Chapter 4
The New Industrial Organization

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Abstract Economic Activity takes two alternative forms: the Market and the Firm. Economics is a social science that tries to explain how to generate wealth and how it is distributed. The firm is a social organization whose members decide to cooperate to generate wealth and its distribution among the stakeholders. They certainly share a common goal. However, to translate economic principles to management is an open challenge. Traditional IO as understood among the economists deals with the generation of wealth through the market, which if it is well designed will achieve a fair distribution through endogenous dynamics towards equilibrium. On the other hand, a proper theory of the firm needs explicit rules of governance and operations. This fact requires a New I.O dealing with uncertainty far beyond probability; individual and collective bounded rational agents; specialization and heterogeneity; imperfect information and variety; incentives and penalties to avoid free riding, and how to develop core competences such as entrepreneurship, innovation and knowledge management. The paper revised I.O and ends up with a map of Management Sciences to help designing the Management Engineering curricula and the range of specific skills and competences demanded by different institutions.

Keywords Industrial organization · Economics and management of the firm · Governance and strategy · Organizational sciences

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1 Introduction

There are two alternative forms; two basic institutional frames under which economic activity may be organized: the market and the firm. Although each develops under different organizational patterns, both the firm and the market, function through the (social) interaction of the different economic agents that participate in them and have common goals. In all economic events, there is a dynamic process, which conditions the results obtained both by the firm and by the market. This process is subject to continuous changes and adaptation, due to the business environment and the social nature of the individual participants.

In the market, the free interplay of offer and demand looks after the distribution of the different resources between individuals, leading to the determination of equilibrium prices. In the firm, on the contrary, this task develops through a governance structure that assures management and planning.

The market provides the simplest form of coordination, as its functioning requires no planning of conscious activity on the part of individuals, but it is rather its own individualistic orientation what dynamizes resource assignation. The characterization of the functioning of the market is therefore justified, as a mechanism regulated by an "invisible hand", in so far as, the system of prices is not consciously created (Lipsey 1963).

With such a system, it is not necessary to foresee and to coordinate all the necessary variations. These occur automatically resulting from separate decisions taken by a large number of individuals, who seek their own benefits, but are obliged to respond, in relation to changes in demand and in prices. The firm, however, requires greater personal interaction between its parts, a governance structure, as well as more complex and lasting relations between them.

The development of organizational patterns is similar to the biological process of natural selection. Competition in the market leads to the predominance of more efficient solutions. Unlike the biological case, this social evolution is much more rapid, is transmitted by learning (Hayek 1988), and is subject to human manipulation. Moreover, the opposing organizational patterns can coexist, above all in the short term.

The study of factors that determine the adoption of one or another alternative constitutes the first big question to analyze, as these factors will set the limits and the *raison d'être* of the firm as against the market. Why, on some occasions, there are organizations that mediate in the transactions between individual agents and the market?: the discovery of the firm as an alternative mechanism to the market for resource assignation.

This paper starts with the definition of some exemplary concepts in Economics that constitute the grounding of the different theories on the firm and the market, as alternative institutions that compete between each other. We make a succinct review of the theories that in our view can be considered as the most representative. Among others, some are the result of having studied these core facts of the economic activity with greater or lesser emphasis and degrees of success.

Neo-classicism is locked in the omnipotent authority of the market, the only economic scenario in which the firm is reduced to a mere intellectual concept, a production unit. The institutionalists countered that approach, principally through the Nobel prize-winner, R. Coase, and the undeniably pragmatic observation of market inefficiency, as well as the discovery of the firm as an alternative mechanism to the market for resource assignation.

Management theories, in addition to profit margins, introduce other components like restrictions on the objective function; but it is the behavioural theories that substitute the objective of profit maximization by that of satisfaction under limited rationality within the framework of structures of ownership rights in the firm. Thus, we come to Agency theory with the conflicts of control between ownership and management and the agency-cost minimization objective, which are nothing but a very concrete definition of transaction costs, as opposed to market costs. Finally, we deal with the resource and capabilities view of the firm.

The paper concludes by presenting a structure of integration of the Economy, the Economic Theory of Contracts and the Theory of Endogenous Growth, which Professor C. Hernández refers to as the New Industrial Organization (Hernández 1997).

2 Core Concepts

Organizations are the result of the contractual interaction of human beings who follow a particular conduct. In essence, it is supposed that individuals seek their own self-interest (profit) in an intelligent way and interact in an environment characterized by the cost of information, which is neither perfect and nor asymmetrically held, and by the need to relate to other people. They do it with cognitive limitations, individual bounded rationality.

Besides, although opportunism is a natural consequence of the search for self-interest in an environment with information shortages, opportunism is constrained by its own rationality. This brings up substantive uncertainty that ads to the one coming from organization environment.

In what follows, we shall define a series of core concepts in Economics on which to construct the different theories that exist on the firm and the market, such as competitive alternative institutions, among others.

2.1 Uncertainty

Nothing is more certain than the predominance of uncertainty over the consequences of any economic decision. There is no doubt that uncertainty is inseparable from the human condition and dominates the majority of their thoughts.

Knight (1921) highlighted the failings of the probabilistic approach in characterizing the essential aspects of the business managers, or the entrepreneur's role or the forms evolution: the consideration of uncertainty. Uncertainty per se really introduces something fundamental into Economics: individuals possess different information and their attitudes may change drastically.

Risk (chance) refers to recurrent situations in which, through repeated observations, it is possible to assign frequencies and, assuming an underlying regularity, the corresponding probabilities, for some possible perfectly defined and identifiable results. Uncertainty refers to situations that present no regularity under observation, the results of which are on occasions not clearly identified, and in any case, may not be assessed as probabilities.

In this way, Knight maintained that it is not measurable risk, but uncertainty that is not assessable in terms of probabilities.

