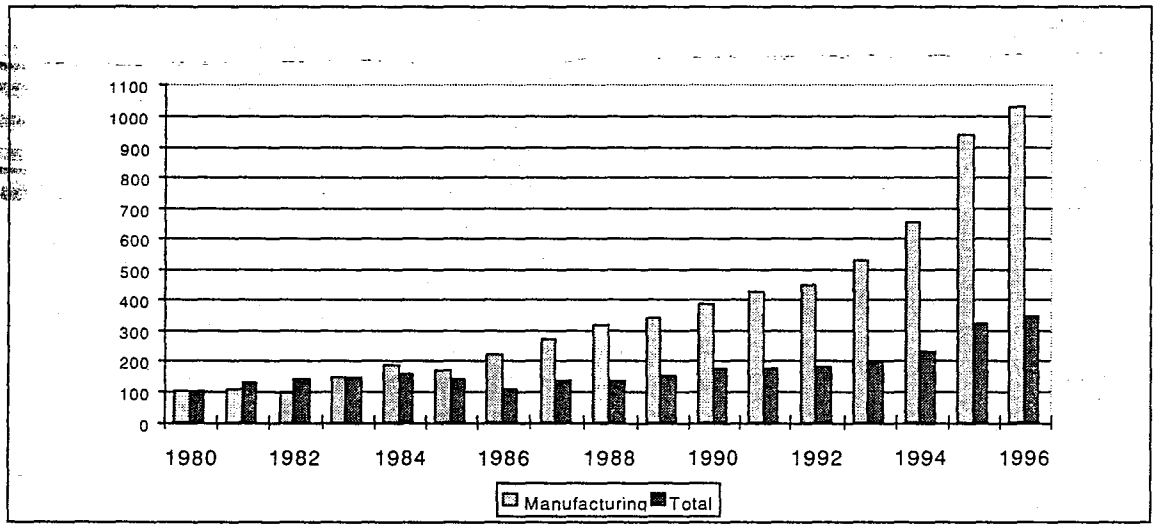
Rules of origin	Rules of origin specify that goods originate in North America if they are wholly North American. Goods containing non regional materials are also considered to be North American if the non-regional materials are sufficiently transformed in the Nafta region so as to undergo a specified change in tariff classification. Regional value content may be calculated using either the "transaction value" or the "net cost" method. The transaction value method is based on the price paid or payable for a good. The net cost method is based on the total cost of the good less the costs of royalties, sales promotion, packing and shipping.
Textiles and apparel	The three countries will eliminate immediately or phase out over a maximum period of 10 years their customs duties on textile and apparel goods manufactured in North America that meet the Nafta rules of origin. In addition, the US will immediately remove import quotas on these goods produced in Mexico and will gradually phase out import quotas on Mexican textile and apparel goods that do not meet such rules.
Automotive goods	Nafta eliminates barriers to trade in North American automobiles, trucks, buses and parts within the free trade area and eliminates investment restrictions in this sector, over a 10 year period transition.
Energy and basic petrochemicals	In Nafta the three countries confirm their full respect for their Constitutions with regard to crude, oil, gas, refined products, basic petrochemicals, coal, electricity and nuclear energy.
Agriculture	Mexico and the US will eliminate immediately all non tariff barriers to their agricultural trade, generally through their conversion to either "tariff rate quotas" or ordinary tariffs. The TQR's will facilitate the transition for producers of import sensitive products in each country. The quantity eligible to enter duty free under the TRQ will be based on recent average trade levels and will grow generally at 3 percent per year. The over quota duty - initially established at a level designed to equal the existing tariff value of each non tariff barrier - will progressively decline to zero during either a 10 or 15 year transition period, depending on the product.
Sanitary and phytosanitary measures	Nafta confirms the right of each country to establish the level of Sanitary and Phytosanitary protection that it considers appropriate
Technical standards	Nafta country will use international standards as a basis for its standards related measures
Review of Antidumping and countervailing duty issues	Nafta establishes a mechanism for independent binational panels to review final antidumping and countervailing duty determinations by administrative authorities in each country.

1. Total exports grew at an average of 8% during 1980-1996 and are forecast to reach more than US$ 100 billion in 1997 including maquiladoras. Of all exports,

manufacturing has shown the most significant dynamism, increasing its share of total exports from less than 20% at the beginning of the 1980s to almost 80% by the mid-1990s. Mining has decreased substantially its share of total exports, from 77.95% in 1982 to 17.24% in 1996.

2. Regarding manufacturing exports several issues stand out. First, the period 1980-1988 represents an AAGR of 15.5%; by 1988-96 the rate was 15.8%. However, export dynamism has been lower in the second period if we exclude 1995-1996, years of extraordinarily high export growth. Second, manufacturing exports have risen more rapidly than all other sectors during 1980-1996: in 1996, manufacturing exports were more than 1000% of their 1980 value. Within manufacturing, structural metal products and metal products, the latter including automobiles and autoparts, realized the highest AAGR for 1980-1996, 30.4% and 22.9%, respectively. Also within manufacturing, metal products increased its share of total exports from 5.15% in 1980 to 40.44% in 1996; this subsector exported more than $21 billion in 1996.

Figure 1.3 Export growth in manufacturing and the economy (1980=100)[4]



3. As with exports, the evolution of imports for 1980-1996 has been characterized by deep structural changes: total imports increased from US$19 billion in 1980 to US$52 billion in 1996, an AAGR of 6.2% and more than 250% of 1980 imports levels, which were themselves relatively high due to the oil-boom,
4. During the liberalization period, imports grew more rapidly than during any other prior period; during 1980-1988 total imports had an AAGR of 0.8%; they grew at it

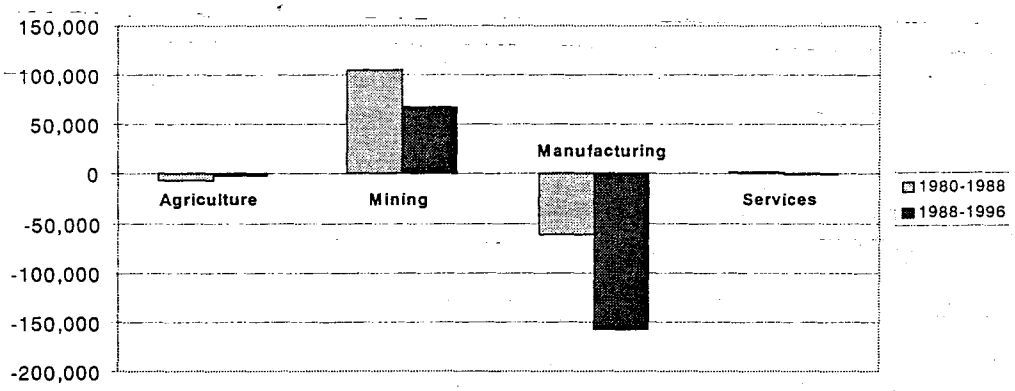
[4] Source: INEGI.

12% between 1988-1996. These tendencies have been strongly influenced by the performance of manufacturing, which increased its share of total imports from 87.9% in 1980 to 93.6% in 1996; agriculture's share of total imports fell over the same period. Within manufacturing, the import dynamism of the more traditional subsectors, such as textiles and apparel and leather is the strongest. Nevertheless, as with exports, imports are highly concentrated in a few subsectors, particularly metal products, which includes automobiles and autoparts; this subsector has accounted for over 50% of total imports since 1991.

5. Due to the 1994 crisis, total imports fell by 19.4% in 1995. However, as a result of the slow economic recovery during 1996, total imports, particularly in manufacturing, increased by over 10%.

The evolution of exports and imports is clearly demonstrated in the trade balance during 1980-1996. The trade balance surplus for the economy during 1981-1987, necessary to service the external debt, has been negative since 1988, peaking in 1994. As Figure 1.4 clearly indicates, the trade deficit during this period was almost exclusively a result of the performance within the manufacturing sector. Manufacturing carried a trade deficit throughout 1980-1996, even during the crises of 1982, 1986-1987 and 1995-1996, and accumulated a deficit of more than $210 billion during this period. The metal product sector substantially reduced its trade deficit, but is still the subsector with the highest trade deficit: it increased from $8.3 billion in 1980 to $16 billion in 1994, and fell to $5.2 billion in 1996. This sector alone ran an accumulated trade deficit of more than US$150 billion during 1980-1996, which represents more than 150% of the total Mexican trade deficit.

Figure 1.4 Trade deficit or surplus by sector (US$ millions)[5]



[5] Source, INEGI.

These tendencies are indicators of one of Mexico's most significant challenges during this decade: its high import dependency, particularly of the most dynamic sectors during growth periods. This "import-oriented industrialization" (Dussel Peters 1996) is also reflected in the trade balance / GDP coefficient, i.e. the relationship between net exports and their value added. The coefficient for the whole economy turned sharply negative at the end of the 1980s, and fell during 1995-1996. It is interesting to observe that manufacturing's coefficient has been negative and relatively high - up to -42.42% in 1992 - during 1980-1996. The coefficient was also negative (-15%) during the crisis of 1995-1996. This evolution reflects both the high import-dependency of the sector, which has not been overcome since the beginning of ISI, as well as the inability of this sector to generate linkages with the rest of the Mexican economy. As mentioned earlier, this data does not include maquiladoras, which would strongly and negatively increase the coefficient.

1.3 Privatization: the Lean State

The privatization of Mexico's state enterprises, which began in 1983, has accelerated since 1989. It represents one of the main macroeconomic policies that were undertaken to induce microeconomic and private sector structural change. Privatization was undertaken to increase the role of the private sector in the economy but was also a crucial element of various structural adjustment and stabilization programs which called for less state involvement in the economy. As well, privatization became an important source of revenue for the government, from which it received US$23.7 billion between 1989-1993 (Rogozinski 1993). Although the absolute number of state enterprises fell drastically - from 1,155 in 1982 to 210 by the end of 1993 and less than 150 in 1996 - the privatization of commercial banks and Telmex, which together accounting for 78.1 percent of the total revenue from privatization between 1989-1993, were the most significant.

This process has continued and since 1995 several ports have been privatized. In 1996 the government started privatization of the secondary petrochemical section of PEMEX and of important parts of the railway system. In future, there is the possibility of continuing to privatize sectors such as airports, telecommunications, natural gas distribution, transportation and other infrastructure services (Banco de México 1996).

Table 1.3 Privatization: Mexico and various other countries

	Airlines	Railways	Electricity	Steel	Telecom
Mexico	PR	TBP	TBP	PR	PR
United States	P	P	M	P	P
Germany	S	S	M	P	S
France	S	S	S	S	S
Italy	S	S	TBP	PR	TBP
United Kingdom	PR	TBP	PR	PR	PR
Australia	TBP	S	S	P	S
New Zeland	PR	PR	S	PR	PR
Chile	PR	PR	PR	PR	PR
Korea	S	S	S	S	S

M. Mixed private and public ownership. P. Private ownership. PR. privatized. S Public ownership. TBP to be privatized by end 1996. Partly privatized (minority stakes).
Source: OECD, 1997

1.4 The Role of Foreign Investment in Globalization

Up to 1972, the Law to Promote Mexican Investment and to Regulate Foreign Investment and a prior 1944 presidential decree gave the government the discretionary power to determine the level of required national ownership and protect certain activities and sectors from foreign investment. However, in 1984 the Mexican government changed the regulations to allow up to 100 percent foreign ownership in specific sectors; applications were reviewed by the National Commission for Foreign Investment (CNIE).

A subsequent May 1989 decree was primarily addressed to small and medium-sized firms. It permitted automatic 100 percent foreign ownership if foreign-financed investments of less than US$100 million showed a positive balance in their current account for the first three years, could guarantee employment and abide by existing environmental protection laws. Moreover, 100 percent foreign ownership was permitted in 698 of 754 activities, 28 allowed minority participation, 11 allowed up to 100 percent foreign ownership with the previous agreement of the CNIE; only 19 activities were prohibited from foreign ownership or control. Similarly, up to 49 percent foreign ownership in the financial sector and 34 percent in commercial banks was allowed if authorized by the CNIE. Foreign investment in the automobile sector was subject only a trade balance restrictions and limitations on the degree of vertical integration in automobile production. Laws governing technology transfers and intellectual property rights were changed in 1987, 1990, and 1991, permitting

unconditional imports of technology and unlimited royalty payments (SECOFI 1994/a).[6]

The decree of December 27, 1993 further relaxed the restrictions on foreign investment in Mexico. Only 13 activities were exclusively reserved for the state, 6 for Mexican investors, while in a range of sectors - such as agricultural cooperatives, national airports, insurance companies and credit unions, and harbor services - between 10 and 30 percent foreign investment was allowed if approved by the CNIE. The new framework also allowed for a more profound deregulation of administrative matters regarding foreign investment, and required the CNIE to respond to foreign investor applications in less than 45 days, otherwise, applications were granted automatically.

NAFTA has significantly changed investment-related issues, and provides an enlarged definition of investment parameters. Each nation must treat investors and their investments on no less favorable terms than national investors. More importantly, new performance requirements, such as export levels, minimum domestic content, trade balancing, and technology transfer are not allowed, while most existing requirements of this type are to be phased out over the next 10 years. Certain provisions allow Mexico to limit foreign investment in its energy and railroad sectors.

Table 1.4 Investment flow financing of Mexico's capital account, 1982-1993 (US$ millions)

Year	Capital account	Debt flows	Investment flows	% of IF/ C. account
1982	9752.7	8095.2	1657.5	17.0
1983	-1416.4	-1876.9	460.5	n.s.
1984	38.9	-352.2	391.1	n.s.
1985	-1809.5	-2300.0	490.5	n.s.
1986	1836.8	314.8	1522.0	82.9
1987	-575.8	-3823.4	3247.6	n.s.
1988	-1488.4	-4083.0	2594.6	n.s.
1989	3037.3	-492.9	3530.2	116.2
1990	8163.6	3535.9	4627.7	47.7
1991	24940.0	7436.0	17504.0	70.2
1992	26542.3	4138.7	22403.6	84.4
1993	30882.3	-2449.4	33331.7	108.1
1994	14584.2	20254.2	19154.7	131.3
1995	15112.0	20068.9	-3174.8	-21.0
1996	3848.0	n.a	21485	n.a
1982-1995	129600.0	48465.9	107740.9	83.1

n.s. non significant.

Source: Banco de México. Indicadores Económicos, Macroasesoría, 1997.

[6] The specific cases of automobiles and autoparts will be discussed in the following section.

Today foreign investment plays an important role in the Mexican economy. Since the emergence of the debt crisis in 1982 the government has decided to redefine the role of foreign investment in the Mexican economy: switching the balance of payments financing from debt flows to foreign investment. In fact investment flows became the driving force of foreign savings during the period 1982-1995 as shown in Table 1.4.

1.5 Reforming Industrial Policy

Since the 1940s and throughout the ISI period, subsequent administrations used industrial policy to modernize Mexico's economy and target specific sectors, activities and firms. Manufacturing was regarded as the crucial sector underlying the modernization of Mexican society. The government implemented a great variety of industrial programs to promote the consolidation and growth of production-chains, exports, import substitution, and obtain foreign exchange (Péres Núñes 1990; CEPAL 1992; Dussel Peters 1997).

This active interventionist policy has been slowly abandoned since the beginning of the 1980s, particularly since the Salinas administration and the National Program of Industrial in Foreign Modernization (*Programa Nacional de Modernización Industrial y del Comercio Exterior), 1990-1994* (PRONAMICE). In general, industrial policy during this period was characterized by the view that macroeconomic change would induce microeconomic and sector change, increasing both efficiency and exports. Industrial policy was considered a secondary tool to be implemented horizontally, i.e. for all manufacturing activities and firms equally, and not as an active, selective strategy targeting specific sectors or firms. Most of the ISI industrial policy mechanisms were eliminated, replaced by market-driven and private mechanisms, particularly in the area of financing. In general, industrial policy focused on deregulation, the rapid removal of tariff and non-tariff barriers, regulation standardization, market access and the provision of information and support to potential exporting firms. Most sectoral programs were eliminated (Pérez Motta 1991; Sánchez Ugarte *et. al.* 1994; Dussel Peters 1997).

After the 1994 crisis the Zedillo administration formulated a new industrial program to face the profound crisis in the manufacturing sector. The Program for Industrial and Foreign Trade Policy (*Programa de Política Industrial y Comercio Exterior)*, unveiled in May of 1996 as part of the *Plan Nacional de Desarrollo 1995-2000*, stresses that manufacturing's exports must grow annually by 20%. As in the prior *sexenio*, the industrial policy emphasizes the need for stable macroeconomic conditions, particularly in the financial sector, to promote technological infrastructure, economic deregulation, and overall competitiveness. As in most of the prior industrial programs,

small and medium firms are promoted by special mechanisms. In contrast to the economic preconceptions and industrial policy of the previous administration, the Zedillo industrial policy acknowledges that market mechanisms *per se* will be insufficient to generate growth conditions for manufacturing and proposes a more active and selective industrial policy. The program highlights several new priorities for 1996-2000:

- Exports will be the pillar of economic growth for manufacturing and the rest of the economy.
- Productive chains and industrial clusters or agglomerations should efficiently substitute for imports.
- In order to promote 1. and 2., regional and sector industrial policies will have to be implemented in collaboration with business chambers and local associations.

To December 1996, few of these guidelines have been implemented.[7] SECOFI has organized several events to develop Mexican subcontracting tier-systems and developed several information systems which offer industrial information and subcontracting opportunities (*Sistema de Información Empresarial de México*, SIEM and *Sistema Nacional de Información para el Desarrollo de la Subcontratación*). Particularly relevant is the National Network of Regional Centers for Business Competitveness (*Red Nacional de Centros Regionales para la Competitividad Empresarial)* (CRECE), a network of regional centers that provide direct and specialized support, particularly to small and medium firms. SECOFI expects to unveil 10 CRECEs by 1996 and another 22 by 1997 which, in coordination with regional private sectors, are to link potential demand and supply within Mexico. The industrial program also includes the following mechanisms:

1. Integral Program for Promoting the Use of Data Processing Technologies (*Programa Integral de Promoción del Uso de Tecnologías Informáticas para las Micro, Pequeñas y Medianas Empresas)* to promote productive linkages between software producers and small and medium firms. The program expects to finance 12,000 computer packages.
2. *Programa COMPITE*, which provides industrial engineering support to firms to enable them to increase their production efficiency; between 1995 and 1996 11 firms benefited from this program.
3. *Programa de Foros Tecnológicos*, seminars to disseminate technological information; so far one seminar, with 2,500 participants, has taken place.
4. Program for the Promotion, Rehabilitation and Consolidation of Integradora Firms (*Programa para la Promoción, Rehabilitación y Consolidación de las Empresas Integradoras. Empresas integradoras)* are small and medium firm clusters grouped

[7] See Blanco Mendoza (1996) and SECOFI (1996).

together to realize economies of scale, to access demand, and other services offered by this program, such as technology, trade, and design, among others. In 1996, 36 new *integradoras* were consolidated.

5. As an important part of industrial policy, the government has continued to support export promotion through several policy instruments (PITEX, ALTEX, ECEX, Draw Back, and maquila).

In spite of these important changes in industrial policy, the impact and orientation of the most recent industrial program is not yet clear. So far, the institutions responsible for implementing industrial policy in Mexico have shown little interest and concern in evaluating and initiating a learning process among themselves or with firms. Moreover the most critical question, the financing of the program, has not yet been solved. The *Programa de Financiamiento al Desarrollo*, which includes the mandates, financing limits and conditions under which the development financing agencies (*Nacional Financiera* and *Banco Nacional de Comercio Exterior*) will support clients, has not been made public. And, many of the activities and programs under the *Consejo Nacional de Ciencia y Tecnología* (CONACYT) are, in general, co-financed projects for large firms.

Many of these problems are related to Mexico's short-term situation and are responses to the dramatic decline in manufacturing following the 1994 crisis. Since Mexico's development banks borrow under market conditions and act as second-tier banks, it is not surprising that demand for capital under these conditions is very low, particularly in the case of small and medium firms.

Another important measure, taken by SECOFI in coordination with business chambers at the end of 1996, was the introduction of a new Law of Business Chambers and Associations (*Ley de Cámaras y Confederaciones Empresariales*). The most important issue within the new law states that in future, affiliation or membership in the chambers will be voluntary, while registration fees will be obligatory.[8] However, the law explicitly forbids that these fees are used for the maintenance and administrative costs of the chambers, i.e. they will have to charge for services and other operations. It is assumed that under the new regulations the chambers will generate more services and overall incentives for their potential members and will thus be more responsive to the needs of client firms. The results of these changes are yet to be seen. Nevertheless, there is the perception that several existing chambers may disappear and that a strong regionalization and decentralization of chambers will occur. As a result, the government may loose an important political partner in the negotiation of future *Pactos* and other agreements. Finally, there is a general perception that Mexico's industrial

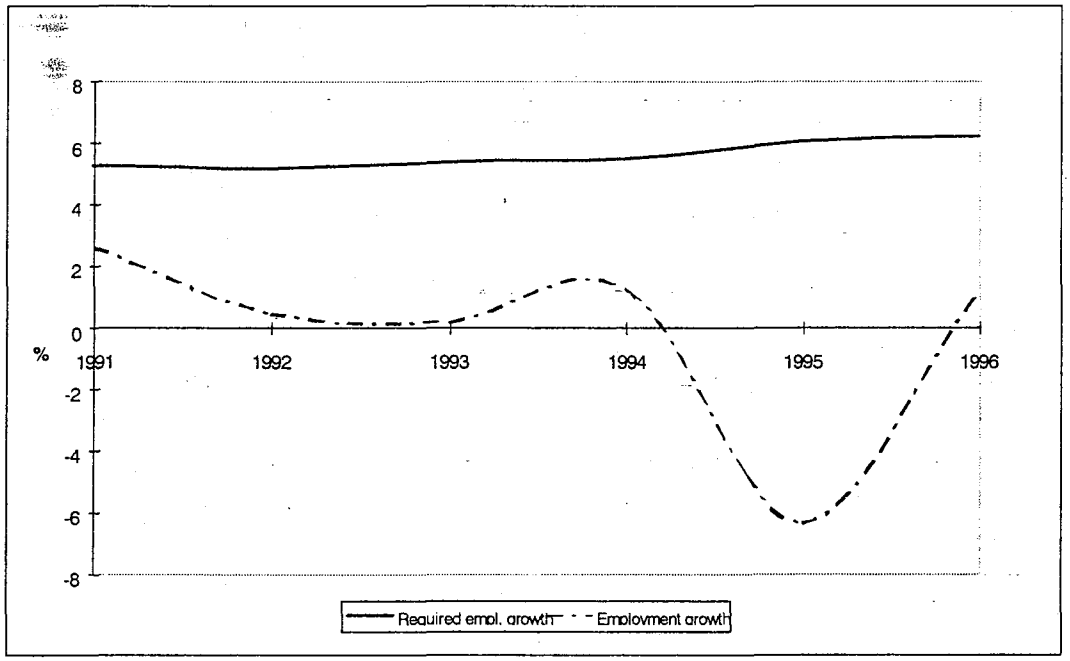
[8] These fees - which must be authorized by SECOFI and will be collected to pay for a new business data system (*Sistema de Información Empresarial Mexicano, SIEM*) - had not been established by the end of 1996. Individual business chambers will be in charge of the SIEM.

policy does not require more policy instruments; on the contrary, Mexico has experimented with many since the 1940s. However, few have been evaluated, their impacts and costs are unknown, and most importantly, they are not the result of a discussion and learning process within the manufacturing sector.

1.6 Demographic Evolution, Employment, and Real Wages

Mexico's population has been growing rapidly since 1980. Total population growth averaged 2.0% between 1980-1992 but has slowed to 1.8% since 1995. Similarly, the economic active population showed a growth of 4% during 1985-1990, but this has declined to between 3.6% and 3.8% during the 1990s. These tendencies are significant for Mexico, since both GDP and employment must grow faster than the total population and the EAP if Mexico is to recover from the effects of the prolonged economic depression.

Figure 1.5 Required employment growth and real employment growth, 1991-96[9]



Thus, one of the most critical aspects for employment is the annual growth of EAP with respect to total existing employment. The coefficient of required employment

[9] Source: INEGI.

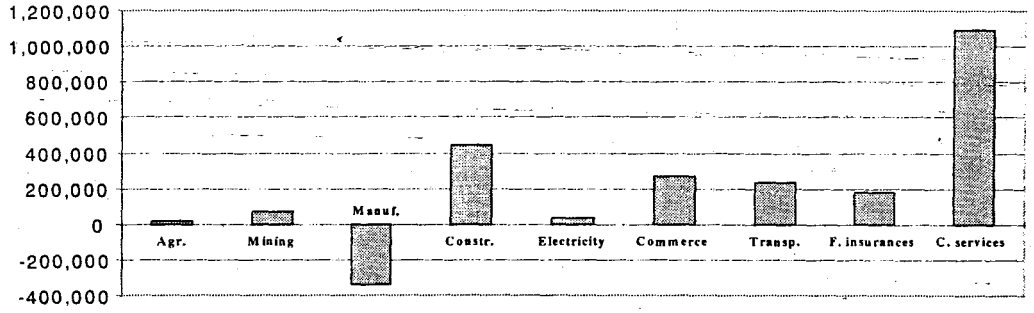
reflects the required growth in employment necessary to incorporate the growth of the EAP and thus depends on the growth of EAP and total employment. The gap - either positive or negative - between required employment growth and employment growth is important, since it highlights the basic conditions of the employment market (see figure 1.5).

Sectoral employment shows a heterogeneous development; primary activities still constitute a large portion of employment, and manufacturing has been capital intensive. Growth has been in services, of which informal activities constituted a rising share. The main features of these developments are described below.

1. Manufacturing's share of total employment fell from 12.04% in 1980 to 9.42% in 1996 and represents an AAGR of -2.35% for the period 1988-1995. With the exception of other manufacturing industries, all of its subsectors show an expulsion of employment and this is particularly pronounced for more traditional subsectors such as textiles, apparel and leather, wood and its products, and structural metal products. However, even metal products, machinery and equipment, which includes automobiles and autoparts, saw a decline in their share of total employment from 2.70% to 1.79% during this period.

2. In the service sector, community services and construction have generated the majority of employment since the 1980s, particularly for the period 1988-1996; construction had an average annual growth rate of 2.80%. This tendency reflects the low quality of the employment generated, since construction has the lowest level of real income per worker.

Figure 1.6 Employment creation by subsector, 1980-96[10]



These broad trends however, do not capture the cyclical pattern following the debt crisis. The stagnation of dependent employment between 1982 and 1986, and a very slow recovery in the following years (1 per cent AAGR) suggest that part of the

[10] Source: INEGI.

employment growth was in the informal sector. During the early years of the adjustment phase following the debt crisis, low job creation in the private sector was partly compensated by continued rapid growth of the public sector employment. However this trend stopped due to intensified fiscal consolidation from 1987 onwards and the privatization wave of the early 1990s. Within this broad portrait, the distinctive features of the Mexican labor market - the contrast between a modern sector increasingly open to foreign competition and traditional informal activities largely in the non-tradeables sector - have become pronounced since 1982. Employment has shifted from agriculture and manufacturing to services and, within manufacturing, to the maquiladoras industry. This subsector has weak links (and few spill-over effects) with other subsectors of the manufacturing industry, yet it has been the most dynamic sector of the economy. Job creation in services has occurred mainly in informal activities with a predominance of self - or family employment; employment has become more precarious," (OECD, 1997, 40).

It is important to stress that within the service sector, community services (social and personal) were the most important economic activities in the 1980s, representing approximately 30% of total employment. Transportation, storage and communications, as well as financial insurance and real estate, have significantly increased their share of total employment, particularly since the end of the 1980s.

Real wages and minimum wages have declined substantially from 1980 to 1996. Real wages had an average growth rates of -0.5% during 1980-1996. Real wages are now 61.3% of 1980 levels; minimum wages are 30% of 1980 levels. This dramatic decline of income is seen across all economic (sub)sectors: real wage levels have not risen above levels reached in the early 1980s. This decline, which has affected significantly effective demand and polarized Mexico's socio-economic structure, has sharpened since December 1994.

These tendencies indicate that Mexico's economy has been unable to provide employment opportunities for its growing labor force. On the contrary, the expulsion of employment in some sectors and the general paucity of formal sector employment opportunities between 1980-1996 has pushed most of the growing labor force to search for employment in other activities, particularly in the informal sector and through migration to the United States. The apparent tertiarization of Mexico's economy is a result of the falling share of total employment in agriculture and manufacturing, and employment generation in specific service subsectors, such as construction and community services. Together, these structural changes reflect a decline in the quality of employment in Mexico.

1.7 Low Investment: the Challenge Ahead

Historically, Mexico's saving and investment ratio has been low and has fluctuated strongly with political and economic variables. Since 1982 Mexico's savings ratio (savings / GDP) has been below 20%. While it rose above 18% during 1980-1981, it fell sharply during the crisis of 1986-1987 and again since 1995. The savings ratio reflects the high and increasing dependence of Mexico's economy on external savings. The change in economic strategy, beginning with the Salinas administration in 1988, and unusually high real interest rates have resulted in an increasing share of external savings and a substitution of savings from domestic to external accounts. The gross fixed investment ratio realized a similar performance during 1980-1996, reaching a plateau in 1980-1981 and falling since than continuously.[11] In response the Zedillo administration has emphasised the importance of the savings and investment ratio, which it hopes to increase substantially by the year 2000. The gross fixed investment ratio has also suffered under liberalization: the privatization of public enterprises significantly reduced the public sector's share of gross fixed investment, which fell as a percentage of GDP, from 10.7% in 1980 to 3.6% in 1996. However, contrary to the government's expectations the private sector's share of gross fixed investment, as a percentage of GDP, is still below the level reached in the early 1980s.

These changes in the investment ratio are also partly explained by the dynamism of foreign investment. From 1980-1988 foreign investments increased slowly. However, between 1988-1994 foreign investments, particularly portfolio investments, increased dramatically accounting for more than US$15 billion. This was mainly due to the attractiveness of Mexico's real interest rate for portfolio investment. This growth reflects one of the most critical issues of Mexico's economic strategy: the instability and precariousness of Mexico's growth process, since it is largely dependent on short-term portfolio investment to balance the current account deficit.

Table 1.5 Savings and investment as a percentage of GDP

	1990	1991	1992	1993	1994	1995
Gross capital formation	22.6	23.4	24.4	23.2	23.5	19.4
Gross domestic savings	19.6	18.4	17.1	16.8	15.6	19.2
Private	13.2	10.6	10.5	11.9	12.0	14.9
Public	6.5	7.8	6.6	5.0	3.7	4.3
Foreign savings	3.0	5.0	7.3	6.4	7.8	0.3

Source: Banco de México

[11] By definition private and public gross fixed investment are not equal to total gross fixed investment (see table 1), since the latter also includes depreciation and inventory changes.

1.8. External Debt

External debt triggered Mexico's 1982 economic crisis. Since then, largely due to foreign investment flows, the external debt and its service has apparently disappeared as a pressing problem facing the government (Gurría Treviño 1993). The improvement of several indicators regarding external debt and its service have apparently alleviated the explosive situation of 1982: total external debt / GDP, total external debt / exports and total external debt service / exports have fallen significantly from their levels of 1982-1983. Prepayment of obligations to the US in early 1997 has reduced the debt pressure, and improved the long term profile of the debt structure.

Total external debt has increased from $57.5 billion in 1980 to more than $170 billion in 1996 and is reflected in the increasing total external debt / GDP coefficient. Throughout this period Mexico has paid $300 billion in external debt service, an amount more than twice as large as the total increase of the external debt in the same period. In 1996 alone Mexico's total external debt service is estimated at 33.6 billion or around 13.65% of its GDP. The economic, social and political costs for this level of debt service are high. As well, the composition of the total external debt has changed: the private sector's external debt accounted for 12.7% of the total external debt in 1980 but has increased to more than 45% in 1996. This issue, one of the main causes of the 1982 debt crisis, reflects the incapacity of the private sector to service its external debt. It also highlights the potential for another crisis, particularly if it is considered that much of this debt has been borrowed directly from international capital markets at relatively high real rates of interest. Thus although total external debt service / exports of goods coefficient has declined, it still accounts for more than 35% of exports and will critically depend on both rescheduling the external debt and continued flows of foreign investment.

In 1996 the Mexican authorities attempted to consolidate its 1995 debt management. Three considerations have prevailed in their strategy: to further lengthen the average maturity of the public debt, to lower funding costs for the public sector and to reduce the vulnerability of debt servicing to swings in exchange rates and interest rates. With the reimbursement in January 1996 of all remaining *Tesobonos* held by the public, an increase of the share of two year bonds in total holdings and large issues of three to ten years bonds on international capital markets, some progress was made in extending the public debt amortization schedule.. Three noteworthy operations were undertaken in the first half of 1996 as part of the government's operations: i) in April an offer was made to exchange Brady Bonds for new 30 year Global bonds issued by the Federal Government, ii) the issue in May of government *Udibonos,* three year bonds denominated in UDIs, units of account indexed to inflation, - which are compatible with the existing price indexed *Ajustabonos*, iii) the repayment in June of part of the US

government loan, for an amount close to US$5 billion, an operation financed with resources borrowed at lower costs and longer maturity than the US funds. This strategy continued and in January 1997 government realized the cancellation of the US loan. With this action the external debt profile has improved, reducing future servicing and improving the long-term stability of the economy.

1.9 Macroeconomic Challenges for Mexico

Since the adoption of drastic stabilization measures in the wake of the collapse of the peso in 1994, the Mexican economy has undergoing a painful recovery process. Economic growth resumed in 1996 (4.5%), supported initially by booming exports and strong investment by outward-oriented enterprises. More recently there have been some signs that the recovery is becoming more broadly-based. The contraction of domestic demand and improved competitiveness brought the current account to balance. With the support of the international financial package, Mexico met its short term external obligations and accumulated some foreign reserves, although these are in large part borrowed reserves.

The speed and extent of deregulation and market opening pursued since the mid-1980s rapidly exposure the economy to foreign trade and increased the degree of competition in certain sectors. The transformation has had important implication for jobs and incomes, although it brought some social disruption, particularly in the forms of poverty and informal activities. As employment creation in the formal sector has been insufficient to meet fast growing supply, people have moved to informal activities or migrated abroad or back to subsistence occupations in rural areas. Employment outcomes in part resulted from rationalization by the industrial sector. But policies and institutional setting may also have contributed to this pattern of employment by creating biases against job creation in the formal sector. Future success will require the introduction of a range of measures that favor formal activity. In the long-term only way to enhance jobs and incomes and, thereby alleviate poverty, is by developing human capital. This requires developing greater opportunities for more and equal access to adequate education and training, regardless of regions or income categories.

Macroeconomic adjustment has been at the forefront of the policy agenda since the currency crisis; long-term or comprehensive programs to solve structural problems have not been put forward. In order to cope with these structural problems, a new institutional setting must be designed the aged institutions that exist with reduced effectiveness. To cope with inequality between activities and lack of productive linkages, regional and local institutions must be developed to increase the investment/savings ratio that has long been deterred, obstructing the development of new entrepreneurial forces at the

local level.

One area that requires immediate and profound restructuring is the financial sector. Although relatively unscathed in the wake of the peso crisis, due to government intervention, the cost of the rescue operation was high by international standards. The fiscal cost of bank assistance programs were initially estimated by the government to be 90 billion pesos, the equivalent of 5 percent of GDP. Additional support programs in 1996 added about 60 billion pesos to the original cost. Total fiscal cost thus stands at almost 8 percent of GDP in 1996, according to official estimates.

Table 1.6 Fiscal cost of bank and debtor support programs (as a percent of 1996 GDP)

	Billion pesos	% of GDP
Debt restructuring in investment units	21.6	1.0
Support to small debtors	13.4	0.6
Direct support to banks	48.4	2.1
Capitalization and loan purchase schemes	35.0	1.6
Restructuring of tolls roads	14.1	0.6
Mortgage programs	27.2	1.2
Agricultural and fishing sector program	14.2	0.6
Small and medium-sized firm support program	7.4	0.3
Total	181.1	8.0

Source: Banco de Mexico

Despite improvements, Mexican banks remain fragile. If the goal is to enhance financial intermediation, the financial system has to be reformed and local intermediaries must be developed. Investment banks, postal savings schemes and other community development institutions are required to promote solid support for local entrepreneurs; at the same time they could become the cornerstone for increased savings. Foreign investors are opening financial intermediation services in Mexico. If regulation is not strengthen, this could become a new source of instability for the economy.

Mexico faces several grand challenges during the remainder of the decade. The close connection between the political and economic spheres suggests that political events will continue to have an important effect on economic evolution until the end of the century. The economic structures resulting from liberalization, compounded by the 1994 crisis, have left a profound social deficit that Mexico must overcome if it is to remain stable and realize the benefits of liberalization. The recovery of real wages and domestic demand, as well as employment generation are challenges that the present

and future administrations will have to face. Mexico will have to strengthen, through institutional and financing mechanisms, the expansion of its export and manufacturing sectors to increase value-added chains as well as employment and technology transfers, among other issues. However, present economic policy grants priority to other issues, particularly the financial sector and privatized banks. It is within these contradictions and challenges that Mexico will emerge into the 21 century.

Chapter II
LIBERALIZATION AND THE DEVELOPMENT OF THE AUTOMOBILE INDUSTRY[1]

The automobile industry has been the most successful sector of Mexico's economy throughout the 1980s and the principal beneficiary of trade liberalization. It has successfully made the transition to an open economy, and increased its intra-industry trade and integrated with the rest of the North American market before and particularly under the NAFTA. Even under ISI, the automobile industry was regarded by some policy makers as the main pillar of Mexico's economy. The automobile industry was favored throughout Mexico's industrialization process, with either direct subsidies and/or protection from foreign competition. Moreover, since the mid-1980s and the 1994 crisis it has, more than all other sectors, implemented the deepest structural changes.

2.1 The institutional setting for automobile industry development

The first automobile decree (Decree on Modernization and Development of the Automotive Industry) originated in a presidential decree issued in 1962. The Decree originally served as a policy instrument to implement the government's import substitution strategy. It was amended, including various additions in 1972, 1977, and 1983 to reflect the economic situation of the country. During this period, the Decree consistently pursued its objective of promoting import substitution for the industry, which included bans or restrictions on imports of certain parts and assembled cars. In 1986 Mexico became a GATT member and started to liberalize its trade policy. The Automobile Decree issued in December 1989 marked the end of the period characterized by protectionism and import substitution. Under the NAFTA the Decree was amended to agree with the objectives of increasing regionalism and market integration.

Since the 1989 decree, the automobile industry has operated in an environment of transition. Imports of assembled cars and autoparts were approved, but it did not mean complete liberalization. Rather, it opened the door to imports, but on a gradual basis, to control imports for at least a decade. This decree will be effective until 2003 and it is unknown at this moment whether it will be entirely abolished in 2004 or if some

[1] Most of the data used for this section, unless otherwise specified, was provided by Asociación Mexicana de la Industria Automotriz (AMIA), which is not necessarily compatible with data from other sources such as INEGI and IMSS.

portions will survive in the form of local legislation. Presently, the automobile decree regulates the automotive industry in two ways: directly and by requiring each company to maintain a positive trade balance. Legislation has been the framework under which producers have decided their investment and production levels. In this sense, the development of the automobile industry has been state oriented, evolving from protective promotion to liberalization (see also Moreno 1994; Zapata et. al 1994).

Since the 1962 decree the main issue has been *how to increase the level of local inputs by assemblers* given that they were owned by transnational corporations (TNCs) and presented a high imported content. Under this decree, assemblers were forced to gradually develop domestic supplier chains. In return, the government restricted competition by regulating the number of new assemblers that could enter the market.

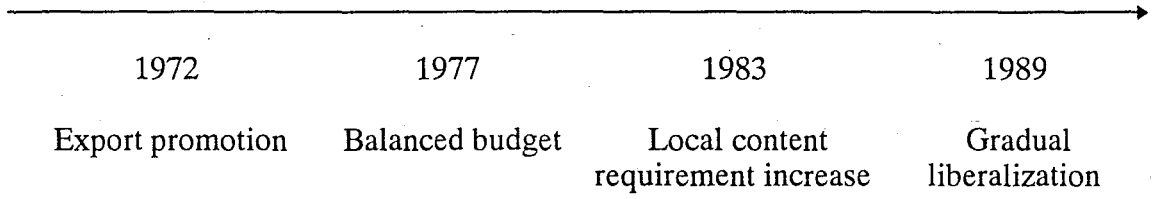
The formula to protect the market during the period of 1962 through 1977 was a combination of legislation outlining *quota production and price restrictions,* which adversely affected the development of a market-oriented industry and attempted to support the automobile industry under the infant-industry argument. Quota production worked against the idea of promoting the maximization of profits through volume. As a result, TNC plant sizes were built below optimal level, incurring in higher costs that were reflected in a reduced expansion of the market. With time, protectionism became obsolete, which reduced its regulatory purpose and led to industry stagnation. This situation was not corrected until the beginning of the nineties (after the publication of the 1989 decree), with the introduction of a more market-oriented formula that induces producers to maximize volumes and minimize prices. However, and as we shall see in this and in the next chapter, these recent liberalization process also involves deep changes in the industrial organization of the regional automobile sector.

The diagrams in this page summarize how legislation has evolved to support the auto industry development over the last 35 years, expanding output from 66, 637 units in 1962 to 935,017 units in 1995 and creating a sectoral trade surplus (see also Table 2.22).

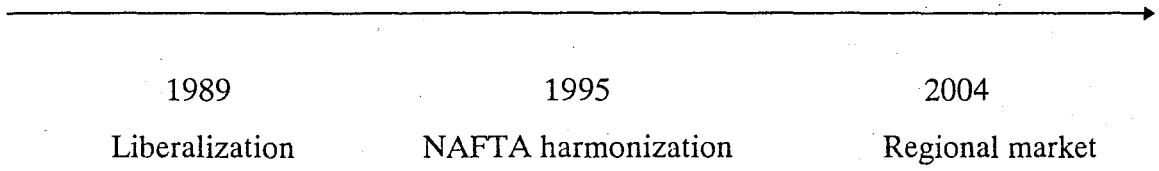
1962	1977
Quota and price determination	Price controls and quota abolishment

An additional feature of the legislation was *export promotion,* adopted in 1972. This idea later evolved to include foreign exchange balance budgets (1977), which induced the terminal industry to develop exports and reduce the pressure on the balance of payments. In 1983 a new policy approach mixing export promotion and local content emerged as the new way to regulate the market. This mechanism evolved as imports were slowly liberalized and production restrictions on models and producers were

relaxed.



After the opening of the market in 1989, regulation focused on how to gradually liberalize the national market within the regional limits of the NAFTA. In May 1995 the government established legislation that outlined the liberalization process, to be completed by 2004. Mexican autoparts producers were afforded protection (based on valued added requirements for assemblers, trade balances and tariff reductions) that will be lifted gradually, forcing autoproducers to integrate rapidly to the world market.



2.2 The automobile industry since the 1980s

A deep structural change in Mexico's automobile exports can be observed in Table 2.1. Item 781 (passenger automobiles) has increased substantially its share over total imports from OECD nations (or market share) since 1980, accounting for 2.65% in 1994. Moreover, the contribution of this item, i.e. the share of the exports of item 781 over Mexican total exports to OECD, has expanded dramatically: from less than 1% in 1980 to 8.17% in 1994.

It is significant to observe that this item has been very dynamic in terms of demand from OECD nations, since it increased its share of total imports by OECD nations throughout the period, i.e. the contribution of this sector increased from 3.85% in 1980 to 6% in 1994. From this perspective, Mexico's automobile industry has been extremely successful in integrating and adapting to the new domestic and international climate. Interestingly, this item also shows an increasing specialization, i.e. dividing the contribution by the sector contribution, from almost zero in 1980 to 1.36 in 1994.

Table 2.1 Mexican automobile export performance to OECD nations, item 781 (passenger automobiles), 1980-1995

Year	Market Share	Contribution	Specialization	Sector's Contribution
1980	0.10	0.31	0.08	3.85
1990	1.53	6.31	1.07	5.89
1994	2.65	8.17	1.36	6.0

Source: based on *Competitive Analysis of Nations (CAN)*, ECLAC.

2.2.1 Automobile production

According to INEGI, automobile production has substantially increased its share of total GDP since 1980, from 0.8% and 3.7% of total and manufacturing's GDP in 1980, respectively, to 1.1% and 5.4% in 1996.[2] Moreover, automobile industry has had a high average annual growth rate of 5.6% for the period. After the mid-1980s the Mexican automobile industry was one of the fastest growing in the world and has more than doubled its production during 1980-1995 (see Table 2.2). Mexican car production output represented 7.8% of US production and 38.6% of Canadian production in 1995. Internationally, Mexico was the 13th largest producer in 1995, and 11th in 1996. Mexico's vehicle production dynamism is clearly reflected in high average annual growth rates, particularly if compared to the US and Canada.

Throughout the period 1980-1996 there was a high, positive association between total GDP growth and automobile production; this association, however, has changed significantly since the 1990s. Table 2.3 reflects some of the most significant structural changes of automobile production during the period 1980-1996:

1. The rapid growth of vehicle production, an average annual growth rate of 5.82%.
2. The impressive growth of exports, an average annual growth rate of 28.20%.
3. The increasing substitution of automobile production from domestic sales to exports. This process continued throughout the period, but has accelerated since 1994.

It is important to keep in mind that the shift of automobile production from domestic sales to exports is recent. 1995 was the first year that exports surpassed production for the domestic market; exports' share in total production was of 83.36%.

Table 2.4 also reflects the specialization of Mexico's automobile industry: a high concentration in the production in cars and light commercial vehicles. The share of trucks and buses, measured in units, has never accounted for more than 2% of production during 1980-1996. But, the production of light commercial vehicles has increased significantly its share over total production, particularly since 1994.

[2] According to INEGI sector 56 refers to automobiles.

Passenger cars have constantly been more than 60% of total automobile production during the period.

Table 2.2 Regional production of cars and annual growth rate of production, 1980-1995

Year	United States (1000)	%	Canada (1000)	%	Mexico	%
1980	8,010		1,324		490,006	
1981	7,943	-0.84	1,289	-2.64	597,118	21.86
1982	6,986	-12.05	1,276	-1.01	472,637	-20.85
1983	9,225	32.05	1,525	19.51	285,485	-39.60
1984	10,925	18.43	1,829	19.93	357,998	25.40
1985	11,653	6.66	1,933	5.69	458,680	28.12
1986	11,335	-2.73	1,854	-4.09	341,052	-25.64
1987	10,925	-3.62	1,635	-11.81	395,258	15.89
1988	11,214	2.65	1,949	19.20	512,626	29.69
1989	10,874	-3.03	2,002	2.72	641,281	25.10
1990	9,783	-10.03	1,928	-3.70	820,576	27.96
1991	8,811	-9.94	1,888	-2.07	989,373	20.57
1992	9.729	10.42	1,961	3.87	1,080,553	9.22
1993	10,898	12.02	2,246	14.53	1,080,572	0.00
1994	12,263	12.53	2,322	3.38	1,122,700	3.90
1995	11,985	-2.27	2,417	4.09	935,017	-16.72
1980-90		2.75		4.38		8.79
1990-95		2.12		3.35		7.48

Source: AAMA and AMIA

Table 2. 3 Vehicle production, domestic sales and exports, 1980-1996 (units)

Year	Production \a	Domestic sales \b	Exports
1980	490,006	464,411	18,245
1981	597,118	571,013	14,428
1982	472,637	466,663	15,819
1983	285,485	272,815	22,456
1984	357,998	330,287	14,300
1985	458,680	391,649	60,488
1986	341,052	258,835	68,884
1987	395,258	247,944	162,743
1988	512,626	341,919	174,246
1989	641,281	445,864	195,467
1990	820,576	550,315	278,558
1991	989,373	642,981	365,354
1992	1,080,553	706,846	391,050
1993	1,080,572	603,340	493,194
1994	1,122,700	624,001	575,031
1995	935,017	188,799	778,678
1996	1,211,297	333,920	970,874

\a Exports included.
\b Imports included.
Sources: SECOFI, DGI with data from AMIA.

Table 2.4 Vehicle production, by type (1980-1996) (units) \a \b

Year	Total	Cars	Light commercial vehicles	Trucks	Buses
1980	490,006	303,056	178,456	6,819	1,675
1981	597,118	355,497	231,963	8,217	1,441
1982	472,637	300,579	167,430	3,305	1,323
1983	308,485	207,137	77,413	579	356
1984	357,998	244,704	110,395	1,653	1,121
1985	458,680	297,064	155,877	3,740	1,651
1986	341,052	208,469	129,767	1,279	1,223
1987	395,258	277,408	116,249	1,392	209
1988	512,626	353,783	156,039	2,198	603
1989	641,281	438,632	198,470	3,498	680
1990	820,576	598,093	217,099	3,853	1,521
1991	989,373	720,384	258,047	8,689	2,248
1992	1,080,553	776,185	295,976	6,299	2,093
1993	1,080,572	835,090	237,085	5,158	3,239
1994	1,122,700	856,563	258,914	6,199	1,015
1995	935,017	699,067	234,805	530	184
1996	1,211,297	797,682	403,764	9,851 \b	

\a Export production included

\b Includes Buses

Sources: SECOFI, DGI with data from AMIA and ANPACT

Mexico's car production for the domestic market, i.e. not including exports, trucks and buses, shows strong a cyclical pattern (see Tables 2.5 and 2.6). After the crisis of 1982 and the "lost decade" of the 1980s, the sector was only able to recover production levels similar to those of 1981 ten years later. After a strong recovery of the sector between 1988 and 1992, vehicle production fell again. 1992 represents the year of highest production, accounting for 681,111 units. Since then production has fallen, particularly in 1995, when total production for the national market was only 154,591 units. In spite of the recovery in 1996, total car and light truck production for domestic market is, with few exceptions, at its lowest level since the 1980s.

Truck production for the domestic market has undergone important changes during the period (Table 2.6). Both the crises of the 1980s and the crisis of 1994 had a profound impact on light truck production for the domestic market. In 1995, for example, it reached its lowest production level since 1980. During the 1980s the Big Three were the main producers, with a share above 65%, with Chrysler de México S.A. the lead producer, followed by Ford Motor Company and General Motors de México. However, since the middle of the 1980s, General Motors and Ford have produced the majority of light trucks for this market segment. This tendency has continued after the crisis of 1994. Moreover, several important truck producers disappeared - Fábrica de

Autotransportes de México, S.A. de C.V. in 1990 and Renault de México, S.A. de C.V. in 1987 - and several new firms emerged: Kenworth Mexicana, S.A. de C.V. and Mercedes Benz México, S.A. de C.V. in 1990, among them. The growth of Nissan has successfully challenged the position of the Big Three and has become, since 1996, the third producer, with a 23.7% share of Mexico's light truck market.

The US Big Three, together with Volkswagen and Nissan, dominate the Mexican motor industry. In 1995 they equaled 98.5% of total car and light truck production for national market. Recently Mercedes Benz, BMW and Honda - all of which produce exclusively for the domestic market - entered the market. The former two are exclusively oriented towards the high end of the market. There were certain fatalities within the market: during the 1980s two automakers - Renault and Vehículos Automotores de México - shut down due to the fall in domestic sales in the early 1980s.

Table 2.5 Passengers car production for the domestic market by manufacturer, 1980-1996 (units)\a

Year	BMW	Chrysler	Ford.	General Motors	Honda	Mercedes Benz	Nissan	Renault	VAMSA	Volkswagen	Total
1980	-	56,838	37,755	16,999	-	-	35,648	21,615	21,168	113,033	303,056
1981	-	58,110	54,594	27,357	-	-	47,449	22,204	23,904	121,879	355,497
1982	-	39,143	36,797	21,250	-	-	48,824	21,319	6,950	126,296	300,579
1983	-	26,203	26,851	14,996	-	-	40,541	19,057	1,400	78,089	207,137
1984	-	35,713	25,817	17,431	-	-	43,979	18,635	-	90,003	231,578
1985	-	39,032	38,372	18,667	-	-	52,284	19,779	-	78,826	246,960
1986	-	27,459	20,016	14,260	-	-	44,541	2,660	-	60,631	169,567
1987	-	23,174	15,805	11,518	-	-	48,286	-	-	43,653	142,436
1988	-	48,800	32,454	15,089	-	-	60,076	-	-	52,362	208,781
1989	-	57,058	47,580	22,839	-	-	70,005	-	-	76,256	273,738
1990	-	52,472	45,987	32,782	-	-	79,953	-	-	134,357	345,551
1991	-	64,567	55,021	38,862	-	-	77,697	-	-	142,411	378,558
1992	-	83,724	68,167	49,590	-	-	95,776	-	-	131,812	429,069
1993	-	57,636	52,533	50,534	-	-	98,946	-	-	129,854	389,503
1994	-	46,816	26,804	41,962	-	590	92,286	-	-	144,517	352,975
1995	245	15,624	9,317	14,985	135	814	28,039	-	-	33,414	102,328
1996	487	19,566	13,889	42,263	1,194	1,043	32,104	-	-	53,105	163,651
% of 1996 total	0.30	11.96	8.5	25.9	0.7	0.6	19.6	0	0	32.5	100.0

\a Exports not included

Sources: SECOFI, DGI with data from AMIA

Table 2.6 Truck production for domestic market by manufacturer, 1980-1996 (units) \a

Year	Chasises y Autopartes Oshmex	Chrysler de México, S.A.	Dina	Famsa	Ford	GM	Kenworth Mexicana	Mercedes Benz	Nissan	Renault	Trailers de Monterrey , S.A. de C.V.	Vamsa	Victor Patron, S.A.	Volkswagen	Total Light Trucks	Total Cars and Light Trucks
1980	-	49,525	19,751	1,886	49,104	21,775	-	-	15,679	-	-	6,388	-	14,348	178,456	481,512
1981	-	57,964	22,094	3,270	57,101	39,879	-	-	24,683	-	-	10,461	-	16,511	231,963	587,460
1982	-	34,592	12,179	1,385	51,878	23,474	-	-	18,800	-	-	7,121	-	18,001	167,430	468,009
1983	-	15,927	4,458	396	17,023	17,938	-	-	10,763	-	-	2,527	-	8,381	77,413	284,550
1984	-	23,892	4,775	691	23,849	28,379	-	-	11,984	5,641	-	-	-	10,135	109,346	340,924
1985	-	27,433	6,507	1,102	35,992	37,038	-	-	16,033	5,583	-	-	-	16,153	145,841	392,801
1986	-	18,839	3,428	1,233	21,396	21,547	-	-	20,564	2,271	3	-	-	10,818	100,099	269,666
1987	-	16,065	2,948	1,118	17,093	25,127	-	-	21,039	-	19	-	-	5,069	88,478	230,914
1988	-	31,284	2,227	2,017	29,938	32,461	-	-	22,193	-	19	-	-	6,299	126,438	335,219
1989	-	36,548	4,613	3,216	39,111	49,571	-	-	25,742	-	43	-	-	9,053	167,897	441,635
1990	-	38,764	6,081	-	35,903	62,311	172	5,085	32,314	-	163	-	-	10,290	191,083	536,634
1991	-	47,635	9,218	-	55,519	66,851	303	8,017	35,143	-	10	-	-	11,823	234,519	613,067
1992	-	48,915	11,650	-	58,942	71,623	434	8,880	38,122	-	18	-	-	13,458	252,042	681,111
1993	-	32,610	8,365	-	39,428	50,985	312	8,075	37,383	-	3	-	-	11,888	189,049	578,552
1994	326	35,147	8,883	-	35,534	48,754	515	7,845	37,012	-	-	-	15	12,928	186,959	539,934
1995	20	10,154	1,535	-	7,219	19,569	37	744	10,092	-	-	-	-	2,893	52,263	154,591
1996	n.a	16,346[1]	3058[1]	-	20,240[1]	22,012[1]	n.a	n.a	18,174[1]	-	-	-	-	-	76,772	240,423

\a Exports, trucks and buses not included

1 Include all trucks

Sources: SECOFI, DGI with data from AMIA and ANPACT.

