

**Microeconomic Behavior in  
High Uncertainty Environments:  
The case of Argentina**

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UNITED NATIONS



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## **Abstract**

Over the last three decades Argentina's real output underwent violent and with frequent fluctuations. Moreover, the trend growth rates also varied with large amplitudes. The economic oscillations interacted with sometimes drastic changes in economic policies. Agents adapted to that environment with heterogeneous and variable results. This document tries to identify the interrelations between that macro performance and private behaviors, and their effects on the industrial structure.

Fundamental dimensions of those behaviors include investment criteria, the time horizon over which corporate decisions are made, attitudes towards innovation and technological learning. The Argentine case highlights the consistency requirements between micro and macro policies and the connections between macroeconomic sustainability and medium-term economic performance.



## Introduction

In recent decades –or, to establish a more specific starting point, since the middle of the seventies– Argentina’s real output underwent violent and frequent fluctuations. Intense variations in the short run combined with striking changes in the long run tendencies of the economy. The unstable behavior of the Argentine economy is outstanding even within the group of so called (for reasons that escape us) “developing countries”. Repeatedly, real volatility was observed to be associated with very poor economic growth.<sup>1</sup> Therefore, short run effects and their dynamic interaction with long term effects disturbed investment and growth and caused an accumulation of irreversible losses of business assets –of tangible as well as intangible character–. In essence, the history of Argentina of the period has shown with ruthlessness that real volatility is very costly in social terms.

The difficulty in identifying and extrapolating tendencies in income and expenditures was also reflected in the fierce fluctuations of per capita output in constant dollars:<sup>2</sup> in 1980 Argentina generated a GDP that was similar to Spain’s until the recent revaluation of the euro; that is, approximately 15,000 dollars. This level was unsustainable and, a couple of years after, per capita output had fallen –after a crisis, naturally– to somewhere around 5,000 dollars. The instability of the late eighties, which culminated in the hyperinflationary episodes of 1989 and 1990, reduced GDP per capita so somewhat more than 3,000 dollars, a level that was lower than many other Latin American countries. But not long after, in the nineties, Argentina reached and maintained during almost a decade a GDP that oscillated around 8,000 dollars per capita. As a result of the post-convertibility depreciation and fall in the level of activity, the lowest value of the series is in the year 2002, with a level below 3,000 dollars. Despite evident economic recovery, in the year 2005 per capita output reaches values just above 4,000 dollars. In short, observing the pattern of fluctuations of the last 30 years, the amplitude of the range of the series is striking (almost 5 to 1). Even more remarkable is the absence of periods of moderate and persistent growth without

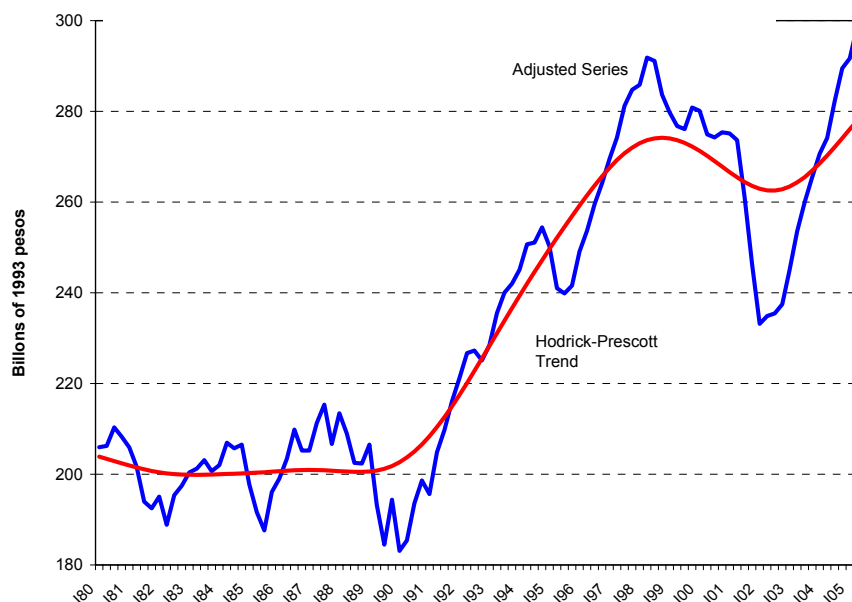
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<sup>1</sup> The annual average growth rate of per capita output between 1950 and 2004 was a disappointing 0.6%. This performance intensified with time. Thus, between 1950 and 1974, the rate of annual increase of GDP per capita reached 1.3%, while in the period encompassing the last thirty years it was 0.1% per annum. While until 1974 the probability of experiencing a downturn was 20%, in the subsequent period that frequency increased in abrupt fashion until it reached a probability of half of the time (47%).

<sup>2</sup> In this calculation of output in dollars 2000 is taken as the base year.

shocks. This behavior occurs within a feedback process and interferes with the identification of “permanent” income and expenditure and, therefore, disrupts consumption and investment decisions.<sup>3</sup>

**FIGURE 1**  
**SEASONALLY ADJUSTED GDP PER QUARTER, AT CONSTANT PRICES.**  
**HODRICK-PRESCOTT VALUES AND TRENDS**



Source: Author’s elaboration on the basis of official figures.

Recently, various studies have presented empirical evidence demonstrating that high output volatility negatively affects long run economic growth, imposes high costs for the welfare of economic agents and adversely impacts on the poorest members of society.<sup>4</sup> The studies show that these effects are particularly severe in developing countries. Two mechanisms are most frequently mentioned in the attempt to explain the negative correlation between volatility and growth: 1) that greater uncertainty reduces growth as investment falls and 2) that the existence of credit restrictions or imperfect access to the capital market aggravates the impact of short term volatility on long term growth by limiting the financing options of long term investment. In addition, the studies indicate that economic welfare is strongly reduced in the face of greater amplitude of fluctuations in consumption deriving from output volatility. Lastly, they show that the poorest sectors are most affected by these economic dynamics. Because they suffer limitations of access to financial markets, the most poor are unable to diversify risks associated with their main sources of income: salaries and government transfers. Also, because they use public services to a greater extent (e.g., health and education), they are subjected to the demonstrated procyclical pattern of public spending of developing countries, especially in times of economic crisis. In the Argentine case, extreme volatility resulted in a fiscal breakdown not only in terms of

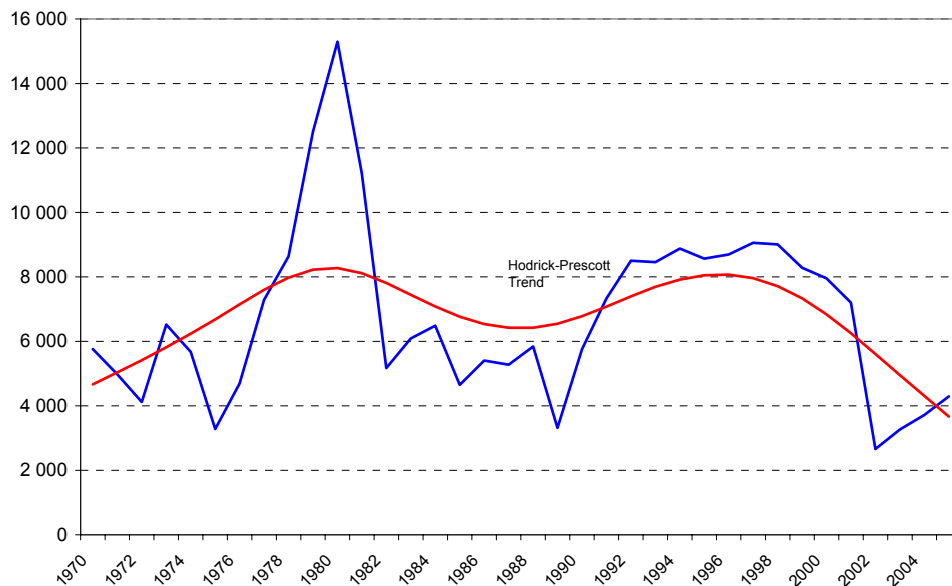
<sup>3</sup> Cf. Heymann and Sanguinetti (1998).

<sup>4</sup> Cf. Kose, Prasad and Terrones (2005) and Aizenman and Pinto (2005) include recent surveys of the economic literature on the topic and Fanelli (2003) studies the Argentine case.



the sources of financing of expenditures but also in the erosion of the quality and contraction of the amounts destined to the provision of public goods.

**FIGURE 2**  
**GDP PER CAPITA IN YEAR 2000, DOLLARS. HODRICK-PRESCOTT TREND**



Source: Author's elaboration on the basis of official figures.

The above mentioned studies focus their analysis on some of the aggregate economic effects of real volatility. However, few studies exist that attempt to explain the microeconomic aspects of the decision making process of agents and its reciprocal influence on macroeconomic behavior in the case of countries characterized by high volatility and low institutional quality.

This paper aims to identify in exploratory fashion some of the effects of real volatility on the structure of the industrial sector and on the evolution of the micro-economy of industrial companies, emphasizing that what happened after the most recent period of market reforms provides evidence that helps understand why macroeconomic sustainability and the solidity of micro foundations are two mutually dependent dimensions. Therefore, after a brief review of the history of industrialization in Argentina since the end of the 19th century, we proceed to the exploration of the micro-foundations of the decision making processes in high instability and economic reform contexts. The conceptual aspects used to advance in the understanding of the observed behavior constitute an eclectic collection of fragmented evidence rather than a unified body of theory.<sup>5</sup> In particular, some of the questions that will be considered in the following sections are: uncertainty, investment and productive strategies; opening of the economy, learning and imports; effects of imperfect financial markets; the technological path and the trade liberalization; the evolutionary perspective and microeconomic dynamics; trends, fluctuations and perceptions of economic agents; heterogeneity and productivity gaps; differentiated responses of heterogeneous economic actors; idiosyncrasies in knowledge and crisis management.

<sup>5</sup> Cf. Dal Bó and Kosacoff (1998), and López (2005).