However, throughout the Microeconomics literature it is difficult to stumble across this distinction, as the majority of authors consider uncertainty measurable through subjective probabilities. In this way, and with the help of Bayesian statistics, it converts uncertainty into risk, and the treatment of the different situations is simplified (Pindyck and Rubenfield 1998); mindful with the exceptions that Baumol (1961) and Frank (1991) pointed out.

2.2 Limited Rationality

The hypothesis that the agents are rational is the central assumption of many theories of the social sciences. Its role is particularly obvious in economic analysis (Kahneman 1994). The term limited rationality is used to designate the rational choice that takes into account the cognitive limitations and calculative capability of the decision-maker, fundamental to estimating the market behaviour of the economy.

The notion of bounded rationality was introduced by Simon (1947), diverting from the theory of the Subjective Expected Utility (SEU) of global maximization, lying beneath neoclassical Economics. It is a consequence of there being empirical knowledge on human thought and the decision process.

Limited rationality is procedural, not substantive. Substantive rationality comes under the neoclassical model, according to which, it is enough to assure compliance between what the behavioural model predicts and what it is really observed. However, human behaviour cannot predict the optimal behaviour in a given environment. It depends on how the economic actors perceive and represent the environment, how they define their goals and the methods to value the achievement of those goals, what facts they know or assume and what strategies they have to resolve the problems.

The rationality of the economic actors, can be defined by the process that they use to construct their decisions, but that process cannot be assumed from the description of the objective that is pursued when the problem is solved. It cannot be

determined inductively from empirical observation, or inferred from behavioural theories with an empirical base. In particular, as Simon (1997) stated, the economic agents will be highly influenced by social change.

Thus, instead of searching for the optimal, the cost-effective and the difficult solution in accordance with their calculative capability, individuals are content to find satisfaction by renouncing the optimal. The agents, aware of their limited rationality, act by trying to do it as best as they can, given the limitations under which they are working. And they also learn and use frugal and fast rules (Posada and López-Paredes 2008; Gigerenzer et al. 2002; López-Paredes et al. 2002).

In spite of it all, individuals are complex entities that will not always follow rational criteria when taking their decisions. Apart from the informational limits, the deviations of the supposed rational conduct are due to the information processing it involves. According to the model of rational selection, agents evaluate the events or the sets of events from the point of view of their global influence on their utility function.

However, Kahneman and Tversky (1979) observed that the agents usually weigh up each of the events separately. They developed the prospective theory, to explain these distractions, to eliminate the paradoxes of consistency in the expected utility from consumer behaviour, through a value function defined over changes that the economic agents experience in their wealth.

2.3 Information Asymmetry

An efficient choice requires information on individual tastes, technological opportunities and resource availability. All the information is not held by all individuals, nor is it the same for all those who hold it.

Regrettably, information asymmetries are omnipresent in economic relations: "The clients know more about their tastes and inclinations than the firms. Firms know more about their costs than the government, and all agents assume actions that are partially unobservable" Salanié (1997).

The competitive system can be represented, in the same way as any resource assignment mechanism, as an information exchange structure between individual agents. From this point of view, the key to its efficient operation is the transmission of sufficient and identical information for all agents. The fact that the agents hold different information before or after reaching an agreement generates, respectively, events termed in the literature as adverse selection and moral risk, giving rise to opportunistic behaviour that provokes inefficient resource assignation.

Williamson (1985) describes opportunism as a wily search for enlightened self-interest; in other words, individuals can leave contractual commitments unfulfilled, if so required. In this way, when a conflict arises between what people wish to do and what they have accepted to do for others, will act in their own self-interest if it is costly for the other parties to supervise and control their behaviour. In no way does this idea imply that all individuals behave in an opportunistic

way, nor that they do so at all times; being difficult to distinguish honest individuals from those who are not and, therefore, to determine when the opportunistic behaviour will take place.

2.4 Specialization, Negotiation and Cooperation

Economic activity and the value it generates comes from productive specialization and the subsequent exchange. Efficient external markets and an internal market organization are required to materialize those potential benefits; through the exchange between links in the value chain, between the divisions of the decentralized corporate firm, or between the components of the virtual firm, as previously pointed out by Hirshleifer (1956) with a keen sense of anticipation.

More and better can be produced when cooperating; each one specializing in their productive activities and then negotiating between each other to acquire those goods and services that are necessary. This specialization in production and exchange should be coordinated by providing cooperation, from motivation and incentives for the participant agents Milgrom and Roberts (1992). But, effective coordination is achieved when they all have access to the necessary information for efficient resource assignation. Thus, there are different organizational structures to achieve that coordination.

The cost of production is reduced and the product value increases by specialization, but generates coordination costs. Among these costs, the most problematic ones are those called motivation costs or incentives, related with the opportunistic behaviour of the actors in the exchange. In more complex products, scale economies and learning emerge. Adam Smith had already highlighted the specialization of functions as a source of efficiency (Friedman 1991).

The modern example of specialization is the value chain and the organization of the firm by processes. The productive process is broken down into stages of activity and the relation of exchange, among which, results into as a bilateral monopoly. From this model, the concept of incentives emerges. Two decades ago, the model of bilateral monopoly was a curious field in our microeconomic culture; however, it has finally assumed greater importance because it applies to many problems of real negotiation and transfer pricing.

The transaction cost economy of Coase, and the economy of transfer pricing of Hirshleifer are two alternative discourses on the difficulties of establishing incentives that reduce the internal exchange costs of the firm. The concept of exchange becomes an internal mechanism of the firm that works with internal transfer pricing. The need therefore arises to include imperfections and asymmetries in that exchange process to set the price for internal transactions in the modern multi-divisional firm: the theory of transaction costs.

