# Foreign direct investment and transnational corporations in Brazil: recent trends and impacts on economic development

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# Foreign Direct Investment and Transnational Corporations in Brazil: Recent Trends and Impacts on Economic Development

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## Introduction

From the 1980s on, the exhaustion of Brazil's postwar economic-development model became manifest in severe macroeconomic disequilibriums and the inability to maintain earlier high and sustained rates of economic growth. The stagnation of investment and weak efforts at technical innovation translated into low levels of efficiency, productivity, and technological modernization.

The 1990s saw a break with the statist postwar model in favor of reduced state economic intervention and a more comprehensive liberalization of both trade and capital flows. Among the economic policies adopted to this end, trade and financial liberalization and privatization of state-owned enterprises stand out. Proponents expected these policies to eliminate bottlenecks hindering the competitiveness of Brazilian industry and to hasten the convergence of Brazil's technology, managerial practices and levels of productivity to those of the "advanced" economies.

Some scholars and policy makers[i] saw foreign corporations as the protagonists of this process. They believed that most domestic private companies would not be able to survive or expand in a liberalizing, non-inflationary context without the subsidies they had enjoyed under the earlier model. Given the privatization process and the declining importance of state-owned companies, these analysts argued, economic modernization would be accomplished by affiliates of transnational corporations (TNCs). Under a liberalizing regime, these affiliates, mainly in the most capital and technology-intensive sectors, would have stronger incentives to invest in cost reduction and technology modernization, and to become more specialized and less vertically integrated increasing their efficiency, productivity, and competitiveness in world markets.

Part of the knowledge accumulated by TNCs, according to these vision, would spill over to national firms, contributing indirectly to their modernization, and resulting in a more competitive economy, able to generate higher levels of income and employment in the long run.

During the 1990s, particularly in the second half of the decade, there was a boom in foreign direct investment (FDI) flows to the Brazilian economy, which translated into an increase in the already large role of foreign corporations in the Brazilian productive structure. Despite some decline in FDI flows to Brazil in the first years of the twenty-first century, inflows remain high.

TNCs will probably continue to make important investments in Brazil and hold a prominent place in many sectors. Therefore, an assessment of these corporations' activities and the effects of government economic policy on them is crucial as a guide for future policymaking.

What have been the effects of the FDI boom and the growth of the foreign share in the Brazilian economy? Have the optimistic expectations of mentioned scholars and policy makers been fulfilled? If not, what have been the actual effects on foreign trade, productivity, employment,

and the technological capabilities of the Brazilian economy? What has been the impact of government economic policy in this process?

This paper seeks to answer these questions based on a review of several studies on the topic. Besides this introduction, the paper comprises three sections. In section 2, we offer a general characterization of recent FDI inflows, as well as of the growth of TNC affiliates' share in the Brazilian economy. In section 3, we analyze the impacts of FDI on productivity, trade flows, R&D expenditures, and wage levels. In the last section, we make our final remarks and policy recommendations.

## General characteristics of the recent FDI boom in the Brazilian economy

One of the basic characteristics of the Brazilian economy is a high level of internationalization, with foreign corporations playing a leading role in many sectors.

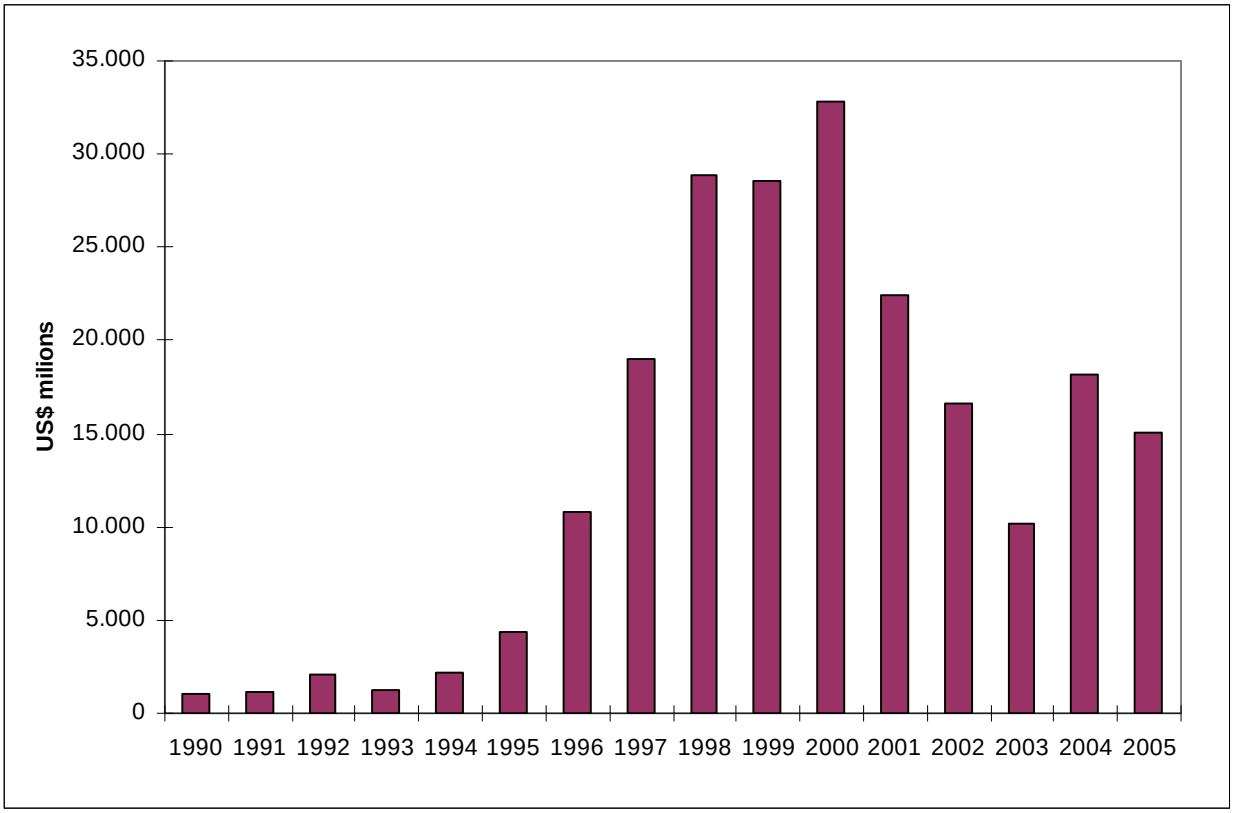
This is not a new phenomenon. FDI inflows and the TNCs' leading role in the most dynamic sectors have been key features of the Brazilian industrialization process from its beginnings. Especially from the early postwar years to the end of the 1970s, TNC affiliates, connected to public and private domestic companies by state planning, were fundamental to developing a diversified industrial structure, convergent with that of high-income countries at least in terms of the sectoral composition of output.

