Fiscal Incentives, Public Policies and Structural Changes: A Large Automobile Plant in a Brazilian Less Developed Region

Autoria: Simone Uderman, Luiz Ricardo Mattos Teixeira Cavalcante

Abstract. The aim of this paper is to evaluate the costs and benefits associated with the establishment of a large automobile plant in the state of Bahia. 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 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 structural change in the state economy, as a result of the backward and forward linkages to be created.

1 Introduction

In June 1999, Ford Motor Company announced the Brazilian state of Bahia site selection for a US$ 1.9 billion automobile plant investment. 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. Both federal and state incentives have been given to the 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. The opponents to the incentives package argued that it not only broke economic rationality, but also created unnecessary fiscal costs (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). 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).

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 discussed. An effort towards a measure as 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 to understand and improve their action to promote economic development.

Besides this introduction, this paper is structured in for additional sections. Section 2 discusses the automotive industry and its location patterns in Brazil in the 1990s. In the following section, Ford Project in Bahia is presented, focusing the reasons behind the firm's decision to establish a

plant far from Brazilian and Mercosur[1] economic centers. In Section 4, the present value of the incentives package is calculated and compared to incentives provided to other automobile plants in the 1990s. Section 5, by its turn, discusses the economic benefits the project can bring about to the state and present the main conclusions of this paper.

2 The Automobile Industry in Brazil

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. Domestic vehicle production rose from slightly above 900 thousand units in 1990 to about 1,800 thousand in the early 2000s[2], 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 2003, about three times the production due to one employee in 1990, as shown in Table 1 below:

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
1995	1,297,467	239,399	92,142	1,629,008	104,614	15.6
2000	1,361,721	235,161	94,358	1,691,240	89,134	19.0
2003	1,504,998	216,112	105,928	1,827,038	79,153	23.1

Source: Anfavea (2003; 2005).

A number of factors contributed to this scenario of growth of investments and productivity indexes. First, the solid expansion of vehicles sales in the emerging countries, along with good perspectives for the future (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 other markets. 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.

Other factors the companies took into account were the low production costs and the opportunities for testing new models of production and work. 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. Thus, even after the trade liberalization wave, the car-manufacturing sector in Brazil remained 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 creation of Mercosur also encouraged the rush of FDI. The removal of import duties on transactions 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 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 brought about a bunch of trade protection measures. 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"[3]. To clarify this assertion, 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).

Table 2: Brazilian Automotive Trade, 1991-2004 (US$ Million)

	Exports			Imports			Trade Balance	
	Total	**Mercosur**	**%**	**Total**	**Mercosur**	**%**	**Total**	**Mercosur**
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	3.448	665	19,3%	867	418	48,2%	2.581	247
2004	4.636	1.446	31,2%	891	464	52,1%	3.746	981

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. 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.

The instability of the trade balance between Brazil and the other partners – especially Argentina – led these countries to adopt protectionist measures to counterbalance the effects of overvalued currencies. In 1991, Argentina created its "Automotive Regimes", triggering a bias in the FDI attracted to Mercosur (Zauli, 2000, p. 79). 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. 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[4]. As would be expected, several disagreements took place, and some adjustments had to be introduced in the original Brazilian Automotive Regime. In spite of all these controversies, the results were significant: between 1995 and 2001, the investments made in this industry are estimated in US$ 14 billion and, almost all major world car-producers have announced the building of automobile plants in the country (Table 3) [5].

Table 3: New Automobile Plants in Brazil 1995-1999

Company	Invest. (US$ million)	Planned Capacity (1,000 vehicles)	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	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

