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**THE COST OF A STRUCTURAL CHANGE: A LARGE AUTOMOBILE PLANT IN A  
BRAZILIAN LESS DEVELOPED REGION**

by

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**The Cost of a Structural Change:  
A Large Automobile Plant in a Brazilian Less Developed Region**

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## **The Cost of a Structural Change: A Large Automobile Plant in a Brazilian Less Developed Region**

**Abstract.** The aim of this paper is to evaluate the costs and benefits associated with the establishment of a large automobile plant in the Brazilian state of Bahia, located in one of the poorest macro-regions of the country. It is argued that behind Ford's decision to establish a plant far from the economic center of the country are not only the large incentives package offered at the Federal and State levels, but also the 1999 Southern Common Market (Mercosur) crisis, and the global strategies of the company. The incentive package given to Ford at the state level is estimated in about R\$ 2.642 billion, or 75% of the total investment. Although high in absolute terms, when the total incentives are divided by the investment, they seem to be similar to the incentives given by other Brazilian states to automobile assemblers in the 1990s. It is shown that the largest part of the incentives is due to tax breaks, which represent more than three quarters of their total value. Despite the large absolute number of jobs created by the assembler and first tier suppliers, it is argued that the main benefit associated with the project is a likely (but uncertain) structural change in the state economy, as a result of the backward and forward linkages to be created. The strength of these linkages, however, depend upon the success of the project itself, and the state government, actually, has little control over this issue.

**Key words:** fiscal war / fiscal incentives / territorial competition / automobile industry / regional development / Bahia (Brazil) / Ford Motor Company.

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In June 1999, Ford Motor Company announced the Brazilian state of Bahia site selection for a US\$ 1.9 billion automobile plant investment<sup>1</sup>. It was the largest one made in a single automobile plant so far in the country, and because of the strong competition among Brazilian states for new investments, much attention has been carried to this project. The plant was the first large scale automobile factory outside the Southern and Southeastern Regions of Brazil, which together concentrate about three quarters of Brazilian GDP<sup>2</sup>. In contrast, the state chosen by Ford Motor Company is located in one of the poorest macro-regions of the country, and positioned around 1,250 miles away from São Paulo, Brazilian's economic center. Ford Motor Company announced its decision a few months after having given up on installing a plant in the Brazilian southernmost state (Rio Grande do Sul), strategically located between São Paulo and Buenos Aires, and after a severe competition among Brazilian states for the investment.

Both federal and state incentives have been given to Ford Motor Company in order to attract the plant to Bahia. This incentives package was object of large discussions and became a symbol of the territorial competition among Brazilian states for new investments in the 1990s. The opponents to the incentives package argued that it not only broke economic rationality, but also created unnecessary fiscal costs to the federal and state governments (Rodríguez-Pose and Arbix, 2001). On the other hand, some authors suggest that the attraction of new investments can generate positive spillovers and increase local welfare (Greenstone and Moretti, 2003). As a consequence of these last visions, incentives might be a useful tool to promote economic growth and correct market failures that cause territorial inequalities.

In any case, tax incentives historically had been a major policy instrument to attract private investments and promote regional distribution of income in Brazil (Baer, 2001, p. 341-2), a country widely known by its strong territorial inequalities. Besides, the state and local governments have assumed, over the past years, a greater responsibility for economic development in several countries (Greenstone and Moretti, 2003). This is particularly true for Brazil after the promulgation of the new Constitution, in 1988, which endowed states with greater flexibility to deal with fiscal policy and investment attraction.

Considering all these features, a case-study about the installation of a large automobile plant in a Brazilian less developed region during a period marked by strong territorial competition for new investments can enlighten the discussion about location decisions of the firms and the externalities likely to result of their operation. Despite the close attention paid both to Ford Motor Company's investment and to the associated incentives package, the costs and benefits of the project at the state level have not yet been evaluated. This work tries to face this challenge, addressing two main interrelated questions: the factors behind Ford Motor Company's location decision and the impacts of the project on the state economy. The approach adopted is chiefly qualitative, as many aspects associated with these questions are subjective. Nevertheless, the present value of the incentives package given to the company was estimated, and the main benefits associated with the project were widely discussed. An effort towards a measure as

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<sup>1</sup> This amount was equivalent to R\$ 3.515 billion at the time the investment was made, according to official information.

<sup>2</sup> Data about Brazilian states GDP can be found in the web page of the Brazilian Institute of Geography and Statistic (<http://www.ibge.gov.br>).

concrete as possible of the costs and benefits of such a large investment from the state point of view has certainly not only academic purposes, but can also help policy makers and citizens, in a broader sense, to understand and improve their action to promote economic development.

Besides this introduction, this paper is structured in six more sections. Section 2 briefly outlines the main trends and location patterns of the automobile industry. In this section, the role of the emerging markets as a target for new investments is also discussed. Based upon this background, Section 3 discusses the automotive industry and its location patterns in Brazil in the 1990s. In the following section, Ford Project in Bahia is presented, focusing particularly the reasons behind the firm's decision to establish a plant far from Brazilian and Mercosur<sup>3</sup> economic centers. In Section 5, the present value of the incentives package given to the company is calculated and compared to similar incentives provided by other Brazilian states to new automobile plants in the 1990s. Section 6, by its turn, discusses the economic benefits the project can bring about to the state. Finally, the main conclusions of this paper are presented in Section 7.

## 2 The Automobile Industry

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### 2.1 Structural Changes

It is widely recognized that the automobile industry underwent significant structural changes from the 1980s on, as a result both of the microelectronic revolution and of changes in global regulation patterns. In fact, innovative techniques of management and production, higher volumes of international trade, new models of labor regulation and the increasing levels of productivity of Japanese producers brought about deep changes in the automobile industry throughout that period. In spite of the diversity of trajectories followed and industrial models established, companies all over the world have been influenced by the lean production patterns described by Womack, Jones and Ross (1990). In a broad sense, the switch from mass to lean production was characterized by the following changes:

- Single purpose machines were progressively replaced by integrated, flexible and automated machines that benefited from the advances in the microelectronic industry. These capital goods not only became less expensive from the 1980s on, but were also required to allow the manufacture of a larger mix of products, in order to face the developed countries saturated markets (product differentiation strategy).
- Labor requirements switched from semi-unskilled to multi-skilled workers able to operate more complex and flexible machines. As a consequence of the increasing productivity, a significant reduction of the total number of jobs in the assembling sector could be noticed. Although this cutback has sometimes been compensated by a growth in the components and service sectors, the precarious nature of the new posts created, the low levels of remuneration and the lack of collective bargaining may have led, in total, to a decrease in worker's real wage (Freyssenet and Lung, 2000, p. 79).
- The traditional vertical relationship between assemblers and suppliers was replaced by a large number of different arrangements including quasi-independent suppliers progressively involved with the development of parts and components. Some of these schemes evolve, in

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<sup>3</sup> The Southern Common Market involving Brazil, Argentina, Paraguay and Uruguay.

the 1990s, to experiments such as the creation of modular supply<sup>4</sup> and the formation of industrial condominiums<sup>5</sup>, the currently vanguard of innovation in assembler-supplier relations.

- Low stocks and just in time supplying requirements contrasted with the patterns established until that moment, impacting on the traditional relationship between assemblers and suppliers.

These new arrangements require, in addition to physical proximity between assemblers and suppliers, interactions that imply the transfer of some activities to the suppliers, and the increase in service content associated with manufacturing work. Although modular supplying increases the importance of transportation costs and synchronization of production, not all components suppliers must necessarily be positioned close to the assembler. Some parts, which diverge insignificantly between vehicles, can, for that very reason, be produced at a centralized place, especially if they benefit from scale economies greater than the ones that can be achieved by just one plant. In this case, just in time delivery can be managed from decentralized warehouses (Humphrey and Salerno, 2000, p. 161).

## 2.2 Location Patterns in the Automobile Industry in the 1990s

The structural changes described above strongly affected the location patterns followed by assemblers and suppliers in the 1990s. In addition, market stagnation in the industrialized countries contrasted with the potential of the developing countries, compelling firms to relocate. Indeed, developed countries had very low inhabitant per car ratios, especially when compared to those presented by the promising markets of Latin America: according to Anfavea (2003), in 2000, these ratios were 1.2 in US and less than 2.0 in Canada, Italy, Japan, Germany, Spain and France, while in Brazil, Chile, Mexico and Argentina, on the other hand, they reached, respectively, 8.8, 7.4, 6.6, and 5.5<sup>6</sup>. In some cases, emerging markets also provided opportunities to cut costs, increase productivity and test innovative methods of production and organizational schemes<sup>7</sup>. As a result, as pointed out by Freyssenet and Lung (2000, p. 72), “if the challenge facing automobile producers in the 1980s was how to change their industrial model, that of the 1990s [was] how to reorganize internationally”.

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<sup>4</sup> The modularization concept is strongly related to the idea of communalizing platforms and standardizing designs at the global level (Humphrey and Salerno, 2000, p. 149). The automobile assembler, in this case, is supposed to work with the same first-tier suppliers at several locations around the world, setting-up strategies referred to as follow design (which means the use of the same design as much as possible across different markets) and follow sourcing (which means the use of one single supplier for a specific part or system across all markets where it is needed).

<sup>5</sup> As defined by Humphrey and Salerno (2000, p. 158), an industrial condominium is formed when the assemblers set the facilities of the main suppliers surrounding its factory. The assembler, in such arrangements, defines which part or modules will be produced, chooses the supplier, and stipulates that they must construct dedicated plants. As they perform in the same site and build up mutual dependency relationships, in a kind of hierarchical network, the assembler plans all the supplier facilities as part of the plant development strategy.

<sup>6</sup> Rodríguez-Pose and Arbix (2001, p. 139) had already stressed this point based on 1996 data.

<sup>7</sup> The relative fragility of trade unions and the higher degree of flexibility presented by the governance structures seemed to offer an opportunity to experiment original projects, simultaneously preserving the structure in the developed countries and avoiding huge and irreparable damages.

Although the organizational and productive arrangements, as well as the degree of economic and spatial integration, depend on each company's trajectory, there seems to have been a common strategy shared by the main automobile assemblers in the last decade. As a general rule, developing countries increased their relevance as strategic markets and were particularly responsible for the production of small cars, small utility vans and small engines. For these products, wages represent a relatively higher proportion of the total value, and prices seem to be the main competitive factor (Layan, 2000, p. 135). As a consequence, profit margins are usually lower and low-cost production is required.