## 1. A Brief History of Argentine Industrial Development

The process of industrialization in Argentina found its beginnings at the end of the 19th century. Initially, the industrial sector was driven by an agroexporting open economy model based on the production of cereals and meat. With its vicissitudes, this setup lasted until the expansion of the agricultural frontier came to an end and the world was overcome by wars, economic crises and protectionism.<sup>6</sup> Similarly to what was happening in other nations around the globe, in order to respond to this new scenario a new economic regime began to develop from the thirties onwards. This new regime operated under the form of the so called “Import Substituting Industrialization Process” (ISI). Thereafter, industry gradually began to occupy the most privileged position in the Argentine economy. Initially, the most prominent economic actors were the large state owned companies in sectors labeled “of national interest” (steel, iron, energy, transport, among others) and small and medium enterprise in the private sector that were stimulated by unsatisfied domestic demand and by the high trade tariffs (clothing, shoes, other consumption durables, simple machinery).

From the fifties onward, industrial activity was the engine of the economy, of job creation and the basis for capital accumulation. In addition, a remarkable local technological capacity gradually developed, which became outstanding in Latin America. At the end of the nineteen fifties, the massive influx of subsidiaries of international companies in the industrial sector<sup>7</sup> transformed them into important actors in the local setting. This phenomenon shook the structure of existing markets, altered the forms of the organization of production and drove the development of activities that were new and more complex technologically and for which the demand was not satisfied locally (vehicles, pharmaceutical products, petrochemicals, agricultural equipment, processed foods).

In the decade between 1964 and 1973, industry enjoyed continuous growth, without a single decrease in production in any given year. In addition, this latter period was characterized

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<sup>6</sup> Villanueva (1972) and Schvarzer (1996) showed that the strong industrial expansion of the thirties and beginning of the forties did not constitute a rupture with the dominant tendencies of the 20th century.

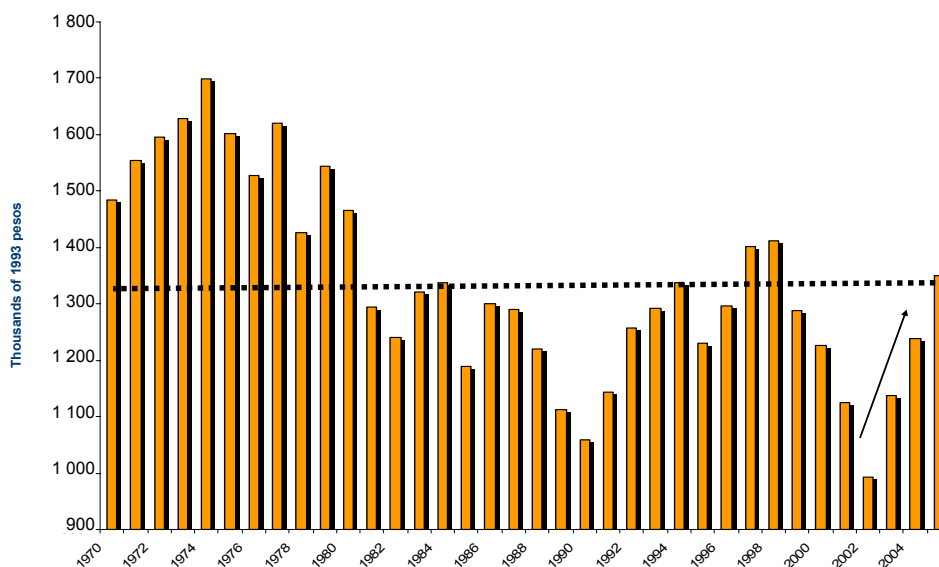
<sup>7</sup> Between 1957 and 1965 approximately 200 subsidiaries of the main international corporations set up their industrial production facilities in Argentina. Cf. Sourrouille et al. (1985).

by a fall in relative prices of industrial goods due to increases in productivity, a rise in industrial exports, an increase in the average size of plants (metalmecanics, and chemical and petrochemical activities were most dynamic) and the creation of employment at rates higher than the rate of increase of the population.

Concurrently with this prolonged process of industrialization, after the Second World War external growth and commercial opportunities began to reappear across the globe. As the substitution strategy became exhausted, the option of maintaining a closed economy subjected Argentina to progressive deterioration relative to other countries.<sup>8</sup> On the other hand, the option of opening up the economy would harm the popular classes, whose interests were best protected by a strong currency that made exportable foods less expensive and by the protection of industry, which demanded a large amount of labor.

In the middle of the nineteen seventies, this growth scheme faced an increasingly more evident set of difficulties. These difficulties included aspects related to the general functioning of the economy (balance of trade limitations and persistent inflation, among others), as well as those derived from the form of industrial organization that was unfolding (plants working at reduced scale, weak subcontracting and specialized supplier networks, low international competitiveness, among others). At the productive level, the local answer was an initial attempt at structural reform consisting in the opening up and modernizing of the economy within the framework of an abrupt appreciation of the local currency. During the four decades of ISI, a large amount of skills, knowledge, engineering capacity, equipment, human resources, an entrepreneurial base, etc. had accumulated. The “regressive” character of the industrial restructuring that took place did not attempt to rescue the positive aspects of the previous phase and thus valuable resources existing in the economy were not made use of.

**FIGURE 3**  
**INDUSTRIAL GDP PER CAPITA, 1970-2005**



Source: Author's elaboration on the basis of official figures.

<sup>8</sup> Through import substitution Argentina grew even slower than other countries of the region that were better prepared for this industrialization strategy (for example, Brazil and Mexico).

From 1975 onward, the Argentine industrial sector lost its capacity for productive dynamism, for employment generation, and for leadership in the investment process that had characterized it in the past. Driven by changes in the international technological frontier and local instability and uncertainty, considerable modifications occurred at the institutional, sectorial, microeconomic and commercial integration levels. Gradually, a pattern of specialization characterized by the predominance of natural resource and capital intensive activities was taking root in Argentine industry. These are activities in which the weight of the labor factor in the production function is small and in which the larger economic agents have a central role. On the other hand, “knowledge” intensive activities, which utilize a large proportion of labor in their production functions and where Small and Medium Enterprises (SME) have considerable participation, were present in lesser proportion (Kosakoff and Ramos, 2001).

For example, in the year 2004, Argentina produced a per capita industrial added value, that was 40% smaller than that which was produced thirty years before. During that period, the manufacturing sector had expelled labor, drastically reduced the number of plants and intensely increased the openness of its commerce. Thus, remarkable changes occurred in the nature and composition of industry. Today, we see a smaller, more concentrated industrial sector, characterized by high transnationalization and an organizational model of production of goods that is very different to that of the period of the semi-closed economy. Metalmechanic activities, which displayed the most dynamic behavior during ISI, now only represent one third of what they represented three decades ago. In addition, inherited from sectorial and regional public policies implemented since the beginning of the seventies that originally sought to strengthen the substitutive strategy and expand industrial capacity in capital intensive goods, the production of basic inputs (steel, aluminum, paper, petrochemicals, among others) became the new pattern of industrial specialization as a result of enormous transfers of public resources in its favor. Also, after four decades of stagnation, the natural resource sector, with the leadership of agriculture (in particular, of soybean production) and energy, expanded again and today is noted for being the most dynamic of sectors, a fact which is reflected in its substantial incorporation of new technology in recent times.

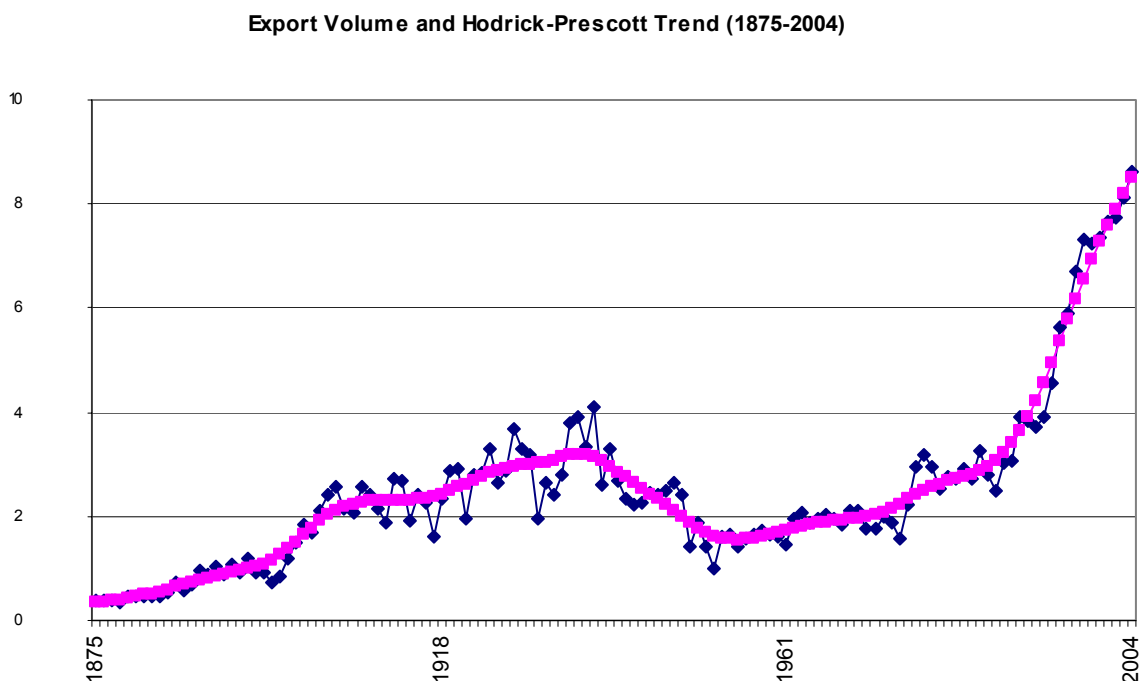
**TABLE 1**  
**INDUSTRIAL MAP (INPUT OUTPUT MATRIX, 1997)**

Relative Intensity	Industrial Activity	Manufacturing Industry Total		
		Gross Product	Labor	Imports
		(in %)		
Capital & imported inputs	Automotive, Electric Machinery, Chemicals, Pharmaceutical, Audio, Packing Containers	32.8	22.6	64.2
Labor & domestic inputs	Commodities, Beverages, Cosmetics and Clearing Products, Appliances	28.5	13.8	15.5
Labor & imported inputs	Capital Goods, Parts and Components	5.5	9.0	8.4
Labor & domestic inputs	Non Durable and Semi Durable Consumers Goods	33.3	54.6	12.0

Source: Author's elaboration on the basis of official figures.