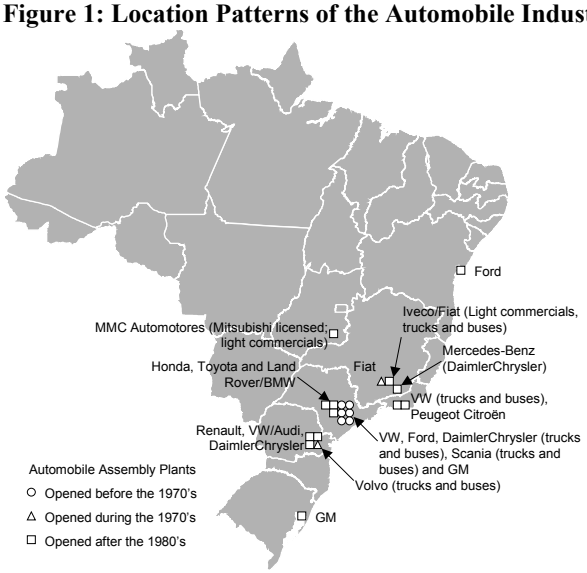
Note 1: Trucks and buses.
Note 2: Mitsubishi licensed; light commercials.
Note 3: Announced suspension of operations in Jan 2001.
Note 4: Light commercials, trucks and buses.
Note 5: Incentives renegotiated in May 1999.
Source: "O Estado de São Paulo", several editions, Anfavea (2003), Rodríguez-Pose and Arbix (2001), and Santos e Pinhão (1999).

During the so-called first migration of the automobile industry to Brazil, between 1956 and 1970, productive units clustered basically in São Paulo[6]. 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 significant and the educational gap had been reduced;
- The develop of road infrastructure in Brazil, 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 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, strengthen by the Automotive Regimes and the boom of FDI. 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 a polygonal area between Belo Horizonte, Uberlândia, Londrina, Porto Alegre, and Florianopolis. It is noteworthy that the only point out of this area is Ford's plant in Camaçari, not coincidentally, the last one to be established[7].

Figure 1: Location Patterns of the Automobile Industry in Brazil



Source: "O Estado de São Paulo", several editions, Anfavea (2003), Rodríguez-Pose and Arbix (2001), and Santos e Pinhão (1999).

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" (Humphrey and Oeter, 2000, p. 57). 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 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, 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.

3 The Ford Project in Bahia

After a crisis that almost led the company to discontinue its operation in Brazil[8], Ford Motor Company announced, in 1997, an US$ 1.0 billion investment in an automobile plant in Rio Grande do Sul, 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, the newly elected Governor decided to renegotiate the incentives package previously offered both to GM and Ford. 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 (Pernambuco and Bahia)[9]. 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 polices adopted.

In June 1999, Ford announced the Bahia site selection for a quite new investment, which was the biggest in a single new plant in the 1990s in Brazil[10]: it was estimated at R$ 3.515 billion[11] 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[12]. 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, and 17 first tier suppliers were, at that point, prearranged to follow the assembler to Bahia. It was also announced then that 60% and 95% of the value added would be produced in the state and in the country 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. 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[13]. 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 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

	Ford Project in Rio Grande do Sul	Ford Project in Bahia
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, the second one is likely to be a world scale project. 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 South and decided to install a plant in Bahia. As pointed out by Alban, Souza and Ferro (2000), the 1999 Real devaluation made the Mercosur strategy no longer interesting to Ford, the last company to begin the construction of an automobile plant in Brazil.

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. On the other hand, attracting final goods production became one of the main objectives of the state industrial strategy. It is recognized that the extreme concentration in intermediate goods not only has negative impacts on employment levels, but also expose the state's economy to the fluctuations of commodities goods markets, which explains, considerably, the aggressive policies adopted[14].

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. In spite of its harmful effects to the state territorial development, this feature contributed to create, in the neighborhood of Salvador, a satisfactory infrastructure supply when compared to 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 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) [15].

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. However, Ford's project in Bahia seems to be adjusted to the Ford 2000 plan launched in 1994. This restructuring proposal 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 procedures. 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.

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 simple 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 incentives package offered, but also the Mercosur crisis, and the global strategies of the company.

4 The Incentives Package[16]

The aim of this section is to estimate the monetary values of the incentives package given to Ford Motor Company in Bahia, 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. Estimating the fiscal sacrifice associated with the incentives package, however, imposes some methodological problems. Firstly, not all contracts clauses go public, under the argument that negotiation secrecy must be kept. 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[17]:

- **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 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[18].
- **Financial incentives** (F_n), i.e., credit programs at lower interest rates, either directly financed or "equalized" by the state[19]. 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.

Considering an investment of R$ 3.515 billion[20], 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;
- 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[21];
- 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[22];
- The percentage of value added locally was set in 60% for all years.