The emerging markets, however, are not homogeneous and can be segmented, according to Humphrey and Oeter (2000), in three main categories:

- Protected autonomous markets, as China and India, which continued to provide extensive protection to the domestic industry;
- Integrated peripheral markets, as Mexico and Central Europe, which are located close to industrialized countries like Canada, United States and Eastern Europe; and
- Emerging regional markets that integrate emerging countries in one region. That is the case of Brazil, which is part of Mercosur, and the countries that form the Association of Southeast Asian Nations (ASEAN).

In the third group of countries, a Foreign Direct Investment (FDI) friendly environment in the 1990s resulted from trade liberalization and, in the case of most Latin American countries, from the shift from import-substitution to export oriented economies. In fact, if in the 1950s and 1960s the import-substitution policies managed to attract investments that aimed to take advantage of higher profits in the Latin America protected markets<sup>8</sup>, in the 1990s, when worldwide integration was required, openness and FDI seemed to be highly correlated, especially in the case of the automobile industry. Besides, the possibility of exploring larger markets and, at the same time, benefit from a regional division of labor certainly contributed to attract new investments to these freshly integrated countries. However, there remain many uncertainties surrounding the emerging regional markets that have to be taken into consideration. According to Humphrey and Oeter (2000, p. 64), the main question for the countries in Mercosur, for instance, is whether they can maintain regional spaces as a block and whether such spaces would give rise to industries efficient enough to survive in a more exposed global automotive market.

If a trend towards the emerging markets can be identified in the 1990s, the same cannot be said about the location choices inside countries with a large territorial extension, like the United States or Brazil. Usually, just in time system for delivery of components and parts, progressively adopted by the main automobile companies, requires suppliers and assemblers to be close to each other. This is especially true for the first tier suppliers, which are increasingly operating close to the assemblers. In many cases, even the boundaries between suppliers and assembling plants are no longer apparent<sup>9</sup>. However, the proximity requirements may bring about two opposite location patterns from the assembler's point of view. In the first one, assemblers could select sites near previously established suppliers, and, as a consequence, new plants would tend to agglomerate in traditional locations. Many cases described by Rubenstein (1986) and Klier

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<sup>8</sup> This is, essentially, the argument of Shapiro (1994) and Addis (1999) for the Brazilian case.

<sup>9</sup> This is the case of the modular assembly and industrial condominiums described above.

(1998) seem to fit this pattern<sup>10</sup>. Ó hUallacháin and Wasserman (1999) argue that vertical integration and scale economies still play an important role in flexible production systems. As a result, assemblers might prefer locations close to existing suppliers. In the second possibility, on the other hand, new suppliers may tend to follow assemblers to the site they have selected. In these circumstances, assemblers' mobility increases and new investments are not necessarily directed to the traditional locations. This seems to be the case of countries where previously established suppliers do not match the assembler's quality and scale requirements, and to fit the patterns observed in Brazil in the 1990s.

As a final point, it is worthwhile to keep in mind that the assembling companies do not necessarily make a definitive, synoptic, and ex-ante selection of a product development strategy and the correspondent location decision. Agreeing with Sugiyama and Fugimoto (2000, p. 183), one could say that it seems more appropriate to think that the choices were accomplished through successive rounds of decision-making, as many uncertain factors should be reevaluated and reconsidered over the time. This assumption is particularly important for the emergent markets, not only because of the higher risks involved in their development path, but also because they can be used as experimental laboratories for organizational, commercial, and productive innovative formats.

### 3 The Automobile Industry in Brazil

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#### 3.1 A Brief View of the 1990s

After a period of high inflation and low growth rates in the 1980s and early 1990s, when the pace of investments in the automobile industry could be considered low, a large amount of Foreign Direct Investment (FDI) of assembling companies flowed to Brazil. As a result, between 1995 and 2001, the total investments made in the automobile industry in the country reached US\$ 14 billion (Anfavea, 2003). These investments supported the restructuring of existing plants, as well as the building of new ones, using modern and advanced technologies. Domestic vehicle production rose from slightly above 900 thousand units in 1990 to about 1,800 thousand in the early 2000s<sup>11</sup>, while the total employment, in the same interval, fell from more than 117 thousand to roughly 82 thousand, on account of the increasing productivity observed. In fact, on average, a single worker produced, in 2002, about 2.8 times the production due to one employee in 1990, as shown in Table 1 below:

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<sup>10</sup> Both Rubenstein (1986) and Klier (1998) argue that the reduced output per model (as a consequence of the proliferation of car and trucks models) created an incentive to concentrate the production of each model in a single plant and contributed to reinforce the concentration of US automobile industry the Midwest region.

<sup>11</sup> That includes cars, light commercials and heavy commercials. Most of this growth is due to car production.

**Table 1: Automobile Industry: Vehicle Production and Employment in Brazil**

Year	Vehicles Production			Employment	Vehicle / Employee	
	Car	Light Commercials	Heavy Commercials			Total
1990	663,084	184,754	66,628	914,466	117,396	7.8
1991	705,303	182,609	72,307	960,219	109,428	8.8
1992	815,959	201,591	56,311	1,073,861	105,664	10.2
1993	1,100,278	224,387	66,770	1,391,435	106,738	13.0
1994	1,248,773	251,044	81,572	1,581,389	107,134	14.8
1995	1,297,467	239,399	92,142	1,629,008	104,614	15.6
1996	1,458,576	279,697	66,055	1,804,328	101,857	17.7
1997	1,677,858	306,545	85,300	2,069,703	104,941	19.7
1998	1,254,016	247,044	85,231	1,586,291	83,049	19.1
1999	1,109,509	176,994	70,211	1,356,714	85,100	15.9
2000	1,361,721	235,161	94,358	1,691,240	89,134	19.0
2001	1,501,586	214,936	100,594	1,817,116	84,834	21.4
2002	1,521,431	180,030	91,199	1,792,660	82,050	21.8

Source: Anfavea (2003).

A number of factors contributed to this scenario of visible growth of investments and productivity indexes. First, the solid expansion of vehicles sales in the emerging countries, along with good perspectives for the future, led to a “scramble for position” among car manufacturers (Humphrey and Salerno, 2000, p. 153). In the early 1990s, when its population was approaching 150 million inhabitants, Brazil seemed to offer a huge market with a very low level of car ownership in comparison with markets in North America, Europe, Japan, and even some Latin American countries, as Argentina, Chile, and Mexico. The Brazilian level of car ownership became especially attractive to FDI in the automobile sector after the monetary stabilization that occurred in 1994, when the Real Plan was launched. Indeed, following more than a decade of inconstant and low GDP growth rates, and after the failure of a sundry of monetary stabilization plans, Brazil’s GDP growth prospects became very optimistic, as the inflation rates seemed to be under control.

Other factors the companies took into account were the low production costs and the opportunities for testing new approaches of production and work offered by the emerging markets. In fact, the relative weakness of the Trade Unions, the lower remuneration levels and, in a certain way, the straightforward processes of introducing new manufacturing styles played an important role in the attraction of FDI to countries like Brazil (Humphrey, Lecler and Salerno, 2000, p. 1).

Trade liberalization was an additional aspect that contributed to foster investments in Brazil in the 1990s, not only because it allowed firms to set up their international supplying and sales arrangements in a more efficient way, but also because it created an FDI-friendly environment. The reduction of external tariffs on assembled passenger’s cars to 20% by 1994, along with the revival of domestic demand (Humphrey and Oeter, 2000, p. 56), led, though, to successive trade deficits in vehicles and components (Table 2), and the Brazilian government, in 1995, decided to raise import duties up to 70%. These taxes functioned as an additional incentive to automobile

FDI, because they could fall to 35% for companies assembling in the country. Besides, these companies could also benefit from a reduction in tariffs on imported components. As a result, even after the trade liberalization wave, the car-manufacturing sector in Brazil remained highly regulated and protected. Not surprisingly, Brazil became one of the favorite investment targets in the world, and, according to Baer (2001, p. 257), 32,4% of investment intentions of multinationals in the manufacturing sector in the country were directed to the automobile industry.

The regional integration process resulting from the creation of Mercosur also encouraged the rush of FDI observed. The removal of import duties on transactions established among Brazil, Argentina, Paraguay and Uruguay was launched in 1991 by the Asuncion Treaty, and, in 1995, a common external tariff applying to 85% of total trade was instituted. The investments in the automobile sector could, then, benefit from larger markets (Baer, 2001, p. 212, 255 and 260) and from complementarily supplying, and Brazilian production came to a competitive scale. However, as discussed by Baer, Cavalcanti and Silva (2002, p. 271), although “trade integration in Mercosur has undeniably increased since the Asuncion Treaty”, the lack of macroeconomic policy coordination among the participants of the block, especially with regard to the exchange rates, brought about a bunch of trade protection measures and produced a tense atmosphere, especially between the two main partners, Brazil and Argentina. After the devaluation of the Brazilian currency, in the beginning of 1999, the disagreements turned into a really problematical issue, imposing to the Argentinean motor industry a quite disadvantageous position. This situation allowed some authors to affirm that, as Humphrey and Oeter (2000, p. 59) did, “a free market in automotive products within Mercosur is still some distance away”<sup>12</sup>. To clarify this assertion, which is crucial for the comprehension of some hypotheses admitted in this paper, it seems opportune, before discussing the location patterns of the automobile industry in Brazil, to take a look at the evolution of Brazilian automotive trade during the last years, focusing also on the share of Mercosur in these commercial flows (Table 2).

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<sup>12</sup> It is interesting to stress that the same authors admitted that a “considerable and effective integration of auto industries of Argentina and Brazil was achieved by 1998” (Humphrey and Oeter, 2000, p.2), which strongly indicates that some important changes occurred.