Since 1980, Volkswagen has been the leader in the production of passenger cars for the domestic market, except for 1987 and 1988, when Nissan took its place (see Table 2.5). Volkswagen's share, 42% of total domestic production in 1982, has fallen significantly during the 1990s and was 32.5% in 1996. The main reason for Volkswagen's market position is the success of the Sedan or Beetle, with 98,236 units produced in 1993.[3] It is the most successful model in Mexican history. As well, Volkswagen has chosen Mexico as the supply base of several models for the US market, although severe production and quality problems have limited and delayed production plant expansion. Total production of the Sedan, Golf and Jetta, the three most important models of Volkswagen, increased by more than 146% during 1989-1994.

Nissan, the fourth largest car producer at the beginning of the 1980s, saw its market share rise to 26.2% in 1994. Nissan saw its production fall from 92,286 units in 1994 to 28,039 in 1995. In 1996 it was the third most important producer. Nissan has been most successful with Tsuru model, which per unit has surpassed production of the Sedan since 1989. It has diversified production since 1995, introducing two new models: Lucino and Sentra; the latter has been chosen to supply the Japanese market. Estimations for 1996 show that Nissan has substituted the Tsuru model for Sentra, the latter with more than 61,000 units of production.

Within the Big Three, several important changes have taken place during 1980-1996. Until 1995, Chrysler was the lead producer, followed by Ford Motor Co. and General Motors. However, since then General Motors has taken over production leadership and became the second producer largest in Mexico's domestic market in 1996, after Volkswagen. General Motors had the highest domestic production growth rate of any producer in 1996, accounting for 182%.

The US Big Three are important actors in the passenger car market (Table 2.5 and 2.7). For example, Ford's Escort is the most highly produced passenger car by Ford, accounting for more than 90,000 units in 1995 and 1996. Ford has also started a new assembly line for exporting Mercury Mystique, whose production is estimated to reach 75,000 units a year (Piquini 1995). Both models are to replace older models, particularly Topaz and Ghia, which were phased out at the beginning of 1994.

General Motors' most successful model range has been the Cavalier, introduced in 1990, while other models such as Century and Cutlass have declined continuously. Several new models, Monza, Sunfire, and particularly the Chevy, introduced in 1994, have been extremely successful in the domestic market; the latter has increased production from 1,193 units in 1995 to 15,120 in 1996.

[3] In this section, all data on passenger car production by manufacturer and model refers to total production, i.e. including production for exports.

Table 2.7 Passenger car production by manufacturer and model, 1989-1996 (units) \a

	1989	1990	1991	1992	1993	1994	1995	1996
BMW								
325							245	487
Total BMW	***0***	***0***	***0***	***0***	***0***	***0***	***245***	***487***
Chrysler								
Acclaim	0	8,618	15,224	10,511	38,473	35796	27	0
Dart/Volare	52,325	0	0	0	0	0	0	0
New Yorker/Phantom	2,844	2,862	2,953	2,637	1,351	217	0	0
Le Baron	3,209	35,053	28,940	31,659	11,256	4697	30	0
Shadow	35,970	29,344	41,196	38,098	35,992	10112	0	0
Spirit	8,386	32,494	44,168	55,853	66,928	55990	63	0
Sundance	0	0	7	15,887	5,144	0	0	0
Stratus							6513	11,052
Cirrus							1646	2,693
Breeze							638	1,143
Neon						41051	64823	58,849
Sebring								
Total Chrysler	***102,734***	***108,371***	***132,488***	***154,645***	***159,144***	***147863***	***73740***	***73,737***
Ford								
Cougar	1,466	S,647	6,954	4,793	4,632	1518	0	0
Escort	0	40,902	71,884	67,738	68,751	88635	95657	99,712
Ghia	0	3,670	13,501	14,469	11,623	5736	0	0
Grand Marquis	0	2,945	15,194	7,314	2,197	6857	1582	0
Taurus	8,953	3,502	2,899	0	0	0	0	0
Thunderbird	3,694	4,504	3,797	3,672	3,756	1238	0	0
Topaz	33,467	28,664	24,925	30,039	25,208	7400	0	0
Tracer	39,580	47,702	40,099	62,353	48,647	62665	44712	4,001
Contour						11155	44948	42,503
Mystique						4779	20116	14,913
Total Ford	***87,160***	***134,591***	***167,004***	***198,258***	***169,931***	***189983***	***207015***	***161,129***
General Motors								
Cavalier	0	15,024	63,201	70,400	87,801	80405	134107	109,603
Celebrity	24,990	0	0	0	0	0	0	0
Century	24,607	45,075	44,556	37,140	38,530	17125	824	261
Cutlass	13,464	13,676	17,906	18,969	14,963	11450	3564	5,469
Chevy							1193	16,120
Monza							0	7,787
Sunfire							0	1,682
Total General Motors	***63,061***	***73,775***	***125,663***	***126,509***	***141,294***	***108980***	***139688***	***140,922***
Honda								
Accord							135	1,194
Total Honda	***0***	***0***	***0***	***0***	***0***	***0***	***135***	***1,194***
Mercedez Benz								
E-320								351
E-420						508	99	0
C-220						0	344	372
C-230k								129
C-280						82	371	191
Total Mercedez-Benz	***0***	***0***	***0***	***0***	***0***	***590***	***814***	***1,043***
Nissan								
Tsuru	86,749	98,450	98,151	121,743	137,606	143533	54700	42,989
Lucino							279	1,959
Sentra							1079	61,938
Total Nlssan	***86,749***	***98,450***	***98,151***	***121,743***	***137,606***	***143533***	***56058***	***106,986***
Volkswagen								
Golf	40,026	58,482	66,657	35,162	49,351	66028	55941	88,429
Jetta	26,460	39,494	44,740	53,255	79,517	99072	99190	107,041
Sedan	32,442	84,930	85,681	86,613	98,236	78276	15933	33,099
Derbi							4570	2,509
Total Volkswagen	***98,928***	***182,906***	***197,078***	***175,030***	***227,104***	***243376***	***175634***	***231,078,***
Grand Total	**438632**	**598093**	**720384**	**776185**	**835079**	**856563**	**699067**	**797682**

\a Exports included.
Source: AMIA.

According to several sources (AMIA, Piquini 1995), Chrysler has begun a period of intense model renewal. Models such as Phantom, Shadow and Spirit have been replaced by Neon and, since 1996, by Sebring. Chrysler has been producing the Neon at Toluca, Estado de México, since 1994.

Other newcomers such as BMW, Honda, and Mercedez Benz have been able to establish themselves - with less than 1,500 units each until 1996 - in the luxury car market and are planning to expand production significantly.

2.2.2 Investments and new projects

During the 1990s new investment in facilities and new products increased dramatically, and capacity was greatly expanded. Despite the fall in the domestic market in 1993 and 1995-1996, investments of terminal manufacturers have continued to grow strongly and several new firms have announced plans to manufacture in Mexico. Much of this investment dynamism is due to the NAFTA, associated changes in investment laws and regulations (see Chapter I), and the strong regional integration of the North American automobile market.

Table 2.8 Total investment in the automotive industry, 1989-1996 (US$ millions)

Year	Total	Terminal industry	Autoparts industry
1989	360	360	n.a
1990	923	310	613
1991	1,774	875	899
1992	2,409	1,348	1,061
1993	2,167	1,217	950
1994	2,232	1,363	869
1995[p]	1,817	770	1,047
1996[e]	2,222	1,099	1,123
Total	13,904	7,342	6,562

\n.a Not available p Preliminary
\e Estimated
Sources: SECOFI, DGI

Table 2.9 Investment by terminal manufacturers, 1989-1996 (US$ millions)

	1989	1990	1991	1992	1993	1994	1995[p]	1996[e]
Chrysler	49	45	52	230	332	392	490	409
Ford	142	69	167	441	297	124	229	114
General Motors	131	29	49	87	235	631	888	227
Nissan	n.a	76	302	317	242	154	164	89
Volkswagen	38	91	305	273	100	61	66	251
Total	360	310	875	1,348	1,217	1,363	1,837	1090

\p Preliminary
\e Estimated by companies
Sources: SECOFI, DGI.

These tendencies in the automobile industry are reflected as well in soaring investments in Mexico's autoparts industry (Table 2.8). Up to the beginning of the 1990s investments in the terminal industry accounted for around $300 million a year and reached $1,363 in 1994. The optimism that surrounded the NAFTA negotiations between 1992 and 1994 and its subsequent implementation, are clearly reflected in the behavior of total investments. Preliminary and estimated data for 1995-1996 reflect the effect of the crisis of December 1994. However, more recent data for 1996 show that investments in the terminal industry are deepening regional integration of the autoparts market. The North American integration of the automobile industry is clearly reflected in investments by terminal firms (see Table 2.9).[4] Manufacturers' investment plans suggest a swift modernization of Mexico's manufacturing facilities. Such a move towards a better equipped industry could be seen before the NAFTA, but the agreement's implementation has accelerated the trend. The Big Three represent 69% of total investments for 1989-1995, although other firms, particularly Nissan, have also invested heavily during this period. Investments are expected to increase in 1997 due to several new investment programs.

The Mexican automobile sector has already attracted several newcomers during the 1990s and several manufacturers are expected to follow. Scania, Honda, BMW, and Mercedes, among others, have already established Mexican subsidiaries and are producing for the domestic market and in future for exports. Several of the new firms are using Mexico as a production site for exports to other Latin American nations, as well as to the US. Recent announcements by Nissan and Volkswagen to manufacturer Sentra and Concept One exclusively in Mexico have put Mexico in a new qualitative position in the automotive production world (see Table 2.10).

There are few estimations on production capacity in Mexico. According to some sources (AMIA; Piquini 1995), total capacity at the midst of the 1990s is around 1.3m-1.4m, which would suggest that by the end of this decade the industry could be coming close to its limit. However, new projects and investments in the next years and productivity increases will probably offset these limitations. Scenario forecasts assumes that under an optimistic scenario for the year 2004, total capacity will allow production of 2 million cars, and the pesimistic scenario assumes 1.6 million production. Under both scenarios capacity will have to increase during next seven years to accommodate the forecaster production.

[4] Data for 1995 and 1996 for investments (see Tables 2.8 and 2.9) in the terminal industry shows significant differences due to their preliminary character.

Table 2.10 Major new investment programs (US$ millions)

Company	Investment	Program
BMW	10	Construction of an assembly plant at Lerma, Estado de Mexico to assemble up to 5,000 cars per year from 1995; the investment is shared with local investors and may reach $80m in ten years
Chrysler	577	Transfer of light commercial vehicles and truck assembly operations from Mexico City to Saltillo, Coahuila, nearer the US border, where 4-cylinder engines for the Mexican-built Neon will also be produced
Dina	109	Purchase of a majority share holding in US based Motor Coaches Industries, and completion of a bus assembly plant in Hidalgo
Ford	155	Refurbishing of the Chihuahua engine plant and capacity expansion at the Cuautitlán, Estado de Mexico car plant, to produce the new Mercuy Mystique Ford Contour models
General Motors	316	Transfer of truck and car assembly from Mexico DF to a new plant in Silao, Guanajuato; assembly of the Opel Corsa in Mexico DF from 1995
Honda	50	New plant built at Guadalajara, Jalisco, to assemble 15,000 cars per year from November 1995
Kenworth	75	Doubling of production capacity at the Mexico DF truck plant to 40 units per day
Mercedes-Benz	100	Completion of a new bus assembly plant at Monterrey, Nuevo Leon
Nissan	315	Construction of a proving ground and laboratories at Aguascalientes, Aguascalientes. Designated as the world production center for the Sentra, which is currently produced and assembled at Smryna plant, Tennessee, US.
Scania	10	Construction of a truck plant at San Luis Potosí, to produce 600 heavy trucks per year using Brazilian and Argentinean parts
Volkswagen	83	Assistance for components manufacturers to locate production facilities around the Cuidad de Puebla factory, in order to ease the flow of components and to improve quality control
Volkswagen	500	Construction and assembly of Concept One in the Ciudad de Puebla. This car will be produced exclusively in Mexico and sold to the US and other markets. Creation of 1,500 direct jobs and 3,500 indirect jobs
Navistar International Co.	167	Construction of an assembly plant for heavy trucks in Escobedo, Nuevo León. Production for the domestic market and exports to Latin America. Creation of 1,000 direct jobs and 5,000 indirect jobs

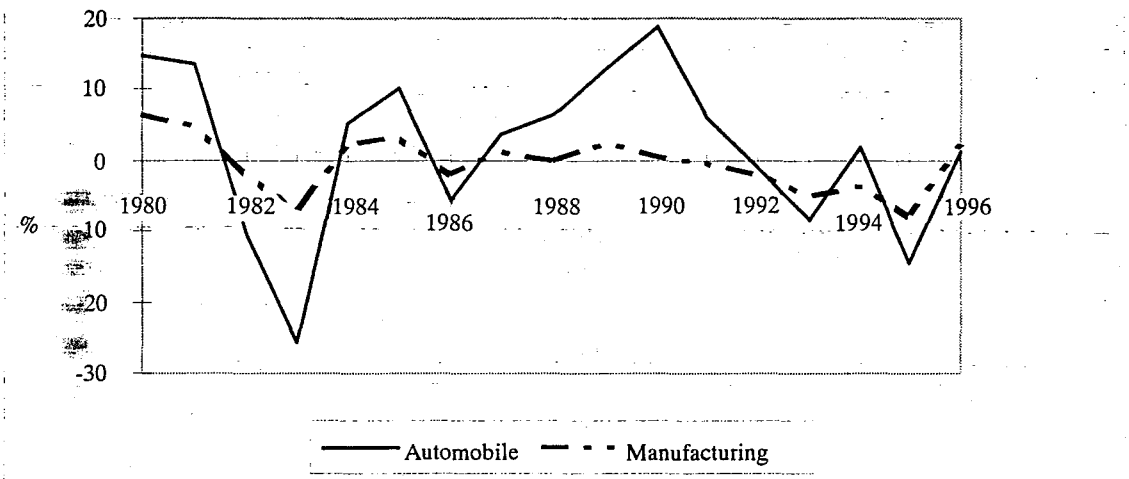
Sources: Own research based on Piquini (1995); SECOFI (1997).

2.2.3 Employment and productivity

The automobile industry is one of the most capital intensive sectors of Mexico's economy. Thus, it is not surprising that its share of employment is not high, although important in particular regions of Mexico. Its share over total employment and over manufacturing's employment increased slightly from 0.24% and 2.0% in 1980 to 0.25% and 2.4% in 1996, respectively. For 1980-1996 Mexico's average annual rate of growth in total employment was 0.6% and that of manufacturing -0.9%. The automobile sector stands out as being one of the few sectors within manufacturing that has not expelled

employment, accounting for a 0.2% average annual rate of growth. Some of the outstanding features of the sector regarding its employment are its relatively high dependency on the domestic economy and overall economic stability and certainty. However, as already analyzed, these conditions changed substantially since 1994. As reflected in Figure 2.1, automobile sector employment has varied significantly if compared with manufacturing.[5]

Figure 2.1 Variations in sectoral employment in the automobile industry and manufacturing, 1980-1996



Nevertheless, and in spite of automobile's relatively small share of employment, it is significant due to its linkages to the rest of the economy, as reflected in Table 2.11. From this perspective, the terminal industry during 1982-1996 never accounted for more than 22% of employment in this sector.[6] Furthermore, the employment evolution of the motor industry clearly shows that the terminal industry's share fell continuously since 1992, reaching 10.9% in 1996, while other directly related activities, such as distributors and maquiladoras, increased their share.

[5] The source of all figures is INEGI.

[6] Without any doubt, the employment effect of the auto sector is much larger and affects many other sectors. However, data is not available for such an analysis.

Table 2.11 Automobile industry employment, 1982-1996 (thousands of workers)

Year	Terminal industry	% of total	Autoparts industry	% of total	Distributors	% of total	Maquiladoras	% of total	Total
1982	49.9	19.2	119.8	46.1	77.1	29.7	13.0	5.0	259.8
1983	46.8	21.9	102.5	47.9	44.6	20.9	20.0	9.4	213.9
1984	54.9	20.7	114.7	43.2	53.0	23.7	33.0	12.4	265.6
1985	53.6	18.5	128.7	44.3	65.1	22.4	43.0	14.8	290.4
1986	49.8	18.9	116.8	44.4	43.2	16.4	53.0	20.2	262.8
1987	50.9	17.7	121.9	42.4	51.9	18.0	63.0	21.9	287.7
1988	51.9	15.5	141.1	42.0	59.8	17.8	83.0	24.7	335.8
1989	52.4	13.5	155.2	42.0	89.3	23.1	90.0	23.3	386.9
1990	52.7	13.7	173.6	40.1	69.0	18.0	89.1	23.2	384.4
1991	68.8	15.5	184.2	45.2	78.0	17.6	112.0	25.3	443.0
1992	72.0	15.0	201.5	41.6	81.0	16.9	124.4	26.0	478.9
1993	66.2	14.8	175.1	42.1	79.0	17.7	126.6	28.3	446.9
1994	65.7	14.7	171.8	39.2	80.0	17.9	129.4	29.0	446.9
1995[a]	52.5	13.5	145.4	38.4	52.0	13.4	139.1	35.8	389.0
1996[e]	-	10.9	-	35.5	-	16.5	-	37.1	424.1

\a Preliminary

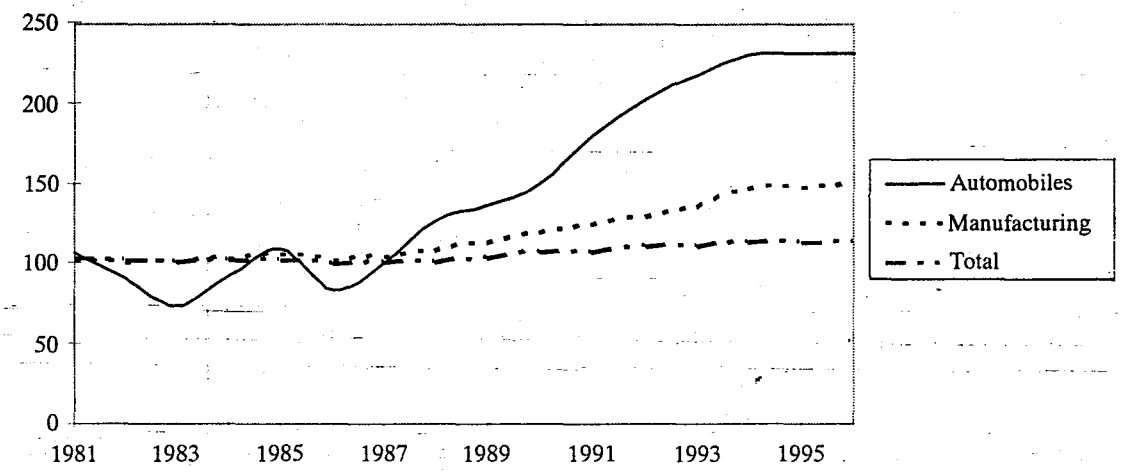
\e Estimated

Sources: SECOFI, DGI

Output per employee at vehicle assembly plants has been rising fast. Piquini (1995) shows that in 1969 an average of 12.2 vehicles per employee were produced. In 1990 the rate increased to 15.5 vehicles, fell slightly to 14.3 in 1991, and then rose to 18.8 in 1993. INEGI data also highlights these tendencies. Labor productivity (millions of 1980 pesos / employee) grew during 1980-1996 annually by 5.3%, 2.5%, and 0.8% for the automobile industry, manufacturing and total economy, respectively. Figure 2.2 displays the significant productivity increases of automobiles, particularly if compared to the rest of the Mexican economy.

This suggests that automobile manufactures are modernizing and providing new technologies and industrial organization techniques and mechanisms for increasing productivity and setting production at world standards. This trend has increased parallel with the liberalization strategy since 1988.

Figure 2.2 Productivity in automobile industry, manufacturing and the economy, 1982-1996 (1980=100)



2.2.4 Domestic vehicle sales

The Mexican domestic market[7] for automobiles during 1980-1996 has experienced profound cyclical movements associated with total GDP and domestic demand. It is also important to mention that car imports increased because of trade liberalization. The domestic market saw its highest sales figures in 1992 when 706,846 units were sold. It has since fallen to 188,799 units in 1995 and is still far from recovering, in spite of a growth rate of 76.9% for 1996. Domestic vehicle sales were probably one of the worst hit economic activities by the 1994 crisis: total vehicle domestic sales fell by almost 70% and all segments suffered. The bus sector registered a growth rate of -90.1% in 1995.

The structure of domestic sales also displays several interesting characteristics. Both, passenger cars and light commercial vehicles present a share of over 98% of total domestic the market for 1980-1996, while trucks and buses represent a relatively small share. Moreover, passenger cars never accounted for a share below 60% of total domestic market for the same period. All different types of vehicles show a strong positive association with each other, i.e. with few exceptions their positive or negative dynamism is similar for the whole period.

[7]The domestic automobile market in Mexico refers to domestic sales and imports and does not include production for exports.

Table 2.12 Domestic vehicle sales by type, 1980-1996\a (units)

Year	Passenger cars	Light commercial vehicles	Trucks	Buses	Total
0	286,041	170,331	6,671	1,368	464,411
1981	340,363	220,886	8,002	1,762	571,013
1982	286,761	174,861	3,611	1,430	466,663
1983	192,052	80,037	451	275	272,815
1984	217,650	110,195	1,376	1,066	330,287
1985	242,187	144,038	3,600	1,824	391,649
1986	160,670	95,647	1,298	1,220	258,835
1987	154,152	92,071	1,504	217	247,944
1988	210,066	129,102	2,140	608	341,916
1989	274,505	167,409	3,269	681	445,864
1990	352,608	192,050	4,146	1,511	550,315
1991	392,110	240,211	8,256	2,404	642,981
1992	445,303	250,997	7,119	3,427	706,846
1993	398,743	194,916	5,363	4,318	603,340
1994	414,654	200,671	6,379	2,297	624,001
1995	117,393	70,473	725	208	188,799
1996	200,102	133,818	n.a	n.a	333,920

\a Imports included \na Not available

Sources: SECOFI. DGI.

Volkswagen has been the leading domestic vehicle seller in Mexico since 1980, reaching its highest share ever in 1994 with 145,315 units and 40.6% of domestic sales. Nissan, on the other hand, has become the second largest seller since 1981. Its best year was 1995 when it controlled 26.1% of the domestic market. Both companies are followed by the Big Three: of these firms Chrysler has been the leading seller in the domestic market. However, in 1995 Chrysler lost its position against General Motors and Ford. Ford has been increasing strongly its domestic sales during 1996, accounting for 68,150 units and has become the second most important domestic seller after GM and followed by Nissan, Chrysler and Volkswagen.

Table 2.13 Domestic passengers car sales by manufacturer, 1980-1996 (units) \a

Year	Total	BMW	Chrysler	Ford	GM	Honda	Mercedes Benz	Nissan	Renault	VAMSA	Volks-wagen
1980	286,041	0	56,850	38,533	17,278	0	0	36,093	21,460	20,900	94,927
1981	340,363	0	57,730	53,365	26,345	0	0	47,340	19,464	23,071	113,048
1982	286,761	0	39,590	36,667	22,450	0	0	47,828	22,048	8,126	110,052
1983	192,052	0	24,166	27,553	14,362	0	0	41,743	19,803	1,230	63,195
1984	217,650	0	31,102	26,861	18,470	0	0	44,281	19,212	216	77,508
1985	242,187	0	38,796	38,129	18,794	0	0	51,493	18,611	0	76,364
1986	160,670	0	27,666	19,516	11,365	0	0	43,291	3,967	0	54,865
1987	154,152	0	23,464	16,524	14,444	0	0	49,064	25	0	50,631
1988	210,066	0	48,732	32,001	15,284	0	0	60,247	0	0	53,802
1989	274,505	0	56,952	47,801	22,876	0	0	69,855	0	0	77,021
1990	352,608	0	52,580	52,352	32,351	0	0	80,502	0	0	134,823
1991	392,110	0	64,681	56,460	42,970	0	0	79,353	0	0	148,646
1992	445,303	0	83,675	68,323	50,835	0	0	100,051	0	0	142,419
1993	398,922	0	59,614	52,807	51,267	0	179	83,358	0	0	151,697
1994	414,654	0	53,070	50,189	63,667	0	835	98,784	0	0	148,109
1995	117,394	398	17,906	20,227	18,511	420	860	27,003	0	0	32,069
1996	200,102	1,020	53,179	68,150	96,245	1,998	1,213	59,008	0	0	53,075

\a Imports included

Sources: AMIA, SECOFI, DGI.

2.2.5 Exports, imports and trade balance

As already examined, structural changes within the automobile industry during the 1990s were a result of diminished domestic demand and sales, and the increased production for the export market. This shift is reflected in the increasing share of automobiles in total exports: 0.9%, 9.6% and 18.5% in 1980, 1990 and 1996, respectively. Moreover, it is important to notice that vehicle exports, measured in units, have grown steadily during the 1980s, and accounted for a share of 3.7%, 34% and 80.2% of total vehicle production in 1980, 1990, and 1996, respectively (Tables 2.4 and 2.14).

Passenger cars represented the majority of Mexican vehicle exports during 1980-1996, increasing from 72.9% of total vehicle exports in 1980 to 65.24% in 1996; it reached its highest ever level in 1989 with 84.6% (Table 2.14). Vehicle exports have increased substantially due to the NAFTA, government incentives and individual firm strategies. However, it is also important to assess that export growth in vehicle exports has been very dynamic throughout 1980-1996, accounting for an average annual growth rate of 28.2%.

Table 2.14 Vehicle production for exports by type, 1980-1996 (units) \a

Year	Passenger cars	Light commercial vehicles	Heavy commercial vehicles	Total
1980	13,293	4,904	48	18,245
1981	9,296	5,069	63	14,428
1982	14,142	1,494	183	15,819
1983	20,768	1,450	238	22,456
1984	30,397	2,802	436	33,635
1985	49,856	8,213	354	58,423
1986	40,216	31,886	327	72,429
1987	135,481	27,592	-	163,073
1988	144,000	29,147	-	173,147
1989	165,800	30,198	1	195,999
1990	249,921	26,938	10	276,869
1991	334,749	23,912	5	358,666
1992	344,532	44,207	-	388,739
1993	424,445	47,467	-	471,912
1994	497,049	70,570	9	567,628
1995	598,049	183,561	312	782,676
1996	635,906	339,502	n.a	975,408

\a Data with Table 2.3 is not equal since AMIA and SECOFI show different information. Production for exports (Table 2.3) is different than sold exported units (Table 2.14).
\n.a. Not available
Sources: SECOFI, DGI with data from AMIA, ANPACT

Volkswagen took the first steps to export at the beginning of the 1980s, and at one point accounted for 96% of total car exports, but its share has since decreased. Ford began to ship large numbers of its units to the US from its Hermosillo plant in 1987 - total exports from Ford were 51,777 units or 26% of total exports of the industry - and several other manufacturers followed (Table 2.15). From 1987 to 1995 Ford was the main car exporter. In 1996 Chrysler became the leading exporter, followed by General Motors and Ford. Nissan, which has been exporting the AD van to Japan, has also expanded production capacities and exports since the beginning of the 1990s, and is expected to increase significantly its exports as a result of the firm's export strategy.

As the other important part of the automobile industry, light commercial vehicles have also seen high dynamism since 1980; in 1996 there were 339,502 units sold or 34.8% of total vehicle exports. The exports in this segments - mainly pickups and vans - have picked up since 1994 and the abolition by the US of a 25% import tax; only during 1994-1996 exports in this segments increased by 381.1%. Since Mexico's light commercial vehicles have regional value-added above 50%, they are subject to a 10% tax which will be completely eliminated in 1998. Thus, it is expected that Mexico's exports in this segment will continue to increase.

Table 2.15 Passengers car production for exports by manufacturer 1980-1996 (units)

Year	Total	Chrysler	Ford	General Motors	Nissan	Volkswagen	Renault
1980	13,293	0	0	0	1	13,136	156
1981	9,296	0	0	0	0	9,204	92
1982	14,142	504	0	0	1	13,582	55
1983	20,767	2,198	0	0	85	18,454	30
1984	32,241	6,686	0	7,897	2,536	15,122	0
1985	49,856	13,534	0	29,347	3,809	3,166	0
1986	40,216	15,499	0	18,672	5,965	80	0
1987	123,919	41,037	51,773	20,710	10,325	74	0
1988	144,000	28,495	66,361	36,389	12,319	436	0
1989	165,800	45,643	39,580	40,292	17,228	23,057	0
1990	249,921	55,355	88,604	40,993	18,737	46,232	0
1991	334,749	67,805	111,983	81,231	23,298	50,432	0
1992	344,532	71,340	130,434	82,488	26,995	33,275	0
1993	424,445	101,712	117,216	90,663	37,382	77,472	0
1994	497,049	117,498	162,777	70,482	48,617	97,675	0
1995	598,803	64,595	200,595	124,524	52,877	156,212	0
1996 \1	635,906	124,893	154,538	101,075	78,743	176,657	0

\1 Data is taken from AMIA

Sources: SECOFI.

Table 2.16 clearly shows the strong integration of the Mexican vehicle industry into the North American market. In 1980, for example, 100% of total exports were shipped to regions other than North America, particularly Europe and South and Central America. However, the share of Mexican exported vehicles to the US began to increase in 1984; by 1995 90.2% went north to the US. The European market, which was important at the beginning of the 1980s, had completely disappeared as an export market for Mexican manufacturers in the 1990s. It is also important to notice the share of exports to South and Central America, which during the 1990s have been at around 10% of total exports. Moreover, exported units shipped to Asia are almost exclusively due to Nissan's exports to Japan, which has so far not been above 2.5% of total exports.

Most of vehicle imports can be explained by the NAFTA and several decrees since 1962. Explicit prohibitions and different forms of tariffs and non-tariff barriers limited strongly vehicle imports. However, the import liberalization of this market has substantially increased the share of imported vehicles over total Mexican production, from 0.7% in 1980 to 7.1% in 1996; the average annual growth rate of imports of vehicles was of 50.8% for 1990-1996 (table 2.17). Moreover, the NAFTA and changes

in the automobile decrees since 1983, as well as strategies and projects of the respective firms, have had an important impact and will continue to increase imports.

Table 2.16 Vehicle exports by destination, 1980-1996 (units)

Year	North America	South & Central America	Africa	Asia	Europe	Other	Total
1980	1	4,853	2	308	13,062	19	18,245
1981	3	4,841	1	1	9,198	-	14,428
1982	623	767	0	845	13,584	-	15,819
1983	203	3,733	1,521	269	16,730	-	22,456
1984	13,448	4,269	0	702	15,120	96	33,635
1985	47,197	7,974	-	99	3,153	-	58,423
1986	60,466	10,909	-	707	347	-	72,429
1987	145,658	16,668	-	377	370	-	163,073
1988	153,040	19,700	92	4	311	-	173,147
1989	170,270	24,141	125	717	746	0	195,999
1990	251,360	23,376	289	1,201	399	244	276,869
1991	328,321	29,299	121	803	55	67	358,666
1992	342,113	40,070	50	885	156	100	383,374
1993	422,706	43,057	0	5,432	20	697	471,912
1994	497,454	50,325	32	13,481	0	5,026	567,107
1995	704,532	66,872	148	1,411	-	8,119	781,082
1996	865,106	86,603	276	12,425	4	10,994	975,408

Sources: SECOFI, DGI, AMIA.

Table 2.17 Vehicles imports by type, 1990-1996 (units)

Year	Passenger cars	Light commercial vehicles	Trucks	Buses	Total
1990	3,805	1,571	0	0	5,376
1991	5,191	4,180	0	0	9,371
1992	6,048	2,733	878	1,046	10,705
1993	3,452	5,200	250	1,075	9,977
1994	56,432	18,490	148	1,175	76,245
1995	16,969	10,727	48	53	27,797
1996	30,241	55,467	n.a	n.a	85,708

Sources: AMIA, SECOFI.

Thus, total vehicle imports increased from 10,101 units in 1993 to 76,356 units in 1994, but fell drastically in 1995 due to devaluation and domestic crisis. Most imported vehicles are passenger cars, which jumped during 1993-1994 by almost twenty times and represented in 1994 73.9% of total vehicles imports.

Car imports were almost exclusively a result of the Big Three and reflect, again, the increasing integration of the North American market. As reflected in Table 2.18, they accounted for 94.1% of total car imports in 1994 and 97.2% in 1996; their imports accounted for only 2,119 units in 1990 and 53,106 units in 1994. Other new manufacturers, such as BMW, Honda and Mercedez Benz, still relied heavily on imports to supply domestic sales. On the other hand, both Nissan and Volkswagen showed very few imports of cars. With the exception of the new manufacturers and Nissan, the rest of car firms decreased substantially their imports during 1995. However, car imports picked up in 1996 again, with a growth rate of total vehicle imports of 208.2%. Without exceptions all firms increased substantially their imports.

Table 2.18 Imports of passengers car by manufacturer, 1990-1996 (units)

	Total	BMW	Chrysler	Ford	GM	Honda	Mercedez Benz	Nissan	Volkswagen
1990	3,805	0	77	940	1,102	0	0	557	1,129
1991	5,191	0	34	915	2,515	0	0	1,667	60
1992	6,048	0	39	303	1,255	0	0	4,271	180
1993	3,273	0	1,959	386	699	0	0	213	16
1994	56,432	0	6,735	23,330	23,041	0	135	397	2,794
1995	16,968	132	2,115	9,569	2,322	420	47	758	1,605
1996	85,708	561	17,241	33,462	32,578	706	97	1,866	427

Sources: SECOFI.

The latter tendencies in imports as well as in exports resulted in one of the most striking changes in Mexico's economy. Total automobile trade balance, not including maquiladoras, had been negative since the 1980s and before, with few exceptions. Even further, before the NAFTA trade deficit began to increase substantially and reached more than $2 billion in 1994 (Table 2.19). However, the already discussed and examined tendencies within the automobile industry resulted in a major trade balance surplus for 1995 and 1996, accumulating $5.5 billion only for January-October 1996.

Table 2.19 Automobile industry trade balance, 1980-1996 (thousands of dollars) \a

Year	Exports	Imports	Balance
1980	404	2,319	-1,915
1981	377	3,514	-3,137
1982	483	1,812	-1,329
1983	981	1,119	-138
1984	1,492	1,652	-160
1985	1,476	2,314	-838
1986	2,290	1,993	297
1987	3,042	2,351	691
1988	3,311	3,325	-14
1989	3,585	3,965	-380
1990	4,625	5,229	-604
1991	5,383	6,496	-1,113
1992	5,937	7,971	-2,034
1993	7,249	8,994	-1,745
1994	8,766	10,859	-2,093
1995	12,948	8,594	4,354
1996[ab]	14,109	8,371	5,738

\a Does not include maquiladoras

\b Preliminary

\c January-October

Source: Banco de México.

From this perspective, 1996 was a record year for the automobile industry from several perspectives, particularly if regarding foreign trade. In the context of the domestic crisis and still low levels of domestic demand, exports surged and the trade balance, particularly with the US, achieved its highest ever volume and value.

2.3 Intra-industrial trade

The classical Heckscher-Ohlin international trade theory usually assumes that nations trade with each other as a result of comparatives advantages through factor endowment specialization. From this perspective, nations with similar factor endowment do not have reasons to trade with each other.

However, there has been an increasing theoretical and empirical literature in the last decades which questions the classical approach. The transnationalization of capital, trade liberalization, heterogeneous goods and imperfect markets, among others, are some of the arguments used in order to justify the increasing exchange of similar goods

among nations (Helpman/Krugman 1985).

In this light, there have been several attempts to measure intra-industrial trade in Mexico (Buitelaar/Padilla 1996; Mercado/Godínez 1995; Taniura/Máttar/Schatán 1988). Without making the attempt to discuss different approaches to intra-industrial trade, in what follows we will use the expression suggested by Grubel and Lloyd (1975):

$$B_j = 1 - [\ |X_{it} - M_{it}| / (X_{it} + M_{it})\ ]$$

B_j stands for the intra-industrial index for sector j, X_{it} is exports of product i to sector t and M_{it} are imports of product i to sector t. Bj will be = 1 when exports of the sector are exactly equal to its imports, which indicates complete intra-industrial trade among both nations. If the sector only exports (imports), without importing (exporting), intra-industrial trade among both nations will be equal to zero.

Based on this short introduction to intra-industrial trade, in what follows we will briefly present the main results of intra-industrial trade between Mexico and the US for Mexico's main export items at the four-digit level of the Harmonized Tariff Schedule[8]. Data was obtained for 1990-1995.

The results on Table 2.20 are important in several aspects. On the one hand, both imports and exports from and to the US have boosted for 1990-1995 in almost all items of fraction 87; they both amount levels above 250% of 1990. Moreover, it reflects the high concentration of both Mexican imports and imports from and to the US of fraction 87, which are above 80% in 1995.

Intra-industrial trade of fraction 87 shows the high concentration of the car segment in relatively few items and its rapid growth throughout 1990-1995. Only three items (8703, 8704 and 8708) accumulate 98% of total automobile exports to the US and 14.6% of total Mexican exports to the US in 1995. In general, and as expected, intra-industrial trade of automotive vehicles has increased during 1990-1995, particularly for these items. As expected, intra-industrial trade increases for almost all considered items during 1990-1994, and falls again in 1995 as a result of increasing exports and falling imports. This tendency is very significant for the three items selected before due to their high share in exports of fraction 87. Item 8703 and 8704 are the most significant, since they increase their intra-industrial trade index from 0.166 and 0.026 in 1990 to 0.412 and 0.242 in 1994. However, the index fell for both in 1995.

[8]Data on the automobile sector (Fraction 87 of the Harmonized Tariff Schedule refers to automobile vehicles, tractors, and other vehicles, its parts and accessories in terms of value) was obtained from Sistema Comercial Mexicano (SIC-M) from SECOFI and BANCOMEXT.

Table 2.20 Automobile industry imports, exports and intraindustrial trade with the United States

Fraction	Description	1990	1991	1992	1993	1994	1995	1990	1991	1992	1993	1994	1995
	IMPORTS FROM THE US (1990=100))							Share of imports from the US over total Mexican imports in same items					
8701	Tractors (other than works tru	100	86.7	71.7	45.0	45.4	19.0	82.7	67.2	71.0	69.3	69.8	68.2
8702	Motor vehicles for the transpo	100	40.8	104.9	40.8	43.0	50.0	81.1	13.7	7.1	3.7	4.2	64.5
8703	Motor cars and other motor veh	100	90.9	149.0	149.4	448.5	159.4	87.8	87.8	86.3	82.8	80.0	80.3
8704	Motor vehicles for the transpo	100	114.9	194.6	126.9	135.3	115.9	93.9	92.8	96.8	91.3	85.3	87.1
8705	Special purpose motor vehicles	100	249.0	324.5	207.4	181.9	83.3	69.2	86.0	94.8	87.2	82.3	91.9
8706	Chassis fitted with engines fo	100	100.0	17300.0	2100.0	300.0	5000.0	50.0	100.0	89.6	77.8	21.4	90.9
8707	Bodies (including cabs), for t	100	144.4	266.7	281.5	1192.6	314.8	93.1	92.9	88.9	87.4	61.5	50.3
8708	Parts and accessories for trac	100	140.1	186.2	191.9	281.1	785.6	76.9	73.4	73.2	70.8	75.1	80.7
8709	Works trucks, self-propelled,	100	100.0	146.4	128.6	196.4	103.6	90.3	75.7	85.4	90.0	82.1	87.9
8710	Tanks and other armored fighti	–	–	–	–	–	–	–	69.3	93.3	95.2	83.8	0.0
8711	Motorcycles (including mopeds)	100	93.7	141.1	112.6	91.6	12.6	36.7	29.4	23.3	21.4	17.2	10.1
8712	Bicycles and other cycles (inc	100	104.5	118.8	65.2	66.1	8.0	65.5	41.1	30.2	29.4	26.9	27.3
8713	Invalid carriages, whether or	100	133.3	233.3	233.3	266.7	166.7	100.0	100.0	77.8	77.8	57.1	83.3
8714	Parts and accessories for moto	100	86.8	55.9	35.3	64.7	122.1	21.7	15.3	7.4	4.6	6.7	22.4
8715	Baby carriages (including stro	100	126.9	188.5	134.6	176.9	57.7	70.3	68.8	74.2	50.7	48.4	39.5
8716	Trailers and semi-trailers; ot	100	90.1	143.2	166.0	176.5	152.7	97.9	92.9	92.3	96.5	94.5	92.1
	Total 87	100	115.5	164.8	150.0	273.0	366.4	79.8	72.8	68.6	67.1	72.0	80.0
	EXPORTS TO THE US (1990=100)							share of exports from the US over total Mexicanexports in same items					
8701	Tractors (other than works tru	100	21.9	18.3	60.4	205.3	272.2	82.0	84.1	93.9	94.4	77.1	50.4
8702	Motor vehicles for the transpo	100	0.0	200.0	0.0	0.0	500.0	100.0	0.0	2.1	0.0	0.0	10.4
8703	Motor cars and other motor veh	100	136.8	119.2	131.5	156.5	237.4	94.3	88.9	89.2	76.4	76.4	77.8
8704	Motor vehicles for the transpo	100	12540. 0	50260. 0	60230.0	74290. 0	173860 .0	4.5	76.1	86.0	90.0	90.9	94.0
8705	Special purpose motor vehicles	100	381.3	0.0	18.8	0.0	0.0	50.0	87.1	--	100.0	--	--
8706	Chassis fitted with engines fo	100	138.7	191.1	393.0	643.1	655.3	100.0	97.5	75.3	91.6	94.8	94.4
8707	Bodies (including cabs), for t	100	92.5	542.5	777.5	962.5	1142.5	100.0	94.9	98.6	99.7	99.2	99.8
8708	Parts and accessories for trac	100	248.7	378.8	474.6	543.6	624.0	85.1	93.3	87.0	88.2	90.8	95.5
8709	Works trucks, self-propelled,	100	150.0	107.1	100.0	57.1	85.7	77.8	95.5	100.0	93.3	88.9	92.3
8710	Tanks and other armored fighti	–	–	–	–	–	–	--	0.0	0.0	--	--	0.0
8711	Motorcycles (including mopeds)	100	100.0	8300.0	12100.0	6100.0	9200.0	20.0	6.7	42.8	68.0	64.9	82.1
8712	Bicycles and other cycles (inc	100	50.0	50.0	0.0	50.0	750.0	18.2	7.7	8.3	0.0	11.1	62.5
8713	Invalid carriages, whether or	–	–	–	–	–	–	--	100.0	100.0	99.1	99.3	100.0
8714	Parts and accessories for moto	100	163.6	175.8	209.1	224.2	330.3	86.8	94.7	98.3	90.8	98.7	96.5
8715	Baby carriages (including stro	100	300.0	1900.0	3100.0	1800.0	1500.0	100.0	100.0	95.0	100.0	94.7	100.0
8716	Trailers and semi-trailers; ot	100	136.1	279.2	423.6	779.9	1446.5	90.0	94.7	97.6	95.8	97.8	96.9
	Total 87	100	154.1	169.9	198.9	238.8	356.6	92.3	89.3	87.9	81.3	82.1	84.0
	INTRAINDUSTRIAL TRADE												
8701	Tractors (other than works tru	0.288	0.081	0.082	0.368	0.864	0.587						
8702	Motor vehicles for the transpo	0.014	0.000	0.026	0.000	0.000	0.132						
8703	Motor cars and other motor veh	0.166	0.114	0.203	0.187	0.412	0.115						
8704	Motor vehicles for the transpo	0.026	0.819	0.453	0.275	0.242	0.096						
8705	Special purpose motor vehicles	0.145	0.214	0.000	0.014	0.000	0.000						
8706	Chassis fitted with engines fo	0.006	0.005	0.449	0.034	0.003	0.048						
8707	Bodies (including cabs), for t	0.806	0.974	0.498	0.393	0.911	0.314						
8708	Parts and accessories for trac	0.959	0.684	0.624	0.543	0.646	0.926						
8709	Works trucks, self-propelled,	0.667	0.857	0.536	0.560	0.254	0.585						
8710	Tanks and other armored fighti	–	0.000	0.000	0.000	0.000	–						
8711	Motorcycles (including mopeds)	0.021	0.022	0.765	0.939	0.824	0.231						
8712	Bicycles and other cycles (inc	0.035	0.017	0.015	0.000	0.027	0.750						
8713	Invalid carriages, whether or	0.000	0.113	0.099	0.124	0.110	0.067						
8714	Parts and accessories for moto	0.653	0.956	0.792	0.516	0.746	0.865						
8715	Baby carriages (including stro	0.074	0.167	0.559	0.939	0.563	1.000						
8716	Trailers and semi-trailers; ot	0.405	0.554	0.662	0.787	0.943	0.587						
	Total 87	0.516	0.531	0.611	0.523	0.594	0.567						

Sources: Own estimations based on SIC-M.

2.4 Strategies of the automobile firms

The following part will briefly indicate some of the main strategies and intentions of the main passenger producing firms in Mexico. It is extremely difficult to obtain data directly from the respective firms, and even more difficult to gain access to privileged information. Moreover, it is important to keep in mind that all automobile manufacturers in Mexico are subsidiaries, i.e. in most of the cases subsidiaries in Mexico do not design the general guidelines of the firms and are decided in their parent companies.[9]

1. Chrysler de México, S.A.

Chrysler is owned by Chrysler Corporation, based in the US, and has operated in Mexico since 1938. In 1995 it accounted for an 15.7% share of domestic car sales and of 19.4% of light truck production for the domestic market and became the fourth and second most important producer in the respective market segments. Production facilities in Mexico City for trucks are to be closed and transferred to Coahuila for vehicle assembly. The rest of the production is concentrated in Toluca, Estado de México. In 1993 it employed 9,960 blue-collar and 2,000 white-collar workers. Its production has concentrated in the medium segment of the Mexican car market - particularly passenger cars and light commercial vehicles - with the assembly of new models such as Neon in 1994 and Stratus in 1995. Chrysler has become one of the most integrated manufacturers in the North American market. It is assembling the Neon model since 1994 in Mexico and is importing large quantities of cars and light vehicles such as minivans.

As already examined, Chrysler has invested heavily during the 1990s, accumulating for more than $1.5 billion during 1990-1995. Moreover, recent investments are to expand export capacity. It is thus expected that Chrysler will increase both imports and exports to continue with its regional integration strategy. In the first months of 1996 Chrysler had already exported 90.7% of its car and light vehicle production.

2. Ford Motor Company S.A. de C.V.

Ford is a wholly owned subsidiary of Ford Motor Co. and began production in Mexico in 1926. Ford has been loosing market share since the end of the 1980s to its US-competitors as well as to Nissan and Volkswagen. In 1995 it hold a 10.6% share of total domestic car sales and 13.8% in the light truck production, and became fifth and fourth in the respective market segments. Since 1987 it has began a strong integration process as part of Ford's strategy in the US. The main production facilities are located at Hermosillo - producing the Escort and Mercury Tracer models for export - Cuautitlán,

[9] Information of this part was obtained from several interviews, newspapers and documents from AMIA and SECOFI, as well as from Piquini (1995) and Fujita et. al (1994).

Estado de México, and Chihuahua.

Ford's production in Mexico has concentrated on the models Escort, Tracer and Countour and reduced several of the number of models it produced. From 1994 on it has imported a large quantity of cars made in the US, such as Lincoln Mark VIII, Mustang and Explorer. Like GM and Chrysler, Ford has reduced the types and models of cars, particularly of the more expensive and larger cars, due to the relative small demand of these cars in Mexico. The latter cars are then imported from the US.

Investment's of $1.3 billion for 1990-1995, a joint venture program with IMSA to assemble new truck and buses, as well as production expansion at the largely robotised plants in Hemosillo and Chihuahua seem to indicate that Ford will continue with restructuring of its production in the US and Mexico, producing a smaller range of models in Mexico. Moreover, exports are also expected to pick up. During the first 10 months of 1996 it exported 85.7% of its car and light vehicle production.

3. General Motors de México, S.A. de C.V.

General Motors, a wholly subsidiary of General Motors Corporation, initiated production in Mexico in 1935. In 1995 it held a 16.2% share of total domestic car sales and 37.44% in the light truck production, and became third and first in the respective market segments. General Motors - and following the current trend among car producers in Mexico - has transferred most of its production capacities from its plant in Mexico City to Silao, Guanajuato, and Saltillo, Coahuila. Both plants, particularly the one in Saltillo, are considered to produce the highest quality cars in Latin American plants of General Motors. Including the engine factory in Toluca, Estado de México, General Motors employs 14,300 workers, including 2,500 white-collars workers.

General Motors has been traditionally the number one producer of light commercial vehicles and trucks and retained this position until 1996. Since the midst of the 1980s it began production of passenger cars in Mexico and has been most successful in selling the Chevy model, which was initially imported. The new assembly line of the Chevy model has been a break through for General Motors in the lower segment of the Mexican market and has expanded production from 1,193 units in 1995 to 14,410 units in 1996.

With investments over $1.9 billion during 1990-1995, and being by far the most important investor during 1994-1995, it is expected that General Motors will continue with high productivity increases and a stronger presence in the car market segment. The Chevy model will be important for this development and will compete directly with other models from Nissan and Volkswagen. Similarly, it is expected that General Motor will continue increasing its export share of car and light vehicle production, which was 71.5% for the first 10 months of 1996.

4. Mercedes Benz México S.A. de C.V.

Mercedes Benz began operations in Mexico in 1986. It bought a minority stake in

Fábrica Mexicana de Autobuses (FAMSA) and took majority control in 1991. Mercedes Benz in Mexico works in close collaboration with Mercedes Benz do Brazil, which exports many of the components and transferred much of the technology and models to Mexico. Mercedes Benz has concentrated on heavy trucks and also assembles passenger cars. Car production, of 814 units in 1995, specializes in the luxury car segment of the Mexican automobile industry. It assembles trucks in Santiago de Tianguistenco and owns a bus factory in Monterrey.

In spite of recent full-scale operation, Mercedes has been able to introduce a rather large number of models and took over market leadership of the segment from DINA. Moreover, it amounted to $500 million investments during 1989-1995 and will compete for dominance in the truck and bus markets, as well as in the school bus segment. Car production is also expected to increase significantly in the next years, although it will be limited due to the particular market segment it is approaching. Mercedes Benz sells 100% of its production in the domestic market.

5. Nissan Mexicana S.A. de C.V.

Nissan began operations in Mexico in 1974 and is wholly-owned by Nissan Motor Co. of Japan. In 1995 it hold a 16.2% share of total domestic car sales and of 19.3% in the light truck production, and became second and third in both market segments, respectively. Nissan has two main production facilities in Cuernavaca and Aguascalientes; the latter being a highly automated car assembly plant.

Nissan has concentrated in the passenger car segment and has been very successful during the 1990s in penetrating the light commercial vehicles market. Tsuru has been the only Mexican produced car Nissan sales in Mexico and produced 143,533 units in 1994. This model - coming in three body styles - has during the 1990s always been ahead of Volkwagen's Beetle. The introduction of General Motor's Chevy will probably increase competition in this market segment and challenge Tsuru's position.

Nissan has also been very successful in the light commercial vehicle market. During most of the 1980s its light commercial vehicle production lagged behind the Big Three, but, is in third place, after General Motors and Chrysler, in 1995. Total investments for 1990-1995 amounted to $1.3 billion and have declined since 1992, contrary to boosting investments from the Big Three. Moreover, and as already examined, Sentra model will be produced exclusively in Mexico for world wide distribution. It is estimated that Sentra production might achieve around 350,000 cars in the next 5 years. As a result of new investment projects and already existing capacity, it is expected that Nissan will consolidate its exports to the North American market and other Latin American nations, both for passenger cars and light vehicles. However, the new competition of General Motor's Chevy as well as the one-model production line of passenger cars might cause a fall in domestic sales as well as increase imports of other models. Like the rest of the automobile manufacturers in Mexico, Nissan has also

increased substantially exports, which amounted to 65.5% of cars and light vehicles during the first ten months of 1996.

6. Volkswagen de México S.A. de C.V.

Volkswagen established in 1964 in Mexico and is a subsidiary of Volkswagen AG. In 1995 it hold a 30.33% share of total domestic car sales and of 5.5% in the light truck production, and became first and fifth in both market segments, respectively. Volkswagen in Mexico has achieved a strategic importance for Volkswagen AG since 1987, when it closed its Westmoreland factory in the US, which allowed the Mexican plant to become the only supplier of Golf and Jetta models to the US. Volkswagen's main production facility is in Puebla, which has been refurbished completely during the 1990s.

Volkswagen has traditionally been a car and light vehicle manufacturer, although the latter has lost much ground to its competitors. The Beetle (or Sedán) is since the 1960s Volkswagen's best selling car, although both Golf and Jetta are increasing their share in Volkswagen's production as well as in the Mexican market.

The Combi model, Volkswagen's only light commercial vehicle, has lost much ground in this segment. It's share fell from 11.1% of the market in 1985 to 5.5% in 1995. Nevertheless, Volkswagen is not expected to increase investments or to develop a new model for this market segment.

Volkswagen's investments, accounting for $896 million during 1990-1995, were mainly spent at the beginning of the 1990s, and investments have declined since then. Volkswagen will invest more than $500 million for producing exclusively in Mexico the passenger car known as Concept One. Moreover, exports have increased significantly throughout the 1990s, from 33,275 units in 1992 to 156,212 units in 1995 and they represented 77.3% of total production for the first ten months of 1996. From this perspective, Volkswagen's situation is Mexico will strongly depend on the domestic Mexican market, the demand for Jetta and Golf model in the US, and the development and performance of Concept One.

2.5 The NAFTA strategy: creating a regional market

Canada, Mexico and the United States negotiated a regulatory scheme to allow for a transition period of not more than 10 years (until 2003) after which there will be no barriers to trade or investment in the North American automobile industry. This part will indicate the major dispositions of the NAFTA for Mexico regarding the automobile industry's regional content or rules of origin and trade liberalization issues such as export/import quotas and other trade and non-trade barriers.

The decree of 1989 still regulates trade balance and value added requirements.

Mexico's domestic-content requirement will be phased out over 10 years. However, domestic value-added of automobile industry suppliers in Mexico will be of 34% for the first 5 years after the NAFTA implementation and will be reduced by 1% annually to 29% over the next five years, and to zero after 10 years.[10] Moreover, it is significant to highlight that:

1. The rules of origin will be used to measure net cost: 69 key foreign components will be analyzed and each will have to have a North American component of at least 60% in order to receive duty-free treatment.
2. After the 10 year transition period the rule of origin for the car industry rises to 62.5% for autos, light trucks, engines, and transmissions, and to 60% for other vehicle parts.
3. The NAFTA also includes a transition period regarding the rule of origin: already established manufacturers will be considered North American for the first four years with a regional content of 50%, 55% for the following four years for light vehicles and trucks and 56% for passenger cars and light trucks. At the ninth year the rule of origin will be at 60% for medium trucks and transport vehicles and 62.5% for passenger cars and light trucks.

Autoparts will be regulated by the same regional content as medium trucks and transport vehicles, with the exception of motors and transmissions, which will follow the same regulations as passenger cars and light trucks.

From this perspective, the NAFTA negotiations have been particularly careful and clear in establishing a slow transition period for both automobile manufacturers and component producers. The NAFTA will phase out all of Mexico's automobile industry's tariffs and non-tariff barriers over the next 10 years, with the exception of used cars. Major provisions for Mexico are summarized as follows (see also Table 2.22):

1. Passenger car and light truck manufacturers will have to achieve balance exports and imports until 2003. If they account for a trade surplus, these manufacturers will be allowed to import vehicles for the same surplus. Before the NAFTA, they were required to export $2 for each $1 imported.
2. Used car imports will be gradually permitted after year 16 (2009) and will receive duty-free treatment in year 25 (2018) if they accomplish regional content requirements. Between years 16 and 25 only specific used cars with a certain age range will be allowed to be imported. In 2009 only 10 year old used cars or older will

[10] Hufbauer/Schott (1993:38) argue that the average domestic-content requirement can quickly drop to 20% before going to zero since automobile manufacturers have to achieve in the first five years the domestic content requirement achieved in 1992, which in almost all cases was below 34%. Moreover, manufacturer's can reduce the domestic content requirement as they increase auto output.

have duty-free treatment, and the age of the used cars will be reduced two years every two years.