The structural pro-market reforms of the nineties left a set of lessons about the transformation of the productive apparatus. The rise of a business platform subjected to the restrictions of an accelerated process of trade liberalization (reinforced by the effects of a disproportionate appreciation of the exchange rate), to the imperfections of capital markets (with real interest rates at times inconsistent with production) and a framework of competitive and foreign trade policies that were not evaluated, examined or coordinated in any depth, gave rise to an extreme degree of exposure to international competition. Within this context activities based on natural resources and basic inputs, which were already endowed with considerable capabilities, quickly advanced towards the application of the best international practices. This explains to a great extent the export dynamics of the nineties: sales abroad based on natural resources displayed good performance and generated an outstanding mass of foreign currency, although they consisted of products reaching only the first stages of added value.<sup>9</sup>

**FIGURE 4**  
**EXPORT VOLUME PER CAPITA AND HODRICK-PRESCOTT TREND (1875-2004)**  
*(Hundreds of 1993 dollars per capita)*



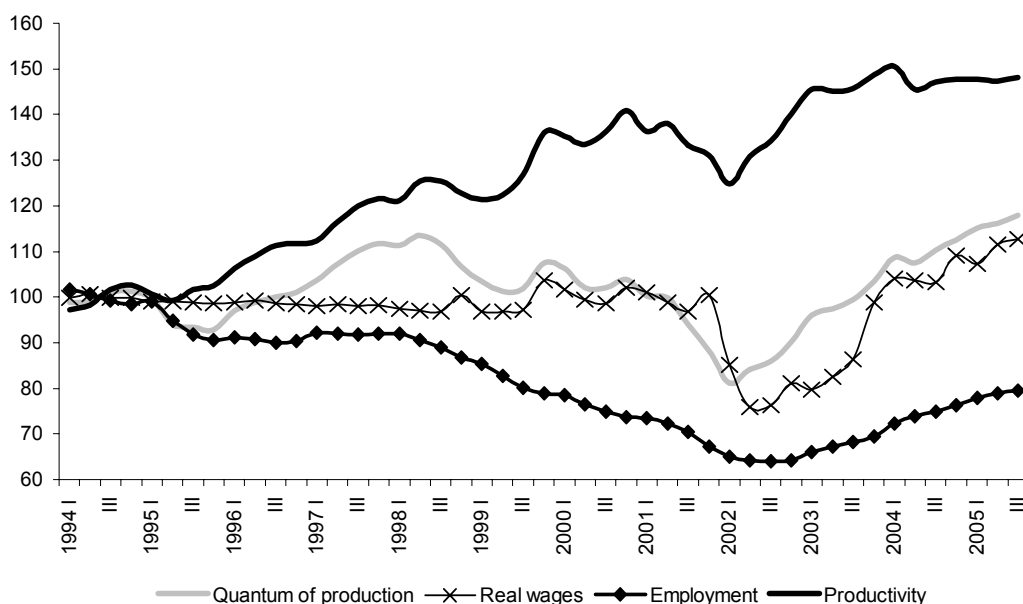
Source: Author's elaboration on the basis of official figures.

In contrast, there was a remarkable loss of social capital in wide sectors of the economy that could not adapt and the majority of activities resorted to survival strategies, moving from the world of production to the world of assembly and commercialization of imported inputs and products. The result of these processes was a pattern of specialization in exports that was

<sup>9</sup> The performance of these products, along with that of the manufacture of gearboxes, valves, etc., is only comprehensible from an evolutionary perspective that combines routines, learning and selection. Also, it suggests that the local economy is ready to advance towards more sophisticated productive processes.

excessively concentrated in primary products and increases in productivity that occurred concurrently with the expulsion of labor and with negligible promotion of new productive initiatives.

**FIGURE 5**  
**MICROECONOMIC ADJUSTMENT. MANUFACTURES. 1994-2005**



Source: Author's elaboration on the basis of official figures.

The economic reforms caused imbalances, divers contradictory phenomena, heterogeneous responses. It is undeniable that economic processes are not linear and that therefore it is necessary to avoid falling into oversimplified models of analysis. For example, privatization and concessions of public services, although set within the framework of insufficient and inadequate regulatory schemes, set in motion a substantial modernization process of the infrastructure systems in telecommunications, energy, ports, etc. Furthermore, during a certain period of the post convertibility transition, there was a generalized perception that a process of massive destruction of entrepreneurial capacities had occurred. However, once again the business sector displayed a remarkable capacity to adapt to contexts of excessive uncertainty and loss of institutional quality. It was thus that industrial firms and those in natural resource activities found a transitory position that allowed them to continue with the exercise of their businesses and avoid the widespread closure of companies. The following pages attempt to bring to light some underlying factors from the perspective of economic analysis.





## 2. The Investment Decision and Accumulation of Capabilities under Changing and High Uncertainty

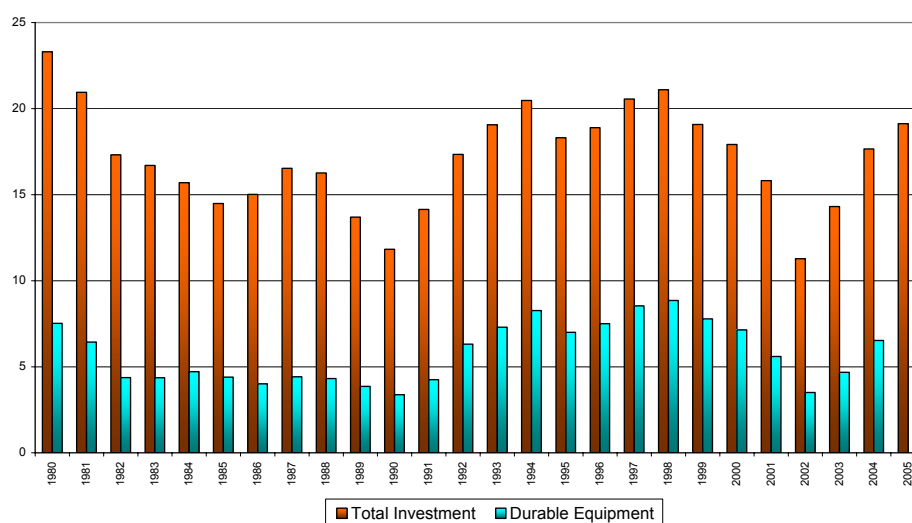
As was noted above, instability and elevated uncertainty are essential aspects for the understanding of Argentine industrial performance during recent decades. The economic history of Argentina demonstrates that in unstable economies with high uncertainty flexibility is a very valuable and tremendously profitable attribute. This fact should not be ignored in the analysis of the decision making process by economic agents.

In contexts of high volatility and low institutional quality there is great uncertainty –which manifests itself in a multitude of ways– about the evolution of the economy and the planning horizon of firms becomes shorter. From a productive perspective, microeconomic behavior in general translates into a predominance of defensive strategies that negatively affect the “animal spirits” and long term growth, feeding back on the unstable workings of the system. Under these conditions, the predominant attitude is one of reluctance to invest in specific assets and to commit to long term strategies. Regarding investment in fixed capital, as well as in intangibles, and also in human capital, the maxim seems to be one and only one: *wait and see*. Thus, in Argentina, uncertainty and recurrent macroeconomic fluctuations induced microeconomic behavior that resulted in low growth and reinforced tensions at the aggregate level.

In general, the economic activities of companies involve the willingness to invest in specific assets with different degrees of irreversibility. When the decision to incur in important sunk costs can be postponed in time, the company has the “option” of delaying this investment and maintaining open its alternatives. In this way, in the presence of scenarios of great instability, the economic value of “waiting” increases, and, for this reason, the accumulation of capital in the present does not exclusively reflect the discounted value of future income from investment. Firms must also be compensated for giving up the “option”, that is, for not being able to wait until they have a better understanding about pursuing different possible events. Thus, even in the case of projects with positive net present values, companies may decide to postpone their investments. Within this perspective of “real options”, the higher the uncertainty, the greater the threshold of profitability that companies will require in order to make their investment in the present (Dixit and Pindyck, 1994).

The extreme volatility existing in the eighties drove economic agents to develop special capabilities to endure the situation. With average annual consumer price variations above 500% between 1982 and 1990, accompanied by sizable changes in relative prices and two hyperinflationary processes, along with frequent and abrupt modifications in economic policies and with the inherent instability of a process of transition towards democracy, very little margin was left for making decisions on investment that involved high entrepreneurial risk or substantial sunk costs, or that required great capacity by economic agents to foresee future scenarios. In fact, this highlights the importance of public policies: industrial policy attempted to resolve the uncertainties associated with basic inputs (generated in part by public policy itself).

**FIGURE 6**  
**GROSS FIXED INVESTMENT, IN % OF GDP**  
*(Total and durable equipment)*



Source: Author's elaboration on the basis of official figures.

At the beginning of the nineties, the expansion of the decision making horizon introduced a change of primary importance for the formation of capital. A decade of “investment crises” had been left behind and, therefore, a wide field of opportunity for the modernization of production capacities was opening up. However, the sudden modification of the competitive environment and of the “rules of the game” introduced new uncertainties. The predominant analytical frameworks of the semi-closed economy were useless for evaluating decisions of investment in specific assets, of incorporation or replacement of lines of production, of human resource training within the company or of the identification of a technological learning path in a context of an open economy (Kosacoff, 2000).