**Table 2: Brazilian Automotive Trade , 1989-2003 (US\$ Million)**

	Exports (1)			Imports (2)			Trade Balance	
	Total	Mercosur	%	Total	Mercosur	%	Total	Mercosur
1989	1,506	79	5.2%	6	-	0.0%	1,500	79
1990	929	76	8.2%	34	0	0.2%	895	76
1991	871	227	26.1%	198	36	18.4%	673	191
1992	1,631	699	42.9%	339	105	30.8%	1,292	595
1993	1,432	614	42.9%	879	233	26.5%	553	381
1994	1,414	600	42.5%	1,841	306	16.6%	(427)	295
1995	1,075	434	40.4%	3,898	586	15.0%	(2,823)	(152)
1996	1,249	717	57.5%	2,109	1,032	48.9%	(860)	(315)
1997	2,494	1,296	52.0%	3,397	1,970	58.0%	(903)	(674)
1998	2,831	1,382	48.8%	3,812	2,386	62.6%	(980)	(1,004)
1999	1,893	703	37.2%	1,790	1,083	60.5%	103	(380)
2000	2,590	780	30.1%	1,893	1,156	61.1%	697	(376)
2001	2,588	465	18.0%	2,015	1,297	64.4%	573	(832)
2002	2,569	187	7.3%	1,104	643	58.2%	1,465	(456)
2003 (3)	2,033	344	16.9%	569	287	50.5%	1,464	57

Note 1: Exports: preliminary data subject to adjustment from 1999 on.

Note 2: Imports: preliminary data subject to adjustment from 1997 on.

Note 3: Jan/Aug.

Source: Ministério do Desenvolvimento, Indústria e Comércio Exterior (MDIC) / Secretaria de Comércio Exterior (SECEX) / Sistema de Análise das Informações de Comércio Exterior (ALICE)

Between 1991 and 1993, when the Brazilian currency was undervalued, and the Argentinean Peso was already pegged to the US Dollar, both total and Mercosur trade balances were favorable to Brazil. In the period between 1994 and 1998, conversely, the Brazilian Real significantly appreciated against the US Dollar and, consequently, against the Argentinean Peso. Not surprisingly, Brazil had successive trade deficits throughout this period, both in total and in Mercosur trade balances. The devaluation of the Brazilian currency in 1999 once again changed the signal of the total trade balance, as a consequence of an expressive fall in total imports (over 50% between 1998 and 1999). However, Mercosur trade balance remained unfavorable to Brazil until 2002 because of the significant decrease in Brazilian exports to Mercosur caused by protectionist measures implemented by the other countries and, above all, by the severe recession that stroke Argentina during that period.

In fact, the instability of the trade balance between Brazil and the other partners that integrate Mercosur – especially Argentina – led these countries to adopt several protectionist measures to counterbalance the effects of overvalued currencies in some occasions. Many of these countries also adopted additional measures, once in a while, to deal with this kind of problem. Particularly concerned with the automobile industry, Brazil and Argentina, for instance, issued their “Automotive Regimes” to encourage FDI and promote exports during the 1990s. In 1991, Argentina created its program, triggering, as pointed out by Zauli (2000, p. 79), a bias in the FDI attracted to Mercosur. In 1995, it was Brazil’s turn to launch the so-called “New Automotive Regime”, containing a package of fiscal incentives offered by the Federal Government. Among

the tax incentives presented, the cited 50% reduction on import duties over produced cars was granted to companies assembling in Brazil<sup>13</sup>.

Still at the federal level, in 1997 additional incentives were offered in Brazil to the firms interested in installing plants in the Northern, Northeastern and Center-Western regions of the country in order to calm down the claims professed by the poorest states<sup>14</sup>. As would be expected, several disagreements with other countries or economic blocks – as the US, European Union and Japan – took place, and some adjustments had to be introduced in the original Brazilian Automotive Regime. The regional incentives provided by the “Special Automotive Regime” had also been questioned by Argentina. In spite of all these controversies, the results of the efforts made to attract productive capital to the Brazilian automobile sector were definitely significant: as stated before, between 1995 and 2001, the investments made in this industry are estimated in US\$ 14 billion and, as detailed in Table 3, almost all major world car-producers have announced, in this period, the building of automobile plants in the country<sup>15</sup>.

**Table 3: New Automobile Plants in Brazil 1995-1999**

Company	Invest. (US\$ million)	Planned Capacity	Jobs	Announ- cement	Start Up	City	State
Volkswagen (1)	250	50	1500	n.a.	Nov-96	Resende	RJ
Honda	100	30	450	Apr-96	Oct-97	Sumaré	SP
MMC Automotores (2)	35	8	500	Jul-1996	Jun-98	Catalão	GO
DaimlerChrysler (3)	315	12	400	Mar-97	Jul-98	Campo Largo	PR
Toyota	150	15	350	Aug-96	Sep-98	Indiatuba	SP
Land Rover / BMW	148	5	800	Dec-97	Oct-98	São Bernardo do Campo	SP
Renault	1000	120	2000	Mar-96	Dec-98	São José dos Pinhais	PR
Volkswagen / Audi	750	160	1000	Dec-96	Jan-99	São José dos Pinhais	PR
Mercedes-Benz (DaimlerChrysler)	820	70	2000	Apr-96	Apr-99	Juiz de Fora	MG
Iveco/Fiat	120	12	n.a.	Apr-97	Nov-00	Sete Lagoas	MG
Peugeot Citroën	600	100	1000	Jul-97	Feb-01	Porto Real	RJ
General Motors (5)	600	120	2000	Dec-96	Jul-01	Gravataí	RS
Ford	1900	250	5000	Jun-99	Oct-01	Camaçari	BA

Note 1: Trucks and buses.

Note 2: Mitsubishi licensed; light commercials.

Note 3: Announced suspension of operations in Jan 2001.

Note 4: Light commercials, trucks and buses.

Note 5: Incentives renegotiated in May 1999.

Source: Elaborated by the authors from data available in “O Estado de São Paulo”, several editions, Anfavea (2003), Rodríguez-Pose and Arbix (2001), and Santos e Pinhão (1999).

<sup>13</sup> A detailed description of the “New Automotive Regime” can be found in Negri (1999).

<sup>14</sup> Compared to the “New Automotive Regime”, the denominated “Special Automotive Regime” enlarged federal taxes incentives, especially those related to imports.

<sup>15</sup> Although the investments, planned capacities and job creation are usually based upon ex-ante announced data, and the jobs may also include, in some cases, direct suppliers, the list can provide a basis to understand the location patterns observed in the automobile industry in Brazil in the 1990s.

### 3.2 Location Patterns

During the so-called first migration of the automobile industry to Brazil, between 1956 and 1970, productive units clustered basically in São Paulo<sup>16</sup>. Although in the 1970s Fiat was installed in Minas Gerais, and a few smaller plants did not install in São Paulo, the automobile industry remained, until the latter 1980s, highly spatially concentrated. During the 1990s, however, the expansion of the automobile industry was not geographically concentrated as it used to be, as illustrated in Table 3. As pointed out by Rodríguez-Pose and Arbix (2001, p. 142 and forth), several factors contributed to the dispersion process:

- Wage differentials within Brazil are quite significant, and the educational gap across the country had been reduced in recent years;
- The develop of road infrastructure in Brazil, combined with the need of larger markets, as well as technological evolution in car manufacturing, increased companies' flexibility to choose the position of their factories;
- The level of congestion and pollution, along with several administrative problems, is much higher in São Paulo than in other regions, as well as the vigor and the organization of trade unions.

The opportunities created by these factors and the opening of the Brazilian economy have endorsed a process of territorial competition among Brazilian states, not surprisingly strengthen by the Automotive Regimes (despite their federal natures) and the boom of FDI in automobile sector. The major weapons used in the fiscal wars (or tax competitions) are, beyond massive tax incentives in no case shorter than 10 years, the donation of the land, the provision of the necessary infrastructure for preparation of the site (road infrastructure and utilities, rail links, port terminals etc), the provision of loans by the state at fixed rates below of the Brazilian credit market, a series of financial and legislative cautions and guarantees, and a sundry of additional benefits, which range from providing public transport for workers to a variety of environmental measures (Rodríguez-Pose and Arbix, 2001, p. 145).

Also behind the territorial competition for the announced investments, there is one crucial fact that cannot be missed: the role of the state intervention clearly changes from the 1980s on. In effect, the strengthening and enlargement of the neo liberal ideology, along with the financial-fiscal crisis that took away from the central government the possibilities to make direct investments and to implement a regional policy as it had done in the past<sup>17</sup>, guided the state competition for new investments. Although Rodríguez-Pose and Arbix (2001, p. 150) argue that the Brazilian federation was not well prepared to handle this kind of competition after so many years of policies subordinated to federal governments directives, especially during the authoritarian period, the fact is that the bidding war was certainly triggered by the absence of a coordination structure and by the lack of a centralized policy that could assure for the less

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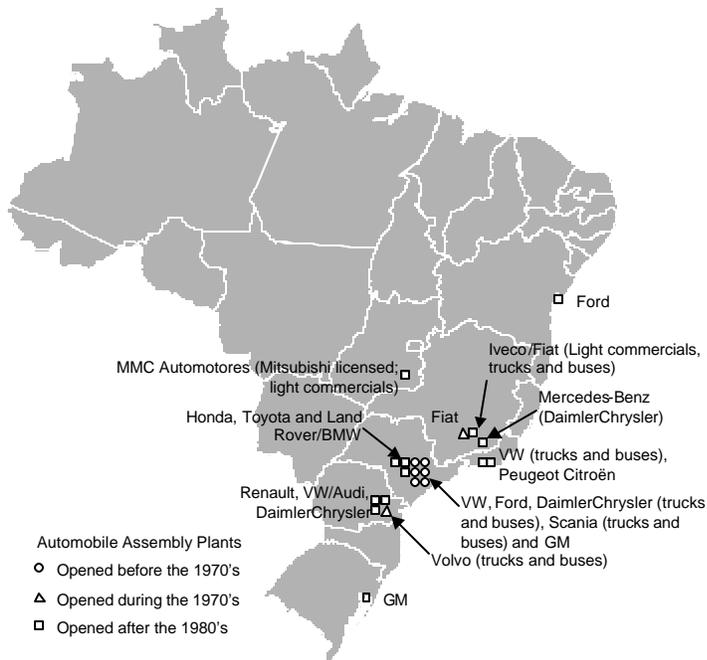
<sup>16</sup> For a detailed description of the automobile investment attraction policies adopted in Brazil during this period, see Shapiro (1994).