3. Mexico's tariff on autos and light trucks (20%) will be cut in half immediately and will then eliminate tariffs over 10 years for autos and 5 years for light trucks. Moreover, Mexico cut to zero 15% of automobile items and will do so in five years with 54% of items. The rest of tariffs will be eliminated in 10 years. Mexico's base tariff, which will be eliminated in 10 years, is 10%, and 4.6% for Canada, while the US abolishes tariffs for cars immediately.
4. All three countries will phase out light truck tariffs in 5 years, Mexico and the US from 10% and Canada from 4.6%. The rest of vehicles, besides passenger cars and light vehicles, will be phased out over a period of 10 years based on the current tariff. In the latter cases Mexico will have to eliminate non-tariff barriers in the next 5 years.
5. New passenger cars and light vehicles imports will be restricted by Mexico's last decree for 10 years. After year 11, all import restrictions will be eliminated.
6. Import quotas will also apply for 5 years to transport vehicles and manufacturers will only be allowed to import up to 50% of total production in Mexico.

From this perspective it is clear that the Mexican government has granted more weight and importance to the automobile and autoparts sector than to any other economic activity in the NAFTA negotiations. Long phase-out periods for tariffs for

Table 2.21 Geographic location of production plants, part 1

Firm	Product or Process	Location	Origin of the technology
BMW	Assembly of cars	Lerma, Estado de Mexico	Germany
Chrysler	Assembly of trucks Assembly of trucks Assembly of cars, engines, condensers, transmissions, Engine supports, and stamping engine parts	Mexico, D.F. Saltillo, Coahuila Toluca, Estado de Mexico Ramos Arizpe, Coahuila	United States
Ford	Assembly of cars, trucks, engines, and foundry of engines Assembly and stamping	Cuatitlan, Estado de Mexico Chihuahua, Chihuahua Hermosillo, Sonora	United States
General Motors	Assembly, stamping and engines Assembly of cars	Ramos Arizpe, Coahuila Silao, Guanajuato	United States
Honda	Assembly of cars	El Salto, Jalisco	Japan
Mercedes Benz	Assembly of cars	Santiago Tianguistenco, Estado de Mexico	Germany
Nissan	Assembly of engines Stamping engines Foundry	Jiutepec, Morelos Ags. Aguascalientes Toluca, Estado de Mexico	Japan
Volkswagen	Assembly of cars, foundry and stramping engines	Cuatlancingo, Puebla	Germany

Source: SECOFI, DGI, 1996

Table 2.21 Geographic location of production plants, part 2

Firm	Product or process	Location	Origin of the technology
Chrysler	Heavy trucks	Mexico, D.F.	United States
DINA Autobuses	Buses, engines, transmissions and suspensions	Ciudad Sahagun , Hidalgo	Mexico
DINA Camiones	Heavy Trucks	Ciudad Sahagun , Hidalgo	Mexico
Especializados Cajoma	Truck trailers, and its basic structures	Ecatepec, Estado de Mexico	Mexico
Eurocar	Bodyworks	San Juan Tultepec, Estado de Mexico	Mexico
Fabrica nacional de autobuses	Urban and travel buses	Monterrey, Nuevo Leon	Mexico
Ford de Mexico	Heavy trucks and truck trailers	Monterrey, Nuevo Leon	United States
General Motors	Heavy trucks, foundry and assembly of engines	Toluca, Estado de Mexico	United States
Grupo Ruvesa	Travel buses	Ciudad Juarez, Chihuahua	Mexico
Integracion de autobuses	Light travel buses	Santiago Tezoyuca, Estado de Mexico	Mexico
Kenworth	Trucks and truck trailers	Mexicali, Baja California	Mexico
Mercedes Benz	Trucks and truck trailers	Santiago Tianguistenco, Estado de Mexico	Germany/Mexico
Mexicana de Autobuses	Urban and travel buses	Tultitlan, Estado de Mexico	Mexico/United States/Brasil
Neobus de Mexico	Buses	Toluca, Estado de Mexico	Mexico
Omnibus Integral	Buses	Ags., Aguascalientes	Mexico
Péña Tractor	Truck trailers	Santa Catarina, Nuevo Leon	Mexico
Scania	Truck trailers and buses	SLP., San Luis Potosi	Sweden
Sistemas Automotrices y de Potencia (SAPSA)	Heavy trucks chassises	Los Reyes la Paz, Estado de Mexico	Mexico
Spartan de Mexico	Chassises	Qro., Queretaro	United States/Mexico
Thomas Built Buses de Mexico	Buses	Apodaca, Nuevo Leon	Unites States/Canada
Tractocasa	Truck trailers and its basic structures	Monterrey, Nuevo Leon	Mexico
Trailers de Monterrey	Trucks and Truck trailers	Monterrey, Nuevo Leon	Mexico
Tren Motriz de la Frontera	Trucks and its basic strctures	Ciudad Juarez, Chihuahua	Mexico
Victor Patron	Truck trailers and Cabine chassises	Mazatlan, Sinaloa	Mexico

Source: xyz

passenger cars and vehicles, as well as a long transition period for new and used cars, reflect the critical importance of this sector for the government. Besides the agricultural and financial sector, no other was granted these transition and protection mechanisms. Terminal firms have taken advantage of this situation and have modified their strategies in order to get ready for the regional market. As can be seen in Table 2.21, they have begun to relocate their plants from the central region to the north, in order to increase the efficiency of production process for the regional market and take advantage of the domestic market.

Table 2.22 The Mexican automobile industrial: policy evolution, 1962-1995

First Decree 1962	Second Decree 1972	Third Decree 1977	Fourth Decree 1983	Fifth Decree 1989	NAFTA
1. Seven manufacturers were allowed to produce automobiles 2. Import ban on new cars 3. Establishment of minimum ratio of local content for finished cars of 60% of the direct cost of the car 4. Foreign capital in autoparts industry was limited to a 40% share 5. Prior approval of imported parts and many components were to be produced locally (batteries transmission, shock absorbers, among others). 6. Prohibition on parts production by assemblers, except for engines	1. Manufacturers were required to export 30% of value of their imports from 1973 on; the export/import ratio was to increase by 10% annually. 2. Local content was maintained at 60% of production costs, but vehicles produced specially for exports could lower the level to 30% 3. Foreign companies were allowed for a maximum of 40% participation in any components industry. They were banned from producing components locally if there were already Mexican producers established 4. The government offered a 30% incentive to manufacturer's export prices 5. There were also specific requirements and export incentives for assemblers: a)at least 40% of exported parts should be made by local suppliers in which local capital holds a majority, and b)if they achieved a trade surplus, they were allowed to increase production quota.	1. Price controls and production quota were abolished 2. Assemblers were required to increase local content, measured at the cost of components and not of production, up to 75% for passenger cars and 85% for trucks 3. Assemblers were to offset all foreign currency spending required for production activities by exports 4. Local components of exported parts was increased from 40% (decree of 1972) to 50% 5. Minimum ratio of local contents required for parts was increased from 60% to 80% 6. The governments introduced several incentives for exports of components, particularly for locally assembled engines.	1. The number of produced models and types were restricted; only manufacturers that export more than 50% of its production were allowed to produce additional models. 2. In general, local content was increased. However mandatory local content ratio would be halved if the export/production ratio was of 80%	1. The ratio of local content was to be calculated on the basis of local value added in Mexico, rather than on parts cost. The value added ratio was of at least 36% in cars sold in Mexico 2. For every $1 imported of new cars, manufacturers must export $2.50, $2 in 1992 and 1993, and $1.75 in 1994 3. Removal of restrictions on models that could be assembled locally 4. Since 1994 truck and bus assemblers have not had local content requirements; parts imports for their production were permitted 5. Passenger car imports were allowed and limited to a maximum of 20% of the local market	1. In May 1995 the decree introduced harmonization formulas, to get to the regional market. The formulas describe the requirements of: 2. Value added 3. Trade Balance, and 4. Tariff Reduction
Level Production: 66,637 (units) Exports: n.a Imports: 187 Balance: n.a	Level Production: 189,986 (1970) (units) Exports: 540.3 Imports: 280.6 Balance: 259.7	Level Production: 280,813 (units) Exports: 209.4 Imports: 639.1 Balance: -429.7	Level Production: 285,485 (units) Exports: 981 Imports: 1,119 Balance: -138	Level Production: 641,281 (units) Exports: 3,583 Imports: 3,965 Balance: -380	Level Production: 935,017 (units) Exports: 12,948 Imports: 8,594 Balance: 4,354

Source: own research.

- National integration
- Import substitution
- Autoparts manufacture
- Producer rationalization

- Exports promotion
- Domestic market growth
- Trade balance problems
- National content emphasis

- Flexible regulation
- New vehicles importation
- Orientation to the free regional market
- Regional content emphasis
- Used vehicles importation until 2009

Chapter III
The Automobileparts Sector: Adapting to the Global Market

3.1 A general overview of the automobileparts industry

The production and supply of autoparts are critical to the automobile industry commodity chain, since the cost and quality of autoparts determine the competitiveness of the finished vehicles. Building effective supplier networks that produce a wide variety of autoparts is one of the most challenging tasks for the terminal firms in the automobile industry, since a single vehicle require more than 15,000 parts. While some important autoparts - such as engines - are produced by assemblers in-house, a large proportion of autoparts are produced by separate autopart firms and subsidiaries. Part suppliers are made up of various tiers and differ in size and in terms of their linkages to assemblers. Usually one assembler needs to organize several hundred autoparts firms, and many more employees than the terminal firms. Some large part firms produce sophisticated autoparts for assemblers, while small firms produce minor parts that later become part of more sophisticated autoparts (Lee and Cason 1994). It could be considered that the assembly production network of the automobile industry is the most complex part of the automobile commodity chain, one that is directly linked to the ownership structure and the size and number of automobile firms. *In Mexico, transnational corporations (TNCs) dominate the commodity chain; the situation is very different from developing economies such as Korea, where local producers (chaebols) were able to organize the network or in Brazil where governments pushed TNCs to develop a network of local producers.* In Mexico state policy has also influenced the development of the autoparts industry, in the form of decrees that permitted export platforms for the automobile industry but with the condition that terminal producers include some degree of locally produced parts in the finished products. This section will try to explain how the autoparts industry has taken advantage of this policy statement to adapt to globalization and to the enactment of the North American Free Trade Agreement (NAFTA) that came into effect January 1994.

The Mexican autoparts industry is one of the country's largest industrial sectors. In 1996 it included more than 500 participant firms and 150,600 workers, 7% of manufacturing employment. Sales were US$5,700 million and of that, exports were US$3,000 million (12% of manufacturing exports); the value added was equivalent to 3% of manufacturing GDP. Of the 500 firms, 351 are registered with SECOFI, to comply with the decrees of the automobile industry as described in Chapter II. During 1996, of the 351 firms, 214 were registered as national suppliers (includes maquiladoras), 39 were new producers, and 5 were new independent maquiladoras that

became national suppliers complying with NAFTA regulations.[1]

Table 3.1 Registered terminal industry suppliers, 1995 and 1996

Concept	Total	New enterprises	Maquiladoras that adopted legislation to become national suppliers
		1995	
National supplier	176	43	11
National industry of autoparts	171	32	-
Total	347	75	11
		1996	
National supplier	214	29	5
National industry of autoparts	137	10	-
Total	351	39	5

National suppliers means an enterprise constituted or organized under the law of, and operating in, Mexico, registered in the Secretaría de Fomento Industrial, that supplies to autoparts and terminal firms of those autoparts classified in the following sectors: (a) other textiles indutries; (b) other chemical industries; (c) rubber products; (d) plastics items; (e) glass products; and (f) body work and other autoparts. Beside it is required that terminal industry shall not have majority share in them, that its valued added has to have a 20% of domestic content, allowing them to have up to 100% of foreign investment. ***National industry of autoparts*** means an enterprise constituted or organized under the law of, and operating in, Mexico that produces autoparts and: (a) whose annual invoice value of sales of autoparts to manufacturers, for use as original equipment by the manufacturer in its production of automotive products for sale in Mexico constitutes more than 60 percent of the enterprise's annual total invoice value of sales of autoparts to manufacturers in accordance with rule 20 of the Auto Decree Implementing Regulations as of August 12, 1992, or any other measure adopted by Mexico that is no more restrictive than such rule - specified in the Diario Oficial of 1995 as 20% domestic, and that foreign investment share should not be larger than 40% (Diario Oficial . Diciembre May 31, 1995. Pag 32).

Source: SECOFI, 1996

The *directory of the Association of Automotive Parts Industry in 1994* (INA) lists approximately 500 companies as Mexican autoparts manufacturers, of which 111 companies are INA members[2]. According to INA, all of its member companies are primary (Original Equipment Manufacturers) suppliers who deliver products directly to assemblers. The table below classifies approximately 500 automotive parts manufacturers listed in the INA directory according to part type. Needless to say, many companies manufacture two or more parts, resulting in grand total of 721 entries.

[1] SECOFI. La industria automotriz en cifras 1996. Dirección General de Industrias/Dirección General de la Industria Automotriz. México 1996.

[2] INA. Noti-ina Reporte Mensual Enero de 1997.

Table 3.2. Autoparts manufacturers, by product

Parts	No. of INA members	Others
Accessories	11	59
Lubricating oil / Grease	3	21
Seats	4	27
Electrical	16	51
Radiators	3	22
Stamping	0	79
Brakes	10	26
Measuring instruments	1	2
Engine parts	33	97
Others	13	104
Rubber-steel	11	44
Transmission/Suspension/Steering/Clutch	34	40
Glass	2	11
Total	141	580

Source: INA Directorio 1994

The table below classifies the same companies according to their location by state.

Table 3.3. Autoparts manufacturers by state

Location	No. of INA members	Others
Baja California	1	1
Sonora	0	2
Chihuahua	1	0
Coahuila	4	3
Nuevo Leon	11	77
Durango	1	2
Aguascalientes	3	3
San Luis Potosí	1	3
Jalisco	1	12
Guanajuato	6	2
Querétaro	14	5
Hidalgo	0	1
Michoacán	1	1
México	37	109
DF	25	154
Morelos	0	2
Tlaxcala	1	1
Puebla	4	8
Yucatán	0	1
Total	111	387

Source: INA Directorio, 1994.

The description below is based on data published by government agencies, by the autoparts trade association (Industria Nacional de Autopartes), and the data obtained from two surveys. One conducted by UNICO International Corporation under the support of JICA (Japan International Cooperation Agency) and the other was carried out directly. The surveys were completed in 1996 among firms specializing in engine parts and car part components; the total number of enterprises was 18 in the first group and 162 in the latter, a total of 182 firms and 52% of the registered firms. The surveys show that these firms are the result of a consistent policy to promote the auto industry. The average year of establishment among engine parts companies is in 1968 and among car part components it is 1977, indicating their flexibility in the face of crisis, the opening of the economy and the NAFTA.

1968	1977	1987	1994
Average establishment of engine parts firms	Average establishment of component parts firms	Opening of the economy	NAFTA

Most of the firms surveyed could be considered small[3], indicating the existence of a network of enterprises that have become key to Mexico's economic development.

Large firms	Medium firms	Small firms	Micro firms
17	31	114	18

3.2 The institutional setting for the development of the autoparts industry

With liberalization and the NAFTA agreement there are new rules of the game for the autoparts industry. The underlying idea was that with the gradual liberalization of imports external competition would force national component producers to adapt their production techniques and standards to international levels. As mentioned in Chapter 2, there are two types of decrees regulating the automotive industry. One is direct

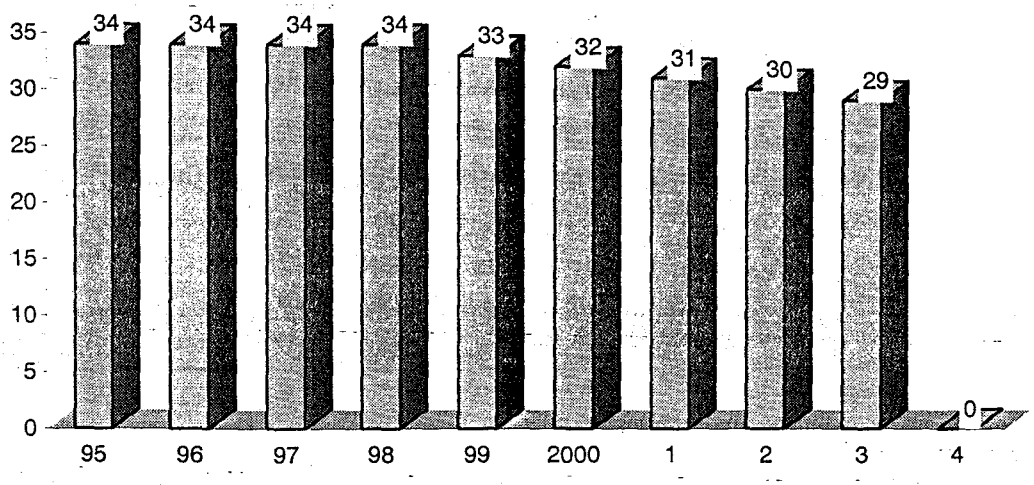
[3] The firms by size in Mexico are classified in accordance with the following criteria: micro occupies up to 15 workers, and has sales up to US$290 thousand dollars, small up to 100 workers and sales up to US$2.9 million dollars, medium size business up to 250 workers and sales up to US$6,5 million dollars and big enterprises, more than 250 workers and sales above US6.5 million dollars.

regulation and the other requires each company to maintain a positive trade balance. Firms are regulated on the level of domestic value added with which they impart their automobiles. The definition of domestic value added is as follows:

$$\text{Domestic Value added (\%)} = \frac{\text{Domestic value added of all the parts from local suppliers (VANp)}}{\text{Domestic value added by assembler (VAN)}} \times 100\%$$

In accordance to the 1995 decree the domestic value added will be reduced gradually until 2003 when it will be abolished, as can be observed in Figure 3.1 below:

Figure 3.1 Required domestic value added by assembler, 1995-2004



Combined with the above regulation is the trade balance requirement for assemblers, which requires that assemblers must earn more foreign currency than they spend. The formula stresses that the value of directly exported cars and automotive parts (X) plus the net foreign current earnings by the suppliers from export of parts made through the assembler (TP), should be greater than the sum of value added to raw materials, parts, components and sub-assemblies imported by the assembler for production of assembled cars (ID) plus the imports included in the value of locally purchased parts.

Trade balance by individual assembler = X - (ID + IP) + TP

This formula restricts the value of parts imported by assemblers, directly or indirectly and is thus contrary to the spirit of the NAFTA; as result, it will be abolished

within seven years. For the purposes of calculation, the sum of ID + IP will be weighted by a factor that will reduce it gradually. For 1997 the factor is 0.716, by the year 2000 it will be 0.633, in 2003 it will be 0.55 and in 2004 the formula will be abolished.

Thus the rules and institutional setting under which the autoparts industry will operate in the next few years are set; it could be argued that it is a temporary program that will help autoparts producers adapt to international and regional competition. Both definitions define a guaranteed market for autoparts producers: they put a lower boundary on the demand given the increasing strength of automobile production, but do not limit domestic sales.

The institutional setting for domestic autoparts is complemented with broad legislation for the NAFTA market, what is known as the rule of origin covering automobiles and autoparts (see Table 3.4). This rule requires that assemblers make vehicles that have a regional value content as determined by the net cost method. Net cost is defined as the total cost less the following costs and expenses (NAFTA section 402): sales promotion, marketing and after sales services, royalties, shipping and packaging and non-allowable interest. As the regional value content required for certification of origin will be increased gradually, production of components and parts within the region needs to be boosted accordingly. This implies the need for fostering autoparts industries or increased in-house production by automobile manufacturers.

Table 3.4 Rules of origin for automobiles and autoparts: required percentage of regional value added content

Vehicle Size	1994-1997	1998 to 2001	2002 onward
-Vehicles for 15 or fewer persons -Vehicles for 5 tons or fewer cargo - Engines & transmissions of the above	50	56	62.5
- Vehicles for 16 or more persons - Vehicles for 6 tons or more cargo - Other parts & components	50	55	60

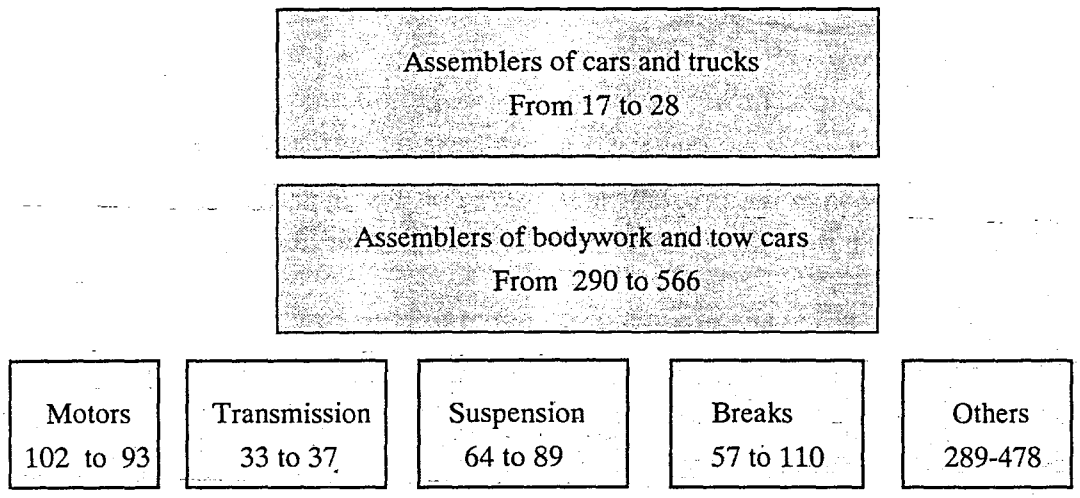
Source: NAFTA Article 403

From the institutional setting described above there are two trends that can be identified in the evolution of the autoparts industry. First, there will be a consolidation of the fittest autoparts producers, which will benefit the domestic inputs requirements set out under the 1995 decree and the NAFTA. A second feature will be that certain groups with lower productivity or productivity lags could disappear, without some sort of enhancement program. There it is unclear what will happen, it is expected that firms will take advantage of these new rules.

3.3 Strategic reorganization in the components industry after the opening of the economy.

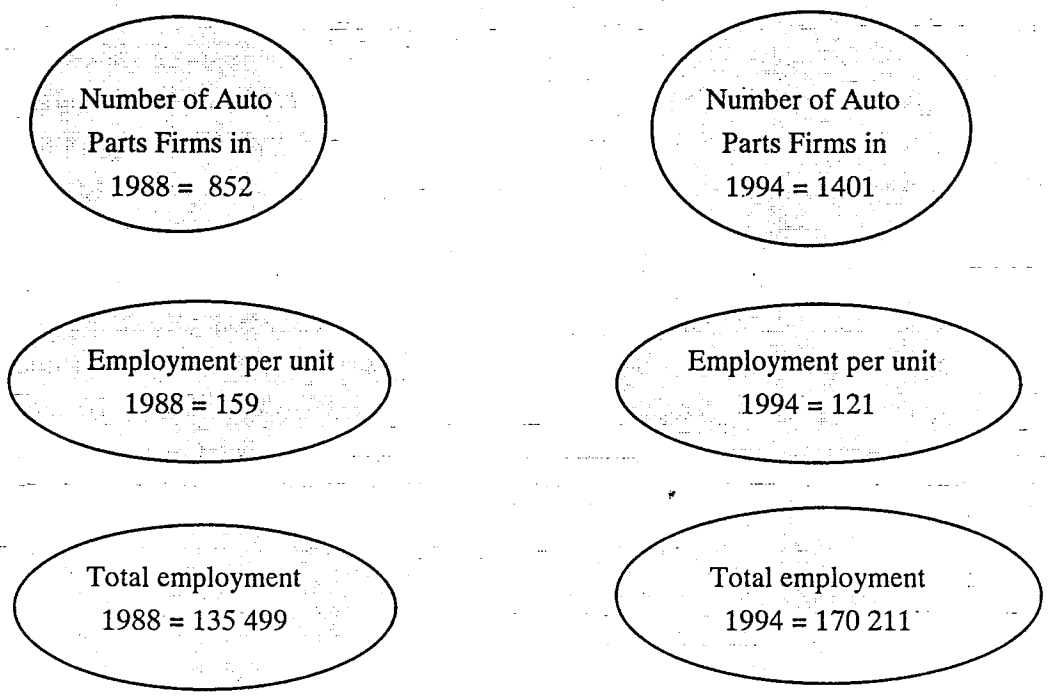
Autoparts industries in the period 1988-1994 increased considerably, in large part due to the anticipatory investment strategies of firms that decided to built or expand existing capacity to take advantage of the NAFTA. Assemblers of bodywork and tow cars almost doubled in the period, especially in the terminal sector, where the number of assemblers increased from 17 to 28. A similar pattern is found in "other accessories and parts" where producers increased from 289 to 478 (a 65 percent expansion) and brakes and suspension systems also increased (93 and 39 percent). Transmission producers remained almost stagnant and motors producers decreased slightly. It could be argued that the auto cluster was strengthened in this period; more producers came into the arena, with a new philosophy: *invest to compete in the global economy.*

Figure 3.2 Mexican automobile sector restructuring



Producers willing to compete in the world economy were willing to adapt to lean production systems with less workers per unit; as reported by the census data, the effect was a reduction of approximately 500 workers. The restructuring also implied a larger number of production units. Moreover, the expansion of producers also increased overall employment.

Figure 3.3 Structural changes in the autoparts industry, 1988-94



Census data indicates that average employment in the 340 firms surveyed was 155 persons. Numbers in the autoparts firm surveyed were well above those totals in almost all cases, which shows more labor intensive production system than in the census registers.

Figure 3.4 Employment by firm size

Survey of autoparts firms: average employment by size, 1994

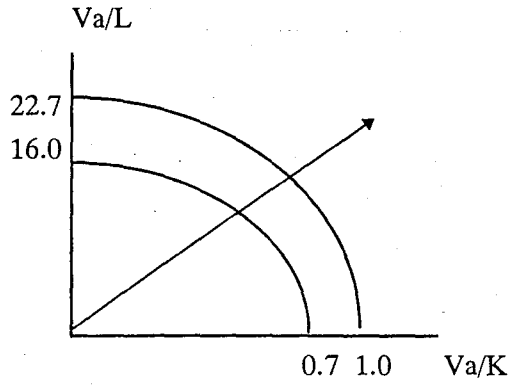
Large	Medium	Small	Micro
977	174	43	9

Census: average employment by size, manufacturing firms, 1988

Large	Medium	Small	Micro
623	156	38	3

Census average value added per unit increased as did labor and capital productivity, improving the overall efficiency of the auto sector. Both increased around 37 percent in dollar terms, resulting in an increase of total factor productivity (see Figure 3.5). The increase in total factor productivity was supported by better worker training and the modernization of existing capacity.

Figure 3.5 Total factor productivity, 1988-94



As productivity increased there was also a trend for higher wages, so total wage payments as percentage of total value added moved from an average of 36 in 1988 to 49 in 1994. In value terms, remuneration in the autoparts industries made employees an elite among Mexican workers. Average remuneration almost doubled in the period, reaching 6 times the minimum wage in 1994, a ratio that was 4 times that of 1988.

Investment in the sector also increased the average assets in the autoparts industry. Census data indicates that from 1988 to 1994, average assets increased from US$ 5 to US$ 7 million. Although there was an average increase of investment of 37 percent for the period, we find a decrease in the average investment for brake parts and accessories, and in other accessories and parts.

3.4. Autoparts industries organization: group formation and the emergence of networks

Since the implementation of the first automotive decree in 1962, the development of the Mexican components industry has followed two distinct paths. On one side there is a local industry, dominated by local capital and focused on the local market. On the other side there are the maquiladoras, oriented towards exports and with different production processes. Latest estimates suggest that there are around 500 component manufacturers and 170 maquiladoras within the automotive sector in Mexico. One

characteristic of the Mexican autoparts industry is its concentration. Data from 1996 show that about 50 companies, out of 111 INA associates, were part of 18 *grupos,* Mexican conglomerates with interests in industry, services, agriculture and other businesses (see Table 3.5 below). The Unik *grupo*, for example, controls 20 major component companies, employing around 8,200 people in 1993. Other big *grupos* are Condumex, Vitro and Tebo. *Grupos* have technological ties with US, European and Japanese component manufacturers, but in most cases the foreign share is very small. *Grupos* are mainly domestically owned and they generate considerable employment. *Grupos* in the sector form the nucleus of primary subcontractors for the terminal industry. Although domestically-owned these enterprises do not operate like a *keiretsu* system; rather, they are more linked to outside producers and their domestic sourcing is very low. In interviews, *grupos* the stated that they did not have supplier development programs or nor did they intended to design programs in the immediate future. The behavior of the *grupos* in this case is based more on the a framework of vertical integration or outside integration. Hence they lack the organizational flexibility to use the domestic market to advantage as they globalize.

Table 3.5 *Groups* in the autoparts industry

Group name	Number of auto parts firms in the group
1. Amaya	2
2. Bocar	3
3. Bodies	3
4. Bosch	2
5. Central de Industrias SA de CV	2
6. Condumex	8
7. Echlin Automotriz	6
8. Federal Mogul	3
9. ICA	3
10. Industrial Ramírez	4
11. Industrial Summa	8
12. Industrial Telleria	3
13. Moresa	11
14. Proeza	4
15. San Luis	1
16. Spicer	8
17. Tebo	10
18. Vitro	3

Source: SECOFI

Outside the control of the groups there is a large group of unorganized, independent small producers that constitute a potential core of second and third-tier subcontracting enterprises. This group of producers that up to now have been mainly maintenance part suppliers for after market, under a strong policy approach could be incorporated into a flexible production scheme. Dispersion has increased through time and today there is a large subgroup among this producers who have less than 15 workers (the census data had a sample of 794 micro enterprises) and low value added. These producers requires upgrading programs in order to work in the network economy that is emerging among autoparts producers. As well, these firms are generally under-capitalized: any supplier development program will have to include financial support to upgrade their equipment and their management programs.

Table 3.6 Autoparts producers by firm size

Sector	Units	% of total firms by sector
Assemblers of bodywork and tow cars	**566**	**100.0**
From 0-15		73.1
16 to 100	414	20.8
101 to 250	118	3.3
More than 250	19	2.7
	15	
Motors	**93**	**100.0**
From 0-15	8	8.6
16 to 100	39	41.9
101 to 250	15	16.1
More than 250	31	33.3
Transmissions	**37**	**100.0**
From 0-15	8	21.6
16 to 100	12	32.4
101 to 250	6	16.2
More than 250	11	29.7
Suspensions	**89**	100.0
From 0-15	42	47.2
16 to 100	28	31.4
101 to 250	12	13.5
More than 250	7	7.9
Brakes	**110**	100.0
From 0-15	51	46.4
16 to 100	38	34.5
101 to 250	10	9.1
More than 250	11	10.0
Others	**478**	100.0
From 0-15	271	56.7
16 to 100	124	25.9
101 to 250	46	9.6
More than 250	37	7.7

Source: INEGI Censo Industrial 1994

INA data show that registered firms have a larger ratio of domestic capital (83%). Survey data show that paid up share capital, was average US$ 700 000 in 1995, with lower figures for the micro and small businesses - US$ 12,770 dollars and US$ 110 000, respectively. Medium and large firms had considerably higher ratios: US$ 647 000 and US$ 5 million, respectively. The main source of foreign capital is the USA (26 firms), followed by Germany (10), Canada (3), Spain (2) and Austria, Sweden and United Kingdom with one firm each.

Low level of foreign capital are the result of former investment regulations which restricted foreign capital from owning more than 40% of local automotive component companies. This restriction has been liberalized under the NAFTA, and a transition period has opened. From 1999 on there will be no limits: any locally manufacturer, regardless of product, can then be wholly owned by a foreign concern.

In 1996 there were 345 foreign investors in the autoparts industry, located mainly in the accessories and parts sector and in the electrical systems sector where more than 264 firms are located; other firms are distributed across the other subsectors.

Table 3.7 Foreign investment in the autoparts industry by activity, 1996

Activity	Number of firms	Share in total
- Other parts and accessories	212	61.5
- Electrical systems	52	15.1
- Motors and its parts	39	11.3
- Break systems	15	4.3
- Suspension systems	13	3.8
- Transmission system	8	2.3
- Car body	6	1.7
Total	345	100.0

Source: SECOFI. Dirección General de Inversiones Extranjeras

Accumulated investment in the autoparts industry for the period 1994 -1996 (up to August 1996) totals one billion dollars, mostly concentrated in the accessories and electrical systems subsectors. Most of the investment comes from the United States (76%), Germany (7.4%), Japan (4.4%), Canada (2.2%), Netherlands (2.2%) and Spain (1.9%).

Table 3.8 Accumulated investment in the autoparts industry, 1994-1996

Activity	Accumulated investment	Share in total
- Other parts and accessories	692.1	64.9
- Electrical systems	228.1	21.4
- Motors and its parts	83.3	7.8
- Brake systems	41.8	3.9
- Suspension systems	9.9	0.9
- Transmission systems	5.6	0.5
- Car body	5.4	0.5
Total	1066.2	100.0

Source: SECOFI. Dirección General de Inversiones Extranjeras

3.5 Switching markets: from domestic toward export oriented

In the 1990s total sales (domestic plus exports) of the components industry reached new heights. Although earnings in the domestic market stagnated between 1989 and 1996 in dollar terms, exports more than doubled in the same period, highlighting a new dynamic in the industry. However car production increased by 45.8% in the same period, as imports of components by local manufacturers also rapidly increased. As mentioned above the assumption underlying the local content decrees, was that the components industry would constitute a network of suppliers, creating linkages and greater integration. Unfortunately industrial policy was never strong enough to accomplish this goal, and with the NAFTA the presumption is that the final destination of most sales will not be the domestic market. Earnings per sale in the components sector will come under intense pressure as the NAFTA reduces local content levels from 36% to 34% between 1994 and 1998. Between 1999 and 2003 they will be reduced further to 29% and from 2004 they will be completely removed.

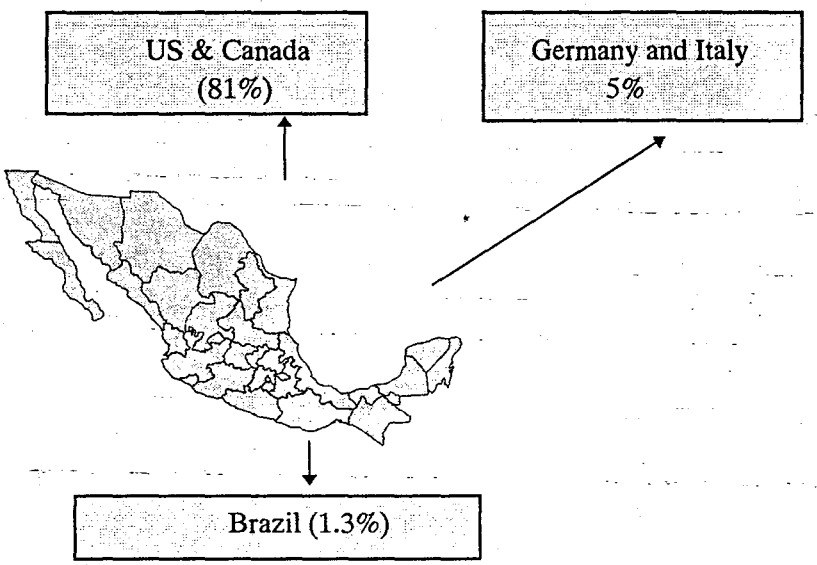
Table 3.9 Sales, investment and exports by the autoparts industry 1989-1995 (US$ millions)

Year	Sales	Capacity utilization (%)	Investment	Employment (000 of workers)	Exports
1989	5,642	n.a.	n,a	155.2	1490
1990	6,171	n.a.	613	173.6	1530
1991	6,491	71	899	184.2	1945
1992	6,572	72	1061	201.5	2162
1993	6,418	65	950	175.1	2541
1994	6,795	62	869	171.8	2982
1995	5,400p	55	1047p	145.4	3513p
1996	5,700e	n.a.	1123 e	150.6	3554*

p preliminary n.a. not available e estimated . * Up to November 1996.
Sources: Industria Nacional de Autopartes, SECOFI Dirección General de Industria

Under the NAFTA exports have become and will continue to be the largest portion of production; market integration with USA and Canada will dominate the future of the autoparts industry. This is confirmed by INA data which reports that NAFTA countries get 81% of total exports: USA (76.9%) and Canada (4%). Other exports are split among Germany (3.6%), Italy (1.5%), Brazil (1.3%), and others (12.7%).

Figure 3.6 Main export markets for the Mexican components industry



The hypothesis of a single market for autoparts producers receives more support with analysis at the product level, where data indicates that Mexican autoparts producers has been able to capture an increasing share of the USA market.

Table 3.10 USA sourcing of Mexican products

Product	Mexican share of US market
Axles and external parts for tractors	96
Safety belts	87
Sparkplug cables	80
Taximeters and speedometers	75
Windshield wipers	73
Steering wheels and gear boxes	45
Windshield wiper blades	43
Windshields and side windows	35
Internal combustion engines	26
Motors parts	24
Tires and tire parts	24
Directional lights	19
Vulcanized rubber tubes and accessories	18
Leaf springs	12
Bumpers	11

Source: SECOFI

As specified in Table 3.11. the penetration of autoparts into OECD markets has increased substantially, especially in parts and accessories for vehicles, followed by internal combustion motors of which Mexico has become a large exporter. General Motors, Ford, Chrysler and Nissan assemble engines for use in their US or Japan assembly plants; Renault also has an engine manufacturing plant in Mexico, with exports to Europe worth around US $600 million per year.

Table 3.11 Mexico's autoparts export performance to OECD nations, 1980-1994

Item	Market share	Contribution	Specialization	Share of the sector
713 (internal combustion engines)				
1980	0.96	0.59	0.76	0.78
1990	5.24	3.60	3.50	1.03
1994	6.02	3.52	3.09	1.14
784 (Vehicle parts and accesories)				
1980	0.85	1.33	0.68	1.96
1990	2.63	4.30	1.74	2.47
1994	3.87	5.39	1.99	2.71
786 (Tractor trailers and containers)				
1980	0.03	--	0.02	0.12
1990	0.52	0.05	0.33	0.16
1994	3.39	0.24	1.74	0.14

Source: Based on Competitive Analysis of Nations, ECLAC

Most of the firms export through a third party, so when asked if they were interested in expanding direct exports 88 % answer yes. Among engine parts companies, their first choice is to export to the US market (59%), followed by Brazil (17.6%), Colombia (11%) and Central America (5.9%). Among car parts components producers USA was also the main market (52.1%), but destinations included others countries such as Chile. The expected sales share they are willing to export is up to 49% of total sales. When questioned about the difficulties they find in promoting exports they argued that the main three problems are:

- Marketing
- Procedures
- Contracting

3.6. Specialization of the autoparts industry

Specialization of the components industry is very diversified, in late 1995 the main products by system were: stamping and its parts, followed by electrical system, and motors and their parts.

Table 3.12 Sales in the autoparts industry by production system, 1995 (% share of total sales)

System	1994	1995
Stamping and its parts	11.90	22.12
Others parts	31.71	19.62
Electrical	13.92	17.87
Motors and their parts	19.88	15.99
Brakes	1.63	9.61
Accessories	10.92	8.78
Seats and their parts	2.68	2.15
Glass	1.16	1.24
Cooling systems	0.35	1.00
Transmissions, suspensions, steering and bearings	5.85	1.63
Total	100.00	100.00

Source: INA in the Web

Larger producers in the component industry has a diversified line of production as can be observed from Table 3.12. The survey output mix is very diversified with 284 products, and no single product has more than an 8% share among engine parts and less among car parts components. Main products were in engine parts: 6 cylinder motor (4.2%), auxiliary frames (4.2%), carburetors (4.2%), chassis (4.2%), condensers (4.2%), distribution boards (4.2%), engine components (4.2%), internal combustion engines (4.2%), joints for engines (4.2%), switches (8.3%).

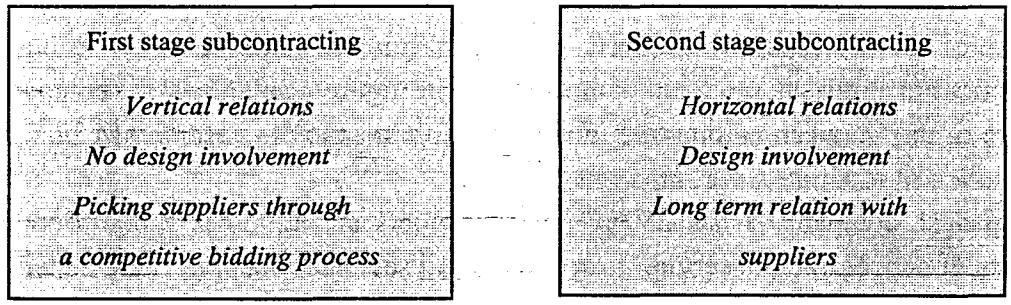
3.7. Domestic subcontracting: network development in Mexico

Although unspecified in legislation, it could considered that subcontracting was the goal of the local content decrees, and that with subcontracting would evolve a network of suppliers and backward linkages from the terminal industry. Subcontracting has evolved gradually but it is weak by international standards. It is expected that the

terminal industry under the NAFTA will adopt Japanese-style practices to cut their production and component costs and overhaul their supplier bases. They will attempt to extract greater benefits from their suppliers. They should also be willing to closely involve their suppliers in product development and in the drive for the continual improvement of production processes. Terminal assemblers Nissan and Volkswagen have already launched large projects such as Sentra (Nissan) and Concept 1 (Volkswagen).

In Mexico today subcontracting can be termed first stage. It exhibits a traditional adversarial relationship: manufacturers have continued to design products largely without input from suppliers, choosing suppliers on the basis of price and a competitive bidding process, and dictating the contract terms. They continue to expect suppliers to do as they rare told and not much more. Second stage subcontracting is much more difficult, because it involves suppliers in a cooperative process of product development and process improvement. It requires a *bona fide* partnership, in which there is an unimpeded two way flow of ideas. Most terminal producers in Mexico continue to operate using a first state mentality, under the assumption that domestic suppliers are still low quality producers, unable to meet the requirements of product development and process improvement.

Figure 3.7 Subcontracting relationships, first and second stages



The terminal industry has not realized yet that trust takes root only if suppliers share the rewards, not just the risks. That can only be achieved if suppliers and terminal assemblers operate with a common vision of how to collaborate and jointly create value. However, trial and error is still the preferred method by which Mexican producers define their relations with suppliers. There is no systematic approach by terminal firms to subcontract; until now subcontracting has been random exercise in the Mexican automobile industry. Terminal assemblers have not been able, or willing, to create a

keiretsu sourcing model. This is confirmed with the results of a survey conducted in 1994[4] among kogaisha firms in Mexico, a basic conclusion was that Japanese firm (J firm) get only 6.5 percent of their procurements from Mexican firms, the rest they get from J firms operating in Mexico or foreign firms.

This poor performance of J firm in Mexico is more deceptive, when you compare the development of suppliers network in Japan and in Mexico. Mexican automotive industry has the capacity to produce about 1 million cars per year, including passenger cars, buses and trucks. There are 5 passenger car manufacturers and 12 bus /truck assemblers. The number of autoparts manufacturers is between 500-600 according to various statistics, of which 110-150 firms are presumed OEM suppliers. In comparison, the Japanese automotive industry consists of 11 assemblers, under which roughly 20,000 autoparts manufacturers operate. These 20,000 firms form a subcontracting framework which is divided in stages: primary parts production, parts, units and processes, within the uniquely stratified, specialized production system.[5]

The Mexican approach to subcontracting is similar to that of Europe, the United States and Canada, where terminal assemblers tend to deal directly with parts manufacturers even if the parts in question are small, implying that they deal with more manufacturers directly. On the other hand, in Japan, suppliers are organized into a multilayered structure led by primary suppliers, so that assembly makers deal with a limited number of suppliers. Furthermore, suppliers are classified by the assembly market to which they supply their products, i.e. each supplier is captive to a particular assembler and few of them deal with more than two makers. Figure 3.8 is a conceptual drawing of the relationship between assembly makers and suppliers using the hypothetical example of Japanese company A. The figure also shows the comparable structure of the Mexican automobile industry; autoparts manufacturers in Maquiladora are excluded to facilitate the comparison.

Japanese company A has 230 primary suppliers and 2,000 to 3,000 secondary suppliers. If subcontractors serving for primary and secondary suppliers are added (the tertiary level and below), the company would have more than 10,000 subcontracted firms. In contrast, Mexico as a whole has a roughly 500-600 subcontracting firms, including repair-parts and motorcycle-parts manufacturers. This shows that the foundations of the Mexican autoparts industry are shallow, and hence its industrial structure is umbrella-shaped rather than pyramidal, as in Japan.

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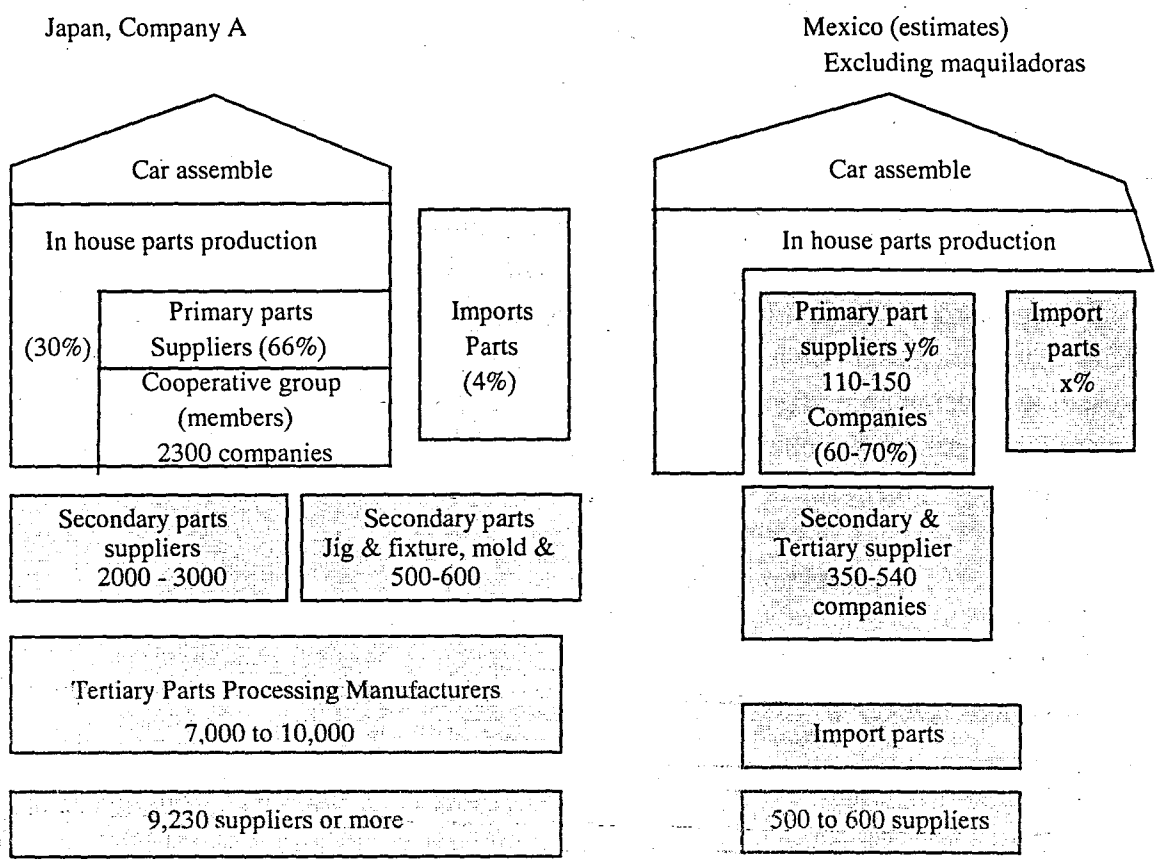
[4] Ruiz Durán Clemente The Role of Japanese Direct Investment in Developing Countries: the case of Mexico. Report prepared for the Ministry of International Trade and Industry of Japan March 1995, p.. 208.
[5] JICA/UNICO International Corporation. The Study of the Master Plan for the Promotion of Supporting Industries in the United Mexican States. Final draft report. December 1996, 1.3.21- 1.3.25

Figure 3.8 Subcontracting structures, Japan and Mexico



The survey shows that Mexican subcontracting networks differ among assemblers: the largest network seems to be Volkswagen with 25 primary parts suppliers, followed by the three US assemblers. It appears from the data that these firms are more *keiretsu* -oriented than the Japanese firms, that one would have expected to have a larger and more organized subcontracting network.

Table 3.13. Assembler networks, number of subcontracting firms per terminal firm

Firm	Engine parts	Car part components	Total
Volkswagen	3	22	25
Chrysler	4	9	13
Ford	1	11	12
General Motors	2	6	8
Nissan	1	6	7
Mercedes Benz	-	5	5
Honda	-	1	1
Total	11	60	71

Autopart producers are supported by different types of assistance/cooperation from customers. *The main type of cooperation is technical assistance*: 65 firms reported such cooperation; the second type is supplier assistance from customers, 37 firms; training assistance, 29 firms; financial support, 24 firms and management assistance from customers, 18 firms. When asked what sort of assistance they expected in the future, the main areas of cooperation ranked on a similar basis, with financial assistance moving to third place.

When all firms were asked about the type of market in which they participated in 1995, the firms answered that subcontracting was the main practice (49.82%), followed by the aftermarket (42.92%) and the reconditioning market (7.51%). Most of the firms (85.4%) expected to increase subcontracting, 10.7% did not, and 3.9% argued that their present level of subcontracting was sufficient. For all firms the three main difficulties in expanding or penetrating the subcontracting market were:

- Insufficient production 10.0%
- Lack of company information 35.6%
- Penetration is not easy 27.5%

3.8 The Emergence of Regional Networks under NAFTA

Creating productive linkages in the global economy has not been properly defined as a goal of industrial policy, rather it derives more from the strategies of TNCs have attempted to set up lean production systems at the world level, beyond national borders. The autoparts agreement, reached under NAFTA's rules of origin formula, could be considered an industrial policy approach, one that tries to increase the size of the regional content from 50 to 62.5%, by fostering cooperation among businesses, a technique similar to that created under the European Union agreements. The autoparts agreement will compensate for the lack of domestic content requirements, that would otherwise have a deleterious effect on Mexican value added and on the trade balance. These factors have divergent trends, but are complementary for the integration of the autoparts industry within the NAFTA region.

The single market will be fostered also by the complete elimination of tariffs, scheduled for 2004. In the transition period Mexico will eliminate its tariffs gradually, while the USA opted to quickly reduce its tariffs. Although tariffs for autoparts were not excessively high, this step will benefit trade in the NAFTA region, integrating the market. The transition period will see shifting investment among the three countries to take advantage of comparative advantages. For example, Lee and Cason (1994) estimate that the relative cost of labor between the USA and Mexico in the auto industry is five times as great. Thus it is expected that the shift will benefit Mexico due to its lower wages.

Figure 3.9 Increase in regional content, 1995-2004

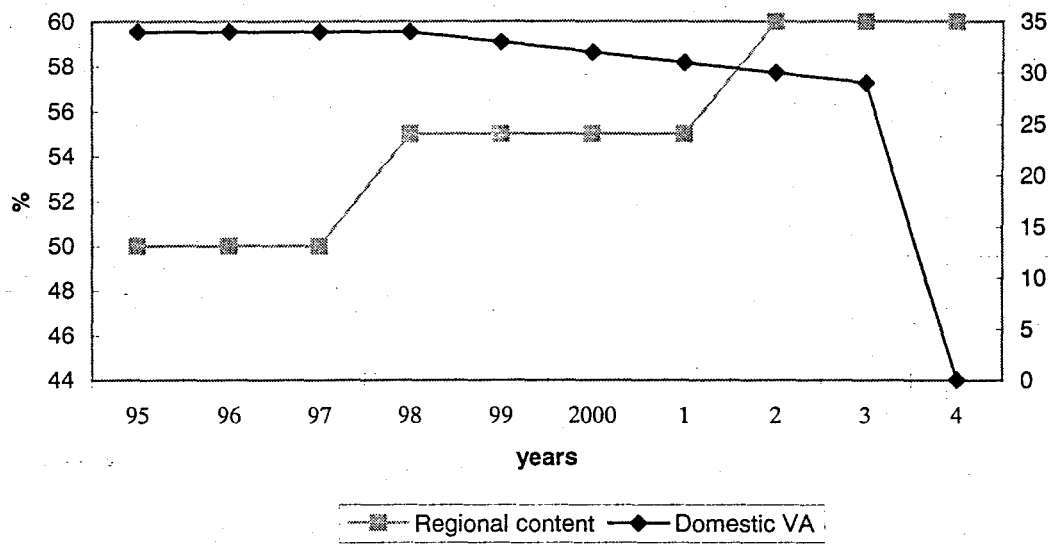


Table 3.14 Schedule of tariff elimination by tariff rate

(%)

	Before	Schedule		
	NAFTA	1994, Jan	1998, Jan	2003, Jan
Imports to Mexico from USA and Canada				
Passengers	20	10		0
Light Trucks	20	10	0	
Big buses and trucks	20			0
Parts & components (1)	10-15 (av. 13)	(5%)	(70%)	(25%)
Exports from Mexico to USA				
Passenger cars	2.5	0		
Light trucks	25	10	0	
Cab/chassis	4			0
Other trucks	25			0
Buses	0			
Part & components (1)	av. 3.1	(81%)	(18%)	(1%)
Exports from Mexico to Canada				
Passenger cars	9.2	4.6	2.3	0
Trucks	9.2	4.6	0	

Notes: 1) Elimination schedule is mentioned in percentage of import value in parenthesis.

The integration of the NAFTA region into one market poses obstacles for policymakers, the main one being that should Mexico lack foreign exchange earnings, the integration process could be hampered by balance of payment restrictions. Today, Mexico's overall automotive balance is positive, reaching US$ 5,700 million in 1995. *However, there exists a regional autoparts deficit (more than three quarters of it originates from unbalanced trade with USA and Canada) due to the character of the regional market.* The problem will rise when the domestic content regulations vanish in the year 2004, at which point the autoparts industry deficit could become very large, causing the overall auto industry balance to become negative. In this case, the NAFTA participants will have to design a new accounting system for the balance of payments, substituting national for regional accounting, or create some sort of regional transfer mechanism.

Table 3.15 Imports and exports of the auto-parts industry (US$ 000)

	1992	1993	1994	1995
Imports	8595073	8943617	10037865	9031982
Automobile chassis	24861	9382	50064	17883
Assembly materials for automobiles	6007099	6439314	6733137	3649430
Motors and motor parts for automobiles	376917	394219	565446	997742
Maintenance parts for automobiles & trucks	1337861	1377121	1980573	3919961
Non-automatic trailers for vehicles	41606	22456	31481	26588
Others	806729	701125	677164	420378
Exports	3330799	3978155	4891987	5848280
Chassis for all kinds of vehicles	80982	134313	212771	216538
Automobile motors	1202724	1302179	1778112	2122644
Springs and sheets for automobiles	63015	106036	125719	125761
Automobile parts	1524715	1888961	2106949	2300796
Motor parts	271530	316752	404798	468722
Others	187833	229914	263638	613819
Balance	-5264274	-496540	-5145878	-3183702

Source: Banco de México "Indicadores del Sector Externo"

3.9. Overall technology: how the learning process has evolved

Sourcing within the region will be the basic business practice in the region. As noted by Berry (1997), gains from inter firm cooperation tend to be greater and cooperation easier when the cooperating firms sell their product(s) outside the country. In light of current trends towards greater openness, special attention should be given to those types of interactions most likely to work in relatively open economies. Since new

international customers often have higher standards than national ones, it will be important that local institutions can help firms upgrade their production and design capabilities. The autoparts industry has had a dual learning process, a formal one through technology transfer, and another known in the literature as practical, implicit or tacit knowledge. Its essential characteristic is that it is difficult to transmit verbally or in written instructions and instead is taught by demonstration, on the job and in the process of production. Both of these mechanisms have enabled domestic producers to add design to their repertoire of skills. Some are trying to adapt to international technology, and in the process they have adopted some of the common upgrading strategies.

