

Economics of the Firm and Economic Growth. An hybrid theoretical framework of analysis

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ECONOMICS OF THE FIRM AND ECONOMIC GROWTH. AN HYBRID THEORETICAL FRAMEWORK OF ANALYSIS

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ABSTRACT

The characterization of individual firms is an essential step toward the study of the behaviour of industries and other more aggregated units of economics, and so to the analysis of economic growth processes. Hence, the main goal of this study is to achieve a critical discussion around the conceptualisation of the firm and its role in the dynamical process of economic growth.

The approach to the main topic starts with the construction of a theoretical matrix of the economics of the firm, opening with the two major traditions of institutionalist thought in economics, and evolving then towards some considerations around the contractual and the evolutionary approaches. Another important theoretical stream that deals with organizations in economic and sociological terms also appears, the population ecology approach. After this overview, it is developed a cross-exam of distinct theoretical perspectives and the identification of possible flaws of the neoclassical theory. This confrontation, which goes throughout many imperative and controversial issues within economics such as the nature of the firm and the cognitive capacities of economic agents, results in a systematisation about the impact of this discussion on economic growth. The conclusions appear as crucial to develop further research aiming the construction of economic growth models based on a microeconomics that is closer to the reality of firms.

KEYWORDS: Firm; Economic Growth; Institutionalism; Evolutionary theory; Contractual Theory; Ecology Population Theory

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'It is our strongly held belief, however, that modeling at an industry – or an economy – wide level ought to be guided and constrained by a plausible theory of firm capabilities and behavior that is consistent with the microcosmic evidence.' (Nelson and Winter 1982: 52)

1. INTRODUCTION

The main motivation behind this paper is a definite believe on the idea that the characterization of individual firms is a crucial step toward the study of the behaviour of industries and other more aggregated units of economics, and so to the analysis of economic growth processes. Therefore, the key goal is to achieve a critical discussion around the conceptualisation of the firm and its role in the dynamical process of economic growth.

As it is widely known, economic growth theory is usually identified with neoclassical growth models that, even in the so-called endogenous growth theory, consider the firm as an anonymous production function (Foss 1997: 37). However, at the analysis of industry level phenomena the firm has a role to play. We may ask whether a conceptualisation of the firm distinct from the one adopted by the neoclassical frame has important implications in more aggregated analysis.

The identification of inadequacies in neoclassical economic growth theory by more or less dissent economists is a standard event. However, the recognition of limitations by investigators that belong to the mainstream itself, for example Philippe Aghion and Peter Howitt, is clearly a testimony that much is still to be thought and appraised in that theoretical approach. One important limitation pointed out by Aghion and Howitt (1998) in their book *Endogenous Growth Theory* is the lack of attention devoted to institutions and transaction costs, almost completely ignored by endogenous growth literature (Aghion et. al. 1997). They also consider as shortcomings the representation of firms and R&D activities in endogenous growth models, strongly believing in the need to understand the financial and institutional aspects of R&D. Moreover, they stress that the discard of the representative agent assumption would allow these models to 'incorporate the *political dimension* of "creative destruction"' (Aghion and Howitt 1998: 67).

New Institutional Economics (Williamson 1985, Coase 1937, North 1981, 1990) deals mainly with the problem of defining the boundary between the market and the firm, keeping the individualist assumption of neoclassical theory. The crucial question it asks is: If the market is an efficient co-ordinator, why are some activities combined together in firms rather than being coordinated through markets? Why making products inside the firm, when the firm can buy

them in the market? Within this approach the concept of transaction costs emerges as a key variable. As a matter of fact, while usually neoclassical theory assumes market and internal business transactions as costless, this school reminds that the market exchange is featured by many distinct types of costs: search costs, costs of bargaining, costs of monitoring and enforcing contractual agreements. Also the internal business transactions have associated costs such as management costs of co-ordinating production, and costs of monitoring and supervising the workforce.

The concept of transaction costs represents in a certain extent a departure from the neoclassical theory. Transactions are costly because information is incomplete and there is uncertainty about future economic environment. Also, there is the problem that economic agents are opportunistic. Since information is limited, opportunism increases the costs and risks of market transactions.

Once argued that the concept of transaction costs is coupled with problems of information and uncertainty we cannot reject bounded rationality (Hodgson 1999: 209). This concept, brought up by Simon (1956, 1957), recognises not only that information is incomplete but also the existence of important cognitive limitations on human rationality. Therefore, decisions are based on partial information because the ability of the human mind for formulate and solve complex problems is limited. This notion of rationality implies that a firm cannot achieve the optimum maximum for its goals such as profits. Instead, the firm search for new options until it finds a satisfactory one. This means that the decision-making process is one of satisficing rather than maximising as occurs in neoclassical approach. Rules are crucial for achieving satisfactory results (Simon 1956). This emphasis on bounded rationality and satisficing behaviour have led the theorists within this approach to be concerned more with firm's internal decision-making processes departing from the neoclassical economists' emphasis in the firm's outcomes.

Old institutionalism stresses the role of norms and culture in understanding and explaining institutions such as the firm and markets. John Commons (e.g. 1925, 1931) was crucial for the development of this framework, having based his work on the idea that economic activity was dependent on the fundamental legal and institutional connections, and that these evolved over time (Backhouse 2002: 199). This school has influenced two theoretical approaches: the Behavioural theories and the Managerial theories. The first ones emphasize the idea that firm's goals are achieved from compromises among a coalition of crucial players within the firm. The second ones stress the role of professional managers in defining a firm's objectives,

pointing to the ongoing conflict between managers' goals (growth of sales and their own income) and those of shareholders (maximise profits).

Evolutionary economics is strongly related to the old intuitionist vision. It clearly selects processes and routines as the key elements (Nelson and Winter 1982) that allow a firm to deal with uncertainty justifying firm's actions. Faced with uncertainty, firms are characterised by bounded rationality with their decisions being made based on rules and routines. Nelson and Winter (1982: 14) stress the concept of routine as carrying the accumulated skill and knowledge of the firm. 'Our general term for all regular and predictable behavioral patterns of firms is "routine"'.

One of the most important issues in the study of evolutionary economic processes is path dependency that is, how history matters (Andersen 1994). So, in this approach the options made by the firm are also path-dependent as the decisions made in the past determines what the firm is able to do in the future. Penrose (1959) already emphasized that the only way to fully understand the pattern of diversification of a certain firm was explaining it being aware of its prior development of capabilities.

A rationalization around the nature and role of an organization such as the firm should take into account the contributions brought by Michael Hannan and John Freeman's population ecology perspective on organizations-environment relations. This approach has many convergent points with the evolutionary theoretical framework such as its emphasis on selection processes and the adoption of similar cognitive conceptions and similar ways of perceiving the future.

It is important to note that, more recently, neoclassical economists, recognising that the assumption of full knowledge is unsatisfactory, tried to deal with the fact that entrepreneurs cannot know the future with certainty (e.g. Aghion and Howitt 1992). Risk was incorporated into the neoclassical framework by assuming that firms consider the probability of all possible future results associated to its decision-making. However, it is clear that in some circumstances firms are not able to assign probabilities to possible outcomes or they may not even know all the feasible results (Silverberg and Verspagen 1997). These situations are referred as *uncertainty* (*ibid.*). The economist is faced with a new problem: to know how decision-makers behave under uncertainty.

