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# Foreign Investment and Sustainable Development in Argentina

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# Foreign Investment and Sustainable Development in Argentina

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## Introduction

Foreign Direct Investment (FDI) has played a major role in Argentina's During the 1990s, a period of deep structural reforms largely based on the neoliberal "Washington Consensus," Argentina was one of the main destinations for FDI among "emerging markets." Transnational Corporations (TNCs) were already a major presence in the Argentine economy. With the surge in FDI during this period, the role of TNCs reached unprecedented levels. In 2003 more than 80 per cent of the value added generated by the 500 leading Argentine firms belonged to TNC affiliates.

In the view of the reformers, FDI was to play a significant role in the needed restructuring of Argentina's economy. At the macroeconomic level, FDI was to help finance current-account deficits. Since TNCs often follow long-term investment strategies and, once installed in a host country, have large sunk costs, the reformers believed FDI would be less volatile than portfolio investment and other types of international financial flows. Last but not least, FDI was supposed to contribute to investment, and therefore to economic growth and increased employment, not only directly but also indirectly, that is, by fostering investments by local firms competing with, serving as suppliers to, or making purchases from TNCs (so-called "crowding in" effects).

At the microeconomic level, foreign firms engaging in FDI usually have ownership advantages (Dunning, 1993) over local firms in the host markets where they invest. These ownership advantages may include, among others, greater access to state-of-the-art technologies – and therefore the development of new products and processes of production – as well as superior organizational, productive, managerial and/or marketing (including brands) capabilities.

Foreign firms' advantages should be reflected in their productivity records and their introduction of new products and processes of production in the countries where they invest. Unless a TNC invests only to serve the internal market where the affiliate is located, those advantages should also be reflected in TNC affiliates' export performance. TNCs' international production and trade systems should foster the export performance of their affiliates, since affiliates may act as suppliers of products or components to the parent company or other affiliates and as recipients of inputs and products from them.

TNCs could also transfer environmentally friendly technology to developing economies and may find it advantageous to comply (even in their overseas establishments) with home-based regulations that tend to be stricter than those in the host country. It is often more cost-effective to establish a single set of practices and standards instead of scaling back environmental investments at overseas facilities. In addition, the greater level of scrutiny that TNCs are exposed to and the prospect of liability for failing to meet the appropriate level of standards tend to drive these firms to adjust their operations to higher requirements than those imposed by local regulations (see Chudnovsky and López, 2002a).

FDI could also have indirect effects (i.e., spillovers) on host countries, mainly through the impact of TNCs' presence on domestic firms' performance. The indirect effects of FDI can be very significant, since domestic firms are the bulk of the business sector in almost all countries.

Spillovers from FDI may take different forms:

a) There may be an increase in the human capital stock in host countries through the growing availability of workers, technicians and engineers trained by the TNC affiliates.

b) Competition from TNC affiliates may cause horizontal or intra-industry spillovers. Since TNC affiliates are usually more productive than the local firms with which they compete, domestic firms may increase productivity or improve product quality by reorganizing their businesses, increasing their innovative efforts, or acquiring additional machinery, equipment, or disembodied technologies. Sometimes, knowledge leakages from TNCs (in areas such as work process organization, product design, marketing, etc.) can help domestic firms increase productivity, although the TNCs may try to prevent these spillovers (Kugler, 2000).

c)TNC affiliates, on the other hand, may have an incentive to promote vertical or inter-industry spillovers. The diffusion of knowledge across sectors could benefit TNCs by helping their clients or suppliers to increase their productivity and competitiveness. TNCs may provide technical and marketing assistance, information, training, etc. to their suppliers, helping to generate positive spillovers. Affiliates established through acquisitions may source more locally than those taking the form of green field projects. While the latter have to put time and effort into developing local linkages, the former can take advantage of the supplier relationships of the acquired firm (Javorcik, 2004).

d) TNC affiliates could also generate market access (export) spillovers, as their export activity may reduce the cost of information about foreign markets or facilitate an export learning process for domestic firms.

e) Positive environmental spillovers could also arise if domestic firms learn from better environmental practices of TNC affiliates, or must adopt stricter environmental standards to become suppliers to those affiliates.

However, while TNCs are interested in a limited number of private economic goals, nation states have a broader range of objectives, economic (GNP growth, full employment, etc.) and non-economic (distribution of income and wealth, sovereignty in decision-making, political and cultural identity, environmental protection, etc). Also, whereas TNCs are interested in maximizing global profits or sales, states are interested in maximizing the welfare of their own citizens (Dunning, 1993).

In view of this divergence, some host countries may be worse off as a result of TNCs' activities. They may lose national control over strategic economic sectors, indigenous enterprises may be displaced from certain activities, jobs may be lost, the local environment may suffer, etc. Even if the net benefits are positive, host countries may not end up as well off as they could (Dunning, 1993). As Dunning points out, this implies a difficult counterfactual analysis. The questions to be answered in each case are 1) what would have occurred in the absence of TNCs or 2) in the absence of a set of policies aimed at maximizing the net benefits of TNCs (with policies instead aimed at building national capabilities).

At the macroeconomic level, FDI could cause a crowding-out effect (domestic firms investing less than what they would have invested in the absence of FDI) instead of the above-described

crowding-in effect.[ii] Regarding the balance of payments, it is important to consider not only the initial entry of capital. Profit flows from FDI operations sooner or later will have a negative impact on the balance of payments. These profits are remitted abroad as dividends, royalties, or interest payments, and through transfer pricing of merchandise imports and exports. Moreover, TNCs may have a greater import propensity than local firms, as documented in several studies.Thus, in the long term, many FDI projects may have negative effects on a host country's balance of payments.

At the same time, have raised doubts about whether FDI is more stable than other capital inflows. New developments in financial markets (e.g., derivatives) and the expansion of existing financial instruments (e.g., hedging) have greatly reduced the difference in stability between FDI and portfolio investment. Moreover, profit remittances may be as volatile as portfolio investment flows, especially during an economic crisis (South Centre, 1997).

At the microeconomic level, TNC presence may bring about not only positive, but also negative, spillovers. TNC affiliates cause negative horizontal spillovers if domestic firms are forced to reduce their production (reducing productivity if they are operating with high fixed costs) or even to exit the market, as a result of TNC competition (Aitken and Harrison, 1999). Negative vertical spillovers may also appear if domestic suppliers are displaced from the market as a consequence of the TNC affiliates' bias in favor of foreign suppliers[iii].

FDI could also have negative impacts on employment if TNC affiliates acquiring local firms replace local suppliers with imports. Moreover, domestic enterprises may be squeezed out by the size and strength of foreign branch plants. New firm formation may also be inhibited. In these cases, TNCs may displace existing or potential jobs in local firms.

