This paper analyses the emergency of new forms of relationship between the automobile industry and the autoparts industry, based upon a field research in new assembly plants (just open or still under construction) in Brazil, and in some of their principal suppliers. The main purpose is to discuss and to characterise, based on an empirical basis, some of the concepts that have been spread both on some of the analysis about the sector and on managers’ discourse. These concepts are, in the end, assumed as representing the truth without a critical reflection. They are concepts such as proximity relationships (suppliers located near the assembler plant), partnerships, co-design, global and follow sourcing, carry over.

We propose the following considerations:

• Proximity, as it is currently referred to, is not just a physical relation, but also, and in some cases mainly, a service relation.
• Proximity and global sourcing, although at first may seem opposed concepts, are almost complementary concepts, since for an industrial basis that reaches a relatively elevated scale – as it is the case in Brazil, whose production is above 2 million vehicles/year (1997) and is expect to increase – there is viability for local production of many vehicle components; global sourcing is used by assemblers mostly as a basis for price negotiation (comparison of FOB prices in several countries_regions), and as a way to reduce the timing for launching new products while the local production of the components does not start.
• The concept of condominium, that is, the location of suppliers’ productive facilities inside or in the same site of the assembly plant, is valid only for some cases where there are logistical problems, critical handling of products and/or low fixed cost, but is not valid for other situations: for instance, for autoparts companies where the labour costs are important in the final cost might be “contaminated” by the generally higher salaries in the assemblers’ plants; or where there are aspects of economies of scale and fixed costs that require a centralised production for the autoparts. The case of Magneti Marelli
illustrates the point: Marelli is participating in the Mercedes Benz A-class plant condominium in order to supply exhaust systems; the company is investing US$40 million in a plant almost 400km far away from Mercedes plant in order to manufacture the exhausts (for Mercedes, for Fiat and for other companies), and is investing only US$1 million in the condominium - only for assembly and warehouse in order to cope with just in time requirements.

- Concerning the modular consortium of VW’s truck plant in Resende, it is still early to make an analysis of its operational viability, since only in the end of 1997 the factory began to operate with all of its facilities, with the inauguration of the body and painting shops.
- The tendency of new plants in design and construction have been to introduce, within the idea of condominium, some characteristics of modular consortium, with no substantial changes, however, in the concept of condominium.
- There is a series of conditions for the existence of partnership, and they do not necessarily mean stable and lifelong relationships between assemblers and suppliers.
- The autoparts makers have organised themselves, internally as well as in associations, in order to offer complete subsystems to their clients. The more technological developed firms in Brazil have been looking up to incorporate also the development of subsystem design, as a way to increase its added value, which may lead to a larger possibility of including gross margins during the negotiations of their prices with the assemblers, and also as a way to try to guarantee a stronger control in the relationship with the client, the assembler.
- The experience related to cars originally designed specifically for the developing countries, which were developed partially through co-design between the assembler’s headquarters, its Brazilian branch and Brazilian suppliers (for instance Fiat Palio, GM’s Blue Macaw, a small Corsa), have shown itself to be an important source for the local developing of competencies even to global players suppliers, which expect to win new contracts internationally counting on the experience acquired in Brazil. Also, the local design of new models based on international platforms in order to explore local niche markets (like the Corsa sedan, pick up and station wagon; the Ford Fiesta Courier, a pick up) is another distinctive feature of Brazilian industry that makes the Brazilian case much more complex - some of these models are being exported overseas.
- So, we must consider two hypothesis: a) this kind of design is still alive due to a transitory phase of design strategies of the assemblers; b) Brazil will constitute a peripheral design centre of the auto industry, integrated and subordinated to the design headquarters of some companies - assemblers or suppliers
- Finally, the employment crisis in the automotive sector has definitely arrived in Brazil, where, despite the increasing production level observed in the plants during the last years, the employment level has been strongly reduced.

A GENERAL VIEW OF THE BRAZILIAN AUTOMOTIVE INDUSTRY

After the first migration of the main vehicles assemblers during the fifties, a second wave of industrialisation can be noticed in Brazil in the end of this century, which is causing deep changes in the structural basis of the automotive sector. Similarly to the first movement, when the big American and European corporations that dominated the global market had been installed in the country, the basic push of the present restructuring also has its epicenter in the assemblers and the big foreign companies. Once again, the state intervention has been fundamental. But the aim of this intervention is qualitatively different now, which has to a large extent determined the profile and the performance of the restructuring of the sector.

From the fifties to the end of the military cycle (middle 80s), the automotive industry had been the “apple of the eye” to the government’s policy of national-development. During the nineties, the automotive industry has played an important role in the policies aiming to redesign the state institution, which was marked by import substitution and restriction to import policies. The declared reasons,
once more, tried to enhance the capacity of investments, technological innovation and creation of jobs supposedly shown by the automotive industry, that are fundamental to the competitive reintroduction of the Brazilian economy in the world-wide market and, so, to the elevation of social life patterns in the country.

What can be noticed, however, is that the industrial restructuring has shown contradictory results, which can compromise any prospect of sustained development to the sector, with impacts on the economy as a whole.

Beyond the successive production records, the productivity increase, the multiplication of new investments, the construction of new plants and the modernisation of the products, one can find a powerful net of state benefits, a deeper degree of internationalisation of the sector, the disaggregate of the tissue of small, medium and large national suppliers that have been built during the last forty years, the weakening of the local research and development centers, a reduced activity of technology transference, as well as a constant decrease of the employment level through all the chain.

After the government had given up the new tripartite mechanisms of negotiation, aroused in the beginning of the nineties (the so called “sectoral chamber of the automotive industry”), both the general lines of policies for the sector and the production and productivity increases have been practically defined and implemented by the big corporations, through a movement that has been pressing for the deregulation of the labour legislation, for achieving work flexibility and the weakening of the workers' unions.

The Recent Evolution

The assembler industry has been growing from its installation in the fifties, pulling an entire industrial network of suppliers. Protection policies to the industry disabled the practice of importing vehicles and components, taking to a high degree of nationalisation of the production. In 1980 the industry reaches the production of 1 million vehicles, entering in crisis in 1981; the recovery would only begin in a more consistent way starting from 1992, the year of constitution of the institutional articulation called “sectoral chamber of the automotive industry”, that gathered managers from the whole automotive chain, workers’ unions (captained by the ABC Metalworkers, that impelled the Camera) and government representatives.