In an attempt to deal with such wide theoretical considerations and accomplish our main goal - to achieve a critical discussion around the conceptualisation of the firm and its role in the

dynamical process of economic growth -, this paper is organized in the following way. In section two it is briefly presented what intends to be the theoretical matrix of the economics of the firm, starting with the two major traditions of institutionalist thought in economics, and evolving then towards some considerations around the contractual and the evolutionary approaches. Also within this section appears an important theoretical stream that deals with organizations in economic and sociological terms: the population ecology approach. After this overview, section three consists in a cross-exam of distinct theoretical perspectives and identification of possible flaws of the neoclassical theory. This confrontation, which goes throughout many imperative and controversial issues within economics such as the nature of the firm and the cognitive capacities of economic agents, results then in our final section, where a systematisation about the impact of this discussion on economic growth is rehearsed.

2. THEORETICAL MATRIX OF THE ECONOMICS OF THE FIRM: A BRIEF OVERVIEW

2.1 The two major traditions of institutionalist thought in economics: The Old Institutional Economics and the New Institutional Economics

An overview of theoretical approaches that tried to incorporate issues relating to institutions and institutional change within economics must comprise two major traditions of institutionalist thought.¹ The first is the American institutionalist school that began at the turn of the century and has continued incessantly to this day, though with large moves back and forth in popularity and prestige. The second is a more recent perspective that, in a significant extent, can be seen as a revitalization and extension of the institutionalist elements to be found in classical, neoclassical, and Austrian economics (Rutherford 1994: 1). Nowadays, the former approach is usually labelled as the ‘old’ institutional economics (henceforth OIE) while the latter is called the ‘new’ institutional economics (henceforth NIE).

Within the OIE we have the tradition of thought associated with Thorstein Veblen, Wesley Mitchell, John R. Commons, and Clarence Ayres, and more recently the contributions of Allan Gruchy, Wendell Gordon, Marc Tool (Rutherford, 1994: 1). Two main research

¹ According to Rutherford (1994), the term ‘institution’ may be defined in terms similar to those found in Veblen ([1914] 1964: 7) and in Schotter (1981: 11). ‘An institution is a regularity of behaviour or a rule that is generally accepted by members of a social group, that specifies behaviour in specific situation, and that is either self-policed or policed by external authority. It is important to distinguish between general social rules (sometimes called the institutional environment) and particular organizational forms (sometimes called institutional arrangements). Although organizations can also be thought of as sets of rules, the rules apply only internally. Organizations have constitutions, are collective actors and are also subject to social rules’ (Rutherford 1994: 182, footnote 1).

programmes feature the old institutionalism. One is associated with Veblen and Clarence Ayres. ‘This program is built around the concept of a fundamental dichotomy between the business or pecuniary and the industrial aspects of the economy. This is also expressed in a more general way as a dichotomy between institutional and technological or between ceremonial and instrumental ways of doing and thinking’ (Rutherford 1994: 1-2). Broadly, this programme intends to explore the impact of new technology on institutional arrangements, and the ways in which the social conventions and the interests already established resist to such transformation. Typically, these ideas are now associated to a view of the structure of the modern economy that highlights the political and economic power of large corporate interests (*ibid.*: 2).

The work of John R. Commons and the more recent analyses developed by authors such as Warren Samuels and Alland Schmid (Schmid 1978, Samuels and Schmid 1981) correspond to the second key programme within the OIE. This approach focuses on law, property rights and organizations, their evolution and impact on legal and economic power, economic transactions, and the distribution of income (Rutherford 1994: 2).

Rutherford (1994) also emphasizes that distinct perspectives characterize the NIE. One major approach is to be found in the work of property rights (Demsetz 1967, Alchian and Demsetz 1973) and common law (Posner 1977, 1981). Another one is that concerned with public choice processes, comprising those involving rent seeking and the actions of distributive coalitions (Olson 1982, Mueller 1989). A third important facet analyses organizations and includes the agency theory developed from Jensen and Meckling (1976), and also work on transaction costs game theorists, ‘some of whom use game theory primarily to model action within given institutional situations (Shubik 1975), while others use it in a more ambitious attempt to explain the evolution of the social institutions themselves (Schotter 1981). Many of these elements can be found combined in the institutional economic history of Douglass North (1981, 1990)’ (Rutherford (1994: 3).

2.2 The two central economic approaches within the theory of the firm: the evolutionary and the contractual approaches

In this section it is presented an overview on what are arguably the two dominant economic approaches to the theory of the firm – the contractual and the competence-based (Foss. 1997: 1).² Both these perspectives took-off at the beginning of the 1970s with contributions such as

² Also labelled as resource-based or capabilities theories of the firm (Hodgson 1999: 247).

Alchian and Demsetz (1972), in the first line of thought, and Nelson and Winter (1982) in the second one.

Evolutionary and Competence-Based Theories of the Firm

Hodgson (1999) offers an analysis of evolutionary and competence-based theories of the firm. The former can be regarded as a subset of the latter. The wider approach of competence-based theories advocates that the existence, structure and boundaries of the firm have as an important determinant the associated existence of individual or team competences, for example skills and tacit knowledge, which are promoted and sustained by the organization (Hodgson 1999: 247-8). This view was supported in the past by ancestors such as Adam Smith and Karl Marx who considered the division of labour as the essential key to the enlargement of the skills. However, it is in the twentieth century that we find the major exponents of such approach, remarkably Frank Knight (1921), Edith Penrose (1959), George Richardson (1972), and Richard Nelson and Sidney Winter (1982).

Hodgson (1999: 248) stresses that ‘the central idea of competences provides the basis for evolutionary and non-equilibrium theories of industrial competition and development.’ Therefore, there is room here to explore the potential implications of these approaches on economic growth theory.

Within the frame of competence-based theories it is possible to identify diverse perspectives, particularly over the nature of tacit knowledge, the units and methodology of analysis, and the use of the evolutionary paradigm (Hodgson 1999: 248).

One of the most important subsets of the competence-based perspective is evolutionary theorizing. The key mentors of modern evolutionary economics are Richard Nelson and Sidney Winter. In their (1982) book *An Evolutionary Theory of Economic Change* they offer a wide theory, with specific associated models that incorporate basic assumptions distinct from the ones prevailing on orthodox theory of firm and industry behaviour.

The discussion on the economics of the firm demands a brief look at the characterization of evolutionary economics. On the grounds of firms’ behaviour the evolutionary reasoning puts the concept of ‘routine’. It captures all regular and predictable behavioural patterns of firms. The routine embodies a wide range of firms’ features since technical specifications for production to procedures for hiring and firing, investment policies, research and development, advertising or business strategies (Nelson and Winter 1982). ‘In our evolutionary theory, these routines play the role that genes play in biological evolutionary theory. They are a

persistent feature of the organism and determine its possible behavior (though *actual* behavior is determined also by the environment); they are heritable in the sense that tomorrow's organisms generated from today's ... have many of the same characteristics, and they are selectable in the sense that organisms with certain routines may do better than others, and, if so, their relative importance in the population (industry) is augmented over time' (*ibid.*: 14).

Of course, as Nelson and Winter (1982: 15) highlight an important part of business behaviour is not able to be embedded in the term 'routine', either from the point of view of the firm or the society. Within evolutionary theorizing what is listed under the concept of 'routine' is what consists the regular and predictable of business behaviour, therefore including the relative constant dispositions and strategic heuristics that mould the way firms' deal with the 'nonroutine' problems. Also, 'the fact that not all business behavior follows regular and predictable patterns is accommodated in evolutionary theory by recognizing that there are stochastic elements both in the determination of decisions and of decision outcomes' (*ibid.*: 15).

