

УДК 330.942

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## **SYNERGETIC UNDERSTANDING OF ECONOMIC SYSTEMS ESSENCE AND PROPERTIES**

*Understanding is represented of essence and properties of the economic systems from the point of system and synergetic approaches in the article. The results of comparative analysis of properties of synergetic and complex of economic systems are reproduced in this article. And it is demonstrated their correlation.*

*Keywords: economic system, heterarchy, emerjenty, relativism, synergetics.*

**Actuality.** The problems of development of the economic systems in the conditions of vagueness take on the special scientific – theoretical and practical significance taking into account modern realities of the development of Ukraine. The socio-economic transformations which were carried out in a country resulted in findings, qualitatively different from expected ones. This fact is recognized. Without regard to the numerous declared intentions, in society, and above all things at the political elite, there is not any unity as touch as the strategic prospects of the national development, directions, and aims of deep structural changes, mechanisms of indemnification of recessive processes, induced by external influences. Experience, accumulated for years of transformations, convincingly has led to the necessity of revision of formed presently understanding of the economic system from the point to the modern tendencies of synergetic achievements introduction in all spheres of knowledge. Insufficient degree of the theoretic – methodological principles development of understanding economic systems in the context of indeterministic paradigm of scientific thought stipulated electing of this research theme and its actuality.

**Analysis of previous researches.** Research workers of many scientists are devoted to consideration of the economic systems essence and its structural organization, such as: K. L. Astapov, A. A. Bogdanov, G. A. Bashnyanin, V. G. Bodrov, I. Valenstayn, P. P. Gregory, S. Zlupko, Ya. Kornaii, S. V. Lyubimtseva, Ye. Platova, Zh. K. Sapir, V. Sidneva, S. V. Sinyakov, R. S. Stewart, G. Hacken and many others. However there are variations in relation to the author understanding of essence and determination of the system, conditioned by the specific of world view of certain scientific school in most works.

So, for example, the economic system is characterized as an aggregate of economic relations between people [12, p. 16] in the process of production, exchange, distribution and consumption of commodities and services (or

economic product). Economic system is determined also as an aggregate of all types of economic activity in the process of their cooperation [3, p. 88; 10, p. 623; 15, p. 395;]. The system is examined as an “aggregate of elements which are in relationships and connections with each other, which forms certain integrity, unity” [10, p. 615; 13, p. 610]. There are selected structures of making decision, information and motivation in the economic system. For example, Ye. Platova interprets the economic system as scope structure of flowing of economic processes and selects such its subsystems: the system of making decisions (aggregate of institutional legal rules of distributing plenary powers in industry of making decisions among the members of society) where the special role is taken by the order of property, which determines some character of relations between subjects, and depending on the concrete patterns of ownership they distinguish the relations of submission, stimulation or authority; informative subsystem, which engulfs mechanisms and channels of collection, storage, transmission and reverse control of actual information, and executes the function of concordance and co-ordinating of economic decisions. Among co-ordinating mechanisms there are selected vertical (hierarchical) and horizontal (market ones); motivational subsystem which engulfs mechanisms and rules, that provide practical realization of economic decisions, including compulsion, financial stimulation, loyalty, public consciousness, traditions. The market system, which arises up not on the base of traditional one, but on the basis of command one, differs above all things with a system dynamics the theory of which has investigated by A. A. Gritsenko. In a classic variant the origin of the market system is linked on the coming of the traditional system. A forming of the new system conduces to the curriculum of traditional one. A converting of the market system into integrity conduces to disappearance of the traditional system [5, p. 19]. A specificity of realization in Ukraine of institutional relations a “power-property”, in opinion of Yu. Kindzerskiy [6, p. 11], does not enable to identify its economic system as market, without regard to the officially given status. The main difference of market economy is distribution of imperious and economic functions (in basis of which some free division and moving between the agents of property rights are fixed), which does it to be capable quickly to reconstruct the methods of production and proportions of in-use resources without the substantial change of the system of withstood social statuses and imperious hierarchy.

The aggregate of the economic systems which are in this socio-economic space-time forms the unique unit with the dialectical unique conformities to the law of the development. Actually the economic systems and state of socio-economic space-time are agreed and mutually linked by the unique logic of natural evolution of socium [2, p. 90–91].