Table 1. Trajectory of the Industry in the Nineties

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Economy opening</td>
<td>- Sectional Chamber: tripartite tentative of elaboration of industrial policies</td>
<td>- Monetary stabilisation</td>
<td>- Production and sales records</td>
<td>- Fiscal war among states (fiscal renounce)</td>
</tr>
<tr>
<td>- The broke of traditional protectionism</td>
<td>- Beginning of the restructuring</td>
<td>- Mercosur</td>
<td>- New investments: newcomers, new plants, new marks</td>
<td>- The state acts again as partner of the production</td>
</tr>
<tr>
<td>- Decrease of the production and sales</td>
<td>- New style of trade union action</td>
<td>- Automotive Regime (policy)</td>
<td>- Crisis and concentration in autoparts</td>
<td>- Crisis in the stock exchanges, affecting investment programs, particularly Korean</td>
</tr>
<tr>
<td></td>
<td>- Decrease of the general strikes in the sector</td>
<td>- Intensification of the modernisation</td>
<td>- Internationalisation production/materials and equipment/products</td>
<td></td>
</tr>
</tbody>
</table>
The Camera facilitated tripartite agreements that, by the reduction of the taxes and (theoretically) of the rate of profit of the companies, had reduced the price of the cars to the consumer, as well as enlarging the conditions for obtaining financing for the purchase, conditions which had been restricted for years as part of tight monetary policies. There was not reduction of wages; on the contrary, monthly readjustments were guaranteed in a period of high inflation rates. The result was the explosion of demand and the incentive to the new investments, as can be seen in Tables 2 and 4.

And, as the taxes were relatively more reduced for cars with smaller engines, there was a particularly accentuated reduction for cars with engines up to 1.000 cc (that were well-known as “popular cars”, in spite of its price to be approximately 100 times the Brazilian minimum wage).

Table 2. Brazilian Vehicle Market

<table>
<thead>
<tr>
<th>Year</th>
<th>Employment (Assemblers)</th>
<th>Sales</th>
<th>Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980-89 (average)</td>
<td>-</td>
<td>730.000</td>
<td>960.000</td>
</tr>
<tr>
<td>1990</td>
<td>117.396</td>
<td>713.000</td>
<td>914.000</td>
</tr>
<tr>
<td>1991</td>
<td>109.428</td>
<td>771.000</td>
<td>960.000</td>
</tr>
<tr>
<td>1992</td>
<td>105.664</td>
<td>740.000</td>
<td>1.073.000</td>
</tr>
<tr>
<td>1993</td>
<td>106.738</td>
<td>1.061.000</td>
<td>1.391.000</td>
</tr>
<tr>
<td>1994</td>
<td>107.134</td>
<td>1.206.000</td>
<td>1.581.000</td>
</tr>
<tr>
<td>1995</td>
<td>104.614</td>
<td>1.359.000</td>
<td>1.635.000</td>
</tr>
<tr>
<td>1996</td>
<td>101.857</td>
<td>1.506.000</td>
<td>1.804.000</td>
</tr>
<tr>
<td>1997</td>
<td>106.145</td>
<td>1.640.000</td>
<td>2.067.000</td>
</tr>
</tbody>
</table>

Source: National Association of Automotive Vehicles Manufacturers (Anfavea)

Table 3. Percentile Participation of Sales of Popular Cars on the Total of Internal Vehicle Sales

<table>
<thead>
<tr>
<th>Year</th>
<th>Popular Cars / Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>4,3%</td>
</tr>
<tr>
<td>1991</td>
<td>11,5%</td>
</tr>
<tr>
<td>1992</td>
<td>16,0%</td>
</tr>
<tr>
<td>1993</td>
<td>28,4%</td>
</tr>
<tr>
<td>1994</td>
<td>45,9%</td>
</tr>
<tr>
<td>1995</td>
<td>53,8%</td>
</tr>
<tr>
<td>1996</td>
<td>56,3%</td>
</tr>
<tr>
<td>1997</td>
<td>64,0%</td>
</tr>
</tbody>
</table>

Source: Anfavea.
Table 4. New Vehicles and Engines Brands and Plants in the Mercosur