Upgrading in the industry will be required almost immediately as terminal industry producers - General Motors and Chrysler - are demanding that all suppliers, worldwide, acquire the QS9000 certificate between July and December of 1997. QS9000 is a quality standard formulated about the same time as ISO 9000[6], under the leadership of the Big Three. It came about by unifying different quality assurance criteria of US producers with those of autoparts suppliers, and related businesses, in addition to extra requirements unique to the automotive industry. It consists of three sections: 1) Terms and conditions based on ISO 9001; 2) additional terms and conditions common to the automotive industry, and 3) requirements set forth by the firms. It will not be easy for Mexican firms to attain this certification; the survey registered 60 enterprises as meeting some sort of international standard, but only 3 firms are registered with as ISO9000 producers, and another 3 were QS9000 certified. Volkswagen and Nissan have their own standards, but only 3 firms having meet German standards and one reported meeting the Japanese standards. In addition, 78 firms reported having adopted some set of foreign standards, mainly from USA; 56 stated they met Mexican Standards and 106 firms stated they had devised company standards.

Table 3.16 Application of Industrial Standards

Industrial standards	Total number of answers	(%)
International (ISO,IEC)	78	43.8
Foreign Standards	43	24.2
Mexican Standards	56	31.5
Customer's Standards	107	60.1
Own standards	106	59.6
None	2	1.1

Source: JICA-UNICO report

[6] ISO 9000-series standards are quality control and quality assurance standards enforced in 1987 by the International Organization of Standardization (ISO: established in 1947118 member states as of 1995; about 10,000 industrial standards). They consist of 5 standards, out of which ISO-9001 - ISO-9003 are subject to examination/registration, and stipulate the requirements for corporate quality -assurance systems, not for the product itself. In Mexico, three standards are registered as compatible standards, namely NMX, CXC-3 and CC5 (JICA-UNICO report).

To evaluate the state of firm technology among surveyed firms, the questionnaire asked firms to list the type of essential technology that they required in their operations. Usually, two or more essential technologies are required for the manufacture of any one product; enterprises specializing in one technology are exceptional.

Table 3.17 Essential Technology (number of answers)

Essential technology	Number of answers	%
Casting	49	12.3
Forging	21	5.3
Stamping	123	30.9
Plastic processing	59	14.8
Rubber processing	9	2.3
Machining	25	6.3
Heat treatment	10	2.5
Surface treatment/Electroplating	3	0.8
Glass Working	5	1.3
Sheet work/wedding	17	4.3
Assembling of parts/components	47	11.8
Printing	3	0.8
Others	27	6.8
Total	398	100.0

Source: JICA/UNICO report

Six areas were covered in the technology analysis: quality control practices and rate of defects; modernization level, capacity utilization and new machinery acquisition; technology transfer from overseas, manpower and management.

(a) Quality control practices, and rate of defects

Quality control was one of the main areas where most firms have developed some sort of practice, it is not only a practice but they have develop a systematic approach, developing a division for quality control, full time inspectors, inspection system, and some have even gotten into quality circles.

Table 3.18 Quality control practices

Practice	Engine parts firms	Car parts firms	% of total firms involved
Division for quality control	9	78	49.2
Full time inspectors	9	79	49.7
Operators themselves	10	121	74.0
Inspection system	9	102	62.7
Inspection between processes	7	74	45.8
QC circles	3	42	25.4
Prop. system	5	65	39.5

Source: Survey data

These quality control mechanisms have allowed the firms to achieve a very low defect rate. Estimates by the firms themselves are an average 2.0%, with a larger proportion among micro (2.64%) and small firms (2.27%), falling to 1.64% in medium-size enterprises and as low as 0.39 % among large firms. This rejection rate emulates the levels in industrialized countries. The weakest area in technology regarding the defect rate is due to production technology (31.6%), to lack of quality control equipment (22.1%), to production facilities (28.7%) and to quality control technology (16.9%).

(b)Modernization level, capacity utilization and new machinery acquisition

Self-evaluation of existing machinery and equipment by the enterprises indicates that only 28% of the firm consider their equipment to be above the average level of modernization.

Table 3.19 Self evaluation of machinery and equipment

Level of modernization	Number of companies	(%)
Modernized enough	50	28.1
Medium level	107	60.1
Still low	21	11.8
Total	178	100.0

Source: Survey data

For 14% of the firms surveyed stated they were short capacity, 45% believe they had over capacity and 41% mentioned they possessed the appropriate level of capacity. This suggests that existing machinery and equipment is not fully utilized due to small orders.

Table 3.20 Self assessment of production capacity

Level of capacity	Number of companies	(%)
Over	80	44.9
Appropriate	73	41.0
Short	25	14.0
Total	178	100.0

Source: Survey data

Plans to acquire new machinery varied among firms, but on average 59% of the firms are planning to acquire new machinery, a figure that is above average among, large business (80%), and below average in small and micro firms, 62% and 13%, respectively. More engine parts companies are planning to acquire new machinery (58%), than car part component firms. The main problems faced by these firms in acquiring new machinery is financing (55.1%) and high interest rates (14.7%), followed by an insufficient market size (10.3%) and the cost of new machinery (5.1%). Perhaps in response to this last situation, 65.7% of firms are planning to acquire second-hand machinery.

(c) Technology transfers from overseas

Nearly 47.2% of firms receive technology transfers from international sources, and 35.4% are planning to acquire it in the future. The main means of receiving technological assistance is through seminars (35.8%), overseas training (12.3%), advisory services (13.6%), licensing (9.9%), training in Mexico (8.6%), workshops (6.2%) and technological information (3.7%).

(d) Joint ventures

Around one fourth of the firms (23%) are involved in joint ventures partnerships to technology transfer. In the case of engine parts the product is European but the company is USA-based. For car parts there is a larger diversification: 25.6% of the products comes from Europe, and 69.2% comes from USA-based companies. Among car parts, 21 products are the result of joint ventures with foreigners that had as their objective the transfer of technology.

(e) Institutional problems with technology transfer from overseas

One of the problems facing firms willing to acquire technology from international sources is the institutional atmosphere. When asked to list the main problems, firms mentioned that the lack of timely procedures (20.4%) was their first concern, followed by the lack of information (18.5%), expensive services (16.7%) and complicated procedures (13%).

(f) Human resources and management

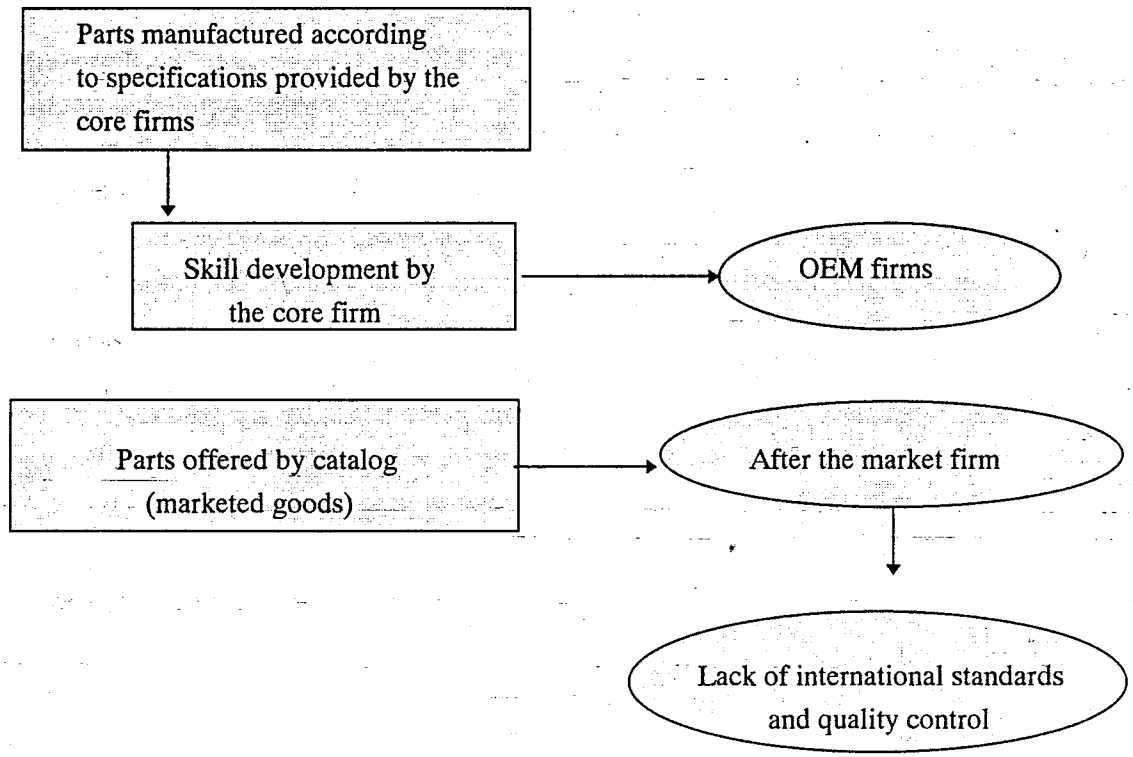
A profile of firm workers shows that their average age is 28 years and that the average worker stayed in the same job for 6.59 years, with a longer period in medium-sized industries (8.65 years) and lower periods in large and micro enterprises (5.9 and 6.7 years, respectively). The main problems facing human resource management were recruitment (37.2%) followed by training (27.7%), job hopping (10.2%), and discipline (9.5%).

Most of the companies train or educate their employees using on the job training at the factory level (97%), half of the firms (47.9%) make workers participate in seminars and workshops, one fifth (21.9%) schedule training courses in schools and community centers and only 18% of the businesses dispatch employees

overseas.

In the case of management, the two fifths (41.3%) of the managers had transferred from a domestic firm, followed by directors who were successors to their families or relatives (26%), and directors spun out from a foreign-based company in Mexico (20%). Management are highly trained: 53% have a diploma or higher and 27% have gone to university or college outside the country. One of the main problems facing these firms is that they do not have what we can call a process of continuos management improvement. Rather, they are forced to obtain management skills from external sources, substantially increasing the cost of human resource upgrading. However, management realize the problem and seem willing to take the necessary steps: 82% of management mentioned that they are willing to participate in management upgrading programs.

Although a learning process has developed and has allowed firms to get in a better shape, but does not allow to develop the concept of relation specific skill among terminal and suppliers, that Asanuma (1988) analyze for the case of Japan, in which you can divide goods acquired by the core firm, into those purchased goods (konyuhin) and ordered goods (gaichuhin). The difference among this two types of goods is that purchased goods usually are offered to the public irrespective of the core firm and are therefore purchasable by merely selecting from the catalog. In contrast ordered goods means that those goods or processing services which are supplied by outside firms according to specifications issued by the core firm. In Mexico the learning process has been bounded by the type of goods produced by the autoparts industry. Original equipment firms get in a more systematic relation with the terminal industry (core industry for Asanuma) so they could be considered gaichuhin, in terms that the design is discussed and parts are manufactured according to drawings provided by the core firm. The other set of goods are those provided by "after the market manufacturers" are the ones that could be considered as marketed goods (shihanhin) that corresponds to those goods which are offered to the public irrespective of the will of the core firm and are therefore purchasable by merely selecting from the catalog, so they do not get certified by the terminal industry as filling out the standards. So we can say that in that sense skill development is being developed among OEM producers, but not among all those firms producing for after the market, that are the largest portion of the autoparts network. A classification of the autoparts industry following the degree of initiative in design of the product could be done, borrowing from Asanuma (1988).



3.10. Menu financing of the autoparts industry

One of the main problems for all firms is sound financial backing that allow them to expand production without restriction. In the components industry we can divide firms into three major groups: public firms that solicit capital from the stock market; firms connected with foreign capital, that receive financial resources from abroad, and finally those firms that must restrict their financial resources to those obtained from the banking system and self-financing. The first group is quite small, only 11 components firms are listed in the Mexican Stock Market: Condumex, San Luis, Vitro, Sudissa, Tremec, Acmex, Dina, Eaton, Iasa, John Deere and Perkins. Their consolidated financial statement shows how these firms recuperated from the 1994 financial crisis and were able to return to profitability in 1995, but with lower total assets and net worth. This firms were not of the highly indebted group and obtained foreign exchange earnings, so debt to equity ratio did not increase drastically (in 1994 was 1.59 and by 1995 it reached only 1.66).

Table 3.21 Quoted firms consolidated financial statement

	1994	1995	1994	1995
	(1000 of US$)		(% of total assets)	
Balance sheet data				
Total assets	6,636,113.18	6,530,743.77	100.0	100.0
Current assets	2,015,728.94	1,878,540.82	30.4	28.8
Long-term assets	701,893.47	695,449.82	10.6	10.6
Property, plant and equipment	2,885,658.43	2,906,480.10	43.5	44.5
Deferred assets	173,476.56	150,941.88	2.6	2.3
Other assets	859,355.78	899,331.15	12.9	13.8
Total liabilities	4,075,113.95	4,082,586.34	61.4	62.5
Currents liabilities	1,310,150.36	1,395,752.48	19.7	21.4
Long-term liabilities	2,739,020.73	2,651,263.14	41.3	40.6
Deferred credits	3,393.74	1,247.37	0.1	0.0
Other liabilities	22,549.13	34,323.35	0.3	0.5
Net worth and minority equity	2,560,999.23	2,448,157.43	38.6	37.5
Net worth (A+B)	2,275,306.05	2,078,921.44	34.3	31.8
Paid-in-capital (A)	1,158,432.99	1,092,116.14	17.5	16.7
Earned capital (B)	1,116,873.06	986,805.30	16.8	15.1
Income statement				
	(1000 of US$)		(% of total sales)	
Net sales	4,307,384.87	4,256,342.96	100.0	100.0
Cost of sales	3,309,584.09	3,120,644.28	76.8	73.3
Operating expenses	654,774.69	646,335.77	15.2	15.2
Operating earnings	343,026.08	489,362.91	8.0	11.5
Earnings before taxes	-245,797.32	127,498.97	-5.7	3.0
Net earnings	-423,219.80	66,708.17	-9.8	1.6

Source: BMV Anuario Financiero 1994-1995

Firms with foreign investment financial statements showed a very heterogeneous situation: some, such as brake system firms, other parts and components, and suspension systems, had a drastic drop in profitability. Others with very low profitability were firms making parts and accessories for the electrical system, and the car body parts and thriller components subsectors. Finally, those firms that maintained high profitability were motors and its parts, while the only subsector to show a rebound in profitability was transmission systems.

Firms with foreign investment had a lower debt-equity ratio than those on the stock market, so they had also a better capitalization ratio, with the exception being the car body parts firms that registered negative accounting capital.

Table 3. 22
Balance and income statement of autoparts firms with foreign investment

	1988	1994	1995	1988	1994	1995
	(thousands of dollars)				(ratios)	
Parts and accesories for the electrical system						
Assets	187325.6	510559.3	235572.9	100.00	100.00	100.00
Liabilities	55486.2	247946.9	104346.6	29.62	48.56	44.29
Accounting capital	131839.4	262612.4	130906.7	70.38	51.44	55.57
Income	169662.0	523949.2	257843.5	100.00	100.00	100.00
Salaries	15302.4	32529.2	23208.1	9.02	6.21	9.00
Manufacturing costs	28785.1	153569.9	134091.6	16.97	29.31	52.01
Operating profits	6862.3	9443.1	9953.6	4.04	1.80	3.86
Car body parts and trailer transporting, fabrication & assembly						
Assets	N.A.	16070.2	9667.3	N.A.	100.00	100.00
Liabilities	N.A.	14085.6	11991.6	N.A.	87.65	124.04
Accounting capital	N.A.	1984.6	-2324.3	N.A.	12.35	-24.04
Income	N.A.	31836.3	1143.8	N.A.	100.00	100.00
Salaries	N.A.	93.6	34.3	N.A.	0.29	3.00
Manufacturing costs	N.A.	6835.6	491.8	N.A.	-21.47	43.00
Operating profits	N.A.	0.0	0.0	N.A.	0.00	0.00
Motors and its parts						
Assets	740184.0	829972.7	619729.2	100.00	100.00	100.00
Liabilities	137126.0	309889.4	237030.7	18.53	37.34	38.25
Accounting capital	603058.0	520083.3	382903.0	81.47	62.66	61.79
L/Ac	0.2	0.6	0.6			
Income	400156.4	587170.6	301374.5	100.00	100.00	100.00
Salaries	15194.3	16284.3	9062.9	3.80	2.77	3.01
Manufacturing costs	46544.0	59220.1	79592.9	11.63	10.09	26.41
Operating profits	76524.9	23237.1	44882.6	19.12	3.96	14.89
Transmission system						
Assets	194391.2	309861.7	193070.3	100.00	100.00	100.00
Liabilities	54493.8	73353.9	48586.0	28.03	23.67	25.16
Accounting capital	139897.4	236507.7	144484.2	71.97	76.33	74.84
Income	182685.6	195499.9	74667.1	100.00	100.00	100.00
Salaries	7673.5	11920.5	4086.0	4.20	6.10	5.47
Manufacturing costs	44952.5	70695.7	23517.2	24.61	36.16	31.50
Operating profits	12206.4	10522.3	11037.7	6.68	5.38	14.78
Suspension systems						
Assets	69765.1	156881.0	92438.4	100.00	100.00	100.00
Liabilities	25671.1	72312.0	48474.5	36.80	46.09	52.44
Accounting capital	44094.0	84569.0	43963.9	63.20	53.91	47.56
Income	46037.6	134266.7	73444.0	100.00	100.00	100.00
Salaries	2579.1	10300.4	4162.2	5.60	7.67	5.67
Manufacturing costs	7329.7	28322.8	15738.7	15.92	21.09	21.43
Operating profits	4617.2	3181.6	2622.2	10.03	2.37	3.57
Break systems						
Assets	112486.4	216109.5	116965.3	100.00	100.00	100.00
Liabilities	45454.4	107398.2	41598.6	40.41	49.70	35.56
Accounting capital	67032.0	108711.2	75366.8	59.59	50.30	64.44
Income	64152.2	255170.3	72618.8	100.00	100.00	100.00
Salaries	4103.7	8977.8	3530.1	6.40	3.52	4.86
Manufacturing costs	24528.5	59283.6	22733.8	38.23	23.23	31.31
Operating profits	10094.4	5040.9	3584.2	15.74	1.98	4.94
Other parts and accesories						
Assets	647049.18	1694803.01	1357790.1	100.00	100.00	100.00
Liabilities	277113.42	1003030.02	795936.1	42.83	59.18	58.62
Accounting capital	369935.75	691773.00	557800.9	57.17	40.82	41.08
Income	543901.58	1034453.46	26766575.7	100.00	100.00	100.00
Salaries	40930.60	67141.03	244646.5	7.53	6.49	0.91
Manufacturing costs	111482.11	398133.36	2914392.1	20.50	38.49	10.89
Operating profits	54463.53	56130.07	102650.4	10.01	5.43	0.38

Source: SECOFI. Dirección General de Inversiones Extranjeras

Comparing the two sets of financial statements some conclusion may be drawn: leverage is low compared with international standards, the capitalization level is much higher in those quoted on the stock market, while firms with foreign investment have a very low level of capitalization, and finally, profitability was higher in 1995 for firms with foreign investment, mainly in the motors and transmission system.

Table 3.23 Compared financial data of autoparts firms

Firm	Debt-equity ratio	Capitalization level of average firm in millions of US$	Profitability as % of total sales
Quoted firms	1.7	223	1.6
Foreign investment firms			
- Electrical systems	0.8	5.9	3.9
- Car body	n.s.	n.s.	0.0
- Motors and its parts	0.6	18.2	14.9
- Transmission system	0.4	36.1	14.8
- Suspension systems	1.1	5.5	3.6
- Break systems	0.6	6.8	4.9
- Other parts and accessories	1.4	5.3	0.4

Source: Tables 3.9. and 3.10

Survey data show that the main sources of working capital for firms are commercial banks (62.2%), followed by informal financing (23.4%), overseas sources (18%) , and state banks (16.7%). For the purchase of machinery and equipment, the main source of financing is also commercial banks (55.7%), followed by overseas sources (23%) and by state banks (20.9%). When firms were asked if they were in need of loans, half of all firms answered affirmatively (49.4%), while the average amount of credit required was around US$ 1.4 million. The main problems have when trying to obtain commercial banks loans are insufficient mortgage or collateral to meet the loan requirement (34.6%), complicated procedures, the requirements for documentation and the long processing time required to evaluate the loan application (13.5%), high interest rates (11.5%), and the passive attitude by banks to small and medium scale enterprise financing.

3.11. Overall evaluation

When the firms were asked as to what was the most urgent or serious matter impeding modernization or growth of their company, respondents ranked these problems as follows:

Financial support by institutional credit facilities	26.5%
Modernization of machinery and equipment	22.0%
Promotion of the direct export of parts/components	17.9%
Promotion of match-making and subcontracting business	14.0%

An institutional agenda should be built around the above problems to help corporations reduce the bottlenecks that impede autoparts firms from integrating into the regional networks that are developing. No longer can firms remain isolated from international competition; globalization will provide a demand for all firms able to survive in such an environment. However, institutions will be required to cope with the challenges that face the autoparts industry. They need to be developed quickly, to take advantage of the transition period before regionalization under the NAFTA concludes in 2004. Some areas that requires to be strengthened are the following:

- Institutional development could promote a learning process to upgrade management and technological skills among SMEs in the autoparts industry, up to now institutions has not been able to cope efficiently with this problem. Its bureaucratic performance has led to a lack of communication with autoparts SMEs that are unable to get the benefits of institutional development.
- Subcontracting has shown to be more successful in developing skills through the purchase of ordered goods, in which quality is certified by core firms. This process has been successful in OEM, it could be also successful in the after market so as to upgrade firms skills in this sector.
- Subcontracting could be set by terminal industry to train SMEs to improve management skills and to introduce them to basic technological knowledge, in order for those firms to become part of their suppliers network.
- Subcontracting practices shall be encouraged by improving institutional mechanisms, but it will be required that a more systematic process shall be followed, strengthening of match making activities, improving suppliers competitiveness and technology, changing management's attitude toward a more customer oriented practices and expanding SMEs production/supply capacity.
- For those firms not getting into subcontracting, market oriented upgrading will require to set independent training facilities that could substitute the training and certification mechanism that is found in subcontracting.
- Training and certification institutions require to be strengthened in order for them to cope with the large demand for this services that will be required. Human resources development should be encouraged, CIMO (Program for Quality and Modernization of the Labor Ministry) experience has proven to be successful and could be extended.
- Developing an effective financial support for SMEs in the autoparts industry. Up today the system has been short of supporting enhancement of production facilities

and solving short term requirements.

- A technology development center for the auto industry should be developed, instead of having programs spread across a number of uncoordinated institutions that has led to the ineffectiveness for training and technological development.

IV. Conclusions

4.1. An economy in transition

Mexico's economy has gone through deep structural changes during 1980-1996. Since 1982 and particularly since 1988, government policy shelved import-substitution industrialization and shifted towards integrating Mexico into the world market. As stressed in the first chapter, Mexico's economy throughout the period has seen severe cyclical development and deep crises. After the "lost decade" of the 1980s, government policy has focused on macroeconomic issues and ignored traditional sectoral development policies. The privatization of state-owned enterprises and horizontal industrial policies reflect some of the major elements in this new economic policy.

As examined in the first chapter, liberalization strategy has provided mixed results. It generated massive foreign investment flows, controlled inflation and fiscal deficit, some of the main handicaps under import-substitution industrialization until the end of the 1970s. Reflecting Mexico's rapid integration into the world market, exports increased massively throughout the period. Manufacturing exports increased by more than 900% during 1980-1996, and the performance of the automobile and autoparts industry has been extremely important in this context.

Moreover, since the end of the 1980s the government has conscientiously increased the general flexibility and liberalization of Mexico's economy in several aspects: privatization and internationalization of financial services, import liberalization, the loosening of foreign investment controls. Overall, it has created the conditions for a shift from a mixed economy to a market economy in which foreign capital and the domestic private sector have a more significant weight in the economy.

However, this strategy has also presented profound setbacks. GDP and GDP per capita have been far below the dynamism of the import-substitution industrialization period. Moreover, liberalization strategy has polarized Mexico's economy and society in a variety of forms. A few sectors and firms have been able to integrate into the world market through exports and financing, while the rest, particularly small and medium firms, have not participated in this process.

This has resulted in an increasing cleavage between export-oriented firms and domestic-oriented activities. The high import propensity of export-oriented firms, as well as the weak linkages and productive chains with the rest of the economy, have resulted in increasing trade balance difficulties and uncertainty. This was recently manifest in the 1994 crisis. Massive flows of foreign capital and external debt increase this potential uncertainty. Furthermore, liberalization strategy has deeply polarized

Mexico's economy and society, while regional differences have increased. Employment, one of the main income and distribution mechanisms, has lost dynamism since 1988. Manufacturing and public sector, which were the traditional employment generators since the 1950s, have expelled labor since the 1980s.

From this perspective, and in spite of important institutional and economic reforms that have taken place since liberalization, there are still substantial challenges for the next century. The NAFTA and the integration of the North American market provide a huge economic and social potential for Mexico, although it may also exacerbate existing contradictions.

4.2. The terminal industry under the liberalization process

Auto manufacturers have benefited mostly from industrial policies since the 1960s. The respective decrees protected the sector from imports through several tariffs and non-tariff barriers and offered mechanisms to increase a subcontracting tier-system. However, the decrees issued from 1962 to 1989 generated limited linkages between the terminal and autoparts industries, both as a result of government's lack of long-term vision and accountability, as well as firm strategies. The size of the domestic market and the proximity of the US-market were also significant for the failure of automobile sector industrial policy. Nevertheless, the NAFTA reflects the importance of this activity in Mexico. Negotiations for this sector were some of the most difficult, and the NAFTA provides a long transition period compared with other sectors.

Since the 1980s, and particularly due to the 1994 crisis, exports have taken a leading share of total production. Investment projects and new plants for the automobile industry suggest that this evolution will continue and deepen throughout the 1990s, resulting in a higher independence with the domestic market and better overall conditions for Mexico's economy. The contraction of the domestic market and increasing exports have accounted for impressive trade balance surplus since 1995.

The performance of the automobile industry during the 1990s also indicates a profound integration with the rest of the North American market. Massive investments, which have continued independently of the 1994 crisis, indicate a strong relocation of production from the Mexico City area to the north-central region of the country. The implications of these strategies are still uncertain. National content of automobile and autoparts production value added may increase or decrease as a result of high imports from the NAFTA countries, which have yet to formulate regional content requirements.

There is also a general industry tendency to increase investments due to the

NAFTA, as well as to introduce new plants of international quality and standards, with high capital intensity and with relatively few direct jobs. Finally, automobile firms have directed investments and research towards compact and middle-sized cars for the domestic market, while larger and more expensive cars are imported. Models such as Tsuru, Chevy, VW Sedan and Fiesta may take advantage of this evolution.

In general, estimations for the sector are very positive. Total passenger car and light truck production in 1996 was of 1.2 million, and according to different scenarios it will increase to between 1.6 and 2 million units by 2004. The introduction of new models, such as Nissan's Sentra and Volkswagen's Concept One, among others, clearly show that large-scale production of a few models will make Mexico an important production site for the transnational automakers, due to its preferred market access and international competitiveness.

In the terminal industry, the following changes and issues are noteworthy:

1. An increase in the number of terminal producers. Since liberalization, several new passenger car and truck terminal producers have entered the Mexican market. By the beginning of 1997, there were 18 firms. In the passenger car segment, 8 producers control production, including the US Big Three, Volkswagen and Nissan; and there are no domestic producers. In spite of more than 30 years of industrial and automobile policies, including the attempt to build a Mexican car through the purchase of the Borgward plant, there are no immediate expectations for a domestic car industry, as occurred in Korea or Malaysia.
2. The strategy of automobile firms in Mexico, particularly of the US Big Three, is clearly oriented towards lean production and high quality and standards, including product diversification, i.e. in 1988 there were 17 models built in Mexico and in 1996 28 models, including new firms. However, it is expected that in future passenger car firms will continue to integrate into the NAFTA market and will reduce the number of models and types of vehicles produced in Mexico. In order to achieve economies of scale and cost reductions, firms have began a restructuring of production in the NAFTA area, resulting in higher imports and exports from the member countries. Increasing trade and intra-industrial trade, particularly with the US, reflects this process of integration. Besides the US Big Three, Nissan and Volkswagen have decided to use Mexico as a main production site for international distribution.
3. Given the increasing integration of the NAFTA market, firms have heavily invested in new plants with international standards and quality. Thus trend will continue: contrary to prior periods there will no longer be a distinction in the production of vehicles and quality for the domestic market and for exports.
4. Investment strategies and programs have resulted in a clear relocation of

production plants out of Mexico City. Firms have located their new production sites to the north-central region of Mexico. This process of regional sourcing is related to both geographic proximity to the US as well as a "delinking" process with the rest of the Mexican economy. This has created auto districts in Hermosillo, Sonora, Gomez Palacios, Coahuila, and Aguascalientes.

5. In general, there is a trend for Mexican vehicle exporters to specialize in passenger cars and light commercial vehicles, as well as compact passenger cars for the domestic market.
6. Production and exports of light and heavy trucks are expected to rise in the next years, as they have done since liberalization. The domestic truck fleet, which averages between 12 and 15 years, as well as NAFTA regulations regarding free transportation between the US and Mexico, will require modernization of the Mexican truck fleet. This presents a large future market for automakers.
7. Increasing regional integration under the NAFTA, particularly with the US, have also resulted since the 1990s in "delinking" vehicle production with domestic GDP and other Mexican economic and political events, contrary to prior decades. The liberalization of industrial policies and decrees regarding vehicles since the midst of the 1980s and NAFTA have fostered this process: while in 1980 3.7% of total production of vehicles was exported, in 1996 this share accounted for 80.2%.
8. In spite of these significant successes and structural changes in the automobile industry, there still remain several challenges and questions for the future, particularly:
    a) The impact of implementing regional and not national content regulations for the sector will generate one of the most significant challenges for Mexico's economy. The potential of generating linkages through tier systems and subcontracting firms will strongly depend on the firm's strategies. However, in general Mexico's industrial policy has failed to create these forward and backward linkages.
    b) It is to be seen if the evolution of the sector in the next years can continue to generate a surplus, particularly if domestic demand increases.
    c) According to government officials, it is expected that vehicle production by 2004 will be between of 1.6 and 2 million vehicles. This estimated increase in production will not only require continuous investments, already witnessed by some firms, but also new forms of industrial organization and embedding production and subcontractors in Mexico.

4.3. Autoparts facing globalization

The autoparts network is the most complex part of the auto commodity chain, one that is directly linked to the ownership structure and the size and number of autofirms. In Mexico transnational corporations dominate the commodity chain. This sector has more than 500 producers, 351 registered as terminal industry suppliers. The institutional setting has protected the autoparts market, allowing the development of firms in this sector in a dynamic way; according to census data, in the period 1988-1994 the number of firms expanded from 852 to 1401. These firms also adopted lean processes, reducing the absolute number of employees per firm. However, overall sectoral expansion outnumbered collection firm employment reductions, and total employment in the sector reached 170,211 workers in 1994, 25% higher than in 1988. Lean production allowed the sector to become globally competitive, and factor and total productivity increased substantially.

The industrial organization of the sector is dominated by large firms that are organized in groups. The nucleus consists of 18 main groups and 84 affiliated groups, which have become the subcontracting cluster of the terminal industry. Other firms do not have organized links with the terminal sector or with autoparts groups and they serve the market in an unorganized manner. This lowers their profitability and leaves them vulnerable to bankruptcy in the event of economic downswings. Although most of the firms in the autoparts industry are domestically owned, foreign investment has been increasing with relaxed foreign investment controls: they are presently 345 firms with foreign share capital. Foreign investment in the autoparts sector has been mainly in the area of accessories.

Autoparts firms have become direct or indirect exporters and the share of production for external market has been increasing: estimates for 1996 suggest they reached US3.5 billion dollars. As expected most firm exports are to the United States and Canada (81%); the second market for Mexican autoparts is Germany and Italy, and the rest of the market is split between variety of other markets. Mexico has become the main supplier for certain accessories to the US market (i.e. of total imports, Mexican producers control up to 96% of the American axle and 87% of the American safety belt markets).

The Mexican autoparts industry specializes in stamping, electrical accessories, motors and their parts. This specialization has allowed the emergence of specialized networks through subcontracting with the terminal sector. The dominant subcontractor are Volkswagen and the US Big Three. Subcontracting by Japanese firms is low compared the practice in auto producing Asian countries. The NAFTA legislation provides the opportunity to develop regional networks, reflected in the increased autoparts trade with USA and Canada

Survey data permits a better understanding of the overall technology used by autoparts firms. It was found that there is an increasing number of industrial standards and that producers follow quality control practices comparable to those found at international level (average rate of defects was of 2%, in a sample of 178 firms). Self-evaluation of machinery and equipment among producers shows that on average they have a medium level of quality and the level of production capacity is appropriate. Nearly 47.2% of the firms receive technology transfers from international sources, around one fourth of the firms are involved in joint ventures for product development.

Survey data shows that the labor force in the autoparts industry is quite young (28 years on average) and the average worker stayed in the same job for 7 years, allowing the firms to get benefits from training. Training is done through job training at the factory level.

Regarding the financing mechanism of these firms, it was found that there are basic mechanisms: the stock market, bank financing and self financing. Most of the firms are moderately leveraged: this is not a basic problem for their development. The main problem for their growth has been the profitability level of firms with the exception of those in the motors and transmission system autoparts subsectors.

Survey allowed an overall evaluation of the main problems facing autoparts firms wishing to expand. They were ranked as follows: financial support (27% of the answers), modernization (22%), promotion of direct exports (18%) and promotion of subcontracting business (14%).

An overall view of this report is that the automobile and autoparts industries are facing a great challenge with the emergence of the regional market. It provides all firms a good chance to improve their competitiveness, but if the transition is not well managed it could mean the unnecessary destruction of many small businesses. Industrial policy will be crucial for achieving a smooth integration of the Mexican automobile and autoparts industries into the North American market.

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APPENDIX I
Macroeconomic Data Base

TABLE 1
MAIN MACROECONOMIC VARIABLES (1980-1996) \a

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995 \b	1996 \d
GDP	8.2	8.8	-0.6	-4.2	3.6	2.6	-3.8	1.7	1.2	3.5	4.4	3.6	2.8	0.9	3.5	-6.9	3
GDP per capita	5.4	6.1	-3.0	-6.5	1.2	0.5	-5.5	0.0	-0.2	1.7	2.5	1.7	0.9	-0.9	1.7	-8.7	1.2
Employment	14.7	6.2	-0.3	-2.3	2.3	2.2	-1.4	1.1	0.9	1.3	0.9	2.6	0.4	-1.9	-0.2	-6.4	1.1
Real wages (1980=100)	100.0	106.4	99.7	81.5	80.5	80.9	78.6	73.9	72.1	73.1	73.5	76.7	83.2	86.0	87.6	77.4	61.3
Real wages (1980=100), minimum wage	100.0	101.3	104.7	84.8	71.8	70.9	63.2	60.3	53.6	49.4	43.1	40.7	39.3	38.9	38.8	34.0	30.0
Open unemployment	4.7	2.5	7.0	6.6	5.7	4.4	4.3	3.9	3.6	3.0	2.8	2.6	2.8	3.4	3.7	6.3	5.7
Open unemployment and insufficient income	--	--	--	--	--	--	--	--	16.3	17.4	12.9	10.9	9.8	11.7	10.6	16.1	18.0
Gross fixed investment / GDP	24.8	26.4	23.0	17.5	17.9	19.1	19.5	18.4	19.3	18.2	18.6	19.5	21.9	21.1	22.1	16.9	15.7
Private	14.1	14.3	12.3	11.0	11.3	12.5	12.9	13.2	14.2	12.7	13.7	14.9	16.6	16.6	17.3	11.9	11.4
Public	10.7	12.1	10.2	6.6	6.6	6.6	6.5	5.2	5.0	4.7	4.9	4.6	4.2	3.3	3.6	3.5	3.6
Savings / GDP	18.6	18.8	13.1	8.6	8.5	9.9	4.8	6.2	8.4	10.8	13.3	14.0	15.0	13.4	13.7	12.8	12.5
Domestic	13.6	12.8	12.6	12.5	11.1	11.2	4.4	8.9	7.3	8.2	10.6	9.6	7.7	7.3	6.1	11.6	12.5
External	5.0	6.0	0.5	-3.9	-2.6	-1.3	0.4	-2.7	1.1	2.6	2.7	4.4	7.3	6.1	7.6	1.2	0.0
Inflation	29.8	28.7	98.8	80.8	59.2	63.7	105.7	159.2	51.7	19.7	29.9	18.8	11.9	8.0	6.9	54.5	31.5
Financial deficit / GDP	7.5	14.1	16.9	8.6	8.5	9.6	16.0	16.1	12.5	5.6	3.9	-1.5	1.6	0.7	-0.1	0.1	1.0
Exports	35.2	28.6	10.5	3.0	7.7	-9.7	-25.1	24.5	0.9	11.3	18.2	0.1	2.5	9.4	15.8	39.0	8.1
Imports	34.8	26.6	-48.9	-25.8	25.5	15.4	-7.2	10.9	49.2	26.3	23.5	21.6	25.7	1.9	14.9	-19.4	10.0
Trade balance \c	-4.7	-5.7	8.7	12.6	11.9	7.7	3.3	5.9	-0.9	-4.1	-6.3	-13.4	-23.0	-21.4	-24.3	0.6	-0.2
Current account \c	-10.7	-16.1	-6.2	5.4	4.2	1.2	-1.7	4.0	-2.4	-5.8	-7.5	-14.9	-24.8	-23.4	-28.3	-0.7	2.5
Capital account \c	11.4	26.4	9.8	-1.4	0.0	-1.5	1.8	-0.5	-1.4	6.2	11.1	23.0	26.3	30.7	11.2	-16.9	8.7
International reserves \c	4.2	5.0	1.8	4.7	8.0	5.7	6.7	13.7	6.6	6.9	10.3	18.1	19.3	24.3	6.1	15.7	18.0
Foreign investment \c	2.1	3.5	2.6	-0.2	-0.4	-0.5	0.7	2.6	5.6	3.5	6.0	16.9	23.6	32.7	15.6	-5.6	8.7
Foreign direct investment \c	2.2	2.5	1.7	0.5	0.4	0.5	1.5	3.2	2.9	3.2	2.6	4.8	4.4	4.4	8.0	7.0	6.0
Foreign portfolio investment \c	-0.1	1.0	0.9	-0.6	-0.8	-1.0	-0.8	-0.4	2.7	0.3	3.4	12.1	19.2	28.4	7.6	-12.5	2.7
Total foreign debt \c	57.5	78.3	86.1	93.1	94.9	96.9	100.9	105.5	99.2	93.8	100.8	103.8	112.9	127.6	136.5	161.1	172.3
Public \c	34.0	43.1	51.6	66.9	69.8	72.7	75.8	84.3	80.6	76.1	77.8	80.0	75.8	78.7	85.4	100.9	94.5
Private \c	7.3	10.2	8.1	14.8	16.3	15.7	15.1	14.1	5.9	13.9	16.5	17.0	37.1	48.9	51.1	60.2	77.8
Total External debt service \c	9.4	10.6	12.3	13.0	15.9	15.3	12.9	12.1	8.1	14.5	11.2	16.1	25.7	24.7	32.9	31.6	33.6
Interest payments \c	4.6	6.1	7.8	8.2	10.3	10.2	8.4	8.3	6.4	6.9	5.5	5.8	5.3	4.8	5.4	6.3	15.6
Principal repayments \c	4.8	4.5	4.5	4.8	5.7	5.1	4.6	3.8	1.7	7.6	5.7	10.3	20.4	19.9	27.5	25.3	18.0
Total external debt / GDP	25.9	32.2	79.9	93.4	93.0	91.8	116.1	117.1	58.9	49.5	43.7	40.8	34.8	35.1	36.2	64.0	65.4
Total external debt / exports	215.1	259.3	334.8	345.1	222.1	356.8	459.5	370.9	273.8	225.2	209.4	223.2	205.8	208.0	191.8	179.6	184.3
Total external debt service / exports of goods	38.3	22.9	75.3	37.5	59.1	49.3	53.5	45.8	56.8	41.2	27.9	37.7	55.6	47.6	54.0	34.3	36.3
Real exchange rate (1978=100) \e	65.2	78.6	116.3	131.5	115.8	116.2	150.7	151.5	122.4	115.8	110.3	100.5	91.9	86.8	90.2	130.7	125.0

\a All data refers to growth rates, unless otherwise specified. Does not include maquiladora activities.
\b Preliminary.
\c Billion SU.S
\d Estimations.
\e The real exchange rate is calculated as the nominal exchange rate deflacted by the consumption index of Mexico and the US (1978=100).

Sources: Own estimations based on INEGI, CEPAL, Banco de México, and Oxford Economic Forecasting

TABLE 2
MEXICO: GDP 1980-1996
(millions of pesos of 1980)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996 \a	1980-1988	1988-1996	1980-1996
PERCENTAGE OVER TOTAL																				
Agriculture, forestry and fishing	8.23	8.03	7.92	8.44	8.36	8.46	8.55	8.52	8.10	7.65	7.75	7.56	7.34	7.46	7.36	7.35	7.47	8.29	7.55	7.88
Mining	3.22	3.40	3.71	3.84	3.79	3.69	3.68	3.81	3.78	3.62	3.57	3.47	3.43	3.43	3.37	3.65	3.70	3.66	3.55	3.59
Manufacturing industry	22.12	21.65	21.19	20.38	20.66	21.36	21.03	21.30	21.72	22.49	22.84	22.92	22.77	22.41	22.44	22.54	22.66	21.27	22.54	21.96
Food products, beverages and tobacco	5.44	5.21	5.48	5.65	5.53	5.60	5.78	5.74	5.68	5.91	5.83	5.91	5.94	5.93	5.76	6.11	6.09	5.57	5.91	5.75
Textiles, apparel and leather	3.05	2.96	2.84	2.80	2.73	2.73	2.70	2.52	2.51	2.51	2.47	2.29	2.15	2.03	1.93	1.80	1.84	2.76	2.16	2.43
Wood and its products	0.94	0.86	0.86	0.83	0.83	0.84	0.84	0.86	0.83	0.79	0.74	0.72	0.70	0.67	0.66	0.56	0.56	0.85	0.69	0.76
Printing and publishing	1.21	1.17	1.19	1.15	1.17	1.24	1.24	1.24	1.28	1.32	1.32	1.26	1.24	1.19	1.13	1.23	1.24	1.21	1.24	1.22
Basic petrochemicals, rubber and plastic	3.29	3.32	3.42	3.52	3.63	3.74	3.76	3.89	3.93	4.14	4.17	4.15	4.11	3.98	4.04	4.25	4.27	3.61	4.12	3.88
Non-ferrous metals	1.54	1.47	1.44	1.38	1.41	1.48	1.44	1.55	1.50	1.52	1.55	1.54	1.58	1.59	1.59	1.47	1.50	1.47	1.54	1.51
Structural metal products	1.36	1.31	1.20	1.17	1.26	1.24	1.20	1.32	1.37	1.35	1.40	1.30	1.27	1.32	1.38	1.63	1.67	1.27	1.41	1.34
Metal products, machinery and equipmen	4.71	4.75	4.19	3.40	3.58	3.95	3.53	3.68	4.11	4.41	4.78	5.19	5.21	5.14	5.39	5.12	5.14	3.99	4.96	4.53
Other manufacturing industries	0.57	0.60	0.58	0.49	0.53	0.55	0.53	0.50	0.52	0.54	0.56	0.55	0.57	0.56	0.55	0.36	0.34	0.54	0.51	0.52
Construction	6.42	6.76	6.32	5.33	5.42	5.43	5.06	5.11	5.03	4.96	5.08	5.02	5.26	5.36	5.51	4.75	4.92	5.65	5.11	5.38
Electricity, gas and water	0.99	1.02	1.12	1.18	1.20	1.27	1.36	1.39	1.46	1.52	1.49	1.48	1.48	1.53	1.59	1.77	1.79	1.22	1.57	1.40
Commerce, restaurants and hotels	27.95	28.43	28.35	27.36	27.07	26.67	25.90	25.50	25.59	25.80	25.71	25.88	26.04	25.47	25.31	23.37	22.64	26.97	25.08	25.99
Transportation, storage and communication	6.39	6.47	6.02	6.12	6.21	6.22	6.26	6.34	6.41	6.44	6.58	6.72	7.02	7.19	7.50	7.87	7.79	6.27	7.08	6.72
Financial insurances, real estate	8.59	8.39	8.87	9.61	9.79	9.89	10.66	10.84	10.89	10.85	10.79	10.81	10.89	11.30	11.49	12.40	12.67	9.74	11.35	10.58
Communal services, social and personnal	17.15	16.97	17.68	19.00	18.79	18.28	18.86	18.55	18.42	18.05	17.60	17.61	17.22	17.27	17.01	17.91	17.73	18.19	17.63	17.86
AGRICULTURE	8.23	8.03	7.92	8.44	8.36	8.46	8.55	8.52	8.10	7.65	7.75	7.56	7.34	7.46	7.36	7.35	7.47	8.29	7.55	7.88
MINING	3.22	3.40	3.71	3.84	3.79	3.69	3.68	3.81	3.78	3.62	3.57	3.47	3.43	3.43	3.37	3.65	3.70	3.66	3.55	3.59
MANUFACTURING	22.12	21.65	21.19	20.38	20.66	21.36	21.03	21.30	21.72	22.49	22.84	22.92	22.77	22.41	22.44	22.54	22.66	21.27	22.54	21.96
SERVICES	67.50	68.03	68.36	68.62	68.48	67.76	68.10	67.74	67.79	67.61	67.24	67.51	67.91	68.12	68.41	68.07	67.55	68.04	67.81	67.93
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
ANNUAL GROWTH RATE																				
Agriculture, forestry and fishing	7.21	6.12	-1.97	2.02	2.69	3.75	-2.72	1.37	-3.78	-2.25	5.90	0.96	-0.05	2.61	1.99	-7.04	3.23	0.88	0.60	0.74
Mining	21.74	14.65	8.68	-0.87	2.17	-0.05	-4.12	5.30	0.37	-0.65	2.79	0.78	1.79	0.90	1.60	0.84	2.78	3.12	1.35	2.23
Manufacturing industry	6.63	6.45	-2.74	-7.84	5.01	6.08	-5.26	3.04	3.20	7.19	6.07	4.01	2.27	-0.76	3.62	-6.56	2.13	0.86	2.16	1.51
Food products, beverages and tobacco	4.91	4.27	4.53	-1.28	1.45	3.77	-0.54	0.94	0.19	7.67	3.09	5.07	3.39	0.78	0.43	-1.33	1.27	1.64	2.51	2.08
Textiles, apparel and leather	2.34	5.70	-4.77	-5.50	0.95	2.56	-4.75	-4.83	0.78	3.28	2.86	-3.68	-3.66	-4.81	-1.37	-13.15	3.59	-1.31	-2.26	-1.79
Wood and its products	6.86	-0.62	-1.24	-7.33	3.34	3.68	-2.96	3.55	-2.44	-1.59	-1.09	0.58	-0.47	-3.92	2.25	-21.12	2.96	-0.57	-3.10	-1.84
Printing and publishing	11.28	5.14	0.68	-7.34	5.60	8.77	-3.26	1.63	4.06	7.01	4.42	-1.26	1.23	-3.30	-1.40	1.07	2.83	1.79	1.28	1.53
Basic petrochemicals, rubber and plastic	9.67	9.64	2.48	-1.61	6.90	5.77	-3.31	5.42	2.02	9.26	5.19	3.00	2.07	-2.33	5.04	-2.17	2.04	3.33	2.70	3.01
Non-ferrous metals	8.67	3.23	-2.57	-7.74	5.65	7.64	-6.57	9.46	-1.58	4.82	6.44	3.14	5.45	1.30	3.83	-14.05	3.18	0.75	1.56	1.16
Structural metal products	3.52	4.90	-9.28	-6.17	11.59	1.05	-6.80	11.09	5.23	2.48	8.15	-3.63	-0.02	4.93	8.46	10.12	3.92	1.17	4.21	2.68
Metal products, machinery and equipmen	9.77	9.66	-12.32	-22.36	9.10	13.18	-13.81	5.91	12.97	11.09	13.35	12.35	3.52	-0.57	8.59	-11.77	2.02	-0.63	4.51	1.91
Other manufacturing industries	-1.94	13.05	-3.90	-18.69	11.34	8.26	-8.63	-3.15	4.18	8.02	9.00	1.83	7.14	-0.77	0.09	-36.14	-4.03	-0.23	-3.41	-1.83
Construction	12.31	14.41	-7.06	-19.19	5.37	2.72	-10.32	2.79	-0.41	2.12	6.95	2.42	7.81	2.79	6.44	-19.81	5.26	-1.95	1.36	-0.31
Electricity, gas and water	6.46	11.61	9.66	1.13	5.00	8.31	3.64	3.74	6.02	7.65	2.91	2.67	3.01	4.18	7.70	3.29	3.17	6.09	4.30	5.19
Commerce, restaurants and hotels	8.08	10.61	-0.91	-7.52	2.49	1.10	-6.54	0.16	1.57	4.34	4.07	4.32	3.59	-1.34	2.82	-14.09	-1.59	-0.02	0.08	0.03
Transportation, storage and communication	13.26	10.08	-7.46	-2.58	5.12	2.78	-3.19	3.04	2.28	4.06	6.65	5.84	7.61	3.31	7.82	-2.32	0.57	1.13	4.14	2.62
Financial insurances, real estate	4.73	6.32	4.99	3.87	5.56	3.63	3.74	3.43	1.65	3.13	3.84	3.84	3.72	4.67	5.17	0.42	3.76	4.14	3.56	3.85
Communal services, social and personnal	7.36	7.63	3.50	2.98	2.45	-0.19	-0.72	0.09	0.47	1.44	1.84	3.69	0.64	1.20	1.92	-2.07	0.55	1.99	1.14	1.57
AGRICULTURE	7.21	6.12	-1.97	2.02	2.69	3.75	-2.72	1.37	-3.78	-2.25	5.90	0.96	-0.05	2.61	1.99	-7.04	3.23	0.88	0.60	0.74
MINING	21.74	14.65	8.68	-0.87	2.17	-0.05	-4.12	5.30	0.37	-0.65	2.79	0.78	1.79	0.90	1.60	0.84	2.78	3.12	1.35	2.23
MANUFACTURING	6.63	6.45	-2.74	-7.84	5.01	6.08	-5.26	3.04	3.20	7.19	6.07	4.01	2.27	-0.76	3.62	-6.56	2.13	0.86	2.16	1.51
SERVICES	8.29	9.63	-0.16	-3.83	3.41	1.51	-3.27	1.19	1.29	3.24	3.87	4.05	3.54	1.19	3.90	-7.43	0.80	1.15	1.58	1.36
TOTAL	8.17	8.77	-0.63	-4.20	3.61	2.59	-3.75	1.73	1.21	3.51	4.45	3.63	2.95	0.87	3.47	-6.97	1.57	1.09	1.62	1.36

\a Estimates
Source: Own estimations based on INEGI (Sistema de Cuentas Nacionales) and Cambridge Economic Forecasting

TABLE 3
MEXICO: EMPLOYMENT (1980-1996)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996 \a	1980-1988	1988-1996	1980-1996
PERCENTAGE OVER TOTAL																				

SERVICES	6.29	9.63	-0.16	-3.83	3.41	1.51	-3.27	1.19	1.29	3.24	3.87	4.45	3.63	2.95	0.87	3.47	-6.97	1.57	1.09	1.62	1.36
TOTAL	8.17	8.77	-0.63	-4.20	3.61	2.59	-3.75	1.73	1.21	3.51	4.45	3.63	2.95	0.87	3.47	-6.97	1.57				

\e Estimated

Source: Own estimations based on INEGI (Sistema de Cuentas Nacionales) and Cambridge Economic Forecasting

TABLE 3

MEXICO: EMPLOYMENT (1980-1996)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996 \e	1980-1988	1988-1996	1980-1996
										PERCENTAGE OVER TOTAL									
Agriculture, forestry and fishing	27.96	27.05	26.24	27.98	27.65	27.77	27.48	27.60	28.06	27.08	25.44	25.77	25.27	25.46	25.34	25.55	25.53	27.53	25.93	25.63
Mining	1.03	1.04	1.10	1.13	1.15	1.18	1.19	1.23	1.25	1.22	1.24	1.21	1.15	1.10	1.16	1.23	1.25	1.15	1.20	1.17
Manufacturing industry	12.04	11.87	11.66	11.08	11.05	11.16	11.11	11.11	11.03	11.16	11.14	10.81	10.54	10.00	9.50	9.35	9.42	11.34	10.32	10.81
Food products, beverages and tobacco	2.96	2.89	2.99	3.01	2.98	2.99	3.08	3.04	3.00	3.03	2.98	2.97	2.98	2.96	2.84	2.92	2.95	2.99	2.96	2.97
Textiles, apparel and leather	2.18	2.14	2.10	1.99	1.95	1.95	1.93	1.88	1.82	1.81	1.77	1.66	1.58	1.49	1.40	1.33	1.36	1.99	1.58	1.78
Wood and its products	0.72	0.67	0.63	0.55	0.55	0.55	0.53	0.56	0.54	0.52	0.51	0.49	0.49	0.45	0.40	0.38	0.39	0.59	0.46	0.52
Printing and publishing	0.60	0.58	0.57	0.54	0.54	0.56	0.56	0.55	0.55	0.56	0.56	0.54	0.53	0.50	0.46	0.48	0.49	0.56	0.52	0.54
Basic petrochemicals, rubber and plastic	1.36	1.38	1.43	1.43	1.45	1.44	1.46	1.50	1.51	1.50	1.52	1.46	1.39	1.29	1.23	1.24	1.25	1.44	1.38	1.40
Non-ferrous metals	0.77	0.76	0.73	0.70	0.72	0.76	0.73	0.78	0.75	0.79	0.78	0.73	0.72	0.68	0.63	0.59	0.60	0.75	0.69	0.72
Structural metal products	0.51	0.50	0.49	0.48	0.49	0.47	0.43	0.40	0.41	0.40	0.37	0.34	0.30	0.25	0.24	0.24	0.23	0.46	0.31	0.38
Metal products, machinery and equipmen	2.70	2.70	2.49	2.15	2.13	2.20	2.13	2.14	2.17	2.24	2.30	2.26	2.19	2.02	1.93	1.80	1.79	2.31	2.08	2.19
Other manufacturing industries	0.24	0.24	0.23	0.22	0.23	0.23	0.25	0.27	0.29	0.32	0.34	0.35	0.37	0.36	0.37	0.37	0.37	0.24	0.35	0.30
Construction	9.52	10.45	10.21	8.43	8.79	8.91	8.74	8.68	8.63	9.53	10.70	10.77	11.33	11.65	12.11	10.49	10.66	9.15	10.67	10.01
Electricity, gas and water	0.40	0.40	0.42	0.43	0.44	0.45	0.47	0.48	0.48	0.49	0.50	0.49	0.48	0.46	0.48	0.51	0.52	0.44	0.49	0.46
Commerce, restaurants and hotels	14.50	14.52	14.70	14.63	14.56	14.34	14.36	14.41	14.51	14.73	15.04	15.00	15.18	14.92	14.90	14.52	14.40	14.50	14.80	14.67
Transportation, storage and communication	4.46	4.51	4.83	4.71	4.68	4.68	4.78	4.85	4.69	4.59	4.76	4.82	4.88	4.85	4.86	5.11	5.10	4.69	4.85	4.78
Financial insurances, real estate	1.74	1.79	1.98	2.08	2.17	2.14	2.18	2.19	2.21	2.20	2.20	2.17	2.18	2.20	2.24	2.36	2.39	2.06	2.24	2.15
Communal services, social and personnal	28.37	28.37	28.87	29.51	29.50	29.38	29.70	29.45	29.14	29.00	28.98	28.97	29.00	29.35	29.42	30.89	30.74	29.15	29.49	29.34
AGRICULTURE	27.96	27.05	26.24	27.98	27.65	27.77	27.48	27.60	28.06	27.08	25.44	25.77	25.27	25.46	25.34	25.55	25.53	27.53	25.93	25.63
MINING	1.03	1.04	1.10	1.13	1.15	1.18	1.19	1.23	1.25	1.22	1.24	1.21	1.15	1.10	1.16	1.23	1.25	1.15	1.20	1.17
MANUFACTURING	12.04	11.87	11.66	11.08	11.05	11.16	11.11	11.11	11.03	11.16	11.14	10.81	10.54	10.00	9.50	9.35	9.42	11.34	10.32	10.81
SERVICES	58.98	60.04	61.00	59.81	60.14	59.90	60.22	60.05	59.66	60.54	62.19	62.21	63.04	63.44	64.00	63.88	63.80	59.98	62.54	61.40
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
										ANNUAL GROWTH RATE										
Agriculture, forestry and fishing	19.70	2.81	-3.30	4.21	1.14	2.62	-2.46	1.51	2.52	-2.28	-5.20	3.95	-1.56	0.94	0.70	-5.61	1.07	1.10	-1.05	0.02
Mining	-4.86	6.92	6.10	0.40	4.05	4.20	-0.31	4.86	2.39	-1.58	2.77	-0.05	-4.50	-4.28	6.57	-0.36	2.38	3.55	0.06	1.79
Manufacturing industry	6.57	4.75	-2.04	-7.14	2.05	3.22	-1.90	1.07	0.09	2.50	0.70	-0.46	-2.07	-4.99	-3.88	-7.87	1.97	-0.05	-1.82	-0.94
Food products, beverages and tobacco	5.50	3.99	3.05	-1.67	1.36	2.66	1.29	-0.30	-0.37	2.22	-0.55	2.07	0.79	-0.59	-2.97	-3.76	2.31	1.24	-0.08	0.57
Textiles, apparel and leather	3.28	4.52	-2.57	-7.02	0.34	1.92	-2.45	-1.43	-2.60	0.90	-1.39	-3.58	-4.35	-5.99	-4.41	-11.60	4.04	-1.22	-3.40	-2.31
Wood and its products	8.69	-1.38	-6.02	-14.69	1.65	2.99	-4.73	5.48	-2.61	-2.00	-1.12	-0.88	-0.29	-7.33	-10.17	-10.59	2.39	-2.60	-3.86	-3.23
Printing and publishing	6.88	3.41	-2.10	-8.28	2.73	4.91	-0.61	0.13	0.45	2.52	0.91	-1.27	-1.03	-5.65	-7.17	-1.53	2.83	0.00	-1.36	-0.68
Basic petrochemicals, rubber and plastic	1.07	7.83	3.54	-2.09	3.21	1.90	0.07	3.33	1.67	0.52	2.37	-1.12	-4.78	-7.24	-3.07	-5.62	1.45	2.40	-2.24	0.05
Non-ferrous metals	7.61	4.51	-4.12	-6.04	5.45	7.14	-4.82	7.17	-3.05	6.73	0.25	-4.28	-1.61	-4.77	-6.39	-12.69	2.56	0.63	-2.68	-1.04
Structural metal products	5.38	4.79	-3.32	-3.71	5.89	-1.91	-10.51	-6.01	2.02	-0.53	-6.26	-5.77	-12.55	-14.34	-4.91	-7.29	-2.18	-1.73	-6.83	-4.32
Metal products, machinery and equipmen	13.79	6.15	-7.99	-15.71	1.66	5.41	-4.66	1.38	2.42	4.48	3.90	0.43	-2.52	-7.52	-3.38	-12.59	0.22	-1.68	-2.27	-1.98
Other manufacturing industries	0.15	5.62	-3.19	-5.25	3.59	4.57	6.52	8.33	7.69	12.61	6.72	7.15	3.97	-1.58	3.00	-5.20	2.30	3.38	3.49	3.44
Construction	26.96	16.68	-2.64	-19.25	6.70	3.51	-3.28	0.34	0.32	11.83	13.24	3.24	5.66	3.02	5.20	-18.93	2.80	-0.17	2.80	1.31
Electricity, gas and water	40.47	6.25	3.67	1.27	3.79	5.58	1.88	2.80	2.47	2.12	4.17	-0.89	-1.61	-3.28	4.70	0.50	2.19	3.45	0.95	2.20
Commerce, restaurants and hotels	16.02	6.44	0.90	-2.71	1.80	0.64	-1.27	1.42	1.55	2.81	3.02	2.28	1.63	-1.55	1.05	-8.78	0.31	1.07	0.03	0.55
Transportation, storage and communication	15.88	7.47	6.67	-4.53	1.63	2.26	0.61	2.40	-2.43	-0.88	4.77	3.75	1.62	-0.34	1.40	-1.51	0.86	1.69	1.19	1.44
Financial insurances, real estate	0.15	9.71	10.30	2.60	6.44	0.93	0.21	1.67	1.71	0.70	1.01	1.51	0.82	0.99	2.85	-1.30	2.32	4.13	1.10	2.51
Communal services, social and personnal	10.46	6.25	1.45	-0.08	2.29	1.77	-0.37	0.20	-0.20	0.77	0.85	2.57	0.51	1.35	1.41	-1.68	0.63	1.39	0.80	1.09
AGRICULTURE	19.70	2.81	-3.30	4.21	1.14	2.62	-2.46	1.51	2.52	-2.28	-5.20	3.95	-1.56	0.94	0.70	-5.61	1.07	1.10	-1.05	0.02
MINING	-4.86	6.92	6.10	0.40	4.05	4.20	-0.31	4.86	2.39	-1.58	2.77	-0.05	-4.50	-4.28	6.57	-0.36	2.38	3.55	0.06	1.79
MANUFACTURING	6.57	4.75	-2.04	-7.14	2.05	3.22	-1.90	1.07	0.09	2.50	0.70	-0.46	-2.07	-4.99	-3.88	-7.87	1.97	-0.05	-1.82	-0.94
SERVICES	14.69	8.17	1.27	-4.18	2.89	1.79	-0.90	0.76	0.20	2.74	3.66	2.64	1.75	0.78	2.10	-6.56	1.01	1.20	0.97	1.08
TOTAL	14.74	6.25	-0.31	-2.27	2.32	2.20	-1.44	1.05	0.66	1.25	0.92	2.60	0.41	0.15	1.19	-6.37	1.13	1.05	0.13	0.59

\e Estimated.