<sup>17</sup> The regional policies conducted by the federal government were based upon institutions that sustained differential conditions to support the poorest regions development, and in the use of large fiscal instruments, surrounded by significant direct investments.

developed states conditions to improve their economic situation<sup>18</sup>. The shift of the political regime by itself does not explain, in essence, the tough competition for the announced investments, which have more to do, in a broader vision, with the restrictions of the state intervention in front of a considerable and complex fiscal-financial crisis.

Regardless of the explanation, unquestionably the result is that many Brazilian states definitely competed for the new plants announced. From a geographical point of view, as can be seen in Table 3 and also in Figure 1, the effect was a kind of concentrated distraction. It means that São Paulo remained the core, but a higher geographical dispersion could be observed, compared to the distribution pattern originated from the first wave expansion of the industry. This new configuration in the automobile sector seems quite similar to the polygon proposed by Diniz (1993), who argued that the Brazilian economy would grow, in the 1990s, sketching, territorially speaking, a polygonal area between Belo Horizonte (MG), Uberlândia (MG), Londrina (PR), Porto Alegre (PR) and Florianópolis (SC). This location pattern is also consistent with Ó hUallacháin and Wasserman's (1999) arguments about Brazil's automobile component parts industry spatial configuration. It is noteworthy that the only point out of this area is Ford's plant in Camaçari<sup>19</sup>, not coincidentally, the last one to be established<sup>20</sup>.

**Figure 1: Location Patterns of the Automobile Industry in Brazil**



Source: Elaborated by the authors from data available in "O Estado de São Paulo", several editions, Anfavea (2003), Rodríguez-Pose and Arbix (2001), and Santos e Pinhão (1999).

<sup>18</sup> The promulgation of the new Constitution, in 1988, increasing the states autonomy, also contributed to the fiscal competition in focus.

<sup>19</sup> Camaçari is the municipality where Ford built up its plant. The city is in the Metropolitan Region of Salvador, the capital of the state of Bahia.

<sup>20</sup> Also MMC Automotores, a Mitsubishi licensed plant, has been implanted outside the mentioned polygonal area. It is, however, a small investment to produce light commercials. Besides, the investment has been located in Catalão, a city in Goiás close to the Uberlândia (MG) region.

As can be observed in the map above, Mercosur played, until the end of the 1990s, an important role in the location decision taken by the firms. As pointed out by Humphrey and Oeter (2000, p. 57), it seems that, “by the late 1990s, a genuine regional automotive production system was developing in Mercosur, based on a division of labor in vehicle and components production between Brazil and Argentina”. In truth, not only from a market point of view, but also considering the sourcing of major components, Mercosur seemed, at that moment, to accomplish a good performance. Another strong evidence that Mercosur was behind the location decision taken by the assemblers is the fact that it was explicitly mentioned as a target for many companies investing in Brazil, as stated by Santos e Pinhão (1999, p. 188).

Most of these investments have been announced when the trade flows involving Brazil and the other countries of Mercosur were very high (see Table 2). By that time, the location pattern, as a rule, seemed to pursue the following rationale: the newcomers in Brazil built their plants around São Paulo (Honda, Renault, Peugeot, Chrysler), while firms already based in the country (GM and Ford, as originally intended) announced the Southern area as their focal position (Alban, Souza e Ferro, 2000, p. 20). After the Mercosur crisis, triggered by the Brazilian Real devaluation and aggravated by the Argentinean recession, the expectations changed a lot, affecting the companies’ forecasts and strategies. Indeed, besides the previous tensions involving taxes, quotes and subsidies, the uneven exchange rates in Brazil and Argentina made the regional automotive market not reliable anymore. From this moment on, Mercosur did not seem to play the same role in the location decision taken by the assemblers.

#### 4 The Ford Project in Bahia

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After a crisis that almost led the company to discontinue its operation in Brazil<sup>21</sup>, Ford Motor Company announced, in 1997, an US\$ 1.0 billion investment in an automobile plant in Rio Grande do Sul, Brazil’s southernmost state, strategically located between São Paulo and Buenos Aires. Because of its geographical position, this state could be considered the gravity center of Mercosur, and Ford Motor Company, at that moment, seemed to follow the strategy adopted by GM, that a few months before had announced an investment in the same state. As usual, an agreement between the company and the state government was signed, and an incentive package involving tax breaks, loans, infrastructure and other advantages was offered.

In 1998, when the site earthwork had already been started and the state government had transferred part of the loan to the company, there were gubernatorial elections in all Brazilian states, and the Workers Party candidate was elected in Rio Grande do Sul. In January 1999, the newly elected Governor decided to renegotiate the incentives package offered both to GM and Ford by the previous administration. Although the renegotiation succeeded with GM, in April 1999, Ford stopped the building of its plant, as no deal between the company and the State Government was achieved. In May 1999, according to the company’s chairman in Brazil at that time, all Brazilian states (excluding Rio Grande do Sul and three Northern small states) presented proposals to attract the factory (“O Estado de São Paulo”, May 05, 1999). Amongst the strongest candidates, the remaining Southern states (Paraná and Santa Catarina), three states in the Southeast region (São Paulo, Rio de Janeiro and Espírito Santo), and two Northeastern states

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<sup>21</sup> The share of Ford in the automobile industry revenue in Brazil fell down from 20% in 1980 to 7% in 1996 (McKinsey Global Institute, 1998, p. 11-12).

(Pernambuco and Bahia)<sup>22</sup>. Not surprisingly, this competition became an icon of the fiscal war among Brazilian federation members, and several discussions took place in the media focusing the concerns associated with the investments attraction policies adopted.

In June 1999, inside a skeptical atmosphere, Ford announced the Bahia site selection for a quite new investment, which was, for sure, the biggest in a single new plant in the 1990s in Brazil<sup>23</sup>: it was estimated at R\$ 3.515 billion<sup>24</sup> and the total income, when operating at full capacity, may reach R\$ 6.0 billion (see section 5). Although these numbers have to be used with care for many reasons, even a very imprecise calculation could show that they are extremely expressive, as the total investment represented 8,4% of the state GDP in 1999, and the estimated amount of income may reach more than 10% of this aggregate value<sup>25</sup>. 5,000 direct jobs – referred to the assembly plant and the first tier suppliers – and 50,000 indirect jobs – estimated using a rough 10:1 relationship between direct and indirect jobs – were announced, both by the company and the State Government, and 17 first tier suppliers were, at that point, prearranged to follow the assembler to Bahia. It was also announced then that 60% of the value added would be produced in the state, as well as 95% would be created in the country as a whole after some years of operation.

The incentives package was usually considered in the press the main (and sometimes the only) factor behind Ford’s decision to establish a plant in Bahia (“O Estado de São Paulo”, several editions). This hypothesis, however, does not explain why the same decision was not taken back in 1997, when the company had announced the investment in Rio Grande do Sul. At that moment, Bahia did not figure among the candidates to host Ford’s plant, despite the local government efforts to attract other automobile industries<sup>26</sup>. On the other hand, the factors that attracted Ford to Rio Grande do Sul in 1997 no longer seemed to prevail in 1999, otherwise the company could have chosen another state in the South macro-region of Brazil after the failure of its renegotiation with the government of Rio Grande do Sul. In fact, when the announced characteristics of the projects in Rio Grande do Sul and Bahia are compared (Table 4), it can be seen that not only the location, but also the project itself, had changed.

**Table 4: Announced Characteristics: Ford Project in Rio Grande do Sul and Bahia**

	<b>Ford Project in Rio Grande do Sul</b>	<b>Ford Project in Bahia</b>
Investment	1.0 billion	1.9 billion
Capacity	150,000 vehicles / year	250,000 vehicles / year
Direct Jobs	1,500	5,000

Source: Elaborated by the authors from data available in “O Estado de São Paulo”, several editions.

Table 4 makes clear that while the first project visibly intended to attend Mercosur market, the second one is more likely to be a world scale project for which Mercosur is just a part of the

<sup>22</sup> “O Estado de São Paulo”, June 16, 1999.

<sup>23</sup> The Special Automotive Regime, no longer valid in 1999, was revival due to successfully political pressures carried out by the representatives of this state.

<sup>24</sup> The announced investment includes the first tier suppliers’ investments and the values were converted to Brazilian currency based upon the 1999 average US Dollar rate.

<sup>25</sup> In 1999, the state GDP was around R\$ 42 billion (<http://www.sei.ba.gov.br>).

<sup>26</sup> In the second half of the 1990s, the state government tried, unsuccessfully, to attract other automobile plants to Bahia (Asia Motors, Hyundai and Skoda).

aimed market. The incentives package and the institutional problems between Ford and Rio Grande do Sul Government, hence, are not sufficient to explain why Ford gave up on investing in the Southern region of Brazil and decided to install a plant in Bahia. As pointed out by Alban, Souza and Ferro (2000), and reinforced by some arguments mentioned above, the 1999 Real devaluation made the Mercosur strategy, the way it was conceived before, no longer interesting to Ford, the last company to begin the construction of an automobile plant in Brazil<sup>27</sup>.

Of course the preexisting conditions of the state played an important role in the location decision, as there are several key location requirements for a 250,000 vehicles world scale plant beyond the tax incentives, as infrastructure (especially the access to an efficient port), labor skills and wage costs. Bahia, between the 1950s and the 1980s, has developed an industrial structure based on intermediary goods, complementary to the economic structure of the Southeastern regions of the country and highly concentrated in petrochemical and metallurgical commodities, that represented, by themselves, around 75% of the gross value added in the local manufacturing sector<sup>28</sup>. This background is important, as it created a positive environment for new investments, which can take advantage of the available infrastructure and the potential connections with other producers, benefiting from agglomerations economies. On the other hand, attracting final goods production became one of the main objectives of the state industrial strategy. In effect, it is largely recognized that the extreme concentration in intermediate goods not only has negative impacts on employment levels (as these sectors are more capital intensive, particularly when facing international competition, which happened after the opening of the Brazilian economy), but also expose the state's economy as a whole to the typical fluctuations of commodities goods markets, which explains, considerably, the aggressive policies adopted<sup>29</sup>.