The development of an investment strategy begins in the evaluation of which are the necessary actions for surviving and prospering in a specific economic environment and if these actions are practicable by the firm. Its constituent parts are the level of vertical or horizontal integration of the company, its degree of participation in international flows, the pace of its technological progress and the ownership advantages it is endowed with. Despite the prominent role played by financial, technological and organizational aspects in the transfer of some local companies to foreign hands, the perception by local businessmen of being somewhat unable to adequately respond to the challenge of operating in an open economy and high

internationalization context was decisive in some cases. Within these circumstances, the strategic position defined by corporate offices of trans-national companies was crucial in diminishing some of these uncertainties.

In the nineties, in industry, the uncertainties of microeconomics prevailed. Argentina became a laboratory for analytical cases of the response by economic agents to market reforms. It demonstrated that microeconomic actions have their own timing and their own sequence, and that this cannot be ignored when considering the aggregate consistency of a model of the functioning of the economy.

In addition, given the change in economic regime that occurred in the nineties, it was difficult for economic agents to discern cycle from trend. As a consequence, some firms and investors made economic decisions based on forecasts of future income and demand growth that were not in fact realized. Also, in the middle of the boom in company mergers and acquisitions, the value of local firms incorporated projections of growth in the economy and its commercial partners. This mistaken perception about trends acted as a determinant of long term investment and, at the same time, the resulting behavior modified economic performance itself and influenced perceptions of other actors that also had to grope their way to forecast future evolution.

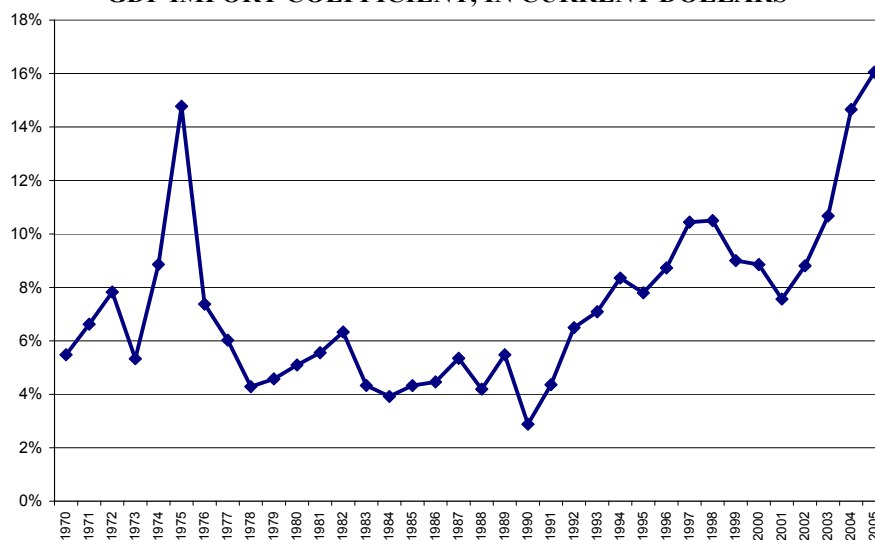
As a result, some of the investments made in the middle of the decade assuming more optimistic scenarios in terms of economic returns than were to come true generated a growth in the financial debt of companies that became difficult to manage in a context of lesser returns and greater weight of interests resulting from the sharp restrictions to financing in general. Constantly increasing real interest rates drove companies to debt levels that in many cases exceeded the value of their assets. Thus, during the period 1998/2001 financing at 25% per annum within a context of price deflation resulted in a generalized process of summons to creditors' meetings.

The average real exchange rate since the convertibility regime was abandoned is almost double that which presided over the economy during almost a decade. Nevertheless, in recent years, the import of final goods is the alternative being adopted by those industrial firms –in particular large ones– that have reached the limit of their installed capacity and still face excess demand from the domestic market. In aggregate terms, purchases of foreign goods during the first six months of 2005 were similar to those of 1997 when, with a GDP that was comparable, the exchange rate was considerably lower.

In this situation, two different economic arguments about the behavior of local companies seem applicable. On the one hand, we have the above mentioned argument about the effects of uncertainty on economic decisions about irreversible but deferrable investment: a reticent attitude towards long term commitments and a greater value being put on “the waiting option”. As a consequence, if the long term perspectives are not clear, numerous local companies find it simpler to make the decision to import than the more complex decision to invest, develop suppliers or train human resources. This is so in particular because importing is an action that can be self-financed and completed in a few months, while investing implies borrowing today in order to make irreversible commitments involving high uncertainty in the long term.

On the other hand, a possible variant of the “beachhead effect” is applicable. In the middle of the eighties there was a revival of interest in research on the effects of the real exchange rate on the evolution of exports and imports in an economy. In this period, the American dollar displayed strong oscillations with respect to the main currencies of the world. Its initial persistent appreciation and the subsequent rise of imports affected the market position of a wide set of local companies of the United States and opened up the debate on whether the return to levels considered sustainable would revert those losses in market share.

**FIGURE 7**  
**GDP IMPORT COEFFICIENT, IN CURRENT DOLLARS**



Source: Author's elaboration on the basis of official figures.

Within this context, several theoretical works emphasized the existence of hysteresis in the interaction between the exchange rate and international commerce.<sup>10</sup> The basic assumption behind these models was that a company that does not export must pay a cost of entry in order to access the international market and that this cost is characteristically a sunk cost. As a consequence, given the so called “beachhead effect”, they suggested that imports would decrease slower than expected as the dollar weakened. This is so, because foreign exporters, once they made the investment in distribution channels, marketing, research, development, reputation, etc, would only expect to cover operating costs to stay in the market. Even if the real exchange rate returned to its previous level, the pattern of commerce would not. Although not very extensive yet, there are studies that provide empirical evidence about the relevance of exchange rate effects in the microeconomic decisions of firms on export market entry and exit.<sup>11</sup>

A variant on this hypothesis is applicable to the interpretation of certain specific business attitudes present in the Argentine case. Thus, through this possible variant of the “beachhead effect”, the persistence of the open economy model stimulated a set of learning processes that were reinforced by a high real exchange rate that later became unsustainable. In fact, a salient feature of the productive conformation of the nineties was that industrial companies applied a strategy in which local production combined with import of supplies and final goods, with the purpose of taking advantage of the new rules of the economic order. In this way, the establishment of import channels for local companies during convertibility implied the development of processes of experimentation, routines and the payment of certain sunk costs that were not compensated once the macroeconomic situation changed.

<sup>10</sup> Cf. Baldwin (1988), Baldwin and Krugman (1989). Models were even presented in which those decisions prompted by overvaluation induced a permanent reduction of the equilibrium exchange rate of the economy.

<sup>11</sup> Cf. Campa (1993 and 2000), Roberts et al. (1995), Roberts and Tybout (1997).

### 3. Financial Markets and Microeconomic Behavior

From a long term perspective, the weakness of the financial intermediation structure is a basic characteristic of the evolution of the Argentine economy. Meager financial deepening, the absence of certain long term markets, of risk management and of liquidity management markets have been permanent attributes that affected the investment process. In fact, in the Argentine case, several studies stressed that the weakness of capital markets impaired the selection process of investment projects, resulting in the absence of a strong core of entrepreneurs, and translating into serious difficulties to soften the fluctuations in cash flow and to diversify company risks.

Usually, these characteristics in the microeconomic functioning of an economy will induce greater macroeconomic instability and the development of abrupt start and stop processes. In principle, this is so given that in such an economy it is difficult, for consumers as well as for businesses, to distribute the effects of a reduction in current income in time. Consequently, faced with negative shocks on the economy, economic agents will contract current expenditures beyond the extent to which this would happen in economies with more complete financial markets. Thus, they will disrupt the level of aggregate activity even to a greater degree, in general causing a recession. If such a recession expands, the financial position of firms and individuals will deteriorate even more, possibly to the point of affecting their solvency and perhaps even that of the economy as a whole.

The existence of financial factors in the amplification of shocks on an economy has been a topic of interest in economic research in recent years (Bernanke et al., 1994; Hubbard, 1998). Certain imperfections in financial markets provoke discrepancies –which are variable throughout the business cycle– between the cost of own funds and those from a source outside the company. These can magnify relatively small shocks, which reduce equity and affect the value of its collateral. “Financial accelerator” models, which attempt to explain the effects of these operating characteristics on aggregate economic fluctuations, have been developed even considering economies with much more complete financial markets than Argentina’s.

Despite these indissoluble attributes of its intermediation structure, Argentine industrial history can be divided in two distinctly differentiated periods in terms of the financing modalities of manufacturing activities. The first period begun in the middle of the forties, and was

symbolized by the creation of *Banco de Crédito Industrial* (Industrial Credit Bank)<sup>12</sup> with the explicit purpose of giving subsidized financing to companies. It was a period in which the international perspectives introduced questions about the future after the rapid Argentine industrial growth of the crisis and World War years. This period came to an end with the drastic change in the pre-existing rules of the game resulting from the financial reform of 1977.

A prominent characteristic of this period was that industrial companies were net financial debtors of the rest of the economy within a context of negative real interest rates. Guadagni (1972) showed that the real interest rates of the banking system applicable to loans registered positive values only in four of the 22 years between 1950 and 1971.<sup>13</sup> Despite the fact that the inflation rate displayed wide fluctuations and that on average it was almost 30% per year (with annual peaks exceeding 100%), nominal interest rates in the banking system experienced few modifications and reached a maximum of 16% in the last year of the period being considered. In addition, in this high inflation situation with interest rates controlled by the monetary authority, while families reduced the quantity of financial instruments demanded in favor of real assets (particularly, in favor of durable goods, such as houses, or the purchase of automobiles), in businesses a similar process occurred: the importance of real assets, such as inventories, increased. With loans generally granted as a function of precepts provided by government economic policy, industrial companies organized production with criteria stemming from borrowing at negative interest rates. As a consequence, from the forties and until the middle of the seventies, negative real interest rates for industrial producers transmitted a clear message: to the extent possible, borrow in order to gain participation in the markets protected from international competition.