In the 1980s, however, the external debt crisis ended the Brazilian economy's long growth cycle. Brazil started to experience highly volatile GDP growth rates, as well as chronic inflation. FDI inflows stagnated at low levels, with TNC affiliates refraining from large-scale expansion projects.

The resumption of investment during the 1990s meant the return to more aggressive expansion strategies by TNC affiliates. Motivated by changes in economic policy and conditions – liberalization, privatization, and macroeconomic stability, followed by an increase in demand for consumer durables –TNCs began to expand their presence in the Brazilian economy again.

From approximately US$ 1.5 billion annually in the 1980s and early 1990s, FDI inflows increased to an average level of US$ 24 billion anually between 1995 and 2000. It's interesting to mention that the inflows continued to grow through the year 2000, despite the Asian crisis of 1997, the Russian crisis of 1998, and even the Brazilian crisis of 1999. Starting in 2001, with a world economic slowdown considerably reducing trade and investment flows, FDI inflows to Brazil declined, reaching a low of US$10.1 billion in 2003. In 2004, the volume of FDI went up again, dipping slightly again in 2005 (Chart 1).

**Chart 1 – Brazil – Inward Foreign Direct Investment – 1990-2005 – US$ millions**




Source: UNCTAD.

Table 1 shows that Brazil's share in world FDI flows increased from less than 1% in 1990-1995 to 2.9% in 1996-2000, dropping to 2.3% in 2001-2005. In the latter period, the Brazilian share of total inflows to developing countries was 7.3%, and represented 23.5% of total inflows to Latin American and Caribbean countries.

**Table 1 – Brazil – Share in world and regional FDI inflows - %**

| **Period** | **1990-1995** | **1996-2000** | **2001-2005** |
|---|---|---|---|
| **Share in World FDI** | 0.9 | 2.9 | 2.3 |
| **Share in Developing FDI** | 2.8 | 11.9 | 7.3 |
| **Share in Latin America&Caribbean FDI** | 10.7 | 29.7 | 23.5 |

Source: UNCTAD.

Important changes occurred in the sectoral composition of FDI inflows as well. Until 1995, the manufacturing sector accounted for almost 67% of all FDI stock in Brazil, whereas in the second half of the decade, the prevalence of the service sector was remarkable, with electricity, gas, water, postal services and telecommunications, financial services, and wholesale and retail trade

attracting significant FDI flows. A large part of the investment in these sectors was associated with the privatization process. By 2000, the service sector's share in the FDI stock had increased to 64% and that of the manufacturing sector had dropped to 33.7%, though manufacturing industries such as food and beverages, automotive, chemicals, metallurgy, and telecommunications equipment continued to receive significant volumes of investment.

