THEORETICAL APPROACHES TO THE MICROECONOMIC EVIDENCE ABOUT STRUCTURAL CHANGE

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1. Introduction

In the crisis years of the early 1930s, Argentina - a country with a strongly agriculture-based economy - started on a process of late industrialization in which state interventions played a major role. The experience resulting from this, especially as regards how things developed in the post-war years, is now seen as a typical example of so-called Import Substituting Industrialization (henceforth called ISI).

The economic performance Argentina achieved in nearly 50 years of ISI was uneven, although it did manage to reach what is often called an intermediate stage of industrial development. Various different policies were applied throughout these years and were the target of important social conflicts; at the same time, demands were repeatedly made for the prevailing structure of the economy to be altered.

In the second half of the 1970s policies were adopted which had a great impact on macroeconomic, sectoral and microeconomic conditions. They led to pronounced structural changes in the Argentine economy by the beginnings of the 1980s - a decade which was marked by the debt crisis and its consequences, by rationing of external credit, by macroeconomic instability, and then by the reversal of the reforms that had been introduced in the second half of the 1970s (although not all their consequences could be undone).

By the beginning of the 1990s, international financial conditions had noticeably changed. Allied to this, a stabilization plan (the Convertibility Plan) was implemented and sweeping structural reforms were introduced - which led agents to hold a more favourable view of future economic prospects. The result was that rapid growth took place in investments and in the level of economic activity - and this lasted until the Mexican peso devaluation in December 1994.

Anyone who looks at the last twenty years of Argentina's economic history can hardly avoid coming to the following view: that the process of opening-up and liberalization of the economy in the second half of the 1970s, the debt crisis and the decade of credit rationing which followed it, and the further opening-up and liberalization experience in the 1990s have all had something in common. Each of these stages involved a very drastic change in the type of economic game that agents were involved in. The environment in which the economic game was taking place, the identities of the participants themselves, and the rules applying to everyone all changed.
A good idea of the magnitude of the above-mentioned changes can be obtained by taking a close look at the first half of the 1990s. In this period at least four major changes can be identified:

- credit rationing came to an end and price stability of a durable kind was restored by means of the Convertibility Plan
- progress was made in deregulating economic activities and the majority of public sector firms were privatized
- further substantial steps were taken to open up the economy
- the process of regional integration with neighbouring countries, begun at the end of the 1980s, was completed.

These events changed the economic prospects and calculations of most individuals and firms. This led to matching changes in the content of Argentina's economic debates as previously ubiquitous issues were replaced by new, largely unfamiliar ones. The impetus leading to this can be described as a change in the type of uncertainty which economic agents were facing. The days when the nominal macroeconomic variables were extremely volatile were over, and the behaviour of the aggregate indicators was that they were converging into a pattern which economic agents could more easily grasp. Suddenly these agents found themselves having to take strategic decisions of a quite different kind from before - ones based on longer planning horizons.

It is a striking fact that simplification in the macroeconomic environment did not lead to a matching simplification in the observed microeconomic behaviour that took place in the course of these changes. Indeed the empirical material presented throughout this book reveals basically two things: firstly that varied and contrasting reactions by agents were widespread in response to the same stimuli, and secondly, that the changes occurring in the traits of both agents and sectors were very diverse ones. There is no obvious explanation for this pattern of behaviour.

Therefore the aim of this chapter is to discuss some of the concepts available from economic theory which can help to explain what was observed. We shall argue that the heterogeneity observed in the characteristics and reactions of agents can be understood as something arising naturally and pervasively, but not accidentally.

In the section that follows, we comment on some of the strains that emerge when the attempt is made to make use of a series of different theoretical concepts which are not fully consistent with each other. We also set out the main lines we shall be following in our presentation of these theoretical concepts.

In the third section we briefly describe the changes in the characteristics of the economic problem faced by the agents in the 1990s compared to the late 1980s.
Sections 4 and 5 put forward what we consider to be the most pertinent concepts for explaining the heterogeneity of characteristics and reactions that is a central fact about microeconomic behaviour in Argentina as it undergoes structural change.

Section 6 presents some final reflections - on the theme that microeconomic evidence can be valuable in identifying problems related to aggregate growth. With this in mind, we address the question of whether the evidence collected about microeconomic behaviour in Argentina during structural change could be useful for appraising possible problems that may arise in other countries going through similar changes.

2. The basis for an eclectic theoretical scheme, and problems with it

2.1 The basis for a theoretical scheme. Comprehensiveness versus consistency

In our view the evidence presented in this book cannot be accounted for by means of any unified, pure theory - although it is normal for economists to strive for one. The theoretical "baggage" which we think is useful in trying to understand the observed behaviour is more a collection of fragments than a unified body of theory. This is so firstly because the observed phenomena are so complex, and secondly because real caution must be exercised when any actual attempt is being made to specify an overall stylization of the empirical picture. For, in making such an attempt, differences will have to be neglected in order to select the common factors which make up the stylization - in circumstances when the differences do seem, from observation, to represent a central issue.

When one considers how many of the factors involved have a non-trivial impact upon events, it is clear that multiple interdependencies are involved - so any study of their interactions is bound to be very difficult. This accentuates the problem posed by the standard obstacle which economists have to face anyway -namely that the experiments of interest to them are always designed by others (i.e. by the agents who actually engage in economic activities). All this makes it very hard to pick out a few factors (to be presumed as the fundamental ones) for fitting into a simplified model of their relationships. In summary: as it is not very obvious which factors to neglect and which to select, and as the phenomena considered as a whole are so complex, this advises us that our approach can aspire only to provide an appraisal of the situation, and makes it inevitable (given our current possibilities) that our approach can only be fragmentary in its scope.

By way of illustration, the differences that exist between agents or between sectors can sometimes be explained on the basis of the transaction costs approach. However, if the aim is to understand better how these agents or sectors change, then it is useful to turn to a different approach -one that explains better what agents consist of and how they engage in technical and organizational innovation. Simultaneous consideration of both approaches can, in the end, provide a better overall understanding of how certain behaviours and capabilities of the agents in question actually develop. Employing a single kind of approach is unsuitable, and this underlines why a heuristic component, as well as a "touch of art", need to be included in the economic explanation of a complex process.