Contractual or Contractarian Theories of the Firm

Another large set of theories of the firm is usually labelled as contractual or contractarian. To these theories the heart of attention is not on the resources and skills developed within the firm but on explicit and implicit contracts between employers, employees and other contractors. 'That is, firms and other institutions are seen as alternative bundles of contracts, understood as mechanisms for creating and realigning incentives' (Langlois and Foss 1997: 5). This approach comes from the work of Ronald Coase (1937) and highlights the cost of making and monitoring transactions (Hodgson 1999: 248).

This contractarian approach is featured by somehow distinct theories. Hodgson (1999: 248-9) recalls Oliver Williamson (1975, 1985) who stressed the distinction between markets and hierarchies. He also evokes Armen Alchian and Harold Demsetz (1972) who impose no such division but see monitoring or metering costs as critical. Oliver Hart, Grossman and John Moore (Grossman and Hart, 1983, 1986; Hart, 1988, 1995; Hart and Moore, 1990) propose another important contractarian approach to the theory of the firm, focusing on a formal analysis of incomplete contracting and the principal-agent problem. But, in spite of their differences, 'all these exponents see the informational and other difficulties in formulating, monitoring and policing contracts as the crucial explanatory elements. In particular, work in the Coase-Williamson tradition is described as 'transaction cost' economics, because of its

emphasis on the costs of formulating, enforcing and monitoring contracts' (Hodgson 1999: 248-9). Therefore, while the 'evolutionary' perspective is a subset of competence-based theories of the firm, 'transaction cost' theories is a subset of the contractual approach.

Recently, many writers have claimed that the evolutionary perspective to the firm is a serious alternative to the contractual approach, as the evolutionary theory seems to be able to address the essential investigating frame of the contractual line, namely the existence, boundaries and internal organization of the firm, making use of an explanatory loom that is fundamentally distinct from the one used by the contractual perspective (Foss, 1997: 1). This distance appears immediately on the reasons pointed to the existence of the firm. Instead of the contractual rationalization in terms of firms' ability to efficiently line up incentives of the diverse input-owners that participate in productive activities under certain circumstances, the evolutionary theorists claim that firms exist because they are better institutional arrangements for accumulating specific productive knowledge (*ibid*). So, the explanatory mechanisms invoked are different.

Although the overview above seem to mean a relation of theoretical competition between the contractual and the competence perspectives, some hybrid analyses have been emerging from the incorporation of both perspectives. Based on a taxonomy extracted from the philosophy of sciences, Foss (1997) tries to compare those approaches, aiming to provide the illustration of reasoning areas where evolutionary and contractual insights get in touch. 'Indeed, the plausibility of hybrid explanations may stem from the complex nature of economic reality and the fact that a number of causal mechanisms are simultaneously at work. As long as they do not involve internal inconsistencies, plural rather than singular explanation may, in principle, be possible and plausible' (Hodgson 1999: 249). Richard Langlois (Langlois, 1992; Langlois and Robertson, 1995) David Teece and Gary Pisano (1994) are examples of such plural works. They emphasize human learning and the improvement of competences within the firm while recognizing the role of transaction costs.³

2.3 'Beyond' the theory of the firm: the population ecology of organizations

One thread of literature born within the sociological theory – The Population Ecology of Organizations – is also relevant to understand economic evolution and the role of organizations such as the firm in the evolutionary process. Particularly important to the

³ Langlois (1992) identifies what he calls 'dynamic transaction costs' as costs emerging from particular problems of coordination, precisely the coordination of knowledge, learning and expectations that are basic for an understanding of internal organization (Foss 1997).

consideration of this theoretical approach was the awareness that it provides macro-level explanations for changing rates of organizational population.

Michael Hannan and John Freeman started their research programme in the 1970s and they were particularly inspired by the human ecology principles developed by the sociologist Amos Hawley. Hannan and Freeman (1977) proposed a population ecology perspective on organization-environment relations as an alternative to the leading adaptation perspective. As they stress, while the ecological approaches focus on selection, most of the literature on organizations adopts the already mentioned adaptation perspective. The authors recognize that at least some of the connection between structure and environment must reflect adaptive behaviour or learning. However, they claim that there is no reason to presume that the vast structural variability among organizations reveals only or even mainly adaptation.

To sustain such claim they start pointing out the existence of several obvious limitations on the ability of organizations to adapt. What they mean is the presence of a number of processes responsible for structural inertia, which are strongly connected to organizations' adaptive flexibility. The authors recall that this subject has been mainly ignored by research, except the suggestions made by Burns and Stalker (1961) and Stinchcombe (1965).

It is important to stress that it was Stinchcombe (1965) who asked why, in general, a higher proportion of new organizations fail than old ones. He then points out the significant role of the 'liability of newness'. Particularly when this liability is extremely large, organizational innovation will tend to be accepted only when the alternatives are severe, for example in wartime. The author illustrates with some aspects that make up the liability of newness and asks how do social circumstances influence the degree of liability.

Stinchcombe starts emphasizing that new organizations involve new roles that have to be learned, and that the process of creating new roles has important costs in time, concern, divergences and temporary inefficiency. He then stresses the importance of standard social routines in the organization culture of the population that work out many such problems, for example cost accounting and inventory control systems, hence being crucial to the reduction of the liability of newness. Another important factor to reduce such liability is the existence of a disciplined and responsible work force, combined with social routines favourable to responsible initiative.

Michael Hannan and John Freeman, inspired by Stinchcombe's ideas, developed their theory on waves of organizing by pointing out a number of reasons for anticipating organizational

inertia. As Freeman (1982: 17-18) emphasizes: ‘Existing organizations derive their competitive advantages from the stability of their internal social relationships and on the basis of their relationships with other organizations. This often leads to the development of ideologies and traditions that at once legitimate the status quo and dampen innovative tendencies. In addition, basic changes in product, technology, and organizational structure threaten to upset patterns of accommodation that were often quite expensive to develop.’

Hannan and Freeman (1977) point out internal structural arrangements and environmental limits responsible for inertial pressures. As internal constraints they suggest: sunk costs; constraints on the received information; internal political constraints; and constraints generated by the organizations’ own history.

On external pressures towards inertia they suggest: legal and fiscal barriers to entry and exit from markets; external constraints upon the availability of information; and legitimacy constraints (*ibid.*).

Then, the authors claim that in order to deal with inertial pressures the adaptation perspective must be complemented with a selection approach. Within this broader analysis, two issues emerge as vital: the election of appropriate units of analysis (Hannan and Freeman argue for a clear focus on populations of organizations); the applicability of population ecology models to the analysis of human social organization. On this last issue they start with Hawley’s (1950) classic statement on human ecology, then extending Hawley’s work in two ways: by using explicit competition models to detail the process producing isomorphism between organizational structure and environmental demands, and by using niche theory to expand the problem to dynamic environments.

We have seen in our work that the wider approach of competence-based theories advocates that the existence, structure and boundaries of the firm have as an important determinant the associated existence of individual or team competences, for example skills and tacit knowledge, which are promoted and sustained by the organization (Hodgson 1999: 247-8). Therefore, the theorizing built by the population ecology (or organizational ecology theory) has many convergent points with the above approach.

Coase (1937), one of the most important authors within New Institutionalism Economics, identified the firm in terms of organizational coordination. Edith Penrose, consensually considered as one of the most important precursors of the competence-based approach, shared such a notion of firm. Penrose (1959: 24) perceived the firm as ‘a collection of productive

resources the disposal of which between different uses and over time is determined by administrative decision.’

