

# Evolution and modernization of the theory of the firm

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Economic Transformation  
and Evolutionary Theory of J. Shumpeter.  
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## **Evolution and modernization of the theory of the firm**

**This work compares, analyzes and classifies the well-known theories of the firm. The analysis takes into account various positional, target, environmental and social aspects of firm's activities. The analysis provides the directions along which the theory of the firm may develop. The work argues for a unified theory of the firm that should be complete, systemic and dynamic. These requirements should reflect the firm as a multifunctional and multistructural subject of the economic space. System-integrational theory of the enterprise that is developed by the author is being broadened by the inclusion of the eventual structure that facilitates the coherence of various subsystems and makes the theory more dynamic.**

According to Paul Milgrom, the theory of the firm has once again (after decades of neglect) taken the central place in the microeconomic theory. This kind of attention is long overdue. The economic events of the last fifteen years, especially those that had taken place in the transition economies, and the development of the economic theory itself have demonstrated the need to restructure the firms themselves, their normative and legal environment, and the whole body of descriptive and normative knowledge regarding the firm. Existing theories were unable either to explain or to forecast the firm's behavior. They were also unable to give any advice on how to create the effective normative and legal environment of firms or to give any recommendations to concrete businesses. In our opinion, the inefficiency and inaequacy of the theory of the firm is a powerful obstacle on the path of world economic development.

Nevertheless, a number of economists share a well-known opinion that the theory of the firm plays a secondary role in the family of economic theories. According to them, everything useful produced by the former was absorbed and reformulated by the theory of industrial organization, while the firm by itself can be a source of information for the economic theory only if it is considered in the context of the market. According to Hay and Morris (1999), the development of the theory of industrial organization was a result of a number of inconsistencies inherent to the theory of the firm.

In our opinion, the theory of the firm has an independent object of study, a unique vision of the economy as a whole, as well as its own analytical techniques. Each enterprise is a socio-economic universe that can be viewed as a projection of the economy as a whole. Understanding the firm is essential to understanding the economy. This is especially important for Russia. Here we can say, paraphrasing the famous poet E. Evtushenko expression, "A firm in Russia is more than a firm". Most of Russian enterprises are not simply producers of goods, but miniature cities - places where a worker spends most of his life, finds friends, loved ones and realizes his social potential. This special role of enterprises is one of the defining features of Russian economy. This specificity may require the introduction of country parameters in the theories of the firm and industrial organization.

This work attempts to analyze the development of the theory of the enterprise and to suggest several ways to modernize that theory by considering various strains of the theory in the framework of the system-integrational paradigm. It should be noted that the comparative analysis of various branches of the theory of the firm is still an

important task. This is evidenced in the recent works by Demsetz (1997) and Jensen (2001). Another example is the work by Foss (1996), that synthesizes institutional and informational theories, and the work by Cohendet and Llerena (1998) that integrates the evolutionary, cognitive and informational approaches.

In the beginning, it is necessary to define the terminology. The enterprise (or the firm) is a concrete organization that produces, on a regular basis, goods or services for use outside the organization. The theory of the enterprise (or a branch of that theory) is a conception describing the causes and nature of one or several processes taking place within the enterprise or between the enterprise or one of its components and the environment.

Table 1 gives the main (best-known) variants of the theory of the firm (in another terminology – the bases of enterprise theory). For each case the table gives three characteristics. First, it is a brief annotation describing the theory's vision of the enterprise (the "what" and "how" the enterprise is doing). The second characteristic is the description of the defining feature ("portrait") of an enterprise according to each theory. Finally, a reference to a representative seminal publication is provided for each case. The theories are sorted according to the date of the paper's publication<sup>1</sup>.