From the end of the seventies on, once attempts to open up the economy were introduced, the described financial mechanism changed substantially. The preferential access by productive activities to financing with negative real interest rates existing in the substitution stage was eradicated by the Financial Reform of 1977. The main characteristics of the new system were the autonomous fixing of interest rates by financial entities, lack of constraints in granting and orienting credit, the absence of restrictions to the entry, operation and competition strategies of these entities, and freedom to take credit from foreign sources. In addition, the *Banco Nacional de Desarrollo* (National Development Bank)<sup>14</sup> practically abandoned its function of generalized industrial development and concentrated in a reduced quantity of companies of larger size which were beneficiaries of industrial promotion systems.

From that time on, except for brief exceptions, high real interest rates persisted in the system. At times, real rates largely exceeded levels that would have allowed any possibility of productive profitability and investment in external liquid assets or in public sector debt became more lucrative. In fact, the persistence of high positive real interest rates often diverted resources towards non-productive investments. Within a context of strong macroeconomic turbulence and

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<sup>12</sup> Previously, credit oriented towards industry was scarce and the longer term operations were only associated with the mortgage portfolio. The central features of this first period were analysed by Altimir, Santamaría and Sourrouille (1966), Itzcovich and Feldman (1969), Brodersohn (1972), Guadagni (1972) y Schvarzer (1981), among others.

<sup>13</sup> This behaviour had its counterpart in that in 21 of those 22 years of inflation with controlled interest rates, the rates on deposits were negative. Therefore, those who saved (as well as other economic agents) contributed through this “tax” to the financing of borrowers in the system and of the financial intermediaries themselves.

<sup>14</sup> *Banco de Crédito Industrial* (Industrial Credit Bank) created in 1944 underwent several modifications in its structure, range of action and form of operation through the years. Its name also changed in time to *Banco Industrial de la República Argentina* (Industrial Bank of the Argentine Republic) in 1952 and to *Banco Nacional de Desarrollo* (National Development Bank) in 1971.

high interest rates, the fate of many companies was determined by the ability of their finance management to administer financial liquid balances and adapt productive models to the new restrictions. The persistence of high positive interest rates had a big impact on the rationality of industrial organization. The financial weight of excess inventory management, of the administration of discontinuous processes with lengthy dead times, of the lack of systematization in purchase systems, etc., resulted in the gradual incorporation of automation technologies to the production lay out that spanned from process control and inventory management to the improvement of quality control systems, among others.

According to economic theory, increases in real interest rates cause reductions in company inventories. However, during a long period of time empirical research did not find conclusive evidence to support this idea (Blinder and Maccini, 1991). This cast considerable doubt on the existence of one of the traditional channels by which it was suggested that monetary policy affected investment. A more recent line of research proposed that the answer could be found in the dynamics of the real interest rates themselves, which exhibit temporary variations around stable average values during extensive periods (regimes). In this way, firms would only modify their decisions about inventory levels to the degree that they perceived a change in real interest rates as persistent in time, that is, as a change in regime –a situation that is generally uncommon–. There is some evidence that support this hypothesis (Maccini et al., 2004).<sup>15</sup> An argument of this type could account for the behavior displayed by Argentine industrial companies described above.

In the history of Argentine industrial development, self financing (particularly, the reinvestment of profit) represented an increasingly important source of funds to firms. During ISI, high levels of protection and the concentrated industrial market structure itself allowed domestic prices that were substantially higher than international prices to finance capital accumulation by firms. The legal frameworks for industrial promotion were another key mechanism for the fostering of investment. In the case of bank credit, until the middle of the seventies, the larger firms were the ones that concentrated the access to credit or collateral (within a context of excess demand), while the main form of financing for the remaining companies was commercial credit. In fact, direct investment by international firms arrived in Argentina since the very beginning of its industrialization process. Since they enjoyed privileged access to local credit with negative interest rates, these companies operated with financing that was, to a large extent, from the local capital market.

The change in real interest rate regime did not entail modifications in the persistent internal segmentation in terms of access to financing nor in the discrimination that particularly affected companies of smaller size. This segmentation was not neutral for financial administration even among larger size companies. In fact, these companies interacted with small and medium enterprises that were their suppliers and clients and in many cases acted as finance and capital market substitutes with the purpose of overcoming the above mentioned imperfections. The participation of large firms in reciprocal collateral systems, for example in the siderurgy and aluminum sectors, is representative of this situation.

Credit rationing is a direct result of the effects of the information asymmetry in these markets. In the case of smaller size firms, these effects are aggravated by the accounting and administrative structure that characterizes them. In a case often presented in economic theory, the combined effects of interest rates on interests charged on credit and on the risk of the loan

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<sup>15</sup> Other studies postulate that in the short run the level of inventories is more influenced by financial restrictions and the company's availability of internal resources than by the real interest rate itself (Kashyap et al, 1994; Gertler and Gilchrist, 1994). However, in the long run, when financial conditions allow it, firms will adjust inventories in accordance with the prevalent interest rates.

portfolio (originating in problems of moral hazard and adverse selection) result in a supply curve of credit institutions that does not monotonously increase with the interest rate and that therefore can lead to credit rationing (Stiglitz and Weiss, 1981). One way to reduce these problems (although not eliminating them completely) is to introduce high requirements in terms of real collateral. In addition, in the case of Argentina, the banks displayed a notable lack of capacity to correctly evaluate projects. To a considerable extent, efficiency problems in risk assessment impacted directly on productive processes.

During the transition from a semi-closed to an open economy, difficulties in access to financing found the local offices of transnational companies and the large local economic conglomerates in very different positions. The former had better access to international capital markets, while there is empirical evidence showing the difficulties faced by the latter. In some cases, these difficulties led large locally owned companies to sell their market positions due to the imperfections of the capital market more than to their own tecnoproductive limitations. In other cases, local companies found it impossible to dissociate their nationality of origin from the country's sovereignty risk. This distortion was one of the factors that motivated the purchase of the American oil company Maxus by the company called YPF at the time.

It is also interesting to corroborate the association that existed between financing and the process of internationalization. Financing restrictions were one of the most important limiting factors for success in the internationalization process by Argentine companies. In Kosacoff (1999) this phenomenon and its consequences was analysed. The experience of the telecommunications company IMPSAT teaches us about the central role that financing plays in internationalization. In an early stage, this firm sought a technological alliance in order to increase capabilities and earn a reputation in the international market. For this purpose it partnered –with a participation of 25% of capital– with the Italian firm STET. To the degree that it positioned and acquired prestige, the limiting factor for international growth became financing at international rates. Therefore, in a second stage, it switched from its technological partner to the investment bank Morgan Stanley. This type of case illustrates that, although it is not possible to think of a business strategy that does not consider a complementary financing plan, it is undeniable that financial aspects acquire an outstanding dimension in projects associated with international expansion.

The hyperinflationary episodes that occurred at the end of the eighties and beginning of the nineties in Argentina shrunk the financial markets almost to the point of their disappearance. Due to the conditions prevailing during the Convertibility Plan there was a substantial rise in the demand for financial assets (usually denominated in foreign currency) and in financial deepening.<sup>16</sup> Furthermore, the increase in supply of financial assets and the initial fall in sovereignty risk allowed certain firms access to the voluntary market of international credit, which had been inaccessible to them in the eighties. This entry was facilitated in the nineties by international markets characterized by greater liquidity, a fall in rates and the appearance of new instruments. In this way, there was a tendency to increase the levels of leverage.<sup>17</sup> Argentina became a learning laboratory for business management of operations in international capital markets. As a result of this process, finance departments developed sophisticated capabilities for the management of the different options arising from the opening of markets. The majority of

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<sup>16</sup> While in 1991, the total value of credit in the economy was around 5% of GDP, towards the end of the nineties it reached values around 25%. Also, the dollarized credit portfolio in the financial system increased from less than 40% to almost 70% of the total.

<sup>17</sup> Bebczuk, Fanelli and Pradelli (2002) calculated that between quarters 1992:I and 2000:III the net wealth of a certain set of companies that were listed in the stock exchange increased 22% in real terms, while the total debt of these firms in the same period rose 221%.



these companies opted for new instruments, which included negotiable obligations launched in local and international markets; credit lines originating in international financial organisms; participation in stock and derived instrument markets; etc. These types of operations required greater company transparency, among other elements, due to the stricter rules of international stock exchanges and regulations on the protection of stockholders.

During the convertibility regime, the volatility of capital flow and its effect on the credit supply and the level of activity was a source of potential financial fragility. Also, industrial firms absorbed the fall in profit margins derived from the competition of imported products by commercializing greater volumes. The placement of products in the market implied credit transactions with terms of 150 to 180 days. This process occurred in a payment chain that was sensitive to economic fluctuations. In order to place these commercial credit operations industrial firms increased their levels of debt in dollars. Along the same lines, the relationship between firms' long term debt (in dollars) and short term debt varied in a procyclic fashion. Although it made longer terms possible, the dollarization of debt caused a substantial rise in the devaluation risk, given a financial structure with income flow in local currency. Thus, negative shocks reduced leverage as well as the duration of debt: as equity of a company shrinks, creditors transfer their demand towards less mature debt. This increases the vulnerability of the firm as it has to finance longer term assets with short term liability. This process continued given that it encouraged creditors to cut terms even shorter.

After the collapse of convertibility, starting in mid 2002 the progressive normalization of markets and the attenuation of uncertainty were related to the activation of domestic demand. Based on the dramatic reduction of labor costs and on the postponement of increases in prices of public services, the source of financing for production was the larger business margins. In summary, a fall in physical volumes of close to 20% took place, but it coupled with an abrupt recovery of the operating flows. Companies markedly reduced the terms of their commercial operations, arriving at a situation of near exclusive cash sale. During a long time, firms' operating costs (salaries, public utility fees, taxes, rent, etc) remained practically unchanged in nominal terms. In contrast, prices of tradable goods increased significantly. The result was a marked improvement in the profit margins that, along with the recovery of cash flow, allowed self-financing of investment and the restructuring of debt. Business self-financing is an extended characteristic that will most probably continue. However, in order to grow in a sustained fashion, Argentina needs a new spurt in the investment rate. This greater accumulation of capital must be financed. The creation of long run financial markets and a greater orientation of the credit system towards selection and financing of investment projects seem inevitable.