The agent we have in mind in this Chapter is, in most cases, the firm. Our core arguments will seek to outline certain ways of looking at the firm which can make some
theoretical sense out of the material presented in the rest of the book. As will be seen, such ways of looking at the firm do not emerge from just a single theoretical tradition.

One of the things that interests us is to think of the firm as an entity which is "dense" (i.e. which has an internal structure). The technical information contained in production functions is an insufficient basis for understanding many of the phenomena in which firms act as protagonists. Our ability to interpret the facts documented in this book will be greater if we think of the firm as an agent made up of other agents, and as an organization with an "interior life" which involves processes that are continuously being carried out inside it so as to resolve recurring problems. This does not, however, prevent us from acknowledging that the firm has a certain potential for breaking out from its own inertia by introducing innovations and making changes in its strategy.

The question of what factors determine the attributes of any particular firm is a very valid one to ask, especially in the light of the need to explain how such very different kinds of firms (in respect of almost any dimension of analysis) can manage to coexist - such as, for example, small and medium-sized firms, large national holding companies and transnational subsidiaries.

To know why a firm tends to be of one type rather than another - even though such knowledge is bound to be only partial - can enlighten us about the firm's nature, and this in turn can tell us something about how it processes its information and resolves its problems. Considering how varied the conditions in the Argentine economy have been in recent years, it is difficult to evaluate what a firm's capabilities for action and reaction are without looking specifically at what kind of firm it is. Sometimes consideration of the reasons for the very existence of firms may throw light on why they have come to have the features they do. It may also help to understand diversity in those features.

The "institutionalist" approach with its stress on transaction costs - as introduced by R. Coase (1937) and O. Williamson (1975, 1985) - basically provides us with elements that enable us to reason statically about where a firm's boundaries are located. (We refer here to boundaries in terms of what the firm is currently doing with regard to production and exchange of goods and services, and what it has currently determined to be the most economic way of doing both these things). This approach can offer only limited support when considering how a firm will respond over time when it faces unexpected changes in its environment. It can, to some extent, help by prompting us to think in a way analogous to the one we adopt when carrying out a comparative statics exercise. We therefore believe that much can be gained by paying attention to other approaches within economic thought whose framework is intrinsically a dynamic one.

For that purpose, the contributions made in the "evolutionary" approach prove to be useful - as set out in numerous works in which R. Nelson and S. Winter (along with some other authors) have led the way. This approach clearly emphasizes (even more than the previous approach did) that the firm cannot be conceived of merely as some ethereal entity which is presumed to have the exclusive goal of optimizing a simple, well-defined function. Instead, in the evolutionary view, the firm is considered to be a collection of agents and resources and a network of interactions between them.
In this view the firm is a device that turns out to be capable of generating changes as well as adapting to them, tracing out an evolutionary trajectory over time.

This view also enables a figure to be incorporated whose treatment is difficult to systematize: namely, the entrepreneur. The evolutionary approach has absorbed ideas from the work of J. Schumpeter (1942), and has done so especially in three areas. First it considers that the market which firms participate in (and where they compete) operates as a dynamic selection mechanism. Secondly, it incorporates innovation into its analysis as an instrument for securing competitive advantages. Thirdly it shares the vision that competition, rather than acting as a phenomenon which leads to equilibrium, actually works as a permanent source of departures from it. Schumpeter's contributions prove to be relevant when one is actually interpreting firm behaviour and certain changes that occur in how the generation of technical and organizational innovations is managed. The innovation factor is central to how the evolutionary model approaches the issue of economic change.

2.2 Behavioural assumptions. Information, cognitive capacity and uncertainty

An issue which must be spelt out clearly as an illustration of how fragmentary our appraisal will be, is this one: the various different approaches are compatible with different behavioural assumptions and with varying specifications as to what it is that agents want and are able to do. In the case of the transaction costs framework, the notion subsists that the firm is an entity which optimizes, even though we consider that its ability to do so is quite limited. In the evolutionary approach, this notion is much more diffuse and can even be dropped altogether. We shall take the view that, generally speaking, firms do have a goal which is linked to profit-making, although this does not imply that they are able systematically to achieve optimality. Furthermore we consider that the component parts of a firm will not, in reality, always be equally fully committed to the pursuit of the firm's overall objectives. Indeed, anyone who makes direct contact with firms often comes across "principal versus agent" problems.

At the same time, we shall keep in mind that agents have limited cognitive and information processing capabilities. This fact alone is enough to make the task of optimizing into a complex one as different kinds of costs of acquiring information and resolving optimization problems have to be considered, even assuming (by hypothesis) that optimization is the actual behavioural goal being aimed for. The assumption about absence of perfect information is usually accepted as being an essential part of the transaction costs approach, although actually it is not a necessary condition for such costs to exist. In contrast it would be much harder to find any relevance in the evolutionary approach and its arguments relevant unless one could assume imperfect information or bounded rationality. Indeed this approach largely emerged in response to the need to explain phenomena, such as innovation and economic change, in which uncertainty (regarded as imperfect knowledge of the future) was found to play a centre-stage role.

We may perhaps prefer not to accept that randomness forms part of nature. Even so, the assumption we shall be adopting - that human limitations make it impossible to get to know the environment with complete certainty- still outlines a framework in which uncertainty is the rule. In this context, agents carry out (so far as they are able to) three main activities:
forecasting, formulating strategies and planning. There is no need for us to define the first of these terms but it makes sense to clarify what we mean by the second and third. We shall consider a strategy to be an action or a series of consistent actions planned as a combined whole which will - it is hoped - enable an objective to be achieved whilst allowing for the occurrence of those external developments which have been forecast as probable. In other words, strategies are devised by taking into account the changes in the environment which are considered most likely to occur. We take planning to be, in a static context, the activity which firms carry out in order to allocate resources by means of duly authorized managerial decisions. In a dynamic context, we view it as the activity taking place in the present time period (i.e. currently) which seeks to ensure the future availability of those means that will be required for implementing a strategy.