FDI may also have negative effects on income distribution. Since FDI creates demand and hence raises wages principally for skilled labor, it could lead to greater wage inequality in host countries (Barry *et al*, 2001).

Finally, developing countries could become "pollution havens" (Zarsky, 1999), attracting TNCs escaping from countries with high environmental standards ("environmental refugees"). TNCs could also employ technologies forbidden in their home countries due to their damaging impact on health or the environment.

In this context of conflicting theoretical and empirical evidence regarding FDI impacts,[iv] it is no wonder that a recent book analyzing the relations between FDI and development concludes that "the evidence gathered in this volume demonstrates that a search for a 'universal result' of FDI on a developing country is simply misguided. FDI can have dramatically differing impacts – both positive and negative" (Moran *et al*, 2005, p. 375).

Case studies are, hence, needed to analyze the specific impacts that FDI has on different host countries under very different circumstances (in terms of domestic economic policies, productive structures?], social frameworks, and institutional contexts). This paper aims at undertaking that kind of study by focusing on the Argentine case. This is relevant since FDI has often been mentioned as a source of some of the major problems of the last decade (e.g., unemployment) in Argentina. Advocates of "Washington consensus" policies had expected FDI to have a positive influence on the country's economic competitiveness through its contribution to productivity gains, technological modernization, and export capabilities. It is important, hence, to learn to what extent those promises were fulfilled.

Section 1 presents an account of the role of FDI under the agro-export (1860-1930) and import substitution (1930-1990) models in Argentina. Section 2 focuses on the structural reforms period of the 1990s, describing the evolution of key economic and social variables as well as the nature of FDI inflows during that period. Section 3 deals with the Convertibility crisis and its effects, reviewing the main changes in FDI trends during this period. Section 4 describes the available evidence on FDI impacts in Argentina, including key economic, social and environmental variables. The main conclusions and policy recommendations are laid out in Section 5.

## Main historical trends

Foreign investment has played a key role in the Argentine economy since the beginning of the country's modern history. During the period of the so-called agro-export model (1860-1930), under which primary-product exports drove a powerful economic expansion, FDI was one of the main channels of technology transfer (along with immigrants, who were the bulk of industrial entrepreneurs, and capital goods' imports) (Barbero, 2003).

FDI was important in several areas, including i) export-related activities (e.g., railroads, meat-packing), ii) sectors where demand was growing due to urbanization and economic modernization (e.g., public utilities, banking), and iii) industries aimed at meeting booming domestic demand (e.g., food and beverages, chemicals). British investment was particularly important (between 1880 and 1913, British investment in Argentina increased twentyfold; see Romero, 2002), but FDI from the United States had a growing presence throughout this period as well (especially in industrial sectors).

The Great Depression of the 1930s led to the end of the agro-export model and to the beginning of the import-substitution industrialization (ISI) process. FDI shrank sharply, due first to the economic crisis (and the disruption of world's trade and capital flows) and then to the Second World War. The Peronist regime (1945-1955) mostly did not welcome FDI, although General Perón tried to attract foreign investment in areas such as oil and automobiles during the last years of his government.

The big FDI boom was to take place under the *desarrollista* (developmentalist) government of President Frondizi (1958-1962), who launched an ambitious industrialization program aimed at "deepening" import substitution by promoting foreign investment in the intermediate, consumption durables, and capital goods industries. [Law 14780 on FDI and Law 14781 on industrial promotion[v] were the main pillars of the effort to attract FDI to these sectors.

TNCs were key participants in this stage of the ISI process. Between 1958 and 1963, some 200 foreign companies made green-field investments in the country. By the early 1970s, TNCs' share in industrial production had reached 33 percent (Kosacoff and Bezchinsky, 1993).

Though many TNCs brought second-hand machinery to Argentina, they also transferred modern product and process technologies, quality-control techniques, and subcontracting practices to their subsidiaries (Katz and Kosacoff, 2000). This, together with the TNCs' use of more capital-intensive techniques and their propensity to locate in capital-intensive sectors, ensured higher labor productivity in TNC affiliates than in than local firms (Sourrouille *et al*, 1985).

The massive arrival of TNCs had a substantial impact on Argentine industry. Many TNCs created engineering departments and supplier development programs. They trained their labor force, introduced their personnel to the technological and entrepreneurial culture of their parent

companies, and diffused the use of quality norms as part of the routine industrial practices. In some cases, they even played a role in the transfer of engineering services within the corporation to affiliates operating in similar environments (Katz, 1999).

Even though TNCs did not invest in Argentina with the explicit intention of developing a local technological capacity – and, in fact, their expenditures in R&D were usually low – in practice they often contributed to this development. TNC affiliates often had to develop new methods to apply product and processes technologies developed in their respective parent companies under the varying circumstances of different host countries (Cimoli and Katz, 2003).

As TNCs invested in Argentina primarily with the aim of supplying the domestic market,[vi] exports played a marginal role in their activities. They often used product and process technologies which fell well short of international practices and operated plants with strong diseconomies of scale. However, a technological learning process took place in many affiliates, contributing over time to increased export flows, which were mostly, but not exclusively, destined to other Latin American countries (Katz and Ablin, 1977).

The large TNC presence in the Argentine economy led to increasing concerns – on the part of intellectuals, politicians, and public opinion – about their market power (concerns which, in fact, had begun with the dominance by TNCs of the meat-packing industry in the first decades of the century). Hence, it is no wonder that the different governments of the turbulent late 1960s to mid 1970s aimed at restricting and controlling TNCs' activities.

This trend was dramatically reversed when a military dictatorship took office in 1976. As part of a package of pro-market reforms, the dictatorship passed a new foreign investment law.[vii] In spite of this legal change, FDI flows were not significant during the military government and, in fact, some large TNCs, especially in the automobile sector, closed their subsidiaries or scaled down their operations in those years.

The volatile and stagnating macroeconomic conditions of the 1980s did not attract much new FDI, although some TNC investment took place in the second half of the decade under external debt-equity swap programs. In any case, from 1976 to 1990, TNC affiliates reduced their presence in Argentina's economy, while some large domestic conglomerates emerged as the new "economic elite."

## The FDI boom of the 1990s

### i. The Convertibility regime and the structural reforms: from boom to bane

After coming into office in 1989, the administration of Carlos Menem made several unsuccessful attempts to stabilize an economy suffering from hyperinflation. The renewed inflationary episodes of 1990 and the resignation of two Ministers of the Economy led the way to the appointment of Cavallo as Minister of the Economy in early 1991.

Cavallo launched a currency-board scheme (the so-called Convertibility Law) in order to stop inflation. The adoption of the currency board went hand-in-hand with a complete deregulation of international capital flows.