Another central consequence of the economic development path in Bahia was an excessive concentration of the production around the Metropolitan Region of Salvador, which represents approximately 50% of the state economic activity and almost 25% of the state population. In spite of its harmful effects to the state territorial development, this feature contributed to create, in the neighborhood of Salvador, the capital of the state, a satisfactory infrastructure supply when compared to the resources available in other areas that had access to the incentives offered by the Special Automotive Regime, especially when the harbor system is considered. Besides, the geographic position of Bahia, located between the other Northeastern states and the major industrial production and consumption area of Brazil, as well as closer to the North American and Europeans markets, represents a favorable point.

An additional issue to be remarked is the lower cost of labor in the Northeast region of Brazil. According to a research carried out by the Inter Union Institute Dieese, the wages paid in Camaçari represented only 30,4% of the average wage in the Greater ABC, while in Gravataí, where GM installed its plant in Rio Grande do Sul, this proportion is 41,1% (“O Estado de São Paulo”, July 24, 2003). Because of this discrepancy, workers in Camaçari went on strike, in March 2003, claiming a 25% increase in salaries and others benefits. Immediately, the company

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<sup>27</sup> It is important to remind that, at the same time, pressures for the creation of ALCA had increased.

<sup>28</sup> Data about the composition of Bahia's GDP can be found in the web page of the official statistic institute of the state (<http://www.sei.ba.gov.br>).

<sup>29</sup> The political dividends associated with the attraction of a large project to the state have to be also considered a good reason for the assertive policies implemented.

contra offered increments that vary from 8% to 10%, depending on the wage level of the employee (“O Estado de São Paulo”, March 21, 2003)<sup>30</sup>.

Of course, there remain some queries whether savings on labor in Bahia could offset the cost of transporting supplies and a large share of the final products to the traditional automotive districts in Brazil, located 1,250 miles away. However, Ford bets that it can be worthwhile, if supported by the development of a network to collect materials from tier one and tier two suppliers and assure just in time delivery. According to Ford’s chief of business strategy in 2002, the plant built in Camaçari is going to be Ford’s lower cost factory in the world and it would quickly turn into a key regional asset for the company, particularly for exports (Brown, 2002).

Without doubt, Ford Motor Company had pondered all these different aspects before it took the decision to start the so-called Amazon Project in Bahia, which seems to be totally adjusted to the Ford 2000 plan launched in 1994. This restructuring proposal – an effort to reduce cost and increase efficiency – intended to focus on globalizing corporate organizations and to take advantage of the economies of scale in purchasing and manufacturing by consolidating international automobile operations and launching a reengineering process of several basic procedures. According to Studer-Noguez (2002, p. 118), “the underlying aim [of this program] was to transform the company’s organization from one based on regional profit centers to a global car-manufacturing business organized by product line”. Some market analysts claim that the Amazon Project would be a model for Ford’s future manufacturing organization, increasing outsourced supply of entire sub-systems for the first time<sup>31</sup>.

To sum up, the differences between the plant installed in Bahia and the one originally announced to be installed in Rio Grande do Sul suggest that what really happened was not a project relocation (as a result of territorial competition among Brazilian states), but rather a shift in the company’s business plans. Thus, the main factors behind Ford’s decision to establish a plant far from the economic center of the country and from Mercosur seem to have been not only the large incentives package offered at the Federal and State levels, but also the 1999 Mercosur crisis, and the global strategies of the company.

## 5 The Incentives Package

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As became clear in the previous sections, the incentives given to Ford Motor Company in Bahia were by no means an exception in the automobile industry in Brazil during the 1990s. As a matter of fact, not only in the emerging markets, but also in the more developed countries, automobile companies have always been the beneficiary of several kinds of fiscal and financial incentives.

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<sup>30</sup> Currently, the productivity level estimated for Ford’s plant in Bahia is around 30 cars/employee/year, and it is expected to reach 50 cars/employee/year when the production reaches nominal capacity. These levels are higher than the Brazilian average index showed in Table 1.

<sup>31</sup> Over the 1990s, most carmakers have progressively outsourced their supplies, but union opposition have always prevented from contracting out final assembly, especially in the US. In Bahia, Ford would try some different methods, which could be extended to other new plants in emerging markets, depending on their success (Ford to farm out key jobs in final assembly, 1999).

On the other hand, especially during the 1960s and 1970s, fiscal incentives played a very important role in the development of Bahia. The nature of these previous incentives was, however, quite diverse, because they were mostly given through a national agency (Sudene) created to foster the economic development of the Northeastern region as a whole. Besides, the main instruments employed were the incentives on federal income taxes, either reducing their charge or using them to provide funding for new investments<sup>32</sup>. As most of these incentives were given by the federal government, their effects on the states fiscal position were actually reduced. Moreover, territorial competition was really kept under control because of the coordination role played by Sudene and the lack of states and municipalities' autonomy resulting of the earlier Constitution.

As pointed out in Section 3, after the fiscal crisis of the 1980s and the significant changes in the political situation and in the economic environment, a territorial competition among Brazilian states began, generally based upon incentives provided by the sub national governments themselves. As each state created, by that time, specific programs and policies, comparisons between the incentives packages turn out to be not an easy task. The aim of this section is to establish a calculation method for the incentives package given to Ford Motor Company in Bahia, in order to estimate its monetary values so that it can be compared to the incentives given to other automobile plants and, to some extent, to the expected benefits the project might create in the state.

Estimating the fiscal sacrifice associated with the incentives package, however, imposes some methodological problems. Firstly, not all conditions and contracts clauses go public, under the argument that negotiation secrecy must be kept. The agreement between GM and Rio Grande do Sul government, for instance, was just made public after a judicial inquiry triggered by Worker Party states representatives. In Bahia, even after the publication of the State Law n. 7.537, that establishes the main conditions of the incentive package negotiated with Ford Motor Company, credit contracts and other instruments are protected against disclosure. Secondly, the estimation requires some parameters to be forecast, like the real cost of capital or the company's income level during the incentives period. Some authors tried to estimate the present value of the incentives related to other automobile plants. Alves (2001), for example, projected the "fiscal sacrifice" for three projects in Brazil, based upon some simplifications and certain assumptions about the unknown parameters.

Centering the attention on Bahia, the incentives package offered to Ford Motor Company can be divided in three parts<sup>33</sup>:

- **Fiscal incentives** ( $F_c$ ), i.e., the incentives associated with tax breaks or the financing of taxes due by the company. As Brazilian states cannot simply reduce their VAT taxes (because it would require unanimity in the National Fiscal Policy Council, where all states are represented), these incentives assume the form of working capital financing. In practice, the company pays the VAT and the state returns the payments in the form of working capital credit, creating a sort of triangular transaction. In spite of the naive argument that these **fiscal incentives** are costless for the state (as it would be sacrificing taxes that would not otherwise

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<sup>32</sup> This is essentially what came to be called in Brazil 34/18 System and, later on, Finor System.

<sup>33</sup> A discussion about these instruments and its fiscal implications can be found in Varsano (1997).

exist), the point is that several budgetary duties are directly associated with the state tax collection. As the state actuality collects the taxes, these obligations must be enforced. That means that the **fiscal incentives** in fact generate a cost for the state (and, as will be shown, they do represent the main cost).

- **Financial incentives** ( $F_n$ ), i.e., credit programs at lower interest rates, either directly financed or “equalized” by the state<sup>34</sup>. In both cases, these incentives create an opportunity cost, as the interest rates charged to the company are smaller than the market interest rates;
- **Budget incentives** ( $B$ ), i.e., infrastructure provision, land and building subsidies, job training sponsored by the state and any other incentives that directly affect the state budget.

## 5.1 Calculation Method

The present value  $IP$  of the incentives package is given by the sum of the present value of its three parts, as shown in Equation 1 below:

$$IP = F_C + F_N + B \quad (1)$$

Where  $F_C$ ,  $F_N$ , and  $B$  are the present value of the three parts that compose the incentives package. To simplify the calculations, it was assumed that plant building began in 2000 (actually it was in the mid-1999) and the start up was in 2002 (in fact it was in the end-2001). The values for  $F_C$ ,  $F_N$ , and  $B$  have been calculated as their present value in 2000.

### 5.1.1 Fiscal Incentives

The present value  $F_C$  of the **fiscal incentives** is given by:

$$F_C = \sum_{i=0}^{14} \frac{F_{C,i}}{(1+r_S)^i} \quad (2)$$

Where  $i = 0$  stands for the year 2000 and so on,  $r_S$  is the real cost of capital to the state, and  $F_{C,i}$  is the fiscal incentive given in year  $i$ . The sum holds the period between 2000 and 2014 (a total fifteen-year fruition incentive)<sup>35</sup>.

According to the State Law n. 7.537, the **fiscal incentives** given to Ford Motor Company can be divided in two parts:

- During the six first years (2000 to 2005), up to 12% of total income is financed under special conditions. If the payments are anticipated, a 98% discount is offered. In practice, it was assumed that all payments would be anticipated, what means that only 2% of the VAT due are really paid during this period;
- During the following nine years (2006 to 2014), the VAT due is financed at zero interest rates, a ten-year grace period and a twelve-year amortization period.

<sup>34</sup> It means that the state government pays for the differences between the market interest rates and the lower interest rates settled in the agreement.

<sup>35</sup> Although production began only in 2001, imports through the state began in 2000. According to the State Law n. 7.537, these imports also benefit from the **fiscal incentives**, as they refer to the total income.

Then, during the first period (2000 to 2005), for each year  $i$  the **fiscal incentives**  $F_{C,i}$  are estimated as indicated in the equation below:

$$F_{C,i} = 0.98T_{D,i} \quad (3)$$

The taxes due in year  $i$   $T_{D,i}$  are given by the sum of the taxes due to vehicles sales in the domestic market ( $T_{DI,i}$ ), the taxes due to vehicles exports ( $T_{DX,i}$ ), and the taxes due to imported vehicles sold in the domestic market ( $T_{D,M,i}$ ), as shown in the following equation:

$$T_{D,i} = T_{DI,i} + T_{DX,i} + T_{DM,i} \quad (4)$$

The taxes due to vehicles sales in the domestic market ( $T_{DI,i}$ ) are given by:

$$T_{DI,i} = (N_{I,i}P_{I,i})[t_V - (1 - L_i)t_C] \quad (5)$$

Where  $N_{I,i}$  is the number of vehicles sold in the internal market in year  $i$ ,  $P_{I,i}$  is the average price of the vehicles in the internal market,  $L_i$  is the percentage of value added locally,  $t_V$  is the value added tax on the vehicles sold, and  $t_C$  is the average value added tax on the components produced elsewhere.