Table 1

The main directions of the theory of the enterprise

No.	Name	Annotation	«The picture» of an enterprise	Representative publication
1.	Profit maximization	The enterprise produces and sells output, choosing the combination of inputs that maximizes the difference between revenue and cost	The production function	(Marshall, 1919)
2.	Entrepreneurial (Schumpeterian) theory	An enterprise led by an innovative entrepreneur, uses borrowed resources to produce a new product, explore a new market or introduce a new technology. The enterprise led by an imitator uses innovations in competition.	The production function, a source of innovative or imitative entrepreneurial activity	(Shumpeter, 1934)
3.	Contract theory	The main activity of an enterprise is the setting and fulfilment of contracts between the enterprise and its internal (workers) and external (partners) contractors (correspondingly, the transactional and relational contracts). The enterprise must	The set of contracts between the enterprise and is internal and external contractors	(Coase, 1937)

<sup>1</sup> We are conscious of the subjectiveness of the list itself as well as of each description and of the choice of publication. Each description corresponds to a stylized theory. At the same time, the structure represented here is necessary for the classification of the theories and for the analysis of their appearance.

		also monitor the fulfillment of such contracts. The boundary of the enterprise is defined by the correspondence between the levels of transaction and administrative costs.		
4.	Revenue maximization	An enterprise produces and sells output using the combination of inputs that maximizes revenue	The production function	(Baumol, 1958)
5.	Maximization of the value of the firm	An enterprise's activities are aimed at improving the market value of the enterprise.	The generator of cash flows (inflows and outflows)	(Modigliani, Miller, 1958)
6.	The self-governing firm	An enterprise's activities are a compromise between the maximization of total wage per worker and the maintenance of a certain level of employment	The production function and the wage function	(Ward, 1958)
7.	Cognitive theory	An enterprise is engaged in productive and learning activity, using its knowledge and skills (collective and personal) as one of the production inputs. The learning abilities are limited.	The production function that reflects the use of inputs (including cognitive resources) in production, and the function of knowledge production. The internal network for generation and storage of knowledge.	(Polanyi, 1962)
8.	Maximization of the growth rate of the firm	An enterprise produces and sells output using the set of inputs that maximizes the long-term rates of growth of the assets and resources of the enterprise предприятия	The production function	(Marris, 1963)
9.	Behavioral theory	An enterprise conducts economic activity and in each period realizes the goals of a concrete member of the managing coalition. The existing routines or the procedures of structural search are used to solve the problems.	The coalition of unequal participants that have differing objectives acting under uncertainty.	(Cyert, March, 1963)

10.	The efficiency theory	X-	An enterprise produces and sells output, uses the available resources and organizes the intrafirm system of motivation.	The production function that takes into account the factors of intrafirm and external motivation.	(Leibenstein, 1966)
11.	Maximization of manager's utility		An enterprise produces and sells output and uses the available resources in order to maximize the total income of the manager as well as the absolute and relative volume of his authority	The production function	(Williamson, 1967)
12.	Evolutionary theory		By conducting economic activity, an enterprise reacts to the changes in its external environment according to the inherited set of rules (routines) that play the role of a genotype. At the same time an enterprise is a member of a population of agents engaged in a competitive struggle for consumers or other sources of income; that leads to the selection and reinforcement of the corresponding routines	The set of routines, the socio-economic genotype	(Nelson, Winter, 1973)
13.	Corporate culture theory		An enterprise conducts competitive economic activity, makes decisions, acquires and processes information in the basis of the set of values, opinions, convictions, ways of explaining new information and historic facts and style characteristic of the enterprise. The compromise between the interests and evaluations of different actors within and without the enterprise is realized.	"«A corporation does not <i>have</i> culture. Corporation <i>is</i> culture» (Weick, 1995).	(Rhenman, 1973)
14.	The theory of behavioral control (the principal-agent model)		An enterprise conducts economic activity under the guidance of the manager whose interests and the degree of risk aversion are different from those of the auctioneers, with the manager having more	The set of principal-agent links	(Jensen, Meckling, 1976)

		information regarding these characteristics.		
15.	Political theory (the theory of power)	The functioning of an enterprise is defined by the decisions made as a result of a bargaining process between the members of a limited group of “power centers” of the enterprise.	The structure of the distribution of power on the enterprise.	(Pettigrew, 1977)
16.	Positioning theory (in an industrial, territorial or administrative space).	The results of an enterprise’s activity are determined by its position in the industry, city or by its relationship with the local administration	A point in an industrial, territorial or administrative system of coordinates	(Porter, 1980)
17.	Property rights approach	The boundary of an enterprise are formed according to the correspondence between risk and income of the owner of the residual property rights for the output, as well as to the enterprise’s specific assets.	Assets that are in the collective property of the owners and workers that are bound to the enterprise by incomplete contracts	(Hart, Grossman, 1986)
18.	Information theory	The main aspect of an enterprise’s activity is the processing of information as well as its use in the production process. An enterprise organizes its activities so as to minimize (including by the way of specializing) the cost of processing and internal dissemination of informatiuon.	The collective system of acquisition, creation, accumulation, internal dissemination, processing and transfer of socioeconomic information	(Aoki, 1986)

The lessons that can be learned from this table can be separated into two groups. The first group of results is concerned with the classification and grouping of the theories according to their content, the second group – with the process of their appearance.