However, this is not enough as the following fact proves. Goods exchange generates wealth but as such is mute about its distribution. In fact, consider a firm with two divisions, A and B. If say division A increases efficiency, the optimal

transfer price between the two divisions leads to the maximum profit for the firm. However, division A may well have less profit than before, whereas division B will take all the increase in profit. Therefore, incentives and cooperation have to be induced in the multidivisional firm; something else that pricing, cost or information. It is a question of incentives and fairness.

2.5 *Variety*

In the 1930s, General Motors literally pushed Ford out of the market, all because of an idea that it put into practice: "a model for each pocket and for each use: all Americans can have an automobile to match their taste, needs and purchasing power". Specialization and the cost objective are not sufficient to compete. It is a question of generating value from variety: price margin over cost. Organizational changes also become evident: the multidivisional firm, where each division is treated as a different business unit.

This new organizational structure opens the door to external economies based on technological improvements, which opens up another means of wealth generation, somewhat more important to explain the Solow's residual in the long term. So Romer (1990), used the idea of Marshall, to ground the new "theory of growth", according to which knowledge and more specialized machinery can originate externalities. Knowledge may be included as a non-rival factor.

Finally, there are also external economies arising from the variety: external but internal to the multiple divisional firm. For example, the increase in the number of intermediate and increasingly specialized factors, as happens with the multidivisional firm and flexible production systems. Caballero and Lyons (1990) gave further consideration to the importance of market size and technological innovation and diffusion, as elements that generate positive external economies.

2.6 *Exchange: Institutional Dimension of Production*

It no longer makes any sense to talk of product exchanges, except perhaps for raw materials, but instead of the inherent attributes of the product. Productive processes may be broken down into n different activities that may be done at places and under alternative conditions, through independent agents who freely exchange, coordinating without coercion and generating advantages. This coordination of the exchange process entails costs. Firms and markets are two scenarios in which to estimate where the exchange costs are lower.

Exchange entails transaction costs that arise, on the one hand, because of the coordination of offer and demand, in such way that they rationally maximize their personal utilities reassigning the use of goods and resources; and, on the other, the motivations of individuals, due to their possible opportunistic behaviour.

"We can see the firm as a series of markets, throughout its value chain, with their corresponding transaction costs; or the market as a production unit where the factors are the rights on offer and the production of that exchange activity, the satisfied demand, the rights conceded" (Hernández 1997).

Property rights mark the position of each agent in relation to the scarce resources. It is the ownership rights that constitute the importance of the contribution from Coase in 1960, the relevance of social cost (Coase 1960). Exchanges are, in reality, the transference of property rights.

A system of ownership rights configures a certain system of incentives; therefore, substantial variations in ownership rights can change the dynamics of the production system, as well as the hierarchical relations of the firm and, in general, the relations of power or dominance that prevail in society.

Uncertainty, limited rationality and information asymmetries are circumstances associated with the governance mechanism or mode of exchanges in the firm and in the market. These factors imply a certain sort of incomplete contract in all economic relations. In short, there are always transaction costs that limit the initial advantages of pure exchange.

2.7 The "E" Factor and Other Intangibles

Economic growth is not completely explained by the growth of productive factors. In the long run, Solow (1956) found that the increase in wealth could not be attributes to the usual factors of production. There was a welcome unexplained residual. Marginalism could explain this residual. A dummy factor was introduced called Total Productivity Factor. Perhaps should have been a "measure of the economist ignorance". It was important to determine the set of non-physical factors, to understand the nature of the Solow's residual, such as the accumulation of capital, educational improvements, technological change, etc., and finally, if applicable, to guide the growth policy accordingly.

The contributions of the theories of endogenous growth underline that the residual is fundamentally due to the capability to improve the intangibles of the firm, and in particular, knowledge accumulation (Lucas 1993). The conclusion is that management capability to mobilize tangible and intangible resources would be, in the final analysis, the complete explanation of the residual.

The success of the firm depends of the set of its resources, among which of special importance are the training of human resources, business organization and that visible hand (Chandler 1977) that we call entrepreneurship. It is the sixth productive factor, a generator of added value, after land, work, capital, human capital and technology. As Gordon (1993) affirmed, it should now form part of the principles of Economic Theory.

Economic activity may be defined as the transformation of attributes of goods and services through the integration of technology and organization, the task of

management; and the change of those physical attributes into ownership rights, into value, which is the task of the entrepreneur.

It is not so important for the entrepreneur to coincide with other functions. It is the entrepreneur who adds value and the manager who reduces costs (efficiency). There are therefore two groups of basic economic agents with different roles—entrepreneurs and managers—although the same person often fulfils both functions.

Managerial functions are: to coordinate production factors to achieve efficiency; to formalize generally incomplete contracts with the members of the firm, determining the incentives; and to capture opportunities for continuous improvement of the business, from a portfolio designed by the entrepreneur.

The role of the entrepreneur can be summarized as: seizing opportunities for gain, exploiting market imperfections; planning and deciding on the business portfolio and its dynamics; and innovating in a changing environment where variety and short product life-cycles prevail.

We can see some of the different approaches to the entrepreneur that we consider relevant. Cantillon (1775) accurately identified the profile of an entrepreneur, by highlighting the nature of the risk that entrepreneurial decisions involve, the innovative function that focuses on market opportunities and the motivations of the entrepreneur. Schumpeter (1954) highlighted the innovative nature of the business activity. Knight (1921) considered that the entrepreneur is a guarantor of rents, while the benefits of the firm represent payment for taking those risks. Kirzner (1997) took imitation and innovation into account. "The role of the entrepreneur is to notice what others may have overlooked" (Kirzner 1982). Casson (1982, 1990) agreed with Kirzner in his appraisal of the entrepreneurial role as gainful re-assignation of resources and of the entrepreneur as an agent of change. He also described the personality and the motivations of the entrepreneur with an economic and psychological analysis.

