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Trade openness and *structural change in the* Brazilian motor industry

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This article aims to classify and analyse the evidence of structural change in the Brazilian motor industry between 1990 and 1996, seeking to relate it with the economic policy measures which had most impact on the sector. The study begins by examining the explosive increase in domestic demand for motor vehicles, its determining factors, and its main implications, especially the achievement of efficient scales of production and the initiation of a wave of investments which has been further intensified in the last three years. It goes on to study the increase in the technological dynamism of the sector, which is partly the result of these new investments. A series of changes relating to the new international linkages of the Brazilian motor industry are then analysed, since as a result of greater trade openness there has been a significant increase in the coefficients of importation of parts and components or finished vehicles. Finally, an analysis is also made of some aspects of the Motor Industry Regime, whose adoption has had repercussions on the external linkages of the motor industry not only in the short term, by establishing import barriers, but also in the long term, by bringing it home to the big firms in the sector that they must make investments to expand local production and maintain higher levels of competitiveness.

I

Introduction

The motor vehicle industry, which comprises the segments involving the assembly of vehicles and the production of parts and components, is among those which most strikingly reflect the profound restructuring which has taken place in connection with the change in the Brazilian industrial policy and foreign trade regime. Since the process of trade openness began, there is increasing proof that this sector of the Brazilian economy is changing its place in international trade, increasing its already high previous level of internationalization and making far-reaching changes in its production base which have been reflected in higher productivity. Moreover, this is the only industrial sector which was the subject, in the phase following the initiation of greater openness, of a broad set of sectoral policies which culminated in the establishment of what has come to be called the Motor Industry Regime.

This represents the first concrete example of sectoral policies, equipped with powerful instruments, designed to cope with the "headaches" of the openness process. This article, which was motivated by these special features of the motor industry, seeks to arrange and analyse the evidence of the structural changes made in this sector between 1990 and 1996, seeking to link them with the economic policy measures that had the greatest impact on the sector.

We shall seek to organize our arguments around four aspects which correspond to the following sections in this study. First of all, we shall look at the explosive increase in domestic demand for motor vehicles and the factors responsible for it (section II).

The new dimension of the domestic market, especially from the regional point of view, has been linked with its specialization in smaller vehicles and has represented a qualitative change in this market, while at the same time smoothing the way for the achievement of efficient scales of production in all the assembly firms, for the first time in the history of the Brazilian motor industry. In our view, the new size of the market has been the main factor in the wave of investments which gained further impetus in 1994-1996 (section III), although it must be acknowledged that the greater trade openness and the Motor Industry Regime have also operated as catalysts for investment. The new investments have had two other important effects on the economy of the Brazilian motor industry: a change in the market structure with the entry of seven new competitors, and the narrowing of the technology gap with the plants located in more industrialized countries which had always marked the Brazilian subsidiaries. To a large extent, all these phenomena are related with what are beginning to take shape as the new international linkages of the Brazilian motor industry (section IV). The process has been a painful one, with many fits and starts in the way trade policy has been handled, and it has been conditioned by the globalization strategies of the vehicle manufacturers. The Motor Industry Regime, for its part, has been of decisive importance in indicating to these big transnational firms the acceptable (if not desirable) balance between local production and the importation of vehicles and parts.

□ This article is based on the report prepared by the Study Group on Companies and Innovation of the Department of Science and Technology Policy of IG/UNICAMP for the Institute of Applied Economic Research (IPEA) as part of the project entitled "Indicators of Brazilian Industrial Productivity: Limits and Possibilities". The authors wish to express their gratitude

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II

Growth and specialization of the domestic motor vehicle market

The sudden increase in the size of the market and the trend towards specialization in small vehicles were the basis for the recovery in investment, the modernization of the companies and the achievement of economically viable scales of production. The regional integration furthered by MERCOSUR helped to strengthen these characteristics. We consider this to be one of the most important changes which took place in the motor industry in the 1990s, since the small size of domestic demand was for many years one of the main obstacles to growth and investment.