Convertibility was part of a far-reaching program of structural reforms that had been cautiously initiated during the late 1980s. By the early 1990s, Argentina was ahead of other Latin American countries in privatization of State enterprises, market deregulation, trade and financial

liberalization, central-bank independence, and social-security reforms. As a result of structural reforms and price stabilization, the Argentine economy entered into a stabilization and growth period that lasted until 1998 (interrupted only by the recession in 1995, due to the so-called "Tequila effect".Between 1991 and 1998, GDP grew at an annual average rate of 5.9 percent. From the levels reached in 1989 and 1990 (index number 100 in 1990), the consumer price index dropped to 84 in 1991 and 17 in 1992. One-digit inflation rates were registered by 1993 and 1994, and there was practically no inflation during the rest of the 1990s.

Total factor productivity (TFP) increased at an annual average of 3.2 per cent between 1991 and 1998. In fact, TFP was the main source of growth, since both the size of the capital stock and aggregate employment increased at relatively low rates (Maia and Kweitel, 2003). However, productivity performance was heterogeneous, both in terms of sectors and firms.

On the basis of information from both large firms and small and medium enterprises (SMEs), a study by Fiel (2002) shows that, while TFP grew for firms in non-tradable sectors, the opposite occurred with firms in tradable activities. In fact, although value added in the manufacturing industry increased by 19 percent between 1991 and 2000, the share of industry in Argentina's GDP fell steadily during that decade, from 18.5 percent in the early 1990s, to 17 percent in 1998, to less than 16 percent in 2001. The services sector, including privatized utilities, gained the share lost by industry.

Within the industrial sector, when comparing 1993 and 2000, the "winning" sectors – i.e. those with the highest growth rates – were food and beverages, petroleum refining, chemicals, rubber and plastics, and, to a lesser extent, metals and the pulp-and-paper industry. These activities mainly depend on the stock of natural resources or produce industrial commodities with scale-intensive processes. In general, they are able to easily enter external markets in times of falling local demand. The sectors that declined in output included textiles and clothing, metallurgy and machinery, electro-technology, and transportation equipment. These are sectors either with high levels of unskilled (textiles) or skilled (machinery) labor, or rapid technological advances (electronics). They were also severely affected by the trade liberalization of the 1990s.

Economic restructuring in the 1990s meant a new round of decline of "knowledge intensive" sectors. Recent research (e.g., Haussman, *et al*., 2005) has shown that production and trade patterns may have a significant influence on growth(much as structuralist theorists pointed out decades ago) and that specialization patterns in Argentina are not conducive to high growth (see for instance, Guerson *et al*., 2006). As seen below, FDI has not contributed to solving this problem, since in fact it has mostly reinforced existing trade and production structures.

Winners and losers also existed within the business sector. Affiliates of TNCs were the main "winners" in the restructuring process (Chudnovsky and López, 2001). The number of TNC affiliates among the 500 Argentine leading firms increased from 219 in 1993, to 318 in 2000, to 340 in 2003, mainly through the takeover of public or private domestic firms. Their share in total output increased from 60 percent in 1993, to 79 percent in 2000, to 82 percent in 2003 (estimated from INDEC's data). Similar trends characterize the manufacturing sector in particular. In fact, the TNC share in manufacturing output during the 1990s was notably higher than during the ISI stage. In 1963, TNC affiliates accounted for 46 percent of total value added and 36 percent of employment for leading industrial firms . In 1997, the equivalent figures were 79 and 61 percent, respectively.

In contrast to TNCs' growing weight in the Argentine economy, local conglomerates, while pursuing heterogeneous strategies and exhibiting heterogenous performance, as a whole lost the central role they had played since the late 1970s. Although some of these conglomerates disappeared or shrank drastically, others (such as Techint and Arcor) strengthened their positions in the domestic market, often concentrating their activities on their "core business." At the same time, these successful conglomerates increased their presence in external markets, both through exports and FDI (Kosacoff, 1999).

Before the reforms most SMEs had obsolete machinery, inefficient production layouts, lack of skilled human resources, an excessively diversified product mix, little or no export experience, few cooperation linkages with other firms and organizations (including those offering technological or entrepreneurial services), weak quality control systems and marketing capabilities, and a management style strongly dependent on the technological and other expertise of the owner. Naturally, these deficiencies seriously affected their competitive potential and, in any event, SMEs were generally more exposed to market failures in fields such as finance, technology, information, and others (see Gatto and Yoguel, 1993; Yoguel, 1998).

The SMEs' adaptation to new market conditions was especially difficult. Many of them went bankrupt, while others lost market share, had to retreat to the lower end of their respective markets, sold their businesses, or became importers in whole or in part. However, there was a group of dynamic SMEs, estimated at around 20 percent of the SME manufacturing sector, that had sufficient technological capabilities, management skills, and human capital stocks to survive and expand in the domestic market, and, in many cases, even to export (Yoguel and Rabetino, 2002).

It is no wonder that, while large and foreign-owned enterprises (especially those participating in the privatization process and generally in the provision of services) largely supported the Menem government's policies, local manufacturing firms (and SMEs in particular) were less enthusiastic about them.

Exports grew significantly during this period, especially after 1994, favored by the regional integration process in MERCOSUR, improved international prices for commodities (at least until 1998), growth in agricultural output, and the maturation of some large industrial and energy projects. As a result of these factors, exports doubled between 1993 and 2000. However, as imports grew far more than exports, Argentina ran significant trade deficits in most of the Convertibility years. Trade deficits were financed by growing inflows of foreign capital, in the forms of both portfolio capital and FDI.

Trade deficits led to huge current account deficits (an average of 3.5 per cent of GDP between 1992 and 2001), one of the many warning signs on the macroeconomic horizon during the 1990s. Other gathering storm clouds were the deterioration of fiscal accounts, growing foreign indebtedness, and relatively low levels of savings and investment (between 1991 and 2001, savings averaged 15.5 per cent of GDP, while fixed investment averaged 18.5 per cent). Meanwhile, unemployment became a serious problem after 1995, when it reached almost 20 percent of the labor force. In addition, poverty increased and the income distribution became more unequal beginning in the mid 1990s.