Our work has been concerned with the way economics deals with institutions to ultimately accomplish our main goal, achieving a critical discussion around the conceptualisation of the firm and its role in the dynamical process of economic growth. It may be pertinent to recall that ‘institution’, following the definition offered by Rutherford (1994: 182) [cf. footnote 1], corresponds to ‘a regularity of behaviour or a rule that is generally accepted by members of a social group, that specifies behaviour in specific situation, and that is either self-policed or policed by external authority. It is important to distinguish between general social rules (sometimes called the institutional environment) and particular organizational forms (sometimes called institutional arrangements)’. About organizations, Rutherford (1994: 182) focus that ‘although organizations can also be thought of as sets of rules, the rules apply only internally. Organizations have constitutions, are collective actors and are also subject to social rules.’

For Hannan and Freeman (1984), a population of firms is a group of organizations sharing a common dependency on their material and social environment and on the resources they can attain.⁴ Therefore, the firm is seen as an organization and their definition of organization has its roots in Stinchcombe (1965: 142)’s proposal, which conceives organization as a ‘set of stable social relations deliberately created with the explicit intention of continuously accomplishing some specific goals or purposes.’ There is convergence with the concept typically embraced by the institutionalist perspective in economics: if organizations have ‘constitutions’ as Rutherford pointed out, they share ‘specific goals or purposes’ and if they correspond to ‘collective actors’, they are ‘a set of social relations’.

Our research effort around the conceptualisation of the firm must involve the population ecology approach since there is clear convergence on the basic level of analysis, even if evaluated at distinct levels.

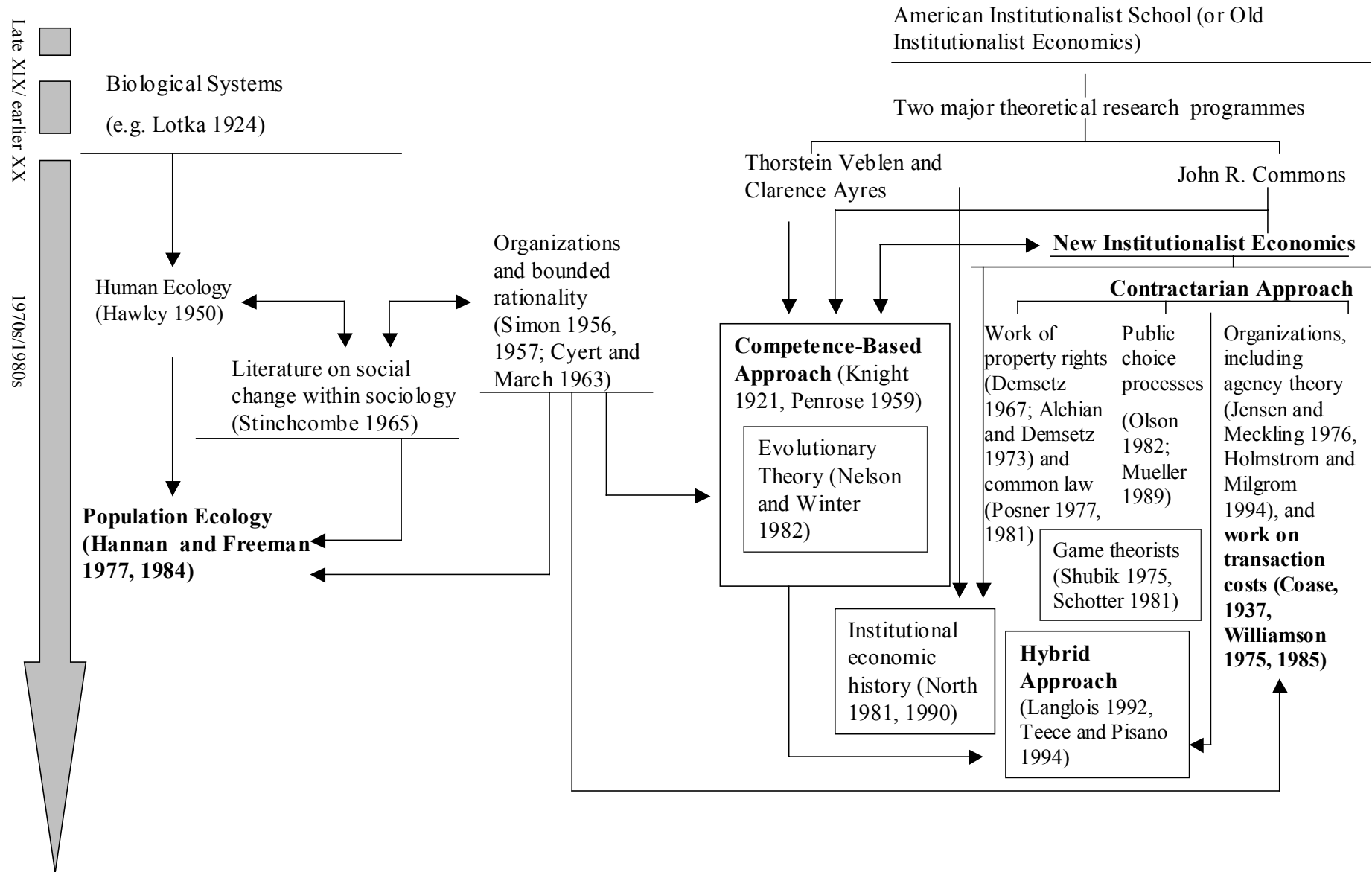
Figure 1 below offers a schematic representation of distinct theoretical proposals. On one hand we have the two major traditions of institutionalist thought in economics and the more

⁴ Hannan and Freeman (1977, 1989) consider that their conceptualisation is in favour of the Darwinian theory of change and selection, rather than Lamarck’s notion. The Lamarckian process means that human actors and firms learn and include learning into their behavioural repertoires. In the Darwinian form, the fitness adaptation crucially depends on the environment selecting organizational forms. ‘Thus, in the Darwinian competitive process, ‘if there is a *rationality* in play, it is the rationality of natural selection’ (Hannan and Freeman 1977 quoted from Durand 2001: 400).

recent developments associated to each of them or to both at the same time. On the other, we have a schedule of the main contributions to the emergence of Hannan and Freeman's population ecology perspective. It is important to note the influence of contributions on organizational analysis and cognitive frames, mainly Simon (1956, 1957) and Cyert and March (1963), on the three crucial streams in study: the competence-based perspective, the contractarian approach and the population ecology approach.

The confrontation of the distinct theoretical proposals that have been produced around the topic of the firm, for obvious reasons only feasible if focused on a few perspectives, tries to anticipate the recognition of potential flaws of the neoclassical framework. For such purpose the contractarian and the evolutionary approaches identified above were selected since they appear as two modern major contributions in the field. A confrontation is also made with the population ecology perspective, hoping to obtain important insights from such cross analysis. The next two sections cover this goal.

Figure 1 – The conceptualisation of the firm - from the Institutionalist Thought in Economics to the Population Ecology Perspective



3. THE CROSS-EXAM OF DISTINCT THEORETICAL PROPOSALS AND THE IDENTIFICATION OF POTENTIAL FLAWS OF THE NEOCLASSICAL FRAMEWORK

3.1 The nature of the firm, knowledge and learning

According to Hodgson (1999: 200), Coase (1937), one of the most important authors within New Institutional Economics, did not offer a clarification why firms exist although he made a conceptual division between the firm and the market. He identified as a key characteristic of the firm the allocation of resources by command rather than by price. Following Coase (1937: 390-1 quoted from Hodgson 1999: 200), ‘the main reason why it is profitable to establish a firm would seem to be that there is a cost of using the price mechanism ... It is true that contracts are not eliminated when there is a firm but they are greatly reduced.’

