

EVOLUTIONARY THEORY AND THE MARKET COMPETITION

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Abstract: *Evolutionary theory study of processes that transform economy for firms, institutions, industries, employment, production, trade and growth within, through the actions of diverse agents from experience and interactions, using evolutionary methodology. Evolutionary theory analyses the unleashing of a process of technological and institutional innovation by generating and testing a diversity of ideas which discover and accumulate more survival value for the costs incurred than competing alternatives. This paper presents study the behavior of the firms on the market used the evolutionary theory. The paper is to present in full the developments that have led to the re-assessment of theories of firms starting from the criticism on Coase's theory based on the lack of testable hypotheses and on non-operative definition of transaction costs. In the literature in the field studies on firms were allotted a secondary place for a long period of time, to date the new theories of the firm hold a dominant place in the firms' economic analysis. In an article, published in 1937, Ronald H. Coase identified the main sources of the cost of using the market mechanism. The firms theory represent a issue intensively studied in the literature in the field, regarding the survival, competitiveness and innovation of firm on the market. The research of Nelson and Winter, "An Evolutionary Theory of Economic Change" (1982) is the starting point for a modern literature in the field which considers the approach of the theory of the firm from an evolutionary perspective. Nelson and Winter have shown that the "orthodox" theory, is objectionable primarily by the fact that the hypothesis regarding profit maximization has a normative character and is not valid in any situation. Nelson and Winter reconsidered their microeconomic analysis showing that excessive attention should not be paid to market equilibrium but rather to dynamic processes resulting from irreversible economic exchanges. This paper is focused on the market competition. In this market the firms must define its behaviour and formulate strategies for future actions affected by risk and uncertainty. The conclusions of the paper reveal that using a theory of the firm as reference framework regarding the representation of the economic agent's on market structure, opens the way for a new field of investigation.*

Keywords: *market structures, market competition, firm, evolutionary theory*

JEL classification: *D41, D42, D43*

1. Introduction

Evolutionary theory is part of mainstream economics as well as a heterodox school of economic thought that is inspired by evolutionary biology. Much like mainstream economics, it stresses complex interdependencies, competition, growth, structural change, and resource constraints but differs in the approaches which are used to analyze these phenomena.

A term coined by Thorstein Veblen (1857-1929), an American economist and sociologist. Veblen's evolutionary economics drew upon anthropology, sociology, psychology and darwinian principles. Evolutionary economists believe that economic organization is a dynamic process involving ongoing transformation, and that economic behavior is determined by both individuals and society as a whole

The evidence suggests that it could be adaptive efficiency that defines economic efficiency. Mainstream economic reasoning begins with the postulates of scarcity and rational agents (that is, agents modeled as maximizing their individual welfare), with the "rational choice" for any agent being a straightforward exercise in mathematical optimization. There has been renewed interest in treating economic systems as evolutionary systems in the developing field of Complexity economics (Longuet S., 2011).

The research of Nelson and Winter, "An Evolutionary Theory of Economic Change" (1982) is the starting point for a modern literature in the field which considers the approach of the theory of the firm from an evolutionary perspective. Nelson and Winter have shown that the "orthodox" theory, is objectionable primarily by the fact that the hypothesis regarding profit maximization has a normative character and is not valid in any situation (Dosi, G., R. R. Nelson, S. G. Winter, 2000). Secondly, Nelson and Winter reconsidered their microeconomic analysis showing that excessive attention should not be paid to market equilibrium but rather to dynamic processes resulting from irreversible economic exchanges.

Evolutionary theory does not take the characteristics of either the objects of choice or of the decision-maker as fixed. Rather its focus is on the non-equilibrium *processes* that transform the economy from within and their implications. The processes in turn emerge from actions of diverse agents with bounded rationality who may learn from experience and interactions and whose differences contribute to the change (Longuet S., 2011). The subject draws more recently on evolutionary game theory and on the evolutionary methodology of Charles Darwin and the non-equilibrium economics principle of circular and cumulative causation. It is naturalistic in purging earlier notions of economic change as teleological or necessarily improving the human condition.

2. The firms theory

In the literature in the field studies on firms were allotted a secondary place for a long period of time, to date the new theories of the firm hold a dominant place in the firms' economic analysis. In an article, published in 1937, Ronald H. Coase identified the main sources of the cost of using the market mechanism. The firms theory represent a issue intensively studied in the literature in the field, regarding the survival, competitiveness and innovation of firm on the market (Coase R., 2002).