Source: Own calculations based on INEGI (Sistema de Cuentas Nacionales) and Cambridge Economic Forecasting

TABLE 4
TOTAL POPULATION AND ECONOMICALLY ACTIVE POPULATION

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1980-1996
					Thousands					
Total population	67,003	74,036	81,290	82,884	84,502	86,092	87,687	89,267	90,848	–
Economically Inactive Populatio	45,007	48,183	49,851	50,244	50,672	51,022	51,337	51,597	51,798	–
Economically Active Population	21,996	25,853	31,439	32,640	33,830	35,070	36,350	37,670	39,050	–
					Structure \a					
Total population	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Economically Inactive Populatio	67.17	65.08	61.32	60.62	59.97	59.26	58.55	57.80	57.02	60.48
Economically Active Population	32.83	34.92	38.68	39.38	40.03	40.74	41.45	42.20	42.98	39.52
					Growth rates \b					
Total population	–	2.0	1.9	2.0	2.0	1.9	1.9	1.8	1.8	1.9
Economically Inactive Populatio	–	1.4	0.7	0.8	0.9	0.7	0.6	0.5	0.4	0.9
Economically Active Population	–	3.3	4.0	3.8	3.6	3.7	3.6	3.6	3.7	3.7

\a As a percentage of total population.
\b Data for 1985 and 1990 refers to the annual average growth rate for 1980-1985 and 1985-1990, respectively.

Source: Own calculations based on INEGI and Oxford Economic Forecasting.

TABLE 5
MEXICO'S EXPORT/a
(does not include maquiladoras)

MILLION US-DOLLARS

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996/b	1980-88	1988-96	1980-96
Agriculture, forestry and fishing	691	728	528	603	709	747	1,058	901	1,046	1,028	1,669	1,849	1,759	2,156	2,250	3,385	3,098	7,010	18,240	24,203
Mining	10,071	14,057	16,731	15,494	15,646	14,026	6,303	8,617	8,780	8,221	9,944	8,068	7,996	6,996	6,995	8,210	8,964	107,726	72,172	173,118
Manufacturing industry	3,891	4,111	3,680	5,635	7,207	6,695	8,670	10,470	12,347	13,192	14,936	16,640	17,481	20,638	25,343	36,478	39,926	62,707	196,981	247,342
Food products, beverages and tobacco	1,268	1,090	1,123	1,182	1,301	1,339	1,844	1,866	1,852	1,849	1,449	1,631	1,427	1,676	2,010	3,055	2,981	12,865	17,930	28,945
Textiles, apparel and leather	507	498	334	315	472	292	431	658	747	759	743	864	941	1,014	1,193	2,171	2,397	4,252	10,829	14,335
Wood and its products	52	59	52	90	113	73	103	135	178	196	156	182	224	268	265	285	327	855	2,081	2,768
Printing and publishing	79	82	77	77	95	88	153	232	322	268	203	233	217	192	229	522	539	1,203	2,725	3,606
Basic petrochemicals, rubber and plastic	932	1,221	815	1,554	2,145	2,062	1,571	1,879	2,242	2,177	2,872	2,894	3,007	3,100	3,584	5,151	5,725	14,420	30,752	42,930
Non-ferrous metals	124	124	144	213	285	310	378	451	538	556	515	617	658	789	854	1,011	1,111	2,567	6,649	8,678
Structural metal products	69	73	158	308	362	219	425	655	816	1,099	1,123	1,160	1,200	1,453	2,235	4,613	4,841	3,084	18,540	20,809
Metal products, machinery and equipmen	778	868	892	1,732	2,233	2,157	3,542	4,312	5,281	5,850	7,221	8,351	9,134	11,314	14,353	18,845	21,025	21,794	101,374	117,886
Other manufacturing industries	82	98	86	166	200	156	223	282	373	437	545	708	674	832	620	825	980	1,668	5,994	7,386
Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Electricity, gas and water	448	526	520	346	227	4	57	64	50	74	67	77	78	85	0	0	0	2,243	431	2,625
Commerce, restaurants and hotels	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transportation, storage and communicatio	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Financial insurances, real estate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Communal services, social and personnal	6	6	5	25	16	15	6	4	3	7	10	16	7	4	0	0	0	86	47	130
AGRICULTURE	691	728	528	603	709	747	1,058	901	1,046	1,028	1,669	1,849	1,759	2,156	2,250	3,385	3,098	7,010	18,240	24,203
MINING	10,071	14,057	16,731	15,494	15,646	14,026	6,303	8,617	8,780	8,221	9,944	8,068	7,996	6,996	6,995	8,210	8,964	107,726	72,172	173,118
MANUFACTURING	3,891	4,111	3,680	5,635	7,207	6,695	8,670	10,470	12,347	13,192	14,936	16,640	17,481	20,638	25,343	36,478	39,926	62,707	196,981	247,342
SERVICES	454	532	525	371	244	20	63	67	54	81	77	93	85	89	0	0	0	2,329	479	2,754
TOTAL	15,107	19,428	21,464	22,103	23,805	21,489	16,094	20,055	20,227	22,522	26,626	26,648	27,322	29,879	34,588	48,073	51,988	179,772	287,873	447,417

a/ Caluculated in current Pesos and divided by the average annual nominal exchange rate.
b/ Estimated.
Source: INEGI.

TABLE 6
MEXICO'S IMPORT/a

(does not include maquiladoras)	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996/b	1980-88	1988-96	1980-96
	MILLION US-DOLLARS																			
Agriculture, forestry and fishing	1,983	2,360	925	1,718	1,797	1,444	906	944	1,680	1,875	1,950	1,919	2,555	2,348	3,174	2,481	2,706	13,757	20,688	32,765
Mining	384	362	230	188	234	257	212	301	386	418	440	432	432	380	509	603	624	2,554	4,224	6,391
Manufacturing industry	17,432	22,344	11,642	7,577	9,878	12,018	11,618	12,890	19,016	24,304	30,474	37,590	47,057	48,350	55,194	44,376	48,863	124,415	355,223	460,621
Food products, beverages and tobacco	1,361	1,307	757	560	627	625	535	623	1,329	2,184	2,883	2,780	3,623	3,613	4,084	2,904	3,374	7,724	26,774	33,169
Textiles, apparel and leather	328	475	273	71	123	170	167	211	523	963	1,254	1,659	2,291	2,468	2,349	1,405	1,499	2,341	14,399	16,217
Wood and its products	111	119	61	38	50	65	62	70	105	154	226	354	515	504	547	211	227	681	2,843	3,418
Printing and publishing	668	741	429	319	393	441	449	645	830	983	1,109	1,303	1,613	1,812	2,291	2,099	2,411	4,915	14,451	18,535
Basic petrochemicals, rubber and plastic	2,798	3,184	2,027	1,756	2,419	2,991	2,376	2,807	3,629	4,599	5,154	6,399	7,381	7,989	9,227	8,543	9,431	23,987	62,353	82,711
Non-ferrous metals	186	224	113	53	83	123	101	123	193	288	398	507	676	748	609	447	485	1,199	4,351	5,357
Structural metal products	2,142	2,506	991	505	860	956	665	731	1,170	1,397	1,543	2,098	2,537	2,281	2,648	2,308	2,528	10,526	16,510	27,865
Metal products, machinery and equipmen	9,084	12,736	6,404	3,923	4,866	5,963	6,600	7,000	10,343	12,435	16,224	20,179	25,493	25,875	30,423	23,998	26,215	66,919	191,185	247,761
Other manufacturing industries	753	1,054	586	352	458	684	665	680	892	1,312	1,682	2,311	2,929	3,061	3,016	2,461	2,693	6,124	20,357	25,587
Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Electricity, gas and water	10	10	4	3	4	6	13	15	18	61	48	60	231	149	0	0	0	82	567	631
Commerce, restaurants and hotels	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transportation, storage and communicatio	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Financial insurances, real estate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Communal services, social and personnal	13	11	7	11	9	31	10	4	12	12	13	22	27	22	0	0	0	107	107	202
AGRICULTURE	1,983	2,360	925	1,718	1,797	1,444	906	944	1,680	1,875	1,950	1,919	2,555	2,348	3,174	2,481	2,706	13,757	20,688	32,765
MINING	384	362	230	188	234	257	212	301	386	418	440	432	432	380	509	603	624	2,554	4,224	6,391
MANUFACTURING	17,432	22,344	11,642	7,577	9,878	12,018	11,618	12,890	19,016	24,304	30,474	37,590	47,057	48,350	55,194	44,376	48,863	124,415	355,223	460,621
SERVICES	23	20	10	14	13	36	23	19	30	73	61	82	258	172	0	0	0	188	675	833
TOTAL	19,821	25,086	12,807	9,497	11,922	13,755	12,759	14,153	21,111	26,670	32,925	40,023	50,302	51,249	58,877	47,460	52,193	140,911	380,810	500,610

a/ Caluculated in current Pesos and divided by the average annual nominal exchange rate.
b/ Estimated.
Source: INEGI.

TABLE 7
TRADE BALANCE \a
(does not include maquiladoras)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996 \b	1980-1988	1988-1996	1980-1996
Agriculture, forestry and fishing	-1,293	-1,632	-397	-1,115	-1,088	-697	152	-43	-634	-848	-281	-70	-796	-193	-924	904	392	-6,746	-2,449	-8,561
Mining	9,687	13,695	16,501	15,306	15,411	13,770	6,091	8,316	6,394	7,803	9,504	7,634	7,564	6,616	6,486	7,607	8,340	105,172	67,948	166,726
Manufacturing industry	-13,540	-18,233	-7,961	-1,942	-2,671	-5,322	-2,948	-2,420	-6,868	-11,112	-15,538	-20,949	-29,576	-27,712	-29,851	-7,898	-8,937	-51,706	-158,241	-213,279
Food products, beverages and tobacco	-94	-218	366	621	674	715	1,309	1,243	523	-334	-1,434	-1,148	-2,195	-1,937	-2,074	151	-393	5,142	-8,843	-4,224
Textiles, apparel and leather	179	23	61	243	348	122	264	446	224	-194	-510	-795	-1,350	-1,452	-1,156	766	898	1,911	-3,570	-1,882
Wood and its products	-58	-60	-9	51	63	7	41	66	72	42	-60	-172	-291	-236	-282	74	100	173	-752	-651
Printing and publishing	-589	-659	-352	-242	-297	-354	-296	-413	-509	-715	-906	-1,070	-1,396	-1,621	-2,062	-1,577	-1,872	-3,711	-11,727	-14,929
Basic petrochemicals, rubber and plastic	-1,866	-1,963	-1,213	-203	-274	-929	-805	-928	-1,387	-2,422	-2,282	-3,505	-4,374	-4,889	-5,643	-3,392	-3,706	-9,567	-31,602	-39,781
Non-ferrous metals	-62	-100	31	160	202	187	277	328	345	269	117	109	-18	41	245	564	626	1,367	2,298	3,320
Structural metal products	-2,073	-2,433	-834	-197	-498	-737	-239	-76	-354	-298	-421	-936	-1,337	-827	-413	2,305	2,313	-7,441	30	-7,057
Metal products, machinery and equipment	-8,306	-11,868	-5,513	-2,191	-2,633	-3,807	-3,057	-2,689	-5,062	-6,585	-9,003	-11,827	-16,359	-14,561	-16,070	-5,153	-5,190	-45,125	-89,812	-129,875
Other manufacturing industries	-671	-958	-501	-185	-257	-527	-441	-398	-519	-875	-1,038	-1,602	-2,255	-2,230	-2,396	-1,636	-1,713	-4,456	-14,294	-18,201
Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Electricity, gas and water	438	516	517	343	224	-1	44	49	32	13	19	16	-153	-64	0	0	0	2,162	-136	1,994
Commerce, restaurants and hotels	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transportation, storage and communication	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Financial insurances, real estate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Communal services, social and personnal	-7	-5	-2	14	7	-15	-4	0	-9	-4	-3	-6	-20	-18	0	0	0	-21	-60	-72
AGRICULTURE	-1,293	-1,632	-397	-1,115	-1,088	-697	152	-43	-634	-848	-281	-70	-796	-193	-924	904	392	-6,746	-2,449	-8,561
MINING	9,687	13,695	16,501	15,306	15,411	13,770	6,091	8,316	6,394	7,803	9,504	7,634	7,564	6,616	6,486	7,607	8,340	105,172	67,948	166,726
MANUFACTURING	-13,540	-18,233	-7,961	-1,942	-2,671	-5,322	-2,948	-2,420	-6,868	-11,112	-15,538	-20,949	-29,576	-27,712	-29,851	-7,898	-8,937	-51,706	-158,241	-213,279
SERVICES	431	511	515	357	231	-17	40	49	24	9	16	10	-172	-82	0	0	0	2,141	-196	1,921
TOTAL	-4,715	-5,658	8,657	12,606	11,883	7,734	3,336	-5,902	-885	-4,148	-6,298	-13,375	-22,980	-21,370	-24,289	613	-205	32,860	-92,937	-53,192

\a Calculated in current Pesos and divided by the average annual nominal exchange rate.
\b Estimated.
Source: Own calculations based on INEGI.

TABLE 8
TRADE BALANCE / GDP COEFFICIENT \a
(does not include maquiladoras)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996 \b
Agriculture, forestry and fishing	-8.08	-7.94	-3.11	-9.62	-7.21	-4.16	1.25	-0.35	-4.65	-5.30	-1.44	-0.32	-3.46	-0.79	-3.82	5.64	2.33
Mining	154.68	228.08	308.64	144.48	155.56	159.58	128.46	115.67	112.82	140.82	150.93	126.93	109.24	104.59	98.09	161.12	162.64
Manufacturing industry	-31.49	-33.68	-22.09	-6.18	-6.77	-12.36	-9.27	-6.67	-14.24	-21.97	-27.96	-32.78	-42.42	-38.06	-40.31	-16.21	-17.10
Food products, beverages and tobacco	-0.89	-1.65	3.96	7.62	6.58	6.37	14.36	13.27	4.51	-2.61	-9.93	-6.91	-11.55	-9.30	-9.99	1.04	-2.54
Textiles, apparel and leather	3.02	0.32	1.34	5.95	7.59	2.54	7.70	11.86	4.72	-3.85	-9.60	-13.56	-22.53	-24.50	-19.80	21.03	22.64
Wood and its products	-3.18	-2.73	-0.60	4.35	4.33	0.45	3.43	5.14	4.18	2.35	-3.24	-8.75	-13.81	-10.73	-12.51	6.01	7.45
Printing and publishing	-25.04	-21.83	-17.57	-13.58	-13.16	-14.24	-15.70	-17.87	-17.19	-21.67	-26.05	-27.67	-33.50	-37.81	-48.88	-51.32	-56.37
Basic petrochemicals, rubber and plasti	-29.14	-24.12	-20.74	-3.49	-3.92	-12.35	-14.10	-13.07	-14.89	-25.03	-21.96	-29.93	-34.52	-37.70	-41.93	-36.29	-36.94
Non-ferrous metals	-2.07	-2.58	1.21	7.12	7.36	6.01	12.02	12.24	10.35	7.62	2.91	2.25	-0.32	0.66	3.77	14.28	14.54
Structural metal products	-78.43	-74.99	-41.47	-11.03	-18.84	-29.68	-13.49	-3.32	-10.96	-8.92	-12.26	-27.66	-41.26	-25.63	-12.71	95.65	88.46
Metal products, machinery and equipm	-90.70	-99.60	-74.73	-39.22	-35.16	-44.06	-54.72	-40.45	-56.85	-66.29	-79.77	-84.08	-109.00	-96.30	-101.77	-53.09	-50.12
Other manufacturing industries	-60.31	-66.35	-51.08	-23.07	-25.11	-47.26	-54.73	-47.70	-49.63	-73.75	-75.69	-101.46	-120.24	-111.55	-120.37	-186.98	-193.84
Construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity, gas and water	22.77	22.55	32.96	24.62	13.32	-0.08	2.73	3.20	1.47	0.47	0.57	0.38	-3.00	-1.16	0.00	0.00	0.00
Commerce, restaurants and hotels	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transportation, storage and communicati	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Financial insurances, real estate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Communal services, social and personna	-0.02	-0.01	-0.01	0.06	0.03	-0.05	-0.02	0.00	-0.03	-0.01	-0.01	-0.01	-0.03	-0.02	0.00	0.00	0.00
AGRICULTURE	-8.08	-7.94	-3.11	-9.62	-7.21	-4.16	1.25	-0.35	-4.65	-5.30	-1.44	-0.32	-3.46	-0.79	-3.82	5.64	2.33
MINING	154.68	228.08	308.64	144.48	155.56	159.58	128.46	115.87	112.82	140.82	150.93	126.93	109.24	104.59	98.09	161.12	162.64
MANUFACTURING	-31.49	-33.68	-22.09	-6.18	-6.77	-12.36	-9.27	-6.67	-14.24	-21.97	-27.96	-32.78	-42.42	-38.06	-40.31	-16.21	-17.10
SERVICES	0.33	0.30	0.43	0.37	0.20	-0.01	0.05	0.06	0.02	0.01	0.01	0.01	-0.07	-0.03	0.00	0.00	0.00
TOTAL	-2.43	-2.26	4.98	8.47	6.77	4.19	2.58	4.18	-0.51	-2.00	-2.58	-4.66	-6.98	-5.81	-6.44	0.24	-0.08

\a Calculated in millions of current Pesos
\b Estimated.

Source: Own calculations based on INEGI.

APPENDIX II
Census Data

Table 1. Automotive Industry, Average Growth Rate % 1988-1994.

Description	By size of firm	UE	POP	RT	AFN	FBCF	PBT	VPE	IT	GP	VACB
Car body parts and tow cars, fabrication & assembly	Total personel ocuppied	11.79	8.94	27.80	14.73	15.68	19.40	19.59	19.96	17.90	18.57
	0 to 15	13.86	13.89	27.65	30.72	6.42	25.21	25.91	22.61	20.37	29.39
	16 to 100	7.37	8.32	30.27	19.39	5.11	23.85	24.76	25.49	23.83	20.63
	101 to 250	4.02	2 58	25.65	35.61	24.43	16.63	20.22	19.97	19.96	11.19
	More than 250	11.05	11.06	27.61	9.70	18.83	18.06	16.99	17.36	14.64	18.94
Motors and its parts	Total personel ocuppied	-1.53	1.90	14.54	3.43	34.64	5.50	8.30	11.80	13.33	-4.72
	0 to 15	-15.52	-16.73	3.68	28.44	27.98	38.70	40.11	42.06	34.83	32.60
	16 to 100	0.88	1.56	15.18	0.63	-0.08	25.13	25.42	25.46	33.12	24.22
	101 to 250	5.31	7.95	30.34	-4.34	16.75	30.19	29.01	27.87	29.62	33.33
	More than 250	-0.53	1.54	13.74	3.64	36.12	4.20	7.14	10.89	12.37	-6.79
Parts and accesories for the transmission system	Total personel ocuppied	1.93	0.10	13.21	4.64	12.49	8.68	9.44	11.59	10.79	4.82
	0 to 20	-2.75	6.01	23.49	22.57	-36.72	19.96	21.17	16.58	15.95	25.00
	21 to 100	10.29	13.92	29.78	26.45	50.12	20.93	20.58	13.47	14.67	32.20
	101 to 500	3.09	-2.73	11.73	2.78	16.41	1.65	1.16	10.33	6.45	-9.08
	More than 500	0.00	0.93	13.39	5.24	10.35	12.37	13.82	12.16	12.37	12.69
Parts and accesories for the steering system	Total personel ocuppied	5.65	5.23	17.12	10.15	17.76	25.50	25.23	22.62	24.81	30.67
	0 to 15	10.56	8.86	27.42	34.97	1.71	23.17	25.52	18.26	17.58	30.53
	16 to 100	-1.14	-0.55	20.31	11.45	7.94	11.96	12.19	9.11	9.06	16.12
	101 to 250	15.71	12.43	28.92	18.70	-90.66	37.94	38.72	44.34	50.45	23.79
	More than 250	2.60	4.23	14.05	8.36	66.59	25.22	24.64	20.02	22.27	34.32
Parts and accesories for the brake system	Total personel ocuppied	11.58	7.42	16.56	7.93	14.53	7.87	5.84	6.37	5.63	10.41
	0 to 20	15.17	15.48	37.33	43.18	17.62	55.48	56.28	58.07	60.45	51.01
	21 to 100	9.64	10.03	28.32	24.03	21.72	8.00	5.77	4.08	0.83	16.88
	101 to 250	12.25	12.05	8.20	-2.87	-7.60	-5.22	-6.86	0.09	0.24	-11.87
	More than 250	3.40	5.29	16.90	5.13	15.17	11.63	8.92	7.10	6.55	20.82
Other parts and accesories	Total personel ocuppied	8.75	2.16	14.62	4.56	2.43	10.68	12.20	12.05	13.47	8.43
	0 to 15	15.19	14.79	30.35	40.93	17.84	37.90	41.45	33.66	34.62	44.62
	16 to 100	4.00	6.99	19.55	9.91	-11.85	6.32	4.78	8.29	5.01	3.76
	101 to 250	3.24	3.44	23.79	7.92	15.78	19.13	19.79	23.86	27.36	10.78
	More than 250	0.00	0.39	12.00	2.50	1.14	8.61	10.71	9.14	10.95	7.73

Source: INEGI, Economic Census, 1988, 1994.

UE Economic units
POP Average of personel ocuppied
RT Total wages
AFN Net assets
FBCF Invest
PBT Total gross production
VPE Value of the production
IT Total inputs
GP Raw material
VACB Gross added value

Table 2. Automotive Industry, Census Data, 1988

Description	By size of firm	UE	POP	Dollars RT	AFN	FBCF	PBT	VPE	IT	GP	VACB
Car body parts and tow cars, fabrication & assembly	Total personel ocuppied	290	11220	34200.9	111566.0	6374.3	213933.5	193405.2	125548.6	105278.1	88384.9
	0 to 15	190	985	1395.7	5576.4	756.5	9947.5	9177.8	6448.5	5448.5	3499.1
	16 to 100	77	2984	6092.5	14505.7	1679.1	40140.2	35840.7	25719.6	20988.0	14420.6
	101 to 250	15	2557	5658.4	5621.9	917.3	36803.7	29726.1	21138.0	16209.2	15665.7
	More than 250	8	4694	21054.3	85862.1	3021.4	127042.1	118660.6	72242.5	62632.3	54799.6
Motors and its parts	Total personel ocuppied	102	30427	170751.1	2070398.0	41860.1	2244378.7	1870623.0	1174787.6	926737.8	1069591.1
	0 to 15	22	132	285.9	1351.0	290.1	1859.2	1726.3	1124.6	740.2	734.6
	16 to 100	37	1578	5041.0	31173.5	1407.0	34582.7	32678.7	25252.2	15460.3	9330.5
	101 to 250	11	1696	5580.1	63120.2	2311.8	33892.9	32567.0	20314.8	14352.0	13578.1
	More than 250	32	27021	159844.0	1974753.3	37851.2	2174043.9	1803651.0	1128096.0	896185.3	1045947.9
Parts and accesories for the transmission system	Total personel ocuppied	33	8589	56107.8	246749.7	11247.1	407068.3	380106.7	216711.8	160902.8	190356.3
	0 to 20	13	93	210.3	295.8	68.5	1008.1	883.5	645.1	458.1	362.9
	21 to 100	5	270	815.1	3323.7	99.4	4001.2	3707.4	2760.7	1662.2	1240.5
	101 to 500	10	3687	19841.0	116395.5	2425.7	169357.2	161194.9	73634.5	48421.7	95722.6
	More than 500	5	4539	35241.4	126734.8	8653.6	232701.8	214320.9	139671.5	110360.9	93030.3
Parts and accesories for the steering system	Total personel ocuppied	64	5174	22931.7	75380.9	3798.4	146570.7	142130.2	99427.4	75179.7	47143.3
	0 to 15	23	158	216.5	582.2	74.6	1984.0	1732.5	1305.3	1029.0	678.7
	16 to 100	30	1106	2582.2	5636.0	904.9	21452.1	19993.1	13532.4	9654.9	7919.7
	101 to 250	5	920	2563.7	7090.4	744.0	16033.5	14908.0	9692.0	6016.9	6341.5
	More than 250	6	2990	17569.3	62072.3	2074.8	107101.2	105496.5	74897.8	58478.9	32203.3
Parts and accesories for the brake system	Total personel ocuppied	57	5931	27935.2	72688.9	5041.1	196422.0	187198.0	127690.0	84328.8	68731.9
	0 to 20	24	183	313.3	1050.6	235.6	1523.0	1404.6	925.0	614.7	598.1
	21 to 100	19	891	2175.0	6699.5	870.1	27642.3	27101.6	20819.6	15805.1	6822.8
	101 to 250	5	779	7086.4	12202.7	735.4	65686.5	59175.2	31357.9	20761.7	34328.6
	More than 250	9	4078	18360.4	52736.1	3200.1	101570.1	99516.6	74587.6	47147.3	26982.5
Other parts and accesories	Total personel ocuppied	289	34952	136237.9	426680.3	54566.1	804282.1	653370.6	482860.1	326917.3	321422.0
	0 to 15	116	711	1243.7	3209.7	447.2	8436.5	6895.7	5564.4	3925.9	2872.2
	16 to 100	98	3755	10193.6	30782.9	6900.9	105385.7	98676.9	56906.8	43237.2	48478.9
	101 to 250	38	6247	16466.3	53951.7	6015.3	110555.8	97956.1	63307.9	39472.5	47247.9
	More than 250	37	24239	108334.3	338736.0	41202.7	579904.1	449841.9	357081.0	240281.7	222823.1

Source: INEGI, Economic Census, 1988

UE Economic units
POP Average of personel ocuppied
RT Total wages
AFN Net assets
FBCF Invest
PBT Total gross production
VPE Value of the production
IT Total inputs
GP Raw material
VACB Gross added value

Table 3. Automotive Industry, Census Data, 1994

FBCF Invest
VACB Gross added value

Table 3. Automotive Industry, Census Data, 1994

Description	By size of firm	UE	POP	Dollars RT	AFN	FBCF	PBT	VPE	IT	GP	VACB
Car body parts and tow cars,	Total personel ocuppied	566	18756	148989.1	254440.5	15272.4	619820.1	565675.7	374192.9	282710.1	245627.2
fabrication & assembly	0 to 15	414	2150	6039.5	27820.8	1098.9	38335.5	36562.2	21913.7	16570.5	16421.7
	16 to 100	118	4820	29780.7	42005.3	2263.9	144868.6	135156.3	100443.5	75664.4	44425.1
	101 to 250	19	2980	22267.8	34964.3	3403.7	92633.4	89749.3	63036.5	48301.7	29596.9
	More than 250	15	8806	90901.0	149650.1	8505.8	343982.7	304207.9	188799.1	142173.6	155183.6
Motors and its parts	Total personel ocuppied	93	34072	385655.4	2534052.6	249333.0	3094246.2	3018606.1	2293785.9	1963041.8	800459.9
	0 to 15	8	44	355.2	6065.6	1274.9	13237.5	13060.4	9243.6	4446.7	3993.7
	16 to 100	39	1732	11771.5	32361.4	1400.6	132765.0	127205.7	98479.2	86045.7	34285.8
	101 to 250	15	2684	27363.5	48363.0	5854.8	165065.2	150146.5	88802.3	68062.6	76262.8
	More than 250	31	29612	346165.2	2447262.6	240802.6	2783178.6	2728193.5	2097260.8	1804486.8	685917.6
Parts and accesories for the	Total personel ocuppied	37	8642	118145.9	323984.9	22794.5	670939.0	653095.0	418399.3	297552.2	252539.7
transmission system	0 to 20	11	132	745.8	1002.7	-4.4	3004.0	2796.5	1619.3	1113.4	1384.7
	21 to 100	9	590	3894.6	13585.3	1137.7	12513.6	11397.3	5892.0	3778.6	6621.5
	101 to 500	12	3122	38593.6	137196.2	6035.3	186841.9	172794.4	132780.9	70441.7	54061.0
	More than 500	5	4798	74911.9	172200.7	15625.9	468579.6	466106.9	278107.0	222218.5	190472.6
Parts and accesories for the	Total personel ocuppied	89	7025	59184.6	134627.5	10130.0	572622.7	548318.2	337890.0	284136.4	234732.8
steering system	0 to 15	42	263	926.4	3519.6	82.6	6927.9	6774.9	3571.2	2719.0	3356.7
	16 to 100	28	1070	7829.9	10802.4	1431.5	42246.7	39858.6	22829.0	16247.5	19417.7
	101 to 250	12	1858	11770.5	19831.6	-35736.1	110469.7	106222.9	87651.5	69768.3	22818.3
	More than 250	7	3834	38657.9	100473.9	44352.0	412978.4	395461.8	223838.3	195401.6	189140.1
Parts and accesories for the	Total personel ocuppied	110	9112	70042.3	114878.4	11380.1	309500.0	263182.8	184995.3	117148.9	124504.8
brake system	0 to 20	56	434	2101.8	9052.6	623.7	21518.9	20460.5	14426.9	10487.8	7092.0
	21 to 100	33	1581	9711.8	24392.5	2829.6	43857.4	37944.6	26461.1	16608.4	17396.3
	101 to 250	10	1542	11369.4	10244.6	457.5	47604.4	38642.6	31522.4	21068.4	16082.0
	More than 250	11	5555	46859.2	71188.6	7469.3	196519.4	166135.0	112584.8	68984.3	83934.6
Other parts and accesories	Total personel ocuppied	478	39724	308973.3	557585.1	63028.4	1478179.6	1303688.2	955716.8	697887.9	522463.1
	0 to 15	271	1627	6100.6	25148.6	1197.3	58006.6	55231.5	31726.5	23361.4	26280.1
	16 to 100	124	5631	29759.1	54268.6	3236.9	152248.8	130584.3	91754.6	57968.7	60494.2
	101 to 250	46	7654	59264.0	85240.9	14489.7	315964.9	289376.3	228629.0	168435.1	87335.8
	More than 250	37	24812	213849.7	392927.0	44104.5	951959.3	828496.0	603606.7	448122.7	348352.9

Source: INEGI, Economic Census, 1994

UE Economic units
POP Average of personel ocuppied
RT Total wages
AFN Net assets
FBCF Invest
PBT Total gross production
VPE Value of the production
IT Total inputs
GP Raw material
VACB Gross added value

APPENDIX III
Data Base: Parts and componenets supplier

Table 1	Parts and components supplier, status of the company
Table 2	Parts and components supplier, status of the company Country of foreign capital
Table 3	Parts and components supplier, main products
Table 4	Sum of the above top three products in sales (%)
Table 5	Parts and components supplier Market and linkage with customers general
Table 6	Parts and components supplier Market and linkage with customers general, export countries
Table 7	Parts and components supplier Market and linkage with customers general
Table 8	Parts and components supplier Market and linkage with customers general, type of market in 1995
Table 9	Parts and components supplier Market and linkage with customers subcontract: buyers
Table 10	Parts and components supplier Market and linkage with customers general
Table 11	Parts and components supplier market and linkage with customers general Dificulties in expanding or penetrating the subcontract: buisness
Table 12	Parts and components supplier Market and linkage with customers exports
Table 13	Parts and components supplier Market and linkage with customers

TABLE # 1
PARTS AND COMPONENTS SUPPLIER
STATUS OF THE COMPANY

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
ESTABLISHED IN THE YEAR OF								
Mean	1968	1977	1976	1979	1978	1974	1966	1976
Valid N	N=18	N=164	N=182	N=18	N=114	N=31	N=17	N=180
NUMBER OF EMPLOYEES								
Mean	604	106	150	9	43	174	977	150
Valid N	N=16	N=164	N=180	N=18	N=114	N=31	N=17	N=180
CAPITAL (THOUSAND OF USD)								
Mean	4486.64	330.19	699.66	12.77	110.80	646.81	4965.82	627.74
Valid N	N=16	N=164	N=180	N=18	N=114	N=31	N=16	N=179
% DOMESTIC CAPITAL								
Mean	70	83	82	93	88	66	61	82
Valid N	N=18	N=164	N=182	N=18	N=114	N=31	N=17	N=180
% FOREIGNERS CAPITAL								
Mean	30	17	18	7	12	34	39	18
Valid N	N=18	N=164	N=182	N=18	N=114	N=31	N=17	N=180
SALES IN 1995 (MILLION PESOS)								
0.9 OR LESS								
%	14.3%	23.8%	23.0%	6.2%	16.3%	.6%		23.0%
MORE THAN 0.9 UP TO 9								
%	50.0%	38.4%	39.3%	2.8%	33.1%	3.4%		39.3%
MORE THAN 09 UP TO 20								
%		15.2%	14.0%	.6%	9.0%	4.5%		14.0%
MORE THAN 20								
%	35.7%	22.6%	23.6%	.6%	5.6%	9.0%	8.4%	23.6%

TABLE # 2
PARTS AND COMPONENTS SUPPLIER
STATUS OF COMPANY
COUNTRY OF FQREIGN CAPITAL

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
COUNTRY FOREIGNERS CAPITAL								
AUSTRIA								
Freq.		1	1			1		1
row %		100.0%	100.0%			100.0%		100.0%
BELGIUM								
Freq.		1	1		1			1
row %		100.0%	100.0%		100.0%			100.0%
CANADA								
Freq.		3	3			1	2	3
row %		100.0%	100.0%			33.3%	66.7%	100.0%
GERMANY								
Freq.	2	8	10		6	2	2	10
row %	20.0%	80.0%	100.0%		60.0%	20.0%	20.0%	100.0%
SPAIN								
Freq.	1	1	2		2			2
row %	50.0%	50.0%	100.0%		100.0%			100.0%
SWEDEN								
Freq.		1	1			1		1
row %		100.0%	100.0%			100.0%		100.0%
UNITED KINGDOM								
Freq.	1		1			1		1
row %	100.0%		100.0%			100.0%		100.0%
USA								
Freq.	2	24	26	2	9	10	5	26
row %	7.7%	92.3%	100.0%	7.7%	34.6%	38.5%	19.2%	100.0%

TABLE # 3
PARTS / COMPONENTS SUPPLIER
MAIN PRODUCTS

	Type of company					
	Engine Parts			Car Parts Components		
	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3
AIR CONDITIONED						
Frequency				1		
%				.6%		
(OPTACOPLADORAS) CARDS						
Frequency					1	1
%					.9%	1.2%
30 WATTS SOUND AMPLIFIER						
Frequency						1
%						1.2%
40 WATTS ELECTRONIC STARTER						
Frequency					1	
%					.9%	
6 CILINDER MOTOR						
Frequency	1				1	1
%	5.6%				.9%	1.2%
8D BATTERY						
Frequency		1		1		
%		8.3%		.6%		
AIR BAG CUSHIONS						
Frequency				1	1	1
%				.6%	.9%	1.2%
AIR FILTER						
Frequency				1		
%				.6%		
AIR TANKS						
Frequency				1		1
%				.6%		1.2%
AIRBAG BRAIN						
Frequency				1		1
%				.6%		1.2%
AMPLIFIERS						

(continued)

PARTS / COMPONENTS SUPPLIER
MAIN PRODUCTS

	Type of company					
	Engine Parts			Car Parts Components		
	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3
Frequency					1	1
%					.9%	1.2%
ANTENNA CONNECTORS TO CAR STEREO						
Frequency					1	1
%					.9%	1.2%
ANTENNAS						
Frequency					1	1
%					.9%	1.2%
ARMONIC RESTRUCTURATOR						
Frequency					1	1
%					.9%	1.2%
ARMORED MULTICONNECTOR						
Frequency						1
%						1.2%
AUTOMOTIVE FUSE						
Frequency				1	1	1
%				.6%	.9%	1.2%
AUTOMOTIVE MICA						
Frequency				1		1
%				.6%		1.2%
AUTOMOTIVE PLATFORM						
Frequency				1		1
%				.6%		1.2%
AUTOMOTIVE PUMP						
Frequency				1	1	1
%				.6%	.9%	1.2%
AUTOMOTIVE RADIATOR						
Frequency				1	1	
%				.6%	.9%	
AUTOMOTIVE SELT						
Frequency				1	1	1

(continued)

PARTS / COMPONENTS SUPPLIER
MAIN PRODUCTS

	Type of company					
	Engine Parts			Car Parts Components		
	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3
%				.6%	.9%	1.2%
AUTOMOVILE ANTENNAS						
Frequency					1	
%					.9%	
AUXILIAR FRAME						
Frequency	1					
%	5.6%					
BACK DOOR						
Frequency				1		1
%				.6%		1.2%
BAFFLES						
Frequency					1	
%					.9%	
BAKE ENAMEL						
Frequency		1				1
%		8.3%				1.2%
BALLAD						
Frequency				2		1
%				1.2%		1.2%
BALLAST						
Frequency			1			
%			12.5%			
BATTERIES						
Frequency				3	1	
%				1.8%	.9%	
BATTERY CABLES						
Frequency				1		1
%				.6%		1.2%
BEDLINERS						
Frequency				2		
%				1.2%		

(continued)

PARTS / COMPONENTS SUPPLIER
MAIN PRODUCTS

	Type of company					
	Engine Parts			Car Parts Components		
	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3
BLACK BRAKE PADS						
Frequency				1	1	1
%				.6%	.9%	1.2%
BLADES						
Frequency					1	
%					.9%	
BODIES						
Frequency		1		1		1
%		8.3%		.6%		1.2%
BODIES FOR DROUGHT FREIGHT						
Frequency				1	1	
%				.6%	.9%	
BODY SHOP						
Frequency				1	1	1
%				.6%	.9%	1.2%
BONNETS						
Frequency				2	1	
%				1.2%	.9%	
BRAKE BLOCKS						
Frequency				1	1	1
%				.6%	.9%	1.2%
BRAKE CHAMBER						
Frequency				1		
%				.6%		
BRAKE PADS						
Frequency				1	1	
%				.6%	.9%	
BRAKES DRUMS						
Frequency				1	1	
%				.6%	.9%	
BRAKES FLUID						

(continued)

PARTS / COMPONENTS SUPPLIER
MAIN PRODUCTS

	Type of company					
	Engine Parts			Car Parts Components		
	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3
Frequency				1	1	1
%				.6%	.9%	1.2%
BREAKE-DRUMS						
Frequency				1		1
%				.6%		1.2%
BRIGHT SWITCHES						
Frequency			1		1	
%			12.5%		.9%	
BRONZE BUSHING						
Frequency				1		1
%				.6%		1.2%
BURGLAR ALARM						
Frequency				1	2	
%				.6%	1.7%	
BUS BODY						
Frequency				2	1	
%				1.2%	.9%	
BUS SEAT						
Frequency		1		1		
%		8.3%		.6%		
BUSHINGS						
Frequency				3	1	
%				1.8%	.9%	
CABINETS						
Frequency					1	
%					.9%	
CABLE-SPARK PLUG						
Frequency				1		1
%				.6%		1.2%
CABLE ASSEMBLIES						
Frequency					1	
%					.9%	

(continued)

PARTS / COMPONENTS SUPPLIER
MAIN PRODUCTS

	Type of company					
	Engine Parts			Car Parts Components		
	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3
CABLES						
Frequency			1		1	
%			12.5%		.9%	
CAR BACKING						
Frequency				1		1
%				.6%		1.2%
CAR DOOR GUM						
Frequency				1		1
%				.6%		1.2%
CAR DOOR VESTMENTS						
Frequency			1	1	1	
%			12.5%	.6%	.9%	
CAR WINDOWS						
Frequency				2		1
%				1.2%		1.2%
CARBURATORS						
Frequency	1					1
%	5.6%					1.2%
CARDAN BARS						
Frequency				1	1	
%				.6%	.9%	
CARPET						
Frequency				1		
%				.6%		
CARPETING WOVEN						
Frequency	1				1	1
%	5.6%				.9%	1.2%
CASSETTES						
Frequency					1	1
%					.9%	1.2%
CATALYTIC CONVERTERS						
Frequency				1		1

(continued)

PARTS / COMPONENTS SUPPLIER
MAIN PRODUCTS

	Type of company					
	Engine Parts			Car Parts Components		
	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3
%				.6%		1.2%
CATHADE- RAY TUBE						
Frequency			1		1	
%			12.5%		.9%	
CHASSIS						
Frequency	1					
%	5.6%					
CIGAR ANTENNAS						
Frequency						1
%						1.2%
CLAMPS						
Frequency				1	1	
%				.6%	.9%	
CLUTCH PLATES						
Frequency				1	1	
%				.6%	.9%	
COACHWORK FOR EXPRESS BUSES						
Frequency				1	1	
%				.6%	.9%	
COAXIAL CABLE						
Frequency						1
%						1.2%
COILS						
Frequency				1	2	1
%				.6%	1.7%	1.2%
COMPONENTS FOR COFFE POT						
Frequency						1
%						1.2%
COMPUTER SEGURITY CARD						
Frequency					1	1
%					.9%	1.2%

(continued)

PARTS / COMPONENTS SUPPLIER
MAIN PRODUCTS

	Type of company					
	Engine Parts			Car Parts Components		
	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3
CONDUCTORS						
Frequency						1
%						1.2%
CONNECTION BOXES						
Frequency					1	1
%					.9%	1.2%
CONNECTORS						
Frequency						1
%						1.2%
CONSTRUCTION CABLES						
Frequency						1
%						1.2%
CONTROL PANELS						
Frequency				1		
%				.6%		
COUPLINGS						
Frequency				1		
%				.6%		
CURRENT TRANSFORMER						
Frequency						1
%						1.2%
DESK CALCULATOR						
Frequency					1	1
%					.9%	1.2%
DETECTORS						
Frequency					1	
%					.9%	
DIELS						
Frequency			1	1	1	
%			12.5%	.6%	.9%	
DIES						
Frequency					1	

(continued)

PARTS / COMPONENTS SUPPLIER
MAIN PRODUCTS

	Type of company					
	Engine Parts			Car Parts Components		
	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3
%					.9%	
DIGITAL DPU						
Frequency				1		1
%				.6%		1.2%
DIGITAL INSTRUMENTS						
Frequency						1
%						1.2%
DIRECTIONAL FLAT						
Frequency				1	1	1
%				.6%	.9%	1.2%
DISK BRAKE PADS						
Frequency				1	1	1
%				.6%	.9%	1.2%
DISK BREAKE PAD COVER						
Frequency				1	1	1
%				.6%	.9%	1.2%
DISTRIBUTION BOARD						
Frequency						1
%						1.2%
DRAMPERS						
Frequency				1	1	
%				.6%	.9%	
DRIFT INDICATOR						
Frequency				1		1
%				.6%		1.2%
DRIVE WITHOUT SHAFT						
Frequency				1	1	
%				.6%	.9%	
DRUMS						
Frequency				1	1	1
%				.6%	.9%	1.2%

(continued)

PARTS / COMPONENTS SUPPLIER
MAIN PRODUCTS

	Type of company					
	Engine Parts			Car Parts Components		
	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3
Frequency				3	1	
%				1.8%	.9%	
EVAPORATING EQUIPMENT						
Frequency						1
%						1.2%
EXHAUST SYSTEM						
Frequency				1	1	1
%				.6%	.9%	1.2%
FASTENER 30-47-7 MM.						
Frequency				1		1
%				.6%		1.2%
FASTENERS						
Frequency				1		1
%				.6%		1.2%
FENDERS						
Frequency				1		1
%				.6%		1.2%
FILTERS						
Frequency				1	1	
%				.6%	.9%	
FIRE EXTINGUISHER						
Frequency				1	1	1
%				.6%	.9%	1.2%
FLOOR MAT						
Frequency				1	1	1
%				.6%	.9%	1.2%
FONT TRACTION ASSEMBLING						
Frequency				1	1	1
%				.6%	.9%	1.2%
FRICTION ELEMENT						
Frequency				1	1	1
%				.6%	.9%	1.2%

(continued)

PARTS / COMPONENTS SUPPLIER
MAIN PRODUCTS

	Type of company					
	Engine Parts			Car Parts Components		
	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3
ELECTRIC COILS OUTLETS						
Frequency				1		1
%				.6%		1.2%
ELECTRIC CONTROL						
Frequency					1	1
%					.9%	1.2%
ELECTRIC RESISTANCE						
Frequency					1	
%					.9%	
ELECTRIC SWITCH (800 MODELS)						
Frequency					1	
%					.9%	
ELECTROLYTIC CAPACITOR						
Frequency					1	1
%					.9%	1.2%
ELECTRONIC CARDS						
Frequency			1			
%			12.5%			
ELECTRONIC PARTS						
Frequency						1
%						1.2%
ELECTRONIC REGULATOR						
Frequency					1	1
%					.9%	1.2%
ELECTRONIC THIN BOARD						
Frequency					1	
%					.9%	
ENGINE COMPONENTS						
Frequency	1					
%	5.6%					
ESCAPE SYSTEMS						

(continued)

PARTS / COMPONENTS SUPPLIER
MAIN PRODUCTS

	Type of company					
	Engine Parts			Car Parts Components		
	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3
FRIDGE GRID						
Frequency				1	1	
%				.6%	.9%	
FRONT SPOILERS						
Frequency				1	1	
%				.6%	.9%	
FUSE						
Frequency						1
%						1.2%
GASOLINE TANK SUPPORTS						
Frequency				1		1
%				.6%		1.2%
GASOLINE TANKS						
Frequency		1		1		
%		8.3%		.6%		
GLASS SCREEN						
Frequency					1	1
%					.9%	1.2%
GLOVE COMPARTMENT						
Frequency		1		1		
%		8.3%		.6%		
GOLF DOOR LOCKS						
Frequency				1	1	1
%				.6%	.9%	1.2%
GRILL						
Frequency					1	
%					.9%	
HALOGEN HEADLAMPS CONNECTOR						
Frequency						1
%						1.2%
HARNESS AND CABLE						

(continued)

PARTS / COMPONENTS SUPPLIER
MAIN PRODUCTS

	Type of company					
	Engine Parts			Car Parts Components		
	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3
Frequency						1
%						1.2%
HEADLAMP FOR MERCURY CARS (APPLIQUE)						
Frequency				1		1
%				.6%		1.2%
HEADLAMPS						
Frequency				1		1
%				.6%		1.2%
HEADWALL A 3						
Frequency				1	1	
%				.6%	.9%	
HEATER ELECTRIC RESISTANCE						
Frequency					1	
%					.9%	
HEXAGONAL SCREW 6-5						
Frequency				1	1	1
%				.6%	.9%	1.2%
HOPPER						
Frequency				1		1
%				.6%		1.2%
HOSES BREAKES						
Frequency				1		
%				.6%		
INDICATOR LAMP						
Frequency				1	1	
%				.6%	.9%	
INDUCTION COIL						
Frequency				1		1
%				.6%		1.2%

(continued)

PARTS / COMPONENTS SUPPLIER
MAIN PRODUCTS

	Type of company					
	Engine Parts			Car Parts Components		
	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3
INTERNAL COMBUSTION ENGINE						
Frequency				1		
%				.6%		
INTERNAL COMBUSTION EUGINE						
Frequency	1					
%	5.6%					
INTERPHONES						
Frequency					1	
%					.9%	
JOINTS FOR ENGINES						
Frequency	1					1
%	5.6%					1.2%
KINESCOPE						
Frequency					1	
%					.9%	
KINESCOPES						
Frequency					1	
%					.9%	
KIT OF CARBURETION						
Frequency		1		1		
%		8.3%		.6%		
LAMP BASES						
Frequency						1
%						1.2%
LAMP HOLDER						
Frequency		1				1
%		8.3%				1.2%
LATERAL CABINET OF TENSION						
Frequency					1	
%					.9%	

(continued)

PARTS / COMPONENTS SUPPLIER
MAIN PRODUCTS

	Type of company					
	Engine Parts			Car Parts Components		
	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3
LEAF SPRINGS						
Frequency			1	3		
%			12.5%	1.8%		
LEAF SPRINGS VAN						
Frequency				1		1
%				.6%		1.2%
LOGARITHMIC ANTENNAS						
Frequency					2	
%					1.7%	
LONG DISTANCE CALLS RESTRICTOR						
Frequency					1	
%					.9%	
MACHINE BODIES						
Frequency					1	1
%					.9%	1.2%
MACHINE HEXAGONAL SUREW						
Frequency					1	1
%					.9%	1.2%
MAGNETO WIRE						
Frequency				1		
%				.6%		
MEMORY BANKS						
Frequency					1	
%					.9%	
METER WOOD BODY						
Frequency				1	1	
%				.6%	.9%	
MICROBUS						
Frequency				1	1	
%				.6%	.9%	
MICROPHONES						

(continued)

PARTS / COMPONENTS SUPPLIER
MAIN PRODUCTS

	Type of company					
	Engine Parts			Car Parts Components		
	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3
Frequency					1	
%					.9%	
MIRROR SUPPORT						
Frequency				1		
%				.6%		
MIRRORS						
Frequency				1	1	
%				.6%	.9%	
MODULAR CIRCUIT						
Frequency					1	
%					.9%	
MOLDING PARTS RUBBER						
Frequency				1	1	
%				.6%	.9%	
MOLDS FOR ENGINES						
Frequency	1				1	
%	5.6%				.9%	
MONOBLOCK SEAL						
Frequency				1	1	
%				.6%	.9%	
MOTOR HOME CHASSISES						
Frequency				1		
%				.6%		
MOTOR IMPELLER						
Frequency	1					
%	5.6%					
MOTOR MUFFLERS						
Frequency	1					
%	5.6%					
MUDGUARDS						
Frequency				1		
%				.6%		

(continued)