**Table 2 – Brazil - FDI stocks and flows by industry – US$ millions and %**

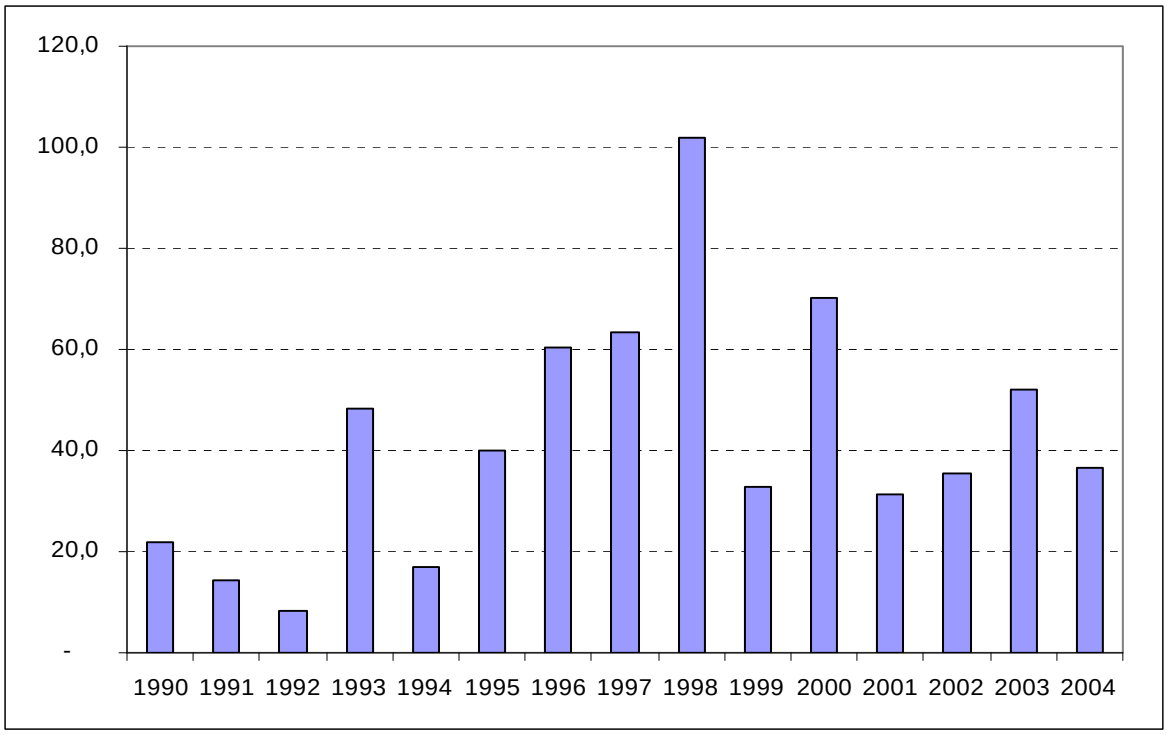
| Economic Sector | Stock | | | | Flows | |
|---|---|---|---|---|---|---|
| | 1995 | | 2000 | | 2001-2006 | |
| | US$ millions | % | US$ millions | % | US$ millions | % |
| **Agriculture and mining** | **925** | **2.2** | **2,401** | **2.3** | **8,249** | **7.1** |
| **Manufacturing** | **27,907** | **66.9** | **34,726** | **33.7** | **44,917** | **38.5** |
| Food and beverage | 2,828 | 6.8 | 4,619 | 4.5 | 11,004 | 9.4 |
| Chemicals | 5,331 | 12.8 | 6,043 | 5.9 | 7,295 | 6.2 |
| Automotive | 4,838 | 11.6 | 6,351 | 6.2 | 6,335 | 5.4 |
| Metallurgy | 3,005 | 7.2 | 2,513 | 2.4 | 3,759 | 3.2 |
| Electronic and telecom. equipment | 785 | 1.9 | 2,169 | 2.1 | 3,023 | 2.6 |
| Pulp and paper | 1,634 | 3.9 | 1,573 | 1.5 | 2,642 | 2.3 |
| Machinery | 2,345 | 5.6 | 3,324 | 3.2 | 1,989 | 1.7 |
| Electrical equipment | 1,101 | 2.6 | 990 | 1.0 | 1,500 | 1.3 |
| Rubber and plastic | 1,539 | 3.7 | 1,782 | 1.7 | 1,402 | 1.2 |
| Others | 4,502 | 10.8 | 5,361 | 5.2 | 5,966 | 5.1 |
| **Services** | **12,864** | **30.9** | **65,888** | **64.0** | **63,575** | **54.5** |
| Telecommunications | 399 | 1.0 | 18,762 | 18.2 | 17,216 | 14.7 |
| Electricity, water and gas | 0 | 0.0 | 7,116 | 6.9 | 8,708 | 7.5 |
| Finance services | 1,638 | 3.9 | 10,671 | 10/4 | 7,916 | 6.8 |
| Business services | 4,953 | 11.9 | 11,019 | 10.7 | 7,248 | 6.2 |
| Retail trade | 669 | 1.6 | 3,893 | 3.8 | 5,353 | 4.6 |
| Wholesale trade | 2,132 | 5.1 | 5,918 | 5.7 | 3,773 | 3.2 |
| Others | 3,072 | 7.4 | 8,509 | 8.3 | 13,362 | 11.4 |
| **Total** | **41,696** | **100.0** | **103,015** | **100.0** | **116,741** | **100.0** |

Source: Central Bank of Brazil. Compiled by NEIT/IE/UNICAMP.

Between 2001 and 2006, the service sector continued to account for more than half of total inflows although its share dropped compared to the previous period. The manufacturing sector, in turn, accounted for 38.5% of the total inflows during this period. Agriculture and mining also grew in importance, accounting for 7.1% of total FDI.

Another feature of recent FDI inflows to the Brazilian economy has been the importance of mergers and acquisitions. Chart 2 shows the value of international mergers and acquisitions in which Brazil is the home country of the acquired company as a percentage of the total value of FDI received. As we can see, the share peaked at a very high level at the height of the privatization process, in the second half of the 1990s, but remained high even after the reduction in privatizations. The large share of FDI attributable to mergers and acquisitions shows that a substantial part of the investment inflows did not contribute to the development of new productive capacity (Laplane and Sarti, 2002).

**Chart 2 – Brazil – Share of Mergers and Acquisitions in the total FDI -**




**%** oS ource: UNCTAD.

In fact, despite the high levels of FDI inflows, the Gross Fixed Capital Formation in the Brazilian economy stagnated during this period as a whole.

The high FDI inflows have meant an increase in the foreign share in the Brazilian economy. According to data from the census of foreign capital carried out in 1995 and 2000 by the Brazilian Central Bank, total sales of foreign majority-owned companies reached 14.4% of Brazil's total output in 1995. In 2000, this ratio increased to 19.7%. Foreign corporations also increased their share of the country's foreign trade, reaching 41.3% of exports and 49.3% of imports.