Coase’s work was strongly motivated in what concerns historical specificity (Hodgson 1999). As it was already mentioned in section 2.3, his main suggestion consisted in the identification of the firm in terms of organizational coordination. Such conceptualisation integrates the understanding that production processes involving human beings depend fundamentally upon spread, uncodified and tacit knowledge. Since much of this knowledge is complex and inaccessible neither worker nor manager can know entirely what is going on. As Hodgson stresses (1999: 228): ‘all production involves learning; and in principle we do not know now what is yet to be learned in the future. Further, production processes are generally complex to the degree that precise analysis and prediction are often confounded. In particular, they involve human actors, who are sometimes unpredictable. Finally, they are subject to uncertain shocks and disturbances from the outside world. Overall, key outcomes are uncertain, in the Keynesian and Knightian sense, and also many events and innovations are both unenvisaged and unforeseen.’

Therefore, the microfoundation present in such conceptualisation – the firm seen as a cognitive entity (Foss: 1997) - surely gives rise to a different understanding of structural change and economic growth relatively to the concept of the firm as an anonymous production function.

Williamson (1985), another crucial reference within NIE, also supported a conceptual distinction between the market and the firm. However, he proposes a concept that is narrower than the one pointed by Penrose, or even by Coase. Indeed, he reduces his theory to the idea that economic institutions such as the firm ‘have the main purpose and effect of economizing on transaction costs’ (Williamson 1985: 1 quoted from Hodgson 1999: 200-1).

Within the evolutionary approach Nelson and Winter (1982) provides us with important insights on the concept and the nature of the firm, also making the parallelism with neoclassical approach. Their ambition is that modelling individual firm behaviour based on more detailed and realistic assumptions of individual firm's rationality may result in the building of models of industry evolution able to bring new insights into the understanding of economic phenomena.

The population ecology perspective appears as particularly relevant on aggregate analysis, with their focus on the relations between the population of organizations and the environment. According to Hannan and Freeman (1989), this theoretical approach is interested in describing the variety of organizational forms and in explaining this variety. Therefore, this perspective is most relevant when understandings about industry evolution and economic growth are in investigation.

It is interesting to stress that both the competence-based approach and the population ecology theory put selection, with heterogeneity and variation as the premises for selection, at the core of their argumentations. As Durand (2001) points out: 'The ecological perspective focuses on the way in which *various strategies* fit in with an environment that selects for or against these strategies by encouraging foundings and discouraging failures' (Freeman 1995: 222 quoted from Durand 2001: 395). Evolutionary economics and the competence-based perspectives 'place major emphasis on the *heterogeneity* of the population of business firms and on the sources of that heterogeneity in the idiosyncratic internal features of individual firms' (Winter 1995: 147 quoted from Durand 2001: 395).

A subject quite relevant in the discussion around economics of the firm and economic growth concerns knowledge itself. While the neoclassical and the NIE approaches deal with information problems, Hodgson (1999: 206) considers that the treatment of such object is unsatisfactory: 'There is no distinction given between sense-data, i.e. the jumble of neurological stimuli which reach the brain, and information or knowledge, which involve the imposition of a conceptual framework. There is no regard made to the processes of assessment or computation with given information, which can lead to different conclusions depending on the method of calculation and the cognitive framework.' The way knowledge and the interconnection knowledge-firm are conceived will have significant effects in understanding economic growth. It is important to recall that the neoclassical perspective of knowledge and learning is not able to capture the concept of learning as 'an instituted process of interpretation, appraisal, trial, feedback, and evaluation, involving socially-transmitted

cognitive frames and routinised group practices which are often taken for granted' (Hodgson 1999: 256). Although organizational knowledge interacts with individual knowledge, it is more than the sum of the individual parts. It is context-dependent, bounded by culture and institutionalised (*ibid.*).

On this topic of organizational knowledge the population ecology perspective is highly convergent with the competence-based approach. In the first place its own rationalization around the motivation behind the creation of an organization reveals the concept of knowledge adopted. Since the creation of an organization involves the mobilization of several scarce resources, Hannan and Freeman (1984: 152) ask 'Why do individuals and other social actors agree to commit scarce resources to such expensive solutions to problems of collective action?' It is important to note that they were aware of the responses offered by neoclassical theory: 'The new institutional economics argues that organizations arise to fill the gaps created by market failure (Arrow, 1974).' They also recognized that Williamson's (1975) analysis exposed that organizations are more efficient than markets in circumstances in which economic transactions must be concluded, for example in the face of opportunism and uncertainty. Also, they recall that although sociologists have a propensity to discard the idea that organizations arise mainly in response to market failures, they usually agree that organizations have special efficiency features even if emphasizing their efficiency and effectiveness for the coordination of complex tasks (Hannan and Freeman 1984).

Even if accepting the plausibility of the efficiency arguments, Hannan and Freeman (1984) do not recognize that they are obviously correct. They remind that many comprehensive records of organizational processes conduct to severe doubts that organizations minimize the costs of ending several sorts of transactions. Therefore, they stress distinct types of competencies. The first crucial one is 'reliability' since 'in a world of uncertainty, potential members, investors, and clients may value reliability of performance more than efficiency' (*ibid.*: 153). This means that a distinctive competence of organizations is the ability to produce collective actions with rather small variance in quality (*ibid.*).

Another competence crucial for an organization being highly reproducible is 'accountability' as 'the spread of norms of rationality in the modern world (...) and a variety of internal and external contingencies demand that organizations be able to account rationality for their actions' (Hannan and Freeman 1984: 153).

The above competences help us to understand the above Hodgson's (1999: 256) citation about organizational knowledge: 'It is context-dependent, bounded by culture and institutionalised'. Hannan and Freeman (1984: 154) show a convergent discourse as they argue that 'in general, organizations attain reproducibility of structure through processes of institutionalisation and by creating standardized routines'. Also, they point out that the institutional system has a fundamental role in legitimating the organization since it articulates the whole organization with the broader society (*ibid.*).

Returning to the evolutionary frame, as it was already stressed, knowledge within a firm is basically related to the organization and the group rather than to the individuals that compose them (Winter 1988). According to Dosi and Marengo (1994: 162 quoted from Hodgson 1999: 255) 'organizational knowledge is neither presupposed nor derived from the available information but rather emerges as a property of the learning system as is shaped by the interaction among various learning processes that constitute the organization'. Foss (1997) also emphasizes this point when he argues that recognizing that knowledge about how to connect together one person's or firm's productive knowledge with that of another is imperfect, conducts to the issue of qualitative coordination.

Learning itself must be understood as a developmental and reconstitutive process and not as a plain input of 'facts' (*ibid.*). In general, neoclassical economics conceives learning as the cumulative discovery of pre-existing 'blueprint' information, or Bayesian revision of subjective probability estimates in the light of incoming data. However, Hodgson stresses the presence of severe problems, for example the fact that a process of Bayesian learning in search of an optimum is dependent upon the existence of accurate former knowledge (Hey, 1981 quoted from Hodgson 1999: 252). Besides, as authors such as Giovanni Dosi and Massimo Egidi (1991) have disputed, the Bayesian perspective is a very imperfect way of picture the role of learning, which is to a large extent more than a process of blueprint discovery or statistical adjustment (Hodgson 1999).