All of these problems emerged in the context of a fixed and overvalued exchange rate, fostered by the nominal rigidity imposed by the Convertibility regime. In the early 1990s, the real appreciation of the peso – explained largely by the nominal fixity of the exchange parity in 1991

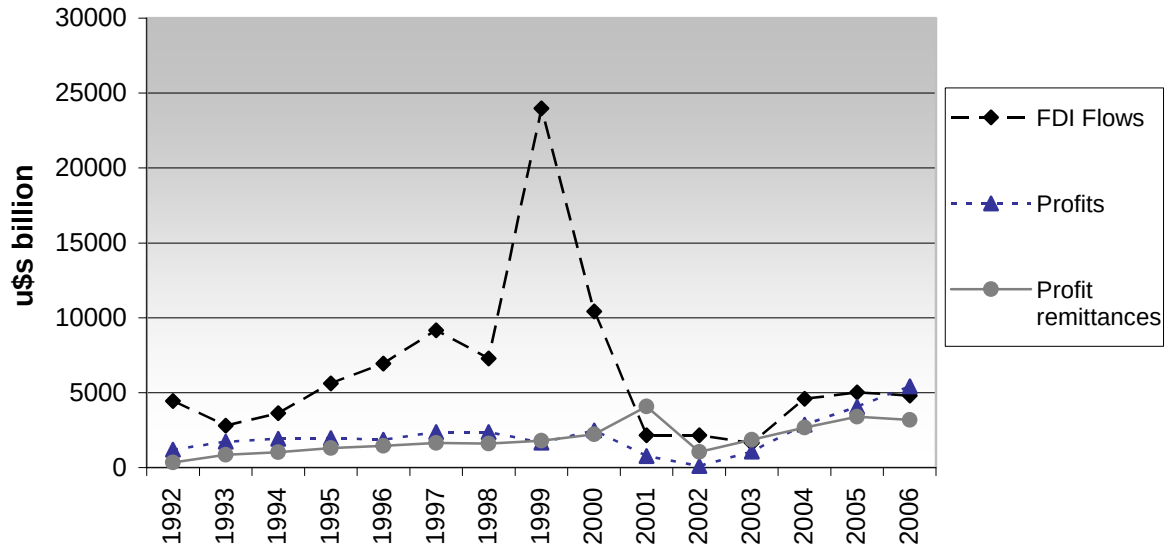
under still-inflationary conditions – was still considered an equilibrium phenomenon. They based this argument mainly on the fact that reforms implemented since the beginning of the Convertibility regime had led to significant productivity improvements that might justify the appreciation of the peso. In contrast, by the end of the decade and in view of the external shocks mentioned above different estimates supported the idea that the real exchange rate was overvalued in relation to both its historical value and its "equilibrium value."[viii]

By the late 1980s, under ominous macroeconomic conditions, with important business interests having serious difficulties adapting to the new rules of the game, and with growing social discontent as a result of the economic reforms, the Argentine economy suffered the external shocks of the Russian and Brazilian crises of 1998 and 1999. The two main consequences of these crises were, first, a "sudden stop" in capital inflows, and second, a new round of peso overvaluation due to the Brazilian devaluation of 1999, but also to the US dollar appreciation (in relation to the euro). Under these conditions, external debt indicators (in relation to GDP and to exports) reached dangerous levels, increasing the country risk premium and resulting in growing capital flight. Argentina suffered three years of recession, along with deflation. By the end of 2001, the country was in the worst crisis in its history.

ii. The nature and evolution of FDI inflows

In sharp contrast to the previous decade, when FDI decreased dramatically, Argentina was one of the main destinations for FDI inflows in the developing world during the 1990s. Between 1992 and 2001 direct investments of over US$ 76 billion flowed into the country, with a peak of more than US$ 23 billion in 1999 (see figure 1).[ix] For several years during this decade, annual inward FDI flows accounted for over 2 percent of GDP and 10 percent of gross fixed capital formation.[x]

**Figure 1. FDI Flows and Profits in Argentina 1992-2006**




Source: Own elaboration based on data from the National Direction of International Accounts (Argentina).

Profit remittances were very high throughout the decade, and in some years surpassed total profits (i.e., profit reinvestment was negative). In fact, remittances were higher than profits over

the period 1995-2001 as a whole. Although it has been suggested that high profit remittances by privatized firms were largely responsible, these figures may also reflect a short-term bias on the part of foreign investors. While it may be understandable that remittances were high in the crisis year of 2001, the same does not apply for high growth years such as 1997 or 1998.High profit remittances obviously lowered the positive impact of FDI on the balance of payments.

Most FDI inflows were related to takeovers, initially of public firms and then of private domestic enterprises, which accounted for around 60 percent of FDI inflows in the 1990s. Although the mergers and acquisitions (M&A) boom reflected worldwide trends, it was also fostered by changes in the domestic business environment. Data from Argentina's Secretariat of Industry, Commerce and Mining show that M&A exceeded US$ 70 billion between 1990 and 1999, with US$ 22 billion due to privatizations. Cross-border M&As totaled over US$ 58 billion during the same period (nearly 83 percent of all M&A activity).

FDI came mainly from the United States and Spain, whose firms purchased many privatized enterprises. Other important sources of investment were France, Italy, the Netherlands, Germany, and the United Kingdom. There were also some major inflows from Chile (largely attracted by privatizations). Neither Japan nor other East Asian countries made significant investments in Argentina (table 1).

**Table 1. FDI INFLOWS TO ARGENTINA BY ORIGIN, 1992-2004 (%)**

| COUNTRY | 1992-2001 | 2002-2004 |
|---|---|---|
| **Europe** | **62** | **14** |
| Germany | 2 | 10 |
| Spain | 39 | 2 |
| France | 10 | -9 |
| Italy | 4 | 4 |
| Netherlands | 4 | 12 |
| United Kingdom | 2 | -11 |
| Others | 2 | 5 |
| **North America** | **25** | **13** |
| United States | 24 | 12 |
| Others | 1 | 1 |
| **Central America and Caribbean** | **1** | **5** |
| **South America** | **5** | **21** |
| Chile | 4 | 1 |
| Others | 1 | 20 |
| **Other Regions** | **6** | **47** |
| **TOTAL** | **100** | **100** |

Source: Own elaboration based on data from the National Direction of International Accounts (Argentina).

The oil industry attracted one-third of FDI inflows[xi] between 1992 and 2001, while the manufacturing sector received around 21 percent. Chemicals (especially petrochemicals), auto, and food and beverages attracted most manufacturing FDI. The rest went into services, partly due to privatizations in communications, electricity, and natural gas, as well as into banking, retail trade, etc (table 2).

As during the ISI period, market-seeking strategies were predominant among TNCs affiliates.[xii] However, most foreign firms also took advantage of the opportunities created by MERCOSUR and in some cases (e.g., the auto industry), had efficiency-seeking objectives.[xiii] As seen below, they were also more prone to engage in foreign trade than domestic firms.