2.3 Information and knowledge. The specificity of assets

Another feature which is empirically relevant, and which will be taken into account later on, is the fact that not all knowledge is codifiable and transformable into information. This means that knowledge is, to some extent, tacit, which is sufficient to prevent it from being fully commercializable in a competitive market.

This feature also helps to endow human capital assets with specificity. The specificity of these and other capital assets is something that will be taken into account.

3. A brief characterization of the changed economic problem which agents faced

Conditions in the first half of the 1990s presented agents with a much longer planning horizon. Towards the end of the 1980s the extreme volatility of the surroundings made it extremely hard to forecast even roughly what developments could be expected even one week ahead. Agents went through an appreciable (and costly) learning process to be able to cope in such conditions. But, in the first years of the 1990s, different skills were needed. The kinds of information that agents required changed - into, typically, needing to know about things such as how relaxed or how severe the intertemporal restriction of the economy (linked to the external sector's performance) was going to be in the medium term, and how international business cycles and trends would evolve, and what the medium and long run supply and demand prospects were for various local markets. Things had now changed from a situation in which the uncertainty was nearly all linked to how the macroeconomic variables (and especially the nominal ones) were evolving, to a situation involving a type of uncertainty which we can term strategic. In the 1990s the decisions which firms have been making in regard to production, demand for factors, investments, exports and imports have depended much more visibly than they did before on the strategy chosen by those firms in terms of:

- what level of horizontal and vertical integration to operate with (this involves decisions on production specialization, outsourcing of some activities, and possible mergers, and relates to how the firm defines its own boundaries);

- how to secure involvement in new markets, which could lead the firm towards transnationalization, or into signing complementarity agreements with firms in other countries;
how to incorporate new product, process, and organizational technologies;

whether to sell the business to some other agent with greater capabilities for exploiting its specific assets.

When a firm has made choices in regard to the above matters, this determines the kind of product mix it will manufacture, the nature of its internal organization, its relationship to the market, its role in adding value, and its competitiveness. In short, the chances which a firm has of surviving and growing in a markedly changing context depend to a considerable extent on what decisions it actually makes in relation to the items mentioned above.

Now, when the way some specific firms actually do make strategic decisions is observed, two distinguishable issues emerge quite clearly. Firstly a given firm asks itself what it absolutely must do if it is to survive (and, if possible, expand) in the future conditions considered most likely to hold. Secondly, that firm analyses whether what is required of it (in order to survive) actually falls within the set of strategies that are feasible for it to adopt.

When decisions taken by firms are studied it is found that the "feasible strategy set" applying to each firm, and how much that firm is aware of it, depend on what the firm's own characteristics are, as well as on the prevailing macroeconomic and sectoral conditions. This implies that the actions which firms take are, in fact, influenced by some of their own current and previous specific attributes.

This characterization of the problem cannot - in principle be handled by means of a theoretical apparatus which assumes that firms do not exist as either institutions or organizations. Nor can it easily be pictured how "feasible strategy sets" could differ from one another if technology were a free good, and if firms did not possess any other factor linked to their production capability which would make them distinguishable from one each other.

Without getting into these complications, we could still make some limited progress by recognizing that firms carry out their activities within a system of imperfect markets. So if, for example, the credit market is imperfect, this may have a differential effect on whether one given firm or another will be able to carry out a re-equipment program and prepare itself to compete with foreign firms. This type of consideration can serve to interpret some findings and make some predictions.

Nevertheless it seems reasonable to think that a fuller appreciation of the problem of why firms differ in their potentials and in their actual performances can be gained by paying attention to certain characterizations which exist in the literature as to what firms consist of and what goes on inside them.

To know about the structure and internal operations of agents can be useful in understanding how they actually process the events and developments that occur in their surroundings, and how they work out their responses.
4. Firms as mechanisms which coordinate by planning

Transaction costs have been broadly defined as the costs of operating the price system. To carry out market transactions inherently involves taking certain costly actions, such as having to negotiate, draw up and sign contracts, and, later on, monitor their fulfilment (Coase, 1937; Williamson, 1985).

The presence of such costs has the effect that a capitalist economy does not consist only of the overall set of spontaneous transactions occurring between atomistic agents. Not all the activities take place by means of market transactions. Observation shows that there exist organizations with a stable structure - firms - in which resource allocation decisions are planned, rather than being handled through the price system. Because transactions are costly, firms organize their production-related economic activities by doing without them, and by utilizing managerial authority as the coordinating mechanism instead (Coase 1937).

To describe the economy as consisting purely of a system of markets is to fail to include in the picture the full range of economic decisions and actions which do in fact get carried out. Many decisions and actions inherent to the actual functioning of a market economy take place more as a result of the operations of managerial hierarchies than they do through transactions agreed between juridically equal agents who have negotiated a price (Williamson 1975).

An agent sets up a firm and then selects the level of integration it will operate with (i.e. the quantity of transactions which it will internalize under managerial control). This decision will depend on the costs that are associated with the transactions required for that firm to be able to exploit its specific asset. This asset could be a capability, an innovation, or a factory with staff and available production capacity. Differences in the specific assets to be exploited can, according to the types of transactions required, account for why firms have the particular features they do. By way of example, if one wished to make use of an available capacity to manufacture chairs, the transaction costs that would be incurred are not the same as those that would be involved if the goal were to exploit a technology that had been developed in-house. For, in the case of the chairs, they can be sold without major problems once manufactured, but, when it comes to the technology, it is quite possible that the firm may need to retain a much greater degree of control over it, by incorporating within its own operations some of the subsequent stages in which that technology would be used.

The transaction costs approach has emphasized the idea that resource allocation efficiency does not depend only on the properties which markets exhibit in terms of their structure and functioning. It is crucial also to take into account the properties of that other coordination mechanism - the firm - and to know what proportion of economic activities rely on the former mechanism or the latter. The economic advantage of using one or the other mechanism depends, in the end, on their relative costs.