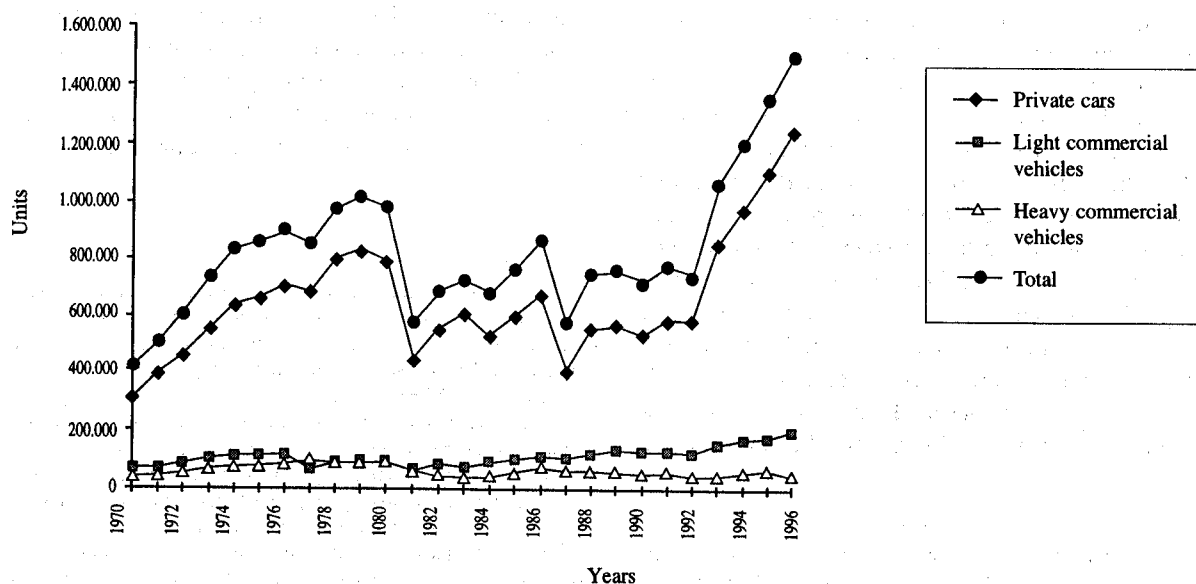
After twelve consecutive years of unstable behaviour, at a level of around 700,000 units per year, the Brazilian motor vehicle market began to grow again in 1993 (figure 1). The 20% average annual growth rate of domestic sales of motor vehicles (in terms of units) in the period 1993-1996 is only comparable with the most dynamic phase of expansion in demand in the early 1970s. The sales of 1.5 million

units in 1996 marked a new record in the marketing of vehicles produced in Brazil. In that year, total sales including imports exceeded 1.7 million units. It should be noted, however, that the heavy vehicle segment (trucks and buses) displays a different trend from the automobile and light commercial vehicle segments, since even in recent years demand has stagnated around 60,000 units per year.

The definition of domestic market must be expanded to include the establishment of MERCOSUR as a unified regional market. In this sense, adding together the numbers of licenses taken out for new vehicles in Brazil and Argentina reveals that in reality the "domestic" market already exceeded two million units in 1995, after having started the decade with less than 1 million units (table 1). There is a qualitative change which derives from this recent growth. The market for motor vehicles, considering MERCOSUR as a whole, has reached a volume comparable to

FIGURE 1

Brazil: Domestic sales of locally produced motor vehicles, by type of vehicle, 1970-1996



Source: National Motor Manufacturers' Association (ANFAVEA).

TABLE 1

**Selected developed and developing countries:
Licenses taken out for new vehicles, 1990-1995**

Year/country	Brazil/Argentina	South Korea	France	United Kingdom	Italy
1990	805	957	2 756	2 231	2 483
1991	957	1 106	2 424	1 801	2 409
1992	1 113	1 270	2 466	1 795	2 573
1993	1 552	1 438	2 077	1 975	1 828
1994	1 905	1 560	2 299	2 139	1 789
1995	2 056	1 563	2 288	2 195	1 868

Source: National Motor Manufacturers' Association (ANFAVEA).

the markets of major industrialized European countries such as England and France, and in fact it actually exceeded the Italian market in 1994. This volume has opened up new prospects for attaining economies of scale in production and for the entry of new producers. The table also shows the extraordinary dynamism of the markets of recently industrialized countries, compared with the relative stability or actual decline of the markets of industrialized countries. This point needs to be emphasized in order to understand the reasons which have given rise to a new cycle of investments in the sector.¹

What factors were responsible for the recovery of growth and the beginning of the realization of the potential of the Brazilian market? The main factors were the systematic adoption of policies to stimulate and sustain demand and, from 1994 on, the effects of the stabilization process. Between 1992 and 1994, the expansion in consumption was due above all to the reduction in prices, primarily as a result of the reduction in taxes on automobiles; this reduction was particularly significant in the case of the "popular" automobiles, since as soon as the measure came into effect they began to arrive on the market at around US\$ 7,500, which was an attractive price for the market conditions of the time. Between 1993 and 1994, according to data provided by ANFAVEA, sales of "popular" vehicles grew by 110%, becoming the spearhead of the growth in demand from then on. The reopening of the consortia also helped in this expansion, but the role of direct credit to the consumer was adversely affected by the high interest

rates prevailing at the time and the reluctance of families to contract debts at a time of high inflation. Already in the Plano Real phase, the factors affecting the continued growth of the domestic market reversed their order of importance. Stabilization made the existing mechanisms for direct consumer credit more effective and substantially expanded the access of new consumers. Thus, the consumption of automobiles (and of other durables) and family indebtedness grew side-by-side and became the characteristic feature of this phase.

The level of taxation on automobiles lost importance after the Plano Real because automobile prices rose once again, cancelling out the reduction in taxes granted by the government since 1992. The most notable rises were in the prices of the "popular" vehicles, some of which rose by between 53% and 65% between August 1994 and October 1996, whereas the wholesale price index only rose by 27% over the same period.² Everything seems to indicate that the assembly plants took advantage of the temporary additional protection granted under the Motor Industry Regime³ to recover part of the profit margins per unit

¹ ANFAVEA does not publish statistics for the other MERCOSUR countries. It is estimated, however, that the annual consumption of vehicles is some 25,000 units in Uruguay and 15,000 units in Paraguay (*Folha de São Paulo*, 1995).