3.2 Transaction costs and uncertainty

Hodgson (1999: 201) considers essential to be conscious about the problems in providing an adequate definition of transaction costs. He quotes from Dahlman (1979: 144) who noted that the concept of transaction costs 'has become a catch-all phrase for unspecified interferences with the price mechanism'. Dahlman also criticized the emblematic formal representation of transaction costs as a proportion of the value of exchanged goods as it works mainly as a

regular transport cost. According to Hodgson (1999), Dahlman made an important step forward into the deeper analysis of transaction costs. He proposed a typology for these costs based on three distinct and sequential phases of the exchange process: 'search and information costs, bargaining and decision costs, policing and enforcement costs'. As the crucial common element between these three classes, Dahlman pointed that they all correspond to resources losses due to lack of information (Dahlman 1979: 148 quoted from Hodgson 1999: 204).

Despite the recognition of Dahlman's contribution, Hodgson considers that many problems still remain around the clarification of the core concept of transaction costs. A reduction of these costs to those of information could mean a precisely fit into a neoclassical framework (Hodgson 1999: 204). As a matter of fact, 'following the lead of George Stigler's classic (1961) article, search and information costs could be accommodated alongside, and treated similarly to, other costs in a probabilistic framework. In this approach information is treated just like any other commodity, and subject to the marginalist rule that its consumption is optimal when the marginal cost of information search and acquisition is equal to its expected marginal return.' However, 'the very idea of rational calculus of information costs is opened to objection. As Arrow (1962) and others have pointed out, if we lack a piece of relevant information then how can we have any firm expectation of its marginal return? The very fact that information is lacking means at most that such expectations are hazy and ill-defined. Clearly there is a problem of circularity here' (Hodgson 1999: pp. 204-5).

Hodgson also recalls that with a treatment of information as in the above terms doubts emerge about why market contracting is supplanted by the firm. In fact, if information is a commodity just like any other, there is no clear cause for the firm to proceed as the minimiser of such costs (Hodgson 1999). 'More specifically, 'search and information costs' could be reduced substantially by a market agency under contract from the producer-trader association, 'bargaining and decision costs' could be reduced by a team of consultants, and 'policing and enforcement costs' could be brought down by pooling information regarding the credit, performance and other reliability ratings of the agents involved. If informational economies of scale are substantial, why is it that such syndicates of independent producers should not arise to minimise the information costs that they would each face on their own, and thus obviate the need for the firm?' Therefore, Hodgson considers that the version of the transaction costs argument focused on the 'information costs' is not capable of giving a persuasive reason for the existence of the firm. He recalls Loasby's (1976) statement that 'there is no need in theory

for non-market forms of organization in the general equilibrium model. Even the probabilistic version of general equilibrium theory, which implies information problems of a stylised and limited kind, provides no reason why firms, as such, should exist' (Hodgson 1999: 206).

From all the above argumentation emerges one major topic to explore when thinking about potential contributors from the economics of the firm for economic growth theory: risk *versus* uncertainty.

Langlois (1986) contributed to a better understanding of the rationale of the firm, making a distinction between distinct types of problems of information. The argumentation was very close to Frank Knight's (1921) distinction between risk and uncertainty (Hodgson 1999). According to Langlois, 'parametric uncertainty' (Knight's 'risk') cannot be used to find the cause of the transaction costs that are relevant to explain the relative efficiency of a firm. Neil Kay (1984) offered a similar argumentation, showing that the firm in a neoclassical world of perfect knowledge lacks most of its familiar structures and functions. As such there is 'a close affinity between perfect knowledge and risk in terms of homogeneity and replicability of associated events. The argument leads inexorably to the consideration of true or radical uncertainty as an essential concept to understand economic institutions such as the firm' (Hodgson 1999: 206).

The above argumentations mean a return to Knight's (1921) core idea that the existence of the firm in the real world is the result of the presence of uncertainty (Knight 1921: 271 quoted from Hodgson 1999: 207). Motivated by such reasoning, Hodgson concludes that 'an answer to Coases's question as to why firms exist re-emerged in terms of a non-probabilistic concept of uncertainty' (Hodgson 1999: 207). This means a restatement that the concept of transaction costs must be mainly associated to problems of radical uncertainty and lack of knowledge. Also, the nature of the firm itself is anchored in Knight's perspective: the need to reduce uncertainty.

It is interesting to focus that both the evolutionary perspective and the population ecology theory offer an option designed to shelter actors against radical uncertainty (or Durand's (2001) causal ambiguity) and diminish the probability of being selected out (*ibid.*). Population ecology theory supports institutionalisation through accountability and reliability as a process that helps newcomers to find the appropriate organizational form that has the best probabilities of survival (Hannan and Freeman 1984). Evolutionary economics proposes the concept of routine as a device to avoid a firm's satisfactory procedures from being

reconsidered at each use. More generally, the competence-based approach identifies learning as the best way to cut the level of causal ambiguity rising through the threat of inter-organizational knowledge transfer, as pictured for example in Teece et. al. (1997).

3.3 Rationality

The problem of rationality is usually present among discussions focused on distinct theoretical contributions. Therefore, another issue that may be relevant here is the concept of rationality adopted by the several streams.

According to Nelson and Winter (1982: p. ix), ‘there is much more to be said on the problem of rational behavior in the world of reality than can be adequately stated in the language of orthodox economic theory.’ Instead of assuming a rational maximizing behaviour, Nelson and Winter inspired on Simon (1955, 1956) and on his insights into human and organizational behaviour, proposed a theory where firms are motivated by profit and engage in search aiming to improve their profits, but their actions are not understood as profit maximizing over exogenous and well-defined choice sets (Nelson and Winter 1982). The theory they proposed stresses the predisposition for the most profitable firms to drive the less profitable ones out of business. Though, they do not centre the analysis on supposed states of industry equilibrium featured by the presence of all the profitable firms at their desired size and the absence of all the unprofitable ones. Within this frame, the modelling approach employed by Nelson and Winter (1982: 4) is such that the ‘firms are modeled as simply having, at any given time, certain capabilities and decision rules. Over time these capabilities and rules are modified as a result of both deliberate problem-solving efforts and random events. And over time, the economic analogue of natural selection operates as the market determines which firms are profitable and which are unprofitable, and tends to winnow out the latter.’

On this last argumentation made by evolutionists on selection we find a fracture between such approach and the population ecology theory. As it was already mentioned on section 2.3 there are other reasons beyond profitability and efficiency important for explaining selection within organizational populations, namely reliability, accountability and legitimacy (Hannan and Freeman 1977, 1984). Sequentially, the founders of the population ecology theory state the following three assumptions: 1) ‘Selection in populations of organizations in modern societies favors forms with high reliability of performance and high levels of accountability’; 2) ‘Reliability and accountability require that organizational structures be highly reproducible’; 3) ‘High levels of reproducibility of structure generate strong inertial pressures’, which

conduct to Theorem 1, the core of their argumentation, ‘Selection within populations of organizations in modern societies favors organizations whose structures have high inertia’ (Hannan and Freeman 1984: pp. 154-5). This theoretical divergence about selection among organizations may be important to understand the role of institutional systems on economic growth processes.