In spite of what has been said, the role of the entrepreneur is frequently linked to the managers; particularly in the modern corporation, where he appears under different denominations. In the firm that is decentralized into business units, and cooperative entrepreneurial networks (virtual firm), the entrepreneurial activities are localized both within the external market and in the internal market of the firm. The role of entrepreneurs is, even so, carefully define by their participation in the definition of corporate strategy, the portfolio of future business and its proactive approximation to that strategy.

3 Economic Theories of the Firm

The different theories and research programmes that shape the Economic Theory of the Firm may be considered as attempts, at all times insufficient, to accommodate some, or all, of the above-mentioned core ideas the conform the complexity of the Economy.

The analysis of the firm, from the economic point of view, is complicated by dealing with real organizations, and therefore with individuals. The firm is constituted by a set of people with different knowledge and interests, where a response has to be given to the ensuing problems of motivation and coordination, with the aim of achieving the coherent and worthwhile behaviour of all participants (Milgrom and Roberts 1992).

The flow of Economic Analysis has been enriched with contributions arising from the at-all-times unsatisfied need to endow that reality of economic activity with normative and/or positive bases: the agents have limited rationality, subjected, moreover, to institutional restrictions. From that point of view, it is possible to value the achievements and expectations of the different approaches to the Economic Theory of the Firm and the New Industrial Organization in a better way.

Economic analysis provides in this way the fundamental theoretical field to understand more fully the problems of business decisions, both for internal resource assignation as well as in relation to the environment. We can distinguish three economic approaches to the phenomenon of the firm, each one of which offers interesting applications. These are conventional Neoclassical Analysis, Contractual Theory and the Evolutionary Theory of the Firm.

Conventional Neoclassic Analysis sees the organizational dimension of business reality completely in the abstract, which has a twofold consequence. On the one hand, it allows us to undertake an analysis of the markets and to construct a theory of price formation, capable of explaining the logic of business survival (Alchian 1950). On the other hand, it sterilizes theory for its use in internal decision taking.

The second approach-Contractual Theory-emerges to endow Neoclassical Analysis and its application with greater realism, the origin of which may be found in the work of Coase of 1937. It explains the existence of the business form of economic organization based on the transaction costs inherent to the exchanges completed on the market. On the one hand, the Theory of Ownership Rights analyzes how the nature of contracts conditions the behaviour of economic subjects. On the other, Agency Theory provides an analytical framework that gives insight into the contractual relations between the participants of the firm, in their positive aspect, and seeks to serve as the foundation for the development of contractual schemes for the agent-principal relation, such that they are optimal for that contractual development, under prevailing norms.

With a process approach, the third approach defends the firm as a unit of accumulation of knowledge and capabilities. Knudsen (1995) sustains that although it coincides with neoclassical theory, by considering the firm as a unit of production, it has in reality implied a gradual enlargement of the assumptions of market behaviour.

The most significant features of the neoclassical model, of transaction cost theory, of ownership rights theory, agency theory and evolutionary theory are presented in the following section.

3.1 Neoclassical Theory

Over some time, the thoughts of economists have centred mainly on the problems of scarcity and wealth; in other words, those relations that in a unilateral way link people with things. Value, exchange, production and the market were the fundamental concepts on which their interest centred.

The firm, excluded from this theoretical framework, was assimilated with production, understood as the change of factors in products, with the help of a transformation process belonging to each industry and in accordance with the state of the technology. The sole agent of multilateral cooperation of interest to the orthodox economist of the 18th and 19th century was the market, and the essential economic decision referred to commercial exchange.

Subsequent developments, completed towards the end of the 19th century and in the first decades of the 20th century, although clarifying some aspects and enlarging the perspective of classic microeconomy, maintained, in essence, the same earlier model of the firm.

Although no authentic Economy of the Firm existed, a microeconomic theory of the firm had formed in the neoclassical framework: that which studied the behaviour of productive economic units that operated under very restrictive suppositions, which together are all known as the market economy (Naylor and Vernon 1969).

We may say that the neoclassical model is a description of the market, the framework in which the firm operates, more than the firm itself. Its operation and the relations that are formed within it are ignored in this way, as well as the reasons that explain its existence. In this environment, the invisible hand of Adam Smith is at its most meaningful, in so far as the prices transmit the necessary information to all the agents, so that efficient assignation of all resources will ensue from the optimization of their particular wealth.

In this respect, assuming that profit maximization is the sole objective of the firm is a deduction based on the action and the operation of the market, and not of a specific study of the real motivations of the business. The methodological defence of such an assumption is based on greater interest because of predictive power than because of the realism of the hypotheses. We may therefore suppose that the entrepreneur acts as if seeking to maximize returns, as otherwise, competition would have to shift to the market.

Economic analysis has frequently been criticized because of its shortcomings with regard to the management of the firm. Thus, for example, in the productive area, the Theory of the Firm considers that the achievement of productive efficiency is a technical reality: the production function is an optimum technology. However, it is a fact that most business management problems consist of the search for efficient resource assignation, which is of course available through that technological optimum.

That critical comment is nonetheless considerably Byzantine, as it accuses Economic Analysis of missing objectives that are not its own. As Jensen (1983)

thoughtfully points out, among many others "… the literature that falls under the heading of 'Theory of the Firm' is not a positive theory of the firm, but a market theory".

Despite these criticisms, the neoclassical model offers at least four sets of fundamental contributions for an economic theory of the firm: (1) it supplies the conceptual framework of internal resource assignation process; (2) the microeconomic analysis offers the scientific basis for decision-making on the relations of the firm with the environment; (3) it provides the fundamental concepts used in the formalization of multiple decision problems; and, (4) it provides an approach to the study of human behaviour.