**Table 2. FDI INFLOWS TO ARGENTINA BY SECTOR, 1992-2004 (%)**

| SECTOR | 1992-2001 | 2002-2004 |
|---|---|---|
| **Petroleum** | **34** | **35** |
| **Mining** | **1** | **4** |
| **Manufacturing Industry** | **21** | **42** |
| Food, Beverages and Tobacco | **7** | **7** |
| Textiles | 0 | 0 |
| Paper | 1 | 3 |
| Chemicals, Rubber and Plastics | 7 | 8 |
| Cement and Ceramic Products | 1 | 1 |
| Base Metals and Base Metal Products | **1** | **15** |
| Machinery and Equipment | **1** | -1 |
| Automotive Industry and Transport Equipment | **4** | 9 |
| **Electricity, Gas and Water** | **12** | **4** |
| **Commerce** | **5** | **1** |
| **Transport and Communications** | **9** | **-10** |
| **Banks** | **10** | **7** |
| **Others** | **7** | **17** |
| **TOTAL** | **100** | **100** |

Source: Own elaboration based on data from the National Direction of International Accounts (Argentina).

Structural reforms created an FDI-friendly environment. FDI had already been strongly deregulated in 1976 by the military dictatorship's Law 21382. The Menem administration completed this task, removing almost all the few remaining sectoral restrictions still allowed under the 1976 regime. After this round of reforms, no approvals, formalities, or registration procedures of any kind were required for FDI operations. There were neither discriminatory withholding taxes on income nor taxes on profit remittances or dividends from FDI.

This investor-friendly approach was followed by the signing of 51 bilateral investment treaties, the endorsement of the failed Multilateral Agreement on Investment (MAI) proposed by OECD countries, and generous concessions in the negotiations leading up to the General Agreement on Trade in Services (GATS). Following the mandate of the Trade Related Intellectual Property Rights (TRIPs) agreement negotiated in the Uruguay Round of GATT, the old Argentine patent law (Law 111 of 1864) was modified in 1995. Among other changes, patent protection was extended to pharmaceutical products, despite the opposition of the leading domestic manufacturers.[xiv]

Privatizations also attracted FDI. The Menem government considered privatization a powerful way to gain a quick reputation with the local and international establishment. This was crucial for a government belonging to a party from a populist tradition that had taken office in the midst of hyperinflation.

Encouraged by the requirement that consortia buying at public auctions had to include a partner with previous experience in the same sector, a high percentage of public utility firms ended up controlled by foreign investors. Most privatizations, however, involved joint ventures between foreign concerns and large domestic conglomerates. Typically, the foreign partner took responsibility for the technical and operational side of the business, while the domestic partner (usually holding a minority interest) remained in charge of its administrative and financial side. Foreign banks often participated as providers of finance, particularly through external debt-to-equity swaps. As the years passed, however, foreign banks and many domestic conglomerates sold their shares.

Trade liberalization also helped to attract FDI, given the change in TNCs' strategies worldwide. TNCs went from establishing stand-alone subsidiaries aimed at penetrating domestic markets with high levels of local content to creating integrated global networks pursuing efficiency and specialization gains through trade flows among subsidiaries, as well as subcontracting. While protectionism was favorable for attracting FDI during the ISI period, openness was more adapted to the new TNCs strategies.

Other policies with positive impacts on FDI attraction included i) the deregulation of sectors such as oil, fishing, mining, foreign trade operations, wholesale and retail trade, land, water and air transport, and insurance and ii) reforms to the technology transfer regime, eliminating the need for government approval of contracts between parent firms and their local subsidiaries.[xv]

Some specific investment incentives were also put in place. In mining and forestry, tax stability was granted, along with some fiscal incentives, to investors. In the automobile sector, a special trade regime was adopted¸ consisting of import quotas, investment and balanced trade requirements for established manufacturers, minimum content rules for locally produced vehicles, and preferential import tariffs for domestic producers. The program aimed at promoting specialization and fostering competitiveness among established car manufacturers in order to take advantage of the rapid increase in domestic demand that followed stabilization.[xvi] The automobile

sector also had a common trade regime with Brazil. This did not, however, prevent "incentives wars," especially in the second half of the 1990s, when a number of major projects – largely but not exclusively in the automobile sector -- received huge incentives from Brazil's national and state governments (see Chudnovsky and López, 2002).

It is very difficult to disentangle the effects of the various factors attracting FDI, especially considering that different factors were important for different kinds of investors. However, on the whole, Argentina's main advantages were the abundance of natural resources, the size and growth of the domestic market, privatization, price stabilization, and trade liberalization, and, to a lesser extent, integration in MERCOSUR[xvii] (Chudnovsky and López, 2001 and 2002b). Neither cheap labor (wages in US dollars were relatively high in Argentina during the 1990s) nor loose enforcement of environmental regulations were key factors in attracting FDI. The "investor-friendly approach" may have been a necessary pre-condition for the FDI boom, but, in itself, would not have had a sizeable impact in the absence of these other attractive conditions.

## FDI after the Convertibility crisis

The end of Convertibility?] a major breakdown for the Argentine economy and society. From 1999 to 2002, real GDP declined by more than 18 percent. There was also a banking crash, resulting in default on the external debt and a huge peso devaluation during a period of sharply increasing unemployment and poverty rates. This unleashed a deep political crisis.[xviii]

After the devaluation, the new government of interim President Eduardo Duhalde,[xix] who took office in January 2002, implemented, among other measures, the denomination in pesos of internal contracts and obligations and of public services rates. In many cases, privatized utilities' rates had been fixed in US dollars during the 1990s. Along with "pesification," public services rates were also frozen. Bank deposits and credits denominated in US dollars were also "pesified," but asymmetrically ,with the government compensating the banks for the difference. Banks became objects of popular anger and legal suits because of the pesification of the deposits.

An economic recovery started in the second quarter of 2002 and since then GDP has grown steadily. While GDP growth was negative in 2002, over the following four years the economy grew at around 9 percent per year. It took until 2006, however, for GDP per capita to surpass the 1998 level. Furthermore, although unemployment and poverty rates fell, they have remained very high by Argentina's historical standards.

GDP growth was fuelled by both consumption and investment. According to data from the Economic Commission for Latin America and the Caribbean (ECLAC) gross capital formation as a percent of GDP increased from a low of 11.3 per cent in 2002 to 20 percent in 2005, but remained lower than the 1998 level of 21 percent.

The increasing total value of exports since 2003, aided by very high international prices for Argentina's main export commodities, made it possible for the country to maintain a relatively large trade surplus even as imports started to growth again with the economy recovery and increasing investment. The trade surplus has led to positive current account balances since 2002.

FDI flows were very low from 2001 through 2003,[xx] and while they recovered somewhat in 2004 and 2005, they fell slightly again in 2006 (see figure 1). In any case, Argentina clearly lost attractiveness for FDI; its share in world FDI inflows fell from nearly 1.5 percent in the 1990s to less than 0.5 percent between 2001 and 2005.