The theory presented by R.H. Coase was based on generalizing organizational situations in an environment dominated by the market where trading costs are significant. Defining firm existence within the marginal theory of the firm is one of the important issues raised by Ronald H. Coase. He analyzed the reasons why organizations exist and survive in an economy of exchange in which resource allocation is governed by the price system. Ronald H. Coase analyzes both the natural reasons of the firm's existence, and the implied contractual costs, the law on market transactions and the costs of market utility. Thus, a firm becomes even greater as additional transactions (exchanges coordinated by the price mechanism) are effectively organized by the entrepreneur (Giovanni Dosi, Teece D., S. Winter, 2008).

Formed in accordance with the values promoted by the neoclassical school (along with his contemporaries Friedrich von Hayek and Milton Friedman), Ludwig von Mises published in 1940 his work "Human Action" in which he stated that the economy is a social science. There were many reactions against this way of considering the economy and hence the calling into question the entire neoclassical paradigm. In this context, the firm, the enterprise, represents a form of human action, namely the creation of the entrepreneur. It is an integrative part of the market, and should be integrated into the general theory on price formation and market process.

Authors like O.E. Williamson (1971), S.G. Winter (1982), S. Ross (1973) H. Demsetz (1972), a.o., developed the approach initiated by R. Coase in 1937 and discovered new areas for its application. Alchian and Demsetz (1972) argued that the neoclassical theory of the firm does not actually refer to firms, but to the industry. Individual firms will, in general, follow routines described by researchers, but in fact the industry is complying with the marginal principles. The industry tends towards the optimal decision, but not because of changes occurred in the behavior of firms, where profit maximization is the result of an evolutionary process which took place in the industry. Langlois (2003) show that firms with identical production functions transform homogeneous inputs into homogeneous outputs according to well known technical "plans".

Machlup (1947) and Stigler (1947) also defended the marginal principle, as a reaction to these studies. Machlup argued that firms use established routines in decision making. Alchian and Demsetz (1972) argue that the hierarchical structure of the firm's control does not minimize transaction costs, only monitoring costs. The idea of the firm's behavior put forward by Demsetz and Alchain is not much different from the market behavior, suggested by Jensen and Meckling (1976) who introduced the idea of agency costs as a source of the firm's structure. In this regard the firm's behavior is similar to that of the market; it is the result of a complex balancing process. E. Fama (1988) stated that the separation of share ownership and their control can be explained as an effective form of economic organization in the perspective of the "set of contracts". Every factor of production within the company is to be found in inputs, which put together can create final outputs. The contractual theories of the firm are based on the importance of property rights, asymmetric information and moral hazard. Continuing the reflection of R. Coase, O. Williamson analyzes the situations in which the exchanges reflect a large opportunist potential. Using the sources of sustainable competitive advantage has renewed the resource-based firm theory.

The resource-based firm theory explains performance differences between firms. Thus, the capabilities are the firm's knowledge base (they belong to the firm and not to individual agents). From this perspective, the firms are heterogeneous, the competitive advantage is translated in terms of efficiency of annuities, and the sustainability is based on the difficulty for the competitors to imitate. The need to integrate the two approaches to the theory of the firm – the contractual perspective and the one based on capabilities – is underlined by other theoreticians on this issue stating that for a better understanding of the firm, more attention should be given to the problem of distribution of knowledge / production knowledge among companies, and especially to their character (Demsetz). The corporation is not only a contractual entity, it is in the same time an entity that both learns and innovates, seeking competitive advantages from economies of scale and scope based on superior capabilities. Continuing the idea of coordinating knowledge, some authors (Cremer 1990, Radner 1992, 1996, Bolton and Dewatripont 1994) identify the firm with a network of communication set up to minimize both the cost of processing new information as well as its communication cost between agents.

Based on these considerations we find that in the literature in the field there are two significant approaches in studying enterprise theories. The first refers to the economic approach, which developed the economic theory of the enterprise, and the second relates to their managerial approach, which developed the entrepreneurial theory of the firm. Alchian and Demsetz (1972) challenge Coase's theory, arguing that the hierarchical structure of the enterprise does not minimize the transaction costs of the company, but its monitoring costs. Jensen and Meckling (1976) study the enterprise behavior on the market, based on results of the research conducted by Alchain and Demsetz, and introduce the idea of agency costs at enterprise level (Jensen M., Meckling W., 2009).