PARTS / COMPONENTS SUPPLIER
MAIN PRODUCTS

	Type of company					
	Engine Parts			Car Parts Components		
	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3
MUFFLER						
Frequency				1		
%				.6%		
MUFFLERS						
Frequency				2		
%				1.2%		
NISSAN TRAY						
Frequency				1	1	
%				.6%	.9%	
NO BREAK						
Frequency					1	
%					.9%	
NO BREAKE						
Frequency		1				
%		8.3%				
NONSHATTERING PLANE GLASS						
Frequency				1	1	
%				.6%	.9%	
ONE BUTTON TELEPHONE						
Frequency					1	
%					.9%	
ONE FACE PC BOARD						
Frequency					1	
%					.9%	
ONE SIDE PC BOARD						
Frequency					1	
%					.9%	
PACKING						
Frequency				1	1	
%				.6%	.9%	
PALLETS						

(continued)

PARTS / COMPONENTS SUPPLIER
MAIN PRODUCTS

	Type of company					
	Engine Parts			Car Parts Components		
	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3
Frequency				1	1	
%				.6%	.9%	
PARABOLIC ANTENNA						
Frequency					1	
%					.9%	
PC BOARDS						
Frequency		1		1		
%		8.3%		.6%		
PICKUP BOX						
Frequency				1	1	
%				.6%	.9%	
PISTONS						
Frequency	1				1	
%	5.6%				.9%	
PLASTICS & DIE						
Frequency					1	
%					.9%	
PLUGS						
Frequency	1			1		
%	5.6%			.6%		
POSTS						
Frequency				1	1	
%				.6%	.9%	
POWER TIMER						
Frequency					1	
%					.9%	
PRESENCE SENSORS						
Frequency					1	
%					.9%	
PRESURE WASHERS						
Frequency				1	1	
%				.6%	.9%	

(continued)

PARTS / COMPONENTS SUPPLIER
MAIN PRODUCTS

	Type of company					
	Engine Parts			Car Parts Components		
	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3
PRINTED CIRCUIT						
Frequency					1	
%					.9%	
RADIATOR PANELS						
Frequency				1		
%				.6%		
RADIATORS						
Frequency				2	1	
%				1.2%	.9%	
REAR LIGHTS						
Frequency				1		
%				.6%		
REAR VISION MIRROR						
Frequency				2	1	
%				1.2%	.9%	
REGISTER BOX						
Frequency				1	1	
%				.6%	.9%	
REGULATORS						
Frequency					1	
%					.9%	
REGULATORS VOLTAGE						
Frequency					1	
%					.9%	
RELAYS						
Frequency				1	1	
%				.6%	.9%	
RIVETING CONTACT						
Frequency		1				
%		8.3%				
RIVETS						
Frequency		1		1		

(continued)

PARTS / COMPONENTS SUPPLIER
MAIN PRODUCTS

	Type of company					
	Engine Parts			Car Parts Components		
	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3
%		8.3%		.6%		
ROD BEARING						
Frequency				1		
%				.6%		
ROLLING OF CONICAL ROLLER						
Frequency				1		
%				.6%		
ROTOR						
Frequency				1		
%				.6%		
SAFETY GLASS LAMINATE						
Frequency				1		
%				.6%		
SATELLITE ANTENNA COMPONENTS						
Frequency				1		
%				.6%		
SCREW GRADE 5						
Frequency				1		
%				.6%		
SEDAN STIRRUP						
Frequency				1		
%				.6%		
SHEET METAL						
Frequency				1		
%				.6%		
SILL STEEL						
Frequency				1		
%				.6%		
SMALL DISK BREAKES						
Frequency				1		

(continued)

PARTS / COMPONENTS SUPPLIER
MAIN PRODUCTS

	Type of company					
	Engine Parts			Car Parts Components		
	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3
STIRRUP						
Frequency				1		
%				.6%		
STOCKS						
Frequency				1		
%				.6%		
SWITCHES						
Frequency	1			1		
%	5.6%			.6%		
THERMAL SHAPING						
Frequency				1		
%				.6%		
TIRE						
Frequency				1		
%				.6%		
TIRES						
Frequency				1		
%				.6%		
TOPS						
Frequency				1		
%				.6%		
TOPS WITH SUNROOF						
Frequency				1		
%				.6%		
TRACTOPARTS						
Frequency				1		
%				.6%		
TUBES OF ELECTRIC WELDING STEEL						
Frequency				1		
%				.6%		
VALISE BELT						

(continued)

PARTS / COMPONENTS SUPPLIER
MAIN PRODUCTS

	Type of company					
	Engine Parts			Car Parts Components		
	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3
%				.6%		
SNUBBERS						
Frequency				1		
%				.6%		
SPARE PARTS FOR AIRBRAKES						
Frequency	1					
%	5.6%					
SPRINGS						
Frequency				1		
%				.6%		
STAKE BODY						
Frequency				1		
%				.6%		
STAMPING						
Frequency				1		
%				.6%		
STARTING MOTOR						
Frequency				1		
%				.6%		
STATOR						
Frequency				1		
%				.6%		
STEEL RHINES						
Frequency				1		
%				.6%		
STEERING GEAR BOX						
Frequency				1		
%				.6%		
STICKERS						
Frequency				1		
%				.6%		

(continued)

PARTS / COMPONENTS SUPPLIER
MAIN PRODUCTS

	Type of company					
	Engine Parts			Car Parts Components		
	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3	NAME OF PRODUCT 1	NAME OF PRODUCT 2	NAME OF PRODUCT 3
Frequency				1		
%				.6%		
VALVES PVC						
Frequency				1		
%				.6%		
VARIOUS ASSEMBLIES						
Frequency				1		
%				.6%		
WATER PUMPS						
Frequency				1		
%				.6%		
WATER PUMPS (CUMIS)						
Frequency				1		
%				.6%		
WINDOWS						
Frequency				1		
%				.6%		
WOOFERS						
Frequency				1		
%				.6%		
INJECTORS						
Frequency	1					
%	5.6%					
BLOCKS						
Frequency	1					
%	5.6%					
RING FOR PISTONS						
Frequency	1					
%	5.6%					

TABLE # 4
SUM OF THE ABOVE TOP THREE PRODUCTS IN SALES (%)

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
HOW BIG IS THE SHARE OF THE SUM TOP THREE PRODUCTS IN SALES AMOUNT								
Mean of %	91	86	87	81	87	90	78	87
Valid N	N=14.00	N=164.00	N=178.00	N=18.00	N=114.00	N=31.00	N=15.00	N=178.00

TABLE # 5
PARTS AND COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
GENERAL

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
DOMESTIC MARKET IN 1995 % OF SALES								
Mean	74	81	80	99	84	69	57	80
Valid N	N=14	N=164	N=178	N=18	N=114	N=31	N=15	N=178
DIRECT EXPORT % OF TOTAL SALES								
Mean	19	15	15	0	11	29	32	15
Valid N	N=14	N=164	N=178	N=18	N=114	N=31	N=15	N=178
SALES TO IN-BOND INDUTRY % OF SALES								
Mean	8	4	5	1	5	2	11	5
Valid N	N=14	N=164	N=178	N=18	N=114	N=31	N=15	N=178

TABLE # 6
PARTS / COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
EXPORT COUNTRIES

	Type of company					
	Engine Parts			Car Parts Components		
	EXPORT 95 COUNTRY 1	EXPORT 95 COUNTRY 2	EXPORT 95 COUNTRY 3	EXPORT 95 COUNTRY 1	EXPORT 95 COUNTRY 2	EXPORT 95 COUNTRY 3
ARGENTINA						
Frequency					2	1
%					5.4%	4.5%
AUSTRIA						
Frequency				1		1
%				1.5%		4.5%
BELIZE						
Frequency			1	1	3	1
%			20.0%	1.5%	8.1%	4.5%
BRAZIL						
Frequency		1		1	6	
%		14.3%		1.5%	16.2%	
CANADA						
Frequency				2		
%				2.9%		
CENTRAL AMERICA						
Frequency	2			2	3	1
%	15.4%			2.9%	8.1%	4.5%
CHILE						
Frequency				2	2	3
%				2.9%	5.4%	13.6%
COLOMBIA						
Frequency		1	1	3	1	2
%		14.3%	20.0%	4.4%	2.7%	9.1%
COSTA RICA						
Frequency				1		1
%				1.5%		4.5%
CUBA						
Frequency		1		2		
%		14.3%		2.9%		
FRANCE						

(continued)

PARTS / COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
EXPORT COUNTRIES

	Type of company					
	Engine Parts			Car Parts Components		
	EXPORT 95 COUNTRY 1	EXPORT 95 COUNTRY 2	EXPORT 95 COUNTRY 3	EXPORT 95 COUNTRY 1	EXPORT 95 COUNTRY 2	EXPORT 95 COUNTRY 3
Frequency				1	2	
%				1.5%	5.4%	
GERMANY						
Frequency	1			3	4	1
%	7.7%			4.4%	10.8%	4.5%
GUATEMALA						
Frequency	1			3	1	
%	7.7%			4.4%	2.7%	
KOREA						
Frequency		1	1	1	1	
%		14.3%	20.0%	1.5%	2.7%	
LATIN AMERICA						
Frequency	1		1	1		
%	7.7%		20.0%	1.5%		
NICARAGUA						
Frequency				1	1	1
%				1.5%	2.7%	4.5%
NORTH AMERICA						
Frequency					1	1
%					2.7%	4.5%
PUERTO RICO						
Frequency				1	2	
%				1.5%	5.4%	
SALVADOR						
Frequency					1	3
%					2.7%	13.6%
USA						
Frequency	7	1		42		
%	53.8%	14.3%		61.8%		
VENEZUELA						
Frequency						1

(continued)

PARTS / COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
EXPORT COUNTRIES

	Type of company					
	Engine Parts			Car Parts Components		
	EXPORT 95 COUNTRY 1	EXPORT 95 COUNTRY 2	EXPORT 95 COUNTRY 3	EXPORT 95 COUNTRY 1	EXPORT 95 COUNTRY 2	EXPORT 95 COUNTRY 3
%						4.5%
UNITED KINGDOM						
Frequency	1	2			7	2
%	7.7%	28.6%			18.9%	9.1%
VENEZUELA						
Frequency						3
%						13.6%
LATIN AMERICA						
Frequency			1			
%			20.0%			

TABLE # 7
PARTS AND COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
GENERAL

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
ASSISTENCE/COOPERATION FROM CUSTOMERS (NOW) TECHNICAL ASSISTENCE FROM CUSTOMER (NOW)								
Cases	6	58	64	5	40	12	7	64
% col. resp.	85.7%	74.4%	75.3%	83.3%	72.7%	70.6%	100.0%	75.3%
FINANCIAL SUPPORT FORM CUSTOMER (NOW)								
Cases		24	24	1	20	2	1	24
% col. resp.		30.8%	28.2%	16.7%	36.4%	11.8%	14.3%	28.2%
MANAG.ASSISTANCE FROM CUSTOMER (NOW)								
Cases		18	18	1	12	5		18
% col. resp.		23.1%	21.2%	16.7%	21.8%	29.4%		21.2%
TRAINING ASSISTENCE FROM CUSTOMER (NOW)								
Cases	2	27	29	1	17	7	4	29
% col. resp.	28.6%	34.6%	34.1%	16.7%	30.9%	41.2%	57.1%	34.1%
SUPPLIES ASSISTENCE FROM CUSTOMER (NOW)								
Cases	3	34	37	1	24	5	7	37
% col. resp.	42.9%	43.6%	43.5%	16.7%	43.6%	29.4%	100.0%	43.5%
ASSISTENCE/COOPERATION FROM CUSTOMEERS (FUTURE) TECHNICAL ASSISTENCE FROM CUSTOMER (FUTURE)								
Cases	7	58	65	7	41	8	9	65
% col. resp.	77.8%	59.8%	61.3%	63.6%	59.4%	53.3%	81.8%	61.3%
FINANCIAL SUPPORT FORM CUSTOMER (FUTURE)								
Cases	1	43	44	6	33	3	2	44
% col. resp.	11.1%	44.3%	41.5%	54.5%	47.8%	20.0%	18.2%	41.5%
MANAG.ASSISTANCE FROM CUSTOMER (FUTURE)								

(continued)

MANAG.ASSISTANCE FROM CUSTOMER (FUTURE)								

(continued)

PARTS AND COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
GENERAL

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
Cases		21	21	4	13	3	1	21
% col. resp.		21.6%	19.8%	36.4%	18.8%	20.0%	9.1%	19.8%
TRAINING ASSISTENCE FROM CUSTOMER (NOW)								
Cases	2	27	29	1	17	7	4	29
% col. resp.	22.2%	27.8%	27.4%	9.1%	24.6%	46.7%	36.4%	27.4%
SUPPLIES ASSISTENCE FROM CUSTOMER (FUTURE)								
Cases	4	44	48	3	33	5	7	48
% col. resp.	44.4%	45.4%	45.3%	27.3%	47.8%	33.3%	63.6%	45.3%

TABLE # 8
PARTS AND COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
GENERAL
TYPE OF MARKET IN 1995

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
TYPE OF MARKET 95: % SUBCONTRACTING								
Mean	43.57	50.35	49.82	49.50	42.04	66.71	74.40	49.82
Valid N	N=14	N=164	N=178	N=18	N=114	N=31	N=15	N=178
TYPE OF MARKET 95: % AFTER-MARKET								
Mean	48.57	42.43	42.92	35.78	49.95	29.91	25.60	42.92
Valid N	N=14	N=163	N=177	N=18	N=113	N=31	N=15	N=177
TYPE OF MARKET 95: % RECONDITIONING								
Mean	7.86	7.48	7.51	14.72	8.45	3.48	.00	7.51
Valid N	N=14	N=164	N=178	N=18	N=114	N=31	N=15	N=178

TABLE # 9
PARTS / COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
SUBCONTRACT. BUYERS

	Type of company					
	Engine Parts			Car Parts Components		
	SUBCONTRACT BUISNESSES: BUYER 1	SUBCONTRACT BUISNESSES: BUYER 2	SUBCONTRACT BUISNESSES: BUYER 3	SUBCONTRACT BUISNESSES: BUYER 1	SUBCONTRACT BUISNESSES: BUYER 2	SUBCONTRACT BUISNESSES: BUYER 3
A.T.T.						
Frequency					1	1
%					1.1%	1.4%
ABASTECEDORA ELECTRICO INDUSTRIAL						
Frequency						1
%						1.4%
ADO						
Frequency				1		
%				.9%		
AGUILA AZTECA						
Frequency				1		
%				.9%		
ALCATEL						
Frequency					1	1
%					1.1%	1.4%
ARNESES AUTOMOTRICES S.A.						
Frequency					1	
%					1.1%	
AUTO LINEAS MEXICANAS						
Frequency				1	1	
%				.9%	1.1%	
AUTOPOLIS MTY S.A. DE C.V.						
Frequency			1	1		
%			12.5%	.9%		
AXA YASAKI						
Frequency				1		1
%				.9%		1.4%
BASF MEXICANA						

(continued)

PARTS / COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
SUBCONTRACT. BUYERS

	Type of company					
	Engine Parts			Car Parts Components		
	SUBCONTRACT BUISNESSES: BUYER 1	SUBCONTRACT BUISNESSES: BUYER 2	SUBCONTRACT BUISNESSES: BUYER 3	SUBCONTRACT BUISNESSES: BUYER 1	SUBCONTRACT BUISNESSES: BUYER 2	SUBCONTRACT BUISNESSES: BUYER 3
Frequency					1	1
%					1.1%	1.4%
BLACK AND DECKER						
Frequency						1
%						1.4%
BOMBAS PICSA S.A. DE C.V.						
Frequency					1	1
%					1.1%	1.4%
BOSCH						
Frequency				1	1	1
%				.9%	1.1%	1.4%
BUNDY S.A. DE C.V.						
Frequency					1	
%					1.1%	
C.P. CLARE CORPORATION						
Frequency						1
%						1.4%
CAFER						
Frequency				1	1	
%				.9%	1.1%	
CARROCERIAS TOLUCA						
Frequency				1	1	1
%				.9%	1.1%	1.4%
CASA LEY						
Frequency		3		1	5	10
%		27.3%		.9%	5.6%	14.3%
CASA SUMMER S.A.						
Frequency		1		1		
%		9.1%		.9%		

(continued)

PARTS / COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
SUBCONTRACT. BUYERS

	Type of company					
	Engine Parts			Car Parts Components		
	SUBCONTRACT BUISNESSES: BUYER 1	SUBCONTRACT BUISNESSES: BUYER 2	SUBCONTRACT BUISNESSES: BUYER 3	SUBCONTRACT BUISNESSES: BUYER 1	SUBCONTRACT BUISNESSES: BUYER 2	SUBCONTRACT BUISNESSES: BUYER 3
CENTRO CAMIONERO JIMENEZ AUTOMOTRIZ						
Frequency				1		
%				.9%		
CHRYSLER						
Frequency	4			9		1
%	33.3%			8.2%		1.4%
CONVERTIDORES BEKI S.A. DE C.V.						
Frequency						1
%						1.4%
DAEWOO						
Frequency				1	1	1
%				.9%	1.1%	1.4%
DINA						
Frequency				3		
%				2.7%		
DIRONA						
Frequency		1		1	5	
%		9.1%		.9%	5.6%	
DISTRIBUIDORA ELECTRICA S.A. DE C.V.						
Frequency					1	
%					1.1%	
DISTRIBUIDORES						
Frequency					1	
%					1.1%	
DYOCNT						
Frequency					1	
%					1.1%	
EATON EJES S.A.						

(continued)

PARTS / COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
SUBCONTRACT. BUYERS

	Type of company					
	Engine Parts			Car Parts Components		
	SUBCONTRACT BUISNESSES: BUYER 1	SUBCONTRACT BUISNESSES: BUYER 2	SUBCONTRACT BUISNESSES: BUYER 3	SUBCONTRACT BUISNESSES: BUYER 1	SUBCONTRACT BUISNESSES: BUYER 2	SUBCONTRACT BUISNESSES: BUYER 3
Frequency				1		1
%				.9%		1.4%
EJES TRACTIVOS						
Frequency			2	1		3
%			25.0%	.9%		4.3%
ELECTREY						
Frequency						1
%						1.4%
ELECTROLIGHTING S.A. DE C.V.						
Frequency			2			7
%			25.0%			10.0%
ELECTRONICA BISTRE						
Frequency					1	
%					1.1%	
ELECTRONICA CLARION S.A.						
Frequency					1	
%					1.1%	
ELECTRONICA NACIONAL DE MONTERREY						
Frequency					1	
%					1.1%	
ELECTRONICA PANTERA						
Frequency					4	1
%					4.5%	1.4%
ELEVADORES OTIS						
Frequency					1	1
%					1.1%	1.4%
FAMA						
Frequency		2			10	
%		18.2%			11.2%	

(continued)

PARTS / COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
SUBCONTRACT. BUYERS

	Type of company					
	Engine Parts			Car Parts Components		
	SUBCONTRACT BUISNESSES: BUYER 1	SUBCONTRACT BUISNESSES: BUYER 2	SUBCONTRACT BUISNESSES: BUYER 3	SUBCONTRACT BUISNESSES: BUYER 1	SUBCONTRACT BUISNESSES: BUYER 2	SUBCONTRACT BUISNESSES: BUYER 3
FORD						
Frequency	1			11		
%	8.3%			10.0%		
GAMA MATERIALES Y ACEROS						
Frequency				1		1
%				.9%		1.4%
GE EQUIPO DE CONTROL Y DISTRIBUCION S.A.						
Frequency						1
%						1.4%
GEDAS						
Frequency				1		
%				.9%		
GENERAL INSTRUMENTS						
Frequency					1	1
%					1.1%	1.4%
GENERAL MOTORS						
Frequency	2			6		1
%	16.7%			5.5%		1.4%
GROTE INDUSTRIES INC.						
Frequency				1		
%				.9%		
HARADA INDUSTRIES						
Frequency				1		
%				.9%		
HONDA						
Frequency				1	1	
%				.9%	1.1%	
IBM						
Frequency					1	2
%					1.1%	2.9%

(continued)

PARTS / COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
SUBCONTRACT. BUYERS

	Type of company					
	Engine Parts			Car Parts Components		
	SUBCONTRACT BUISNESSES: BUYER 1	SUBCONTRACT BUISNESSES: BUYER 2	SUBCONTRACT BUISNESSES: BUYER 3	SUBCONTRACT BUISNESSES: BUYER 1	SUBCONTRACT BUISNESSES: BUYER 2	SUBCONTRACT BUISNESSES: BUYER 3
INDUSTRIAS CONDOR						
Frequency						1
%						1.4%
INDUSTRIAS GORMEN						
Frequency				1		
%				.9%		
INDUSTRIAS SOLA BASIC						
Frequency				1		
%				.9%		
INMER SAW						
Frequency						1
%						1.4%
INTEL						
Frequency						3
%						4.3%
KEIPER DE MEXICO S.A. DE C.V.						
Frequency				1	1	3
%				.9%	1.1%	4.3%
KENMORE						
Frequency					1	
%					1.1%	
KENWORTH MEXICANA						
Frequency				1	1	1
%				.9%	1.1%	1.4%
LAZER						
Frequency					4	
%					4.5%	
LIVERPOOL						
Frequency					1	
%					1.1%	

(continued)

PARTS / COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
SUBCONTRACT. BUYERS

	Type of company					
	Engine Parts			Car Parts Components		
	SUBCONTRACT BUISNESSES: BUYER 1	SUBCONTRACT BUISNESSES: BUYER 2	SUBCONTRACT BUISNESSES: BUYER 3	SUBCONTRACT BUISNESSES: BUYER 1	SUBCONTRACT BUISNESSES: BUYER 2	SUBCONTRACT BUISNESSES: BUYER 3
LTF						
Frequency					1	1
%					1.1%	1.4%
MERCEDES BENZ						
Frequency				5	1	1
%				4.5%	1.1%	1.4%
MEXICANA DE AUTOBUSES S.A.						
Frequency					1	4
%					1.1%	5.7%
MIDWEST CO. ENTERP.						
Frequency						1
%						1.4%
MOLDECO, S.A. DE C.V.						
Frequency		2			12	1
%		18.2%			13.5%	1.4%
MOLEX						
Frequency					1	
%					1.1%	
MOTORES PERKINS S.A.						
Frequency			1	1		
%			12.5%	.9%		
MPS						
Frequency					1	
%					1.1%	
MUELLES Y SUSPENSIONES FABIAN						
Frequency				1		
%				.9%		
N.A.						
Frequency				1		

PARTS/COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH COSTUMERS
SUBCONTRACT. BUYERS

	Type of company					
	Engine Parts			Car Parts Components		
	SUBCONTRACT BUISNESSES: BUYER 1	SUBCONTRACT BUISNESSES: BUYER 2	SUBCONTRACT BUISNESSES: BUYER 3	SUBCONTRACT BUISNESSES: BUYER 1	SUBCONTRACT BUISNESSES: BUYER 2	SUBCONTRACT BUISNESSES: BUYER 3
%				.9%		
N.A. (CONFIDENTIAL)						
Frecuency					1	1
%					1.1%	1.4%
NISSAN						
Frecuency	1			6	1	
%	8.3%			5.5%	1.1%	
NISSAN MEXICO, S.A. DE C.V.						
Frecuency				1		
%				.9%		
NOT AVAILABLE						
Frecuency				1		
%				.9%		
PHILLIPS, S.A. DE C.V.						
Frecuency				1		
%				.9%		
PLASTICOS IMPILA						
Frecuency					1	
%					1.1%	
POLICENTRO, S.A.						
Frecuency				1		
%				.9%		
PRIDA, S.A. DE C.V.						
Frecuency					1	1
%					1.1%	1.4%
RADIADORES INDUSTRIALES S.A.						
Frecuency				1	1	
%				.9%	1.1%	

(continued)

PARTS / COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
SUBCONTRACT. BUYERS

	Type of company					
	Engine Parts			Car Parts Components		
	SUBCONTRACT BUISNESSES: BUYER 1	SUBCONTRACT BUISNESSES: BUYER 2	SUBCONTRACT BUISNESSES: BUYER 3	SUBCONTRACT BUISNESSES: BUYER 1	SUBCONTRACT BUISNESSES: BUYER 2	SUBCONTRACT BUISNESSES: BUYER 3
RADIO PROGRAMAS DE MEXICO						
Frequency					1	1
%					1.1%	1.4%
REL-TEC						
Frequency						1
%						1.4%
ROBERT BOSCH						
Frequency					1	1
%					1.1%	1.4%
SABRITAS						
Frequency				1		1
%				.9%		1.4%
SCANIA DE MEXICO S.A. DE C.V.						
Frequency					1	
%					1.1%	
SELLO ROJO						
Frequency			1	1		4
%			12.5%	.9%		5.7%
SIGMER ALIMENTOS S.A. DE C.V.						
Frequency			1	1	1	
%			12.5%	.9%	1.1%	
SISTEMAS Y COMPUTADORES DE GESTION						
Frequency					1	
%					1.1%	
SUPER DIESSEL						
Frequency				1		
%				.9%		

(continued)

(continued)

PARTS / COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
SUBCONTRACT. BUYERS

	Type of company					
	Engine Parts			Car Parts Components		
	SUBCONTRACT BUISNESSES: BUYER 1	SUBCONTRACT BUISNESSES: BUYER 2	SUBCONTRACT BUISNESSES: BUYER 3	SUBCONTRACT BUISNESSES: BUYER 1	SUBCONTRACT BUISNESSES: BUYER 2	SUBCONTRACT BUISNESSES: BUYER 3
SUPERMATIC						
Frequency				1		
%				.9%		
TAKATA I NTERNATIONAL INC.						
Frequency				1	1	
%				.9%	1.1%	
TELMEX						
Frequency				1		
%				.9%		
TEMICO DE MEXICO						
Frequency					1	
%					1.1%	
TEMPERATURAS CONTROLADS ' S.A.						
Frequency					1	
%					1.1%	
TEXAS INSTRUMENTS						
Frequency					1	
%					1.1%	
THOMAS BUILT BUSSES						
Frequency				1		
%				.9%		
TRACTOCAMIONES ISSA DE LAGUNA						
Frequency		1		1	4	
%		9.1%		.9%	4.5%	
TRAILERS DE MONTERREY S.A. DE C.V.						
Frequency				1	1	
%				.9%	1.1%	

(continued)

PARTS / COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
SUBCONTRACT. BUYERS

	Type of company					
	Engine Parts			Car Parts Components		
	SUBCONTRACT BUISNESSES: BUYER 1	SUBCONTRACT BUISNESSES: BUYER 2	SUBCONTRACT BUISNESSES: BUYER 3	SUBCONTRACT BUISNESSES: BUYER 1	SUBCONTRACT BUISNESSES: BUYER 2	SUBCONTRACT BUISNESSES: BUYER 3
TRASFORMADORES LAMINADOS S.A.						
Frequency		1				
%		9.1%				
TRAVESA						
Frequency				1		
%				.9%		
TRAWS CAR S.A. DE C.V.						
Frequency				1		
%				.9%		
TREMOVIL DE MEXICO						
Frequency				1		
%				.9%		
VITRO						
Frequency				1		
%				.9%		
VOLKS WAGEN						
Frequency				1		
%				.9%		
VOLKSWAGEN						
Frequency				1		
%				.9%		
VOLKSWAGEN DE MEXICO						
Frequency	3			22		
%	25.0%			20.0%		
REF. ROGELIO						
Frequency	1					
%	8.3%					

TABLE # 10
PARTS AND COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
GENERAL

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
EXPAND SUBCONTRACT INTENTIONS								
NO INTEREST								
Freq.	1	18	19	1	13	4	1	19
col %.	7.1%	11.0%	10.7%	5.6%	11.4%	12.9%	6.7%	10.7%
SUFFICIENT SO FAR								
Freq.	1	6	7	1	4	2		7
col %.	7.1%	3.7%	3.9%	5.6%	3.5%	6.5%		3.9%
YES								
Freq.	12	140	152	16	97	25	14	152
col %.	85.7%	85.4%	85.4%	88.9%	85.1%	80.6%	93.3%	85.4%

TABLE # 11
PARTS AND COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
GENERAL
DIFICULTIES IN EXPANDING OR PENETRATING THE SUBCONTRACT. BUISNESS

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
DIFFICULTIES TO PENETRATING SUBCONT. (1)								
ASSEMBLY FACTORIES ARE NOT MANUFACTURING								
Freq.		1	1		1			1
col %.		.7%	.6%		1.0%			.6%
CASHFLOW								
Freq.		8	8	1	6	1		8
col %.		5.5%	5.0%	5.9%	5.9%	3.6%		5.0%
CONTRACT W/ POTENTIAL CUSTOMERS								
Freq.		1	1		1			1
col %.		.7%	.6%		1.0%			.6%
DEVELOPMENT COST								
Freq.	1		1				1	1
col %.	7.1%		.6%				7.1%	.6%
EXCLUSIVE CONTRACT WITH FORD								
Freq.		1	1			1		1
col %.		.7%	.6%			3.6%		.6%
EXCLUSIVITY CONTRACTS								
Freq.		1	1		1			1
col %.		.7%	.6%		1.0%			.6%
FEW GOVERNMENT FACILITIES								
Freq.		1	1			1		1
col %.		.7%	.6%			3.6%		.6%
FINANCIAL PROBLEM								
Freq.		1	1		1			1
col %.		.7%	.6%		1.0%			.6%
HIGH COST OF RAW MATERIALS								
Freq.		1	1		1			1

(continued)

PARTS AND COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
GENERAL
DIFICULTIES IN EXPANDING OR PENETRATING THE SUBCONTRACT. BUISNESS

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
col %.		.7%	.6%		1.0%			.6%
INSUFFICIENT PRODUCTION								
Freq.	4	12	16		10	6		16
col %.	28.6%	8.2%	10.0%		9.9%	21.4%		10.0%
LACK OF CAPABILITY IN SALES								
Freq.		3	3	1	1		1	3
col %.		2.1%	1.9%	5.9%	1.0%		7.1%	1.9%
LACK OF CAPITAL								
Freq.		2	2		2			2
col %.		1.4%	1.3%		2.0%			1.3%
LACK OF COMPANIES INFORMATION								
Freq.	5	52	57	10	37	6	4	57
col %.	35.7%	35.6%	35.6%	58.8%	36.6%	21.4%	28.6%	35.6%
LACK OF COMPETITIVENESS								
Freq.		6	6		4	1	1	6
col %.		4.1%	3.8%		4.0%	3.6%	7.1%	3.8%
LACK OF FINANCIAL CAPABILITY								
Freq.		1	1		1			1
col %.		.7%	.6%		1.0%			.6%
LACK OF MARKET INTETGRATION								
Freq.		1	1		1			1
col %.		.7%	.6%		1.0%			.6%
LOW PRICES								
Freq.		1	1				1	1
col %.		.7%	.6%				7.1%	.6%
LOW PURCHASING ABILITY								
Freq.		6	6	2	3	1		6
col %.		4.1%	3.8%	11.8%	3.0%	3.6%		3.8%

(continued)

col %.		4.1%	3.8%	11.8%	3.0%			

(continued)

PARTS AND COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
GENERAL
DIFICULTIES IN EXPANDING OR PENETRATING THE SUBCONTRACT. BUISNESS

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
MARKET IS NOT STANDARD								
Freq.		1	1		1			1
col %.		.7%	.6%		1.0%			.6%
MINIMUM GOVERNMENT SUPPORT								
Freq.		1	1		1			1
col %.		.7%	.6%		1.0%			.6%
NOT MARKET IN PUEBLA, NO MORE ASSEMBLY PLANTS								
Freq.		1	1			1		1
col %.		.7%	.6%			3.6%		.6%
PENETRATION IS NOT EASY								
Freq.	4	40	44	3	27	9	5	44
col %.	28.6%	27.4%	27.5%	17.6%	26.7%	32.1%	35.7%	27.5%
PROBLEMS IN THE AUTOMITIVE MARKET								
Freq.		1	1				1	1
col %.		.7%	.6%				7.1%	.6%
RAW MATERIALS TOO EXPENSIVE								
Freq.		1	1		1			1
col %.		.7%	.6%		1.0%			.6%
THERE ARE NO CREDITS								
Freq.		1	1			1		1
col %.		.7%	.6%			3.6%		.6%
TIME REQUIRED TO INTRODUCE IN THE AUTOMOTIVE IND.								
Freq.		1	1		1			1
col %.		.7%	.6%		1.0%			.6%
DIFFICULTIES TO PENETRATING SUBCONT. (2)								

(continued)

PARTS AND COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
GENERAL
DIFICULTIES IN EXPANDING OR PENETRATING THE SUBCONTRACT. BUISNESS

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
A LOT OF BUREAUCRACY IN THE LARGEST COMPANIES								
Freq.	1		1		1			1
col %.	11.1%		.9%		1.4%			.9%
AUTOMOTIVE INDUSTRY DOES NOT GIVE HIGH PROFITS								
Freq.		1	1				1	1
col %.		1.0%	.9%				12.5%	.9%
CASHFLOW								
Freq.	2	7	9	1	4	2	2	9
col %.	22.2%	6.9%	8.1%	7.7%	5.6%	11.1%	25.0%	8.1%
CONTRACT POTENTIAL CUSTOMERS								
Freq.	1	22	23	2	16	5		23
col %.	11.1%	21.6%	20.7%	15.4%	22.2%	27.8%		20.7%
DEPREDATORY ATTITUDE ON PRICE								
Freq.		1	1		1			1
col %.		1.0%	.9%		1.4%			.9%
EXCLUSIVENESS IS REQUESTED								
Freq.		1	1		1			1
col %.		1.0%	.9%		1.4%			.9%
FINANCIAL SUPPORT								
Freq.		1	1		1			1
col %.		1.0%	.9%		1.4%			.9%
GOVERNMENT BUREAUCRACY								
Freq.		1	1		1			1
col %.		1.0%	.9%		1.4%			.9%
HIGH COST OF DOMESTIC RAW MATERIALS								
Freq.		2	2			2		2
col %.		2.0%	1.8%			11.1%		1.8%

(continued)

col %.

(continued)

PARTS AND COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
GENERAL
DIFICULTIES IN EXPANDING OR PENETRATING THE SUBCONTRACT. BUISNESS

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
INSUFFICIENT MONEY FOR EXPANTION								
Freq.		1	1	1				1
col %.		1.0%	.9%	7.7%				.9%
INSUFFICIENT PRODUCTION								
Freq.		15	15	2	10	2	1	15
col %.		14.7%	13.5%	15.4%	13.9%	11.1%	12.5%	13.5%
LACK OF CAPABILITY IN SALES								
Freq.		8	8	2	4	2		8
col %.		7.8%	7.2%	15.4%	5.6%	11.1%		7.2%
LACK OF COMPETITIVENESS								
Freq.	1	8	9		7	1	1	9
col %.	11.1%	7.8%	8.1%		9.7%	5.6%	12.5%	8.1%
LACK OF FINANCIAL SOURCES								
Freq.		1	1		1			1
col %.		1.0%	.9%		1.4%			.9%
LITTLE INTEREST FROM COMPANIES								
Freq.		1	1				1	1
col %.		1.0%	.9%				12.5%	.9%
LOW PRODUCTION IN MEXICAN MARKET								
Freq.		1	1		1			1
col %.		1.0%	.9%		1.4%			.9%
LOW PURCHASING ABILITY								
Freq.	1	11	12	3	7	1	1	12
col %.	11.1%	10.8%	10.8%	23.1%	9.7%	5.6%	12.5%	10.8%
MONOPOLY								
Freq.		1	1		1			1
col %.		1.0%	.9%		1.4%			.9%

(continued)

PARTS AND COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
GENERAL
DIFICULTIES IN EXPANDING OR PENETRATING THE SUBCONTRACT. BUISNESS

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
NO INTEREST ON CLIENTS IN SUBCONTRACTING								
Freq.		1	1		1			1
col %.		1.0%	.9%		1.4%			.9%
PENETRATION IS NOT EASY								
Freq.	2	11	13	2	10		1	13
col %.	22.2%	10.8%	11.7%	15.4%	13.9%		12.5%	11.7%
PREFERENCE TO IMPORT								
Freq.		1	1		1			1
col %.		1.0%	.9%		1.4%			.9%
QS9000 ESTABLISHMENT								
Freq.		1	1			1		1
col %.		1.0%	.9%			5.6%		.9%
TECHNOLOGY								
Freq.	1		1			1		1
col %.	11.1%		.9%			5.6%		.9%
THAT SOME COMPANIES HAVE EXCLUSIVE CONTRACTS								
Freq.		1	1			1		1
col %.		1.0%	.9%			5.6%		.9%
THE ASSEMBLY COMPANIES ARE CLOSED TO NEW SUPPLIERS								
Freq.		1	1		1			1
col %.		1.0%	.9%		1.4%			.9%
THE ASSEMBLY COMPANIES ARE NOT INTERESTED								
Freq.		1	1		1			1
col %.		1.0%	.9%		1.4%			.9%
THE QUALITY CONTROLS ARE VERY EXPENSIVE								
Freq.		1	1		1			1
col %.		1.0%	.9%		1.4%			.9%

(continued)

PARTS AND COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
GENERAL
DIFICULTIES IN EXPANDING OR PENETRATING THE SUBCONTRACT. BUISNESS

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
TROUBLES WHITH THE MINISTRY OF FINANCE								
Freq.		1	1		1			1
col %.		1.0%	.9%		1.4%			.9%

TABLE # 12
PARTS AND COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
EXPORT

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
DESIRE TO BEGIN OR EXPAND DIRECT EXPORT								
NO								
Freq.	2	17	19	4	12	3		19
col %.	14.3%	10.4%	10.7%	22.2%	10.5%	9.7%		10.7%
YES								
Freq.	12	147	159	14	102	28	15	159
col %.	85.7%	89.6%	89.3%	77.8%	89.5%	90.3%	100.0%	89.3%

TABLE # 13
PARTS / COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS

	Type of company					
	Engine Parts			Car Parts Components		
	EXPORT DESTINATION COUNTRY 1	EXPORT DESTINATION COUNTRY 2	EXPORT DESTINATION COUNTRY 3	EXPORT DESTINATION COUNTRY 1	EXPORT DESTINATION COUNTRY 2	EXPORT DESTINATION COUNTRY 3
ALL THE WORLD						
Frequency						1
%						1.2%
AMERICA						
Frequency		2	1	1	8	
%		20.0%	16.7%	.7%	6.9%	
ANYONE						
Frequency		1				7
%		10.0%				8.4%
ARGENTINA						
Frequency				1	3	
%				.7%	2.6%	
AUSTRIA						
Frequency				1	7	3
%				.7%	6.0%	3.6%
BOLIVIA						
Frequency				1		2
%				.7%		2.4%
BRAZIL						
Frequency	3	3	1	10	24	12
%	25.0%	30.0%	16.7%	6.8%	20.7%	14.5%
CANADA						
Frequency				5	7	1
%				3.4%	6.0%	1.2%
CENTRAL AMERICA						
Frequency	1			4	6	1
%	8.3%			2.7%	5.2%	1.2%
CHILE						
Frequency				4	1	
%				2.7%	.9%	
COLOMBIA						

(continued)

PARTS / COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS

	Type of company					
	Engine Parts			Car Parts Components		
	EXPORT DESTINATION COUNTRY 1	EXPORT DESTINATION COUNTRY 2	EXPORT DESTINATION COUNTRY 3	EXPORT DESTINATION COUNTRY 1	EXPORT DESTINATION COUNTRY 2	EXPORT DESTINATION COUNTRY 3
Frequency	2			2	2	1
%	16.7%			1.4%	1.7%	1.2%
COSTA RICA						
Frequency			1	2	3	4
%			16.7%	1.4%	2.6%	4.8%
COSTARICA						
Frequency				1	2	1
%				.7%	1.7%	1.2%
CUBA						
Frequency		1		2	1	6
%		10.0%		1.4%	.9%	7.2%
ECUADOR						
Frequency					1	3
%					.9%	3.6%
EUROPE						
Frequency	1			2		
%	8.3%			1.4%		
FRANCE						
Frequency				2		
%				1.4%		
GERMANY						
Frequency			1	5		
%			16.7%	3.4%		
GUATEMALA						
Frequency				4	2	
%				2.7%	1.7%	
JAPAN						
Frequency				3	3	3
%				2.0%	2.6%	3.6%
NORTH AMERICA						
Frequency		1		1	6	7

(continued)

PARTS / COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS

	Type of company					
	Engine Parts			Car Parts Components		
	EXPORT DESTINATION COUNTRY 1	EXPORT DESTINATION COUNTRY 2	EXPORT DESTINATION COUNTRY 3	EXPORT DESTINATION COUNTRY 1	EXPORT DESTINATION COUNTRY 2	EXPORT DESTINATION COUNTRY 3
%		10.0%		.7%	5.2%	8.4%
PANAMA						
Frequency				1	6	2
%				.7%	5.2%	2.4%
PERU						
Frequency				1		2
%				.7%		2.4%
PUERTO RICO						
Frequency				1	2	1
%				.7%	1.7%	1.2%
RUMANY						
Frequency				1		2
%				.7%		2.4%
SALVADOR						
Frequency				2	1	
%				1.4%	.9%	
SOUTH AMERICA						
Frequency				3	1	1
%				2.0%	.9%	1.2%
SPAIN						
Frequency			1	1	1	3
%			16.7%	.7%	.9%	3.6%
SUDAN						
Frequency				1		
%				.7%		
TURQUIA						
Frequency				1	1	8
%				.7%	.9%	9.6%
USA						
Frequency	5			82	2	1
%	41.7%			55.8%	1.7%	1.2%

(continued)

PARTS / COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS

	Type of company					
	Engine Parts			Car Parts Components		
	EXPORT DESTINATION COUNTRY 1	EXPORT DESTINATION COUNTRY 2	EXPORT DESTINATION COUNTRY 3	EXPORT DESTINATION COUNTRY 1	EXPORT DESTINATION COUNTRY 2	EXPORT DESTINATION COUNTRY 3
VENEZUELA						
Frequency				2	5	1
%				1.4%	4.3%	1.2%
SOUTH AMERICA						
Frequency					5	6
%					4.3%	7.2%
SPAIN						
Frequency			1		2	4
%			16.7%		1.7%	4.8%
USA						
Frequency		1			9	
%		10.0%			7.8%	
VENEZUELA						
Frequency		1			5	
%		10.0%			4.3%	

TABLE # 14
PARTS AND COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
EXPORT

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
ANTICIPATED AMOUNT (% OF TOTAL SALES)								
Mean	53.21	50.04	50.29	46.67	46.61	59.77	63.00	50.29
Valid N	N=14	N=164	N=178	N=18	N=114	N=31	N=15	N=178

TABLE # 15
PARTS AND COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
EXPORT

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
DIFFICULTIES IN PROMOTION OF EXPORTATION								
DIFFIC.IN PROMOT.OF EXPORT. (MARKETIN)								
Cases	5	79	84	11	57	11	5	84
% row resp.	6.0%	94.0%	100.0%	13.1%	67.9%	13.1%	6.0%	100.0%
% col. resp.	38.5%	60.8%	58.7%	78.6%	59.4%	50.0%	45.5%	58.7%
DIFFIC.IN PROMOT.OF EXPORT. (PROCEDURES)								
Cases	5	43	48	4	35	6	3	48
% row resp.	10.4%	89.6%	100.0%	8.3%	72.9%	12.5%	6.3%	100.0%
% col. resp.	38.5%	33.1%	33.6%	28.6%	36.5%	27.3%	27.3%	33.6%
DIFFIC.IN PROMOT.OF EXPORT. (CONTRACT)								
Cases	4	30	34	3	23	7	1	34
% row resp.	11.8%	88.2%	100.0%	8.8%	67.6%	20.6%	2.9%	100.0%
% col. resp.	30.8%	23.1%	23.8%	21.4%	24.0%	31.8%	9.1%	23.8%
DIFFIC.IN PROMOT.OF EXPORT. (SEVERE REQUIR.)								
Cases	3	32	35	2	24	6	3	35
% row resp.	8.6%	91.4%	100.0%	5.7%	68.6%	17.1%	8.6%	100.0%
% col. resp.	23.1%	24.6%	24.5%	14.3%	25.0%	27.3%	27.3%	24.5%
DIFFIC.IN PROMOT.OF EXPORT. (INSUFF.PRODUCTION)								
Cases	2	23	25	2	17	4	2	25
% row resp.	8.0%	92.0%	100.0%	8.0%	68.0%	16.0%	8.0%	100.0%
% col. resp.	15.4%	17.7%	17.5%	14.3%	17.7%	18.2%	18.2%	17.5%
DIFFIC.IN PROMOT.OF EXPORT. (UNSTABLE ORDER)								
Cases	2	20	22	1	13	5	3	22
% row resp.	9.1%	90.9%	100.0%	4.5%	59.1%	22.7%	13.6%	100.0%
% col. resp.	15.4%	15.4%	15.4%	7.1%	13.5%	22.7%	27.3%	15.4%

(continued)

PARTS AND COMPONENTS SUPPLIER
MARKET AND LINKAGE WITH CUSTOMERS
EXPORT

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
DIFFIC.IN PROMOT.OF EXPORT.(FINANCIAL PROB.)								
Cases	3	62	65	7	46	9	3	65
% row resp.	4.6%	95.4%	100.0%	10.8%	70.8%	13.8%	4.6%	100.0%
% col. resp.	23.1%	47.7%	45.5%	50.0%	47.9%	40.9%	27.3%	45.5%
DIFFIC.IN PROMOT.OF EXPORT.(INTANGIBLE BARRIERS)								
Cases	3	12	15	2	8	4	1	15
% row resp.	20.0%	80.0%	100.0%	13.3%	53.3%	26.7%	6.7%	100.0%
% col. resp.	23.1%	9.2%	10.5%	14.3%	8.3%	18.2%	9.1%	10.5%
DIFFIC.IN PROMOT.OF EXPORT.(OTHERS)								
Cases								
% row resp.								
% col. resp.								

TABLE # 16
PARTS AND COMPONENTS SUPPLIER
TECHNOLOGY
OVERALL TECHNOLOGY

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
% OF DEFECT OR REJECT								
Mean	1.30	2.10	2.04	2.64	2.27	1.64	.39	2.04
Valid N	N=14	N=164	N=178	N=18	N=114	N=31	N=15	N=178

TABLE # 17
PARTS AND COMPONENTS SUPPLIER
TECHNOLOGY
OVERALL TECHNOLOGY

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
WEAKEST AREA IN TECHNOLOGY REGARDING THE ABOVE DEFECT RATE								
1. PRODUCTION FACILITIES								
Freq.	2	37	39	4	22	10	3	39
col %.	18.2%	29.6%	28.7%	36.4%	24.2%	43.5%	27.3%	28.7%
2. PRODUCTION TECHNOLOGY								
Freq.	6	37	43	5	27	7	4	43
col %.	54.5%	29.6%	31.6%	45.5%	29.7%	30.4%	36.4%	31.6%
3. QUALITY CONTROL EQUIPMENT								
Freq.	3	27	30	1	22	4	3	30
col %.	27.3%	21.6%	22.1%	9.1%	24.2%	17.4%	27.3%	22.1%
4. QUALITY CONTROL TECHNOLOGY								
Freq.		23	23	1	20	1	1	23
col %.		18.4%	16.9%	9.1%	22.0%	4.3%	9.1%	16.9%
QUALITY CONTROL IN GENERAL								
Freq.		1	1			1		1
col %.		.8%	.7%			4.3%		.7%

Freq.		1	1					
col %.		.8%	.7%			4.3%		.7%

TABLE # 18
PARTS AND COMPONENTS SUPPLIER
TECHNOLOGY
OVERALL TECHNOLOGY

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
INTERNATIONALS STANDARS IN USE								
INTERNATIONAL STANDARDS (ISO								
Freq.	5	55	60		37	16	7	60
col %.	71.4%	77.5%	76.9%		88.1%	80.0%	58.3%	76.9%
INTERNATIONAL STANDARDS (ISO 9000								
Freq.		1	1			1		1
col %.		1.4%	1.3%			5.0%		1.3%
INTERNATIONAL STANDARDS (ISO 9000)								
Freq.		1	1			1		1
col %.		1.4%	1.3%			5.0%		1.3%
INTERNATIONAL STANDARDS (ISO 9001								
Freq.		1	1			1		1
col %.		1.4%	1.3%			5.0%		1.3%
INTERNATIONAL STANDARDS (ISO 9002								
Freq.		1	1		1			1
col %.		1.4%	1.3%		2.4%			1.3%
INTERNATIONAL STANDARDS (ISO QC)								
Freq.	1	9	10	3	2	1	4	10
col %.	14.3%	12.7%	12.8%	75.0%	4.8%	5.0%	33.3%	12.8%
INTERNATIONAL STANDARDS (QC 9000)								
Freq.		1	1	1				1
col %.		1.4%	1.3%	25.0%				1.3%
INTERNATIONAL STANDARDS (QS-9000)								
Freq.	1	1	2		1		1	2
col %.	14.3%	1.4%	2.6%		2.4%		8.3%	2.6%

(continued)

PARTS AND COMPONENTS SUPPLIER
TECHNOLOGY
OVERALL TECHNOLOGY

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
INTERNATIONAL STANDARDS (QS9000)								
Freq.		1	1		1			1
col %.		1.4%	1.3%		2.4%			1.3%
FOREIGN STANDARS FEREIGN STANDARDS (GERMANY)								
Freq.		1	1			1		1
col %.		2.5%	2.3%			11.1%		2.3%
FOREIGN STANDARDS								
Freq.	2	7	9	1	6		2	9
col %.	66.7%	17.5%	20.9%	50.0%	25.0%		25.0%	20.9%
FOREIGN STANDARDS (ASME B18)								
Freq.		1	1		1			1
col %.		2.5%	2.3%		4.2%			2.3%
FOREIGN STANDARDS (ASTM)								
Freq.		1	1		1			1
col %.		2.5%	2.3%		4.2%			2.3%
FOREIGN STANDARDS (DIN, SAE)								
Freq.		1	1		1			1
col %.		2.5%	2.3%		4.2%			2.3%
FOREIGN STANDARDS (GERMANY)								
Freq.		2	2		2			2
col %.		5.0%	4.7%		8.3%			4.7%
FOREIGN STANDARDS (GERMANY: DIN)								
Freq.		2	2			1	1	2
col %.		5.0%	4.7%			11.1%	12.5%	4.7%
FOREIGN STANDARDS (JAPAN)								
Freq.		1	1			1		1
col %.		2.5%	2.3%			11.1%		2.3%

(continued)

Freq.		1	1			1		1
col %.		2.5%	2.3%			11.1%		2.3%

(continued)

PARTS AND COMPONENTS SUPPLIER
TECHNOLOGY
OVERALL TECHNOLOGY

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
FOREIGN STANDARDS (QS9000)								
Freq.		1	1			1		1
col %.		2.5%	2.3%			11.1%		2.3%
FOREIGN STANDARDS (SAE (ANSI))								
Freq.		1	1		1			1
col %.		2.5%	2.3%		4.2%			2.3%
FOREIGN STANDARDS (SAE, ANSI, IFI)								
Freq.		1	1		1			1
col %.		2.5%	2.3%		4.2%			2.3%
FOREIGN STANDARDS (UNITED KINDOM)								
Freq.	1		1			1		1
col %.	33.3%		2.3%			11.1%		2.3%
FOREIGN STANDARDS (USA)								
Freq.		12	12	1	6	2	3	12
col %.		30.0%	27.9%	50.0%	25.0%	22.2%	37.5%	27.9%
FOREIGN STANDARDS (USA, CANADA, AUSTRIA, GERMANY)								
Freq.		1	1			1		1
col %.		2.5%	2.3%			11.1%		2.3%
FOREIGN STANDARDS (USA, GERMANY)								
Freq.		1	1				1	1
col %.		2.5%	2.3%				12.5%	2.3%
FOREIGN STANDARDS (USA: DOT)								
Freq.		1	1		1			1
col %.		2.5%	2.3%		4.2%			2.3%
FOREIGN STANDARDS (USA: RMA)								
Freq.		1	1		1			1

(continued)

PARTS AND COMPONENTS SUPPLIER
TECHNOLOGY
OVERALL TECHNOLOGY

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
col %.		2.5%	2.3%		4.2%			2.3%
FOREIGN STANDARDS (USA: SAE)								
Freq.		1	1			1		1
col %.		2.5%	2.3%			11.1%		2.3%
FOREIGN STANDARDS (USA: SAE,DOT)								
Freq.		1	1		1			1
col %.		2.5%	2.3%		4.2%			2.3%
FOREIGN STANDARDS (USA:IFI, SAE)								
Freq.		1	1		1			1
col %.		2.5%	2.3%		4.2%			2.3%
FOREIGN STANDARDS (USA:SAE)								
Freq.		1	1		1			1
col %.		2.5%	2.3%		4.2%			2.3%
FOREIGN STANDARDS (USA:STM CANADA:CSA GERMANY:)								
Freq.		1	1				1	1
col %.		2.5%	2.3%				12.5%	2.3%
MEXICAN INDUSTRIAL STANDARS								
MEXICAN STANDARDS (NMX)								
Freq.	5	51	56	5	36	9	6	56
col %.	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
CUSTOMER'S STANDARS								
CUSTOMER´S STANDARDS								
Freq.	9	98	107	13	63	20	11	107
col %.	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
COMPANY'S STANDARS								
OWN COMPANY´S STANDARDS								
Freq.	8	98	106	10	69	19	8	106
col %.	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

(continued)

PARTS AND COMPONENTS SUPPLIER
TECHNOLOGY
OVERALL TECHNOLOGY

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
NONE								
NONE								
Freq.		2	2	1	1			2
col %.		100.0%	100.0%	100.0%	100.0%			100.0%
I.STANDARS: OTHERS AUTOMOTIVE INDUSTRY								
Freq.		1	1		1			1
col %.		16.7%	14.3%		16.7%			14.3%
EXPERT OF USA STANDARDS								
Freq.		1	1		1			1
col %.		16.7%	14.3%		16.7%			14.3%
GENERAL MOTORS, NISSAN								
Freq.		1	1		1			1
col %.		16.7%	14.3%		16.7%			14.3%
MANUAL OF EACH COMPANY								
Freq.		1	1			1		1
col %.		16.7%	14.3%			100.0%		14.3%
SPECIFICATION HANDBOOK								
Freq.	1		1		1			1
col %.	100.0%		14.3%		16.7%			14.3%
STANDARDS OF ASSEMBLIES								
Freq.		1	1		1			1
col %.		16.7%	14.3%		16.7%			14.3%
STATISTIC CONTROLS								
Freq.		1	1		1			1
col %.		16.7%	14.3%		16.7%			14.3%

TABLE # 19
PARTS AND COMPONENTS SUPPLIER
TECHNOLOGY
OVERALL TECHNOLOGY

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
FACTORY EQUIPMENT FOR QUALITY CONTROL EQUIPMENT FOR QUALITY CONTROL: DEP/DIVISION								
Cases	9	78	87	2	46	25	14	87
% row resp.	10.3%	89.7%	100.0%	2.3%	52.9%	28.7%	16.1%	100.0%
% col. resp.	64.3%	47.9%	49.2%	11.1%	40.7%	80.6%	93.3%	49.2%
EQUIPMENT FOR QUALITY CONTROL: FUL TIME INSPECT.								
Cases	9	79	88	2	52	26	8	88
% row resp.	10.2%	89.8%	100.0%	2.3%	59.1%	29.5%	9.1%	100.0%
% col. resp.	64.3%	48.5%	49.7%	11.1%	46.0%	83.9%	53.3%	49.7%
EQUIPMENT FOR QUALITY CONTROL: OPERATORS THEMSELVES								
Cases	10	121	131	16	80	24	11	131
% row resp.	7.6%	92.4%	100.0%	12.2%	61.1%	18.3%	8.4%	100.0%
% col. resp.	71.4%	74.2%	74.0%	88.9%	70.8%	77.4%	73.3%	74.0%
EQUIPMENT FOR QUALITY CONTROL: INSPECTION SYSTEM								
Cases	9	102	111	9	63	28	11	111
% row resp.	8.1%	91.9%	100.0%	8.1%	56.8%	25.2%	9.9%	100.0%
% col. resp.	64.3%	62.6%	62.7%	50.0%	55.8%	90.3%	73.3%	62.7%
EQUIPMENT FOR QUALITY CONTROL: INSP.BETWEEN PROCES.								
Cases	7	74	81	6	43	21	11	81
% row resp.	8.6%	91.4%	100.0%	7.4%	53.1%	25.9%	13.6%	100.0%
% col. resp.	50.0%	45.4%	45.8%	33.3%	38.1%	67.7%	73.3%	45.8%
EQUIPMENT FOR QUALITY CONTROL: QC CIRCULES								
Cases	3	42	45		20	17	8	45
% row resp.	6.7%	93.3%	100.0%		44.4%	37.8%	17.8%	100.0%
% col. resp.	21.4%	25.8%	25.4%		17.7%	54.8%	53.3%	25.4%