1. Different branches of enterprise theory fall into groups according to the vision of the enterprise’s economic activity. Traditionally one can identify the group of neoclassical theories – maximization of profit, market value, revenue, size or wages of workers and managers. In our opinion, such theories can be identified as “objective-oriented” or, more correctly, “single-objective-oriented” theories, since they acknowledge that the enterprise has some constant objective which explains the decisions made by the enterprise. The argument for this kind of opinion can be found, for instance, in Jensen (2001). The second large group consists of the so-called institutional theories: contract, property-rights, principal - agent approaches. They are

characterized by the acceptance of institutions not only as the limitations, but as the driving force of an agent's behavior. The third group collects theories that link the behavior and condition of an enterprise to its location in some population: evolutionary theory and positional theories. Such theories can be termed "location theories"<sup>2</sup>. Theories belonging to the fourth group (the "social theories") appeal to interests, psychology and behavior of individuals within or around the enterprise: the political theory, the theory of X-efficiency, behavioral, enterpreneural, the theory of managerial wage maximization, and the theory of the self-governing firm. Finally, theories of the fifth group (the "environmental theories") focuses attention on the role of internal and external environments of the enterprise. Such are the informational, cognitive and cultural theories. In our opinion, however, this group should also include all the theories of the institutional group, since these theories rely on some institutional structure within the enterprise that is supported by the corresponding external institutions. Due to the branching nature of institutions and their interdependence (see Kleiner, 2003), the set of all institutions within and outside the enterprise should be seen as a continuous environment rather than as a collection of discrete elements. Therefore, four groups remain on the top level of the classification:

- objective-oriented theories,
- location theories,
- social theories,
- environmental theories.

Of course, such a division is very relative. For instance, in the Shumpeterian case the enterpreneural theory relies both on the abilities of the manager (whether he is an innovator or an imitator), and on the location of the firm in its competitive environment. At the same time, the above classification can help isolate focus factors of enterprise's behavior that are identified by various theories.

The above classification seems to be logical. No doubt, each enterprise has some space of objectives (not necessarily a single long-term purpose), has an internal environment and enjoys a certain location in the outside world. Moreover, an enterprise consists of workers, managers and stockholders, so the identification of theories that treat the social (human) factor as the most important one, is natural.

The differences among theories follow from different specifications of the four spheres mentioned above, from different estimates of enterprise's decision-making ability, and from exogenous assumptions regarding the sphere. For instance, the neoclassical theories assume that the objective sphere consists of only one element (profit maximization in the classic case), has full decision-making ability, and is unaffected by its location and internal environment. The corporate culture theory, on the other hand, treats the objective-setting process as endogenous and secondary to the cultural specificity of the enterprise.

It is important to note another aspect of the generalized groups of theories. Objective-oriented (neoclassical and such) theories are quantitative, since the enterprise's economic activity (the degree of deviation from its objective) can quantitatively measured. The same concerns location theories. Social and environmental theories, on the other hand, measure the position of an enterprise on some qualitative scale.

1. If one considers the chronology of the appearance of theories using the date of first seminal publication, one can see that each of the development of each of the

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<sup>2</sup> Evolutionary theory can belong to this group because it assumes that the mechanism of the change in the routines is induced by the position of the enterprise in the competition with other agents – members of the population.

four groups was differentiated throughout the 20<sup>th</sup> century. For instance, in the 20s-30s the neoclassical theory is rapidly developed, the basis for institutional theories is set, while the Schumpeterian entrepreneurial theory has both social and positional aspects. Indeed, by the middle of the 20<sup>th</sup> century all four directions have appeared, and continued to branch until the mid-90s even though objective-oriented theories were dominant until the early 60s. From that time on, two processes are taking place simultaneously: the broadening of the view and the increase of selectiveness in the theory's view of the enterprise. During that time, the objective theory of Sutter and March appears, while Leibenstein points to the deficiency of the traditional maximization approach, and the conception of implicit and inalienable knowledge is developed in M. Polanyi's work. It can be said that in the 1960s a certain degree of agnosticism appeared in the enterprise theories. More and more empty spots not previously covered by theory were identified.