² The question of the rise in the domestic prices of motor vehicles finally became a point of conflict in the relations between the assembly plants on the one hand and the government and authorized dealers on the other, after the price rises announced in January and March 1997.

³ "Motor Industry Regime" is used to designate the government policy for the motor vehicle sector, which, after the drastic rise in the proportions of automobile imports in February and March 1995, grants the companies registered under the Motor Industry Regime reductions in taxes on the importation of vehicles, machinery and equipment and inputs and, in return, demands the fulfillment of certain export targets and indexes of national production in their purchases of capital goods, raw materials and parts and components.

which they had forgone in the period of the Sectoral Chambers. The assembly plants claim, in their defence, that the increases are due to the incorporation of additional costs involved in the change in models which took place in this period.

Despite the recent increase in prices, sales of "popular" vehicles have continued to expand and to lead the growth in the domestic market. The share of such vehicles in the domestic market has grown steadily since they were launched and has now reached such a magnitude that it forms a special segment of the automobile market. This share came to 56.3% in 1996, and it was expected to rise to 60% in

1997. Behind this increase there are important structural aspects which have repercussions on investment and production. This change has brought the Brazilian motor vehicle market back towards a pattern in keeping with the country's income level: a high-volume market of small cars for the middle class. The assembly plants have reacted positively and furthered this tendency, bringing out updated "popular" models in the last two years. The specialization of the market has been the decisive factor in giving rise to the growth rates in question, as well as leading to product specialization which has helped to increase scales of production.

III

The recovery in investment and technological modernization

The recovery in the growth of the domestic market, the buoyant future growth prospects, and the specialization of this market have encouraged an increase in the rate of investment of the assembly firms. This tendency was further strengthened after the government indicated, through the adoption of the Motor Industry Regime, that it was not willing to absorb large and growing trade deficits in this sector. The behaviour of the investments reported by ANFAVEA shows two peaks in the level of investment between 1985 and 1995 (table 2).

TABLE 2
Brazil: Total sales and investment of the motor vehicle assembly industry, 1985-1995
(Millions of US dollars)

Year	Sales	Investment	Sales/ investment (%)
1985	16 282	674	4.1
1986	15 608	728	4.7
1987	16 777	773	4.6
1988	18 941	735	3.9
1989	17 562	737	4.2
1990	13 096	918	7.0
1991	13 462	981	7.3
1992	16 718	983	5.9
1993	19 369	939	4.8
1994	23 542	1 230	5.2
1995	24 476	1 694	6.9

Source: National Motor Manufacturers' Association (ANFAVEA).

Between 1985 and 1989, the average investment of the companies which are members of ANFAVEA was US\$ 730 million per year, which corresponds to an average of 4.3% of their total sales. Between 1990 and 1994 inclusive, average annual investment grew by nearly 40% to US\$ 1 billion, which equals an average of 6% of total sales. As we shall see below, the trade openness process hastened the assembly firms' plans for modernization of their production facilities and renovation of their line of products, which corresponded to the increase in the rate of investment. From 1994 on, there was a further increase in investment, which amounted to almost US\$ 1.7 billion in 1995 (6.9% of total sales), and the indicators suggest that it will continue to grow until the end of the 1990s.

The expansion of capacity in the first half of this decade was due above all to the investments made in the modernization of the existing plants. The launching of new models based on designs that were simpler to produce, the adoption of new manufacturing techniques, and the spread of organizational concepts and techniques inspired by the Japanese experience raised the productivity of the factories, thus increasing their capacity. In the second half of the 1990s, however, the increase in capacity will also be due to the entry into operation of the new plants currently under construction, belonging not only to assembly firms which are already in the market but also to

TABLE 3

**Brazil: Confirmed investments in new
motor vehicle manufacturing plants, 1996-2000**

Company	Investment (millions of US dollars)	Location	Capacity (units)	Model	Entry into production
Fiat	150-200	Belo Horizonte (MG)	100 000	Light commercial vehicles	1999
General Motors	600	Gravataf (RS)	120 000	"Popular" cars, yet to be specified	1999
Mercedes	400	Juiz de Fora (MG)	70 000	"A" class	1999
Renault	750	S.J. dos Pinhais (PR)	100 000	Mégane	1999
Toyota	150	Indaiatuba (SP)	15 000	Corolla	1998
Honda	100	Sumaré (SP)	15 000	Civic	1997
Chrysler	315	Campo Largo (PR)	40 000	Dakota	1998
BMW	150		15 000	Defender	1998
Audi/Volkswagen	500	S.J. dos Pinhais (PR)	60 000	Audi A3 and VW Vento	1999
Asia	500	Camaçari (BA)	60 000	Topic and Towner	2000

Source: Files of *Folha de São Paulo* and *Gazeta Mercantil*.