About the cognitive capacity of actors in general, population ecologists share a conception of bounded rationality since individuals alone are unable to recognize the real sources of success (Hannan and Freeman 1977). This means that selection is only recognized *ex post* and materialized in its outcomes (Durand 2001).

Within neoclassical theory, firms operate following a set of decision rules that determine what they do as a function of external and internal conditions (Nelson and Winter, 1982: 12). Those rules reflect firms’ maximizing behaviour. In a maximization model of firm behaviour Nelson and Winter identify three distinct parts: ‘1) specification of what it is the firms in the industry are seeking to maximize – usually profit or present value, but in some cases the objective is something different or more complex; 2) specification of a set of things that the firms know how to do’, which may be on production in a traditional sense or comprise other things a firm knows how to do such as advertising policies or financial ones; 3) ‘a firm’s action can be viewed as the result of a choice of the action that maximizes the degree to which its objective is achieved, given its set of known alternative actions, market constraints, and perhaps other internal constraints. ... In some models, the representation of maximizing behavior takes into account information imperfections, costs, and constraints.’

On the structure of evolutionary models Nelson and Winter (1982: 14) stress that ‘the decision rules employed by firms form a basic operational concept’ as in the neoclassical theoretical frame. However, they strongly reject the neoclassical concept of rationality based on maximizing behaviour as the explanation of why decision rules are as they are. As they point out their evolutionary theory give out the three parts of the neoclassical maximization model: ‘the global objective function, the well-defined choice set, and the maximizing choice rationalization of firms’ actions.’

Despite the recognition that some neoclassical theoretical models such as models of optimal search and models of sequential decision making appear not to work on a ‘once-and-for-all’ optimisation, Nelson and Winter (1982: 31) consider that only superficially those modelling efforts fall outside the above critique. As a matter of fact what they do is a ‘once-and-for-all

choice of an optimal *strategy* of response to an unfolding situation. The conclusion, according to Nelson and Winter, must be that the actors in neoclassical models are not able to deal with truly unanticipated information.

The ‘once-and-for-all’ optimisation neoclassical set is inconsistent with, for example, an assumption that the firm works at all times with a current policy, which profitability is compared in inaccurate terms, from time to time, with individual alternatives that present themselves by processes not entirely under its control, and changes policies when the comparison favours the presented alternative over the current status quo (Nelson and Winter 1982). ‘This latter assumption is more on the spirit of the evolutionary theory: it is an assumption of ‘profit seeking’ or ‘profit-motivated striving’, but certainly not of profit maximization’ (*ibid.*: 31).

Nelson and Winter (1982) call out the attention for the fact that in a suitably calm and repetitive decision context, the difference between motivated for profit and profit maximization may be of a little moment, but in contexts of important change it is significantly relevant. Strict loyalty to optimization concepts strongly encourages (or even requires) closing the eyes to essential characteristics of change: the incidence of Knightian uncertainty (Knight, 1921), the multiplicities of opinions, the problems of the decision process itself, the importance of problem-solving heuristics, the plausible magnitude and range of actions recognized *expost* as misguided, and so forth (*ibid.*).

The analysis of firm organization and strategy implicitly, at least, involve the acceptance of a concept of bounded rationality (Nelson and Winter 1982). As a matter of fact, ‘the economic world is far too complicated for a firm to understand perfectly; therefore the attempts of firms to do well must be understood as being conditional by their subjective models or interpretations of economic reality. These interpretations tend to be associated with strategies that firms consciously device to guide their actions. Such strategies differ from firm to firm, in part because of different interpretations of economic opportunities and constraints and in part because different firms are good at different things. In turn, the capabilities of a firm are embedded in its organizational structure, which is better adapted to certain strategies than to others. Thus, strategies at any time are constrained by organization’ (*ibid.*: 37). This ‘satisficing’ behaviour does not occur simply because of inadequate information, but also because it would be hard to execute the calculations even if the appropriate information was available.

As it is focused before, within the theoretical frame on economics of the firm closer to the mainstream dominates the contractual approach, which recognizes that transaction costs as a concept is inevitably tied up with information problems and uncertainty, also embracing bounded rationality.

For Williamson (1985: 32 quoted from Hodgson 1999: 207) 'economizing in transaction costs essentially reduces to economizing on bounded rationality'. However, as Hodgson remarks, 'in practice, Williamson seems to incline to rationality rather than behaviouralism, at least when it comes to 'choosing' the more efficient governance structure'. So, the transaction cost analysis materializes the choice of administratively rational actions itself a substantively rational choice (*ibid.* 1999: 207).

The above perspective cannot be accepted if we remember that the concept of bounded rationality does not mean only problems in gathering information but focus primarily the fact that man's rationality is bounded in the sense that the decision problems that emerge in real-life are far too complex to understand and so firms cannot maximize over the set of all feasible alternatives (Nelson and Winter 1982). As a consequence, they follow simple decision rules as guiders of action. These rules cannot be featured as 'optimal' in the sense that they result from a global calculation that considers all information and decision costs. Nevertheless, they may be very satisfactory for the firms' goal, that is firms 'satisfice' (*ibid.*: 35). This idea of 'satisficing' was put forward precisely by Simon (1955, 1959) and also by Cyert and March (1963). This behaviouralist response may be relevant to understand differences on explicit theories of industrial behaviour and economic growth, although they are concerned with individual firm behaviour.

4 CONTRACTARIAN VERSUS COMPETENCE-BASED AND THE IMPACT ON ECONOMIC GROWTH THEORY: A SYSTEMATISATION WITH SOME INSIGHTS FROM ECOLOGY POPULATION THEORY

The emergence of NIE and the renewal of competence-based approach in the 1970s meant the introduction of institutions in economists' research agenda. However, the analysis of the economic outcomes of institutions is still rather poor in central economic fields (Olsson 1999). Within the mainstream approach areas of research such as growth theory, the existence and importance of institutions are barely recognized at all, and when they are documented, they are merely assumed as given (*ibid.*). Therefore, it is rather important to consider if

alternative developments such as the competence-based perspective may bring relevant insights into industrial change and economic growth theories.

The contractarian approach has three crucial features that are rejected by the competence-based analysis of the firm (Hodgson 1999): i) the assumption of given individuals, typically with given and independent preference functions; ii) the study of the firm is reduced to contracts between individuals repeatedly involving the minimisation of transaction costs; iii) a focus on comparative static rationalization, where one organizational arrangement is considered to have lower transaction costs than another.

The first key characteristic of the contractarian perspective means that the basic starting point of analysis consists in the transactions between the given individuals, being assumed that all such transactions are evaluated by the individuals in terms of unidimensional utility levels (Hodgson 1999). Following Hodgson (1999) this directs to a disregard of the limits of contracts and exchange and the need of non-contractual relations, above all loyalty and trust, and also a neglect of processes of major individual transformation and development, remarkably an adequate concept of learning. Furthermore, this individualistic perspective eliminates notions such as organizational learning and group knowledge, resulting in an overlook of the types of skill and knowledge associated with teams. Consequently, an analysis in terms of economic growth based on such a conceptualisation of the economic agent necessarily overlooks the impact of learning on structural change and on economic growth.

The neoclassical idea of learning as a cumulative process involving the acquisition of codifiable knowledge, whereas learning itself appears as informational absorption is rather reductionist (Cohendet and Steinmuller, 2000). Learning engages acquisition of cognitive frames but it is an open-ended, provisional and potentially fallible process (Hodgson 1999). Moreover, learning is fundamentally a process of problem-formulating and problem-solving which means that it involves conjecture and error (*ibid.*).