When the environment is an unstable one, and events are likely to arise which will be difficult to predict, this will reduce agents' abilities to forecast and plan ahead reliably. It will also affect agents' abilities to enter into credible agreements, and this will increase transaction costs. These considerations suggest that in environments which are unstable
and unpredictable there will, generally speaking, be a stronger tendency for firms to integrate their activities. This can seriously undermine the ability of firms to exploit economies of specialization, and can thus be an important obstacle to their achieving competitive levels of productivity.

A pertinent observable fact is that many firms operate at higher levels of vertical integration than their directors would have judged reasonable if they had been able to choose their own environment. The position is, however, that most of the environment's features have to be accepted by them as given conditions, and they are adverse ones. As long as these firms have to cope with such intense uncertainty about the availability of a sufficiently good network of subcontractors, they will persist in retaining levels of vertical integration which may act as an obstacle for competing internationally, even though they may be adequate for operating with in the local environment.

The fact that firms persist in running such vertically integrated facilities in turn means that nobody will risk their capital to convert themselves into subcontractors for an activity which is vertically integrated. Investments of this type are usually of a highly specific kind, and it would be very difficult to reallocate the capital invested in them if the plans should fail. So unless the firms in that branch of industry have firmly announced, widely known and believable plans for de-integrating their activities, and unless the prospects both for aggregate growth and growth in that branch of industry are reliable, then it is most likely that such investments will be postponed for a long time.

This is only one example of a class of behaviours characterized by the attitude of wait and see, and the postponement of investments. The analysis which Pindyck (1989) and Dixit and Pindyck (1994) have provided of irreversible but postponable investments in conditions of current uncertainty can explain this sort of behaviour - which is of great relevance to Argentina's industrial structure.

The private sector can often find ways to resolve problems related to strategic uncertainty (concerned with determining what a firm's own product mix should be in the light of what other firms can do) by employing special contractual devices which amount to quasi-market relationships. These work by mitigating uncertainty and they permit certain investments to be made which otherwise would have been difficult to proceed with. These devices are transactional to the extent that they are set up between different firms which draw up a contract and negotiate a price, but they include some aspects which are more typically found in the ambit of a firm's internal operations, such as when firms enter into some reciprocal commitments to continue their link-up at a certain level of intensity or frequency.

An example of such methods is provided by firms that are large or strong enough to develop their own subcontractors, and who set up special contractual devices with them, such as long term contracts or contracts specifying guaranteed minimum purchase levels.

It is obvious that this type of link-up reduces transaction costs to the extent that it saves on future search costs and makes evaluating reputations easier. It is also important that these contracts reduce the uncertainty for the different parties that would arise if no contractual commitments bound their future actions once an investment projects had been undertaken.
In fact many kinds of contracts pay a wider role than is explicitly set out in the directly observed exchange. Side conditions in contracts (e.g. like ones maintaining a certain price over time) are actually subsuming insurance markets into transactions for goods and services.

Acknowledgement of these arguments about the many important roles being fulfilled by contracts makes it possible to introduce a further factor into the evaluation of measures which aim to eliminate market distortions and/or facilitate price adjustments.

The further point that needs to be taken into account is that if information and uncertainty problems are being faced, then certain market rigidities can play a part in reducing transaction costs - notwithstanding the fact that eliminating a distortion can have unpredictable effects on welfare if other distortions remain in place (Lipsey and Lancaster 1956).

The above point in no way seeks to ignore how valuable it is to introduce reforms towards a system where non-distorted markets play a more central role. It only aims to indicate that careful consideration of the costs and benefits of every move should be exercised, since complex structures of implicit contracts and uncertainty-mitigating devices could be dismantled before any suitable substitute becomes available.

5. Firms as organizations which evolve

To improve our understanding of the reactions which it is feasible for firms to have when they are confronted by change, we believe it helps to think of firms as organizations which are storehouses of an overall package of production knowledge embodied in the routines that are performed regularly inside them (Nelson 1991). We are referring here to an overall knowledge package because a firm's capabilities are, to a significant degree, independent of the individuals who contingently belong to its organization. This is not to ignore that the quality of individuals can also significantly affect an organization's production capability. Rather, it seeks to point out that a firm cannot be defined only in terms of the factors it has incorporated inside it. The stable manner in which all these factors have been arranged by the firm so as to interact is also a distinctive feature of a firm's capabilities.

Lall (1993) points out that technological capabilities in manufacturing do not depend exclusively on the technology which is incorporated in the physical production equipment or in the manuals, blueprints and patents which a firm has acquired, even though these are the factors with which the capabilities are put to work. Nor (says Lall) is it solely a matter of what the staff's educational qualifications are, even though their education and training certainly do affect their capacity to acquire production skills. The important matter which in his opinion must not be overlooked, is how the firm manages to combine all the above-mentioned things in order to function as an organization.

This emphasizes the idea that the quality of the interactions taking place inside an organization can be important, as well as the quality of the individuals who participate in them, and a point especially worth noticing is that such interactions improve through being exercised."
Let us accept that carrying out their specific functions does improve the interactions between a firm's subdivisions and/or improve the quality of these subdivisions themselves. Let us now consider that such improvements can - to some extent at least only be obtained by this above-mentioned method whereby the firm carries out its specific functions (which means that not all experience is transferable). It then becomes possible to think that some of a firm's capabilities depend, even if only in part, on its own past actions. This, in turn, would imply that there is a real possibility - for each individual firm (or case) - that its evolutionary path will be *sui generis*. The development of different specific capabilities explains why different firms can co-exist. The main implication of what has just been said is that competition does not operate to eliminate every trajectory except one from the market. Many of them can be successful simultaneously, and continue to develop.

In general what is observable is that there is not just one unique course of action open to firms, although the range of possible trajectories they could follow is, in fact, limited by what they are and have been doing.

To sum up, if it is agreed that firms evolve, then it seems reasonable to accept that they do so in a direction and at a pace which are influenced by the trajectories which they previously traced out in terms of the development of their capabilities (Nelson 1991; Dosi 1988). The evolutionary perspective can, according to Dosi (1988), explain persistent asymmetries between firms "in terms of their process technologies and quality of output".