TABLE 4

**Brazil: Scales of production of motor companies,
by main car model families, 1990-1995**
(Units)

Make and model	1990	1991	1992	1993	1994	1995
Uno family (Fiat)	131 372	136 640	134 131	183 999	251 952	266 501
Escort family (Ford)	79 928	86 138	63 391	138 152	157 080	152 215
Chevette/Corsa families (GM)	26 632	26 841	41 034	32 773	68 304	156 573
Gol family (VW)	138 029	147 167	186 254	205 304	225 911	304 457

Source: National Motor Manufacturers' Association (ANFAVEA).

those which came in later. Consequently, these investments must be added to those made in modernization. The investments announced and committed under the Motor Industry Regime by present and future competitors in respect of the installation of new plants amount to US\$ 3.6 billion, to be invested between 1996 and 2000 (table 3). These new factories will increase the production capacity of the Brazilian motor industry by some 600,000 vehicles. If this additional capacity is added to the present level of production, it gives a total volume of 2.4 million units per year for the year 2000.⁴

In line with the growth in sales, Brazil's output of motor vehicles also increased significantly from 1993 on, exceeding 1.8 million units in 1996 (i.e., it

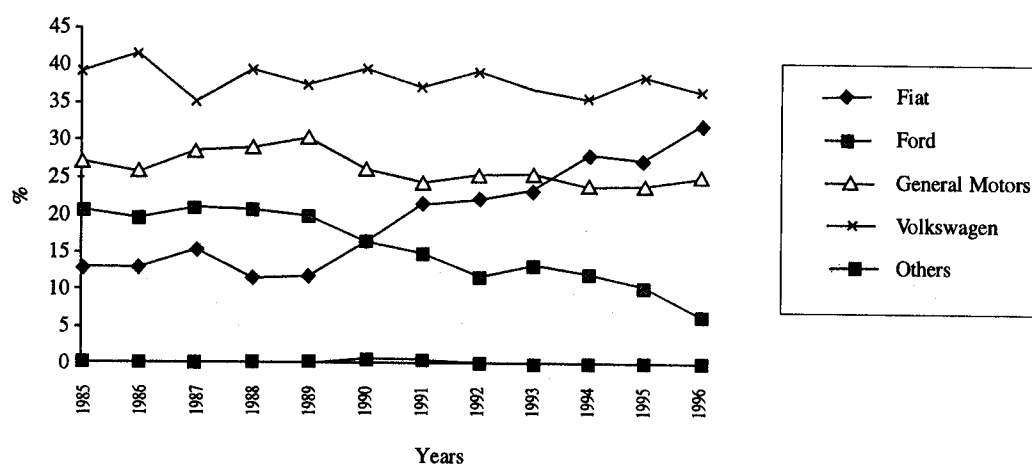
grew by almost 100% compared with the 1990 level). The increase in production by the Brazilian motor industry and its specialization in small vehicles made possible another significant structural change compared with the situation which had prevailed up to the early 1990s. For the first time, all the motor vehicle assembly companies reached optimum scales of production for their best-selling models. According to the assessment made by O'Brien and Karmakolias (1994, p. 21), the optimum scales of production of motor vehicles are between 100,000 and 200,000 units per year, depending on the type of vehicle. In the Brazilian motor manufacturing firms, the scales of production of small cars increased substantially from 1993 onwards, when the production and sale of "popular" vehicles began. By 1995, the scales of production already exceeded 150,000 units per year for the main model families: Gol, Uno, Corsa and Escort (table 4).

The continuation of such increases in scale may be threatened in the future, however, by the structural changes in the motor vehicle market caused by the

⁴ In practice, this total should actually be exceeded, since the capacity and production of some of the present production lines are to be expanded in the coming years. This is so, for example, in the case of the manufacturing facilities for the Fiesta, Palio and Novo Gol models.

FIGURE 2

**Brazil: Share of the ANFAVEA member companies
in domestic sales of locally produced cars, 1985-1996**



Source: ANFAVEA.

entry of new competitors. In the overview of the present structure of the motor vehicle market given in figure 2, there are two points which attract attention. The first is the relatively insignificant share of makes of vehicles other than those which have dominated automobile production in Brazil for over a decade: Volkswagen, General Motors, Ford and Fiat. The second is the notable increase in the market share of Fiat as from 1990, due to its wager on the success of "popular" cars, especially at the expense of Ford, which did not have so much faith in the Brazilian market.

In fact, Fiat's growth strategy and efforts to lead the market may be interpreted as the first important factor in destabilizing the oligopoly which had marked the sector for so long. A significant change which is taking place along with the appearance of the new plants is the entry of seven new competitors into the Brazilian motor vehicle market, of which two are Japanese (Toyota and Honda), two are German (BMW and Audi), one United States (Chrysler), one French (Renault), and one Korean (Asia).⁵ In addition, there is the production of automobiles by Mercedes-Benz, which, although long established in the country, previously only manufactured trucks and buses in Brazil. There is therefore going to be a change

in the marginal positions of other makes compared with the Big Four of today. The reduction of the level of concentration in the motor industry may bring benefits in the form of cheaper and/or better quality products. The entry of new competitors helps to reduce the market power of the established firms, and the resulting competition can generate benefits for consumers. On the other hand, the new competitors will be increasing a level of production capacity which is already substantial. Excessive fragmentation of the market may endanger the benefits of scale provided by the recent growth, thus giving rise once again to the biggest obstacle faced by the developing countries in attaining optimum scales of production. Continued emphasis on specialization is important in order to minimize this risk.