3.2 Transaction Cost Theory

Since the 1930s of the last century, but fundamentally during the seventies, this panorama changed radically. Holistic methodology present in the earlier stage gave way to individualistic concepts, but in accordance with the social nature of the economic discipline. The development of management and, above all, behavioural theories prompted the institutionalists, following the pioneering work of Coase (1937), to develop concepts of the firm as an alternative to the market, and that provoked important reviews of the ideas on how and why firms operate.

The earlier attempts to extend the market to the point of it subsuming the role of the firm are radically improved by the contribution from Coase, in disagreement with the explanations on the existence of the firm, which always overlooked their nature. He was not in agreement with the view of the firm as a black box into which streams of productive factors entered and a flow of products came out, as this conceptualization made an abstraction of very important components of the real world, which missed the essence of the nature of the firm.

In the context of the theory of general equilibrium, it is very difficult to justify the true existence of firms, as all interactions are done through the price system. As Coase (1937) highlighted: "The hallmark of the firm is the suppression of the price mechanism". Information asymmetry is a further challenge to take into account in the general model.

Firms emerge provided that the benefits of coordinated team production exceed those derived from the formalization of individual contracts. The costs of information, and contract negotiation and implementation are not insignificant. Costs that Coase termed transaction costs. Given that the firm contracts in exchange for a salary that is set in advance, the need for supervision and control emerges. However, the costs of supervision and monitoring are different for each firm and quickly grow with size. Therefore, the volume of these costs is an indicator of the size of the firm.

There are therefore some costs that arise from the use of the price system, which are incurred when conducting transactions in the market; when making use of the price mechanism. In consequence, the firm is an alternative mechanism to the

market and arises because it is able to organize certain activities in a more efficient way than through the market.

The firm, for Tirole (1989), appears because it is capable of producing or selling more efficiently than its component parts could do separately. There are two reasons that justify the above. The first is that the firm uses synergies between different units to exploit economies of scale and reach, faced with the indivisibility of certain factors in the production of one or more products. The second reason is that transaction costs have their origin in market imperfections. The firm never supplants the market as a mechanism for assignation, but replaces it in those activities in which the firm can achieve more efficient assignations: minimizing production and transaction costs.

There are some antecedents of the transaction cost economy in the economic (Knight 1921; Commons 1934; Coase 1937), the legal (Llewellyn 1931) and the organizational (Barnard 1938; Simon 1947) field. However, Williamson (1975, 1985) rediscovered and developed the transaction cost model. The economy of transaction costs adopts a contractual approach in the study of economic organization. It maintains that any question that may be expressed as a problem of contracting can be studied in terms of the economy of transaction costs.

In comparison with other theoretical proposals that exist for the study of the organization, Williamson (1986) considered that the economy of transaction costs is more microanalytical. It is more realist in its hypothesis of behaviour; it introduces and develops the economic importance of the specificity of assets; it resides more in comparative institutional analysis; it makes reference to the firm as a governance structure more than as a production function; and it gives greater importance to the ex-post institutions of the contract, with special emphasis on private order.

The relations between economic agents may be better explained by considering the transaction as a unit of analysis; a concept that includes both exchanges and contracts. Exchange would be total transference of ownership rights on a resource that implies no future promises or responsibilities. A contract is the promise of a future result, because one of the parties makes an investment the profitability of which depends on the future behaviour of the other party.

Transaction costs have their origin in the establishment of the conditions of exchange, and are of two types: the ex-ante costs and the costs of the actions and tasks that take place when establishing the contract (negotiation, drafting and guarantee of the agreement), and the ex-post costs or those due to administration, obtaining information, supervising and obliging compliance with the conditions of the contract.

Likewise, Williamson (1985) points to two groups of fundamental conditions that have to arise simultaneously for there to be transaction costs. Conditions related to the behaviour of the individual, especially those associated with the limited rationality of human beings and the opportunism of economic agents. Conditions that are related to the environment of the transaction, in particular, uncertainty over the future and the habitual existence of reduced groups of agents with which to enter into contracts.

In addition, we should take into consideration the specificity of the assets involved in the transaction. In a transaction, it is considered that an asset is specific when it can not be reassigned for an alternative use without a significant reduction in its value. This specificity is considered the most significant dimension in the definition of a transaction, but it is not the only one, as the uncertainty that surrounds the transaction and the frequency with which it is done will also have to be considered.

Transactions are regulated by contracts, the different types of which give rise to different forms of managing transactions in accordance with their characteristics.

Even though firms and markets represent alternative ways of organizing transactions, Putterman and Kroszner (1986) considered that market economies constitute a single network of the entire fabric of the economy. In other words, markets may also exist within organizations and, in turn, the markets may up to a certain point be organized. As Leibenstein (1987) and Douma and Schreuder (1998) pointed out, in practice, markets and organizational coordination are often found in combination.

3.3 Theory of Ownership Rights

The Theory of Ownership Rights (Demsetz 1967), initially formulated by Alchian and Demsetz (1972), provides explanations that justify the firm and the figure of the entrepreneur, but where the relation of authority is not the entrepreneurial. In addition, it seeks to explain not only the existence of the firm, but also its structure.

From that perspective, the firm is contemplated as a set of participants in productive cooperation, who find themselves in a situation that is characterized by the existence of an agent. That agent occupies a central position by participating in the contracts of the other inputs and, hence, that is termed a system of team production. As Alchian and Woodward (1988) affirmed, the figure of the administrator or director of overall production is emphasized.

There is production in a team when the set of individuals cooperate by using different resources to arrive at a product that does not correspond to the sum of the separable outputs for each resource that is employed. Moreover, the set of resources that are used belong to no one single person. Under these conditions, there are problems of measurement and monitoring of individual performance, as well as incentives, as it is costly to determine the contribution of each member of the final product.