During the following decade the theories looked inside the enterprise in a more detailed way. Among those developed was the evolutionary theory, that looked for the causes of enterprise's development in its past; the principal - agent concept that highlighted the relationship between managers and stockholders; the political theory that concentrated attention on the discontinuity of distribution of power and responsibility in the stakeholder structure. Of course, these conceptions could not highlight every aspect of the enterprise. The environmental theories (primarily the cultural theories) were needed to fill all the gaps.

In the 1980s the institutional theories, including the property-rights approach, were developed most rapidly. Institutional theories treated institutions as ways of decreasing future uncertainty, so the informational concepts were a natural addition to them.

In the beginning of the last decade of the 20<sup>th</sup> century the enterprise theory faced considerable problems both due to the inner logic of development and the external circumstances. Corporate problems unforeseen by theories and even scandals that took place in many countries over the last few decades posed a challenge to the theory. There were three major obstacles to adequately responding to the challenge: the existing theories were not systemic (weakly connected to each other), the scope in which enterprise was considered was too narrow, and most of the theories were static.

The nonsystemic problem follows from the fact that none of the theories listed above treats the enterprise as a whole, while theories' creators did not foresee ways of merging the theories. This is not to say that the theories are unconnected (see, for instance, De Alessi (1983) on comparison between the property rights approach and the X-efficiency theory). Nevertheless, the theories differ in their objective focus. The theories may "see" each other, but not the enterprise as a whole.

Thus, the main conclusion that can be made is that none of the "classical" theories of the 20th century adequately reflects the wholeness of the enterprise in time and economic space.

The problem of incompleteness is manifested in the fragmentarity of the theories. The incompleteness of the theory of the firm prevents the enterprise from being considered as an independent system having its internal structure.

The statisticity is manifested in two ways. On one hand, it is not always appropriate to distinguish between internal and external processes. The internal environment is seen as anisotropic as a result. On the other hand, the existing theories do not identify the sources and laws of evolution of the processes themselves.

The development of the theory of the firm in the 1990-2000s has two marked tendencies. The first one is the reformulation of existing theories as well as the

development of new directions and mixing the existing theories (see. Foss, 1996; Cohendet, 1998). A more precise account of stakeholder's interests and the finding of new tasks to realize them is one of the most popular ways of modernizing the theory of the firm. Another such case - an attempt to modernize the neoclassical conception by including the production process (and the production function) into the system of processes at the enterprise. According to Kleiner (2001a), an enterprise can be considered an organic compound of three types of economic processes: the production function (the technological process), sale of output (the market process) and the innovative use of resources and technologies (the innovative-reproductive process).

It follows that one should consider a circular closed model of an enterprise instead of a linear open one. Chart 1 shows, in a circular diagram, the interaction among the three types of processes (the production and sale of output and the reproduction of resources).

As a result, the view of an enterprise as an anisotropic system has been replaced by a more or less isotropic consideration that is, in some sense, close to the environmental approach.