Another important change in the Brazilian motor industry in the 1990s is its greater technological dynamism. In this decade, the investments made by the assembly plants have been directed towards the almost complete renewal of their product ranges and the adoption of new processes and new forms of management inspired by the Japanese experience, as well as the restructuring of relations with suppliers of parts, components and other inputs.

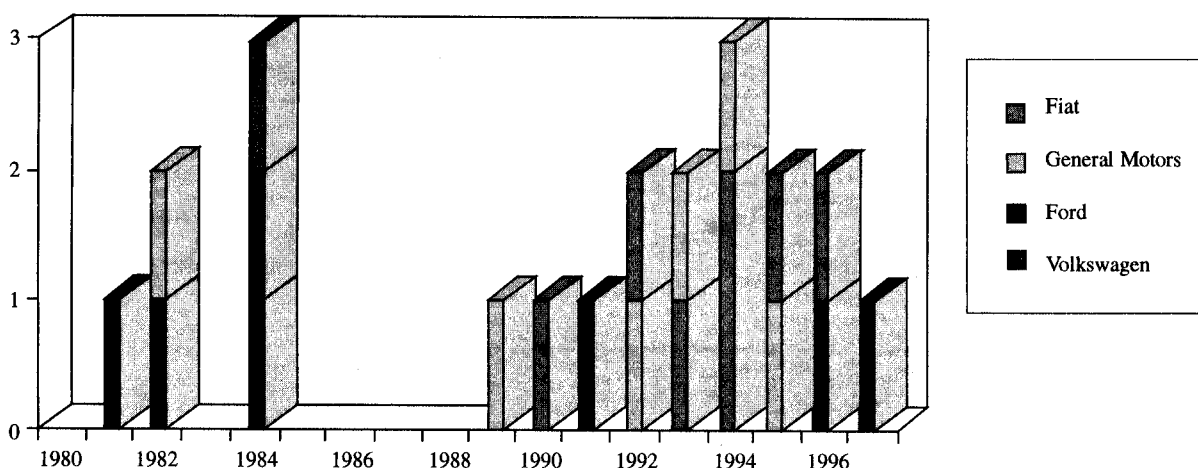
A summary evaluation of the way the launching of new basic models⁶ by the motor manufacturers has

⁵ In addition to the entry of these new competitors, who have made firm investment commitments, there have been rumours regarding the entry of Peugeot (France), Mitsubishi (Japan), and Daewoo and Hyundai (Korea).

⁶ Only the launching of completely new models is considered here, excluding the launching of new models belonging to an existing model family.

FIGURE 3

Brazil: New car model launches, in units per company, 1980-1997



Source: Files of *Folha de São Paulo* and *Gazeta Mercantil*.

evolved since 1990 shows a pronounced increase in such new launches in the decade, especially after 1992 (figure 3); thus, 14 new models have already been launched, compared with only seven in the 1980s. A noteworthy aspect in this renewal of models is the narrowing of the gap between the age of the products manufactured and marketed in Brazil and that of the models launched most recently by manufacturers in the more industrialized countries. Since 1992, almost all the launches have been of up-to-date "world cars", i.e., models produced simultaneously for all the most demanding markets. Models such as the Corsa, Palio and Fiesta are examples of this tendency, which is likely to become still more pronounced.

Together with the renovation of their products, the Brazilian motor manufacturers have also promoted a substantial modernization of their production methods and organizational and management practices, and they have changed their relations with their suppliers. The renovation of models was very soon followed by the incorporation of programmable automation in the Brazilian motor industry. A large number of robots were incorporated, especially on the high-volume production lines of the new small cars.⁷ We estimate, on the basis of market sources,

⁷ This was so, for example, in the case of the production lines for the Corsa, Nuevo Gol and Fiesta models.

that there are currently some 500 robots in Brazilian motor factories. Although this number is only small compared with the size of the industry,⁸ the selective adoption of programmable automation has been speeding up. The spread of such technologies helps to ensure consistent quality of the products of this sector.

Another point worthy of note is the change in management concepts and techniques. The available information and publications suggest that new techniques for the organization of production and labour have spread more rapidly in Brazilian motor companies than programmable automation. We refer to new management principles and organizational techniques inspired by the Japanese, such as just-in-time production (propelled by demand), total quality, and the principle and techniques of *Kaizen* (continuous improvement). There are no exhaustive recent studies on the spread of these innovations in the motor industry as a whole, but the case studies which exist indi-

⁸ More than any other programmable automation technologies, the spread of robots is determined largely by the cost of labour. This explains why there are still only limited numbers of them in Brazil. South Korea, in contrast, had 500 robots as far back as 1985.

cate that, albeit at different rates and with different approaches, most of the motor vehicle companies have made considerable progress in the incorporation of these techniques.⁹

The relations between the motor manufacturing companies and their suppliers of parts, components and other inputs are another important aspect. Generally speaking, the assembly plants are considerably changing their relations with their suppliers of parts and components. The basis for these changes has been an urgent demand for improved quality and lower costs. The raising of the demands with regard to quality and delivery dates and the increased pressure on the profit margins of the producers of parts and components is not a phenomenon which is limited only to Brazil. It became more marked with the spread of the practices known as global sourcing. The fact that this change is known as the "López effect" in industry jargon not only illustrates the importance of the ex-executive of General Motors and Volkswagen in setting off this process but also the global nature of the change. Perhaps the most innovative example in terms of relations with suppliers has been the adoption by Volkswagen of the so-called "modular consortium" system for the production of trucks at its Resende factory.