<table>
<thead>
<tr>
<th>Original Country</th>
<th>Assembler</th>
<th>Localisation / Foreseen Date For First Job</th>
<th>Announced Investment Us$ (10^6)</th>
<th>Annual Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>Mercedes (A class)</td>
<td>Juiz de Fora (MG) / 98-9</td>
<td>820</td>
<td>70.000</td>
</tr>
<tr>
<td></td>
<td>VW-Audi (Audi A3, Golf, Pas.)</td>
<td>S. José Pinhais (PR) / 99</td>
<td>600</td>
<td>120.000</td>
</tr>
<tr>
<td></td>
<td>VW (trucks)</td>
<td>Resende (RJ) / operating</td>
<td>250</td>
<td>50.000</td>
</tr>
<tr>
<td></td>
<td>VW (engines)</td>
<td>São Carlos (SP) / operating</td>
<td>250</td>
<td>300.000^a</td>
</tr>
<tr>
<td></td>
<td>BMW-L. Rover (Defend)</td>
<td>S. Bernardo do Campo (SP)/98</td>
<td>150</td>
<td>15.000</td>
</tr>
<tr>
<td>Korea^a</td>
<td>Kia (small trucks)</td>
<td>Itu (SP) / n.a.</td>
<td>50</td>
<td>10.000</td>
</tr>
<tr>
<td>Korea^a</td>
<td>Asia (Towner/Topic)</td>
<td>Camaçari (BA) / n.a</td>
<td>500</td>
<td>60.000</td>
</tr>
<tr>
<td>Korea^a</td>
<td>Hyundai (H1000)</td>
<td>Aratu (BA) / n.a</td>
<td>280</td>
<td>20.000</td>
</tr>
<tr>
<td>USA</td>
<td>Chrysler (Dakota)</td>
<td>Campo Largo (PR) / 98</td>
<td>315</td>
<td>12.000</td>
</tr>
<tr>
<td>USA</td>
<td>Chrysler (Cherokee)</td>
<td>Argentina (Cordoba) / 97</td>
<td>250</td>
<td>15.000</td>
</tr>
<tr>
<td>USA</td>
<td>Chrysler/BMW (engines)</td>
<td>Campo Largo (PR) / 2000</td>
<td>600</td>
<td>400.000</td>
</tr>
<tr>
<td>USA</td>
<td>GM (press shop)</td>
<td>Mogi das Cruzes (SP) / n.a.</td>
<td>150</td>
<td>1.6 MI</td>
</tr>
<tr>
<td>USA</td>
<td>GM (cars / Blue Macaw)</td>
<td>Gravataí (RS) / 99</td>
<td>600</td>
<td>120.000</td>
</tr>
<tr>
<td>USA</td>
<td>GM (Corsa)</td>
<td>Argentina (Rosario) / n.a.</td>
<td>350</td>
<td>85.000</td>
</tr>
<tr>
<td>USA</td>
<td>Ford (cars)</td>
<td>Gravataí (RS) / 2001</td>
<td>500</td>
<td>100.000</td>
</tr>
<tr>
<td>USA</td>
<td>Navistar (trucks)</td>
<td>Caxias do Sul (RS) / 98</td>
<td>50</td>
<td>5.000</td>
</tr>
<tr>
<td>France</td>
<td>Renault (Scenic; new Clio)</td>
<td>S. José Pinhais (PR) / 99</td>
<td>750</td>
<td>100.000</td>
</tr>
<tr>
<td>Italy</td>
<td>Iveco (light trucks)</td>
<td>Sete Lagoas (MG) / 98</td>
<td>250</td>
<td>20.000</td>
</tr>
<tr>
<td>Italy</td>
<td>Iveco (heavy trucks)</td>
<td>Argentina (Cordoba) / 99</td>
<td>70</td>
<td>10.000</td>
</tr>
<tr>
<td>Italy</td>
<td>Fiat (engines)</td>
<td>Betim (MG) / 98</td>
<td>500</td>
<td>500.000</td>
</tr>
<tr>
<td>Italy</td>
<td>Fiat (pick-up)</td>
<td>Belo Horizonte (MG) / 99</td>
<td>200</td>
<td>100.000</td>
</tr>
<tr>
<td>Italy</td>
<td>Fiat (Palio Siena)</td>
<td>Argentina (Cordoba) / 97</td>
<td>600</td>
<td>120.000</td>
</tr>
<tr>
<td>Japan</td>
<td>Toyota (cars)</td>
<td>Indaiatuba (SP) / 99</td>
<td>150</td>
<td>15.000</td>
</tr>
<tr>
<td>Japan</td>
<td>Toyota (pick-ups)</td>
<td>Argentina (Zarate) / operating</td>
<td>150</td>
<td>15.000</td>
</tr>
<tr>
<td>Japan</td>
<td>Mitsubishi (pick-ups)</td>
<td>Catalão (GO) / not defined</td>
<td>35</td>
<td>8.000</td>
</tr>
<tr>
<td>Japan</td>
<td>Honda (cars / Civic)</td>
<td>Sumaré (SP) / operating</td>
<td>100</td>
<td>30.000</td>
</tr>
</tbody>
</table>

Sources: MICT, Anfavea, press and firms. Data should be considered as approximated values.

OBS.:  

a) Investment being rediscussed.

b) Foresight for 1,800 engines / day.

c) Detroit Diesel inaugurated an assembly plant to supply engines for the Chrysler Dakota.

Relatively lower prices for popular cars and larger repayment periods took to a change in the demand composition: from a demand concentrated on the medium and deluxe cars (with larger margins for the automakers) in the eighties to a concentration in the popular models in the nineties; in the beginning of 1998, three in each four sold cars were “popular” (table 3).

Increase in the sales volume and composition, good market perspectives when internationally the demand was practically stagnated, possibility for components and vehicles import (what facilitated the release of new models and put pressure on the local suppliers), along with a government policies of incentives to the sector with the only restriction of compensating in exports (“Brazilian Automotive Regime”), lead the industry to a rapid growth, attracting many new investments (table 4). According to Anfavea, about US$18 billion would
be invested in Brazil and US$4.5 billion in Argentina until the year 2000.

Among the new investments, some surprises. Volkswagen announces a “revolutionary” truck and bus plant based on a system that was denominated as “modular consortium”, in which the plant is divided in modules that are operated by contracted companies - VW doesn't have direct workers in it. The new car plants have been designed and built based on the so-called “industrial condominium”, in which a series of suppliers are settled inside the assembler building, or build facilities in the assembler’s yard.

Another aspect, more related to the speed and intensity than in the fact in itself, was the shift in the origin of capital in the autoparts industry, mainly in qualitative terms, since the largest national groups in the sector were acquired by multinationals.

Table 5. Origin of Capital of the Autoparts Companies in Brazil

<table>
<thead>
<tr>
<th>Origin Of Capital</th>
<th>1994</th>
<th>1997</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% Brazilian</td>
<td>74.6%</td>
<td>71.0%</td>
</tr>
<tr>
<td>Mostly Brazilian</td>
<td>5.2%</td>
<td>4.1%</td>
</tr>
<tr>
<td>100% foreigner</td>
<td>15.5%</td>
<td>16.1%</td>
</tr>
<tr>
<td>Mostly foreigner</td>
<td>4.8%</td>
<td>7.6%</td>
</tr>
<tr>
<td>Mixed (50%, 50%)</td>
<td>-</td>
<td>1.2%</td>
</tr>
</tbody>
</table>


Ob.: among the foreign capital companies, 31.4% are North American and 30.6% German.

TENDENCIES IN THE NEW ASSEMBLY PLANTS ORGANISATION

Two concepts are central to notice the organisational movement of the assemblers in Brazil: industrial condominium and modular consortium. Industrial condominium is characterised by the location of some suppliers very close to the assembly final, ideally in the same yard of the assembler plant, or in the surroundings.

Fiat has an aggressive policy in that sense, Ford invests in that direction in its main plant in São Bernardo, VW makes the same in Taubaté, and practically all the assemblers are planning the same in their new plants - as the one of Renault, GM (Gravataí), VW-Audi, Land Rover.

We would like to discuss it in a deeper way, in order to better understand and to qualify such movement, because it is not homogeneous if one considers the supply chain as a whole, or even the first tier suppliers, due to issues like fixed cost, total logistical cost, inventories management and assembly flexibility. New logistical systems are arising, as the “milk run”: assemblers (like GM and Ford) hire logistical operators that pick up daily the components in the suppliers plants - a truck passes in several close suppliers, the system seeks to optimise total logistical cost without incurring in large inventories of the same component. The outline is being considered even for factories located in the States of Paraná (in the surroundings of Curitiba town) and Rio Grande do Sul (in the surroundings of Porto Alegre town), 500 and 1.300 km far away from the ABC region, respectively.