**Table 3 – Importance of foreign majority-owned companies in the Brazilian economy**

| | 1995 | 2000 |
|---|---|---|
| **Exports** | 31.2% | 41.3% |
| **Imports** | 31.4% | 49.3% |
| **Sales** | 14.4% | 19.7% |

Source: Brazilian Central Bank and IBGE National Accounts

The role of the foreign capital is even stronger when we consider only large companies. Among the largest 500 private Brazilian companies, those under foreign control accounted for 41.2% of sales in 1989. This share increased to 49.9% in 1997 and, by 2003, reached 51.7%.

These data demonstrate the advance in the process of internationalization of the Brazilian economy. In the next section, we assess the effects of this process.

## Impacts of foreign direct investment and TNC activity on the Brazilian economy

The increase in FDI inflows and in the foreign share in the Brazilian productive structure inaugurated a series of studies assessing their impacts. This section aims at synthesizing the main results of those studies, organizing the discussion around four major questions. The first concerns the impacts on productivity. The second addresses the effects on foreign-trade flows. The third deals with the influence of foreign corporations on technology development and innovation by Brazilian companies, and the fourth details impacts on wages.

### Impacts on productivity

As we highlighted in Section 1, some scholars and policy makers expected the expansion of foreign corporations to improve the competitiveness of the Brazilian economy. In view of TNCs' greater technological capacity, it was expected that TNC affiliates would directly boost productivity levels. Besides the direct effect associated to an expansion in the presence TNC, indirect effects would appear if national companies absorbed part of the production and organization techniques adopted by their foreign counterparts. According to the literature, these spillovers would occur due to both the "competition effect" – when national companies, facing competition from foreign corporations, have to modernize their production and management activities – and the "demonstration effect" – when national companies emulate the more advanced techniques of their foreign competitors.

According to data from the Brazilian Annual Industry Survey of 2003[ii], TNCs are, on average, much larger than domestic companies. Table 4 shows that foreign firms have an average size 4.5 times larger than that of national firms, based on number of people employed. When measured by gross revenue, the foreign firms are 11.4 times larger and, in terms of Value Added, 9.6 times larger. Foreign corporations are, on average, 4.3 times more productive than national companies.

**Table 4 – Brazil - Characteristics of Transnational and National Companies in 2003 - Average values**

| Averages | National | Transnational | TNC/NC |
|---|---|---|---|
| **People Employed** | 128 | 577 | 4.5 |
| **Gross Revenue (R$ millions)** | 22.1 | 252.3 | 11.4 |
| **Value Added (R$ millions)** | 8.7 | 83.4 | 9.6 |
| **Productivity (Value Added/People Employed) R$** | 32.501 | 138.323 | 4.3 |

Source: SECEX, BACEN, PIA, and RAIS. Extracted from Hiratuka and Dias (2007)

Although in fact TNCs are, on average, more productive than national companies, Gonçalves (2003) shows, based on a sample of 22,000 companies, that there is no evidence of faster productivity growth in the foreign companies than in their domestic counterparts. Using data from 1997 to 2000, he points out that national companies actually exhibit greater productivity growth. Moreover, comparing the 40 industries with the highest rates of productivity growth and the 40 industries with the highest rates of increase in the foreign share of total value added, only 14 industries were on both lists.

In the same study, Gonçalves sought to check empirically the existence of productivity spillovers from foreign to national companies. In a panel econometric model at firm level, the author tested whether the expansion of the foreign presence in a certain sector affected the productivity of the national companies in the same sector, controlling for other factors that could affect the productivity of the latter, such as size and sector of activity.

In a first general model, there was no evidence of spillovers, either positive or negative. In a second test, the national companies were classified into three groups, according to the original gap in productivity relative to foreign corporations in the same sector, to check if companies with different levels of productivity would differ in their capacity to absorb potential spillovers. In addition, these sectors were classified according to their FDI strategy (market-seeking, resource-seeking, or efficiency-seeking) to determine if investment directed toward export had a higher potential to generate spillovers.

Contrary to expectations, the national companies with a narrower productivity gap were negatively affected (that is, the increase in foreign share meant a lower increase in domestic productivity). For companies with a wider gap, the effect was positive. Regarding FDI strategies, market-seeking investments had negative impacts, whereas the others were not statistically significant. According to Gonçalves, these results show that, for the largest national companies that compete directly with foreign companies in the domestic market, the positive spillovers associated with demonstration and competition effects were surpassed by the negative effects related to loss of scale and the shift to activities with a lower value added potential.

In sum, the increased foreign presence did not have a dynamizing effect on productivity for the industrial structure as a whole. The indirect positive impacts were seized by a group of less productive companies that compete less directly with the foreign corporations, probably in market niches. For higher-productivity companies that compete directly with foreign firms in the

domestic market, the evidence points to a negative impact, due to a shift to lower-productivity activities and to decline in scale.

### Impacts on foreign trade

Several studies have analyzed the trade performance of foreign corporations and compared it to the trade patterns of national companies, using different databases and methodologies.

In general, these studies have demonstrated that foreign corporations have a greater international orientation than national companies, although this difference is higher for imports than for exports.

Moreira (1999), for example, analyzing 1997 data on the business income tax (IRPJ) for about 26,000 companies, confirms that, for a given sector and company size, foreign corporations' exports were, on average, 179% higher than those of domestic companies, while imports were 316% higher on average.