These ideas can be further explored with the aid of some considerations relating to the absence of perfect information and the fact that agents have only limited capacities for processing information. These aspects give rise immediately to two crucial issues: the first concerns what the economic function of routines is, and how it relates to innovative capability and strategy formulation; the second concerns the problem that it is impossible to turn every kind of knowledge into information.

Once these issues have been analysed, then the notion that microeconomic diversity exists and the idea that agents' own past histories are important will seem somewhat less puzzling.

5.1 The firm as a network of repeated interactions

5.1.1 Routines

The first topic to discuss in relation to the fact that agents have neither perfect information nor unlimited processing capacities concerns the economic role which is fulfilled by routines.

If making use of the capability to process information is costly, or if it is assumed that information cannot be obtained without incurring costs, then agents are bound to have an additional concern: that is, to save time, effort and resources in relation to recognizing the opportunities available to them and choosing methods of exploiting them.

If one takes a look at many of the actions which people and organizations perform on a daily basis, one finds that enormous quantities of information, which in theory would be
needed to justify the observed actions, are more or less consciously being ignored by them. In general the implicit assumption being made is that the whole previously accumulated pile of information has not altered much, and therefore the behaviour adopted on previous occasions can be repeated - without losing much. In this way the agents concerned relinquish the possibility of subtly modifying their behaviour (if some minor change has taken place in the environment which would justify it) in exchange for a more valuable saving in effort and resources (i.e. those efforts and resources that they would have needed to expend to verify if their usual conduct would still be so suitable on this occasion).

The behavioural routines which agents engage in, or the operational ones which organizations perform can therefore be viewed as a strategy which economizes on information or, more precisely, on the resources and efforts needed to obtain and process it.

Gains of this kind can arise when repetitive activities are routinized as part of a drive to economize on times and movements in manufacturing. Tasks which are carried out in a routine manner, with low information requirements, are easier to control and evaluate. In specified circumstances the fact that a supervisor can be easily and quickly informed about what an operative is doing may be more valuable than having an operative who can resolve an unexpected incident or contribute a new idea.

A good deal of a business organization's internal operations can be viewed as an exchange of flows of information between its various subdivisions.

The operations of firms are to a large extent defined by the routines - both the formal and informal ones - which go on inside them in order to manage information and then to implement the specific activities. This applies as much to the gathering and processing of external information as it does to the activities involved in managing the firm's various internal units.

When conditions in the surroundings change, so do the character and volume of information that need to be collected and processed. In the case of a firm it is probable that changes will also need to be made in how that information is distributed and managed inside the organization. This means that, if the skills involved in obtaining and processing information are specific ones, then it is quite possible that not all the potential adaptations will be (a) feasible for the firm to attempt or (b) implementable at the same cost - because different kinds of new learning would be needed. An especially important point to keep in mind is this: even when the changes required may actually be feasible, they still require investment and the larger the change from the previous set-up is the larger the corresponding investment will need to be.

Will such investments automatically be made? It is pertinent here to enquire if the investment concerned is a wholly reversible and postponable one. If it is not wholly reversible but is postponable, and if people assign some likelihood to the possibility that the observed economic changes will turn out to be only temporary ones, this could explain why the pace of introduction of new and improved routines may be only quite slow, or may even be nil.

It is worth pointing out that in Argentina the change that occurred in the type of uncertainty prevailing there led to very drastic changes in the kinds of information which
were considered relevant and in the skills that were required for obtaining and processing that information. The rationale of many businesses changed completely and, along with that, came alterations in the way that firms operated (as regards the most suitable methods to use for exchanging information with the environment and for managing and distributing information internally).

In an environment in which the immediate future was so unstable, most firms devoted their best talents to managing their short term financial positions. But when, within a matter of only months, the pertinent problem that firms were facing changed - into, for instance, one of being able to "decipher" signals about the medium term world growth trends in their own branch of industry - then some pronounced difficulties arose. It required particular skills in the acquisition and management of information for firms to be able to forecast the possible future steps that might occur in regional integration, and then decide on how best to exploit the opportunities or fend off the threats. It was equally hard for firms to predict what the behaviour of direct foreign investment in their own branch of industry would be. It was also extremely difficult to guess whether the perceptions held by all the other economic agents about their own wealth would prove to be sustainable in the medium and long term. (And this, in turn, made it very complex to estimate what the level of the exchange rate would be - since this depended so strongly on such perceptions). These problems of the 1990s involve a different kind of uncertainty to the one which obtained in the 1980s in terms both of its qualitative nature and in terms of the time horizons and time limits associated with it. Planning horizons became much longer-term ones, but because many of the new problems proved very difficult ones to forecast (and hence to plan ahead for) the problem which firms encountered was that it was far from clear what kind of redefinition of their routines would be most appropriate for them to adopt.

The questions of this kind which firms have to deal with do not become entirely settled but at least set narrowed down once a firm has defined what its strategy is to be. One problem is that any definition of strategy is itself affected by what the prevailing routines are.

Routines embody an economic solution to the obtaining and handling of information. It also follows, from what was discussed previously, that routines contribute a component of inertia to the features, operations and performance of organizations. It seems reasonable to think that this will itself be a source of both cohesion and efficiency (for the firms concerned) so long as no major changes occur in their environment, but that it could become an obstacle that hinders firms from changing over to new goals and characteristics when that becomes necessary.

Two important issues arise from these "opposing pulls" between a firm's routines and its capacity to change. The first has to do with the continuous generation of innovations. The second (to a considerable extent linked to the first) concerns the possibilities that exist for strategies to be modified when fundamental changes in external conditions take place. We shall deal with the strategy issue in the succeeding subsection.

As regards the first issue it should be noted that firms, which are routinized organizations, are usually the prime location within a society where industrial innovation work is carried out. It does not matter whether we are thinking of major changes or minor ones, or even thinking of adaptations made to already proven technologies (which still
require some degree of creative input\(^5\) - in every case we are still dealing with a propensity to introduce changes into an arrangement which we have characterized as "routinized". How can one thing be reconciled with the other?