- 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[23]. 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[24].
- 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). A conservative use factor of 100% was assumed for this investment.
- 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 case, neither vehicles exports nor imports have been considered. Though quite unrealistic, these hypotheses are the same admitted by Alves (2001), which makes her results and the ones got here comparable to each other. The outcomes for both scenarios are reported in Table 5[25]:

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 package, the influence of some omitted items should not have a significant impact in the results. 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. Consequently, the total incentives reach a lower value than the one obtained in the first scenario. 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[26].

Based on the assumptions made, the present value of the total incentives offered to Ford is estimated in R$ 2,642 million (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 (68% of the 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. Chapman, Elhance, and Wenum (1995) reported the total incentives given to Mitsubishi in Illinois. Even though following a different calculation method, the results obtained may provide an additional reference to be compared with the results achieved for Ford's plant in Camaçari (Table 6).

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

	Ford (BA) (1)	Mercedes (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%
Fiscal Incentives/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[27] 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 are not especially high when compared with the other cases in Brazil. In fact, the relative incentives granted to this firm (68% of the investment) are lower than those given both to GM (127%) and to Mercedes-Benz (82%)[28]. This conclusion is quite unpredicted, because, in spite of the lower costs of labor, externalities and agglomeration economies in Bahia are lower than in the other two states, and the site is also distant from the major domestic market, and from the Mercosur countries. The results, however, could be explained:

- 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.

- This project, designed to produce at larger scales and export not only to Mercosur, but also to Northern countries (like Mexico, that represented three quarters of Ford exports from Bahia in 2002 and 2003, and around 68% of the automobile exports from the state in 2004) 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[29].

Another conclusion 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.

5 Economic Benefits

Estimating the impacts of such a large investment is not an easy task, as several issues have to be taken into consideration simultaneously. In addition, some effects may be asymmetrically distributed over time. Finally, it may be quite difficult to distinguish real and fake expectations and to predict the authentic results, as 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.

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 short run, showed a positive employment effect of the use of laborsaving technologies and, considering the location choices, 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. 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 Camaçari, as its economic environment is diverse from the one found in the Northeast region as a whole.

Alban, Souza e Ferro (2000), exclusively concerned about the Amazon project, 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, 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[30]. In spite of these significant numbers, the authors defended that Ford project would induce higher GPD 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.

Rodríguez-Pose and Arbix (2001, p. 135) 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". Moreover, they defend that there are indications that contradict the usual argument of

the multiplier effects and spillovers. 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 that the infrastructure created to assist exports also simplifies the process of importing car components, which could frustrate the emergence of local suppliers.

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 Belo Horizonte. As pointed out by Lemos et al (2000, p. 3-7), not only by means of fiscal breaks, 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. At the beginning of the 1990s, the previously presented changes in the automobile world industry, and 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 and Mercedes-Benz. 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%. 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 forth 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 to promote economic growth based on the Ford's externalities.

Although many impacts are to be accomplished in the future, it is already possible to measure some outcomes of the factory's operation. According to data issued by Ford itself in August 2004, when the plant began to operate at full capacity, the assembly plant, together with the 33 first tier suppliers already installed, employed 7,039 workers (more than 40% above the 5,000 jobs mentioned when the project was announced). However, direct employment should not be considered the main benefit of the project, because of the increasing capital intensity of the automobile industry. A rough calculation indicates that the cost to the state of each job created is around R$ 375 thousand[31]. Of course, there are less expensive ways of creating direct jobs, such as the support to labor-intensive small and medium enterprises, especially in specific sectors[32]. 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 and the subsequent development path of the state, this line of reasoning would be hardly defensible.

In effect, the main benefit the project can 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 among different segments of the productive chain. 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. This is the reason why the estimations based upon the preexisting input-output relationships cannot capture all benefits the project might generate. As these forecasts consider an exogenously defined input-output matrix 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.

Nevertheless, to some extent, some changes in the economic structure of Bahia can already be noticed as the official statistics begin to include the project data. Between 1999 and 2004, while Brazilian GDP grew 13.1%, the cumulative GDP growth rate in Bahia was 19.5%. Part of this performance can be credited to the vehicles manufacturing growth rates in 2003 and 2004, which raised the share of the sector in the total manufacturing production in Bahia from 6.5%, in 2003, to 13.3%, in 2004[33]. Based on these data, it is possible to estimate the share of the car-manufacturing sector in Bahia GDP in 2003 in almost 2.1%. In 2004, although the numbers were not officially available yet, this share is likely to be greater than 4.6%. Moreover, the automobile's exports represent by now about 16% of the total Bahia exports values.