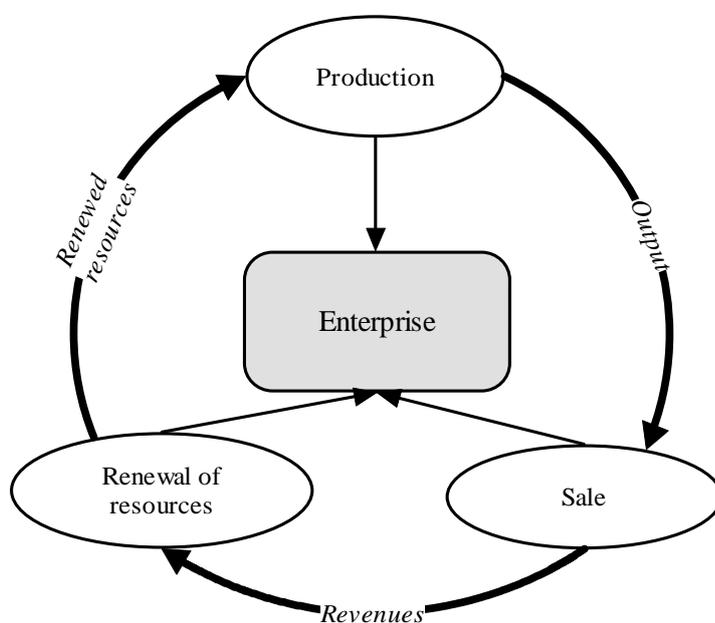


Chart 1. Enterprise as unity of three major economic processes

The model of an enterprise corresponding to such representation should include, besides the traditional vector or scalar production function  $y = f(x)$ , at least two more dependencies. First is the scalar sales function  $r = s(y)$  that reflects the dependence of the revenue  $r$  on the volume of goods sold  $y$  (see, for example, White (1992) for a similar model and Kleiner (1986)). The second one is the reproduction or innovation function  $x' = v(r)$  that reflects the distribution of revenue  $r$ , profit formation and its use in the innovative reproduction of resources (capital, labor and such) in volumes  $x' = (x'_1, \dots, x'_n)$  (this includes models of lagged innovative processes, hiring-firing models and such). One such model, proposed by author in 1973, can be considered as a step toward a broader theoretical representation of the enterprise in the neoclassical framework.

The second tendency in the development of theory during the 1990-2000s deals with an attempt to construct a unified theory of enterprise that is systemic, complete and dynamic through fundamental reconsideration of the essence of the enterprise as an economic subject, of its rights, responsibilities and its place in the system of mutual expectations. Here we are dealing with an entirely new approach. The main source of new knowledge that helps stimulate the development of enterprises is the deeper and broader understanding of the role of the enterprise in the socio-economic structure of the society. The notion of the shareholder gave way to the broader notion of the stakeholder. Moreover, it became evident that the “enterprise – outside world” links cannot be reduced to binary relationships between stakeholders and can be extended to include a fixed or indeterminate group of social or economic subjects or be environmental in nature (see Kleiner (1998)). The analysis of the functions of enterprises in the modern economy identified, besides the traditional output-producing function, at least ten such functions that have concrete consumers with their vested interests and that facilitate the normal functioning of the economy and the society (Kleiner (2001a)).

The understanding of the multifunctionality of the enterprise became the basis for the development of a new type of the firm theory that is systemic, complete and dynamic in nature. First, the new theory took into account the subjectivity of the enterprise. The traditional setting considers the interests of an enterprise as a combination of the stakeholder interests. The new approach (termed integrational theory, see Kleiner, Tambovtzev and Kachalov (1997)) the interests of the enterprise cannot be reduced to stakeholder interests. There remain residual interests that symbolizes the claim that the enterprise is an independent subject (see also Presnyakov (2002)). In this theory, the enterprise acts as an integrator of various material, financial, human, informative and other resources that realize the wholeness of the economy and the society. Integrational theory combined with the principles of systemic paradigm of J. Kornai (2002) was developed into the system-integrational theory of the firm (Kleiner (2002)). Finally, the introduction of the *event* as an independent production resource that changes the configuration and capacity of the existing resources led to the development of the eventualized theory of enterprise (Kleiner, forthcoming).

To briefly explain the essence of the theory use the structure proposed in Table 1. An enterprise is considered as a multidimensional and multistructural system that realizes the functions given in (Kleiner, 2001a). The internal space of the enterprise has cultural, institutional and corporate-genetic components that influence the cognitive processes as well as the organizational and managerial structure and its functioning. The information regarding the functioning of other companies and the own learning experience gradually influences the mental capacity of the participants and, thus, the cultural and institutional environment of the enterprise. The inner filling of the enterprise can be seen as a multi-layered pyramid, with higher layers being able to change more rapidly. The readily identifiable layers are the mental capacity of the participants; the cultural environment; the institutional environment; the cognitive environment and the socio-economic genotype; the managerial and technological subsystems; the behavior of partners chosen as a benchmark; the own experience of the enterprise (see Picture 2).