Modular consortium scheme made the VW truck plant in Resende world-wide known. As we will see ahead, VW doesn't have direct workers. Production operations are carried out by companies - called “modulists” – installed inside a VW building and specifically hired for that. But other auto companies study the modularization of at least some parts of its production - it is the case of Chrysler in Campo Largo (Paraná), a small operation for the assembly of 12.000 Dakotas per year; of GM in Gravataí (Rio Grande do Sul), in the Blue Macaw project, a mini-Corsa to concur with Ford Ka (120.000/year, perhaps 200.000 in the long run); and of VW-Audi in São José of Pinhais (Paraná), at least for some parts of the vehicle.

One must consider, however, the fact that the characteristics of passenger cars are different, from the point of view of its conception, design and
production, compared to trucks and vans, since the last ones have chassis. Seemingly, the modular consortium in car plants should be limited to areas like tapestry (seats, doors trimming and general coatings of the vehicle), dashboards, cooling system, exhaust system, bumpers, since at least part of the press shop, body assembly, painting, mechanics (power train) and final assembly continues being operated by the assembler.

If in a condominium part of the aggregation that happens in the assembly area (including the contiguous area to the main assembly of the assembler) is accomplished by the suppliers, in a consortium practically the whole assembly is accomplished by suppliers, with the implications in management (supplies, human resources etc.) and the risk of the business as will be discussed later on. Obviously there is the possibility of hybrid arrangements, with some suppliers installed in a condominium and other suppliers operating as in a consortium (like the GM Blue Macaw plan), but this situation must be analysed case by case. The considerations below involve a radical case, a “pure” modular consortium, in which suppliers do the whole assembly.

NEW FORMS OF RELATIONSHIP IN THE PRODUCTIVE CHAIN

To discuss changes and persistences in the relationship among assemblers and vendors, we have directly researched two assemblers in advanced apprenticeship of its plans related to new factories in Brazil: Mercedes-Benz (MBB) and Volkswagen. Mercedes, market leader in truck production in Brazil, is currently building its first factory of automobiles for the production of the A class in Juiz de Fora town, state of Minas Gerais. VW, market leader of passengers' automobiles in Brazil - position that has been threatened in the recent period by Fiat - built and already began to operate a truck and bus plant in Resende, state of Rio de Janeiro, in a “pure” modular consortium system.
Eight of the main suppliers of those companies were researched, through interviews with the high management (president, directors) and middle management (production managers, sales manager etc.), observations in the production, data gathering in class associations (industry associations and workers’ unions), published materials of the companies, pertinent literature and specialised publications. We took advantage of, as form of methodological control of the research, other researches accomplished individually by some of the authors of the present text, and of brief surveys in other assemblers - such like Renault, Honda, GM, Ford, Fiat and Chrysler-BMW - and other autoparts companies. We will discuss issues as the forms of contractual relationship; the importance of supplier’s origin of the capital; supply of subsystems; engineering activities and product design; logistics; and the economical and technological risk in the new arrangements.

Table 6. Productive Configuration of the Assemblers’ New Plants

<table>
<thead>
<tr>
<th>Assembler</th>
<th>System</th>
<th>Parts produced by the assembler</th>
<th>Suppliers in the condominium (proximity)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VW Resende</td>
<td>modular consortium</td>
<td>No direct production. 7 productive modules run by suppliers; internal logistics and maintenance by third parties.</td>
<td>8 firms: seats, painted plastic parts, tires assembly, exhausts, dashboards, wiring harness</td>
</tr>
<tr>
<td>Mercedes Juiz de Fora</td>
<td>industrial condominium</td>
<td>Body shop, painting, final assembly. Press shop and axles in the truck plant (São Bernardo); engine and gear box from Germany</td>
<td>in the surroundings: seats, axles, bumpers, wiring harness, fuel tanks, pressed parts</td>
</tr>
<tr>
<td>(A class)</td>
<td></td>
<td>Press, body and painting shops, final assembly, thermoplastics. Engine/mechanics from other VW plants in Mercosur (mainly São Bernardo and São Carlos - Brazil)</td>
<td></td>
</tr>
<tr>
<td>VW Taubaté</td>
<td>traditional with an incipient condominium</td>
<td>Press and body shop, painting, final assembly. Mechanics and pressed parts from Mercosur (mainly São Bernardo and São Carlos) and Germany</td>
<td>11 firms confirmed: seats, plastic parts, fuel system, axles, tires assembly, exhausts, lightning systems, cooling system, windscreen seats, tires assembly, axles, paint preparation, screws management</td>
</tr>
<tr>
<td>VW/Audi</td>
<td>condominium with some consortium</td>
<td>Press and body shop, painting. Mechanics from other plant (130km)</td>
<td>sheets cutting (blanks), pressed parts (partially), seats + trimming, dashboards, exhausts, steering system, plastics, windscreen, cooling in definition during the research: seats, cooling, pressed parts engines assembly, chassis - definitions are being taking</td>
</tr>
<tr>
<td>Ford São Bernardo</td>
<td>traditional with an incipient</td>
<td>Press and body shop, painting. Assembly from GM and suppliers (in consortium)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>condominium with some consortium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GM Gravataí</td>
<td>conventional</td>
<td>Press shop, body shop, painting. Assembly from GM and suppliers (in consortium)</td>
<td></td>
</tr>
<tr>
<td>Chrysler (jeeps)</td>
<td>partial consortium</td>
<td>Body shop, painting, final assembly. Mechanics from Mercosur and France</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assembly plant. Engines Detroit</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chassis in consortium (Dana)</td>
<td></td>
</tr>
</tbody>
</table>
Table 7. Forms of Relationship: proximity, co-design, contract definition