The taxes due to vehicles exports ( $T_{DX,i}$ ) are, as a consequence of Brazilian exports promotion policies, given by the equation below<sup>36</sup>:

$$T_{DX,i} = -(N_{X,i}P_{X,i})(1 - L_i)t_C \quad (6)$$

Where  $N_{X,i}$  is the number of vehicles exported in year  $i$ , and  $P_{X,i}$  is the average price of the exported vehicles.

Finally, the taxes due to imported vehicles sold in the domestic market ( $T_{D,M,i}$ ) are given by:

$$T_{DX,i} = M_{BA,i}t_V \quad (7)$$

Where  $M_{BA,i}$  is the total amount of income resulting from the sales of vehicles imported by Ford Motor Company to the state of Bahia in year  $i$ .

During the second period (2006 to 2014) the **fiscal incentives**  $F_{C,i}$  are given by:

$$F_{C,i} = T_{D,i} - T_{P,i} \quad (8)$$

Where  $T_{D,i}$  is the tax due in year  $i$  and  $T_{P,i}$  is the present value of the mortgages financed at zero interest rate with a ten-year grace period and a twelve-year amortization period.

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<sup>36</sup> The negative signal is because no debts are due in exports, but there remain fiscal credits on raw materials acquired. As a result, the more the company exports, the less **fiscal incentives** are given by the state, as the taxes are, in any case, not due in export operations.

Assuming that zero interest rates will be charged to the company during the grace period,  $T_{P,i}$  is given by:

$$T_{P,i} = \frac{T_{P,i+10}}{(1+r_S)^{10}} \quad (9)$$

Where  $T_{P,i+10}$  is the present value in year  $i + 10$  of the twelve annual mortgages paid in years  $i + 11$  to  $i + 22$ . Considering that zero interest rates will be charged to the company also during the amortization period,  $T_{P,i+10}$  is given by the equation below:

$$T_{P,i+10} = \left( \frac{T_{D,i}}{12} \right) \left[ \frac{1 - (1+r_S)^{-12}}{r_S} \right] \quad (10)$$

Where  $T_{D,i}/12$  is the annual mortgage, as zero interest rates are charged to the company. Now, replacing equations 9 and 10 into equation 8, an equation to define  $F_{C,i}$  during the second period is obtained:

$$F_{C,i} = T_{D,i} - \frac{\frac{T_{D,i}}{12} \left[ \frac{1 - (1+r_S)^{-12}}{r_S} \right]}{(1+r_S)^{10}} \quad (11)$$

### 5.1.2 Financial Incentives

A credit for fixed investments and their associated implantation expenditures has been given to Ford Motor Company by the state. According to the State Law n. 7.537, an annual nominal interest rate  $R_C$  of 6% is charged to the company. The total credit has a five-year grace period (and during grace period interest is charged) and a ten-year amortization period. The present value  $F_N$  of the **financial incentives** is then given by:

$$F_N = C - \sum_{i=6}^{15} \frac{PMT_i}{(1+r_S)^i} \quad (12)$$

Where  $C$  is the total amount of credit given by the state (assumed to be concentrated in 2000, i.e., at  $i = 0$ ) and  $PMT_i$  is the annual amortization paid by the company after the grace period, i.e., between 2006 and 2015.  $PMT_i$  is given by the following equation:

$$PMT_i = \frac{FV_5}{\left[ \frac{1 - (1+r_C)^{-10}}{r_C} \right]} \quad (13)$$

Where  $FV_5$  is the future value of the debt at  $i = 5$ , as shown in the equation below:

$$FV_5 = C(1+r_C)^5 \quad (14)$$

In order to perform the calculations in real terms (instead of nominal terms), the real interest rate  $r_C$ , as defined by the Fisher effect<sup>37</sup>, was used:

$$r_C = \frac{1 + R_C}{1 + h} - 1 \quad (15)$$

Where  $h$  is the expected inflation rate.

Now replacing equations 13 and 14 into equation 12, the present value  $F_N$  of the **financial incentives** is then given by:

$$F_N = C - \sum_{i=6}^{15} \frac{\frac{C(1+r_C)^5}{1 - (1+r_C)^{-10}}}{(1+r_S)^i} \quad (16)$$

### 5.1.3 Budget Incentives

The present value  $B$  of the **budget incentives** is given by the sum of the  $M$  investments done by the state in infrastructure and other items provided to support Ford Motor Company installation in Bahia in the years between 2000 and 2015 ( $i = 0$  to 15). Although infrastructure is the main item in this part, job training, along with land and building subsidies, among other investments, should be considered. As some of these investments may have externalities, i.e., may be used by other economic activities in the state, a use factor  $u_j$  has been multiplied by each investment  $j$ . For each investment the present value is calculated, so that  $B$  is given by the equation below:

$$B = \sum_{i=0}^{15} \sum_{j=1}^M \frac{u_j b_{i,j}}{(1+r_S)^i} \quad (17)$$

## 5.2 An Estimation of the Value of the Incentive Package

As shown in the preceding section, several parameters have to be estimated or forecasted in order to calculate the present value of the incentives package. Considering an investment of R\$ 3.515 billion<sup>38</sup>, the total incentives have been calculated in two different scenarios. The first one is based upon the following assumptions:

- The real cost of capital to the state  $r_S$  had been fixed at 10% per year;

<sup>37</sup> The Fischer effect deals with the fact that the differences between the real and the nominal interests rates should consider the accumulated inflation rate in the period.

<sup>38</sup> This is the value mentioned by the agreement signed by Ford Motor Company and the State Government. As the announced investment was US\$ 1.9 billion (including the first-tiers suppliers' investments), a 1.85 R\$/US\$ exchange rate has been used to convert the values. This is approximately the average exchange rate in 2000, when the bulk of the investments were supposed to have taken place.

- The number of vehicles produced  $N_i = N_{I,i} + N_{X,i}$  in 2002 was assumed to be 100 thousand and the volume of production was considered to grow 50 thousand units per year, so that in 2005 the plant would be operating at full capacity;
- It was assumed that 20% of the vehicles produced were exported in 2002. From 2003 on, the value assumed was 25%.
- The average prices of the vehicle  $P_{I,i}$  and  $P_{X,i}$  were assumed to be R\$ 24.2 thousand in 2000 values<sup>39</sup>;
- The percentage of value added locally was set in 60% for all years. This is a more conservative approach, as the higher the value added, the higher the incentives;
- The total amount of income resulting from the sales of vehicles imported by Ford Motor Company to the state of Bahia in 2000, 2001 and 2002 was R\$ 819 million, R\$ 1,133 million and R\$ 673 million, respectively<sup>40</sup>. From 2003 on, an average of these values was considered.
- The total amount of credit given by the state was R\$ 1.081 billion. This number has been estimated using data from the Finance Secretariat of the State of Bahia and from the executive group created in the government staff to support the project installation<sup>41</sup>.
- Inflation rate  $h$  was set in 5% per year.
- Based upon data from the Planning Secretariat of the State of Bahia and Ford Executive Group, an investment of R\$ 170 million in infrastructure was considered in 2000 (excluding the harbor structure). The use factor for this investment was considered 100%.
- To the R\$ 30 million investment in the port scheduled to 2003, a use factor of 100% has been set, as the port is to be used exclusively by the company.
- Other **budget incentives** (as the investment in labor qualification) have not been considered because there was no estimative for them, and because they have little influence in the results, as they are truly small when compared with the **fiscal** and **financial incentives**. Besides, the conservative 100% use factor assigned to the R\$ 170 million infrastructure investments may overcome these other investments.

A second scenario considering the inflation rate equal to zero was also constructed. In this scenario, neither vehicles exports nor imports have been considered. As a result, it was assumed that the total production was sold in the domestic market. Though quite unrealistic, these hypotheses are the same admitted by Alves (2001), which makes her results and the ones obtained here directly comparable to each other. The outcomes for both scenarios are reported in Table 5:

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<sup>39</sup> To estimate  $P_{I,i}$  and  $P_{M,i}$ , two kinds of vehicles have been considered: a lower price car (Fiesta, whose average price in 2000 was around R\$ 17.000), and a medium price car (Ecosport, whose price ranges, in 2003, between R\$ 31.190 and 47.590; the average price of this car in 2000 was considered R\$ 35.000). Although originally Fiesta should represent 80% of total vehicles production, the actual production mix observed in October 2003 was considered. In this case, Fiesta represents only 60% of total vehicles production. This mix of production has been considered for both  $P_{I,i}$  and  $P_{M,i}$  to avoid underestimating the incentives package.

<sup>40</sup> Based upon the values of the incentives effectively observed in the last years (the source for these data was the Development Agency of the State of Bahia – Desenhahia).

<sup>41</sup> This group was called “Ford Executive Group” and lasted until 2003.

**Table 5: Present Value of the Incentive Package (R\$ million)**

	Scenario 1		Scenario 2	
Fiscal Incentives	1,823	69%	1,878	78%
Financial Incentives	626	24%	331	14%
Budget Incentives	193	7%	193	8%
Total Incentives	2,642	100%	2,402	100%
Incentives / Investment	75%		68%	

Source: Elaborated by the authors.

Under the assumptions made in the first scenario, the present value of the incentives package in 2000 reaches R\$ 2,642 million, or 75% of the total investment. The largest part of the assistance is due to **fiscal incentives** (69%), followed by financial support (24%). As **budget incentives** represent only 7% of the whole package, the influence of some omitted items (such as the land cost or the investment in labor qualification) should not have a significant impact in the results, as presumed before. In the second scenario, the **budget incentives** are the same as in the first one. The **fiscal incentives**, however, are slightly higher (as a consequence of the assumption of no international trade). On the other hand, as a result of the zero inflation rates assumed, the **financial incentives** are much lower than the ones observed in the first scenario. Consequently, the total incentives reach a lower value than the one obtained in the first scenario (R\$ 2,402 million, or 68% of the total investment).