The end of Convertibility brought about conflicts between the government and foreign investors in two areas: in banking, due to the "asymmetric" pesification, and in privatized services, because of the rates freeze. In the former case, many firms brought suits against Argentina in the International Centre for Settlement of Investment Disputes (ICSID) (see Bouzas and Chudnovsky, 2004)[xxi]. Hence, it is no surprise that some investors in banks and privatized companies sold their equity mainly to domestic investors and other Latin American firms. This disinvestment was more than balanced, however, by new investments in different areas, including some large takeovers of private Argentine firms by Brazilian firms. Although no recent data are available on the subject, the presence of TNC affiliates in the Argentine economy today does not appear to be very different from in 2001.

A major shift in the origins of FDI, however, took place compared to the 1990s pattern. The share of Europe and the United States shrank drastically, from 62 percent to 14 percent and 24 percent to 12 percent of total FDI, respectively. For some particular countries (e.g., United Kingdom, France), FDI flows to Argentina were actually negative (disinvestment took place). FDI from South America and from Central America and the Caribbean soared between 1992-2001 and 2002-2004, from 5 percent to 21 percent and from 1 percent to 5 percent of total inflows, respectively (table 1). Brazil and Mexico were the leading sources of investment from these regions.[xxii]

As for FDI destination sectors, petroleum continued to attract more than one third of inflows. The main change in FDI patterns, however, was that, after devaluation and the consequent shift in relative prices in favor of tradable sectors, industry doubled its share (from 21 percent in 1992-2001 to 42 percent in 2002-2004) at the expense of services (table 2). The metals and metal-products sectors attracted the bulk of manufacturing FDI, mainly due to the acquisition of local plants by foreign firms.

## The impacts of FDI on sustainable development in Argentina

### i. The economic impacts

The macroeconomic impacts of FDI are related mainly to growth and investment. Bittencourt *et al*. (2006), using both Granger causality tests and panel data models, find no evidence of positive or negative impacts of FDI on growth and investment. The fact that most FDI came through M&As and that relatively few greenfield investments took place during the 1990s could explain the lack of a positive impact on total investment levels.

On the microeconomic side, the most recent and methodologically rigorous research on the subject is that of Chudnovsky *et al*. (2007), who focus on Argentine firms that were taken over by TNCs during the 1990s.The taken-over firms are the treatment group and the firms that remain in domestic hands are the control group. The latter mimic a "counterfactual" scenario; that is, they allow us to know what would happened to taken-over firms if they had not been acquired by foreign buyers.

Data from two innovation surveys were used for this research. The first survey covered the period 1992-96 and included 1639 firms (INDEC-SECYT, 1998). This sample represented 53 percent of sales, 50 percent of employment, and 61 percent of exports of the manufacturing sector in 1996. The second survey covered the period 1998-2001 and included 1688 firms (INDEC-SECYT-CEPAL, 2003) representing 65 percent, 42 percent, and 80 percent of sales, employment and

exports, respectively, in 2001. The analysis was based on panel data and estimated difference-in-differences[xxiii] models.

The variables of interest were labor productivity, trade (imports and exports), and innovation. Both innovation inputs (i.e., R&D activities) and innovation outputs (i.e., introducing a new or improved product or process) were studied. The main findings of this paper are:

1) Labor productivity increases after a domestic firm is acquired by foreign investors. The growth in productivity takes place gradually, starting the year the firm changes ownership.

2) Exports and export propensities (i.e. exports as a percentage of sales) increase after the firm changes ownership. The findings are similar in the case of imports and import propensities. As in the case of productivity, the increase in foreign trade levels takes place gradually starting at the time of the takeover.

3) Takeovers by foreign investors have no effect on the expenditures and intensity of R&D in the acquired firms, but they increase the probability of introducing a new (or improved) product or process.

4) There is no evidence of horizontal or backward spillovers. The only exception is for positive backward spillovers on innovation output (meaning that firms that supply to sectors where a takeover has taken place may have been induced to launch new products and processes).

Summing up these results, we can state that the new owners of former domestic firms seem to have transferred inputs (such as organizational and production technologies) to the acquired firms. This allowed the acquired firms to launch new products and to increase labor productivity and trade more than domestically owned firms. However, research and development activities seem to have been unaffected by takeovers.

While the direct effects of FDI through takeover seems to be positive, the indirect effects on Argentine manufacturing industry are less encouraging. Spillovers only arise in the case of innovation outputs, meaning that domestic firms need to upgrade their technological assets to become TNCs suppliers.

Moreover, while TNC affiliates trade more than their local counterparts, a sort of “asymmetric integration” within the global trade flows is clearly visible: foreign firms export mostly to other Latin American markets while importing inputs and final goods from developed countries. The “technological content” of their exports is clearly lower than that of their imports (Chudnovsky and López, 2004).

Finally, in a study focused not only on taken-over firms but an all foreign-owned firms, based on the same data set mentioned above, domestic firms with high absorption capabilities[xxiv] appeared to reap positive spillovers from TNCs competing in the same sector (Chudnovsky *et al*, 2006). (To measure absorption capabilities, the study employs an index including variables related to R&D expenditures, capital goods and intangible technologies, the use of modern organizational techniques, and the relevance of training activities.) This suggests that the probability of receiving positive spillovers from FDI presence is mostly related to factors internal to the domestic firms in host countries.

The failure to find any negative spillovers may be a result of the bankruptcy of some firms due to competition from TNC affiliates and therefore the inability to capture the performance of these firms in the surveys. At the same time, if the firms that exit are those with low capabilities, as

seems likely, this strengthens our conclusions regarding the importance of developing domestic capabilities. In the absence of information on firms that exit, however, this cannot be rigorously demonstrated.

ii. Social and environmental impacts

Chudnovsky *et al*. (2007) deal with the impacts of FDI on unemployment and wage inequality. In the first case, on the basis of the same innovation surveys and econometric techniques mentioned above, they find that – contrary to what is often assumed in Argentina and elsewhere about FDI through takeovers – there is no evidence that total employment decreases (or, for that matter, that it increases) as a result of the acquisition of a domestic firm by a TNC. The available literature emphasizes other variables, such as macroeconomic evolution [UNCLEAR] , as the chief causes of unemployment in Argentina (Damill and Frenkel, 2006). While a foreign takeover has no impact on total employment, however, it has a significant effect on its composition, since the share of skilled labor in total employment increases after the acquisition.

In the case of wages, the study tests whether those sectors where FDI presence deepened during the nineties were also the sectors where, *ceteris paribus*, larger increases in wage inequality were observed. Data on wages came from the Permanent Household Survey, a typical labor force survey with information on wages, employment status, and individual and family characteristics (age, gender, family size, etc.). The authors show that wage premiums for skilled workers increase with the FDI presence in the industry where they work. During the 1990s, in those industries where the FDI presence increased the most, wage inequality also widened the most (in favor of the most skilled workers). However, the impact of FDI on wage inequality is small, and it does not seem to be the main cause of the increase in income inequality during the last decade (which has been attributed to factors such as trade liberalization, unequal access to education, and unemployment; see Gasparini *et al*., 2001).