<table>
<thead>
<tr>
<th>Supplier</th>
<th>Product</th>
<th>Form of Relationship</th>
<th>Localisation Cost</th>
<th>Service</th>
<th>Local Engineering</th>
<th>Contract Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm 1</td>
<td>forged</td>
<td>assembles systems</td>
<td>1</td>
<td>2</td>
<td>medium</td>
<td>auction</td>
</tr>
<tr>
<td>Firm 2</td>
<td>electronics</td>
<td>sends parts to systems assembler</td>
<td>1</td>
<td>3</td>
<td>strong, with design</td>
<td>auction</td>
</tr>
<tr>
<td>Firm 3</td>
<td>seats</td>
<td>supplies systems assembler</td>
<td>2</td>
<td>2</td>
<td>strong, with design</td>
<td>auction</td>
</tr>
<tr>
<td>Firm 4</td>
<td>electronics</td>
<td>assembles systems; consortium</td>
<td>3</td>
<td>3</td>
<td>strong, co-designing new models</td>
<td>auction</td>
</tr>
<tr>
<td>Firm 5</td>
<td>plastics</td>
<td>assembles systems</td>
<td>2</td>
<td>2</td>
<td>weak</td>
<td>auction</td>
</tr>
<tr>
<td>Firm 6</td>
<td>clutches</td>
<td>conventional - JIT</td>
<td>2</td>
<td>2</td>
<td>strong, co-designing new models</td>
<td>auction</td>
</tr>
<tr>
<td>Firm 7</td>
<td>chassis</td>
<td>consortium</td>
<td>3</td>
<td>2</td>
<td>strong, with complete development and design (co-design) for adaptations</td>
<td>auction</td>
</tr>
<tr>
<td>Firm 8</td>
<td>seats</td>
<td>condominium - JIS</td>
<td>3</td>
<td>3</td>
<td></td>
<td>auction</td>
</tr>
</tbody>
</table>

Ob.: 1: not important; 2: important; 3: determining  JIS: just in sequence

Contract conditions: price wins, logistics is important, and strategic issues are determining

The decrease of import taxes for autoparts, determined by the government with its automotive policy established in the beginning of the 90’s, has allowed the assemblers to make use of alternative ways of supply. In this new environment, the main change is that in some cases it has been possible and, the most important, viable to purchase parts either from global or local suppliers.

At the same time, the assembly companies themselves have also been exposed, even if in a smaller degree, to external competition, with the reduction of import taxes for vehicles as well. It was necessary, then, to make changes in order to reduce costs at first and also to improve process and product quality. These changes have meant, to a large extent, the adoption of concepts based on the Japanese techniques of management, specially JIT and TQM.

Since an average of 60-70% of the costs in a vehicle are due to the parts and components, it is reasonable to figure out the assemblers looking for the least cost conditions when making a contract. Actually, in our research we found that this is almost a rule. Of course, quality is also an important condition, and issues such as technological background, previous relationship and the origin and amount of capital may bring a firm into the dispute, but none of these is the aspect that guarantees the contract.

In our interviews, all of the autoparts industries managers described the process of choosing a supplier as an “auction system” among local and global firms, based on FOB prices. At first, the assembler picks on some components makers that present a certain quality level – most of the times, this means possessing an ISO or QS 9000 or a VDA-6 certificate and, in some cases, having been evaluated by the assembler itself through a particular evaluation system. As we had said before, other aspects may contribute for a firm to be chosen in this first stage; sometimes this choice is made by the assembler’s engineering, based on characteristics as technological capacity, product
and process quality etc. After the assembler gives the candidates some information about the product they would be supposed to deliver and about the price the assembler considers as being a “reasonable” one, the auction begins. The candidates present their proposals, which are evaluated by the assembler. If the first given price was not reached, the assembler proposes another one, usually based on the least price presented by the candidates. The auction goes on until the price given by the assembler is reached, or until the assembler agrees with one of the prices proposed by the candidates. Sometimes, before deciding, the assembler demands from the candidates the cost sheet related to the specific product, in order to evaluate them.

Both local and global firms may participate in this process. Later we will discuss which are the advantages and disadvantages of being a local or a global firm in this context, and also the pros and cons of follow and global sourcing.

Once a contract is defined, other conditions arise in the discussion. The contract duration is one of them. Most of the contracts we have found refer to part lifetime, and not model lifetime, that is, the supplier must deliver parts to the assembler during all the lifetime of that component. This implies that if the part is changed, even the car model standing the same, there will be another auction to define the new supplier – the current supplier does not necessarily have any kind of preference during the negotiation, although sometimes this may occur, specially if there is a large amount of investments in tools involved in the trade.

Typically, the contracts establish a series of conditions referring to gains of productivity expected to be achieved by the suppliers. For example, some assemblers determine a decrease in the prices of the components on a rate of 1 to 2% per year. On the other hand, if there is any raise in the raw materials prices, the supplier may not include it in the price of its product. Also the delivery conditions are established in advance in the contracts. This subject is very important in a just-in-time or just-in-sequence organised production, which is the case in most of the assemblers all over the world and also in Brazil.

The contract specifies whose the responsibility for the delivery is, and so it specifies also who is to pay for the delays, if they happen. In most of the new contracts, the supplier is responsible to deliver the products – sometimes inside the assembler’s plant. Some assemblers prefer to deal with a “logistical operator” who is responsible to take the parts from the several autoparts producers and to deliver them in the correct quantities to the assembler.

As we have pointed out before, GM and Ford plants in Brazil, for instance, work in a “milk run” system: everyday, a truck from a logistical operator goes to the suppliers and takes the necessary parts according to the assembler’s schedule. This truck is supposed to deliver the components in the assembler’s plant. If the supplier does not have the necessary part at that right moment, it is its responsibility to deliver the part as soon as it can. And if this problem has provoked any additional cost to the assembler, it will be charged from the supplier.

To avoid such problems, sometimes the suppliers prefer to count on a significant inventory of finished products. Although it doesn’t exactly represent the JIT way of acting, it costs less than an eventual fine or, what is worse, the loss of the contract; it is a game based on the evaluation of the risk, the management of the risk.

Not all the suppliers participate in this “milk run” system. It depends on the distance and mainly on the size of the component; if a supplier fills a truck with its daily delivery, there’s no need for the milk run.

The contract conditions are also affected by strategic issues. For example, some assemblers have the policy of dealing with more than one supplier for a component. This gives the assembler more guarantees in case there is any problem with one of the suppliers, and is also a way of pressing the autoparts companies to decrease their prices – if one company can’t keep them down, the assembler can acquire the components from another company.

Follow and global sourcing
Many of the analysis related to the new forms of trading in the automotive supply chain tend to enhance the advantages of follow and/or global sourcing policies to the assemblers, no matter what components are to be provided. What we could observe in the companies we have studied is that both follow and global sourcing are not imperative
ways of supplying. They are not mutually excluding.

We have noticed that there are some issues that influence the choice between global, follow and the commons ways of supplying.

One of the most important aspects we should considerate when analysing the advantages of follow sourcing is the possibility of reducing or even eliminating the needs for testing and developing tools. This is a main issue, since it implies an investment that should be paid back in the long term and, consequently, defines the terms in which a contract is viable and also the probable costs and prices of the components. If the assembler finances the development of the tools it will try to recover that investment in the components prices, trying to reduce them. On the other hand, if a supplier develops the tool with its own resources, it will try to increase the prices to recover the capital. If there is no need to develop and/or test a tool or if the necessary investment had already been paid back abroad, the costs to produce the components in the new plant tend to decrease as well as the prices; also, having tested the tools before, the assemblers are able to reduce the time to market of the products, which is an important factor given the competitive environment where the companies are acting.