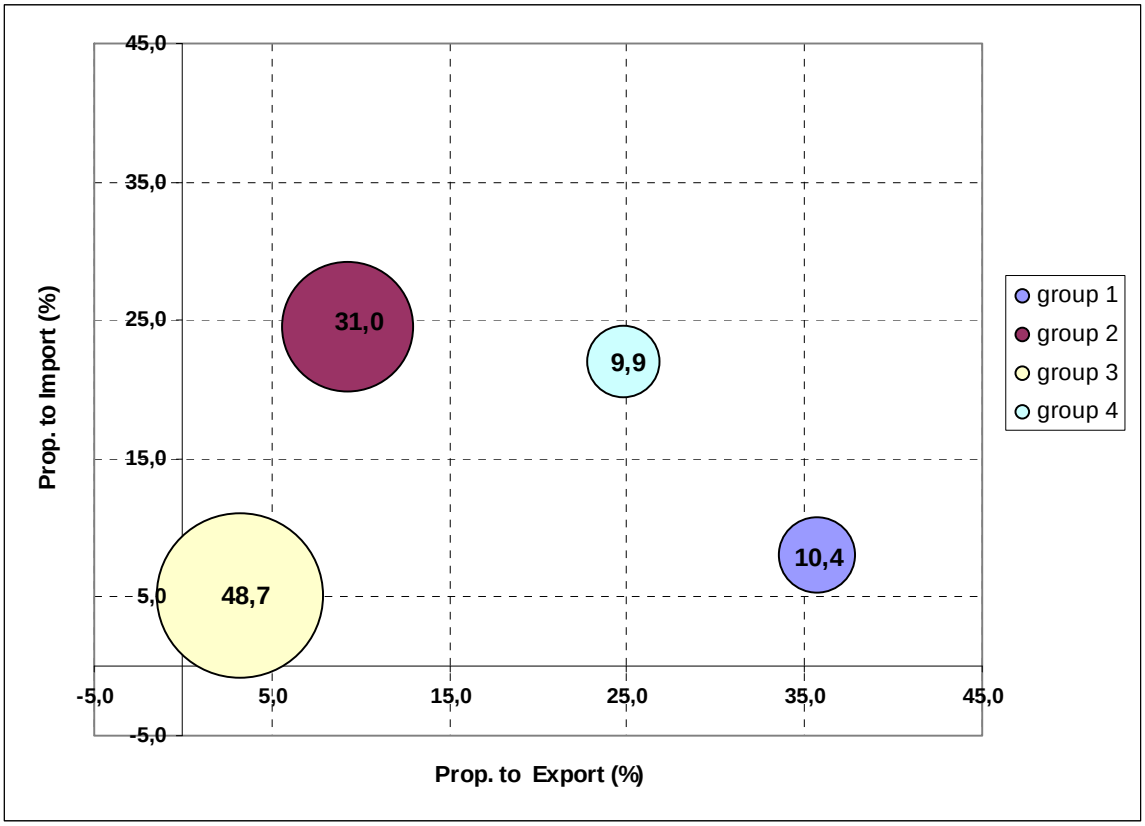
De Negri (2004), investigating microdata from about 54,000 companies from 1996 to 2000, also confirms a difference in the trade behavior of national and foreign companies, based on a panel analysis. Again, the difference in favor of foreign corporations was much higher for imports than for exports. The results showed that foreign companies exported, on average, 70% more than domestic, and imported 290% more, even controlling for other factors, such as sector, size and level of labor education.

These results demonstrate that, although foreign corporations do have a greater international orientation than national companies, their contribution to positive trade balances has been small, precisely because of their higher level of imports. If it is true that one of the advantages of TNCs over domestic companies is TNCs' well-established trade networks, these advantages were used mainly to increase import flows.

Laplane, *et al*. (2001) show that a large proportion of foreign investment in Brazil aimed at exploring growth opportunities in the domestic or, at the broadest, regional (Latin American) market. Investments intending to use Brazil as an export platform for markets beyond Latin America were rare.

Trade liberalization, combined with exchange-rate appreciation during most of the 1990s, meant a large increase in imports, with no corresponding increase in exports, as the data in Chart 3 confirm. These data were compiled from two data sets. The first concerns foreign companies' propensities to export (exports/sales) and to import (imports/sales). Foreign companies covered by the Census of Foreign Capitals in 2000, had an average propensity to export of 14.3% and a propensity to import of 13.6%. Based on these ratios, the sectors were classified into four groups. The first group consists of sectors with a propensity to export above the average and a propensity to import below the average. The second includes sectors with a propensity to export below the average and a propensity to import above the average. The third group comprises sectors with propensities to export and to import below the respective averages. The fourth has both propensities above the respective averages. The second set of data relates to the volume of investment received in each group of sectors between 1996 and 2005. In the chart, the bubble size represents the volume of investment.

**Chart 3 – Propensity to Export and Import of TNC Affiliates in Brazil – 2000**.




Source: Central Bank of Brazil. Compiled by NEIT/IE/UNICAMP.

As Chart 3 illustrates, almost half of total investment was directed to sectors in group 1, with a low degree of trade integration, in terms of either exports or imports. This group largely comprises service industries, which were oriented toward the domestic market and, for that reason, had little impact on trade flows. Group 2, with a high propensity to import and a low propensity to export, accounted for 31% of the accumulated flows between 1996 and 2005. This suggests that these industries prioritized the domestic market, but with a high volume of imported inputs and components. The key industries within this group are chemicals, information technology products, and telecommunications equipment. Group 3, characterized by a high propensity to export and a low propensity to import, accounted for 10.4% of the total investment. In general, these are sectors in which resource-seeking strategies predominate, as in mining. Finally, group 4, with a high propensity to both export and import, includes sectors such as automobiles, as well as machinery and equipment.