## 4. Technological capabilities and the supply of skills

The industrial structure that emerged with ISI was characterized by small sized production plants; high vertical integration; the application of design, process and organization technologies far behind the international state of the art; “short series” production along with a ample mix of manufactured products and internal technological efforts aiming to copy or adapt foreign technologies through small changes.

The size of a typical industrial facility during ISI did not reach even a tenth of the scale of a similar production plant in a developed country. In addition, given the immaturity of the productive structure and the absence of independent parts and spares suppliers, the degree of vertical integration of these companies was much higher than was predominant in the industrialized world. The production of “short series” of various products caused local companies to suffer considerable losses in terms of economies of scale. Similarly, lay-out and organization technologies had a rudimentary character that increased the incidence of “dead time” (Katz, 1986).

The technological challenge for industrial firms was to adapt and assimilate knowledge of foreign origin in a local environment with different prevailing relative prices, less division of labor and high transaction costs. These conditions induced companies to search for incremental improvements in their productive performance. But in order to incorporate knowledge (and in the same process generate new knowledge) it is necessary to master additional know-how. In this way, numerous companies reacted to the particular characteristics of the local context creating engineering departments within the firm with the purpose of achieving these improvements in productive design, in the manufacturing process itself or in the organization of work. Because they faced the same incentives as domestic firms, this behavior was displayed even by local subsidiaries of transnational companies, which, from the technological point of view followed the same path despite the fact that they claimed having know-how applied by the company in the developed world.

From the perspective of static efficiency as well as from the very dynamics of the technological learning path, this set-up resulted in an accumulation of knowledge and idiosyncratic characteristics that did not converge with the international technical frontier. For

this reason, it is difficult to label this set of activities as immature industry, given that its evolution implied a final result that would not be arrived at by other societies. Despite the fact that it gradually diminished the productivity gap and permitted import substitution in a protected market, the “evolution dynamics” of ISI did not aim to increase the international competitiveness or the export capacity of firms in a systematic fashion until far into the seventies (Katz y Kosacoff, 1998).

Similarly to what happened in the semi-closed economy of substitution, the knowledge and technology employed during the nineties were of foreign origin. However, the sudden opening of the economy and the exaggerated overvaluation of the real exchange rate imposed a ferocious competition with “state of the art” products. These conditions, which provided the framework for the economy, introduced new technological dynamics that were very different to the pattern observed during ISI. From a technological perspective, the increasing internationalization of production required specialization in products that were technically compatible with international standards. In this way, through progressive foreign supply, the process tended towards a reduction of the pre-existing gap in product technology while, at the same time, efforts to develop new products or processes or to adapt foreign technologies were minimized. In addition, this process occurred within a context of continuous weakening of the domestic supply chain.

Thus, the processes of integration to international commerce networks were intensified in the case of a wide range of firms. This tendency allowed progress in a process of specialization and reduction in the mix of production, which occurred simultaneously with productive disintegration and a stronger reliance on commercial chains (Cimoli, 2005). As was mentioned above, from the perspective of an international comparison, the typical plant of the seventies had, among other characteristics, a relatively small scale of production and a significant productivity gap. In the nineties, although some modifications were introduced, it can be said that, in essence, those features were maintained. Some studies have shown that most of the industrial plants substantially differed in size compared to their competitors from Brazil as well as the rest of the world.<sup>18</sup>

With regard to the direction of the innovation processes it can be said that, driven by the signals in relative prices, innovation activities of local companies were particularly concentrated in the purchase of technology embodied in capital goods.<sup>19</sup> Along the same lines, other internal and external sources of knowledge and capacity building such as investment in Research and Development (R&D),<sup>20</sup> transfer of technology, efforts in industrial engineering, in management and training or consulting, displayed relatively little importance. The resulting imbalance threatened the development of important capabilities, even those necessary for fully taking advantage of introduced equipment. Taken together, investment by manufacturing companies on innovation activities (particularly R&D) was limited in absolute terms and it was also inferior to that of other countries in the region as a proportion of turnover. According to the Second Innovation Survey, expenditure in innovation activities by Argentine industrial firms varied

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<sup>18</sup> In a study where comparisons were made in scales of production, it was shown that local plants were of smaller size in 78% of the 408 cases analyzed. In the cases where larger or equal scale existed, it was observed that 35% corresponded to the food sector, followed by chemicals-petrochemicals with 30% (Department of Economic Programming, 1994).

<sup>19</sup> Purchase of capital goods and hardware were more than 70% of expenditures in innovation activities (INDEC-SECYT-CEPAL, 2003). Cf. Anlló and Peirano (2005).

<sup>20</sup> The Argentine private sector displays scant participation in R&D (between 20% and 25%) within a domestic outlay (0.4% of GDP in 2003) that is in itself lower than the average in the region and very low when compared to that of other newly industrialized countries (SECYT-Ministry of Education, 2005).

between 2% of total turnover in 1998 to 1.6% in 2001, while the corresponding index for R&D outlays was between 0.2% in 1998 and 0.3% in 2001.<sup>21</sup>

In other words, with little investment in R&D in absolute as well as relative terms, industrial companies tended to increasingly rely on sources external to the firm for its technological endowments, mainly through the purchase of capital goods and information technology. This combined with the fact that import became the most dynamic factor of technology supply, particularly when it involved embodied technology but also in the case of the supply of disembodied technology (Yoguel and Rabetino, 2002).

On the other hand, increased international competition forced a reaction of greater concern for the acquisition of organizational technologies. In particular, due to the modification of systems of production incorporating new criteria based on flexibility and specialization, (subcontracting, quality management, just-in-time, etc.), and to the consolidation of forms of organizing production that were unusual in the seventies (national economic conglomerates, alliances between local and foreign companies, complementation agreements, etc.), large national and international consulting companies displayed high levels of activity during part of this period (Fuchs, 1994), specially through the introduction of quality certification (Ramos, 1995).

Another characteristic of this period was the productive retreat of “technology intensive” sectors, considered the engine of the most successful newly developed economies. In fact, the drop in output in local pharmaceuticals, some capital goods, and electronics and telecommunications, deprived the local economy from the “spillover” effects that their development normally produces. Although different business strategies for the introduction of technological and organizational innovations coexist, recent studies suggest that those that are prevalent in Argentine industry are not the ones that provide greater probability of reaching solid and extensive competitive improvements in international markets. In general, there is an absence of strategies aiming to conquer new markets in productive sectors with more knowledge content. The economic scheme prevalent after the collapse of convertibility does not yet seem to have induced significant changes in business innovation strategies. A *wait and see* attitude is predominant.

Finally, modernization and expansion of agri-food production during the nineties (resulting in double the annual tonnage of oil seeds and cereals of the previous decade, among other effects) allowed the overcoming of one of the main restrictions of the substitution system. This development arose from the introduction in the primary sector of a set of innovations and a complementary capitalization process that brought about a radical change in its productive structure. The widespread use of technologies originating in the developed world and commercialized in Argentina by transnational companies led to the expansion of the agricultural frontier. Some examples are the incorporation of genetically modified soybean, corn and cotton seeds; a greater use of fertilizers and agrochemicals; the proliferation of direct seeding and double cropping in agriculture; improvements in animal genetics; the development of feedlots in beef production and of new dairy techniques, and the use of new field storage technologies (BID-CEPAL-Ministry of Economics, 2003; Bisang, 2003).

In summary, within a framework of heterogeneous actions, industrial firms tended to display technological behavior associated with foreign supply, the dismantling of equipment for projects with greater local participation and an appreciation of organizational aspects, not only in production, but also in marketing and finance. The growing tendency towards the adoption of

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<sup>21</sup> In 2000, in the cases of Brazil and Uruguay expenditure by companies in innovation activities with respect to sales was 3.8% and 2.9% respectively, while the R&D indicator was 0.7% and 0.4% respectively.

product technology of foreign origin at levels close to best international practice went against the generation of local adaptive efforts. This tendency implied a smaller gap in terms of product technology, but a significant loss in the acquisition of domestic capabilities through research and development activities. However, the massive incorporation of imported machinery and equipment was necessarily accompanied by organizational changes and by greater investment in training. Also, the tendency towards de-verticalization of production consolidated fundamentally through the use of imported parts and spares, reducing the probability of creating production networks based on local subcontracting and having pronounced negative effects on the labor market (due to lower direct and indirect labor requirements as well as the loss of qualification in the “learning by doing” of human resources).

## 5. Heterogeneity and Economic Agents

Perhaps the most salient aspect of the conformation of production during the nineties was heterogeneity. It is undeniable that not all economic agents reacted in a similar fashion to the challenge involved in a transition to new productive strategies in which local production combined with the import of inputs and final goods with the aim of taking advantage of the new economic rules of the game.

Coexisting with an industrial apparatus of lesser size, a set of companies grew and not only increased their own previous productivity levels but also reached the best international standards in efficiency and practice. Pre-eminent in this group are activities in the agro-food sector and the restructured basic input industry associated with the public policies of the past. The most representative examples are the large steel and aluminum plants, oil refineries, petrochemicals, among others. They consist of efficient plants with excess supply capacity that sell abroad. Among them, we can also find some facilities from the automotive complex, and several firms that expanded in the mass consumption market. This group is characterized by its “offensive” restructuring, and a significant portion of their production is exported. Exposure to international markets provided them with the necessary motivation to increase their efforts to achieve higher productivity levels. The group consists of no more than 400 establishments and represents approximately 40% of industrial output.

On the other hand we find the rest of the productive network, characterized by having reacted with so called “defensive” behavior. These companies, despite advances in productivity relative to their own past, are still far from the international technical frontier and continue to display certain features of the substitution strategy, such as small scales of production and limited economies of specialization (Kosacoff, 2000).