Even with the government policy for the automotive sector establishing low taxes for the imported components and allowing the assemblers to include a certain amount of imported parts in their vehicles, the follow sourcing policy seems to have some advantages over global sourcing. For components where the transportation costs represent a large amount in the total costs, global sourcing is almost impossible to be adopted, since it probably will not be viable. This is also true for components, which may suffer damages during transportation. When adopting follow sourcing, there are no risks to be taken concerning customs and transportation problems, so JIT and JIS systems can be implemented more easily. The proximity brought by the follow sourcing policy makes possible to develop a service relation between supplier and assembler; this subject will be discussed later.

From the first tier autoparts companies’ point of view, follow sourcing may be a good deal to the extent that it can mean expanding their operations into new markets. Transnational companies that operate with the assemblers overseas and are already operating in Brazil, for instance, may be in advantage; but this is not always true, since some suppliers have lost new contracts in Brazil although they supply in the original country.

We should notice once again that the prime criteria to choose a supplier is the lowest price presented by him, and not a previous relationship.

The research didn’t show us many contracts characterised as global sourcing ones. Actually, global sourcing is more a standard for discussing contract conditions rather than a trade relation in itself, that is, it is a possibility that is present during all negotiation processes, working as a way of comparing FOB/FOB prices, but in the end it hardly occurs, often due to its disadvantages in terms of JIT/ JIS and the volumes concerned. However, in some cases, when the components have a small degree of added value, the assemblers may import large quantities and are eventually willing to pay the costs of stocking them if the difference between the prices proposed by a supplier located in Brazil and by an overseas located one can justify such a policy. The local autoparts companies that operate in this segment are exactly those that are being moved for second or third level in the productive chain, starting to supply components of low added value to companies that join them in subsets of larger value, the first tiers.

An hypothesis to be verified is that this kind of negotiation, based on FOB/FOB price comparisons among firms located in several countries, may occur in the lower levels of the supply chain too, for instance, between the first (or second, third...) tier and its suppliers.

On the other hand, for “high tech” components which could not be produced in Brazil, due to lack of technological development, secrets, patents etc., global sourcing is adopted, but only if the overseas component producer is not interested, in any way, to establish facilities in the country otherwise follow sourcing is preferred by high volume (to say, over 100.000 vehicles/year) assemblers.

Proximity: distance matters, but proximity is also a service relation

It is quite easy to understand the importance of proximity between supplier and assembly plants if we considerate this subject in terms of JIT and JIS
systems. Especially in Brazil, where the logistical costs and risks are high, the physical proximity is an element of great value to reduce the costs. As the first tiers tend to deliver complete subsets, and not individual components, the logistical costs and risks tend to increase, therefore the proximity becomes more important.

However, beyond the question of cost reduction, there is another issue related to the proximity, which seems to be extremely valuable: what we could call the service relationship. Many of the managers we have interviewed have stressed the importance of being located near the assembler’s plant or having a resident engineer there due to service providing.

VW main plant (São Bernardo) is an excellent example: historically, almost 75% of its suppliers are located less than 50 km away from the plant, and nobody, including VW itself, considers this plant as a model of desirable relationship with suppliers. Thinking of this figure, we must consider that there is much more than physical proximity to characterise new forms of assemblers-suppliers “proximity”. More than the distance, the conditions of deliverance, service - problem solving, design adaptation, participation in the assemblers’ continuous improvement programs, understanding the assembler strategies and operational policies etc. are of utmost importance.

When suppliers are located next to the assembler’s plant, it is easier for them to act when there is any quality problem concerning the component in the assembly line. The same occurs when there is any change in the logistic system or in the schedule. So, to the assembler the proximity is mainly a way to decrease risks - deliverance problems, quality problems, general problem solving related to the supply. From the supplier’s point of view, the proximity represents a chance to improve the relationship with its client, which may lead to an adaptation of the component (or subset) design in order to solve some practical problems, or even co-design when developing new components for the local conditions. This co-design is desired because it may lead to cost reductions and general process improvements to the supplier, since it knows its production processes better than the assembler does; it is also an attempt to rise its added value, and its margin, by attempting to consider the subset as a black box. The proximity issue leads to curious situations. One of the firms we have visited is located only a few kilometres from one assembler which is its main client; the company delivers its product just-in-sequence and has never had a complain about quality or delivery from the client. Nevertheless, the supplier keeps a resident engineer in the assembler’s plant to give support to whatever may happen. In one of its manager’s own words, “the client feels better if there is someone there just in case something wrong occurs”.

On the other hand, some suppliers consider important to establish their plants near the assemblers because of the service relation even if their product typically does not suffer from transportation related problems; it is the case of a company that produces electronic automotive components, whose products have high added value and low volume. It could be located almost anywhere, but it does consider an important competitive advantage to be near the assembler’s headquarters and main plant, in order to maintain a frequent relation - new proposals, design etc.

Sometimes, however, it is not viable for the supplier to locate a dedicated plant near every assembler’s plant. This is true especially when the supplier production process involves a high amount of fixed costs. In this case, suppliers are following a strategy of concentrating the part of the process that demands more fixed capital in a main plant, leaving to the plants near the assemblers only the final processes, that is, the components assembly, inventories and the product delivery to the client. Most of the suppliers plants in recent and planned Brazilian industrial condominiums work like that.

The industrial condominium, along with the modular consortium, is a particular way of supplying in which the proximity is one key aspect. It is a system established in all the new car makers’ plants in Brazil, even in those that are still under construction. The industrial condominium is viable for some very specific suppliers: those that carry high logistical costs, low fixed capital or lack economies of scale, and those whose parts are important for diversifying the models (seats, bumpers, dashboards etc, depending on the model.)

For instance, Magneti Marelli has recently announced a new R$ 40 million plant located in Contagem, in the state of Minas Gerais, near the
Fiat assembler plant in Betim, which will produce exhausts and other components. The company is participating in MBB’s industrial condominium for the A-Class project, also located in Minas Gerais; Marelli is opening a R$ 1 million plant there. The plant in Contagem will probably supply the Fiat plant in Betim and also the plant in the condominium, that is, in the later plant Marelli probably will only assemble the components produced by the main plant. This strategy, which seem to be a tendency, aims to invest as little amount of capital as it is possible to the dedicated plant in the condominium, investing more in the main plant, that has more customers.