Hiratuka and De Negri (2004) explain asymmetry in trade flows and in the propensities to import and export of foreign affiliates. They demonstrate, through panel econometric techniques, that affiliates established in Brazil receive most of their imports from their parent TNCs' home countries, while their main export destination is the regional market. Affiliates tend to import from their home countries products, inputs, and components that are highly technology-intensive, which results in significant differences between exports and imports flows not only in value, but also in terms of technological profile.

Affiliates in Brazil tend to bring, from their headquarters or from other affiliates, technologically sophisticated inputs and final products, aiming to supply the domestic market and, in some cases, MERCOSUR and ALADI. Few affiliates in Brazil receive global mandates to produce and develop products in the most important stages of the corporate value chain. This finding is reinforced by studies assessing the position of Brazilian affiliates in the global distribution of TNCs' innovation activities, as we will analyze in section 3.3.

Lastly, Hiratuka and Dias (2007) try to find evidence of spillover effects in exports from foreign affiliates to domestic companies in the period 1997-2003. An econometric test was carried out to check whether the presence foreign corporations, for whom the cost to enter the international market is lower, is associated with an increase the exports of domestic companies in the same sector.

The results reveal that a higher foreign presence has a negative, albeit small, effect on the probability that national firms in the same sector will export. This may be attributable to the same crowding-out effect observed in the analysis of productivity. The effect is not significant, however, for the value of exports of firms that are already exporting. That is, the expansion of foreign corporations reduced the probabilities that non-exporting firms in the same sector would export, although it had no effect on the value of exports of national firms that were already exporting.

These studies indicate that the impacts on trade flows were limited, mainly when compared with existing expectations about the role of foreign corporations on the international competitiveness of the Brazilian economy. This is explained by the fact that most of the foreign investment in Brazil targets the domestic market. However, in an environment of trade liberalization and exchange appreciation, as during most of the period under study, TNC affiliates also increased their imports, primarily of highly technology-intensive inputs.

**Impacts on innovation activities**

FDI may affect innovation and R&D expenditures in host economies. According to UNCTAD (2005), TNCs have been adopting strategies to decentralize R&D activities, to both reduce their associated costs and monitor technology advancements generated outside the home country . Although the internationalization of technology activities occurs primarily among high-income countries, this decentralization has reached developing countries as well.

In the Brazilian case, TNCs tend to introduce innovation more rapidly than domestic companies, even controlling for their sectoral distribution. According to Araújo (2004), 67.9% of foreign companies in Brazil introduced innovations from 1998 to 2000, compared to 30.6% of domestic industrial companies.

Although less innovative on average, domestic companies devote a larger part of their revenues to internal R&D expenditures (0.73% of total sales for domestic firms compared to 0.61% for foreign firms, in 2000) (Araújo, 2004). Foreign corporations, instead, rely on methods developed at their headquarters or by other affiliates. Of all foreign corporations that introduced innovations, 68% stated that they had used, as a source of information, another firm, located abroad, in the same corporate group.

According to Araújo (2004), the higher average in R&D expenditures as a percentage of total sales for domestic companies is robust, even controlling for factors such as sector of activity and

labor skills. This study also suggests that domestic companies tend to spend more on R&D when foreign corporations in the same sector also have high R&D expenditures. This may be due to the competition effect, and represent a positive spillover from the presence of TNC affiliates. However, the data structure in *cross-section* makes it difficult to establish a relation of causality, since it is also possible that foreign corporations spend more in R&D precisely to be able to compete with their domestic counterparts.

In any case, the fact that the average R&D expenditures as a percentage of sales for foreign corporations is lower than for domestic companies shows that TNC affiliates' contribution to technology development in the Brazilian industry could be stronger than it actually is .

**Table 5 - Majority-owned foreign affiliates of U.S. parent companies – R&D expenditures and share of selected developing countries in R&D expenditures abroad - 2004**

| | R&D expenditures/ Sales | Share in total sales | Share in R&D expenditures | Share in R&D expenditures/ Share in sales |
|---|---|---|---|---|
| **Affiliates' total** | **0.8** | **100.0** | **100.0** | **1.0** |
| **Developed countries** | **0.9** | **71.2** | **86.3** | **1.2** |
| **Developing countries** | **0.4** | **28.8** | **13.7** | **0.5** |
| **Latin America** | **0.2** | **11.0** | **3.2** | **0.3** |
| Argentina | 0.1 | 0.7 | 0.1 | 0.1 |
| Brazil | 0.5 | 2.2 | 1.2 | 0.6 |
| Chile | 0.1 | 0.3 | 0.0 | 0.1 |
| Venezuela | 0.1 | 0.4 | 0.1 | 0.1 |
| Mexico* | 0.3 | 3.9 | 1.3 | 0.3 |
| **Asia** | **0.7** | **12.6** | **9.8** | **0.8** |
| China | 1.0 | 1.9 | 2.3 | 1.2 |
| Hong Kong | 0.3 | 1.9 | 0.8 | 0.4 |
| India | 1,2 | 0.4 | 0.6 | 1.5 |
| Korea, Republic of | 1.0 | 0.8 | 0.9 | 1.1 |
| Malaysia | 0.9 | 1.1 | 1.1 | 1.0 |
| Philippines | 0.4 | 0.4 | 0.2 | 0.5 |
| Singapore | 0.6 | 3.8 | 2.6 | 0.7 |
| Taiwan | 1.2 | 1.0 | 1.3 | 1.4 |
| Thailand | 0.1 | 0.9 | 0.1 | 0.2 |

* 2002 data; Source: BEA. Compiled by NEIT/IE/UNICAMP

Hiratuka (2006) shows, based on data from U.S. multinationals, that R&D expenditures outside the United States have been increasing even for affiliates in developing countries, although this trend is driven by affiliates in Asia. Latin America and Brazil are losing share in the total of R&D expenditures made abroad by U.S. TNCs.