In some cases, activities based on natural resources generated downstream effects that also resulted in the attainment of high levels of competitiveness. Such was the case of the candy industry, fine wines, oils, dairy products, lemons, among others. However, the aggregate behavior of these dynamic areas was not enough to result in a macroeconomic impact and propagation to the rest of activities. Within the framework of the recent structural changes in the Argentine economy, modification in business strategies and behavior prove to be highly complex processes, far removed from instantaneous adjustments and strongly influenced by history, context, and the firm’s own perceptions of the future. If there is one factor that emerges as a distinguishing feature

of business strategies and decisions, it is heterogeneity. Firms did not follow a common pattern, but, based on their own specific assets and advantages, they took different directions and postulated disparate long term visions and objectives.

Although it does not yet attest a pattern of specialization, in recent years a body of evidence has evolved that shows the economy in condition to develop more sophisticated productive processes based not only on the use of natural resources but also of human capital and technology. There are notable cases such as those of the firms EDIVAL and BASSO (engine valves) in the district of Rafaela or TRANSAX (gear boxes) in Cordoba, the production of fine wines in various provinces, ARCOR (candies), the Santa Fe Province dairy complex, INVAP (nuclear reactors), among others. Certainly, these coexist with many stories of failures; hence the significance of undertaking case studies that give due importance to the vital role played by historical evolution.

The analysis of firm behaviour based on a concept of the nature of companies as complex organizations that evolve in time in an interactive process with the market and institutions requires an approximation that includes a large quantity of determinants simultaneously. For example, EDIVAL was created in the mid fifties in the city of Rafaela as a family owned company that produced engine valves using rudimentary methods. Initially, it sold in the spares market and benefited from the passion for the sport of car-racing that existed in that city and its surroundings. At the beginning of the sixties its founders travel to Europe with the intention of obtaining quality materials and learning how their product was produced in industrialized countries in order to replicate these methods in Argentina. After developing machinery and operations similar to those in Europe, EDIVAL begins to conquer the finished product industry established in Argentina at the end of the sixties, making enormous efforts to meet technical standards. In the mid seventies, aided by a locally earned reputation, it decides to enter the United States market with its valves for competition and road cars. It thus discovered a difficult but profitable market niche: the high performance competition market, which allowed it to advance during almost a decade until it was able to enter the international market of standard valves. This latter achievement was attained only in the mid eighties, when it signed a sizable contract in the United States that marked the transformation of the company to exporter of original equipment in some cases, and, in others, to an alternative in the spares export market.

Thus, EDIVAL evolved with the needs of the world market while most Argentine companies continued to operate in an almost totally captive market. During the nineties, trade liberalization and the appreciation of the local currency combined with a generational change in management to complicate the evolution of the company. Within this context, it undertook a risky project: to become a global player in the original equipment supply market. In 2002, once a process of professionalization in company leadership was completed, EDIVAL purchased a plant in Portugal in order to increase its production capacity and “get closer” to European clients. Today, EDIVAL is the fourth producer and exporter of valves in the world and has become supplier of automotive producers at their headquarters worldwide despite the distance that separates them from the city of Rafaela.

As Ascúa pointed out in his study about the company,<sup>22</sup> “the case of EDIVAL is interesting not only from the historical point of view, but also from the academic stand, especially in order to better understand globalization processes and their impact on developing countries. During fifty years, this company of humble beginnings has shown that it is possible to build a business model that generates dynamic competitiveness, competing first with other domestic firms and later with dominant transnational ones.” Despite the certainty that the case of each

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<sup>22</sup> Cf. Ascúa (2003).



company has its own specificity, its own limitations and historical elements of difficult reproduction, a business strategy in permanent adaptation aimed at a path of growth, the ability to identify and take advantage of opportunities, the emphasis on the development of technical capabilities and continuous learning are all elements in the course of EDIVAL's evolution that provide lessons for other cases.

INVAP is another such example. It was created by an agreement between the National Commission of Atomic Energy (*Comisión Nacional de Energía Atómica* or CNEA) and the government of the Province of Río Negro. It is well known as an exporter of nuclear facilities, and control systems and equipment for nuclear technology. It has also exported cobalt-therapy machines and automation systems and equipment for industrial projects.

The story of INVAP begins at the end of the forties, with the Huemul Project for the construction of an atomic assay lab. The failure of this project resulted in its reorganization at the beginning of the fifties with the new function of developing knowledge and technologies for an Argentine nuclear complex. It is thus that the Bariloche Atomic Center (*Centro Atómico de Bariloche* or CAB) was created. It was to pursue the study of certain fields of knowledge in response to the specific demands of CNEA. At the end of the fifties, CNEA launched its first experimental reactor built in the country and at the beginning of the seventies, CAB created the Department of Applied Research (*Área de Investigaciones Aplicadas*) that would seek to take advantage of the experience acquired in the field of experimental research in order to work on problems of a practical nature. This step was associated with the decision to build the first nuclear plant in the country.

In the middle of the seventies, INVAP was created from a division of the Applied Research Department. It initiated its activities as contractor of CNEA in the manufacture of equipment for the supply of combustible elements for a second nuclear plant, in an international setting of strong restrictions to the acquisition of nuclear technology. In the eighties, the technological progress made by INVAP allowed it to obtain its first turnkey-plant export contracts. The crisis of the late eighties affected resource availability and it drastically reduced its staff. Some of its former employees created their own companies and became its suppliers. INVAP entered new fields related to space activities and communications and information technology. Finally, the nineties were the decade in which INVAP consolidated its take-off. During this period, it deepened its penetration of foreign markets as supplier of nuclear technology, which culminated in 2000 with its winning a contract for the construction of a research nuclear reactor for Australia (Lugones and Lugones, 2004).

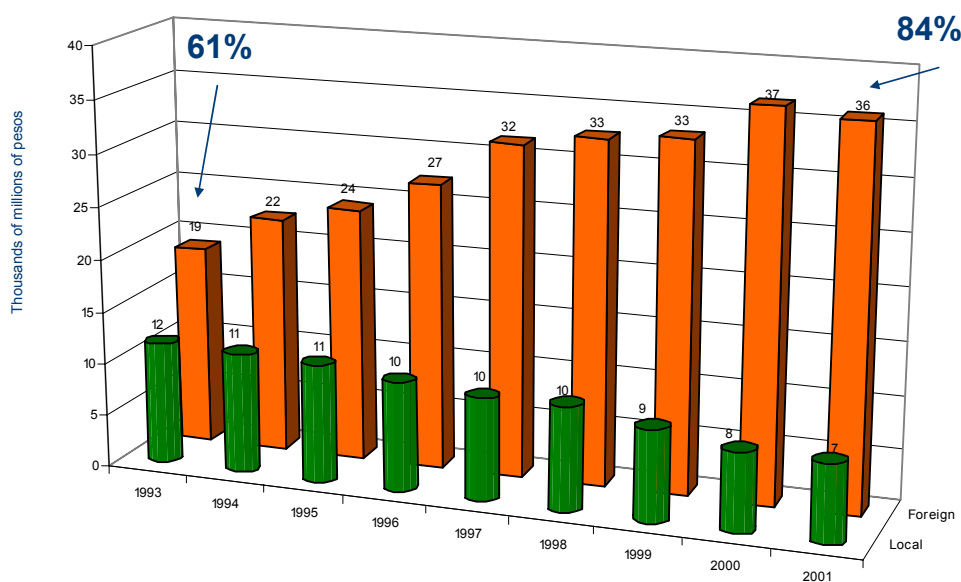
Thus, any effort to explain the complexity of such phenomena is necessarily partial and subject to limitations. The perspective provided by evolution theory is a central element in the understanding of these long term processes, with their ups and downs and their co-evolution with macroeconomic dynamics. Despite the striking dearth of company case studies, there are some works that merit mention, such as Gutiérrez (1999), which analyzed the evolution of IMPSA; Kosacoff et al. (2001) which studied the ARCOR group; Ordóñez and Nichols (2003) and the Grobo case; Vispo and Kosacoff (1991) for the analysis of IBM Argentina; Schvarzer (1989) and the experience of Bunge and Born; Artopoulos (2004) and the Teching group; and Barbero (1998).

During the nineties, as State owned companies disappear and the presence of large independent local companies is reduced, the presence of foreign companies increases

remarkably.<sup>23</sup> Business structure had already changed considerably at the beginning of the decade, given the active participation of foreign investors in the privatization process. But it is from 1995 onwards that the extraordinary growth in the transfer of private sector industrial firms takes place. Although the presence of foreign capital in manufacturing is not new, it increased substantially.<sup>24</sup>

Notwithstanding the importance of Argentine endowment in natural resources as a location advantage for investments in agroindustrial, mining and petroleum commodities, FDI concentrated on those sectors most stimulated by a dynamic demand. Despite the fact that the opening of the economy –within the framework of an exchange rate misalignment– generated an unfavourable bias against domestic production of tradable manufacturing goods, the dynamism displayed by domestic and regional demand in the greater part of the decade became a decisive factor for the investment decisions of Transnational Companies (TNC), both for established firms and “newcomers”.

**FIGURE 8**  
**VALUE-ADDED OF THE 500 BIGGEST COMPANIES (1993-2001)**



Source: Author's elaboration on the basis of official figures.

The imperfections of financial and capital markets and the interest rate differentials between the local and international market assisted in furthering the transnationalization process. For the local entrepreneur selling his company, the flow of future returns was discounted at the interest rate existing in the local market, which was on average no less than two to three times

<sup>23</sup> According to official estimates, between 1990 and 2000 seventy-eight billion dollars entered the country in Foreign Direct Investment (FDI); thus, the amount of foreign capital grew at annual rates above 20% and surpassed eighty billion dollars in 2000. (Kulfas, Porta and Ramos, 2002).