On this basis, the contents of the rights over people affect the assignation and use of the resources in a specific and predictable form. Therefore, the effects arising from the possible assignation of ownership rights on economic activity may be determined. These possibilities lead to different structures for payment and sanctions, as Furubotn and Pejovich (1972, 1974) affirmed, determining the conduct of participants. In this way, an interconnection between rights, incentives and behaviour is brought to light.

The market is not an efficient form of governance for team production, as no modification is introduced in the incentives of the participants. Moreover, the lower the remuneration demanded by a possible team member, the greater the incentives to reduce the level of performance.

On the contrary, the firm organizes production in a team efficiently, by establishing an agent, whether an individual or a group, in charge of measuring the productivity of the other members and to remunerate them or sanction them accordingly. That agent is the entrepreneur or the director, who when negotiating prices with the owners of the inputs, as well as directing and observing the actions of employees and the use of the inputs, will do nothing else than measure the productivity of each resource and remunerate it in consequence.

The appearance of the entrepreneur in the team modifies the incentive of its members when rewarding performance. Reviewing and closing contracts, so that the best can be selected and each member rewarded according to their productivity. In addition, the performance of the team depends on the actions of the entrepreneur, who should find incentives for them to perform their role. It is precisely the residual earnings they receive, as well as the possibility of selling their position in the team that constitute the incentives to do so.

In conclusion, according to Alchian and Demsetz (1972), and under a criteria of economic rationality, the firm is born through two conditions that arise simultaneously, when: (1) it is possible to increase the global productivity of a set of resources through the establishment of a system of team production; and, (2) the cost of disciplining the team members through the figure of the entrepreneur does not exceed the earnings in global productivity that are obtained through the formation of the team.

The above arguments have received numerous criticisms, especially those that defend more participative forms of organization. In this sense, Putterman and Kroszner (1986) warned that it is not necessarily the right to the residual earnings of the central agent that leads it to act in more efficient way, as the costs implied by this class of coordination are higher than what is achieved in exchange.

These forms of cooperativism would partly explain the existence of a multitude of programmes, such as the Israeli kibbutz and industrial complexes like Mondragón, which, through greater worker participation in the decisions that affect them, can improve individual performance without resorting to the production team approach of Alchian and Demsetz. In addition, the benefit or residual earnings to which reference is made depend more on circumstances and not only on the level of production.

3.4 Agency Theory

Organizations, in general, and the firm, in particular, are complex and are constituted by a multitude of heterogeneous agents. Therefore, a transaction costs analysis advises defining archetypes that can channel contractual relations and the costs that

correspond to the two agents: the principal and whoever is strictly speaking the agent.

Agency Theory arises within the institutionalist economy, for Jensen and Meckling (1976), on a different branch from transaction costs branch, because of the interest in the analysis of contracts between individual economic agents. Their object is to minimize agency costs that arise from all forms of cooperation between two or more people. The agency relation appears when a person, the principal, commissions another, the agent, in exchange for a remuneration, a certain task, for the completion of which the agent is conferred a wide margin of independence or freedom of action.

An agency contract differs from an employment contract in which, in general, it is the agent (the employee, in a nutshell) to whom responsibility falls for coordinating, directing and controlling the work commissioned by the principal. To conceptualize the firm as a set of heterogeneous groups: shareholders, directors, creditors, suppliers, clients, etc., implies the existence of a set of different contracts. The costs arise in the firm as a consequence of the conflicts that emerge between these groups with opposing interests. Under this proposal, the firm is organized as a set of principal-agent relations. So, its design should tend to minimize the agency costs that cover all the contractual costs, frequently referred to as transaction costs, costs of moral hazard and information costs, which are incurred with the object of reducing deviations in the behaviour of the agent with regard to the interests of the principal.

It should be recognized that the contracting parties support the agency costs associated with their interaction, and have incentives to enter into contracts that, in so far as possible, reduce those costs. Specifically, the contracting parties benefit from foreseeing actions to negotiate and to sign contracts that facilitate the desired actions. Incentives are thereby generated to enter into contracts and to create institutions with fewer agency costs (Smith 1987).

Agency problems arise from conflicts of interests that are commonly found in most cooperative ventures, both whether they are or are not done in the hierarchical manner implicit in the analogy of principal-agent. This opening of agency costs to all cooperative relations has important implications for agency theory, because when the difference between principal and agent is removed, the distinction between the supervisory costs and finance costs are also lost. In this way, total agency costs are the costs occasioned by actions that aim to reduce residual loss plus the opportunity costs.

The paradigm of agency theory has its immediate antecedents in the literature developed on the basis of the separation between ownership and control. According to Levithal (1988), this current of thought may be understood as the neoclassical response to the questions proposed by Barnard (1938) and March and Simon (1958) on the behaviour of an organizations formed by agents with their own self-interest and objectives in conflict, in a world with incomplete information. It implies that that this theory is based on two basic suppositions; the existence of uncertainty and conflict of objectives. Uncertainty opens the door to opportunistic behaviour and a

conflict of objectives between the principal and the agent. Adding the existence of information symmetries, the need to establish incentive systems is proposed.

There is the risk in all agency relations of a deviation of behaviour of the agent with regard to the interests of the principal. Certainly, every time that authority is delegated in the firm and the behaviour of the agent may not be directly supervised, the problem arises of how to resolve this situation in an efficient way. It may therefore be affirmed, in the words of Rumelt et al. (1991) that agency theory deals with the design of incentives and the assignation of decision rights between individuals with opposing interests.