Table 5 shows that, in 2004, TNC affiliates in Brazil made R&D expenditures equaling 0.5% of total sales, more than the average for developing countries, but below the average for affiliates established in developing Asian countries, especially China, Taiwan, India, South Korea, and Malaysia.

In the same table, it is also interesting to compare, each country's share of total U.S. TNC affiliates' R&D expenditures to its share of total U.S. TNC affiliates' sales. Whereas Latin American countries are invariably more important as markets than as centers for R&D, the Asian countries' sales shares are not so different from their R&D shares. Some of them even stand out for having higher R&D shares than sales shares. Brazil's R&D share is only 60% of its sales share. Therefore, in 2004, Brazil was still more important than China as a location of production and sales for U.S. corporations, but was less important as a location of technology activities.

These data show that TNC affiliates in Brazil, although making higher R&D expenditures relative to sales than affiliates in other Latin American countries, could contribute more to Brazilian innovation, just as they do in some Asian countries. However, it is worth remembering that industry and technology policies in Brazil may explain this difference compared to Asian countries, as we will detail in section 4.

### Impacts on wages

This last part of Section 3 examines the influence of foreign corporations on wage levels in Brazil. The characteristics of people employed by domestic companies are quite different from those of people employed by foreign companies. According to Hiratuka and Fracalanza (2006), white-collar workers in foreign corporations earn, on average, three times more per hour than those in domestic companies, their number of years of study is 30% greater, and their average employment tenure is 70% longer. As for blue-collar workers, the differences are similar, although of a slightly lesser magnitude.

**Table 6 – Brazil – Differences on labor characteristics and wages between Domestic and TNC affiliates - 2002**

| White-collars | NC | TNC | TNC/NC |
|---|---|---|---|
| Hourly wage (R$) | 3.4 | 10.3 | 3.0 |
| Years of study | 8.6 | 11.0 | 1.3 |
| Employment time (months) | 37.0 | 62.6 | 1.7 |
| **Blue-collars** | **NC** | **TNC** | **TNC/NC** |
| Hourly wage (R$) | 2.8 | 6.7 | 2.4 |
| Years of study | 6.9 | 8.7 | 1.2 |
| Employment time (months) | 39.0 | 65.5 | 1.7 |

Source: BACEN, PIA, and RAIS. Extracted from Hiratuka and Fracalanza (2006)

Econometric studies by Arbache & De Negri (2004) and by Bahia & Arbache (2005) find wage premiums for employees of foreign corporations of 38.3% and 21.7% for 1996-1998 and 2000, respectively. Although these studies confirm that foreign corporations pay higher wages, the effects of their growing presence in Brazil was not closely analyzed.

Hiratuka & Fracalanza (2006) assess, using a panel model with data on domestic industrial companies in Brazil from 1997 to 2002, to what extent the expansion of the foreign presence resulted in positive effects on the wages of both white and blue-collar workers, controlling for other factors that could affect pay, such as employment tenure and level of education. For blue-collar workers, the result was not significant, whereas for white-collar workers it was positive, although with a very low coefficient. Therefore, there is evidence that growth in the foreign presence had a positive, albeit small, impact on the wages paid to non-production workers in domestic companies of the same sector.

In the same study, the authors also used the propensity score matching technique, combined with a difference-in-difference model to check if companies acquired by foreign corporations started to pay higher wages. Basically, this technique consisted of analyzing the evolution of wages in a group of companies that had come under foreign control and comparing it with a control group made of companies with similar characteristics that remained national. The statistical test showed no significant differences between the two groups; that is, ownership change did not cause wage levels of acquired corporations to change relative to domestic companies, for either blue- or white-collar workers.

Therefore, although the acquisition of national companies did not translate into an increase in wage levels in the acquired firms, foreign direct investment had a positive effect on the wages of white-collar workers in national companies of the same sector, in spite of not having a significant effect on the wages of the blue-collar workers.

## Final remarks and policy recommendation

The data analyzed in this article demonstrate that TNC affiliates operating in Brazil differ in several characteristics from the averages of domestic companies. In general, they have higher productivity and a more qualified labor force; they also pay higher wages, are more innovative, and have a higher degree of trade integration.

These differences, which reveal ownership advantages accumulated by global corporations, have led many authors to predict that the expansion of these corporations in Brazil would contribute to faster and more sustained economic growth.

These expectations were reinforced by the fact that the new boom in FDI occurred at the same time as a set of economic reforms to create a more open environment, removing mechanisms of state intervention that dated back to the period of import substitution.

One of the most important reforms during the liberalizing period of the 1990s was precisely the gradual elimination of restrictions to the activity and movement of foreign capital, either in financial flows or in FDI flows.