<sup>24</sup> While in 1994 there were 69 foreign owned companies among the largest 200 industrial firms in the country, their participation in this group grew in a sustained fashion, increasing from 87 in 1995 to 129 in 1998. In 1994, sales by foreign companies concentrated 43.4% of total sales by the largest 200 firms, while in 1998 such participation was remarkably higher, reaching 69.2% (*Centro de Estudios para la Producción* (CEP), 1999). In 2002, 325 of the largest 500 companies were subsidiaries of Transnational Companies (TNC) and generated more than 80% of the added value of this business elite.

greater than the international rate at which the TNC buyer operated. Furthermore, in certain cases, a technological factor came into play. In sectors that experienced technological progress at an intense pace beginning in the 1980s (information technology, telecommunications, machine-tools) or where access to innovations was difficult (pharmaceuticals) local firms faced greater constraints to their performance. In summary, besides the tenders for foreign operators in privatized public services, the set of incentives implicit in the new rules, and the financial valorization strategy adopted by the large local agents, favored the transnationalization coefficients reached.

In the production area, the main concern of the new investments was specialization and the increase in scale, which were decisive factors in the new conditions of competition. In the cases of growth by merger or purchase of local companies, the tendency was to vertically dismantle facilities, outsourcing certain sections, and rationalizing activities, downsizing administrative areas and maximizing corporate synergies. It is important to note that, as much as the firm's previous history and some of its tangible and intangible assets were attraction factors and a good basis of the restructuring operations undertaken, in some cases the accumulated equipment imposed technical restrictions to the definition of new projects. In general, only in these cases, and in particular if new investors were involved, were new plants or greenfield investment projects developed.

The marked increase in the degree of transnationalization of the Argentine economy was also reflected in the participation of TNC in foreign trade and, even though their presence was entirely predominant in the import flow, their contribution to exports was also substantial. The great majority of exports were concentrated in a reduced number of sectors based on natural resources, with the exception of the automotive industry. Two other striking facts give the Argentine case a certain singularity: in international terms, the participation of TNC in trade was comparatively high, and, at the same time, the internal market orientation of their operations was also much greater than in other FDI receiving countries.

**TABLE 2**  
**TRANSNATIONAL COMPANIES STRATEGIES IN THE NINETIES**

<b>Main Sectors</b>	<b>Share in FDI flow</b>	<b>Location Advantages or Attraction Factors</b>	<b>Type of Investment</b>	<b>Market</b>
Public Services	37%	Regulation Captive market, monopoly, guaranteed profitability	Market seeking Rent seeking	Internal
Private Services (financial and commercial)	11%	Regulation Expectations about the internal market	Marketing seeking	Internal
Food Light Chemicals Beverages	6%	Expectations about the internal market Market position Natural protection	Market seeking Efficiency seeking	Internal and some Mercosur
Automotive Auto-parts	5%	Regulation Expectations about the regional market	Efficiency seeking Market seeking	Mercosur
Agro-industrial Commodities Petroleum Mining	28%	Natural advantages (frontier expansion) Privatization Regulation	Resource seeking	World Mercosur World

Source: Kulfas, M.; F. Porta and A. Ramos (2002).

Only those FDI strategies that are intensive in the use of natural resources generated a positive balance of trade. This occurred as a result of the strong orientation of these activities towards the export market based on natural advantages and their very low import propensity. In contrast, among the companies that engaged in predominantly market seeking strategies –present in the larger part of the manufacturing sector– there was a generalized trade deficit, even in the case of those firms that had a higher export coefficient than the national average and due to their particularly high reliance on final or intermediate imports. Moreover, this group displays a pattern of integration into the foreign market in which exports to Mercosur and imports outside of the region are predominant, combined with a strong component of intrafirm trade. As far as the availability of international commercialization channels may be a significant ownership advantage of a TNC, an important expected effect of FDI is its potential contribution to the net generation of foreign currency through exports. However, in the case of Argentina the evidence does not support this argument: the export performance of TNC seems to be associated with a deployment of strategies of specialization and complementarity among subsidiaries, layed out on the basis of regional commercial preferences.

In summary, despite their preponderant participation in the country's commercial flows and except for the singular case of the development of the automotive complex within the framework of sectoral integration in Mercosur, the strategies displayed by transnational corporations in the nineties do not appear to have contributed to modifying or diversifying the traditional pattern of Argentine exports. To the extent that these subsidiaries show a clearly greater import than export propensity –except in the obvious case of sectors based on agricultural resources– their actions are the main source of the trade deficit and, therefore, aggravate external restrictions. In addition, they reinforce a “dual” process of productive internationalization, which combines a pattern of intersector trade with markets in developed countries with a pattern of trade with regional markets of a relatively intrasector nature. Lastly, according to available estimates, probably no less than 25% of Argentine international trade corresponds to intrafirm flows. If so, the management of transfer prices may be common practice among firms and a serious economic policy problem.

In recent years a significant contraction in FDI flows has been experienced. Although it is still difficult to differentiate between temporary and permanent changes, a boom similar to that of the nineties seems unlikely to occur.<sup>25</sup> Furthermore, the possibility of a reduction in the participation of foreign companies cannot be discarded. In addition to volume, there are also questions as to what strategies they will follow: in general, subsidiaries have high import coefficients and low export coefficients. Based on the higher real exchange rate a gradual increase in export coefficients may ensue: the challenge consists of the development of “global products”. If so far their contribution to capital formation, to the accumulation of local technological capabilities, to the development of suppliers and the opening of markets was poor, it is nevertheless undeniable that TNC will be key actors in any strategy for sustained growth. Into the future, the question is not so much to attract a greater number of capital investments but to procure foreign investment of greater quality, in a highly transnationalized economy, with insufficient spill-over from FDI flows on the rest of activities.

During a long time various authors stressed the importance of the quality of management for company performance. However, only recently have empirical studies appeared containing detailed information aiming to support this hypothesis. These studies attempt to quantify the contribution of executives and their different practices to productivity gaps that can be found

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<sup>25</sup> Since the 2001-2002 crisis, the purchase of Argentine companies by Brazilian firms suggests a certain ability by regional firms to take advantage of opportunities that emerge in high instability contexts in which the TNC of the developed world are absent or prefer to be absent.

among firms<sup>26</sup> (and that cannot be explained by differences in location, sector, technology used or the capabilities of labor). Thus, evidence was produced that was consistent with the existence of a correlation between best practices in management and greater returns on capital, sales per employee or growth in market participation. Similarly, it was established that the heterogeneity of “styles” among executives explains differences between investment, financial or organizational practices.

An aspect not yet covered by the above mentioned literature and that it is interesting to note in the case of Argentina is how the accumulation of idiosyncratic knowledge by management, produced by years of volatile behaviour in the economy, can affect the firm’s trajectory and performance. In particular, the latest crisis clearly demonstrated that knowledge accumulated through the years about how to act in the face of changing economic scenarios provided some local companies with a better interpretation of what could happen once the crisis accelerated and became a depression.

In this respect, these management capabilities can be associated with the economic literature that interprets the entrepreneur’s actions as decision making under high uncertainty based on the individual’s particular judgement that attempts to anticipate and actively take advantage of changing conditions.<sup>27</sup> This refers to those business decisions that contemplate a range of future results that are unknown (without even reflecting on the specific probability of their occurrence); it is what Knight (1921) called uncertainty to differentiate it from mere probabilistic risk. This entrepreneurial judgment is learned, accumulated and tends to involve components that are not explicitly acknowledged.

These past experiences provide local management with greater flexibility to adapt adroitly, from a financial perspective as well as from a commercial standpoint. In times of crisis, when the decision horizon suddenly shortens, certain business mistakes in short term decision making related to daily operations can irreversibly lead to a forced company sale or merger, or even permanent closure. These same mistakes, in other contexts, may only translate into a reduction in annual profitability, in economic losses, or into changing the manager of the subsidiary in a country that represents less than one percent of total sales. Therefore, the entrepreneurial capacity for day to day crisis management must be added as an asset to the structural strengths possessed by a company.

A successful strategy applied by several local companies during the crisis was to protect the company’s working capital, which generally meant selling goods and services “cash only”. Implicitly, this involves the reduction of sales volumes and the loss of a portion of the market to the competition. Whichever the final objective sought, the fact that losses in market share are accepted can imply situations that are difficult to revert in the future. Decisions of this type generate strong internal tension in the attempt to maintain an adequate balance between financial and commercial aspects of the business (Kosacoff et al., 2001).

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<sup>26</sup> It is worth mentioning, among others, Bertrand and Schoar (2003), who analyzed the impact of changes in style and strategies resulting from the incorporation of new CEOs and CFOs in the development of United States companies, and Bloom et al. (2005), who measure the effects of the quality of practices applied by middle management in United States, United Kingdom, and French and German companies.

<sup>27</sup> Other concepts related to the entrepreneurial spirit that have been emphasized are the management of SMC or start-ups, possessing certain personal and psychological characteristics that result in greater creativity and imagination, Schumpeterian innovation in products and processes, the attitude of constant search for profit opportunities or the capacity for charismatic leadership (Foss and Klein, 2004; Ibrahim and Vyakarnam, 2003).



## 6. Final Considerations

During turbulent times for Argentina, when horizons were shrinking and the lens of analysis focused on the short term, macroeconomic approximation to the problems of the economy was the absolute rule. As a consequence, the microeconomic foundations of those difficulties were unattended. In various articles it was suggested that responses by economic agents to macroeconomic policies and shocks could be considered, without risking oversimplification, as homogeneous and automatic. It was not noticed that to a certain extent the weakness of these foundations and some particularities in their operation could in turn generate macroeconomic problems themselves and contribute to their persistence in time. So much so, that, for example, a review of papers written about the recent Argentine crisis reveals that the great majority does not include among its explanatory arguments any direct consideration of microeconomic foundations.

The connection between modes of productive organization, capacity development and training of human resources, and productivity and competitiveness gains is affected by real volatility and financial fragility, and they, in turn, feedback the process disrupting investing and growth. Therefore, consistency between macro and microeconomic schemes provides a solid basis for long term growth. The development of productive capacities is a complex process, which advances in uneven fashion and takes on specific characteristics according to the sector, region and country, and involves causalities and interactions that are not yet completely understood. The above notes sought to contribute some elements for a better understanding of these phenomena based on the Argentine case.





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