Design & co-design: Brazil as a peripheral design center for some assemblers or only as an operational center?

The areas related to design of new models for cars and components have suffered many and deep changes during the last years. The autoparts industry had been, for a long time, an important engineering center in Brazil, where new products and processes were constantly developed.

This situation has changed with “globalisation”. The concept of “world car” has been a guideline for the design of new models for most of the assemblers. In terms of design and tools development costs, a world model tends to be much cheaper, since the scale of production is larger; the time to market in the countries the model is to be launched is also lower. Having a world car, the automakers have the possibility to centralise its design, preferring to deal with the autoparts companies established in their own country or region, making it difficult for Brazilian suppliers to suggest improvements in parts design. So, we can observe a shift in the power from local to global suppliers with strong links with the automaker headquarters.

In many of the interviews we have made, we could hear from the managers the following statement: “there will be no development to be made by the Brazilian firms or branches of transnational companies, either assemblers or suppliers. The Brazilian engineering will only make adaptations to local conditions in some of the parts”. But even these adaptations only occur in some cases. For instance, Mercedes Benz has made itself the necessary changes in the A Class that will be produced in Brazil; even the Mercedes’ Brazilian branch was not allowed to make adaptations.

When the suppliers in Brazil are subsidiaries of transnational companies, it is easier for them to make suggestions on the component through their headquarters. They work in a “triangle system”: their suggestions are sent to the headquarters, and the later negotiate them with the assembler.

The existence of co-design also depends on the component. As a general rule, parts with high added value and/or high technical requirements are co-designed, either between the headquarters or in the triangle system, while components that don’t fit the former characteristics are totally designed by the assembler. The component producer may only develop its production process. This may mean that, in the long term, Brazil and other developing or non-developed countries will work as operational branches of the transnational companies, while the strategic and development centers will be located in their headquarters.

On the other hand, in a totally opposed way, we can find some new projects that have strong participation of local suppliers; for instance, Fiat’s Palio model and, mainly, GM’s “Blue Macaw” (a small Corsa) model. Both models were or are being partially designed in Brazil with local suppliers, either having Brazilian or foreign capital. One of the inferences we can make from these cases is that the assemblers are taking advantage of the Brazilian tradition and competencies in engineering in order to make the country a peripheral center of adaptation for models specifically designed to explore niche markets and some characteristics of developing countries, which present structural deficiencies that may affect the performance of the vehicle, for example, roads in bad conditions. Anyway, the headquarters always straight supervise the projects.

The Brazilian design tradition has a history of taking advantage of a closed market to reduce investments for new models launching. For instance, VW, the assembler with more tradition of Brazilian design, first launched the Gol model in middle 70’s, based on a Polo platform, redesigned to be equipped with the old Beetle mechanics (air cooled engine, gearbox etc.). The model was not successful - some analysts consider it had some important deficiencies, like the lack of engine power due the weight of the vehicle, a small area
for luggage in comparison with its the external
measures etc. GM launched the Chevette model
(the old small Kadett), with an water cooled engine
transversally assembled, front transmission etc.
Afterwards, VW adapted the Gol for a water
cooled engine, although vertically assembled. It
was only after the water cooled engine that the Gol
became the largest selling vehicle in Brazil.

The attempt to take advantage of local facilities
aiming to reduce investments was not only a VW
prerogative. For instance GM, hearing the
consumers that had claimed for more torque,
changed the Omega engine from the made in
German 3.0 to the made in Brazil 4.1, actually a
redesign of an old Opala (Opel Rekord) engine.

Because of niche market, Fiat, Ford, GM and
VW have adapted a platform for versions unknown
abroad. Fiat adapted the Uno to a small pick up
also exported to Europe (Fiorino); Ford locally
designed a pick up version (“Courier”) of the
Fiesta; GM designed locally some versions of the
Corsa: pick up, sedan and station wagon (exported
to Europe); VW, upon the old Gol platform, has
designed a complete family: sedan, station wagon,
pick up, hatchback.

Adaptation was another important design
activity. With the growth of popular cars demand
(enigines up to 1.0 cc), GM, Ford, VW have
adapted their bigger engines to 1.0 (Fiat already
had a 1.0 engine). The same one can say to alcohol
as fuel, suspensions etc.

Nevertheless, the centralising tendency we
former described, in terms of design concerning
mainly VW, Ford (apart from the Fiesta pick up)
and the newcomers (Mercedes cars, Renault etc.)
also affects the choice of the suppliers and leads to
the following question: in the long term, is this
policy positive for the development of the
assemblers’ business or will it lead to slow and
inefficient strategic decisions related to their
subsidiaries? For instance, if VW really decides to
centralise designs activities in German, will the
company be able to realise market opportunities,
design and launch a model derived from an
existing platform in a short delay? Is the policy of
most assemblers to prohibit design adaptations in
components sustainable in the long run if a
concurent is able to reduce costs by local
adaptation?

All this discussion leads us to consider some
hypothesis to the future, based in the
contradictions of the present:
1. The country would be transformed in a
productive center, with design activities
concentrated abroad. Some local adaptation
would be permitted, but only minor ones. This
would largely affect Brazilian located suppliers,
with virtually no design activities. If one looks
at the future VW Golf and PQ-24 launches, at
the Mercedes A-Class, at the Ford Fiesta and
Ka launches, one could take this hypothesis
seriously.

2. There would be a transition period. The
companies with design activities in Brazil
would slowly transfer them to their main design
centers. This could be mainly VW case even in
trucks if the company confirms the buying of
Scania, but also of GM and Fiat, that could take
advantage of some local expertise to design
some models (“Blue Macaw” and a range of
Corsa models, and the Palio family) but, with
the increase of the opening of the market and
with the ease to establish computer networks
and to travel overseas, local competencies
could be carried out to the main headquarters
centralising design activities.

3. As far as Brazilian market and industry became
very important in the companies’ strategies,
considering scale economies, niche markets,
agility to local adaptations (that sometimes
means adaptation to a large number of countries
- Argentina and South/Central America, Russia,
Turkey etc.), and local design competencies
and facilities with low wages, one could think
of Brazil as a peripheral design center,
subordinated to the main center, but with
specific tasks and decision making. GM and
Fiat cases could lead to this scenario, as well as
VW if the company decides to maintain its
Brazilian design center (partially already
transferred to trucks activities).