Jensen (1983) established two approaches in the development of agency theory, which he termed Positive Agency Theory and the Principal Agent Theory. Both approaches are directed towards the design of efficient contracts in a Paretian sense. But both approaches also diverge into various dimensions.

Positive agency theory has an empirical orientation. It seeks to identify the situations in which it is likely that the agent and the principal have contradictory objectives and, subsequently, in the description of the governance mechanisms that limited the opportunistic and the egoistical behaviour of the agent resolving in this way the agency problems.

The Principal Agent Theory is markedly mathematical and has an acute normative character. It centres on the optimum design of contracts in accordance with various hypotheses on the preferences of agents and asymmetrical information, being in this sense a worthy effort to extend the optimizing neoclassic model to the economy of organizations.

3.5 Evolutionist Theory

At the heart of the institutionalist current, Hodgson (1998a, b) presented the economic analysis of the firm in terms of resources and capabilities. It considers whether Adam Smith and Karl Marx may be considered as precursors of this analysis; Knight (1921), Penrose (1959) and Richardson (1972) are those who have truly developed the concept of capabilities.

The contractual approach is interested in the transactions between given individuals. It pays less attention to production and technology, as well as to questions of accumulation and growth. In short, this analysis is essentially static, which means it can treat neither dynamic efficiency nor perspectives in the long-term. In particular, the heterogeneity of the behaviours and the performance of firms mean those realities are not apprehended.

In contrast, the approach in terms of capabilities grapples with those topics directly, thereby providing, according to Krafft and Maupertuis (1996), a richer theory of the firm and of institutions. In this analysis, the appearance, the structure and the limits of the firm are explained by the presence of individual but also collective capabilities, which are in any case, preserved and reinforced by this organization.

The resources school underlines the differences in resources and capabilities that the firm possesses and the importance of this fact to explain the differences in the results over time. This approach seeks to explain the processes of dynamic change.

Resources are a changing stock of available factors that the firm possesses or controls. They may be either tangible or intangible. The capabilities of the firm are knowledge and skills that arise from the collective learning of the organization, as a consequence of the creation of organizational routines that are developed by the exchange of information between the members of the firm.

It should be highlighted that evolutionist developments that seek to give a theoretical basis to the economic behaviour of the firm frequently recur to contractualist arguments to understand the organization of productive activities. It may be noted that the analysis of dynamic capabilities is oriented towards an attempt to summarize, or at least towards conciliation between the transaction cost economy and the economy of capabilities.

In their seminal work, Nelson and Winter (1982) characterized the firm as a set of capabilities, some of which were intangible, subjected to a process of routinization. In other words, the firm is a hierarchy of organizational routines. The conversion of organizational activities into routines constitutes the principal form of storing its specific operative knowledge; routines as organizational memory. This organizational memory helps to reconsider decisions that are relatively satisfactory in the presence of complex decisions, limited satisfaction or rationality, and to coordinate the respective actions in the absence of perfect communication.

According to Nelson (from Krafft and Maupertuis 1996): "The idea of capabilities that are changing over time, whether within the firm, whether because of exchanges between firms, is fundamental and can contribute a lot to understanding the nature of the firm and its evolving strategies. A certain number of articles have centred on the attempt by firms to accumulate capabilities that are not easily imitable by rival firms. From my point of view, the truly interesting question is not linked to the creation of knowledge that is difficult to imitate. It is rather to study how firms are able to obtain benefits from their knowledge and capabilities".

4 Concluding Remarks: The New Industrial Organization

The evolution of thought relating to the Organization and Management Sciences of has been closely linked to changes in the environment that surrounds the firm. At first, the key concept is management to achieve coordination, in response to the need for integration, of both functional activities and divisions.

Subsequently, as from the 1970s, and in reaction to the acceleration of the process of change in the environment, the emphasis of management was progressively shifting from coordination to the definition and the implementation of strategies, focusing business management not only on internal administration and the type of competition. The work of Learned et al. (1965) pioneered progress in this field.

The firm arose as an economic organization to produce goods and services and as an alternative resource assignation to the market. "A firm will have to grow until the organizational costs of an extra transaction within the firm are equal to the costs involved in completing the transaction in the open market, or the organization costs that relate to the entrepreneur." (Coase 1937). In other words, until the market costs of that additional transaction are equal to the agency costs. It is therefore a problem of equilibrium between business efficiency and where the market ends is the result of a comparative dynamic continuum between transaction and production costs.

As previously stated transaction, cost arise from information, coordination (negotiation), follow up and guarantees to transaction completion. Its origin lies in human factors: limited rationality and opportunism. In contextual factors, repetition and sequencing of stages in the negotiation, relative information asymmetries and the order of intervention in the negotiation. Its amount depends on the specificity of the assets involved, on the frequency of the transaction, its complexity, its uncertainty and possible relations with other transactions.

Hernández (1997) states that transaction costs require recognition and guarantees of the ownership rights, they underline the importance of institutions, and bring to the foreground the art of integrating technology and organization—Engineering of the Organization—, as keys to understand the generation of wealth. The award of the Nobel Prize to R. Coase in 1991 helped his influence to move fast the field of the economy of the firm, forcing convergence into what we may call the New Industrial Organization, of the Economy and the Law, Organizational Engineering and Industrial Organization.

With this approach, it is possible to analyze the different facts that determine the behaviour of organizations and of markets. In other words, how the markets and firms structure themselves, how the sellers, the consumers, the workers and the intermediaries behave in those markets, and how those markets function from the point of view of prices, costs, product quality, innovation, risk distribution and other operational indicators. Without forgetting to mention aspects linked to the organization of management and production in the firm.

In our understanding, the object of Industrial Organization within Economics is represented well by J. Tirole and his work The Theory of Industrial Organization (1989). Basically, it centres on how equilibrium is achieved with a set of alternative economic criteria to the classical competitive market with complete contracts and non-symmetrical information. In fact, equilibrium may be inefficient when comparing it with the earlier norm. Prices can exceed the marginal cost and the quality of the product may be very high or very low. It may have many or few products, etc.