The modernization of products and processes has been reflected in an increase in productivity in the motor manufacturing industry. The Press has highlighted on innumerable occasions the fact that the physical production of vehicles per worker in the industry as a whole has more than doubled between 1990 and 1995, increasing from 7.8 to 15.6 vehicles/worker. This calculation seems somewhat biased to us, however, in view of the profound structural changes which we have analysed in the present study, since it does not take into account the fundamental changes in the structure of production. First, the share of small vehicles and above all of "popular" cars (vehicles of lower value) has increased within the total output of automobiles, so that physical production since 1993 cannot be compared with output

in the 1989–1992 period, unless some form of calculation of equivalent units is applied. Second, and even more important, the "outsourcing" movement, of which Fiat's policy of "outward-looking growth" is a typical example, has involved the transfer to the motor manufacturers' suppliers of a whole set of manufacturing activities which the assembly firms previously carried out themselves. Thus, the structure of production in the mid-1990s already looked quite different from the structure at the beginning of the decade. Consequently, there is every justification for the criticism that this "tertiarization" leads to a bias in the physical output calculations.

The index of sales per employee, discounting the effect of imports, registers much more modest growth: 36% between the 1994 and 1989 figures. This indicator also involves some problems, however, because in addition to maintaining the tertiarization bias it also introduces some additional distortions. In view of this, we carried out an exercise aimed at partly neutralizing the tertiarization effect of the index of sales or output per worker by deducting the consumption of parts and components produced or imported by the companies which are members of Sindipeças. If we use this indicator, the growth in productivity over the three-year period 1993–1995 was 35% compared with the previous three-year period. This is a significant growth rate, but much less than that given by the index of vehicles produced per employee.

In short, this analysis leads us to two main conclusions. First, since all the indicators point in the same direction, and also in the light of other efficiency indicators mentioned in this study, there is proof that the productivity of the motor manufacturing companies increased significantly during the period studied. This increase was less than the productivity growth reported to the public, however. Second, the information available at the sectoral level does not allow exact conclusions to be drawn about the size of that increase. This indicates that additional studies need to be carried out to obtain from the manufacturers the information needed to overcome the biases in question.

⁹ With regard to recent organizational changes in General Motors and Volkswagen do Brasil, see Fleury and Salerno (1995). For a summary of the most important changes in Fiat do Brasil, see Quadros Carvalho and Bernardes (1997).

IV

The new external linkages of the motor industry

The third set of changes analysed in this article concern the international linkages of the Brazilian motor industry. These linkages were substantially changed, first of all by the trade openness process and subsequently by the adoption of the Motor Industry Regime. Brazil ceased to be one of the most tightly closed markets in the world for the importation of motor vehicles, and there was also a reduction in the average index of national content in the finished products (which was over 95% before the trade openness process). It soon became clear, however, that the Brazilian economy's capacity to absorb heavy deficits in the motor vehicle and parts and components trade was limited, and these limits led the government to adopt the Motor Industry Regime. The signals that this Regime sent out helped in turn to induce investments in specialized local production, possibly opening up new prospects for future exports. Against this background of readaptation of trade flows and volumes, a noteworthy feature has been the growth in trade with the MERCOSUR countries, especially Argentina, which reflects the consolidation of the regional market.

The trade openness process led, for the first time in the history of the Brazilian motor industry, to a substantial share of imported vehicles in domestic sales. The increase in this share from the very low levels at which it stood up to the early 1990s is of a structural rather than a transitory nature, and its decline from 21.3% to 12.9% between 1995 and 1996 was the result of the containment measures connected with the Motor Industry Regime and must not be interpreted as a return to the previous conditions. The growth in imports of parts and components has also been very important for the structure of the industry. Between 1991 and 1996, the value of such imports grew at an average annual rate of 30.2%, and their share in total Brazilian consumption of parts and components shot up from 5.6% in 1989 to almost 21% in 1996.

The use of imported parts and components was one of the strategies adopted by the motor manufacturers in order to make possible the short-term reno-

vation of their range of products and improvement of the quality of the vehicles produced.¹⁰

The specific tariff on imports of motor vehicles underwent various changes between 1990 and 1995. What were those changes, and how did manufacturers react to them? Between May 1990 and October 1992, the tariff was gradually reduced from 85% to 40%. With the recovery of the domestic market in 1993, the gradual elimination of tariffs showed its first significant result. In that year, imports of motor vehicles grew by more than 150%, which was much higher than the 43% growth in vehicle output. The tariff reduction process continued until September 1994, when the currency revaluation connected with the introduction of the Plano Real markedly stimulated imports. When the growing external imbalance generated in the motor industry sector became evident, the import tariff was raised again in February 1995 and more sharply in the following month, when it returned to a level of 70%, giving rise to the negotiations which culminated with the adoption of the Motor Industry Regime. Imports continued to grow more than local production in the two-year period 1994-1995, but slackened in 1996 because of the measures adopted the year before. The relevant trade balance figures (table 5) showed a rapid deterioration as from 1994, which got worse in 1995 but was partially reversed in 1996.