These results do not include some other FDI impacts, which cannot be properly measured with available data: a) Innovation surveys, as noted above, do not include firms that closed during the 1990s. If those firms closed due to TNC competition, an indirect negative effect on employment could have taken place. b) The impact on unemployment of FDI in services (included privatized utilities) was not estimated. c) If FDI is positively associated with outsourcing, it is possible that people whose activities were outsourced saw their jobs lowered in "quality" (for instance, because of the fact that instead of being employees of a big corporation with formal jobs, they became employees of smaller firms in which informal employment is more usual).While these potential impacts have not been tested, severe social problems in Argentina should be attributed mainly to other factors.

Regarding the environmental impacts of FDI, Chudnovsky and Pupato (2005) find, on the basis of data from the 1998-2001 innovation survey,[xxv] that firm size and technology acquisition expenditures increase both the probability of undertaking environmental management activities and the "quality" of environmental management.[xxvi]

They find that foreign firms are more prone to undertake environmental management activities and to generate positive environmental spillovers, inducing the adoption of simple clean production management methods in domestic firms with high absorption capabilities. However, somewhat surprisingly, foreign ownership is associated to a relative decrease in the quality of environmental management .

Going beyond econometric studies, no systematic evidence exists in favor of the hypothesis that TNCs came to Argentina attracted by low environmental or labor standards (as seen before, there were other and more relevant attraction factors for FDI). However, according to media reports, some "environmental refugees" may have invested in Argentina, mainly in the mining sector.

In general, no evidence exists for the claim that FDI *per se* has been a key factor contributing to pollution problems or environmental degradation in Argentina. Phenomena not discussed in this paper, such as concerns about the effect of the expansion of transgenic soy in Argentina's agriculture or the management of nonrenewable resources (petroleum and gas), if they are a problem, are due primarily to inadequate domestic regulations rather than FDI.

However, serious environmental problems are still present in the country and the contribution of FDI, although seemingly positive, has been modest. More research is needed to reach more reliable conclusions about the actual and potential impacts of FDI on Argentina's environment.

## Conclusions and policy lessons

Summing up, FDI was not a panacea for Argentina's economy in the 1990s, but also has not been the chief cause of social problems such as unemployment, increasing income inequality, or environmental degradation.

However, from the evidence discussed here, it appears that Argentina missed the opportunity to reap more benefits from the large FDI inflows that the country received in the last decade. While TNC affiliates showed better microeconomic performance than local firms, the latter reaped almost no spillovers from the foreign presence.

Furthermore, FDI did not appear to contribute to diversification of the country's productive structure, improvement of its trade specialization pattern, access to new markets in developed countries, or growing capital formation. Its impacts on the balance of payments, in turn, were not as positive as expected due to high profit remittances.

From these findings emerges a policy agenda. First, FDI impacts depend to a large extent on the capabilities of domestic firms in host countries. Hence, it is a priority to improve the competitiveness of local firms (especially SMEs) in Argentina. Such firms may benefit from government [?] technical assistance, provision of information , linkages with universities and research institutions, supplier development programs, etc. Government programs [?] may also mitigate market failures, especially lack of access to credit, that could be affecting SME performance. This could help local firms to take advantage of the potential spillovers generated by FDI presence, to compete better with foreign firms in their respective markets, and to develop closer ties with TNC affiliates (as suppliers, clients, partners, etc.). The key message is that industrial, technology, and enterprise policies aimed at enhancing local capabilities are probably at least as important as direct FDI policies for improving the impacts of foreign investment on the host economy.

Second, policy efforts in the FDI area must focus not only on the quantity of FDI received but also on its quality. Argentina is well known to international investors. If, as expected, the economy keeps growing in the coming years and if, as is desirable, domestic institutions are improved, the rules of the game become more stable, and policy swings become less frequent, the Argentine economy may attract significant FDI inflows in the future. However, quantity is not enough from the point of view of Argentina's broader development objectives.

In the 1990s, most FDI was market-seeking and took place through M&As. At present, efforts should be made to attract more greenfield investments, as well as FDI aimed not only at taking advantage of the domestic market but also at integrating local affiliates into intra-corporate value chains through efficiency-seeking investments. However, efficiency-seeking FDI should not come at the expense of local linkages, as it often does in Mexico and Central America, since this makes productivity and technology spillovers almost impossible.

The goal of FDI policy should be to induce TNCs operating in Argentina to restructure their affiliates' operations to fit global corporate competitiveness objectives. This means, for instance, that TNCs affiliates in Argentina could get world or regional "product mandates," that is, products that are assigned exclusively to Argentine affiliates for exporting to certain countries or regions (and eventually to the whole world).

This should not, however, come at the expense of local ties. Programs for the development of local suppliers should be established as a way to increase the local content of TNC affiliates' production without losing efficiency; local suppliers could even become world suppliers for the respective TNCs if they attain sufficient scale and competitiveness levels. It is also important to foster innovation activities by TNC affiliates, as is the case for many foreign affiliates operating in Brazil. This involves not only in-house R&D but also research linkages with universities and research labs in Argentina. Fiscal or financial incentives could be employed for both purposes (development of local suppliers and promotion of domestic innovation activities). The same policy instruments could be useful in encouraging TNCs to improve their environmental management systems and to diffuse their environmental knowledge and practices to local firms.

Regarding the objective of transforming the productive structure, TNCs will not invest in knowledge-intensive sectors unless specific government signals are in place. Recently, many TNCs have invested in Argentina in software and information services, a sector favored by many policy interventions in recent years. Creating desirable signals does not necessarily mean granting huge amounts of money to foreign investors, but creating a favorable climate for investment in new and technologically dynamic activities.

Policy measures in the abovementioned areas should not be taken only at the national level. MERCOSUR could coordinate government policies to enhance domestic capabilities and improve FDI quality. However, this kind of coordination has not happened so far. In fact, different MERCOSUR governments have competed for FDI through fiscal incentives, a phenomenon that peaked in late 1990s (Chudnovsky and López, 2002c). Some form of discipline against competitive investment incentives is needed in MERCOSUR, while governments consider common policies in FDI-related areas, such as innovation, environment, or development of suppliers.