It is a question of understanding how economies of scale and hidden costs, asymmetrical information, product differentiation, and other basic economic characteristics of a market, combined with different behavioural hypotheses, affect the resulting equilibrium of imperfect competition that is associated with the operation of the market. In other words, it explores the extensive terrain of imperfect competition that exists between the simple models of perfect competition and the pure classic monopoly.

Few markets are pure competition or pure monopolies. Hence, Industrial Organizations plays a very important role, when providing a refined characterization of what competition means in imperfect markets. In addition, we may create a coherent structure to analyze how changes in the institutional environment (common lays, administrative regulation, etc.) affect the structure and the operation of the market and the behaviour of the firm.

What is more, the Industrial Organization also provides links with Organizational Engineering (governance structure) because the existence of imperfect competition can mean that vertical integration or non-standard contracts are attractive governance alternatives, in order to respond to those market imperfections or to increase the power of the market. However, it largely ignores the institutional environment and the governance structure.

The integration of the institutional environment implies the interrelations between its attributes and the organization and the operation of the markets. It is fundamentally interested in the evolution and the role of formal and informal institutions that govern ownership rights in the market, the nature and impact of regulation on its operation, and its organization. The most relevant aspect is the evolution of ownership rights.

Finally, Organizational Engineering (design, planning, and control of productive systems) may be mentioned, as a generator of wealth and improved coordination; for example, the adoption of assisted productive systems, such as JIT, initially developed by Toyota. It is a system of communication and close coordination between the successive phases of a process, provoking an increase in the reliability of the system. The improvement of the process simultaneously provokes an improvement in product quality. It is, in this way, possible to compete against firms with large economies of scale, through greater flexibility linked to shorter response times.

The adoption of these techniques, which are better forms of coordinating production, by other industries together with the new approaches to management from total quality and virtual organizations, have meant that those economies that have adopted these methods have increased their productivity and reduced the volume of their inventories.

What is it that makes the New Industrial Organization different from the wide and diverse set of methodological approaches for the analysis of firms and the market?

We consider the New Industrial Organization as something the flows from the paradigm of the Industrial Organization, expanding towards a richer and more complete specification of the industrial environment and the transactional variables that characterize the organization of firms and markets. In addition, feedback and interactions between the institutional setting and the structure are taken into account, as well as the behaviour and operation of firms.

From the standpoint of exchange costs and production costs, we are interested in the transaction costs, considering goods and services as transactions with their attributes, in other words, the exchange of rights.

The institutional environment emphasizes ownership rights, legal institutions, and the clients and norms that play a fundamental role to determine how the markets are organized and, more importantly, how they behave. As Williamson (1993) observed, the differences between the governance structure and the institutional environment are probably more important to explain the international and inter-temporal differences in organizational agreements.

Economic agents seek their own interests, but operate in a world of limited rationality. Information is costly, is asymmetrically distributed and the contracts are incomplete. The institutional and contractual agreements arise to reduce the direct and indirect costs of acquiring inputs, manufacturing products, and selling products and services.

Relevant transaction costs include the costs of carrying out the transaction and, more importantly, the costs of contractual failure (suspension and opportunism), and the costs incurred when dealing with rent-seeking and defending oneself from it.

The essence of the governance structure is, therefore, how to organize, control and consume transactions between economic agents, considering the productive function in its widest sense. At all times under the prism of evolutionist thought, industrial dynamics and a changing environment.

So, the New Industrial Organization (NOI) has three dimensions (Fig. 1), which in the terminology of Hernández (1997) are as follows:

- Vector of opportunities and market threats: basic market conditions, number of agents, competitive interactions and strategic behaviours, information asymmetries and market power.

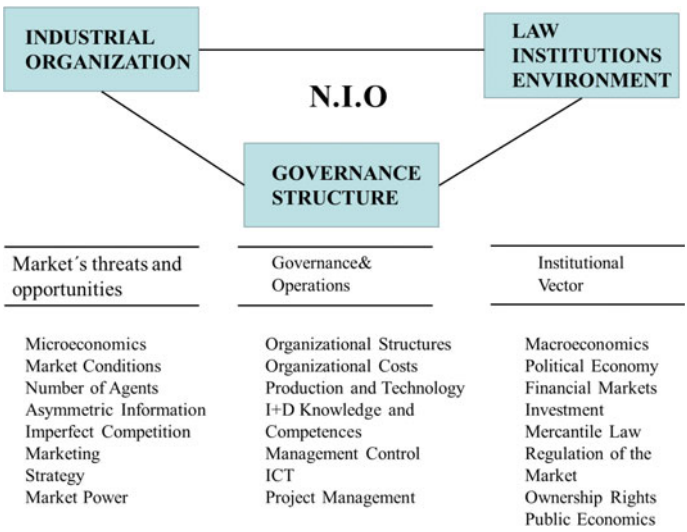

Fig. 1 The dimensions of the New Industrial Organization (NIO)

- Institutional Vector (of economy and law): ownership rights, administrative regulation of those rights, policy of industrial "promotion" and patent protection, etc.
- Vector of governance structures of the firm: technology and production, coordination and motivation, knowledge generation and networking coordination with stakeholders and other firms to maintain the firm as an open system. According to Joskow (1995), it is a matter of efficient coupling of resources and capabilities of the firm with the opportunities of the market and the institutions. Being in the XXI century we should add: In a global world thanks to the advances of the information and communication technologies.

These dimensions can give us a map of the Management and Organization Sciences, and help designing the Management Engineering curricula and the range of specific skills and competences demanded by different institutions.

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