Article 171 of the Brazilian Constitution of 1988 establishes the legal distinction between a domestic company and a foreign-owned company. Thus, it permits policies favoring domestic companies relative to foreign companies, such as selective fiscal incentives or access to financing, as well as legal mechanisms establishing special performance requirements for foreign

companies. Moreover, the Constitution gives the state the power to control the movement of capital in accordance with the national interest, as well as establishing state monopolies in the extraction of radioactive minerals, oil and gas, and telecommunications services. Foreign capital was limited in several sectors, such as exploitation of mineral and water resources, and newspapers, radio and television.

From the beginning of the 1990s, the restrictions on foreign capital started to be eliminated. In 1991, changes in the Information Technology Law, in force since 1984, repealed the prohibition on foreign companies entering the sector. In 1993, the revision of the Constitution eliminated the distinction between domestic and foreign companies. Later, several constitutional amendments gradually eliminated the restrictions on capital movements.

These changes in the regulation of foreign capital occurred at the same time as the elimination of sector-specific industrial and technology policies. From that point on, "horizontal" policies affecting all sectors uniformly predominated, but for rare exceptions. The government policy toward foreign capital was basically to create a "freer" environment for TNC investment and activity.

It was expected by the policy makers that growth in the foreign presence, in an liberalized environment, would result in the transfer of the superior characteristics of TNCs to Brazilian industry as a whole. However, the findings analyzed in this paper show that the actual consequences fell far short of these optimistic expectations.

From a microeconomic perspective, the studies reviewed in this paper demonstrate that, despite the fact that foreign affiliates show higher levels of productivity, foreign trade integration, innovation, and wages than domestic companies, their influence over the latter and was very limited and, in some cases, even had negative spillover effects, as in productivity and access to foreign markets.

Why were these effects so limited, especially when other developing countries were able to take advantage of FDI to spur economic development? In countries such as China, Malaysia, and Singapore, the impacts of foreign investment on industrial and technology development and on the competitive insertion in foreign markets were far greater than those seen in Latin America, and particularly in Brazil (UNCTAD 2002; Lall, 2003).

One of the common traits among the countries that demonstrated this ability was the adoption of active industrial and technology policies (e.g., technical and higher education, support for basic research, financing and incentives to R&D activities) to establish important locational advantages, especially for activities with high technology content. Selective investment policies, structured to channel investment to strategic sectors, also increased the technology content of activities carried out by foreign affiliates and their degree of complementarity and integration with local companies and institutions.

As previously emphasized, the Brazilian government adopted not a selective sectoral policy or a focus on more technology-intensive activities, but a horizontal policy whose main aim was to remove the existing restrictions on FDI and on the activities of foreign corporations.

TNC affiliates responded to this policy, seeking to increase efficiency, but with limited impact on the competitiveness of the rest of the economy. First, the possibility of relying on imported inputs and capital goods meant the replacement of local suppliers with foreign ones, reducing the productive links between TNC affiliates and domestic companies. Second, it also meant a decline in TNCs' technology efforts, previously directed toward adapting products to the local market.

More recently, the Brazilian government has been revisiting its industrial policy. In 2004, it launched the Industrial, Technology, and Foreign Trade Policy (Política Industrial, Tecnológica e de Comércio Exterior-PITCE). The PITCE includes a series of horizontal and sectoral measures. Among the horizontal measures, those turned to industrial modernization and technology innovation support stand out. An example is the new Innovation Law, which establishes a new regulatory framework for relationships among universities, research institutes and private companies, and, at the same time make the concession of subventions to research activities easier.

Four sectors were deemed strategic (capital goods, pharmaceuticals, software, and semiconductors) and three others "carriers of the future" (nanotechnology, biotechnology, and renewable energies), and each given specific financing and support programs for scientific and technology development.

Although resuming a government policy directed to industry and technology development is laudable, its results are still just beginning. First, it has been necessary to create mechanisms to coordinate the ministries and agencies implementing this policy, including the Ministries of Treasury, Planning, Development, Industry and Commerce, Science and Technology, the Funding Agency for Studies and Projects (Financiadora de Estudos e Projetos-FINEP), and the National Bank of Economic and Social Development (Banco Nacional de Desenvolvimento Econômico e Social-BNDES). Second, macroeconomic variables, especially fiscal restriction and high interest rates, are limiting the availability of resources for various programs and making it difficult for companies to make investment decisions, especially when these decisions are related to R&D and innovation. However, under more favorable macroeconomic conditions, the results of this new industrial policy would probably generate stronger results.

Even so, the new Brazilian industrial policy has the weakness of failing to acknowledge explicitly that, in some sectors, TNCs affiliates play a key role. In these sectors, the possibilities of competitive development depend on affiliates' ability to win from their headquarters – in competition with affiliates based in other countries – new projects for capacity expansion and technology development. The industrial policy could act in this direction [HOW?], while trying to ensure spillover effects to other companies.

In Brazil, the vast presence of large TNC affiliates that are world leaders in their sectors, with intense worldwide innovation activity, remains an untapped source of skill and knowledge. The challenge for the future is to devise a foreign investment policy coupled with industrial, technology, and foreign-trade policies. This requires recognizing the important role of foreign corporations in the Brazilian economy, understanding their role in different sectors, and, through well-chosen policies, fostering connections between these corporations and the local companies that will contribute to a more competitive economy with a greater growth capacity.

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[i] See, for example, Mendonça de Barros and Goldenstein (1997), Franco (1999), and Moreira (1999).
[ii] About 30,000 companies.