Together with these direct effects on GDP and exports, the project also increased the attractiveness of Bahia for other important firms, which have already announced their interest in operate in the state. This is the case of two big tires producers, along with other smaller automotive suppliers manufacturers. Together, these announced investments represent something near R$ 3.0 billion from 2002 onward. Some technological spillovers may be expected as well, as Ford has already set up its Product Creation Center (congregating more than 300 engineers), and an advanced technological center was created in 2002, in a partnership involving the Industry Association of the State of Bahia, 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 followed with attention.

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[1] The Southern Common Market involving Brazil, Argentina, Paraguay and Uruguay.

[2] That includes cars, light commercials and heavy commercials. Most of this growth is due to car production.

[3] 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 indicates that some important changes occurred.

[4] The "Special Automotive Regime" enlarged federal taxes incentives, especially those related to imports.

[5] Although the data are based upon ex-ante announced data, and the jobs may also include direct suppliers, the list can provide a basis to understand the location patterns in the automobile industry in Brazil in the 1990s.
[6] For a description of the automobile investment attraction policies in Brazil during this period, see Shapiro (1994).
[7] Also MMC Automotores has been implanted outside the polygonal area. It is, however, a small investment to produce light commercials. Besides, the investment has been located in Catalão, a city close to Uberlândia.
[8] 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).
[9] "O Estado de São Paulo", June 16, 1999.
[10] The Special Automotive Regime, no longer valid in 1999, was revived due to successfully political pressures.
[11] 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.
[12] In 1999, the state GDP was around R$ 42 billion.
[13] The state government tried, unsuccessfully, to attract other automobile plants (Asia Motors, Hyundai and Skoda).
[14] The political dividends associated with the attraction of the plant have to be also considered a good reason.
[15] Currently, the productivity level estimated for Ford's plant in Bahia is around 31.6 cars/employee/year. This level is higher than the Brazilian average index (23.1 vehicles/employee/year) showed in Table 1.
[16] Between the first and the last version of this paper, the agreement between the state of Bahia and Ford Motor Company was reviewed. The changes, however, seem to have a relatively small and negative effect on the present value of the incentives package. As a result, the estimates presented henceforth can be considered conservative.
[17] A discussion about these instruments and its fiscal implications can be found in Varsano (1997).
[18] According to the Brazilian Constitution, from the total VAT collected by the states, 25% must be directed to the municipalities, 18,75% to a fund for education and 5,25% to a fund for health. The constitutional obligations do not sum to 100%, but it was assumed here that all fiscal incentives generate costs to the state.
[19]The state government pays for the differences between the market interest rates and the lower rates settled.
[20] 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.
[21] These numbers are roughly consistent not only with the ones actually observed in 2002, 2003, and 2004, but also with the projected production announced by the company for 2005.
[22] 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 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.
[23] Based upon the values of the incentives in the last years (source: Development Agency of the State of Bahia)
[24] This group was called "Ford Executive Group" and lasted until 2003.
[25] For a detailed description of the calculation method, see Cavalcante and Uderman (2004).
[26] 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.
[27] Even considering that this amount was given in1986, it is for sure smaller than the incentives given to Ford 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.
[28] 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).
[29] In 2002, more than 35% of Ford's exports (in units) from Brazil were already shipped in Bahia.
[30] By that time, the authors understood that the 5,000 direct jobs announced by the company were overestimated. Further studies (Consórcio Intecsa – Inarsa – Concremat – JW – Boursheid, 2003) estimated the number of direct jobs (7,945), indirect jobs (30,172) and the share of Bahia in the indirect jobs (56%).
[31] 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.
[32] Teixeira and Vasconcelos (1999) are also sceptical about the impacts of automobile plants on direct employment.
[33] The authors would like to thank Gustavo Pessoti (SEI), who provided recent information about the car-manufacturing sector not yet available in the web page of the official statistic institute of the state of Bahia (http://www.sei.ba.gov.br).