4. Maybe the future will be a combination of these
hypothesis, but the hegemony is not clear yet.
And maybe there will be important differences
among companies. Brazilian situation is quite
complex, it is not easy to say “bye bye design”
or to say “designed in Brazil”.

All this discussion leads us to consider some
hypothesis to the future, based in the
contradictions of the present:
1. The country would be transformed in a
productive center, with design activities
concentrated abroad. Some local adaptation
would be permitted, but only minor ones. This
would largely affect Brazilian located suppliers,
with virtually no design activities. If one looks
at the future VW Golf and PQ-24 launches, at
the Mercedes A-Class, at the Ford Fiesta and
Ka launches, one could take this hypothesis
seriously.

2. There would be a transition period. The
companies with design activities in Brazil
would slowly transfer them to their main design
centers. This could be mainly VW case even in
trucks if the company confirms the buying of
Scania, but also of GM and Fiat, that could take
advantage of some local expertise to design
some models (“Blue Macaw” and a range of
Corsa models, and the Palio family) but, with
the increase of the opening of the market and
with the ease to establish computer networks
and to travel overseas, local competencies
could be carried out to the main headquarters
centralising design activities.

3. As far as Brazilian market and industry became
very important in the companies’ strategies,
considering scale economies, niche markets,
agility to local adaptations (that sometimes
means adaptation to a large number of countries
- Argentina and South/Central America, Russia,
Turkey etc.), and local design competencies
and facilities with low wages, one could think
of Brazil as a peripheral design center,
subordinated to the main center, but with
specific tasks and decision making. GM and
Fiat cases could lead to this scenario, as well as
VW if the company decides to maintain its
Brazilian design center (partially already
transferred to trucks activities).

4. Maybe the future will be a combination of these
hypothesis, but the hegemony is not clear yet.
And maybe there will be important differences
among companies. Brazilian situation is quite
complex, it is not easy to say “bye bye design”
or to say “designed in Brazil”.

All this discussion leads us to consider some
hypothesis to the future, based in the
contradictions of the present:
1. The country would be transformed in a
productive center, with design activities
concentrated abroad. Some local adaptation
would be permitted, but only minor ones. This
would largely affect Brazilian located suppliers,
with virtually no design activities. If one looks
at the future VW Golf and PQ-24 launches, at
the Mercedes A-Class, at the Ford Fiesta and
Ka launches, one could take this hypothesis
seriously.

2. There would be a transition period. The
companies with design activities in Brazil
would slowly transfer them to their main design
centers. This could be mainly VW case even in
trucks if the company confirms the buying of
Scania, but also of GM and Fiat, that could take
advantage of some local expertise to design
some models (“Blue Macaw” and a range of
Corsa models, and the Palio family) but, with
the increase of the opening of the market and
with the ease to establish computer networks
and to travel overseas, local competencies
could be carried out to the main headquarters
centralising design activities.

3. As far as Brazilian market and industry became
very important in the companies’ strategies,
considering scale economies, niche markets,
agility to local adaptations (that sometimes
means adaptation to a large number of countries
- Argentina and South/Central America, Russia,
Turkey etc.), and local design competencies
and facilities with low wages, one could think
of Brazil as a peripheral design center,
subordinated to the main center, but with
specific tasks and decision making. GM and
Fiat cases could lead to this scenario, as well as
VW if the company decides to maintain its
Brazilian design center (partially already
transferred to trucks activities).

4. Maybe the future will be a combination of these
hypothesis, but the hegemony is not clear yet.
And maybe there will be important differences
among companies. Brazilian situation is quite
complex, it is not easy to say “bye bye design”
or to say “designed in Brazil”.

THE BUSINESS RISK ADMINISTRATION

The risk of the business is one of the components that have been little considered in the current analyses of new relationship forms among the companies of the automotive supply chain. We are watching a process of redefining the borders of the business that compose the sector, that is materialised in redefining the risk-return relation. From the initial processes of outsourcing to the modular consortium system, going by the sharing in the development of engineering and technology function – the co-design and simultaneous engineering – by the redefining of responsibility for the tool development, by the shift in responsibility by the transport and logistics costs as a whole, a lot is changing, redefining the limits of the business.

The modular consortium, as commented previously, indicates a clear shift of risks from the assembler to its partners, since part of the investments is made by the later and is linked to the specific business of the assembler. On the other hand, the industrial condominiums, the location of supplier plants close to the assembly plants, the follow sourcing, the supply of first line subsets, all of this imply investments that are very directly associate to the assembler’s business. If the assembler performances well in the market, all the suppliers tends to do it, but the inverse is also true, unlike the classic situation in that the plant supplier had larger autonomy to supply for different customers, to manage its production mix etc.

In the modular consortium system there is also a technological risk: can an automobile company run its business in the long run without the direct experience of production? What about the risks of loosing some core product and process design secrets to the suppliers, that could utilise it to supply another company or to develop a new version of the vehicle, rising their power to negotiate with the assembler?

Another aspect of the same subject already referred is the process of constitution of autoparts business which are controlled by the assemblers. When the former starts supplying for concurrent assemblers, the later takes a risk related to the heart of its business: the technological domain and the logistics of components of high added value and which are fundamental for the product. The risk of the assembler tends to be compensated by smaller prices, in those cases. That is, however, a hypothesis of difficult confirmation, since data of costs and pricing are not available.

Finally, it is necessary to stand out that the capacity to maintain constant and regular supply, without default risk, is pointed by all the interviewed as more and more critic, what reinforces the tendency of advantages for the first tiers located near the assembler’s site. The default risk is another element that should weigh in the prices and also in the duration of the contracts.

Mario-Sergio SALERNO, Mauro ZILBOVICIUS, Glauco ARBIX and Ana Valeria CARNEIRO DIAS
BIBLIOGRAPHY

Anfavea, *Boletim Anfavea*, several numbers.


________ , *Brazilian automotive industry main information*. São Bernardo, outubro 1997. (mimeo)


Salerno Mario Sergio, Zilbovicius Mauro, Arbix Glauco, Dias Ana Valéria C., *Mudanças e persistências no padrão de relações entre montadoras e autopeças no Brasil: proximidade, global e follow sourcing, parcerias e co-design revisitados*, São Paulo, Escola Politécnica da Universidade de São Paulo, Departamento de Engenharia de Produção, 1998. 163 p. (research report to the Institut Arbeit und Technik - Gelsenkirchen, Germany project on German assemblers and suppliers relationship)