It must be underlined that the incentives package is strongly affected by the success of the project itself, as the **fiscal incentives** are proportional to the volume of production. It means that in case of breakdown, when the total income declines, the **fiscal incentives** decline as well. As a result, if the project had not succeeded, since the government would have removed the incentives related to the vehicles imported, the sunk costs for the state would have reached, in the beginning of 2000, R\$ 819 million or R\$ 524 million, considering, respectively, the first and the second scenarios<sup>42</sup>.

### 5.3 The Incentives Package: A Comparison

As shown in the previous section, based on the assumptions made, the present value of the total incentives offered to Ford Motor Company is estimated in R\$ 2,642 million, or 75% of the total investment. When considering zero inflation rates during the period, the value of the incentives package falls down to R\$ 2,402 million, or 68% of the total investment. In spite of their imprecise nature, these numbers can be roughly compared with some other similar calculations reported in the literature. Alves (2001) estimated the value of the incentives package for three automobile plants installed in Brazil in the 1990s (Mercedes-Benz, GM and Renault), and the calculation method employed in this paper is fully compatible with the one used in that study. Chapman, Elhance, and, Wenum (1995) also worked with this subject, reporting the total incentives given to Mitsubishi in order to attract a plant to Illinois. Even though following a different calculation method, the number obtained by these authors may provide an additional reference to be compared with the results achieved for Ford's plant in Camaçari. Table 6, below,

<sup>42</sup> If the incentives on vehicles imports in 2000 and 2001 (i.e., before the plant start up) were also considered, the present values of the sunk costs in 2000 would have reached R\$ 1,036 million in the first scenario.

reports the incentives package given to the mentioned companies, as well as the results found in the second scenario formerly described.

**Table 6: Incentives Package: A Comparison (R\$ Million; US\$ Million to Mitsubishi).**

	Ford (BA) (1)	Mercedes-Benz (MG)	GM (RS)	Renault (PR)	Mitsubishi (IL)
Fiscal Incentives	1,878	556	520	188 (Note 4)	160 (5)
Financial Incentives	331	85	98	0	24
Budget Incentives	193	51 (2)	141	165	60
Total Incentives	2,402	691	760 (3)	353 (4)	244
Investment	3,515	845	600	1,000	680
Total Incentives / Investment	68%	82%	127%	35%	36%
Share of Fiscal Incentives in Total Incentives	78%	80%	69%	53%	66%
Source	Elaborated by the authors	Alves (2001, p. 58-66).	Alves (2001, p. 14 and p. 67-75).	Alves (2001, p. 75-79).	Chapman, Elhance, and, Wenum (1995, p. 19, 26-7).

Note 1: Results refer to simulation using similar conditions as used by Alves (2001) to make the results comparable.

Note 2: Refers only to land cost; does not include infrastructure.

Note 3: Incentives calculated using the conditions before the renegotiation between GM and Rio Grande do Sul Government. According to RS Government Staff, the total incentives could be R\$ 103 million lower (Alves, p. 77-78).

Note 4: Fiscal incentives do not include the ones given to the suppliers. Total incentives should be much higher (Alves, 2001, p. 79)

Note 5: US\$ 29.7 million in federal incentives are not considered in this table.

As can be seen, the total incentives given to Ford Motor Company in Bahia are by far the largest ones in absolute terms. They are more than three times the incentives given both to Mercedes-Benz and GM, and even much higher than the incentives given to Mitsubishi in Illinois<sup>43</sup> and to Renault in Paraná (in this last case, however, it must be taken into account that the **fiscal incentives** are clearly underestimated, as they do not include the benefits given to the suppliers, considered in all other situations). The extent of the incentives helps to understand why smaller states could not compete for the project, as the total incentives might reach very high proportions of their respective budgets. Even in the case of Bahia, the incentives are still significant in the state budget, and might affect the public investment capacity in the next years.

Considering the whole assistance package vis-à-vis the total investment, in contrast, the incentives given to Ford Motor Company are not especially high when compared with the other cases in Brazil. In fact, the relative incentives granted to this firm (equivalent to 68% of the investment) are lower than those given both to GM (127%) and to Mercedes-Benz (82%)<sup>44</sup>. This conclusion is quite unpredicted, because, in spite of the lower costs of labor in Bahia, externalities and agglomeration economies in this state are lower than in the other two states, and the site chosen by Ford is also distant from the major domestic market, and also from the

<sup>43</sup> Even considering that this amount was given in 1986, it is for sure smaller than the incentives given to Ford Motor Company in Bahia. Taking into consideration both the inflation rates and the exchange rates in the period between 1986 and 2000, it is estimated that the incentives given to Mitsubishi do not reach 30% of the incentives given to Ford.

<sup>44</sup> Again, the underestimated values reported to Renault (35%) do not permit any comparison with this case. Not surprisingly, the incentives given to Mitsubishi in Illinois (36%) are the smaller (excluding Renault data).

Mercosur countries. All these circumstances together would suggest that the relative incentives in Bahia might be higher than those offered in Southern or Southeastern states (such as Rio Grande do Sul and Minas Gerais). The results hereby obtained, however, could be explained by three complementary hypotheses:

- Negotiations do not involve just the material incentives, but also some intangible factors, as the political stability and a reliable partnership, for instance.
- Coordination failures and imperfect understanding, along with the discontinuous nature of the opportunities of attracting large automobile plants, make it hard to the state governments to know how far they should go in the negotiation processes<sup>45</sup>.
- This particular project, designed to produce at larger scales and export not only to Mercosur, but also to Northern countries (like Mexico, that represented more than three quarters of Ford exports from Bahia between January and August 2003) was not jeopardized by the competitive disadvantages of Bahia, which present, on the other hand, compensations connected to its geographic strategic position and to its harbor system<sup>46</sup>.

Another conclusion that can be reached from Table 6 is that, as would be expected, the **fiscal incentives** are the most important ones, representing more the 65% in all cases – except for Renault, since the **fiscal incentives** are underestimated. This fact is especially important, as not only the benefits the project might create are strongly associated with its success, but also are the effects it might generate on the state accounts. In other words, it means that, if the project fails, there would be no benefits to the state, but also the total cost (strictly from the state point of view) would be reduced.

## 6 Economic Benefits

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Estimating the economic impacts of such a large investment is certainly not an easy task, as several issues have to be taken into consideration simultaneously. In addition, some effects may be asymmetrically distributed over time, making their estimation even harder. Finally, it may be quite difficult to distinguish real and fake expectations and to predict the authentic results, as many things are uncertain and highly dependent of other related and doubtful issues. Despite these caveats, some previous studies analyzed and estimated the impacts of automobile industry investments in Brazil. Most of them were particularly concerned with the relationship between investment, economic growth rates and employment, as Haddad and Hewings (1999), and Alban, Souza and Ferro (2000).

Haddad and Hewings (1999), after segmenting Brazil in three big areas (North, Center-South, and Northeast), evaluated the impacts of investments in the automobile industry in the country using an interregional computable general equilibrium model. The results, achieved only for the

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<sup>45</sup> This is, essentially, the point of view of Braybrooke and Lindblom (1970), who argue: “decisions marked by large change and quite imperfect understanding are not rare, even if they are not the typical instrument of policy-making. Nor are such decisions made only in error or by foolish decision-makers. On the contrary, some decisions are sometimes inescapable, forced on decision-makers by circumstances. In addition, such decisions are sometimes deliberately taken by decision-makers because the potential rewards seem attractive enough to outweigh the perils posed by imperfect understanding”.

<sup>46</sup> In 2002, more than 35% of Ford’s exports (in units) from Brazil were shipped in Bahia. This share is likely to grow in 2003.

short run, showed a positive employment effect of the use of laborsaving technologies and, considering the location choices involved, higher national growth rates if the investments were done in Center-Southern region, instead of Northeastern region of the country. In essence, the short run closure was adopted because the main interest of this work was to evaluate the impacts on the levels of employment that affect union negotiations (Haddad and Hewings, 1999, p. 367). For further objectives, including development policies, a condensed period of analysis, however, is possibly insufficient, as some results of the investment need an extended interval to be noticed. In addition, a different concept of region might be required to evaluate the impacts of automobile investments in the Metropolitan Region of Salvador, as its economic structure is quite diverse from the economic conditions found in the Northeast region as a whole.

Alban, Souza e Ferro (2000), exclusively concerned about the Amazon project<sup>47</sup>, got to some measurable benefits related to the investment as adjusted an input-output table previously developed by the Brazilian Development Bank (BNDES) for the country as a whole. The results revealed, considering that 3,575 direct jobs would be created in Camaçari<sup>48</sup>, that 41,720 associated indirect jobs would be generated in Brazil by 2006. Among them, 22,008, or 52,8%, supposed to be found in Bahia. In spite of these significant numbers, as a conclusion, the authors defended that Ford project would induce higher GDP growth rates (and they propose three different prospective sceneries), but it would not be able to produce, just by itself, an accelerated economic growth cycle. Further studies also supported by Bahia State Government with the assistance of the World Bank (Consórcio Intecsa – Inarsa – Concremat – JW – Boursheid, 2003) alter the estimations done in the earlier document and, still based upon the BNDES model, arrived to the results presented in Table 7, considering that 4,481 had already been created until November 2002 and changing the coefficients formerly used<sup>49</sup>.

**Table 7: Direct and Indirect Jobs: CIFN - 2005**

<b>Directs Jobs</b>	<b>Indirect Jobs (Brazil)</b>	<b>Share of Bahia in Indirect Jobs</b>	<b>Indirect Jobs (Bahia)</b>
7,945	30,172	56%	16,833

Source: Consórcio Intecsa – Inarsa – Concremat – JW – Boursheid (2003), using IBGE data – National Accounts – 1998 to 2000.

Rodríguez-Pose and Arbix (2001) argue that, if at a first sight “the influx of foreign funds can be considered beneficial for the whole of the Brazilian economy, since it’s expected to generate know how and technology transfers and is creating direct employment”, in fact, the expansion of FDI in the automobile sector in Brazil has triggered a process of territorial competition among Brazilian states, “which may ultimately jeopardize any long-term economic benefit [...]” (Rodríguez-Pose and Arbix, 2001, p. 135). Moreover, they defend (ibid, p. 148 and following) that, in reality, there are indications that contradict the usual argument of the multiplier effects and spillovers linked to the construction of new car plants. As examples, they mentioned that the new plants would improve the low productivity of the Brazilian car industry, promoting jobless growth or at least a reduction in direct employment; that the new technologies would be in most cases developed elsewhere and applied later in Brazil; and that the infrastructure created to assist

<sup>47</sup> That work was requested and sponsored by Bahia State Government, with the assistance of the World Bank.