Continuing the research of R. Coase, O. Williamson examines situations where exchanges reflect a high opportunistic potential. Thus, contractual theories of the

enterprise are based on the importance of property rights, asymmetric information and moral hazard (Fama E., 1988).

The research of Nelson and Winter, "An Evolutionary Theory of Economic Change" (1982) represents the starting point and main reference of the current literature in the field on addressing enterprise theories from an evolutionary perspective (Dosi G., Nelson R., S. Winter, 2000). The microeconomic analysis is reviewed, insisting not so much on market equilibrium as on the dynamic processes arising from irreversible economic exchanges.

The crisis of the Marshall firm theory raises the question of cooperation between enterprises and the need to address it from a dynamic perspective. There is research in the field developed on this subject among which the transactional analysis, applications of the game theory based on an analogy to intra-enterprise cooperation and inter - enterprise, the combination of the two (inter- and intra- enterprise). Cooperation between firms (Geoffrey A. Jehle, Philip J. Reny, 2000), as a current issue, attested by various empirical studies, is the subject of a relatively small number of studies in the literature in the field.

3. The market competition and the transactions between firms

The market competition notion was and continues to be strongly related on the one hand, to hypotheses of economic agent's behaviors, and to relative hypotheses of market functioning, on the other hand (Geoffrey A. Jehle, Philip J. Reny, 2000). The capacity of putting pressure on price depends on the power of each supplier, on the market characteristics within opposition rapports. In parallel with price deciding or influencing, every supplier is preoccupied with increasing the market share (the percentage from the accomplished offer of industry) as a premise in maximizing the total profit. Real markets are generally characterized by imperfect competition. It's been concluded that there is imperfect competition in a specific field (industry) if salesmen themselves decide or influence the price levels to their offer individually.

The market with pure and perfect competition represents the theoretical pattern, an ideal situation which emphasizes the intrinsic virtues of the „invisible hand" as being the best natural mechanism of economy functioning and adjusting. Although considered as theoretical pattern, the market with perfect competition stresses upon the market strengths which naturally lead to the most rational and the best possible fulfilling of both producers and consumers interests.

Market forces are not impersonal and the reduced number of economic actors leads to adopting a strategic behavior by anticipating competitor's reactions. There are some rules that need to be followed, rules given by the free game of economic actors. The interdependence principle of different actor's behaviors represents one of the minimal rules of imperfect competition policy.

The literature in the economics field identifies two important characteristics in the delimitation of the firms frontiers: on one hand the diversity of production and on the other hand the diversity of portfolios. This shows that the activities of the enterprise are based on a high level liaison, which is called coherence in the literature in the field. The consistency of the enterprise is different from the specialization, the latter being a particular case of the first. For this reason an enterprise can provide real coherence without necessarily being specialized. Thus, a firm can prove consistency when its activities are closely related and share several features .

If the standard neoclassical theory of the enterprise argued isolate the question of consistency, an explicit approach is currently presented not only in terms of production, exchange and transaction costs but also in terms of innovation. Thus, the degree of coherence is manifested by the dependence between knowledge, constraints regarding

enterprise expansion and opportunities on one hand, and additional assets acquired and reinvested in the enterprise on the other hand (Foss Nicolai Juul, 2006).

The specificity of this competition type can be realized with the help of the games theory. Markets with imperfect competition are of huge diversity, but they are never in pure pattern. Therefore, on imperfect markets, consumers are confronted with particular product brands, with a finite range of substitution products, etc. Thus, the modality in which competitive companies choose quality, quantity, price, etc should be studied first. Unlike free entering and exiting the market postulated by the perfect competition, this hypothesis is not verified for the imperfect competition. There already are companies on this market which impose entering barriers for other new companies. Augustin Cournot studied in 1838 the operation of the duopoly markets where each company takes action knowing that its volume of production affects the market cost (Sîrghi N., 2008). In 1833 J. Bertrand studied the operation of the oligopoly markets where the companies with constant efficiencies produce the same product settling the selling price. The result mentioned by Bertrand is known as Bertrand paradox. In 1934 Stackelberg shows that some companies can be leader and that are able to impose the price to the others. The leader company, as a barometer company, knows best the market situation and has the means necessary in order to control the counter party. This doesn't mean that the company is the most powerful but well informed and organised. The following question comes up: Which of the behaviours mentioned above should be followed? In order to answer this question, a theory was needed which could explain the interactions between companies. This is the great contribution of the game theory. It allows the elaboration of an analytical framework regarding the situations when an agent's decisions can affect the earnings of the other agents.