An explanation is available if we can accept either one of two things. The first is that the figure of the entrepreneur coexists with the routinized firm and is seen as a figure who has the specialized (if somewhat unsystematic) talent for exploring the possibilities for creating a monopoly position by means of an innovation\(^6\) that gives the firm an advantage either in products or processes. This person is somebody who probably must be free of certain routines\(^7\).

The other possibility is to accept that invention can be routinized, or, what is more to the point in regard to innovation - that the practical application of new ideas can be. (The latter can be quite separate from inventive activity).

In a way we are saying something paradoxical: that firms improve their competitiveness if they can make their search for new routines into a routine activity.

The two possibilities just mentioned correspond to the two ways that Schumpeter found of explaining why innovations were so pervasive. In his first formulation, it was the ambitious individual in search of economic and personal fulfillment who discovered "new combinations" which provided a temporary monopoly position. In his second formulation, Schumpeter substituted that individual by the R & D Laboratories of large companies, which were founded in order to make generating innovations into a regular activity.

5.1.2 Strategies

The response which agents make when they face uncertainty is to develop strategies. The range of strategies open to a firm at any given moment is not infinite. Nor, in general, does it usually consist of just a single option (or none). What can be said, however, is that the range of practicable strategies - as perceived by the agents - depends on what these agents forecast as being most likely to happen and also on what they consider themselves capable of doing. The observed diversity in the strategies chosen is therefore not at all surprising given the various issues that make the future uncertain and given the substantial initial differences that exist between agents. The above-mentioned issues which create uncertainty about the future also account for the existence of rather indefinite (i.e. unclear) strategies.

First hand contact with entrepreneurs and managers involved in formulating strategies reveals that imperfect information about the future is an absolutely integral and central feature for them to deal with. It operates at the very core of business activity.

In a context like Argentina's business acumen has, over long periods of time and in many instances, been notable for requiring the ability to "manage the waiting period" rather than to be incessantly trying to introduce bold innovations.

Let us accept that business activities do, in general, involve investment decisions which are not fully reversible, yet which are postponable. An environment whose future path
is hard to predict (on whatever time-scale is under consideration) will tend to increase the economic value of waiting, because unfavourable developments can cause investments to become unattractive. Within such a setting, any agent's behaviour is notoriously subject to changes in accordance with the specific external conditions being faced and the agents's own past experience.

Dixit and Pindyck (1994) have shown for situations of uncertainty that when an investment is not wholly reversible (which is so when a specific asset is created) but is postponable, then incentives exist to postpone the decision to invest, provided the investment expenditure is above a specified minimum level. This happens even when the net present value of the investment is positive - in other words, projects which offer returns above the rate of interest (we assume this to be the discount rate) are not undertaken. This explains why interest rate levels have only a partial influence on investment decisions. According to this analysis (and in contrast with what would be implied by the simple criterion of discounting net expected benefits) the perceived risks can have a greater role in explaining investors' behaviour than does the interest rate level. This analysis is very useful for interpreting some of the cases discussed in this book inasmuch as it explains why investors may assign an economic value to waiting time and it shows that this value is positively related to the level of perceived risk. It follows from this that some of the diversity which firms display in their strategic restructuring decisions and especially in their re-equipment decisions can be understood as a consequence of different decision makers valuing "waiting time" differently.

It is worth noticing that when uncertainty persists regarding how the important policy, macroeconomic or sectoral variables will evolve in the medium and long term, there can then be relatively large investments with prolonged payback periods which are not undertaken even in conditions when typical short term uncertainty has been eliminated and when present signals about prices and other things are favourable.

These considerations throw some light on why so much political emphasis has been placed on the irreversibility of the reforms that were embarked on Argentina in the 1990s.

Consideration of the way in which irreversibility effects may influence investment appraisal can account for some behaviours that have been documented in the macroeconomic literature as being characteristic of economies like Argentina's which have passed through stages of great instability. One example is the marked preference which agents have shown for flexibility - which, in essence, is just a microeconomic strategy to prevent resources from becoming immobilized in uses which can quickly turn into being unprofitable ones. This has some important consequences for the kinds of investments that are made, and for the time structure of contracts (see Frenkel 1990; Fanelli and Frenkel 1994; Heymann and Leijonhufvud 1995).

The fact that uncertainty is so important, and that it forms such an essential a part of entrepreneurial activity (and can explain why firms have some degrees of freedom in adopting distinct strategies) is clearly confirmed by the way in which innovation actually takes place in capitalist economies. The innovative process which firms carry out is vitally important for progress - where this is defined as being accelerating growth in the options available to consumers (Nelson 1989). The same author points out that, if perfect information about the future really were available, then the overlapping of innovative efforts
arising from firms having different strategies would amount to a pure waste of resources. It would represent a failure of co-ordination. However, observation shows that this duplication of alternative searches is not only something that can happen but that it can, up to a certain point, be considered as advantageous when viewed from a dynamic perspective. The reason is that firms can, in this way, keep open for themselves a varied set of options, which they need to do, given the absence of certainty about what external conditions will be like in the future.

5.2 Imperfect information viewed as a problem of knowledge not being completely codifiable

Knowledge cannot be made completely explicit. This means that not all knowledge can be transformed into information⁸. If we combine this with the fact that carrying out production activities generates knowledge⁹ (Arrow, 1962), then we can account for an idea that the manufacturing world accepts as being common sense: that to acquire certain capabilities (production and innovative ones) it is necessary actually to carry out the production activities themselves. The experience is not transferable, at least not fully. This is why the specific production trajectory which each agent follows helps to determine what a given agent is capable of doing at each moment of time (whether the agent happens to be an individual or a firm).

The fact that knowledge is not perfectly transferable helps to shape the process of creation of technologies (see Rosenberg 1976; Nelson and Winter 1977; Nelson 1982). At the same time, it has important effects on diffusion patterns for new technologies, insofar as it affects the possibilities for commercial transfer of their applications. Many kinds of problems can arise. A very important one, which affects the chances of organizing a technology market, is that unbalanced situations can exist between a supplier and a demander when it comes to their capacities to appraise and exploit a technology. Often the problem which agents face when it comes to developing their technological capability is not settled simply when they acquire a technology. The reason is that an agent's overall technological capability will also depend on their own skill in utilizing what they have acquired (see Dahlman, Ross-Larson and Westphal, 1987).