(continued)

PARTS AND COMPONENTS SUPPLIER
TECHNOLOGY
OVERALL TECHNOLOGY

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
EQUIPMENT FOR QUALITY CONTROL: PROP.SYSTEM								
Cases	5	65	70	3	38	19	10	70
% row resp.	7.1%	92.9%	100.0%	4.3%	54.3%	27.1%	14.3%	100.0%
% col. resp.	35.7%	39.9%	39.5%	16.7%	33.6%	61.3%	66.7%	39.5%

TABLE # 20
PARTS AND COMPONENTS SUPPLIER
MACHINERY AND EQUIPMENT

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
MODERNIZATION LEVEL								
MEDIUM LEVEL								
Freq.	8	99	107	12	67	21	7	107
col %.	57.1%	60.4%	60.1%	66.7%	58.8%	67.7%	46.7%	60.1%
MODERNIZED ENOUGH								
Freq.	5	45	50	3	34	6	7	50
col %.	35.7%	27.4%	28.1%	16.7%	29.8%	19.4%	46.7%	28.1%
STILL LOW								
Freq.	1	20	21	3	13	4	1	21
col %.	7.1%	12.2%	11.8%	16.7%	11.4%	12.9%	6.7%	11.8%
PODUCTION CAPACITY APPROPRIATE								
Freq.	4	69	73	7	47	10	9	73
col %.	28.6%	42.1%	41.0%	38.9%	41.2%	32.3%	60.0%	41.0%
OVER CAPACITY								
Freq.	8	72	80	9	51	15	5	80
col %.	57.1%	43.9%	44.9%	50.0%	44.7%	48.4%	33.3%	44.9%
SHORT CAPACITY								
Freq.	2	23	25	2	16	6	1	25
col %.	14.3%	14.0%	14.0%	11.1%	14.0%	19.4%	6.7%	14.0%
PLAN TO ACQUIRE NEW MACHINERY								
NO								
Freq.	4	69	73	5	52	13	3	73
col %.	28.6%	42.1%	41.0%	27.8%	45.6%	41.9%	20.0%	41.0%
YES								
Freq.	10	95	105	13	62	18	12	105
col %.	71.4%	57.9%	59.0%	72.2%	54.4%	58.1%	80.0%	59.0%

TABLE # 21
PARTS AND COMPONENTS SUPPLIER
MACHINERY AND EQUIPMENT

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
PROBLEMS WHEN BUY A NEW M&E (1)								
M&E IS TOO EXPENSIVE								
Freq.	1	5	6		5	1		6
col %.	7.7%	3.5%	3.8%		5.0%	3.8%		3.8%
AGREE WITH STACKHOLDERS								
Freq.		1	1				1	1
col %.		.7%	.6%				7.7%	.6%
DELIVERY IS NOT ON TIME								
Freq.		1	1		1			1
col %.		.7%	.6%		1.0%			.6%
DIFFICULTY TO GET FINANCING								
Freq.	6	80	86	7	57	15	7	86
col %.	46.2%	55.9%	55.1%	41.2%	57.0%	57.7%	53.8%	55.1%
HAVE NEW M&E BUT HAVE NOT INSTALLED IT								
Freq.		1	1	1				1
col %.		.7%	.6%	5.9%				.6%
HIGH INTEREST RATES								
Freq.	2	21	23	3	17	1	2	23
col %.	15.4%	14.7%	14.7%	17.6%	17.0%	3.8%	15.4%	14.7%
INSUFFICIENT INFORMATION								
Freq.	1	1	2		1	1		2
col %.	7.7%	.7%	1.3%		1.0%	3.8%		1.3%
INSUFFICIENT MARKET SIZE								
Freq.		16	16	3	10	3		16
col %.		11.2%	10.3%	17.6%	10.0%	11.5%		10.3%
LACK OF AFTER-SALES SERVICES								
Freq.	1	2	3		1	2		3
col %.	7.7%	1.4%	1.9%		1.0%	7.7%		1.9%
LACK OF CAPABILITY AND KNOWLEDGE								
Freq.		1	1		1			1

(continued)

PARTS AND COMPONENTS SUPPLIER
MACHINERY AND EQUIPMENT

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
col %.		.7%	.6%		1.0%			.6%
LIQUIDITY								
Freq.		1	1	1				1
col %.		.7%	.6%	5.9%				.6%
M&E IS TOO EXPENSIVE								
Freq.	1	7	8		5	2	1	8
col %.	7.7%	4.9%	5.1%		5.0%	7.7%	7.7%	5.1%
NOT QUICK SERVICES								
Freq.		1	1				1	1
col %.		.7%	.6%				7.7%	.6%
TAXES								
Freq.		1	1			1		1
col %.		.7%	.6%			3.8%		.6%
THE CORPORATION IS VERY SLOW								
Freq.		1	1		1			1
col %.		.7%	.6%		1.0%			.6%
THERE ARE ONLY NATIONAL SUPPLIERS FOR THE M&E REQ.								
Freq.	1		1				1	1
col %.	7.7%		.6%				7.7%	.6%
THEY MAKE THEIR OWN MACHINERY								
Freq.		1	1		1			1
col %.		.7%	.6%		1.0%			.6%
TOO EXPENSIVE M&E								
Freq.		2	2	2				2
col %.		1.4%	1.3%	11.8%				1.3%
PROBLEMS WHEN BUY A NEW M&E (2)								
DEVALUATION								
Freq.		1	1		1			1
col %.		1.0%	.9%		1.4%			.9%

(continued)

PARTS AND COMPONENTS SUPPLIER
MACHINERY AND EQUIPMENT

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
DIFFICULTY TO GET FINANCING								
Freq.		2	2		2			2
col %.		2.0%	1.9%		2.8%			1.9%
HIGH INTEREST RATES								
Freq.	2	64	66	5	44	12	5	66
col %.	28.6%	64.6%	62.3%	50.0%	61.1%	75.0%	62.5%	62.3%
INSUFFICIENT INFORMATION								
Freq.		4	4	1	3			4
col %.		4.0%	3.8%	10.0%	4.2%			3.8%
INSUFFICIENT MARKET SIZE								
Freq.	1	7	8	2	3		3	8
col %.	14.3%	7.1%	7.5%	20.0%	4.2%		37.5%	7.5%
IT ISN´T ABBLE TO BUY NEW MACHINES								
Freq.	1		1		1			1
col %.	14.3%		.9%		1.4%			.9%
LACK OF AFTER-SALES SERVICES								
Freq.	1	2	3		3			3
col %.	14.3%	2.0%	2.8%		4.2%			2.8%
LACK OF CAPABILITY AND KNOWLEDGE								
Freq.	1	4	5		2	3		5
col %.	14.3%	4.0%	4.7%		2.8%	18.8%		4.7%
THE MACHINERY DOES NOT EXIST IN MEXICO								
Freq.		1	1		1			1
col %.		1.0%	.9%		1.4%			.9%
THEY ARE IN A CHANGING PERIOD								
Freq.		1	1		1			1
col %.		1.0%	.9%		1.4%			.9%
TOO EXPENSIVE M&E								
Freq.		2	2	2				2

(continued)

PARTS AND COMPONENTS SUPPLIER
MACHINERY AND EQUIPMENT

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
col %.		2.0%	1.9%	20.0%				1.9%
TOO EXPENSIVE TO BUY M&E								
Freq.	1	11	12		11	1		12
col %.	14.3%	11.1%	11.3%		15.3%	6.3%		11.3%

TABLE # 22
PARTS AND COMPONENTS SUPPLIER
MACHINERY AND EQUIPMENT

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
INTEREST IN BUYING SECOND HAND M&E								
NO								
Freq.	8	53	61	6	35	12	8	61
col %.	57.1%	32.3%	34.3%	33.3%	30.7%	38.7%	53.3%	34.3%
YES								
Freq.	6	111	117	12	79	19	7	117
col %.	42.9%	67.7%	65.7%	66.7%	69.3%	61.3%	46.7%	65.7%

TABLE # 23
PARTS AND COMPONENTS SUPPLIER
TECHNOLOGY TRANSFER FROM OVERSEAS

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
TEC.ASSIS.FROM OVERSEAS COMPANIES (NOW)								
NO								
Freq.	5	89	94	14	66	10	4	94
col %.	35.7%	54.3%	52.8%	77.8%	57.9%	32.3%	26.7%	52.8%
YES								
Freq.	9	75	84	4	48	21	11	84
col %.	64.3%	45.7%	47.2%	22.2%	42.1%	67.7%	73.3%	47.2%
TEC.ASSIS.FROM OVERSEAS COMPANIES (FUT.)								
NO								
Freq.	8	107	115	14	79	16	6	115
col %.	57.1%	65.2%	64.6%	77.8%	69.3%	51.6%	40.0%	64.6%
YES								
Freq.	6	57	63	4	35	15	9	63
col %.	42.9%	34.8%	35.4%	22.2%	30.7%	48.4%	60.0%	35.4%

TABLE # 24
PARTS AND COMPONENTS SUPPLIER
TECHNOLOGY TRANSFER FROM OVERSEAS

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
MEANS BY RECIVE TECHNICAL ASSISTENCE (NOW1)								
ADVISORY AND SERVICES								
Freq.		1	1	1				1
col %.		1.4%	1.2%	33.3%				1.2%
ADVISORY SERVICES								
Freq.	1	10	11		5	3	3	11
col %.	12.5%	13.7%	13.6%		10.6%	15.0%	27.3%	13.6%
ALL ANSWER								
Freq.		1	1				1	1
col %.		1.4%	1.2%				9.1%	1.2%
IN-HOUSE CONSULTANT								
Freq.		3	3		2	1		3
col %.		4.1%	3.7%		4.3%	5.0%		3.7%
LICENSING								
Freq.	2	6	8		7		1	8
col %.	25.0%	8.2%	9.9%		14.9%		9.1%	9.9%
PERIODICAL CLINIC SERVICES								
Freq.		3	3		2	1		3
col %.		4.1%	3.7%		4.3%	5.0%		3.7%
SEMINAR								
Freq.	2	27	29	2	13	11	3	29
col %.	25.0%	37.0%	35.8%	66.7%	27.7%	55.0%	27.3%	35.8%
TECHNOLOGICAL INFORMATION								
Freq.		3	3		2	1		3
col %.		4.1%	3.7%		4.3%	5.0%		3.7%
TRAINING MEXICO								
Freq.	1	6	7		5	1	1	7
col %.	12.5%	8.2%	8.6%		10.6%	5.0%	9.1%	8.6%
TRAINING OVERSEAS								
Freq.	1	9	10		8	1	1	10
col %.	12.5%	12.3%	12.3%		17.0%	5.0%	9.1%	12.3%

(continued)

Freq.	1	9	10	8	1	1	10
col %.	12.5%	12.3%	12.3%	17.0%	5.0%	9.1%	12.3%

(continued)

PARTS AND COMPONENTS SUPPLIER
TECHNOLOGY TRANSFER FROM OVERSEAS

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
WORKSHOP								
Freq.	1	4	5		3	1	1	5
col %.	12.5%	5.5%	6.2%		6.4%	5.0%	9.1%	6.2%
MEANS BY RECIVE TECHNICAL ASSISTENCE (NOW2)								
ADVISORY SERVICES								
Freq.		3	3		1	1	1	3
col %.		5.8%	5.4%		3.0%	6.3%	20.0%	5.4%
EVENTUAL TECHNICAL CONSULTING								
Freq.	1		1		1			1
col %.	25.0%		1.8%		3.0%			1.8%
IN-HOUSE CONSULTANT								
Freq.		1	1		1			1
col %.		1.9%	1.8%		3.0%			1.8%
LABORATORIES FOR THE PLANS								
Freq.	1		1		1			1
col %.	25.0%		1.8%		3.0%			1.8%
LICENSING								
Freq.		6	6		2	4		6
col %.		11.5%	10.7%		6.1%	25.0%		10.7%
PERIODICAL CLINIC SERVICES								
Freq.		4	4		4			4
col %.		7.7%	7.1%		12.1%			7.1%
TECHNICAL ASSISTANCE FROM SUPPLIERS								
Freq.		1	1			1		1
col %.		1.9%	1.8%			6.3%		1.8%
TECHNOLOGICAL INFORMATION								
Freq.		5	5		5			5
col %.		9.6%	8.9%		15.2%			8.9%

(continued)

PARTS AND COMPONENTS SUPPLIER
TECHNOLOGY TRANSFER FROM OVERSEAS

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
TRAINING MEXICO								
Freq.		11	11	1	7	3		11
col %.		21.2%	19.6%	50.0%	21.2%	18.8%		19.6%
TRAINING OVERSEAS								
Freq.		7	7		2	3	2	7
col %.		13.5%	12.5%		6.1%	18.8%	40.0%	12.5%
VISITING USA COMPANIES								
Freq.		1	1		1			1
col %.		1.9%	1.8%		3.0%			1.8%
WORKSHOP								
Freq.	2	13	15	1	8	4	2	15
col %.	50.0%	25.0%	26.8%	50.0%	24.2%	25.0%	40.0%	26.8%
MEANS BY RECIVE TECHNICAL ASSISTENCE (FUT1)								
ADVISORY SERVICES								
Freq.	1	11	12	2	5	3	2	12
col %.	9.1%	9.1%	9.1%	15.4%	5.7%	14.3%	20.0%	9.1%
ADVISORY SERVICES FROM EXPERTS FROM MGM BREAKS								
Freq.		1	1		1			1
col %.		.8%	.8%		1.1%			.8%
ALL ANSWER								
Freq.		1	1				1	1
col %.		.8%	.8%				10.0%	.8%
LICENSING								
Freq.	1	9	10	2	6	1	1	10
col %.	9.1%	7.4%	7.6%	15.4%	6.8%	4.8%	10.0%	7.6%
M&E MANUFACTURES ASISTENCY								
Freq.		1	1		1			1
col %.		.8%	.8%		1.1%			.8%
PERIODICAL CLINIC SERVICES								

(continued)

PARTS AND COMPONENTS SUPPLIER
TECHNOLOGY TRANSFER FROM OVERSEAS

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
Freq.		3	3	1	2			3
col %.		2.5%	2.3%	7.7%	2.3%			2.3%
SEMINAR								
Freq.	5	44	49	4	32	10	3	49
col %.	45.5%	36.4%	37.1%	30.8%	36.4%	47.6%	30.0%	37.1%
TECHNOLOGICAL INFORMATION								
Freq.		9	9	1	8			9
col %.		7.4%	6.8%	7.7%	9.1%			6.8%
THEY ARE NOT INTERESTED								
Freq.		1	1			1		1
col %.		.8%	.8%			4.8%		.8%
TRAINING MEXICO								
Freq.		11	11		7	3	1	11
col %.		9.1%	8.3%		8.0%	14.3%	10.0%	8.3%
TRAINING OVERSEAS								
Freq.	2	10	12	1	10	1		12
col %.	18.2%	8.3%	9.1%	7.7%	11.4%	4.8%		9.1%
WORKSHOP								
Freq.	2	20	22	2	16	2	2	22
col %.	18.2%	16.5%	16.7%	15.4%	18.2%	9.5%	20.0%	16.7%
MEANS BY RECIVE TECHNICAL ASSISTENCE (FUT2)								
ADVISORY SERVICES								
Freq.		10	10	1	7	2		10
col %.		11.5%	10.8%	12.5%	10.9%	11.8%		10.8%
FREE ADVISORY SERVICES								
Freq.		1	1		1			1
col %.		1.1%	1.1%		1.6%			1.1%
IN-HOUSE CONSULTANT								
Freq.		1	1		1			1
col %.		1.1%	1.1%		1.6%			1.1%
INSTITUTION SUPPORT								

(continued)

PARTS AND COMPONENTS SUPPLIER
TECHNOLOGY TRANSFER FROM OVERSEAS

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
Freq.		1	1	1				1
col %.		1.1%	1.1%	12.5%				1.1%
JOINT-VENTURES								
Freq.		1	1		1			1
col %.		1.1%	1.1%		1.6%			1.1%
LABORATORIES FOR DRAWING PLANS								
Freq.	1		1		1			1
col %.	16.7%		1.1%		1.6%			1.1%
LICENSING								
Freq.		6	6	2	2	1	1	6
col %.		6.9%	6.5%	25.0%	3.1%	5.9%	25.0%	6.5%
PERIODICAL CLINIC SERVICES								
Freq.		5	5	1	3	1		5
col %.		5.7%	5.4%	12.5%	4.7%	5.9%		5.4%
TECHNOLOGICAL INFORMATION								
Freq.		9	9	1	8			9
col %.		10.3%	9.7%	12.5%	12.5%			9.7%
TECHNOLOGY								
Freq.		1	1	1				1
col %.		1.1%	1.1%	12.5%				1.1%
TRAINING MEXICO								
Freq.	3	22	25		20	5		25
col %.	50.0%	25.3%	26.9%		31.3%	29.4%		26.9%
TRAINING OVERSEAS								
Freq.		6	6	1	2	2	1	6
col %.		6.9%	6.5%	12.5%	3.1%	11.8%	25.0%	6.5%
WORKSHOP								
Freq.	2	24	26		18	6	2	26
col %.	33.3%	27.6%	28.0%		28.1%	35.3%	50.0%	28.0%

TABLE # 25
PARTS AND COMPONENTS SUPPLIER
TECHNOLOGY TRANSFER FROM OVERSEAS

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
A JOINT-VENTURE PARTNERS								
NO								
Freq.	13	124	137	14	82	27	14	137
col %.	92.9%	75.6%	77.0%	77.8%	71.9%	87.1%	93.3%	77.0%
YES								
Freq.	1	40	41	4	32	4	1	41
col %.	7.1%	24.4%	23.0%	22.2%	28.1%	12.9%	6.7%	23.0%

TABLE # 26
PARTS / COMPONENTS SUPLIER
TCHNOLOGY TRANSFER FROM OVERSEAS

	Type of company			
	Engine Parts		Car Parts Components	
	A JOINT-VENTURE PARTNERS COUNTRY	A JOINT-VENTURE PARTNERS PRODUCT	A JOINT-VENTURE PARTNERS COUNTRY	A JOINT-VENTURE PARTNERS PRODUCT
ANYONE				
Frequency			2	2
%			5.1%	5.1%
EUROPE				
Frequency		1	2	10
%		100.0%	5.1%	25.6%
FRANCE				
Frequency			1	
%			2.6%	
GERMANY				
Frequency			3	
%			7.7%	
ITALY				
Frequency			1	1
%			2.6%	2.6%
JAPAN				
Frequency			2	1
%			5.1%	2.6%
NORTH AMERICA				
Frequency				1
%				2.6%
SINGAPOUR				
Frequency				1
%				2.6%
TAIWAN				
Frequency				1
%				2.6%
USA				
Frequency	1		27	
%	100.0%		69.2%	

(continued)

PARTS / COMPONENTS SUPLIER
TCHNOLOGY TRANSFER FROM OVERSEAS

	Type of company			
	Engine Parts		Car Parts Components	
	A JOINT-VENTURE PARTNERS COUNTRY	A JOINT-VENTURE PARTNERS PRODUCT	A JOINT-VENTURE PARTNERS COUNTRY	A JOINT-VENTURE PARTNERS PRODUCT
%				2.6%
MOULD INJECTION				
Frequency				1
%				2.6%
MUFFLER SYSTEMS				
Frequency				1
%				2.6%
MUFFLERS				
Frequency				1
%				2.6%
PLASTIC				
Frequency				1
%				2.6%
RADIATORS				
Frequency				1
%				2.6%
SCREWS				
Frequency				1
%				2.6%
SPEAKERS				
Frequency				1
%				2.6%
SYSTEMS EXHAUSTS				
Frequency				1
%				2.6%
T MOLDINGS, EXTRUSION				
Frequency				1
%				2.6%
TELECOMMUNICATION				

(continued)

PARTS / COMPONENTS SUPLIER
TCHNOLOGY TRANSFER FROM OVERSEAS

	Type of company			
	Engine Parts		Car Parts Components	
	A JOINT-VENTURE PARTNERS COUNTRY	A JOINT-VENTURE PARTNERS PRODUCT	A JOINT-VENTURE PARTNERS COUNTRY	A JOINT-VENTURE PARTNERS PRODUCT
USA, JAPAN				
Frequency			1	
%			2.6%	
USA, KOREA, TAIWAN				
Frequency				1
%				2.6%
DELIVERY VANS				
Frequency				1
%				2.6%
ELECTRICAL AUTOMOBILES				
Frequency				1
%				2.6%
FILTERS				
Frequency				1
%				2.6%
GAS FILTERS				
Frequency				1
%				2.6%
GREATER METALIC PRINTING				
Frequency				1
%				2.6%
INJECTED PLASTIC COMPONENTS				
Frequency				1
%				2.6%
LEAF SPRINGS				
Frequency				2
%				5.1%
M&E				
Frequency				1

(continued)

PARTS / COMPONENTS SUPLIER
TCHNOLOGY TRANSFER FROM OVERSEAS

	Type of company			
	Engine Parts		Car Parts Components	
	A JOINT-VENTURE PARTNERS COUNTRY	A JOINT-VENTURE PARTNERS PRODUCT	A JOINT-VENTURE PARTNERS COUNTRY	A JOINT-VENTURE PARTNERS PRODUCT
Frequency				1
%				2.6%
TIRES				
Frequency				1
%				2.6%
TRANSMISSION HEAT SYSTEM				
Frequency				1
%				2.6%

TABLE # 27
PARTS / COMPONENTS SUPLIER
TCHNOLOGY TRANSFER FROM OVERSEAS

	Type of company					
	Engine Parts			Car Parts Components		
	TECHNICAL INSTITUTION NAME 1	TECHNICAL INSTITUTION NAME 2	TECHNICAL INSTITUTION NAME 3	TECHNICAL INSTITUTION NAME 1	TECHNICAL INSTITUTION NAME 2	TECHNICAL INSTITUTION NAME 3
ACEROS PLANOS						
Frequency					1	
%					2.2%	
AGI (ABRAHAM GALDRAT INSTITUTE)						
Frequency				1		1
%				1.1%		5.6%
ANCE						
Frequency				1	2	1
%				1.1%	4.3%	5.6%
ANIPAC						
Frequency				1	1	1
%				1.1%	2.2%	5.6%
APRO						
Frequency				1	1	
%				1.1%	2.2%	
ASOCIACION MEXICANA DEL PLASTICO						
Frequency				1	1	
%				1.1%	2.2%	
ATTACHMATE / WOLLONGONG						
Frequency					1	1
%					2.2%	5.6%
BANCO DE MEXICO						
Frequency				1	1	
%				1.1%	2.2%	
BANCOMEXT						
Frequency						1
%						5.6%
BGH						
Frequency				1	1	1
%				1.1%	2.2%	5.6%

(continued)

PARTS / COMPONENTS SUPLIER
TCHNOLOGY TRANSFER FROM OVERSEAS

	Type of company					
	Engine Parts			Car Parts Components		
	TECHNICAL INSTITUTION NAME 1	TECHNICAL INSTITUTION NAME 2	TECHNICAL INSTITUTION NAME 3	TECHNICAL INSTITUTION NAME 1	TECHNICAL INSTITUTION NAME 2	TECHNICAL INSTITUTION NAME 3
CAINTRA						
Frequency					1	1
%					2.2%	5.6%
CANACINTRA						
Frequency				3	1	1
%				3.4%	2.2%	5.6%
CANIECE						
Frequency					1	1
%					2.2%	5.6%
CFE						
Frequency					2	1
%					4.3%	5.6%
CIDESI						
Frequency				1	1	1
%				1.1%	2.2%	5.6%
CIMO						
Frequency				2		1
%				2.3%		5.6%
CINVESTA						
Frequency					1	1
%					2.2%	5.6%
CIVAC						
Frequency			1			
%			25.0%			
COMISION FEDERAL DE ELECTRICIDAD						
Frequency					1	1
%					2.2%	5.6%
COMPAÑIA HULERA GALGO						
Frequency			1	1		
%			25.0%	1.1%		

(continued)

PARTS / COMPONENTS SUPLIER
TCHNOLOGY TRANSFER FROM OVERSEAS

	Type of company					
	Engine Parts			Car Parts Components		
	TECHNICAL INSTITUTION NAME 1	TECHNICAL INSTITUTION NAME 2	TECHNICAL INSTITUTION NAME 3	TECHNICAL INSTITUTION NAME 1	TECHNICAL INSTITUTION NAME 2	TECHNICAL INSTITUTION NAME 3
CONACYT						
Frequency			1		1	
%			25.0%		2.2%	
CONALEP						
Frequency				2	2	1
%				2.3%	4.3%	5.6%
CONTRACT LICENSING WITH GERMAN COMPANY						
Frequency				1	1	
%				1.1%	2.2%	
COPARMEX						
Frequency					1	1
%					2.2%	5.6%
DURACION INDUSTRIES						
Frequency		1		1	1	1
%		25.0%		1.1%	2.2%	5.6%
ESIME						
Frequency						1
%						5.6%
GAME						
Frequency	1		1		2	
%	20.0%		25.0%		4.3%	
GENERAL ELECTRIC						
Frequency					1	
%					2.2%	
GONZALEZ VARGAS						
Frequency	1				1	
%	20.0%				2.2%	
I.E.E.N.						
Frequency				1	1	
%				1.1%	2.2%	

(continued)

PARTS / COMPONENTS SUPLIER
TCHNOLOGY TRANSFER FROM OVERSEAS

	Type of company					
	Engine Parts			Car Parts Components		
	TECHNICAL INSTITUTION NAME 1	TECHNICAL INSTITUTION NAME 2	TECHNICAL INSTITUTION NAME 3	TECHNICAL INSTITUTION NAME 1	TECHNICAL INSTITUTION NAME 2	TECHNICAL INSTITUTION NAME 3
ICAIS						
Frequency				1	1	
%				1.1%	2.2%	
ICAM						
Frequency				1		
%				1.1%		
IMEX PETROLEO						
Frequency				1	1	
%				1.1%	2.2%	
INFIA MEXICO						
Frequency				1		
%				1.1%		
INFOTEC						
Frequency		1		1		
%		25.0%		1.1%		
INFOTEL						
Frequency					1	
%					2.2%	
INSTITUTO DE INVESTIGACIONES ELECTRICAS						
Frequency				1	1	
%				1.1%	2.2%	
INSTITUTO MEXICANO DEL PETROLEO						
Frequency				1	3	
%				1.1%	6.5%	
INSTITUTO NACIONAL DE METEOROLOGIA						
Frequency				1	1	
%				1.1%	2.2%	

(continued)

PARTS / COMPONENTS SUPLIER
TCHNOLOGY TRANSFER FROM OVERSEAS

	Type of company					
	Engine Parts			Car Parts Components		
	TECHNICAL INSTITUTION NAME 1	TECHNICAL INSTITUTION NAME 2	TECHNICAL INSTITUTION NAME 3	TECHNICAL INSTITUTION NAME 1	TECHNICAL INSTITUTION NAME 2	TECHNICAL INSTITUTION NAME 3
INSTITUTO TECNOLOGICO DE GUADALAJARA						
Frequency		1		1		
%		25.0%		1.1%		
INSTITUTO TECNOLOGICO DE PUEBLA						
Frequency	1			1	1	
%	20.0%			1.1%	2.2%	
IPN						
Frequency		1		1	3	
%		25.0%		1.1%	6.5%	
ITESM						
Frequency	1			8	2	
%	20.0%			9.2%	4.3%	
ITESO						
Frequency					1	
%					2.2%	
KW-MANUFACTURING						
Frequency					1	
%					2.2%	
LAB. GREENING						
Frequency				1		
%				1.1%		
LAB. SIDERURGICA DE GUADALAJARA						
Frequency				1	1	
%				1.1%	2.2%	
LABORATORIO CFE (IRAPUATO)						
Frequency				1	1	
%				1.1%	2.2%	
LABORATORIO DE SECOFI						

(continued)

PARTS / COMPONENTS SUPLIER
TCHNOLOGY TRANSFER FROM OVERSEAS

	Type of company					
	Engine Parts			Car Parts Components		
	TECHNICAL INSTITUTION NAME 1	TECHNICAL INSTITUTION NAME 2	TECHNICAL INSTITUTION NAME 3	TECHNICAL INSTITUTION NAME 1	TECHNICAL INSTITUTION NAME 2	TECHNICAL INSTITUTION NAME 3
Frequency				1		
%				1.1%		
LABORATORIOS DE QUIMICA ORRA						
Frequency				1		
%				1.1%		
LABORATORIOS DEL EJERCITO Y LA ARMADA						
Frequency				1		
%				1.1%		
LABORATORIOS EXPERIMENTALES						
Frequency				1		
%				1.1%		
LABORATORIOS GONZALEZ VILCHIS						
Frequency				1		
%				1.1%		
LABORATORIOS IMP						
Frequency				1		
%				1.1%		
LANFI						
Frequency				1		
%				1.1%		
LINK LABORATORIES						
Frequency				1		
%				1.1%		
MITUTOYO						
Frequency				2		
%				2.3%		
NAFINSA						
Frequency				1		

(continued)

PARTS / COMPONENTS SUPLIER
TCHNOLOGY TRANSFER FROM OVERSEAS

	Type of company					
	Engine Parts			Car Parts Components		
	TECHNICAL INSTITUTION NAME 1	TECHNICAL INSTITUTION NAME 2	TECHNICAL INSTITUTION NAME 3	TECHNICAL INSTITUTION NAME 1	TECHNICAL INSTITUTION NAME 2	TECHNICAL INSTITUTION NAME 3
%				1.1%		
PEMEX						
Frequency	1					
%	20.0%					
PENN STATE						
Frequency				1		
%				1.1%		
PERRY JONHSON						
Frequency				1		
%				1.1%		
PRIVATE LABORATORIES						
Frequency				2		
%				2.3%		
PRIVATE LABS.						
Frequency				1		
%				1.1%		
SECOFI						
Frequency				1		
%				1.1%		
SIEMENS LABORATORIES						
Frequency				1		
%				1.1%		
STPS						
Frequency				1		
%				1.1%		
TEXTIL DETROIT						
Frequency				1		
%				1.1%		
U DE G.						
Frequency				5		
%				5.7%		

(continued)

PARTS / COMPONENTS SUPLIER
TCHNOLOGY TRANSFER FROM OVERSEAS

	Type of company					
	Engine Parts			Car Parts Components		
	TECHNICAL INSTITUTION NAME 1	TECHNICAL INSTITUTION NAME 2	TECHNICAL INSTITUTION NAME 3	TECHNICAL INSTITUTION NAME 1	TECHNICAL INSTITUTION NAME 2	TECHNICAL INSTITUTION NAME 3
U. DE G.						
Frequency				1		
%				1.1%		
UANL						
Frequency				5		
%				5.7%		
UIA						
Frequency				1		
%				1.1%		
UNAM						
Frequency				10		
%				11.5%		
UNIDAD DE TRANSFERENCIA DE TECNOLOGIA						
Frequency				1		
%				1.1%		
UNIVERSIDAD DE NUEVO LEON						
Frequency				1		
%				1.1%		
VITRO						
Frequency				1		
%				1.1%		
VOLKS WAGEN LABOATORIES						
Frequency				1		
%				1.1%		

TABLE # 28
PARTS AND COMPONENTS SUPPLIER
TECHNOLOGY TRANSFER FROM OVERSEAS

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
KIND OF PROBLEMS WITH INSTITUTIONS 1 COMPLICATED PROCEDURES TO ASSISTANCE								
Freq.		7	7	1	6			7
col %.		14.3%	13.0%	33.3%	14.6%			13.0%
EXPENSIVE SERVICE CHARGES								
Freq.	3	6	9		7	1	1	9
col %.	60.0%	12.2%	16.7%		17.1%	14.3%	33.3%	16.7%
INSTITUTIONS FAR IN LOCATION								
Freq.		3	3		2	1		3
col %.		6.1%	5.6%		4.9%	14.3%		5.6%
LACK INFORMATION								
Freq.		6	6	1	5			6
col %.		12.2%	11.1%	33.3%	12.2%			11.1%
LACK OF EQUIPMENT FOR THE MEASUREMENTS								
Freq.	1		1		1			1
col %.	20.0%		1.9%		2.4%			1.9%
LACK OF INFORMATION								
Freq.		10	10		7	3		10
col %.		20.4%	18.5%		17.1%	42.9%		18.5%
LIMITED SERVICES								
Freq.		1	1				1	1
col %.		2.0%	1.9%				33.3%	1.9%
NONE								
Freq.		1	1			1		1
col %.		2.0%	1.9%			14.3%		1.9%
NOT QUICK SERVICES								
Freq.	1	10	11	1	8	1	1	11
col %.	20.0%	20.4%	20.4%	33.3%	19.5%	14.3%	33.3%	20.4%
OBSOLETE EQUIPMENT ANT TECHNOLOGIES								

(continued)

TECHNOLOGIES

(continued)

PARTS AND COMPONENTS SUPPLIER
TECHNOLOGY TRANSFER FROM OVERSEAS

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
Freq.		3	3		3			3
col %.		6.1%	5.6%		7.3%			5.6%
OFFICIAL JUDGEMENT IS NOT DEFINED WHIT CLARITY								
Freq.		1	1		1			1
col %.		2.0%	1.9%		2.4%			1.9%
THE INSTITUTION HAS NOT ENOUGH INFORMATION								
Freq.		1	1		1			1
col %.		2.0%	1.9%		2.4%			1.9%
KIND OF PROBLEMS WITH INSTITUTIONS 2 COMPLICATED PROCEDURES TO ASSISTANCE								
Freq.		2	2		2			2
col %.		7.4%	7.1%		9.1%			7.1%
EXPENSIVE SERVICE CHARGES								
Freq.		17	17	1	15	1		17
col %.		63.0%	60.7%	50.0%	68.2%	33.3%		60.7%
INSTITUTIONS FAR IN LOCATION								
Freq.		2	2		1		1	2
col %.		7.4%	7.1%		4.5%		100.0%	7.1%
NOT QUICK SERVICES								
Freq.		6	6	1	4	1		6
col %.		22.2%	21.4%	50.0%	18.2%	33.3%		21.4%
OBSOLETE EQUIPMENT ANT TECHNOLOGIES								
Freq.	1		1			1		1
col %.	100.0%		3.6%			33.3%		3.6%

TABLE # 29
PARTS AND COMPONENTS SUPPLIER
MANPOWER AND MANAGEMENT
EMPLOYEES

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
AVERAGE STAY OF WORKERS (YERAS)								
Mean	8.96	6.39	6.59	6.72	5.90	8.65	7.50	6.59
Valid N	N=14	N=164	N=178	N=18	N=114	N=31	N=15	N=178
AVERAGE AGE OF WORKERS (YEARS)								
Mean	29.21	28.31	28.38	30.17	28.22	27.87	28.47	28.38
Valid N	N=14	N=164	N=178	N=18	N=114	N=31	N=15	N=178

TABLE 30
PARTS AND COMPONENTS SUPPLIER
MANPOWER AND MANAGMENT
EMPLOYEES

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
PROBLEMS: MANPOWER RECRUTIMENT 1 ABSENTEEISM								
Freq.		1	1		1			1
col %.		.8%	.7%		1.1%			.7%
DIRTY JOB								
Freq.		1	1		1			1
col %.		.8%	.7%		1.1%			.7%
DISCIPLINE								
Freq.		13	13	2	9	2		13
col %.		10.2%	9.5%	16.7%	10.0%	8.3%		9.5%
GRADUATES WITH INSUFFICIENT PREPARATION								
Freq.		1	1		1			1
col %.		.8%	.7%		1.1%			.7%
JOB-HOPPING								
Freq.		14	14	2	9	2	1	14
col %.		10.9%	10.2%	16.7%	10.0%	8.3%	9.1%	10.2%
LABOR DISPUTE								
Freq.		3	3		1	1	1	3
col %.		2.3%	2.2%		1.1%	4.2%	9.1%	2.2%
LACK OF INITIATIVE FROM EMPLOYEES								
Freq.		1	1		1			1
col %.		.8%	.7%		1.1%			.7%
LACK OF KNOWLEDGE OF THE WORKERS								
Freq.		1	1		1			1
col %.		.8%	.7%		1.1%			.7%
NONE								
Freq.		1	1			1		1
col %.		.8%	.7%			4.2%		.7%
RECRUIT								

(continued)

PARTS AND COMPONENTS SUPPLIER
MANPOWER AND MANAGEMENT
EMPLOYEES

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
Freq.	4	47	51	3	34	10	4	51
col %.	44.4%	36.7%	37.2%	25.0%	37.8%	41.7%	36.4%	37.2%
RECRUIT & TRAINING								
Freq.		2	2		2			2
col %.		1.6%	1.5%		2.2%			1.5%
RECRUIT (MANPOWER)								
Freq.		1	1				1	1
col %.		.8%	.7%				9.1%	.7%
SALARIES AND WAGES								
Freq.		9	9		7	1	1	9
col %.		7.0%	6.6%		7.8%	4.2%	9.1%	6.6%
TRAINING								
Freq.	5	33	38	5	23	7	3	38
col %.	55.6%	25.8%	27.7%	41.7%	25.6%	29.2%	27.3%	27.7%
PROBLEMS: MANPOWER RECRUTIMENT 2								
ABSENTEEISM								
Freq.		1	1		1			1
col %.		1.4%	1.3%		2.0%			1.3%
DISCIPLINE								
Freq.	1	19	20	2	12	4	2	20
col %.	16.7%	27.1%	26.3%	28.6%	24.5%	30.8%	28.6%	26.3%
GEOGRAPHY FACTORY SITE								
Freq.		1	1		1			1
col %.		1.4%	1.3%		2.0%			1.3%
JOB-HOPPING								
Freq.	2	14	16	2	11	3		16
col %.	33.3%	20.0%	21.1%	28.6%	22.4%	23.1%		21.1%
LABOR DISPUTE								
Freq.		1	1		1			1
col %.		1.4%	1.3%		2.0%			1.3%
LACK OF TECHNICAL EXPERTS								

(continued)

LACK OF TECHNICAL EXPERTS

(continued)

PARTS AND COMPONENTS SUPPLIER
MANPOWER AND MANAGEMENT
EMPLOYEES

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
Freq.		1	1			1		1
col %.		1.4%	1.3%			7.7%		1.3%
SALARIES AND WAGES								
Freq.	2	16	18	2	13	1	2	18
col %.	33.3%	22.9%	23.7%	28.6%	26.5%	7.7%	28.6%	23.7%
TRAINING								
Freq.	1	17	18	1	10	4	3	18
col %.	16.7%	24.3%	23.7%	14.3%	20.4%	30.8%	42.9%	23.7%

TABLE # 31
PARTS AND COMPONENTS SUPPLIER
MANPOWER AND MANAGEMENT
EMPLOYEES

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
EMPLOYEES TRAINING								
TRAIN AND EDUCATE EMPLOYEES 1								
Cases	14	158	172	18	109	30	15	172
% row resp.	8.1%	91.9%	100.0%	10.5%	63.4%	17.4%	8.7%	100.0%
% col. resp.	100.0%	96.9%	97.2%	100.0%	96.5%	96.8%	100.0%	97.2%
TRAIN AND EDUCATE EMPLOYEES 2								
Cases	8	86	94	4	55	21	14	94
% row resp.	8.5%	91.5%	100.0%	4.3%	58.5%	22.3%	14.9%	100.0%
% col. resp.	57.1%	52.8%	53.1%	22.2%	48.7%	67.7%	93.3%	53.1%
TRAIN AND EDUCATE EMPLOYEES 3								
Cases	3	45	48	1	26	12	9	48
% row resp.	6.3%	93.8%	100.0%	2.1%	54.2%	25.0%	18.8%	100.0%
% col. resp.	21.4%	27.6%	27.1%	5.6%	23.0%	38.7%	60.0%	27.1%
TRAIN AND EDUCATE EMPLOYEES 4								
Cases	3	30	33	1	12	13	7	33
% row resp.	9.1%	90.9%	100.0%	3.0%	36.4%	39.4%	21.2%	100.0%
% col. resp.	21.4%	18.4%	18.6%	5.6%	10.6%	41.9%	46.7%	18.6%
TRAIN AND EDUCATE EMPLOYEES (OTERS)								
COURSES OF MOTIVATION								
Freq.		1	1			1		1
col %.		20.0%	16.7%			100.0%		16.7%
row %		100.0%	100.0%			100.0%		100.0%
INEA								
Freq.		1	1		1			1
col %.		20.0%	16.7%		33.3%			16.7%
row %		100.0%	100.0%		100.0%			100.0%
INTERNAL TRAINING WITH CONFERENCES								
Freq.	1		1				1	1
col %.	100.0%		16.7%				50.0%	16.7%
row %	100.0%		100.0%				100.0%	100.0%

(continued)

row %	100.0%	100.0%				100.0%	100.0%

(continued)

PARTS AND COMPONENTS SUPPLIER
MANPOWER AND MANAGEMENT
EMPLOYEES

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
PROGRAMS OF PRIMARY SCHOOL IN AN OPEN SYSTEM								
Freq.		1	1				1	1
col %.		20.0%	16.7%				50.0%	16.7%
row %		100.0%	100.0%				100.0%	100.0%
TRAINING CENTERS FOR WORKERS								
Freq.		1	1		1			1
col %.		20.0%	16.7%		33.3%			16.7%
row %		100.0%	100.0%		100.0%			100.0%
TRAINING DOES'NT EXIST								
Freq.		1	1		1			1
col %.		20.0%	16.7%		33.3%			16.7%
row %		100.0%	100.0%		100.0%			100.0%

TABLE # 32
PARTS AND COMPONENTS SUPPLIER
MANPOWER AND MANAGEMENT
MANAGEMENT

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
BACKGROUND PREVIOUS JOB OF THE MANAGING DIRECTOR								
DISPATCH FROM A FOREIGN COMPANY								
Cases	1	16	17	1	11	3	2	17
% row resp.	5.9%	94.1%	100.0%	5.9%	64.7%	17.6%	11.8%	100.0%
% col. resp.	14.3%	16.5%	16.3%	10.0%	17.7%	15.0%	16.7%	16.3%
EMPLOYEE/MANANGEMENT/ PARTNER OF THIS COMPANY								
Cases		2	2		1	1		2
% row resp.		100.0%	100.0%		50.0%	50.0%		100.0%
% col. resp.		2.1%	1.9%		1.6%	5.0%		1.9%
SUCCESSOR TO YOUR FAMILIES OR RELATIVES								
Cases	1	26	27	6	19	1	1	27
% row resp.	3.7%	96.3%	100.0%	22.2%	70.4%	3.7%	3.7%	100.0%
% col. resp.	14.3%	26.8%	26.0%	60.0%	30.6%	5.0%	8.3%	26.0%
SPIN-OUT FROM A FOREIGN BASED COMPANY IN MEXICO								
Cases	3	18	21	2	10	7	2	21
% row resp.	14.3%	85.7%	100.0%	9.5%	47.6%	33.3%	9.5%	100.0%
% col. resp.	42.9%	18.6%	20.2%	20.0%	16.1%	35.0%	16.7%	20.2%
SPIN-OUT FROM A DOMESTIC COMPANY								
Cases	2	41	43	3	22	10	8	43
% row resp.	4.7%	95.3%	100.0%	7.0%	51.2%	23.3%	18.6%	100.0%
% col. resp.	28.6%	42.3%	41.3%	30.0%	35.5%	50.0%	66.7%	41.3%
SPIN-OUT FROM A GOVERNMENTAL OR PUBLIC INSTITUTION								
Cases		1	1		1			1
% row resp.		100.0%	100.0%		100.0%			100.0%
% col. resp.		1.0%	1.0%		1.6%			1.0%
OTHERS:								
PROMOTION WITHIN THE COMPANY								
Freq.		1	1		1			1
row %		100.0%	100.0%		100.0%			100.0%
col %.		100.0%	100.0%		100.0%			100.0%

Freq.	1	1		1				1
row %	100.0%	100.0%		100.0%				100.0%
col %.	100.0%	100.0%		100.0%				100.0%

TABLE # 33
PARTS AND COMPONENTS SUPPLIER
FINANCING

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
FINANCIAL SOURCES FOR WORKING CAPITAL								
FINAN.SOURCES FOR WORKING CAP.:STATE BANKS								
Cases	2	22	24	2	14	6	2	24
% row resp.	8.3%	91.7%	100.0%	8.3%	58.3%	25.0%	8.3%	100.0%
% col. resp.	25.0%	18.8%	19.2%	14.3%	16.5%	33.3%	25.0%	19.2%
FINAN.SOURCES FOR WORKING CAP.:COM.BANKS								
Cases	6	76	82	7	59	12	4	82
% row resp.	7.3%	92.7%	100.0%	8.5%	72.0%	14.6%	4.9%	100.0%
% col. resp.	75.0%	65.0%	65.6%	50.0%	69.4%	66.7%	50.0%	65.6%
FINAN.SOURCES FOR WORKING CAP.:NON.BANKS								
Cases	1	16	17	2	10	3	2	17
% row resp.	5.9%	94.1%	100.0%	11.8%	58.8%	17.6%	11.8%	100.0%
% col. resp.	12.5%	13.7%	13.6%	14.3%	11.8%	16.7%	25.0%	13.6%
FINAN.SOURCES FOR WORKING CAP.:SPEC.CRE.INST.								
Cases		5	5		5			5
% row resp.		100.0%	100.0%		100.0%			100.0%
% col. resp.		4.3%	4.0%		5.9%			4.0%
FINAN.SOURCES FOR WORKING CAP.:INFORMAL								
Cases	1	22	23	5	18			23
% row resp.	4.3%	95.7%	100.0%	21.7%	78.3%			100.0%
% col. resp.	12.5%	18.8%	18.4%	35.7%	21.2%			18.4%
FINAN.SOURCES FOR WORKING CAP.:OVERSEAS								
Cases	3	14	17	1	8	3	5	17
% row resp.	17.6%	82.4%	100.0%	5.9%	47.1%	17.6%	29.4%	100.0%
% col. resp.	37.5%	12.0%	13.6%	7.1%	9.4%	16.7%	62.5%	13.6%
FINAN.SOURCES FOR WORKING CAP.:OTHERS								

(continued)

PARTS AND COMPONENTS SUPPLIER
FINANCING

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
CLIENTS								
Freq.		1	1	1				1
row %		100.0%	100.0%	100.0%				100.0%
col %.		2.3%	2.1%	20.0%				2.1%
DEBT REORGANIZATION								
Freq.		1	1			1		1
row %		100.0%	100.0%			100.0%		100.0%
col %.		2.3%	2.1%			9.1%		2.1%
LOANS BETWEEN COMPANIES								
Freq.		1	1				1	1
row %		100.0%	100.0%				100.0%	100.0%
col %.		2.3%	2.1%				16.7%	2.1%
OTHER COMPANIES								
Freq.		1	1			1		1
row %		100.0%	100.0%			100.0%		100.0%
col %.		2.3%	2.1%			9.1%		2.1%
OWN CAPITAL								
Freq.	5	32	37	4	21	8	4	37
row %	13.5%	86.5%	100.0%	10.8%	56.8%	21.6%	10.8%	100.0%
col %.	100.0%	74.4%	77.1%	80.0%	80.8%	72.7%	66.7%	77.1%
PRIVATE SOURCES								
Freq.		1	1			1		1
row %		100.0%	100.0%			100.0%		100.0%
col %.		2.3%	2.1%			9.1%		2.1%
RELATED COMPANIES								
Freq.		1	1		1			1
row %		100.0%	100.0%		100.0%			100.0%
col %.		2.3%	2.1%		3.8%			2.1%
SELF - FINANCING								
Freq.		1	1		1			1
row %		100.0%	100.0%		100.0%			100.0%
col %.		2.3%	2.1%		3.8%			2.1%
SUPPLIER LOANS								
Freq.		1	1		1			1
row %		100.0%	100.0%		100.0%			100.0%
col %.		2.3%	2.1%		3.8%			2.1%

(continued)

col %.		2.3%	2.1%		3.8%		2.1%

(continued)

PARTS AND COMPONENTS SUPPLIER FINANCING

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
SUPPLIERS								
Freq.		1	1		1			1
row %		100.0%	100.0%		100.0%			100.0%
col %.		2.3%	2.1%		3.8%			2.1%
SUPPLIERS CREDIT								
Freq.		1	1				1	1
row %		100.0%	100.0%				100.0%	100.0%
col %.		2.3%	2.1%				16.7%	2.1%
SUPPLIERS FINANCING								
Freq.		1	1		1			1
row %		100.0%	100.0%		100.0%			100.0%
col %.		2.3%	2.1%		3.8%			2.1%

TABLE # 34
PARTS AND COMPONENTS SUPPLIER
FINANCING

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
FINANCIAL SOURCES FOR MACHINERY PURCHASE								
FINAN.SOURCES FOR MACHINERY: STATE BANKS								
Cases	3	30	33	2	19	9	3	33
% row resp.	9.1%	90.9%	100.0%	6.1%	57.6%	27.3%	9.1%	100.0%
% col. resp.	33.3%	25.2%	25.8%	16.7%	22.1%	47.4%	27.3%	25.8%
FINAN.SOURCES FOR MACHINERY: COM. BANKS								
Cases	6	66	72	7	52	8	5	72
% row resp.	8.3%	91.7%	100.0%	9.7%	72.2%	11.1%	6.9%	100.0%
% col. resp.	66.7%	55.5%	56.3%	58.3%	60.5%	42.1%	45.5%	56.3%
FINAN.SOURCES FOR MACHINERY: NON.BANKS								
Cases	1	13	14	1	8	3	2	14
% row resp.	7.1%	92.9%	100.0%	7.1%	57.1%	21.4%	14.3%	100.0%
% col. resp.	11.1%	10.9%	10.9%	8.3%	9.3%	15.8%	18.2%	10.9%
FINAN.SOURCES FOR MACHINERY: SPEC.CRE.INST.								
Cases		5	5		5			5
% row resp.		100.0%	100.0%		100.0%			100.0%
% col. resp.		4.2%	3.9%		5.8%			3.9%
FINAN.SOURCES FOR MACHINERY: INFORMAL								
Cases	1	17	18	4	14			18
% row resp.	5.6%	94.4%	100.0%	22.2%	77.8%			100.0%
% col. resp.	11.1%	14.3%	14.1%	33.3%	16.3%			14.1%
FINAN.SOURCES FOR MACHINERY: OVERSEAS								
Cases	5	22	27	1	14	4	8	27
% row resp.	18.5%	81.5%	100.0%	3.7%	51.9%	14.8%	29.6%	100.0%
% col. resp.	55.6%	18.5%	21.1%	8.3%	16.3%	21.1%	72.7%	21.1%
FINAN.SOURCES FOR MACHINERY: OTHERS								
CLIENTS								
Freq.		1	1	1				1

(continued)

Freq.		1	1	1				1

(continued)

PARTS AND COMPONENTS SUPPLIER
FINANCING

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
row %		100.0%	100.0%	100.0%				100.0%
col %.		2.4%	2.3%	12.5%				2.3%
EXIM BANKS								
Freq.		1	1		1			1
row %		100.0%	100.0%		100.0%			100.0%
col %.		2.4%	2.3%		4.2%			2.3%
FOREING GOVERNMENT								
Freq.		1	1		1			1
row %		100.0%	100.0%		100.0%			100.0%
col %.		2.4%	2.3%		4.2%			2.3%
LOANS BETWEEN COMPANIES								
Freq.		1	1				1	1
row %		100.0%	100.0%				100.0%	100.0%
col %.		2.4%	2.3%				33.3%	2.3%
OWN CAPITAL								
Freq.	3	32	35	6	19	8	2	35
row %	8.6%	91.4%	100.0%	17.1%	54.3%	22.9%	5.7%	100.0%
col %.	100.0%	78.0%	79.5%	75.0%	79.2%	88.9%	66.7%	79.5%
PRIVATE SOURCES								
Freq.		1	1			1		1
row %		100.0%	100.0%			100.0%		100.0%
col %.		2.4%	2.3%			11.1%		2.3%
SELF - FINANCING								
Freq.		1	1		1			1
row %		100.0%	100.0%		100.0%			100.0%
col %.		2.4%	2.3%		4.2%			2.3%
SUPPLIER LOANS								
Freq.		1	1		1			1
row %		100.0%	100.0%		100.0%			100.0%
col %.		2.4%	2.3%		4.2%			2.3%
SUPPLIERS								
Freq.		1	1	1				1
row %		100.0%	100.0%	100.0%				100.0%
col %.		2.4%	2.3%	12.5%				2.3%
SUPPLIERS FINANCING								

(continued)

PARTS AND COMPONENTS SUPPLIER
FINANCING

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
Freq.		1	1		1			1
row %		100.0%	100.0%		100.0%			100.0%
col %.		2.4%	2.3%		4.2%			2.3%

TABLE # 35
PARTS AND COMPONENTS SUPPLIER
FINANCING

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
NEED LOANS OR CREDITS								
NO								
Freq.	11	79	90	7	54	18	11	90
col %.	78.6%	48.2%	50.6%	38.9%	47.4%	58.1%	73.3%	50.6%
YES								
Freq.	3	85	88	11	60	13	4	88
col %.	21.4%	51.8%	49.4%	61.1%	52.6%	41.9%	26.7%	49.4%
CREDIT (MILLION PESOS)								
Mean	$1.69	$10.75	$10.03	$42.18	$2.75	$3.37	$40.60	$10.03
Valid N	N=14	N=164	N=178	N=18	N=114	N=31	N=15	N=178

TABLE # 36
PARTS AND COMPONENTS SUPPLIER
FINANCING

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
DIFICULT TO FACE IN BORROWING LOANS (1) COLLATERAL								
Freq.	3	42	45	5	29	8	3	45
col %.	30.0%	33.6%	33.3%	33.3%	31.9%	36.4%	42.9%	33.3%
COMPLICATED PROCEDURE								
Freq.	1	18	19		14	5		19
col %.	10.0%	14.4%	14.1%		15.4%	22.7%		14.1%
ECONOMICAL SITUATION OF THE MARKET								
Freq.		1	1	1				1
col %.		.8%	.7%	6.7%				.7%
FINANCIAL COSTS								
Freq.		1	1		1			1
col %.		.8%	.7%		1.1%			.7%
GUARANTEE SYSTEM								
Freq.		7	7	1	5	1		7
col %.		5.6%	5.2%	6.7%	5.5%	4.5%		5.2%
HIGH INTEREST RATES								
Freq.	5	9	14		11	2	1	14
col %.	50.0%	7.2%	10.4%		12.1%	9.1%	14.3%	10.4%
LIMIT OF THE LOAN								
Freq.		3	3		2		1	3
col %.		2.4%	2.2%		2.2%		14.3%	2.2%
NONE								
Freq.		1	1		1			1
col %.		.8%	.7%		1.1%			.7%
PASSIVE ATTITUDE								
Freq.		17	17	3	11	3		17
col %.		13.6%	12.6%	20.0%	12.1%	13.6%		12.6%
PROCEDURE								
Freq.		22	22	5	12	3	2	22
col %.		17.6%	16.3%	33.3%	13.2%	13.6%	28.6%	16.3%

(continued)

Freq.	22	22	5	12	3	2	22
col %.	17.6%	16.3%	33.3%	13.2%	13.6%	28.6%	16.3%

(continued)