In the market, price changes lead to different transactions of exchange. Within the firm there are two alternative methods of transactions' coordination: internal coordination and external coordination (Kirzner I.M., 2007). The essence of cooperation agreements is the fact that the parties agree to a system of guarantees and contractual clauses. There are therefore transactions between firms at lower costs than the real market costs imposed by an open market. In this case transaction costs between firms are lower than market transaction costs on the open markets. Thus can be identified the dimensions of the relationship of firms – market, which are related to the analysis of the economic activity coordination.

The market structures vary depending on: the influence on the costs settlement; the companies' production of standardized or non - standardized products; the companies' possibility to enter on the market; the publicity, the products' features, etc. The duopoly means a market structure controlled by a two producers, the actions of each producer affecting the others competitors' actions. If a producer cuts the price in order to increase the sales, then its competitors will react by cutting their price too, thing which will determine a profit decrease for the first company. Before making the decision regarding the price cut, the duopoly company would have to analyse first the future reaction of its competitors and the consequences upon it. In the first works on oligopoly, Cournot (1838) and Bertrand (1883), write about the elements used by the theory of games for analyse of the imperfect competition (Cowen T, D. Parker , 2010).

Studying the situations of imperfect competition, especially the one of duopoly where the buyers' decisions are interdependent, can be achieved with the help of non – cooperative games. Important applications of the game theory reside in different aspects of the duopoly competition, for example: secret agreements or price forming study in a closed economic system (Neamtu M., Sirghi N., Babaita C., Nitu R., 2010). In designing and testing models of evolution and revealing the firm's performance in a competitive environment affected by risk and uncertainty can be used stochastic mathematical models. Below we briefly present one of these models including finite stochastic

differences, namely the Behrens-Feichtinger model. A number of “physical” models were developed as an extension of the nonlinear microeconomic Richardson model. The firm’s reaction to the price cut is like it would be the result of a problem the competitors deal with. They have to operate in order to make the competitors believe in the penalty in case of agreement breakage. Updating the credibility of the menaces is important in order to respect the agreement as longer as possible. On this kind of markets, from time to time, price war can occur, which can end with the exclusion from the market of the weaker competitors.

The analysis of firm development in a competitive market is essential for the reassessment of firm theory from a new perspective. The neoclassical theory of the firm views the firm as a black box rational entity. The transactions cost theory of the firm focuses on problems of asymmetric information in the market. The evolutionary theory of firm places emphasis on production capabilities and process as well as product innovation.

4. Final conclusions

The economic level of the competition can be considered as a mechanism of resources allocation which allows, in many cases, the promotion of the economic efficiency. For this reason the notion of competition was and is related first to the behaviour hypothesis of the economical agents and second to the relative hypothesis of the market operation. When the coordination of the individual actions is adjusted by competition, each economic agent must forecast the other agents’ actions and then maximise depending on the results their own behaviour.

Some of the economic agents have a different behaviour on the market affecting the other economic agents’ behaviour. This type of reality resides in the “market structure” concept. The meaning of market structure represents the features of a market by the number and the relative power of the companies which operate on the market having the purpose of settling their behaviour and its consequences on the economic efficiency of the economic system.

Competition was and is related to the behaviour hypothesis of the economic agents and to the relative hypothesis of the market operation. Market forces are not impersonal and the reduced number of firms leads to adopting a strategic behavior by anticipating competitor’s reactions. The interdependence principle of different actor’s behaviors represents one of the minimal rules of imperfect competition policy. In economy, structural changes and oscillations are the rule and not the exception and the stationary states become instable when certain parameters vary. The economic actors have different behaviours on the market which have different consequences depending on the number, relative size and strategies approached by the other economic actors.

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