<sup>48</sup> By that time, the authors understood that the 5,000 direct jobs announced by the company were overestimated.

<sup>49</sup> These are preliminary outcomes, as the work is not yet concluded.

exports also simplifies the process of importing car components, which could frustrate the emergence of local suppliers, especially when combined with benevolent import tax breaks.

In opposition to these arguments, one could find in Fiat's experience in Minas Gerais an illustrative counter case. In 1976, Fiat began the operation of a plant built in Betim, located 250 miles north from Sao Paulo and close to the capital of the state Belo Horizonte. As pointed out by Lemos et al (2000, p. 3), not only by means of fiscal breaks, large public investments in infrastructure and advantageous financial support the state government played a great role in the business, but also becoming a minor partner in a public-private joint venture<sup>50</sup>. At the beginning of the 1990s, the previously presented changes in the automobile world industry, and also the benefits offered by the state government, had stimulated the attraction of a sundry of suppliers to the surroundings of Betim, and, afterward, the development of two new assembly plants: Iveco (Fiat's subsidiary for light commercials, trucks and buses) and Mercedes-Benz (now DaimlerChrysler). The consolidation of a local suppliers network, associated with the new technologies and organizations models that led to new location patterns, consummated the main objective of the public policies focusing the automobile industry in Minas Gerais: between 1989 and 1998, the share of local suppliers increased from 35% to 90%, while the proportion of local sales' volume grew from 26% to 75% (Lemos et al, 2000, p. 7). As pointed out by Montero (2001), as many suppliers were moving close to Fiat, "between 1992 and 1994, Betim saw \$ 130 million of new investment, \$ 150 million in additional tax revenue, and 5,000 new jobs".

Lima et al (2002), also attentive to Minas Gerais case, but trying to figure out the possibilities of Bahia with the start of Ford assembly activities in Camaçari, proposed a useful typology. Particularly concerned with scales opportunities, the authors divided the second, third and fourth tier automobiles suppliers in four parts, as following: a) firms that cannot locate in Bahia because of the lack of natural factors endowment; b) firms whose installations demands higher economies of scale than Ford may offer; c) firms whose installation is waiting for clearer signs that the Ford Project really succeeded; and d) firms that can be installed in Bahia in the short-run. Centering the attention in the two last groups, they recommended and tried to outline some procedures that could be implemented by the state government to promote economic growth based on the Ford's externalities.

In fact, it is possible to measure some outcomes of the factory's operation, although many impacts are to be accomplished in the future. It is confirmed, for instance, that the assembly plant, together with the 29 first tier suppliers already installed in the state, employed 4,481 workers. This number is close to the 5,000 jobs mentioned when the project was announced, and almost certainly, when the plant is operating at full capacity, it will be overcome<sup>51</sup>. However, direct employment should not be considered the main benefit of the project. Because of the increasing capital intensity of the automobile industry, the total investment and, as a consequence, the total incentives, per direct job are definitely very high. A rough calculation indicates that the cost to the state of each job created is around R\$ 588 thousand<sup>52</sup>. Of course,

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<sup>50</sup> For a description of the close relationships between Fiat and Minas Gerais government and public agencies, see Montero (2001).

<sup>51</sup> Consórcio Intecsa – Inarsa – Concremat – JW – Boursheid (2003) estimates in almost 8,000 the number of direct jobs to be offered in 2005.

<sup>52</sup> If the indirect jobs were considered, this cost would be much lower, but even though there is no evidence that this would be the less expansive way of creating jobs in the short run.

there are less expensive ways of creating direct jobs, such as the support to the widely recognized labor-intensive small and medium enterprises, especially in some specific sectors<sup>53</sup>. It could be argued, as well, that the amount spent by the state could be allocated directly to social assistance. Although a similar argument could also be evoked in the seventies, when Fiat was installed in Minas Gerais, today, after the structural changes that took place in the local economy and the subsequent development path of the state, this line of reasoning would be hardly defensible.

In effect, the main benefit the project could bring to Bahia is not direct job creation, but a genuine structural change that connects the local offer of intermediary supplies to the final goods industry production, establishing solid backward and forward linkages between different segments of the productive chain located in the state. That would be a worthy step forward, which can trigger a virtuous growth cycle and place the local economy in an advanced stage of development<sup>54</sup>. This is the reason why the estimations based upon the preexisting input-output relationships cannot capture all benefits the project might generate to the state. As these forecasts consider an exogenously defined input-output matrix or other equivalent representation of the productive structure in order to reach the results, they are not able to capture changes in the input-output matrix itself. Of course it does not hinder the possibility of testing the impacts of the project based upon ad hoc alterations in the economic structure in order to evaluate the sensibility of some variables (such as employment and income) to these changes. This seems to be an important subject for future researches.

Nevertheless, to some extent, some differences in the economic structure of Bahia can already be noticed or are to be perceived very soon. The automobile's exports, for instance, represent by now about 30% of the total Bahia exports values, contributing significantly for the increase of the share of the state's exports in the international sales of the country<sup>55</sup>. On the other hand, the impacts on GDP growth rates and, even more noteworthy, a significant change in GDP composition, will be noticed as soon as the official statistics include the project data. Another potential spillover is the installation of other automobile plants in the state, as the recently announced US\$ 200 million investment by Hyundai. This plant is expected to be located close to Ford and to benefit from the suppliers already operating in Camaçari (Hyundai será instalada na Bahia, 2003). Also some technological spillovers may be expected, as Ford Motor Company had announced the setting up of its product creation center (congregating 300 engineers), and an advanced technological center (Integrated Center of Manufacturing and Technology – Cimatec) was inaugurated in 2002, in a partnership involving the Industry Association of the State of Bahia (FIEB), the state government and other partners. Finally, qualitative institutional and cultural changes, involving organization structures and business environment, are likely to happen, along with changes in the labor market. These are not really consolidated trends, but still indicate a potential movement that should be investigated and followed with attention.

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<sup>53</sup> Teixeira and Vasconcelos (1999) are also sceptical about the impacts of automobile assembles on direct employment.

<sup>54</sup> As mentioned before, attracting final goods production became, at least since the beginning of the 1990s, one of the major propositions of the state industrial development strategy.

<sup>55</sup> The share of Bahia's exports in total Brazilian's exports rose from 3,3%, in 1999, to 4,5%, in 2003 (considering data until August 2003). Also the share of Bahia's automobiles exports in Brazilian's automobile exports reached 10.7% in the period between January and August 2003.

This paper addressed two main interrelated questions: the reasons behind Ford Motor Company's location decision to install a plant in Bahia, and the impacts of the project on the economy of the state. Based upon a discussion about the automobile industry and its main location factors in the 1990s, it has been argued that behind Ford's decision to establish a plant far from the economic center of Brazil are not only the incentives package offered to the company, but also the 1999 Mercosur crisis and the global strategies of the automobile corporation. After the devaluation of the Brazilian currency, in January 1999, perspectives about the performance of the Southern Common Market were seriously deteriorated, and might have spurred Ford Motor Company's decision of giving up on installing a plant in the Brazilian Southernmost state. The fact that the plant installed in Bahia is two times bigger than the one originally announced to be installed in Rio Grande do Sul suggests that what really happened was not a project relocation (as a result of territorial competition among Brazilian states), but rather a shift in the company's business plans. While the plant intended to be installed in Rio Grande do Sul seemed to have been designed for the Mercosur market, the larger scale one established in Bahia seems to have been planned not only for the internal and Mercosur markets, but also to take advantage of exports to Northern countries, like Mexico, for example.

This does not mean either that the incentives offered to Ford Motor Company to install the plant in Bahia did not play an important role in its location decision, nor that the present value of these incentives is not extremely significant in monetary terms. After having segmented the incentives in three main parts (**fiscal**, **financial** and **budget incentives**) and having made several assumptions about the future behavior of the variables associated with them, the present value of the incentives in the year of reference was estimated in R\$ 2,642 million, or 75% of the total investment. It was shown that the largest part of the incentives is due to the fiscal supports, which represent more than three quarters of the total value. This calculation indicates that the total costs the project create to the state are strongly affected by the success of the project itself, since the **fiscal incentives** are proportional to the volume of production.

Although extremely high in absolute terms, in relative terms (i.e., considering the total incentives divided by the investment), however, the incentives given to Ford Motor Company, calculated using the same assumptions employed to estimate their value for three other automobile projects in Brazil during the 1990s, are not especially substantial. That reinforces the argument that the incentives were not the only factor behind Ford Motor Company's decision to install its plant in Camaçari. Besides, there seems to be no clear reasons why the incentives (in relative terms) are higher in Rio Grande do Sul than in Bahia. That suggests the existence of coordination failures, indicating that the state governments involved in territorial competition do not have information enough to set the maximum incentives they are about to offer.

As a final point, the economic impacts are supposed to go beyond short run growth rates and employment. In fact, as it was shown, short run impacts on employment levels are quite reduced when compared with the cost of the incentives. It was argued, however, that the main benefit the project might create to the state is a genuine structural change that connects the local offer of intermediary supplies to the final goods industry production, establishing backward and forward linkages between different segments of the productive chain placed in the state, as it was observed in Minas Gerais' experience with Fiat. Of course the economic impacts of the project

are directly associated with the success of the plant, and also with the events that may affect Ford Motor Company's performance all over the world. Up to this moment, the project is succeeding, and the cars produced in Camaçari have been well accepted by the market. Nonetheless, Bahia's economic trajectory is naturally exposed to the risks and uncertainties associated with this specific project, and the factors behind its success or failure go far beyond the state control.

To sum up, in an environment characterized by the absence of a national policy of regional development, and by coordination failures that exacerbate the territorial competition among states, the incentives seemed to be the cost to be paid to promote a structural change. As pointed out by Baer (2001, p. p. 363), "left to the forces of the market, the allocation of resources will probably favor the Southeast and South of Brazil".

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