So far, then, we have mentioned how the existence of learning and its incomplete transferability (since knowledge is to some degree tacit) are both important in explaining why the previous trajectories which firms have followed have a differential influence on what their future technological and production capabilities will be. This means that there will be a differential impact on the possibilities which firms have to begin new learning and to absorb new technology successfully. It therefore becomes understandable that firms' chances of making a success of introducing new technologies and organization practices differ according to the extent and nature of the efforts they have previously made at creating or adapting technology. A considerable literature about these kinds of effects already exists: for Latin American cases, one can, for example, consult Katz (1987) and Dahlman, Ross-Larson and Westphal (1987).

A problem with connections to the above discussion is the difficulty that exists in adapting technologies to surroundings that differ from the ones they originated from. In that sense, it is notable that technological adaptation efforts made in Argentina throughout the course of the ISI stage were an important source of minor innovations and idiosyncratic learning (Katz 1987). As will be seen in this book, some of the structural changes of the
1990s have led to a change in the way that technology is incorporated by firms and to an alteration in the scale and character of the efforts associated with this.

The previous discussion can explain why it is that different capacities exist amongst firms for adapting to the changes that occur in, for example, competitive or contractual conditions.

Taking the various points discussed above into account makes it possible to understand why agents affected by a reform process have such astonishingly different capabilities when it comes to choosing a suitable strategy and carrying it through successfully. In some cases agents will be able to expand by exploiting what they will experience as a great many new opportunities; for other agents, the best strategy they can manage will only allow them to survive by taking up a defensive position in what may now have turned into a more difficult context; finally, it is probable that there are yet other agents for whom the surrounding context will prove completely unmanageable unless they can transform themselves into entirely different sorts of units from what they were before.

Such marked variations in agents' capacities to adapt can be understood, at least partly, as being related to the country they operate in, the size they have reached, the industrial branch they belong to, the type of technology they are already using, and the form of organization they have adopted. It also matters how long each of these factors has been operating for.

6. Microeconomic observations and growth

It is not very hard to agree that sustained growth requires individuals possessing the capability and the means both to produce ever increasing amounts of wealth and also to renew those capabilities and means.

So far as these individuals are concerned, this requires not only that they themselves should have certain minimum qualities, but also that they must proceed by increasing the stock of their capital resources (physical and/or human capital) in order to secure systematic improvements in the productivity of their efforts.

The availability of large capacities for generating added value generally means that major efforts must previously have been made to accumulate production capital. The more specific the assets which embody such an accumulation of capital are, the less reversible the investment decisions taken to build up that capital will be. The implication is that the agents in an economy must - to an appropriate extent - run the risk of sinking significant costs - i.e. committing them irreversibly - in order to be able to generate greater wealth-creating capacities. If an economy is to grow, then the temptations which flexibility offers must - to a large degree - be overcome.

In that regard, the evidence which underlies this book, and the set of ideas presented in this chapter tend to confirm the long-recognized point that stability is important for growth. Yet they also tend to emphasize that serious obstacles and risks can persist even when measures to extend the planning horizon have been successful. These risks and obstacles can contribute to preventing those investments which are irreversible due to their specificity
from becoming widespread. This will especially be the case if the profitability of each investment within a particular set of possible ones proves to be dependent upon the extent to which the other ones are undertaken. Coordination problems among a large number of agents may be different to solve. Then a process of generalized accumulation of capital and abilities may fail to take place. On the other hand, it could be the case that many of the required investments would not be perceived as profitable owing to the lack of a sufficient starting stock of essential minimum capabilities.

The microeconomic evidence undoubtedly does lend support to the view that it is very difficult to specify precisely what measures will in fact produce conditions sufficient for sustained growth to occur in real economies.

The basic reason is that the interrelations involved in the phenomenon of growth are very complex. They occur within a framework that is naturally marked by uncertainty and information problems. And the picture is complicated by further issues ranging from institutional ones to co-ordination problems which arise when factors such as increasing returns to scale are taken into account.

The accumulation required by growth is affected by the obstacles and risks which the agents are faced with. Such risks and obstacles depend, to a considerable extent, on the institutions which influence and shape the processes of production and exchange and which define the structure of incentives (North 1990; Baumol, 1993). We are referring to the institution of a modern full market economy. Examples range from the wage relationship to the presence of justice. Some institutions may be difficult to build up relying only on the actions of decentralized agents because of the very complex coordination and free-riding problems they need to overcome, and because in many cases some kind of collective representation - i.e. a social contract - is required to give them legitimacy. The design and establishment of institutions that foster growth - and getting them to work properly - is not a straightforward matter for a central planner or for market-oriented planners either. This is especially so when the economy is undergoing important changes in its structure, codes and practices. The experience of countries both in Latin America and Eastern Europe provides a convincing illustration of these difficulties. The structure of incentives defined by the institutional framework has to guide the accumulation process - which is not a fully reversible one - towards uses which are socially productive and in line with present and future needs - if the process is to be sustained.

So far as Argentina is concerned, the various sets of measures taken to reform the regulatory framework for business activity have clearly led to important structural changes and performance changes. It is difficult to judge if the changes which have taken place in the last few years are part of a process that will lead on to the development of an internationally competitive industrial structure based on firms which have adapted to using the most advanced production techniques. For the time being, the heterogeneity of this structure is its dominant characteristic.