Also, the contractarian analysis is focused on how given, cost-minimising or utility-maximizing individuals relate to each other to shape and maintain institutions, that is the interaction between individuals is reduced to the calculus of costs and the social institutions are not taken seriously enough as the organization is reduced to the position of a way of regulating relationships in default of market relations. The possibility of individual preference functions themselves being shaped by culture and institutions is ignored. Institutions and culture do not affect the individuals fundamentally (Hodgson 1999). Once more, an aggregate

analysis based on such micro perception will miss part of the interconnections between individuals and culture. We may recall that the interaction organization-environment is at the core of the population ecology perspective's argumentation.

The second typical feature of the contractarian approach identified above – the conception of the firm as focused on the alleged contracts between individuals connotes a neglect of technology and production (Hodgson 1999). This happens because this perspective considers the existence of a uniform technology over distinct governance modes that conducts to a partition of production and technology from governance structures or transaction costs. The main analytical concern is with efforts to obtain the optimal benefit from the given resources, with the transaction costs argument assuming that production costs are given and not distinct across governance or transaction modes. Nonetheless, usually technologies are associated to structures of governance and transaction modes. So, the role of production and technology is ignored while the emphasis is put on the choice of governance structures and the efficient allocation of given resources, instead on production, accumulation and growth (*ibid.*).

Although considering that the Coasen literature respects a dichotomy between production costs and transaction costs, Langlois and Foss (1997) recognize that some of the contributions within such literature depict effects between production and exchange. The authors point out that some recent research has demonstrated rigorously that alternative organizational structures might be selected since they involve different incentives to invest in specific assets (Grossman and Hart 1986; Hart 1995). Therefore, in many recent models, technology and organizational structure are determined jointly (Riordan and Williamson 1985; Milgrom and Roberts 1990).

A third characteristic of the contractarian perspective is its focus on comparative static explanations, meaning a poor treatment or even overlook of dynamic facets of the problem, mainly learning, innovation and technological development (Hodgson 1999). Typically the analysis is conducted based on the comparison of transaction costs in equilibrium in two or more governance structures, whereas the structure with lowest costs is believed to be more efficient (*ibid.*). In the real world firms and markets are featured by different capabilities, facing dynamic and disequilibria situations and NIE downplayed such reality (*ibid.*). The acceptance of an equilibrium analytical approach by that perspective implies the neglect of the difference between *ex ante* and *ex post* forms of coordination (*ibid.*: 259): 'Firms, through foresight and planning can have advantages *ex ante*; markets typically coordinate *ex post*. This possible and additional reason for the existence of firms is ignored in equilibrium and

comparative static analyses.’ Therefore, the ability of the firm to promote human learning, technological innovation, and research and development is not understood by such a static frame.

It is within a dynamic frame that the firm is conceived both in population ecology perspective and in evolutionary theory as having a low short-run capacity for strategic reorientation. The evolutionary concept of path dependency accounts precisely for time stickiness in strategic action (Dosi and Nelson 1994). More generally, the competence-based perspective points to the difficulties and costs involved in augmenting strategies, also focusing that it can generally only occur incrementally (Teece et. al. 1997: 529 quoted from Durand 2001: 397).

For the above reasoning the most feasible picture conceives an organization committing itself to long-term paths. This commitment is related with a certain idea of ‘uniqueness’ (Levinthal 1995: 36 quoted from Durand 2001: 397). Population ecology believes in niche strategy as a meticulous model of fitting into environmental circumstances. This niche strategy keeps a firm against selection (Carroll 1985). Evolutionary economics emphasizes the power of innovation versus imitation, with innovation being a device to create uniqueness. The dynamic capability perspective shows how uniqueness and idiosyncrasy guide a firm to appropriate rents unreachable to competitors due to the effects of isolating mechanisms (Mahoney and Pandian 1992 quoted from Durand 2001: 397).

All the above convergent items found between evolutionary theory and population ecology perspective are clearly distinguishable from other available theories. For example, the neoclassical vision on survival and selection does not usually incorporate concepts such as process or bounded rationality, favouring those such as equilibrium and optimisation. Causal ambiguity is mainly missing from agency theory, as is uniqueness from neo-institutionalism (Aldrich 2000 quoted from Durand 2001). About more recent models of organizational and economic evolutions, usually they do not privilege selection, but rather adaptation (Durand 2001). These models list distinctive variations at the organizational level, and employ adaptation to connect organizational behaviour to the competitive and institutional environment levels (Lewin et. al. 1999 quoted from Durand 2001: 397).

In spite of the convergent points listed above, evolutionary and population ecology perspectives differ in some ways. To start, it is important to stress that each approach chooses a different unit to be selected, though belonging to connected levels of analysis. Population ecology works with populations of organizations. Evolutionary economics mainly chooses

firms and routines as the units of analysis for selection. More generally, the competence-based sight focuses on resources, competencies, and trajectories. Nevertheless, there is a deep affiliation between the diverse levels. Durand (2001) sees each level as a stratum of selection at which organizational units are either engaged or eliminated.

The understanding about selection offered by each theory also diverges on the location of the selecting forces. It is relevant to notice that external selection relates to forces external to an organization that influence its routines and competencies. Internal selection concerns forces internal to an organization that influence its routine and competencies (Aldrich 2000 quoted from Durand 2001). Population ecology is clearly focused on the first type while evolutionary economics, and above all the capability approach, stress the latter (Durand 2001).

Another difference between the theories in focus concerns the position of strategic management within the performance of organizations. Whereas for population ecology, strategy has, at best, a reflexive role since strategic management cannot have a major impact on an organization's chance to survive (Durand 2001), the capacity approach clearly point out an active task for strategic management by defining processes, building positions, and controlling paths and trajectories (Teece et. al. 1997 quoted from Durand 2001). Evolutionary economics embraces distinct positions about this item. Durand (2001: 398) recalls Nelson (1991: 70) and his conviction that 'to an extent, the market is selecting on strategies and companies, as well as new technologies', and so the role of strategic management is also understood as mostly reactive, and points out to the replication strategy (Winter and Szulanski 1999) as approaches that offer a premium to strategy in avoiding being selected out.

As we have already focused, recent neoclassical analyses tried to deal with the future picturing the concept of risk and introducing it into their models. Faced with uncertain environments, models assume that agents are able to calculate numeric probabilities for distinct and pre-conceived events. However, the evolutionary theorizing does not accept such procedure as it regards future knowledge as unknown and the results of activities closely associated to the dynamic and interactive learning process as uncertain in the most radical sense as in Knight (1921) or Keynes (1936) (Hodgson 1999). Therefore, the existence of uncertainty as so means the impossibility to reduce the future to the present using probabilistic risk calculation, being impossible the existence of complete future markets for all innovations and knowledge.

Since Knight (1921) it has been suggested the importance of the firm as a decisive instrument to deal with such complex and uncertain world: ‘the firm may cope with uncertainties by lumping them together within a single organization, which has resources to bear many non quantifiable and unforeseeable shocks’ (Hodgson 1999: 259). Mainstream has been proposing analyses of economic growth based on, as it was cited already in section 1, a different concept of the firm – the firm as an ‘anonymous production function’ (Foss 1997: 37).

We believe that the economic understanding of growth and development of human societies will strongly benefit from a conceptualisation of the firm able to capture the ‘spirit’ of the Knightian firm. In our perspective, the great challenge is, based on such a micro conceptualisation, to walk towards the construction of formal interactions between the micro and the aggregate levels.

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