These fluctuations could hardly fail to have repercussions on the companies' investment plans. Within the context of an expanding market and growing trade openness, the companies sought to strike a balance between domestic production and imported supply. To begin with, there was a recovery in investment for expanding production and launching new models to compete with imported products. Later on, the manufacturers who were already installed in the

¹⁰ For a more detailed appraisal of the effects of the openness process on the Brazilian parts and components industry, see Posthuma (1995).

TABLE 5

Brazil: Trade balance for motor vehicles, parts and components, 1989-1996
(Millions of current US dollars, FOB)

Product	1989	1990	1991	1992	1993	1994	1995	1996 ^a
Buses	127	57	118	269	329	206	(14)	(7)
Private cars and light commercial vehicles	681	406	226	494	(78)	(935)	(2 584)	(821)
Trucks	693	437	331	538	301	302	(190)	112
Total, motor vehicles	1 501	900	675	1 300	553	(427)	(2 788)	(716)
Parts and components	1 308	1 185	1 260	1 536	1 511	1 282	713	437
Total for sector	2 809	2 085	1 935	2 836	2 064	856	(2 075)	(279)

Source: Prepared by the authors on the basis of the SECEX data bank.

^a For the year 1996 the figures refer to exports from January through December and imports from January through October, multiplied by 1.2.

country became the main importers themselves, displacing the independent importers, and in a situation which markedly encouraged external purchases they postponed their most daring plans for the expansion of domestic production. Finally, when they were calmed down by the government's indications that it would not stand by idly and permit a deterioration in the external accounts of the motor industry, the companies resumed their investment programmes.

In the light of the above-mentioned structural changes which have been taking place in the industry, it may be wondered up to what point it is reasonable to expect an increase in competitiveness which will bring positive effects for the trade balance, and within what space of time. In our opinion, there are no grounds for expecting significant changes in the short term in the competitive position of the industry. It will be necessary to contain the trade deficit of this sector by imposing restrictions on imports and providing incentives for exports, as envisaged in the Motor Industry Regime. In the medium term, however, the growing specialization and investments which are underway will tend to favour exports. Within the context of an expanding local and regional market, and with the government closely watching over the behaviour of the external accounts, the strategies of most of the companies seem to envisage an increase in production and in the exports needed to offset the imports required to complement their own product lines. This does not mean that Brazil is going to be-

come an important export base for the world market—the primary motive of the investments continues to be production for the domestic and regional market—but it does give grounds for expecting more decided moves to participate in the external market on the basis of the new plants and the modernization of the old ones. This outlook is consistent with the results of a recent study (Reis, Branco and Bielschowsky, 1997) on Brazilian industry as a whole, which shows that the increase in the export coefficient depends above all on the investments motivated by a rapidly growing domestic market.

Finally, another important aspect of the new external linkages which are taking shape for the Brazilian motor industry is the role of MERCOSUR. The share of MERCOSUR in motor vehicle exports has grown considerably since 1991, and between 1992 and 1996 it has stood at a level of around 50%. Between 1995 and 1996, there was also a spectacular increase from 15% to 49% in imports from MERCOSUR (i.e., Argentina). These data reflect the process of regional market unification resulting from the sharing out between Brazil and Argentina of the investments made by the motor manufacturing firms. These firms seek to achieve some degree of equilibrium in intra-regional trade while at the same time attaining greater specialization and, hence, greater efficiency of their plants. The tendency to increase trade in finished products, parts and components among the countries of the region has become firmly established.

V

The role of the Motor Industry Regime

The question that seemed to be clearly facing the motor companies in the second half of 1994, after the acceleration of the tariff reduction schedule planned for MERCOSUR, was to define the best mix of domestic production and imports for taking advantage of that expanding market. The hesitations observed at that time, together with the announcements of expansion plans which were followed by retractions and the study of alternative solutions –the example of the third factory of General Motors is very enlightening in this respect– suggest that the companies are still looking for the right answer to this question.

There are two important elements which need to be emphasized in this respect. First, sales grew more than production during the period 1992-1995 and the share of imported vehicles increased considerably, putting excessive pressure on the sector's trade balance. Second, the companies already installed in the country reacted rapidly to the entry of independent importers, and already by 1993 they themselves were the main sellers of imported vehicles. The first of these events raises the possibility that the "equilibrium" mix of domestic production and exports sought by the companies involved a heavy trade deficit for the sector. The second shows the limits of trade openness as a mechanism capable of affecting the dominant positions of the leading companies, at least in the short term.