The notion that growth is a complex phenomenon has been gaining ground in the economic literature thanks to the appearance of various different contributions, some of which are expounding ideas that are not particularly new.
If one reflects upon the problems which flow from the existence of increasing returns to scale, one can appreciate how growth may be hindered by certain obstacles which it is difficult to find a solution for. For one thing, under certain circumstances the fact that agents' actions are de-centralized means that there can be no guarantee that socially valuable investments will be undertaken (see Rosenstein-Rodan, 1943 and Murphy, Suleifer and Vishny, 1989). For another thing, some interesting arguments have been developed according to which an initial minimum stock of capabilities or of capital (human or physical) is essential, and if this is unavailable then the effect will be to make sustained growth impossible. In this regard, contributions like the one made by Romer (1990) which is based on the endogenous growth approach, are worth keeping in mind. Arguments of this kind can provide an explanation for affirmations like this one, found in OECD (1991): "...in many developing countries, improving of the investment climate through deregulation is not sufficient to cause a big wave of investment. For instance, in the Sub-Saharan countries, it would be hard to find a lot of entrepreneurs to create the anticipated wave of investment."

The idea that there are increasing returns to adopting technology (Arthur, 1983; David, 1985) accounts for irreversibility effects being present in the adoption of technology and explains why dependency exists with regard to steps previously taken. These effects can also have an aggregate impact, and one frequently comes across them in microeconomic case studies.

Further proof of the complexity of growth as a phenomenon can be found in the debates about the role which commercial and industrial policies play in it. A large number of economists warn about the costs which are imposed by the distortions caused by public policy, and they advise that trust should be placed in the allocative powers of the price signals coming from international markets. This position is the one most widely held in the West today, and is associated with various people, including Balassa (1981) and Krueger (1978, 1991) who have documented the drawbacks and undesirable effects of import substitution policies. Other authors, however, continue to deny that the market system can function as an infallible guide to the investment process and the collective learning processes which are needed to bring about transformations like those observed in the countries of South East Asia (Lall, 1992, 1994; Amsden 1994; Hijikino and Amsden, 1995). At the same time the official Japanese interpretation (OECD 1991) of their own success as an exporting country is based on the concept that it is possible to develop dynamic comparative advantages through channeling subsidies (via the interest rate) into sectors in which a country has not traditionally been competitive. Both Japan and the other successful South East Asian countries have managed to transform their previously quite unsophisticated and not very competitive economies into ones whose commercial position in the world is notable for the exports of high value added products.

Their achievements - which, generally speaking, were brought about by avoiding specializing in line with their original comparative advantages - cannot, according to this line of thought, be explained without referring to the state's role as the provider of adequate institutional plans and guidelines which have a helpful influence on the allocation of resources. In the particular case of Korea, Chang (1994) claims that industrial policy permitted a more adequate socialization of risk to occur and that this in turn made it possible for a sufficient stock of specific capital to be accumulated.

We see that growth, besides being difficult to achieve, is also very difficult to explain. Whilst Page (1994) attributes it (in the case of the Asian miracle) mainly to the introduction
of reforms which, by reducing the weight of distortions, made it possible "to get the basics right", authors such as those just mentioned attribute it to the explicit and systematic use of distortions.

Amsden (1994) arguing in favour of the complexity of growth, affirms: "This focus on the fundamentals suggests that economic growth is a fairly straightforward process, in contradistinction to all the new growth models which, given imperfect information, increasing returns, multiple equilibria, path dependence, self reinforcing mechanisms, historical lock-ins and other dynamic properties, emphasize that growth processes have 'no single explanation' (Stiglitz, 1992)".

Microeconomic evidence from countries which are going through structural adjustment, like Argentina, can help in the difficult task of trying to understand the phenomenon of growth better - by identifying relationships between the growth process and structural conditions which as yet have not been entirely investigated. Observation of empirical reality at the micro level provides the opportunity to appreciate the various different sorts of effects (and their scale) which can be derived from learning, from the development of production capabilities, from the dissimilar evolutionary paths of firms, and from the changes occurring in the quality and type of the agents operating in the economy. In addition, it permits an inside view to be gained into the process of productivity change, and how productivity relates to specialization of activities and to the patterns of vertical integration (or de-integration) adopted. One sometimes finds levels of vertical integration to exist which are far removed from what is needed to cope with external competition; and focusing on particular firms and sectors can help identify what the causes of this are.

At the same time, if we accept that microeconomic structural changes can influence macroeconomic performance, then the available evidence can help to identify the effects which certain changes may have on the stabilization plans which often precede or accompany structural reform programmes. Both the reforms themselves and the benefits they confer can suffer serious setbacks depending on how the macroeconomy evolves. It follows from this that the sustainability of a stable macroeconomy and the durability of the actual reforms themselves are concerns that can further justify taking an interest in learning about the changes which have occurred at the microeconomic level.

In view of this, we think that some of the findings and problems presented in this book may be of interest to those who are concerned about the possible effects which may ensue when deep reforms are made to the economic structure of Argentina or other countries.
Notes:

1 All these decisions are ones which, in aggregate, affect the macroeconomic sustainability of the reform process.

2 This explains why teams, such as sporting, military, diplomatic, or other ones, do their training as whole units. What they are practising is not just the talents of their individual members (which already may have reached some sort of plateau) but the interactions between them.

3 Following Pindyck, R (1989) and Dixit, A. and Pindyck, R. (1994).

4 Note that, in any event, forecasting difficulties basically affect the possibilities for redefining strategies.

5 The economic importance of the technological adaptation phenomenon in the case of Latin America is made clear by Katz (1987).

6 An analysis of this figure (the entrepreneur) can be found in the excellent "Entrepreneurship, Management, and the Structure of Payoffs" by W. Baumol (1993).

7 This is not to suggest that he/she does not perform a hard job. However this explanation helps us understand why informality in working hours and habits is a significant matter when an individual's or department's role an organization has to do with developing new ideas. A university research department, or an R&D office, or the creative department of an advertising agency will in general be much more flexible in their routines than will, say, a bank.

8 This is a necessary condition for knowledge to be a good that is tradeable in a competitive market (and experiences can be transferred in this way). However it is not a sufficient condition, to the extent that information, as a good, has unusual characteristics (see Arrow 1973 for a detailed treatment).

9 It does so at least in regard to increasing the capability with which such activities can be repeated. However, the learning acquired can also extend to increasing the capability for doing other things or for beginning new learning.
References


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