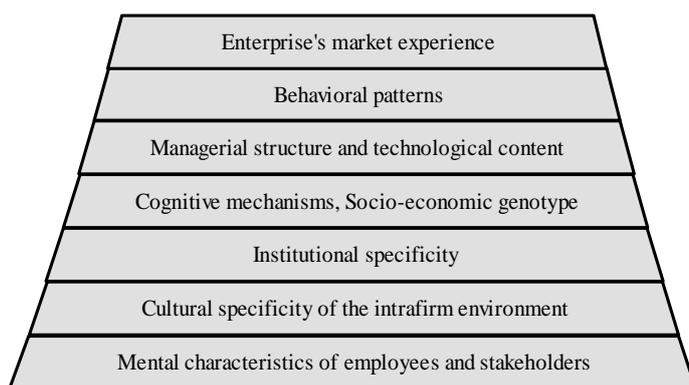


Chart. 2. The pyramid of factors determining the functioning of the enterprise

Each layer is functioning in the sense that it corresponds to some process of formation of some of the components of the internal space of the enterprise: the mental layer generates the “factory” model of thinking; the cultural layer forms the corporate culture; the institutional layer forms the system of intrafirm institutions; the cognitive layer – knowledge and routine; the behavioral layers – the data and knowledge regarding own and partner’s experience. The output of each layer is consumed by the enterprise itself as well as by its surrounding, so the enterprise is not just a producer of goods, but a producer of values, institutions, knowledge and such. At the same time, each layer participates in the productive process of the layer above: the mentality is a factor in the formation of the cultural environment; the cultural environment, in turn, shapes the institutions which, together with the former factors, shape the cognitive mechanisms and the bases for routine; the cognitive mechanisms help analyze past experience of others, which is necessary for setting the own path. There is a reverse relationship as well: every layer, except the bottom one, is engaged in the process of reproduction of the layer below it (so, the socio-economic genome allows the reproduction of the institutional space of the enterprise). Each layer influences the layer below through a lagged process, with the lag being greater for lower layers. The results of this process, specific for each layer and similar to the reproductive process of the enterprise as a whole (see Chart 1) is the evolution and modification of the entire inner space of the enterprise.

Besides the subsystems represented above as layers in the pyramid, the enterprise is also characterized by a functioning system of “corporate events” that can be represented as an upside-down multi-layer pyramid similar to one on Chart 2 (with the same number of layers). The top layer contains the events the central moment of which is the change, in some aspects, of the behavior of the enterprise itself. The essence of the events of the next layer concerns the functioning of other enterprises. This is followed by events that change the managerial or the technological systems of the enterprise and so forth. The bottom layer is occupied by the events that change the mentality of the participants in the production process. Thus, the density of events falls with the move from the top to the bottom. The events are random in nature; each event triggers changes in its own layer as well as in the adjacent layers. An event creates a vertical movement that encompasses the elements of fundamental as well as functional layers of the factor pyramid. This movement helps synthesize the elements of various subspaces; this results in the creation, by each event, of a miniature factor pyramid of subsystems.

In the process of study of a concrete enterprise the event structure should attract significant attention. The identification of events can be carried out through

surveying the opinion of the participants of the enterprise's activities (workers, managers, auctioneers, sometimes – contractors). Then, the composition, “core” and results of an event are identified and the position of the event (in the structure of the layers and in the structure of past and present events – including the event's frequency, rarity and perceived probability of occurrence) is pinpointed. Then, the “event history” for each subsystem and for the enterprise as a whole is formed.

In our opinion, the development of the theory of the firm in the near future will target the following objectives:

1) the broadening of the well-known (classic) branches of the theory - especially the evolutionary, cultural and institutional theories – through the inclusion of the *reproductive circuit*;

2) the search and investigation of the *enterprise invariants* – the characteristics that persist throughout the life span of the enterprise; the “deciphering of the genome” of the enterprise;

3) the structurization of the field of intrafirm institutions as an algebraic system, the research of its *genesis and evolution*, the modeling of interaction with the outside institutions;

4) the investigation of event structures and the laws of their interaction with processual and organizational structures;

5) the integration of theories and the creation of a *unified enterprise theory* that synthesizes the well-known approaches.

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