A recent study shows that MERCOSUR countries could expect increases in FDI inflows from entrance into the Free Trade Areas of the Americas (FTAA) or the signature of an EU-MERCOSUR agreement (López and Orlicki, 2005). The same study suggests that Latin American South-South flows could be strongly stimulated by the FTAA, but that we should not expect MERCOSUR countries to become more attractive for North America-oriented "export-platform" FDI, considering their distance from the United States and Canada. MERCOSUR countries, however, could attract more FDI from northern countries to take advantage of access to other Latin American countries in the FTAA. Moreover, the results of the study suggest that a Latin American and Caribbean regional integration agreement would have roughly the same

effects as the FTAA on FDI received by MERCOSUR countries, while signing bilateral regional integration agreements with the US would not foster more FDI inflows.

While FDI to MERCOSUR countries may increase if the FTAA or an EU-MERCOSUR agreement is signed, caution is needed when forecasting the probable magnitude, origins, and nature of additional FDI inflows. Furthermore, nothing guarantees than an increase in FDI "quality" could follow from the signature of the agreements, since coordinating investment policies with the US or the European Union would mostly involve granting guarantees to foreign investors, but would hardly include the kind of "pro-development" policies discussed above.

Finally, TNCs are not a substitute for local entrepreneurs. There are very few cases of successful TNC-led development strategies (e.g., Singapore, Ireland), and those examples took place under very unusual conditions. Argentina's large conglomerates shrank as a group in the last ten years, but a few of them survived and expanded and could be the basis to build a new domestic business elite, jointly with other new emerging big firms that have been growing recently. In this regard, granting these firms access to long-term credit, under conditions similar to those faced by TNCs in their home countries, could be a first step towards the creation of a new business leadership. This, in our view, is necessary to build a viable, long-term sustainable development strategy in Argentina.

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[ii] See Agosin and Mayer (2000), who find that FDI had a positive crowding in effect in Asia but a crowding out impact in Latin America.

[iii] An important conceptual consideration must be made at this point. If FDI spillovers are associated with knowledge leakages, then speaking about negative spillovers has no sense (since we would be forced to assume that domestic firms reduce their productivity because of those leakages). However, if FDI spillovers include the effects derived not only from technological and geographical proximity but also from TNCs competition with domestic firms it is possible to consider the possibility of negative spillovers.

[iv] For analysis and discussions on the impacts of FDI on development, see Barba Navaretti and Venables (2004), Dicken (2003) and Moran *et al* (2005). For surveys on FDI and spillovers see Gorg and Strobl (2001), Gorg and Greenaway (2004) and Chudnovsky *et al* (2006).

[v]. Industrial promotion policies granted generous fiscal and credit subsidies as well as duty-free imports of capital goods.

[vi] Market-seeking investments are aimed at exploiting the host country's market - and, eventually, neighboring countries' markets- (Dunning, 1993).

[vii] Law 21382 guaranteed equal treatment of foreign and domestic investors and the free remittance of profits and principals.

[viii] Perry and Servén (2002) estimated the real effective exchange rate with respect to its "equilibrium value", in 35 per cent in 1999 and 55 per cent in 2001.

[ix] In contrast, portfolio investment reacted more quickly to the crisis and began a rapid and steady decline in 1998.

[x]. These figures were substantially higher than their counterparts during the ISI period. Between 1959 and 1963, FDI inflows to Argentina averaged US$ 464 million annually (measured in constant 2001 dollars). In the 1990s, the same figure was over US$ 6760 million. While in the first period FDI inflows amounted to around 0.3 per cent of GDP, in the 1990s they were above 2 per cent of GDP almost every year.

[xi] The oil industry, together with the mining sector, attracted mainly resource-seeking investments - resource - seeking FDI is motivated by the availability and/or cost of natural and human resources (Dunning, 1993).

[xii] Comparisons with the trading performance of TNCs during the ISI period are only available for US affiliates. According to data from surveys undertaken by the U.S. Bureau of Economic Analysis, export/sales ratios for U.S affiliates in the manufacturing industry increased from an average of 12 per cent in 1983 to 21 per cent in 1999. Although it is clear that U.S. affiliates are much more export-oriented than in the past, it is also true that their export propensity is lower than in other regions (all U.S. affiliates in the world exported, on average, 41 per cent of their sales in 1999).

[xiii] Investments made by TNC affiliates aimed at increasing the efficiency of their activities by integrating assets, production and markets to better exploit economies of scale and scope are called 'efficiency-seeking' investments (Dunning, 1993).

[xiv]. Patent applications in Argentina increased by 128 per cent between 1990 and 2002. However, almost the entire increase was due to applications by foreign companies aiming to get protection for products already patented in other countries.

[xv] As for payments for technology transfer, while in 1992 the contracts registered amounted to a total of U$S 74 million, the respective figure in 1996 was US$ 632 million and in 1999 they had climbed to US$1.45 billion (Rodríguez, 2004). While the remarkable growth in technology payments may have been due to a real increase in the amount of expertise transferred from abroad in the context of economic restructuring, it may also have been related to the strong presence of affiliates of TNCs in Argentina.

[xvi] The regime consisted of a combination of import quotas, investment and balanced trade requirements for established manufacturers, minimum content rules for locally-produced vehicles and preferential import tariffs for domestic producers. The program aimed at promoting specialization and fostering competitiveness among established car manufacturers in order to take advantage of the rapid increase in domestic demand that followed stabilization.

[xvii] MERCOSUR's role in FDI attraction was higher in some specific sectors such as automobiles.

[xviii] 29.3 per cent of the population was below the poverty line in Greater Buenos Aires in 2000, a figure that escalated to a historic peak of 52 per cent in 2002 (Household Permanent Survey). In turn, the Gini coefficient in Greater Buenos Aires increased from 47.4 in 1999 to 49.1 percent in 2000 and 50.7 percent in 2002.

[xix] ADD NOTE ON DE LA RUA (ELECTION OF, CIRCUMSTANCES OF RESIGNATION, ETC.)

[xx] Portfolio investment turned negative in 2001-2002 (more than U$S 5 billion each year) and after recording small positive inflows in 2003-2004, became negative again in 2005.

[xxi] By June 2005, Argentina was the country with more suits in the ICSID (40 over a total of 183).

[xxii] While the large increase in "other regions" share could suggest that Asian investors were active after the crisis, this only explains a part of the increase, since official sources explain that part of the FDI included in other regions correspond to unidentified operations.

[xxiii]. Difference-in-differences methods compare a treatment and a comparison group (first difference) before and after the intervention (second difference).

[xxv] Only the 1998-2001 innovation survey was used because no questions about environmental issues were asked in the earlier innovation survey.

[xxvi] The authors distinguish three categories of environmental management activities: a) the "end-of-pipe" approach, which focuses on treating pollution once it has been created; b) "simple" clean production activities, such as water, energy, and input savings; c) "complex" clean production activities, generally involving greater investments, longer lead times, and higher technological complexity and uncertainty, such as the development of new cleaner technologies. It is assumed that the larger the role of complex clean production activities, the higher the "quality" of environmental management.