The Motor Industry Regime played a decisive role as a catalyst of the investment decisions taken by the companies from 1995 on. This was due not so much to the benefits provided for in the regime –which only last up to 1999– as to the fact that the government made it clear that it would not tolerate a high and permanent trade balance, which, in view of the weight of the motor industry sector, would end up by affecting the Brazilian balance of payments. Thus, the companies were made to understand that the "equilibrium" relation between domestic production and imports should be closer to a level which would also permit a better sectoral trade balance. This effect on investment was the most important result of the Motor Industry Regime. In 1995, the investments of the companies which were members of ANFAVEA shot

up to nearly US\$ 1.7 million, compared with an average of approximately US\$ 1 billion per year in the previous five-year period. Moreover, there are already confirmed investment applications totalling over US\$ 3.6 billion, mostly from recently arrived companies, solely in respect of the establishment of new plants, which will increase production capacity by some 600,000 vehicles in the next three years. All these plans, whose execution has already begun, provide for the construction of modern plants and the manufacture of up-to-date models.

More rapid modernization of the motor industry may be expected as a result of these investments. The renovation of the industry's products which has taken place in the last five years has narrowed the gap between the age of the products manufactured and marketed in Brazil and that of the most recent models launched by the manufacturers abroad, and this tendency will become more marked. The same applies to innovations in production processes and relations with suppliers. The new Volkswagen truck factory at Resende (Rio de Janeiro) promises to make the so-called "modular consortium" a household word in the motor industry. Thus, General Motors has already announced its intention to establish a similar system, called "industrial condominium", in its new plant at Gravataí (Rio Grande do Sul). All this will give a clearer picture of the real increases in the productivity of the sector, which have been difficult to estimate and very probably less marked than has been claimed.

Thus, the advances promised by the new investments in processes and products should improve the competitiveness of the motor industry, which will be reflected in turn in an improved trade balance. As well as being more modern, the plants are increasingly specialized, thus making possible better use of economies of scale. The volume of production that the main manufacturers are already achieving thanks to the new investments will strengthen their external competitiveness. Within this overall picture, the Motor Industry Regime is helping to improve the external accounts by checking imports and expanding exports through short-term incentives and, in particu-

lar, through greater competitiveness in the medium term.

The role of the Motor Industry Regime in promoting more widespread industrial and technological development also needs to be stressed. It is well known that the motor industry has important linkage effects which multiply the benefits deriving from the investment decisions of the motor manufacturers and their closest associates in the parts and components sector. An example of this is the recently approved investment of US\$ 1 billion by Usiminas to cover the increase expected by 1999 in the demand for high-quality steel due to the entry of new motor vehicle manufacturers. In addition, these companies are establishing a complex pattern of production organization and technological development which will have repercussions on the other segments of the industrial sector.

Nevertheless, the Motor Industry Regime has also had some controversial aspects. The aspect most frequently referred to in this respect is the unequal treatment given to vehicle manufacturers compared with producers of parts and components. Thus, the levels of protection established for the motor industry are exceptionally high and have allowed the manufacturers to impose abusive price increases and increase their profit margins, which were already quite high before the Regime came into force. This situation is only transitory, however, not only because the protection is only temporary but also because the expansion in installed capacity planned for the coming years will oblige the companies to reduce their profit margins in order to expand the market. At all events, doubts remain about the right "calibre" of the levels of effective protection granted to manufacturers. It is a question of finding the right intermediate point between the 20% nominal tariff, which would lead to the reduction of much of the planned investment, and the level of 70%, which allows excessive profit margins that adversely affect consumers' interests. Alternatively, it would be necessary to find effective ways of defending competition in order to stop abuses by the vehicle manufacturers.

The parts and components industry, for its part, is in a situation of limited profit margins and a market threatened by imports. It should be noted that the restructuring process of this segment is different from that observed in the case of the vehicle manufacturers, since it has little to do with the Motor Industry Regime. The changes underway in the parts and com-

ponents industry have a global dimension which, together with the Brazilian economic openness process, is promoting a rapid process of concentration and disappearance of domestically owned firms. The factors behind this situation are: i) the growing demands of the vehicle manufacturers as regards prices, quality and delivery dates; ii) the tendency of the latter manufacturers to work with a small number of suppliers, and iii) also connected with the foregoing, the use of shared assembly practices, that is to say, the preference of the vehicle manufacturers for the supply of systems or sets of components which are already assembled, rather than individual components.

Although the intentions of the vehicle manufacturers to increase their imports of components have proved to be more of a threat than a reality, their demands have led to heavy competitive pressure on the supplier firms. Although the direction and scope of the changes which are just beginning to take place in the parts and components industry are not yet clear, it is already possible to know that some activities are tending to be eliminated, that technological and trade associations with leading world firms are taking on a strategic role, and that the attainment of international levels of quality and productivity has come to be a top priority. Studies in greater depth are needed to establish the exact nature and consequences of the restructuring of the parts and components sector.

It would be premature to try to draw up a balance sheet of the effects of the Motor Industry Regime at this point. The benefits already obtained have been made fairly clear in this article, however: in the short term, an increase in the trade deficit has been avoided, and in the medium term, the investments induced by this measure are speeding up the modernization of the motor industry and also strengthening its external competitiveness. The main problems involved have also been highlighted, especially the unequal treatment given to vehicle manufacturers on the one hand and manufacturers of parts and components on the other, and the increase in automobile prices, at least in the short term. For the moment, it is reasonable to conclude that a process as complex and painful as that of increasing trade openness makes it necessary to adopt pragmatic policies which will allow this transitional phase to be handled as effectively as possible.

(Original: Portuguese)

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