PARTS AND COMPONENTS SUPPLIER FINANCING

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
THEY ARE NOT VIABLE FOR CREDITS								
Freq.	1		1		1			1
col %.	10.0%		.7%		1.1%			.7%
THEY HAVE NOT ASKED FOR THEM								
Freq.		1	1		1			1
col %.		.8%	.7%		1.1%			.7%
THEY HAVE NOT NEED CREDITS BEFORE								
Freq.		1	1		1			1
col %.		.8%	.7%		1.1%			.7%
THEY HAVE NOT USE THEM								
Freq.		1	1		1			1
col %.		.8%	.7%		1.1%			.7%
UNCAPABLE PERSONAL TO MANAGE THE CREDITS								
Freq.		1	1		1			1
col %.		.8%	.7%		1.1%			.7%
DIFICULT TO FACE IN BORROWING LOANS (2) COLLATERAL								
Freq.	1		1		1			1
col %.	25.0%		1.1%		1.7%			1.1%
COMPLICATED PROCEDURE								
Freq.	2	7	9	1	4	4		9
col %.	50.0%	8.2%	10.1%	9.1%	6.8%	25.0%		10.1%
CREDIT LOANS								
Freq.		1	1		1			1
col %.		1.2%	1.1%		1.7%			1.1%
GUARANTEE SYSTEM								
Freq.		8	8	1	5	1	1	8
col %.		9.4%	9.0%	9.1%	8.5%	6.3%	33.3%	9.0%
HIGH INTEREST RATES								
Freq.		15	15	1	11	2	1	15

(continued)

PARTS AND COMPONENTS SUPPLIER
FINANCING

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
col %.		17.6%	16.9%	9.1%	18.6%	12.5%	33.3%	16.9%
LACK OF CREDITS								
Freq.		1	1		1			1
col %.		1.2%	1.1%		1.7%			1.1%
LIMIT OF THE LOAN								
Freq.		4	4		4			4
col %.		4.7%	4.5%		6.8%			4.5%
PASSIVE ATTITUDE								
Freq.	1	43	44	6	29	9		44
col %.	25.0%	50.6%	49.4%	54.5%	49.2%	56.3%		49.4%
PROCEDURE								
Freq.		6	6	2	3		1	6
col %.		7.1%	6.7%	18.2%	5.1%		33.3%	6.7%

TABLE # 37
PARTS AND COMPONENTS SUPPLIER
OVERALL GRADING BY SERIOUSNESS

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
THE MOST URGENT FOR MODERNIZATION (1) CAPABILITIES OF MANPOWER								
Freq.	1	9	10		6	3	1	10
col %.	7.1%	5.5%	5.6%		5.3%	9.7%	6.7%	5.6%
COMPETITIVENESS BY INSTITUTIONAL CREDIT								
Freq.		1	1				1	1
col %.		.6%	.6%				6.7%	.6%
CONTROL TECHNOLOGY								
Freq.		11	11	1	5	4	1	11
col %.		6.7%	6.2%	5.6%	4.4%	12.9%	6.7%	6.2%
DIRECT EXPORT								
Freq.		31	31	5	21	3	2	31
col %.		18.9%	17.4%	27.8%	18.4%	9.7%	13.3%	17.4%
DOMESTIC SUPPLIERS PROMOTION								
Freq.		1	1			1		1
col %.		.6%	.6%			3.2%		.6%
EDUCATION								
Freq.		4	4	2	2			4
col %.		2.4%	2.2%	11.1%	1.8%			2.2%
FINANCIAL SUPPORT								
Freq.	5	39	44	3	29	9	3	44
col %.	35.7%	23.8%	24.7%	16.7%	25.4%	29.0%	20.0%	24.7%
GET THE CRISIS AWAY								
Freq.		1	1		1			1
col %.		.6%	.6%		.9%			.6%
GOVERNMENT								
Freq.		1	1		1			1
col %.		.6%	.6%		.9%			.6%
MATCH-MAKING								
Freq.	1	22	23	5	14	3	1	23
col %.	7.1%	13.4%	12.9%	27.8%	12.3%	9.7%	6.7%	12.9%

(continued)

PARTS AND COMPONENTS SUPPLIER
OVERALL GRADING BY SERIOUSNESS

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
MODERNIZATION								
Freq.	5	32	37	2	26	5	4	37
col %.	35.7%	19.5%	20.8%	11.1%	22.8%	16.1%	26.7%	20.8%
STRENGTHEN SUPPLY SERVICES IN MEXICO								
Freq.	1		1				1	1
col %.	7.1%		.6%				6.7%	.6%
STRENGTHENING								
Freq.		3	3		2		1	3
col %.		1.8%	1.7%		1.8%		6.7%	1.7%
TAXES								
Freq.		1	1			1		1
col %.		.6%	.6%			3.2%		.6%
TRANSFER								
Freq.		3	3		2	1		3
col %.		1.8%	1.7%		1.8%	3.2%		1.7%
TRANSFER AND MODERNIZATION OF PRODUCTION TECHNOLOGY								
Freq.	1	5	6		5	1		6
col %.	7.1%	3.0%	3.4%		4.4%	3.2%		3.4%
THE MOST URGENT FOR MODERNIZATION (2) CAPABILITIES OF MANPOWER								
Freq.	1	17	18	3	11	4		18
col %.	7.1%	10.4%	10.2%	16.7%	9.7%	12.9%		10.2%
CONTROL TECHNOLOGY								
Freq.	3	17	20	1	15	3	1	20
col %.	21.4%	10.4%	11.3%	5.6%	13.3%	9.7%	6.7%	11.3%
DIRECT EXPORT								
Freq.	3	28	31	2	20	4	5	31
col %.	21.4%	17.2%	17.5%	11.1%	17.7%	12.9%	33.3%	17.5%
EDUCATION								
Freq.		7	7		5	1	1	7
col %.		4.3%	4.0%		4.4%	3.2%	6.7%	4.0%

(continued)

col %.		4.3%	4.0%		4.4%	3.2%	6.7%	4.0%

(continued)

PARTS AND COMPONENTS SUPPLIER
OVERALL GRADING BY SERIOUSNESS

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
FINANCIAL SUPPORT								
Freq.		26	26	5	16	4	1	26
col %.		16.0%	14.7%	27.8%	14.2%	12.9%	6.7%	14.7%
FINANCIAL SUPPORT TO PAY TAXES								
Freq.	1		1		1			1
col %.	7.1%		.6%		.9%			.6%
MATCH-MAKING								
Freq.	3	15	18		15	3		18
col %.	21.4%	9.2%	10.2%		13.3%	9.7%		10.2%
MODERNIZATION								
Freq.	2	30	32	3	20	4	5	32
col %.	14.3%	18.4%	18.1%	16.7%	17.7%	12.9%	33.3%	18.1%
STRENGTHENING								
Freq.		2	2	1		1		2
col %.		1.2%	1.1%	5.6%		3.2%		1.1%
TRAINNING OF TECHNICAL EXPERTS								
Freq.		1	1			1		1
col %.		.6%	.6%			3.2%		.6%
TRAINNING TECHNICAL EXPERTS								
Freq.		1	1			1		1
col %.		.6%	.6%			3.2%		.6%
TRANSFER								
Freq.		13	13	2	5	5	1	13
col %.		8.0%	7.3%	11.1%	4.4%	16.1%	6.7%	7.3%
TRANSFER AND MODERNIZATION OF PRODUCTION TECHNOLOGY								
Freq.	1	6	7	1	5		1	7
col %.	7.1%	3.7%	4.0%	5.6%	4.4%		6.7%	4.0%

TABLE # 38
MAN POWER AND MANAGEMENT
EXPERTISE OF THE MD
BASE:RESPONSES

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
Expertise of MD								
EXPERTISE OF MD: TEC.PODUCTION								
Cases	10	115	125	13	78	27	7	125
% col. resp	50.0%	42.0%	42.5%	40.6%	41.9%	52.9%	28.0%	42.5%
EXPERTISE OF MD: SALES								
Cases	5	78	83	10	51	13	9	83
% col. resp	25.0%	28.5%	28.2%	31.3%	27.4%	25.5%	36.0%	28.2%
EXPERTISE OF MD: ADMINIST./ACCOUNTING								
Cases	5	73	78	8	52	11	7	78
% col. resp	25.0%	26.6%	26.5%	25.0%	28.0%	21.6%	28.0%	26.5%
EXPERTISE OF MD: LEGAL								
Cases		8	8	1	5		2	8
% col. resp		2.9%	2.7%	3.1%	2.7%		8.0%	2.7%
Total								
Cases	14	162	176	18	113	31	14	176
% col. resp	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

TABLE # 39
MAN POWER AND MANAGEMENT
EXPERTISE OF THE MD
BASE: RESPONSES

	Type of company		Total	SIZE OF ENTERPRISE				Total
	Engine Parts	Car Parts Components		MICRO	SMALL	MEDIUM	BIG	
Educational background of MD								
EDUC.BACK.OF THE MD: OVERSEAS UNIV./COLLEGE								
Cases	4	46	50	6	27	10	7	50
% col. resp	30.8%	26.9%	27.2%	28.6%	23.5%	31.3%	43.8%	27.2%
EDUC.BACK.OF THE MD: DOM.DIPLOMA OR ABOVE								
Cases	6	91	97	11	59	19	8	97
% col. resp	46.2%	53.2%	52.7%	52.4%	51.3%	59.4%	50.0%	52.7%
EDUC.BACK.OF THE MD: MEX.HIGH SCHOOL OR VOCATION.								
Cases	1	21	22	3	17	1	1	22
% col. resp	7.7%	12.3%	12.0%	14.3%	14.8%	3.1%	6.3%	12.0%
EDUC.BACK.OF THE MD: DOMEST.PRIMARY OR LOW.SECOND.SCHOOL								
Cases	2	13	15	1	12	2		15
% col. resp	15.4%	7.6%	8.2%	4.8%	10.4%	6.3%		8.2%
Total								
Cases	13	158	171	18	109	29	15	171
% col. resp	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

TABLE # 40
MAN POWER AND MANAGEMENT
EDUCATIONAL PROGRAM FOR ENTREPRENEUSHIP

	MD: DESIRE PARTICIP.IN AN EDUCAT.PROGRAM
Frequency	1
%	.6%
NO	
Frequency	31
%	17.4%
YES	
Frequency	146
%	82.0%

TABLE # 41
MAN POWER AND MANAGEMENT
LEAS OF MACHINERY AND EQUIPMENT

	ARE INTERESTED IN LEASING OF MACHINERY
NO	
Frequency	116
%	65.2%
YES	
Frequency	62
%	34.8%

APPENDIX IV
Clusters Groups

Table 1 Autoparts manufacturers clusters

TABLE 1
AUTOPARTS MANUFACTURERS CLUSTERS.

FIRM	PRODUCT	1995			1996		
		% DOMESTIC CAPITAL.	INVESTMENT	EMPLOYMENT	% DOMESTIC SHARE.	INVESTMENT	EMPLOYMENT
AMAYA GROUP.							
1.- ASIENTOS PARA AUTOBUSES AMAYA, S.A DE C.V.	BUS SEATS, RAIL ROAD SEATS AND UNDERGROUND SEATS.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
2.- ASIENTOS VEHICULARES ASTRÓN, S.A. DE C.V.	BUS SEATS, RAIL ROAD SEATS AND UNDERGROUND SEATS.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
BOCAR GROUP.							
3.- AUMA, S.A. DE C.V.	ALUMINUM FOUNDRY AND CARBURATOR PARTS.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
4.- BOCAR, S.A. DE C.V.	FUEL INJECTION SYSTEMS, CARBURATORS AND PUMPS (WATER, FUEL AND OIL), PUMP BODY, MELTING PARTS, LIQUID DEPOSITS AND AUTOMOBILE PLASTIC PARTS.	100.00	244,767	753	100.00	244,767	753
5.- KOSBA, S.A DE C.V.	PLASTIC PARTS FOR IGNITION.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
BODIES							
6.- ALUVAN MEXICANA, S.A. DE C.V.	ALUMINUM BODIES.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
7.- CARROCERIAS PRECONSTRUIDAS	BODIES.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
8.- CARROCERIAS TOLUCA, S.A.	BODIES	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
BOSCH GROUP.							
9.- AUTOMAGNETO, S.A DE C.V.	ELECTRICAL PARTS.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
10.- ROBERT BOSCH, S.A. DE C.V.	STARTER MOTORS, CRANKS, DUALS, WINDSHIELD WIPERS, RADIATOR COOLING UNITS, HEATERS, ALTERNATORS, IGNITION DISTRIBUTORS, AUTOMOBILE GENERATORS, VOLTAGE REGULATORS AND INTERNAL COMPUTERS.	3.80	287,803	1,952	0.00	15,866	136
CENTRAL DE INDUTRIAS, S.A. DE C.V.							
11.- HERMOSILLO PLANT.	COMPLETE SEATS FOR AUTOMOBILE.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
12.- TLAHUAC PLANT.		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
CONDUMEX GROUP.							
13.- ARCOMEX, S.A. DE C.V.	ELECTRIC HARNESSES AND AUTOMOBILE BATTERY CABLES.	100.00	55,252	1,550	100.00	87,468	1,190
14.- ARCLOS, S.A. DE C.V.	AUTOMOBILE HARNESSES.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
15.- CORNISA, S.A. DE C.V.	ENGINE SLEEVES.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
16.- ENSAMBLE ELECTRICO AUTOMOTRIZ DEL NORTE, SA DE CV	AUTOMOBILE HARNESSES.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
17.- GABRIEL DE MEXICO, S.A. DE C.V.	SHOCK ABSORBERS, AUTOMOBILE CARTRIDGE AND STRUTS.	60.00	114,110	458	60.00	3,310	81
18.- MACOPEL, S.A. DE C.V.	AUTOMOBILE ELECTRIC HARNESSES.	100.00	45,045	120	N.A.	N.A.	N.A.
19.- SEALED POWER MEXICANA, S.A. DE C.V.	AUTOMOBILE PISTONS RINGS.	100.00	288,330	642	100.00	61,161	175
20.- VEYCO, S.A. DE C.V.	PISTONS	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
ECHLIN AUTOMOTRIZ GROUP.							
21.- BALATAS AMERICAN BRAKEBLOCK, S.A. DE C.V.	DISC BRAKE PADS	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
22.- ECHLIN MEXICANA, S.A. DE C.V.	AUTOMOBILE IGNITION AND ELECTRIC COILS.	0.00	15,759	474	0.00	15,759	438
23.- FRENOS LUSAC, S.A. DE C.V.	BRAKE PARTS.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
24.- HAPSA S.A. DE C.V.	BRAKE PADS.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
25.- LUSAC COMPAÑIA, S.A. DE C.V.	BRAKE PARTS FOR TRUCKS.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
26.- PROAUSA	ELECTRICAL PARTS	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
FEDERAL MOGUL GROUP.							
27.- FEDERAL MOGUL, S.A. DE C.V.	MOTOR BALL BEARINGS.	39.00	1,338	364	39.00	336,306	395
28.- MANUFACTURAS METALICAS LINAN, S.A.	RATCHETS.	46.00	18,569	388	54.00	26,338	368
29.- RAIMSA, S.A. DE C.V	STEERING BOLTS, CUP AND BALLS, DIESTOCKS, PLANE SMALL COLLARS.	60.00	16,639	279	N.A.	N.A.	N.A.

TABLE 1
AUTOPARTS MANUFACTURERS CLUSTERS.

(CONTINUED).

FIRM	PRODUCT	1995			1996		
		% DOMESTIC CAPITAL.	INVESTMENT	EMPLOYMENT	% DOMESTIC SHARE.	INVESTMENT	EMPLOYMENT
I.C.A. GROUP							
30.- AUTOMANUFACTURAS, S A. C.V.	DISC AND DRUM BRAKES.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
31.- SACHS MEXICO.	CLUTCHS AND OIL PUMPS.	61.00	131,306	206	0.00	113,521	173
32.- TREMEC DE MEXICO, S.A. C.V	TRANSMISSION BOXES.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
INDEPENDENTS FIRMS.							
33.- A.P. DE MEXICO, S.A. DE C.V.	MUFFLERS.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
34.- ACUMULADORES MONTERREY S.A. DE C.V.	AUTOMOBILE BATTERIES.	100.00	107,323	350	100	227,526	362
35 - ARALMEX, S.A. DE C.V.	AUTOMOBILE SHOCK ABSORBERS AND STRUTS (HIDRAULYC AND GAS).	60.00	263,687	1,298	60.00	529,258	1,187
36.- BENDIX MEXICANA	BRAKE PARTS	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
37.- BUJIAS CHAMPION DE MEXICO, S.A. DE C.V.	SPARK PLUGS.	25.00	9,634	620	25.00	10,910	529
38.- CARPLASTIC, S.A.	DASHBOARDS, RADIATOR GRILLES, CONSOLES, DASHBOARD PROTECTORS, HEADLIGHTS AND BACKLIGHTS.	100.00	105,409	1,409	60.00	147,750	1,500
39.- CIFUNSA, S.A. DE C.V.	MOTOR HEADS, MONOBLOCKS, BEARING PLUGS, EXHAUST PIPE MULTIPLES AND INTAKE MULTIPLES.	100.00	1,081,795	4,150	100.00	1,835,554	3,852
40.- CLEVITE DE MEXICO, S.A. DE C.V.	AUTOMOBILE BALL BEARINGS, AXLE BOX AND SHEAVES.	100.00	44,205	370	100.00	48,357	376
41.- CUMMINS S.A. C.V.	DIESEL MOTORS.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
42.- DIRONA, S.A. C.V.	TRUCK AXLES.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
43.- EATON, S.A. C.V.	TRUCK AXLES.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
44 - GONHERMEX, S.A. DE C.V.	FILTERS.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
45 - HOESCH SUSPENSIONES AUTOMOTRICES, S.A. DE C.V.	STABILIZING AND TORSION LEVERS; ARMS, SUSPENSION BRACES AND AUTOMOBILE SPRINGS.	60.00	104,708	368	60.00	141,654	323
46.- KEIPER DE MEXICO, S.A. DE C.V.	AUTOMOBILE SEATS AND TOPS.	0.01	81,934	518	N.A.	N.A.	N.A.
47.- MACIMEX, S.A. DE C.V.	CRANKSHAFTS.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
48.- MOTORES PERKINS, S.A.	DIESEL MOTORS.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
49.- MUELLES IMEX, S.A. DE C.V.	AUTOMOBILE SPRINGS.	100.00	26,562	151	100.00	50,928	90
50.- URRESKO, S.A. DE C.V.	BRACES, TERMINALS AND AUTOMOBILE DIRECTION RODS.	100.00	4,600	153	N.A.	N.A.	N.A.
51.- VALEO TERMICO, S.A. DE C.V.	AUTOMOBILE COOLING UNITS, RADIATORS, CONDENSORS AND HEATERS.	1.00	88,112	410	0.05	46,010	341
INDUSTRIAL RAMIREZ GROUP.							
52.- INDUSTRIA AUTOMOTRIZ, S.A.	STAMPED, WHEELS, RIMS, AUTOMOBILE BUMPERS ASSEMBLIES.	100.00	1,028,843	1,290	66.85	1,504,316	889
53.- INDUSTRIAS METALICAS MONTERREY, S.A. DE C.V.	BODIES	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
54.- INDUSTRIAS VORTEC, S.A. DE C.V.	AXLES AND BRAKE SYSTEM FOR TRUCKS.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
55.- RUEDAS Y ESTAMPADOS, S.A. C.V. (RYESA)	STAMPINGS.	N.A.	N.A.	N.A.	N.A	N.A.	N.A.
INDUSTRIAL SUMMA GROUP.							
56.- AUTOASIENTOS, S.A DE C.V.	AUTOMOBILE SEATS.	99.99	41,764	533	50.00	53,609	460
57.- AUTOSEAT, S.A. DE C.V.	AUTOMOBILE SEATS AND VESTMENTS.	99.99	13,537	215	50.00	16,829	179
58 - EQUIPOS AUTOMOTRICES NACIONALES, S.A. DE C.V.	SEAT FRAMES, TOP LINKS AND AUTOMOBILE TRUNKS.	99.99	41,970	443	50.00	57,044	310
59.- INDUSTRIA AUTOMOTRIZ MEXICANA, S.A. DE C.V.	SEATS COVERS AND KIT COMPLETE SEATS SETS.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
60.- INTERIORES PARA AUTOS, S.A DE C.V.	DOORS PANELS, HEADLINERS AND AUTOMOBILE VISORS.	100.00	15,237	462	60.00	80,026	280
61.- LAPNER TRADING CO.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
62.- POLIURETANOS SW, S.A. DE C.V.	POLYURETHANE FOR: FRONT AND BACK SEATS, SEAT BACKS, ARM RESTS AND HEAD RESTS.	60.00	25,405	182	N.A.	N.A.	N.A.
63.- RESORTES MONTERREY DE MEXICO, S.A. DE C.V.	AUTOMOBILE SEATS AND APHOLSTRY.	99.99	6,838	183	50.00	15,933	365

TABLE 1
AUTOPARTS MANUFACTURERS CLUSTERS.

(CONTINUED)

FIRM	PRODUCT	1995			1996		
		% DOMESTIC CAPITAL.	INVESTMENT	EMPLOYMENT	% DOMESTIC SHARE.	INVESTMENT	EMPLOYMENT
INDUSTRIAL TELLERIA GROUP							
64.- AIRCOMEX, S.A. C.V	NEUMATIC TOOLS.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
65.- APPLIED POWER (MEXICO), S.A. DE C.V.	AUTOMOBILE JACKS (1.5 TO 5 TONS.)	0.00	7,426	133	0.00	13,892	208
66.- SILOS DE CAMIONES, S.A. DE C.V.	SPECIAL TANKS AND TRAILERS.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
MORESA GROUP.							
67.- COMPONENTES DE PRECISION, S.A. DE C.V.	MOTOR BOLTS. (FOR GAS AND DIESEL MOTORS)	100.00	51,946	112	N.A.	N.A.	N.A.
68.- FORJAS Y MAQUINAS, S.A. DE C.V.	AUTOMOBILE VALVES.	100.00	375,937	301	100.00	375,937	301
69.- INDUSTRIA ELECTRICA AUTOMOTRIZ, S.A. DE C.V.	ALTERNATORS, COILS, CONDENSORS, IGNITION DISTRIBUTORS AND REGULATORS.	100.00	1,659	282	100.00	2,840	315
70.- KELSEY HAYES DE CHIHUAHUA, S.A. DE C.V.	AUTOMOBILE ALUMINIUM RIMS.	100.00	3,011	230	100.00	3,011	177
71.- MORESA INDUSTRIAL, S.A. DE C.V.	MOTOR PISTONS (FOR GAS AND DIESEL MOTORS)	100.00	167,829	506	N.A.	N.A.	N.A.
72.- PRODUCTOS ESTAMPADOS DE MEXICO, S.A. DE C.V.	METALLIC STAMPED AND BOXES PICK-UP.	100.00	77,680	881	100.00	77,680	881
73.- RUEDAS DE ACERO K.H. DE MÉXICO, S.A. DE C.V.	STEEL WHEELS.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
74.- RUEDAS DE ALUMINIO K.H. DE MÉXICO, S.A. DE C.V.	ALUMINIUM WHEELS	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
75.- TF VICTOR, S.A DE C.V.	AUTOMOBILE JOINTS AND SEALS.	100.00	128,486	534	100.00	128,486	534
76.- TRANSMISIONES TSP, S.A. DE C.V.	TRANSMISSION, CLUTCHS AND AUTOMOBILE PARTS.	100.00	576,318	550	100.00	576,318	550
77.- VELCON, S.A. DE C.V.	ARROWS CONSTANT GEAR.	61.00	501,931	458	61.00	501,931	458
PROEZA GROUP.							
78.- KUPRA, S.A. DE C.V.	FUEL TANKS.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
79.- METALSA, S.A. DE C.V.	CHASSIS AND ITS PARTS, GAS TANK, MISCELLANEOUS (MOTOR PARTS AND LIGHT STAMP PARTS).	60.00	68,808	1,273	60.00	157,475	2,003
80.- PRECISION MECANICA NACIONAL, S.A. DE C.V.	GAS TANKS, BUMPERS, MOTOR PARTS, LIGHT STAMP PARTS AND AUTOMOBILE ORNAMENTS.	100.00	6,550	227	N.A.	N.A.	N.A.
81.- PREMECNA DEL CENTRO, S.A. DE C.V.	AUTOMOBILE STAMPED PARTS.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
SAN LUIS GROUP.							
82.- ASSINI, S.A. DE C.V.	AUTOMOBILE SPRINGS.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
SPICER GROUP.							
83.- AUTOMETALES, S.A. DE C.V.	AUTOMOBILE RATCHES.	100.00	3,617	305	100.00	130,028	261
84.- AUTOPRECISA, S.A. DE C.V.	PISTON RINGS.	N.A.	N.A.	N.A.	100.00	92,565	414
85.- BUJIAS MEXICANAS, S.A. DE C.V.	SPARK PLUGS.	60.00	85,107	252	60.00	85,107	252
86.- CARDANES, S.A. DE C.V.	UNIVERSAL JOINT ARROW AND COUPLING BRIDLES.	100.00	102,374	356	100.00	257,398	299
87.- EJES TRACTIVOS, S.A. DE C.V.	TRACTION AXLES.	100.00	274,400	490	100.00	274,400	490
88.- ENGRANES CONICOS, S.A. DE C.V.	CROWN WHEEL AND DRIVING PINION, PLANETARY GEAR, PLANET WHEEL AND BOLTS.	100.00	10,607	350	100.00	50,050	348
89.- FORJAS SPICER, S.A. DE C.V.	AUTOMOBILE FORGED PARTS.	100.00	336,306	395	N.A.	N.A.	N.A.
90.- FRENOS Y MECANISMOS, S.A. DE C.V.	BRAKES, BRAKES CABLES AND AXLE ASSEMBLY.	100.00	2,036	55	100.00	2,036	55

TABLE I
AUTOPARTS MANUFACTURERS CLUSTERS. (CONTINUED)

FIRM	PRODUCT	1995			1996		
		% DOMESTIC CAPITAL.	INVESTMENT	EMPLOYMENT	% DOMESTIC SHARE.	INVESTMENT	EMPLOYMENT
TEBO GROUP.							
91.- CELAYA FUNDIDORA S.A.	ALUMINIUM FOUNDRY	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
92.- CÍA. NAL. DE DIRECCIONES AUTOMOTRICES, S.A. C.V.	STEERING PARTS.	N.A.	N.A.	N.A.	60	11,695	213
93.- CORPORACIÓN MEXICANA DE REFACCIONES, S.A.	TRADING CO.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
94.- HIDRO ACERO, S.A.	CLUTCH AND WHEEL MASTER CYLINDER, BRAKE DISK CALIPERS AND GEARBOXES.	100.00	0	143	100.00	0	85
95.- INDUSTRIAL DE AUTOPARTES DE CELAYA, S.A.	PREFORMED BODYWORK JOINTS (DOOR SEALS).	100.00	0	136	100.00	0	117
96.- INDUSTRIAL DE AUTOPARTES, S.A. DE C.V.	BRAKE DISK CALIPERS.	100.00	0	61	100.00	0	74
97.- MOLDEADOS INDUSTRIALES, S.A.	RUBBER HOSES.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
98.- NACIONAL DE AUTOPARTES, S.A. DE C.V.	SUSPENSION ROUNED JOINT AND AUTOMOBILE DIRECTION RODS.	100.00	0	556	100.00	4,733	268
99.- TEBO, S.A. DE C.V.	BRAKE CABLES, MASTER BRAKE CYLINDER, WHEEL CYLINDER, POWER BRAKES AND DRUM BRAKES.	100.00	7,138	1,163	100.00	22,385	943
100.- TEBOTREN, S.A. C.V.	BRAKE CYLINDERS.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
VITRO GROUP.							
101.- CRISTALES INASTILLABLES DE MEXICO, S.A. DE C.V.	AUTOMOBILE ROLLED GLASS.	100.00	166,757	746	100.00	229,234	669
102.- VIDRIO PLANO DE MEXICO, S.A. DE C.V.	AUTOMOBILE GLASS AND CRYSTALS.	100.00	988,202	1,302	100.00	1,035,736	1,213
103.- VITRO FLEX, S.A. DE C.V.	ROLLED AND TEMPERED AUTOMOBILE SECURITY GLASS .	62.00	439,088	1,023	62.00	597,601	950

N.A.: NOT AVAILABLE.
SOURCE: SECOFI, DIRECCIÓN GENERAL DE LA INDUSTRIA AUTOMOTRIZ, 1996.

APPENDIX V
Data Base: Foreign investment information

Table 1 Balance and income statement of autoparts firms with foreign investment

Table 1. Balance and income statement of autoparts firms with foreign investment

	1988	1994	1995	1988	1994	1995
	(thousands of dollars)			(ratios)		
Parts and accesories for the electrical system						
Assets	187325.6	510559.3	235572.9	100.00	100.00	100.00
Liabilities	55486.2	247946.9	104346.6	29.62	48.56	44.29
Accounting capital	131839.4	262612.4	130906.7	70.38	51.44	55.57
Income	169662.0	523949.2	257843.5	100.00	100.00	100.00
Salaries	15302.4	32529.2	23208.1	9.02	6.21	9.00
Manufacturing costs	28785.1	153569.9	134091.6	16.97	29.31	52.01
Operating profits	6862.3	9443.1	9953.6	4.04	1.80	3.86
Car body parts and tow cars, fabrication & assembly						
Assets	N.A.	16070.2	9667.3	N.A.	100.00	100.00
Liabilities	N.A.	14085.6	11991.6	N.A.	87.65	124.04
Accounting capital	N.A.	1984.6	-2324.3	N.A.	12.35	-24.04
Income	N.A.	31836.3	1143.8	N.A.	100.00	100.00
Salaries	N.A.	93.6	34.3	N.A.	0.29	3.00
Manufacturing costs	N.A.	6835.6	491.8	N.A.	21.47	43.00
Operating profits	N.A.	0.0	0.0	N.A.	0.00	0.00
Motors and its parts						
Assets	740184.0	829972.7	619729.2	100.00	100.00	100.00
Liabilities	137126.0	309889.4	237030.7	18.53	37.34	38.25
Accounting capital	603058.0	520083.3	382903.0	81.47	62.66	61.79
L/Ac	0.2	0.6	0.6			
Income	400156.4	587170.6	301374.5	100.00	100.00	100.00
Salaries	15194.3	16284.3	9062.9	3.80	2.77	3.01
Manufacturing costs	46544.0	59220.1	79592.9	11.63	10.09	26.41
Operating profits	76524.9	23237.1	44882.6	19.12	3.96	14.89
Transmission system						
Assets	194391.2	309861.7	193070.3	100.00	100.00	100.00
Liabilities	54493.8	73353.9	48586.0	28.03	23.67	25.16
Accounting capital	139897.4	236507.7	144484.2	71.97	76.33	74.84
Income	182685.6	195499.9	74667.1	100.00	100.00	100.00
Salaries	7673.5	11920.5	4086.0	4.20	6.10	5.47
Manufacturing costs	44952.5	70695.7	23517.2	24.61	36.16	31.50
Operating profits	12206.4	10522.3	11037.7	6.68	5.38	14.78
Suspension systems						
Assets	69765.1	156881.0	92438.4	100.00	100.00	100.00
Liabilities	25671.1	72312.0	48474.5	36.80	46.09	52.44
Accounting capital	44094.0	84569.0	43963.9	63.20	53.91	47.56
Income	46037.6	134266.7	73444.0	100.00	100.00	100.00
Salaries	2579.1	10300.4	4162.2	5.60	7.67	5.67
Manufacturing costs	7329.7	28322.8	15738.7	15.92	21.09	21.43
Operating profits	4617.2	3181.6	2622.2	10.03	2.37	3.57
Break systems						
Assets	112486.4	216109.5	116965.3	100.00	100.00	100.00
Liabilities	45454.4	107398.2	41598.6	40.41	49.70	35.56
Accounting capital	67032.0	108711.2	75366.8	59.59	50.30	64.44
Income	64152.2	255170.3	72618.8	100.00	100.00	100.00
Salaries	4103.7	8977.8	3530.1	6.40	3.52	4.86
Manufacturing costs	24528.5	59283.6	22733.8	38.23	23.23	31.31
Operating profits	10094.4	5040.9	3584.2	15.74	1.98	4.94
Other parts and accesories						
Assets	647049.18	1694803.01	1357790.1	100.00	100.00	100.00
Liabilities	277113.42	1003030.02	795936.1	42.83	59.18	58.62
Accounting capital	369935.75	691773.00	557800.9	57.17	40.82	41.08
Income	543901.58	1034453.46	26766575.7	100.00	100.00	100.00
Salaries	40930.60	67141.03	244646.5	7.53	6.49	0.91
Manufacturing costs	111482.11	398133.36	2914392.1	20.50	38.49	10.89
Operating profits	54463.53	56130.07	102650.4	10.01	5.43	0.38

N.A. Not available data

Source: Secofi. Dirección General de Inversiones Extranjeras

APPENDIX VI
Autoparts firms quoted on the stock market

TABLE 1
AUTOPARTS FIRMS QUOTED ON THE STOCK MARKET

ISSUER	NAME
ACMEX	AC. MEXICANA, S.A. DE C.V.
DINA	CONSORCIO G. GRUPO DINA, S.A. DE C.V.
EATON	EATON MANUFACTURERA, S.A. DE C.V.
IASASA	INDUSTRIA AUTOMOTRIZ, S.A.
JDEERE	JOHN DEERE, S.A. DE C.V.
PERKINS	MOTORES PERKINS, S.A.
CODUMEX	GRUPO CODUMEX, S.A. DE C.V.
SANLUIS	CORPORACION INDUSTRIAL SAN LUIS, S.A. DE C.V.
VITRO	VITRO, S.A.
SUDISA	SUPER DIESEL, S.A.
TREMEC	TRANSMICIONES Y EQUIPOS MECANICOS, S.A. DE C.V.

Source: Bolsa Mexicana de Valores, "Anuario Financiero, 1994 y 1995".

TABLE 2. AUTOPARTS INDUSTRY. FINANCIAL DATA BY IUSSER 1994 (THOUSANDS OF US DOLLARS)

ITEM	ACMEX	DINA	EATON	IASASA	JDEERE	PERKINS	CODUMEX	SANLUIS	VITRO	SUDISA	TREMEC
BALANCE SHEET DATA											
TOTAL ASSETS	14,523.00	929,025.76	41,904.02	102,950.28	120,330.45	50,201.48	639,392.13	345,013.16	4,314,209.56	7,891.69	70,671.65
CURRENT ASSETS	2,616.42	509,840.76	15,305.00	16,762.41	76,108.16	21,344.96	294,261.20	103,535.77	951,021.02	4,237.81	20,695.44
LONG-TERM ASSETS	76.52	70,185.59	0.00	3,736.13	0.00	0.00	52,423.71	1,601.61	573,869.91	0.00	0.00
PROPERTY, PLANT AND EQUIPMENT	11,800.65	164,284.66	26,599.02	80,838.15	42,189.02	28,856.52	284,523.89	228,513.71	1,964,425.72	3,650.89	49,976.21
DEFERRED ASSETS	29.41	0.00	0.00	1,613.58	0.00	0.00	8,183.33	9,563.83	154,083.41	2.99	0.00
OTHER ASSETS		184,714.75	0.00	0.00	2,033.27	0.00	0.00	1,798.25	670,809.51	0.00	0.00
TOTAL LIABILITIES	14,892.33	698,511.44	4,203.19	40,434.76	12,664.76	52,539.42	320,066.50	260,325.14	2,664,998.54	5,377.30	21,100.56
CURRENTS LIABILITIES	14,892.33	185,706.53	4,203.19	22,753.18	11,358.44	26,202.23	158,163.76	162,908.84	705,978.75	4,615.99	13,367.12
LONG-TERM LIABILITIES		493,318.58	0.00	17,681.58	0.00	6,196.39	158,945.10	96,399.13	1,959,019.79	761.31	6,698.85
DEFERRED CREDITS		0.00	0.00	0.00	0.00	0.00	2,957.64	0.00	0.00	0.00	436.09
OTHER LIABILITIES		19,486.33	0.00	0.00	1,306.32	140.81	0.00	1,017.16	0.00	0.00	598.50
NET WORTH AND MINORITY EQUITY	-369.33	230,514.32	37,700.82	62,515.52	107,665.69	17,662.06	319,325.63	84,688.02	1,649,211.02	2,514.39	49,571.09
NET WORTH (A+B)	-369.33	221,501.48	37,700.82	62,515.52	107,665.69	17,662.06	259,347.67	60,718.96	1,456,477.69	2,514.39	49,571.09
PAID-IN-CAPITAL (A)	16,826.44	224,759.62	43,035.17	50,044.66	53,881.78	44,688.58	144,305.24	64,310.38	436,742.43	4,554.83	75,283.87
EARNED CAPITAL (B)	-17,195.77	-3,258.13	-5,334.35	12,470.86	53,783.91	-27,026.52	115,042.43	-3,591.42	1,019,735.26	-2,040.43	-25,712.78
INCOME STATEMENT											
NET SALES	4,075.79	488,410.82	35,117.19	47,390.24	106,569.93	36,335.94	537,134.32	113,643.45	2,880,675.71	7,514.42	50,517.06
COST OF SALES	3,100.02	398,552.02	34,121.38	37,047.01	90,991.64	32,779.92	394,715.43	85,785.35	2,187,353.65	5,977.23	39,160.45
OPERATING EXPENSES	900.03	86,342.47	2,819.57	6,669.44	7,523.79	4,275.42	59,567.63	14,668.10	464,786.62	1,394.04	5,827.58
OPERATING EARNINGS	75.74	3,516.33	-1,823.75	3,673.79	8,054.50	-719.40	82,851.26	13,190.00	228,535.44	143.15	5,529.04
EARNINGS BEFORE TAXES	-2,525.85	-105,562.79	-2,005.30	-4,489.76	8,467.81	-8,678.38	28,041.99	-32,230.46	-106,855.06	-821.43	861.90
NET EARNINGS	-3,741.07	-114,581.35	-3,025.97	-6,072.89	5,099.71	-9,258.01	-10,775.94	-54,678.61	-225,529.77	-920.34	264.44
CASH FLOW											
RESOURCES GENERATED BY THE OPERATION	-607.74	-95,601.13	-372.19	458.48	4,591.66	-2,691.25	-13,116.34	-39,551.38	183,774.51	-84.20	3,677.57
RESOURCES GENERATED BY FINANCING	1,785.75	327,648.34	0.00	4,171.96	-1,340.94	2,503.59	12,476.45	11,601.14	34,973.39	401.87	812.84
TOTAL CASH RESOURCES	56.35	246,692.67	-372.19	3,527.26	3,250.71	-187.66	-2,430.85	32,879.99	218,747.90	317.67	4,490.41
RESOURCES GENERATED UTILIZED TO INVESTMENT	-8.07	-275,687.01	-1,987.08	-2,826.20	-4,355.72	-483.98	-18,899.67	-37,171.94	-285,462.57	-103.33	-1,912.77
NET INCREASE (DECREASE) IN CASH AND TEMPORARY INVESTMENTS	48.28	-28,994.34	-2,359.27	701.05	-1,105.00	-671.64	-21,330.51	-4,291.95	-66,714.68	214.34	2,577.64
CLASSIFICATION OF SOME BALANCE SHEET AND EARNINGS ITEMS											
LIQUID CASH AND ASSETS	137.69	52,775.48	2,157.17	765.86	7,283.17	733.98	55,252.65	50,929.86	98,102.12	395.23	7,909.26
INVENTORY	1,140.27	257,055.03	8,399.36	7,651.33	57,567.02	9,915.86	98,133.48	21,574.78	516,404.26	1,329.88	6,933.75
SHORT-TERM FOREIGN EXCHANGE LIABILITIES	1,720.94	123,244.89	2,715.72	9,302.00	3,585.69	22,745.50	96,821.30	141,949.35	436,543.18	3,148.04	9,888.40
LONG-TERM FOREIGN EXCHANGE LIABILITIES	0.00	493,212.00	0.00	0.00	0.00	5,702.77	135,671.89	96,399.13	1,265,970.11	0.00	5,607.90
WORKS IN PROGRESS	0.00	2,840.91	0.00	0.00	799.18	90.58	11,800.65	68,507.33	76,976.70	0.00	0.00
WORKING CAPITAL	-12,275.91	324,134.22	11,101.80	-5,990.77	64,749.73	-4,857.27	136,097.44	-59,373.08	245,042.26	-378.18	7,328.33
DOMESTIC SALES	4,075.79	340,204.30	33,601.74	37,559.36	90,416.69	36,088.93	475,667.84	26,528.61	2,431,256.16	6,173.09	29,769.18
INTERNATIONAL SALES	0.00	148,206.51	1,515.46	9,830.88	16,153.24	247.00	61,466.48	87,114.84	449,419.55	1,341.33	20,747.89
INTEREST	-2,815.66	-11,979.45	561.28	-6,655.77	2,237.85	-1,392.87	-8,223.28	-7,662.39	-233,934.34	-391.72	-603.32
TOTAL FINANCIAL EXPENSE	2,453.62	77,015.22	181.54	8,685.40	-413.32	8,230.57	57,451.07	64,604.10	342,917.55	1,126.99	4,956.30
LOSS DUE TO CURRENCY EXCHANGE	417.74	71,123.49	339.14	3,619.14	1,310.62	7,659.01	54,098.20	60,830.36	197,048.05	836.40	4,835.66
EARNINGS FROM CASH ASSETS	-779.79	-6,087.72	403.69	-1,589.50	513.91	-821.30	-4,870.41	-3,888.65	-88,064.84	-101.12	-482.68
DATA PER SHARE											
NUMBER OF SHARES (THOUSANDS)	168,750	258,026	12,748	114,000	54,000	11,791	80,818	25,923	300,000	18,000	124,688
BOOK VALUE PER SHARE	0.0026	0.8589	2.9580	0.5479	1.9937	1.4979	3.2092	2.3425	4.8554	0.1392	0.3969
EARNING PER SHARE	-0.0221	-0.4438	-0.2369	-0.0534	0.0950	-0.7847	-0.1327	-2.1095	-0.0911	-0.0508	0.0026

* THESE FIRMS SUSPENDED TRADING IN 1995

Source: "Anuario Financiero". Bolsa Mexicana de Valores, 1994 and 1995; "Indicadores Financieros, 1996-III".

The Exchange Rate used is that of the close of 1995 (7.6841)

TABLE 3. AUTOPARTS INDUSTRY. FINANCIAL DATA BY ISSUER 1995 (THOUSANDS OF US DOLLARS)

ITEM	ACMEX	DINA	EATON	IASASA	JDEERE	PERKINS	CODUMEX	SANLUIS	VITRO	SUDISA	TREMEC
	95-95	95-95	95-95	95-95	95-95	95-95	95-95	95-95	95-95	95-95	95-95
BALANCE SHEET DATA											
TOTAL ASSETS	11,956.03	897,593.55	30,464.24	93,291.18	113,709.69	38,509.37	584,996.44	382,183.28	1,378,039.99	*	*
CURRENT ASSETS	1,676.18	388,666.49	10,733.77	19,229.44	71,641.70	12,657.73	260,063.04	142,628.15	971,244.32		
LONG-TERM ASSETS	39.43	61,963.34	0.00	1,287.32	0.00	0.00	57,674.39	1,463.53	573,021.80		
PROPERTY, PLANT AND EQUIPMENT	10,228.32	185,050.51	19,730.47	71,305.81	40,851.33	25,851.63	262,094.75	229,776.56	2,061,590.71		
DEFERRED ASSETS	12.10	0.00	0.00	1,468.61	0.00	0.00	5,164.26	8,315.03	135,981.88		
OTHER ASSETS		261,913.21	0.00	0.00	1,216.66	0.00	0.00	0.00	636,201.28		
TOTAL LIABILITIES	16,998.22	675,035.73	5,173.37	44,297.25	7,694.01	29,448.91	274,385.37	305,688.74	2,723,864.74		
CURRENTS LIABILITIES	3,078.80	116,214.19	5,173.37	24,216.58	6,852.41	11,729.07	189,531.94	200,878.66	838,077.45		
LONG-TERM LIABILITIES	13,919.42	534,823.72	0.00	20,080.67	0.00	17,452.40	83,719.41	95,480.23	1,885,787.29		
DEFERRED CREDITS		0.00	0.00	0.00	0.00	113.35	1,134.02	0.00	0.00		
OTHER LIABILITIES		23,997.82	0.00	0.00	841.60	154.08	0.00	9,329.85	0.00		
NET WORTH AND MINORITY EQUITY	-5,042.19	222,557.81	25,290.87	48,993.93	106,015.67	9,060.46	310,611.07	76,494.54	1,654,175.26		
NET WORTH (A+B)	-5,042.19	217,018.62	25,290.87	48,993.93	106,015.67	9,060.46	257,375.04	64,526.28	1,355,682.75		
PAID-IN-CAPITAL (A)	16,826.44	224,755.32	43,035.17	53,981.07	53,881.78	44,687.41	144,305.24	64,310.38	446,333.33		
EARNED CAPITAL (B)	-21,868.63	-7,736.70	-17,744.30	-4,987.14	52,133.90	-35,626.94	113,069.80	215.90	909,349.43		
INCOME STATEMENT											
NET SALES	2,468.20	540,055.53	11,413.35	26,419.82	92,752.67	8,354.20	549,256.15	178,725.02	2,846,898.02		
COST OF SALES	1,923.18	443,423.05	16,334.78	20,426.97	76,911.63	7,689.59	420,873.41	111,001.91	2,022,059.76		
OPERATING EXPENSES	776.14	92,734.71	1,962.87	4,284.66	8,382.31	4,130.06	41,722.08	23,718.80	468,624.13		
OPERATING EARNINGS	-231.12	3,897.76	-6,884.30	1,708.19	7,458.72	-3,465.44	86,660.65	44,004.31	356,214.13		
EARNINGS BEFORE TAXES	-2,858.48	-33,258.17	-7,414.48	-6,703.53	10,219.99	-6,151.62	66,350.94	22,424.58	84,889.74		
NET EARNINGS	-3,508.00	-51,961.46	-7,142.62	-8,092.37	6,588.36	-6,441.96	44,987.50	20,711.06	71,567.65		
CASH FLOW											
RESOURCES GENERATED BY THE OPERATION	-1,952.33	51,843.69	-236.07	-6,269.13	14,234.74	489.45	74,018.02	27,297.34	269,060.12		
RESOURCES GENERATED BY FINANCING	2,482.64	11,563.53	0.00	7,335.22	-1,118.80	219.80	-42,824.35	-42,587.76	27,352.52		
TOTAL CASH RESOURCES	-44.90	63,407.22	-236.07	129.10	13,115.95	709.25	30,458.13	53,105.38	296,412.64		
RESOURCES GENERATED UTILIZED TO INVESTMENT	-5.99	-82,251.97	-169.70	-363.21	-5,552.85	-1,212.63	-21,610.70	-20,014.43	-245,589.88		
NET INCREASE (DECREASE) IN CASH AND TEMPORARY INVESTMENTS	-50.88	-18,844.75	-405.77	-234.12	7,563.09	-503.37	8,847.43	33,090.95	50,822.76		
CLASSIFICATION OF SOME BALANCE SHEET AND EARNINGS ITEMS											
LIQUID CASH AND ASSETS	86.80	33,929.29	1,751.53	531.74	14,846.26	230.60	64,100.08	34,020.81	148,924.88		
INVENTORY	680.36	222,439.91	7,422.42	9,961.28	49,774.89	5,504.70	81,883.42	21,116.31	456,016.76		
SHORT-TERM FOREIGN EXCHANGE LIABILITIES	1,106.69	87,479.74	3,958.53	7,705.99	-2,016.75	5,299.87	117,112.53	183,034.28	566,661.05		
LONG-TERM FOREIGN EXCHANGE LIABILITIES	0.00	534,823.20	0.00	286.82	0.00	5,478.81	83,215.51	95,449.91	1,173,585.99		
WORKS IN PROGRESS	0.00	2,285.48	0.00	0.00	5,012.52	81.73	18,216.57	63,266.80	69,554.29		
WORKING CAPITAL	-1,402.63	272,452.30	5,560.40	-4,987.14	64,789.29	928.66	70,531.10	-58,250.51	133,166.87		
DOMESTIC SALES	2,468.20	540,055.53	6,177.65	13,437.65	58,163.58	8,140.39	371,343.44	32,298.67	2,318,679.06		
INTERNATIONAL SALES	0.00	0.00	5,235.71	12,982.17	34,589.09	213.82	177,912.70	146,426.36	528,218.96		
INTEREST	-7,463.80	-35,336.48	154.34	-15,654.42	5,837.34	-3,705.29	8,871.89	-17,458.00	-598,883.85		
TOTAL FINANCIAL EXPENSE	2,267.78	36,699.80	530.18	8,051.63	-2,761.27	2,854.97	22,561.23	24,327.72	290,907.02		
LOSS DUE TO CURRENCY EXCHANGE	659.02	46,435.68	831.71	3,737.56	-1,291.23	7,589.90	72,707.40	68,395.30	220,970.65		
EARNINGS FROM CASH ASSETS	-5,855.03	-45,072.35	-147.19	-11,340.35	4,367.30	-8,440.22	-41,274.28	-61,526.08	-528,947.47		
DATA PER SHARE											
NUMBER OF SHARES (THOUSANDS)	16,875	258,026	12,748	128,006	54,000	11,791	80,817	202,469	360,000		
BOOK VALUE PER SHARE	0.2993	0.8407	1.9833	0.3826	1.9638	0.7678	-3.1845	0.3188	3.7662		
EARNING PER SHARE	-0.2082	-0.2017	-0.5609	-0.0638	0.1223	-0.5466	0.5570	0.1028	0.1340		

* THESE FIRMS SUSPENDED TRADING IN 1995

Source: "Anuario Financiero", Bolsa Mexicana de Valores, 1994 and 1995; "Indicadores Financieros, 1996-III".

The Exchange Rate used is that of the close of 1995 (7.6841)

TABLE 4. AUTOPARTS INDUSTRY. FINANCIAL DATA BY ISSUER 1996-III (THOUSANDS OF US DOLLARS)

ITEM	ACMEX	DINA	EATON	IASASA	JDEERE	PERKINS	CODUMEX	SANLUIS	VITRO	SUDISA	TREMEC
	96-96 III	96-96 III	96-96 III	96-96 III	96-96 III	96-96 III	96-96 III	96-96 III	96-96 III	96-96 III	96-96 III
BALANCE SHEET DATA											
TOTAL ASSETS	13,118.29	960,742.19	40,272.48	109,505.45	126,291.16		641,130.65	433,950.58	3,454,336.22		
CURRENT ASSETS	1,971.07	411,898.84	19,444.95	19,081.86	75,529.96		268,276.69	140,509.25	755,717.07		
LONG-TERM ASSETS	44.64	34,528.32		2,328.43			58,783.16	11,825.89	549,063.28		
PROPERTY, PLANT AND EQUIPMENT	10,721.15	240,254.49	20,827.53	86,730.67	49,160.25		302,686.07	249,448.99	2,021,179.64		
DEFERRED ASSETS	381.43	245,686.96		1,364.50			11,384.72	32,166.45	128,376.23		
OTHER ASSETS		28,373.58		0.00	1,600.96						
TOTAL LIABILITIES	23,237.55	715,677.80	4,288.04	57,296.86	9,859.25		300,186.90	290,719.10	2,149,602.72		
CURRENTS LIABILITIES	4,139.04	158,226.22	4,288.04	31,778.77	8,944.90		124,319.96	189,527.38	640,883.38		
LONG-TERM LIABILITIES	19,098.52	531,313.12		25,518.09			172,033.85	93,280.25	1,434,396.80		
DEFERRED CREDITS							3,566.17		74,322.54		
OTHER LIABILITIES		26,138.46			914.35		266.91	7,911.47			
NET WORTH AND MINORITY EQUITY	-10,119.26	245,064.38	35,984.43	52,208.60	116,431.91		340,943.75	143,231.47	1,304,733.50		
NET WORTH (A+B)	-10,119.26	237,751.28	35,984.43	52,208.60	116,431.91		276,048.27	131,640.61	987,972.11		
PAID-IN-CAPITAL (A)	20,257.79	270,927.73	62,230.65	64,893.79	64,869.97		173,735.54	138,855.45	548,529.33		
EARNED CAPITAL (B)	-30,377.05	-33,176.45	-26,246.21	-12,685.19	51,561.94		102,312.73	-7,214.85	439,442.79		
INCOME STATEMENT											
NET SALES	2,217.81	517,939.89	19,795.28	26,016.13			549,502.24	176,133.85	1,602,186.46		
COST OF SALES	1,713.92	425,053.18	19,894.83	21,560.99	89,601.51		404,977.06	114,868.70	959,666.73		
OPERATING EXPENSES	704.18	77,403.03	996.08	4,169.62	7,237.75		36,168.06	19,531.10	351,281.12		
OPERATING EARNINGS	-200.28	15,483.68	-1,095.63	285.52	8,117.74		108,357.12	41,734.06	291,238.62		
EARNINGS BEFORE TAXES	-1,827.14	24,132.25	-790.46	-5,900.58	8,845.73		119,871.98	51,645.75	213,889.85		
NET EARNINGS	-2,260.89	9,433.57	-1,166.82	-6,274.34	4,859.09		79,940.72	41,660.66	-488,745.40		
CASH FLOW											
RESOURCES GENERATED BY THE OPERATION	-1,477.72	-28,363.30	-3,086.35	508.45	8,409.51		64,960.81	53,223.41	191,657.09		
RESOURCES GENERATED BY FINANCING	1,641.95	-11,784.25	10,411.03	1,389.87	-1,898.19		-84,369.97	-35,682.77	-61,416.50		
TOTAL CASH RESOURCES											
RESOURCES GENERATED UTILIZED TO INVESTMENT	-255.07	-13,206.13	-770.16	-2,429.67	-7,843.15		-25,612.70	-59,762.06	-209,936.13		
NET INCREASE (DECREASE) IN CASH AND TEMPORARY INVESTMENTS	-90.84	-26,941.41	6,554.53	-531.35	-1,331.83		-45,021.86	-42,221.42	-79,695.54		
CLASSIFICATION OF SOME BALANCE SHEET AND EARNINGS ITEMS											
LIQUID CASH AND ASSETS	14.19	14,497.62	8,663.28	105.93	16,542.09		31,864.40	58,972.90	89,543.99		
INVENTORY	918.12	231,009.75	6,811.16	12,259.12	46,061.14		86,679.13	23,996.13	306,828.75		
SHORT-TERM FOREIGN EXCHANGE LIABILITIES	1,463.27	103,133.38	1,677.35	5,184.43	-1,979.14		39,959.10	163,010.48	396,490.64		
LONG-TERM FOREIGN EXCHANGE LIABILITIES		505,769.52					113,344.13	93,250.32	449,640.00		
WORKS IN PROGRESS		782.00			10,632.01		30,156.73	71,959.63	119,856.10		
WORKING CAPITAL											
DOMESTIC SALES	1,973.15	70,606.19	8,965.46	19,911.62	70,382.74		337,190.44	36,385.39	1,175,141.01		
INTERNATIONAL SALES	244.66	447,333.70	10,829.82	6,104.51	34,574.26		212,311.80	139,748.46	427,045.46		
INTEREST	-5,032.30	-31,615.44	-64.29	-13,796.70	3,356.26		-15,532.35	-11,253.81	-394,408.04		
TOTAL FINANCIAL EXPENSE	1,235.01	-9,890.22	-305.17	5,343.33	-727.99		-9,694.88	-12,534.88	97,751.66		
LOSS DUE TO CURRENCY EXCHANGE											
EARNINGS FROM CASH ASSETS											
DATA PER SHARE											
NUMBER OF SHARES (THOUSANDS)	2,196	33,579	2,794	16,658	7,027		10,517	31,034	46,850		
BOOK VALUE PER SHARE	0.5999	0.9214	1.6762	0.4073	2.1564		3.4161	0.5518	2.7446		
EARNING PER SHARE											

* THESE FIRMS SUSPENDED TRADING IN 1995

Source: "Anuario Financiero", Bolsa Mexicana de Valores, 1994 and 1995; "Indicadores Financieros, 1996-III".

The Exchange Rate used is that of the close of 1995 (7.6841)