**Raising of task.** Coming from the actuality of research and existent work of modern scientists in relation to understanding of the economic systems essence and their structure a research purpose is to conduct comparison of essence and properties of complex and synergistic economic systems. The object of this research is general and specific properties of the economic systems development. Methodological subsoil of this research is presented by the methods of abstracting (formulation of concepts of complex and synergistic economic systems) and analysis on the basis of the system and synergistic approaches (analysis of complex and synergistic systems properties).

**Basic results of research.** The development of synergetic as interdisciplinary direction of scientific researches stipulated modifications in understanding the system and its structure. In opinion of N. K. Maksishko the synergistic system is foremost dynamic. The dynamic system can be presented as an object of any nature, the state of which is changed in time in accordance with some dynamic law i.e. That as a result of action of the determined operator of evolution. A concept of the dynamic system is the investigation of certain idealization at which it is despised by influence of casual indignations, unavoidable present in any real system. Dynamic system is the system the conduct of which is set by some set of rules (by an algorithm). The dynamic system is only a model of some real system. Any real system is added by fluctuations and that is why it can not be dynamic [9]. N. K. Maksishko under the dynamic system understands an object or process, for which it is simply defined the notion of the state as aggregates of values of some sizes in a set moment of time and set operator which determines the evolution of the initial state in time. This operator is named the operator of evolution. The operator of evolution (some rule) allows after the initial state to define the state of the system in any next moment of time. Therefore a concept “dynamic system”, “evolutional process” and “evolution of the system” (change of its states sometimes), is examined as synonyms [11, p. 50].

From point of A. V. Buzgalin and O. I. Kolganov [2, p. 86–92] synergistic approach in research of the economic systems is realized, when a system of mutually linked hypotheses is pulled out which position the concrete socio-economic systems as vectors in certain  $n$ -measured socio-economic space:

- socio-economic space can have an unlimited amount of mutually linked socio-state and socio-time co-ordinates;
- the socio-economic systems can be presented as certain vectors in  $n$ -measured economic space-time. As the systems are vectors, they will have certain direction of the development. All the  $n$ -parameters present the system too, dialectically linked between themselves;

- also, one and the same system of co-ordinates can be applied not only to the economic systems but also to their subsystems and metasytem. The noted thesis means that the certain amount of elements will coincide for subsystems, of the economic system itself and its metasytem.
- From point of G. M. Pilipenko [14, p. 33]:
- economic system is ignored as such one which aspires to the equilibrium. Opposite, the deviation from an equilibrium, non-linearity, bifurcations, characterize it;
- economic agents do not behave rationally as a result of narrow-mindedness of possibilities of human mind and presence of high degree of complication, scale and vagueness of information;
- information is not complete and accessible. The receipt of information entails expenses, predefined with the necessity of its search, calculation and treatment;
- aspiring to realization in the economic sphere of own interest often results in an opportunism conduct.

However, the resulted interpretations of properties and dynamics of the economic system quickly correspond to its understanding as difficult formation within the limits of system (but not synergistic) approach. Determining the empiric object of category as “aggregate of economic relations in the process of production, exchange, distributing and consumption of commodities and services (or economic product” or as “aggregate of all types of economic activity in the process of their co-operation. Let’s mark their principal difference. The use of the first empiric object the “aggregate of economic relations” gives possibility to exclude from the limits of the economic system uneconomic relations, which are realized in the process of production, exchange, distribution and consumption of commodities and services, but nevertheless they are for understanding of essence of economic processes (as, for example, interinstitutional relations “power-labour”). On the other hand, the use of object the “aggregate of all types of economic activity” gives grounds to discuss in relation to including those or other types of activity, which can be included to KVED, but to be not economic on the essence (as, for example, “state administration”). As an empiric object of given category it is offered “aggregate of economic processes”. Usually the second element of category is a complementary category, that reflects basic links which combine the empiric object of the formulated category with other empiric objects of other categories. As the ones it is suggested to use such the “production, exchange, distribution and consumption of commodities and services”. Concerning to the third element of category, namely properties (conditions) which characterize its empiric object, it’s exactly in this place we can watch difficulties in application of synergistic approach.

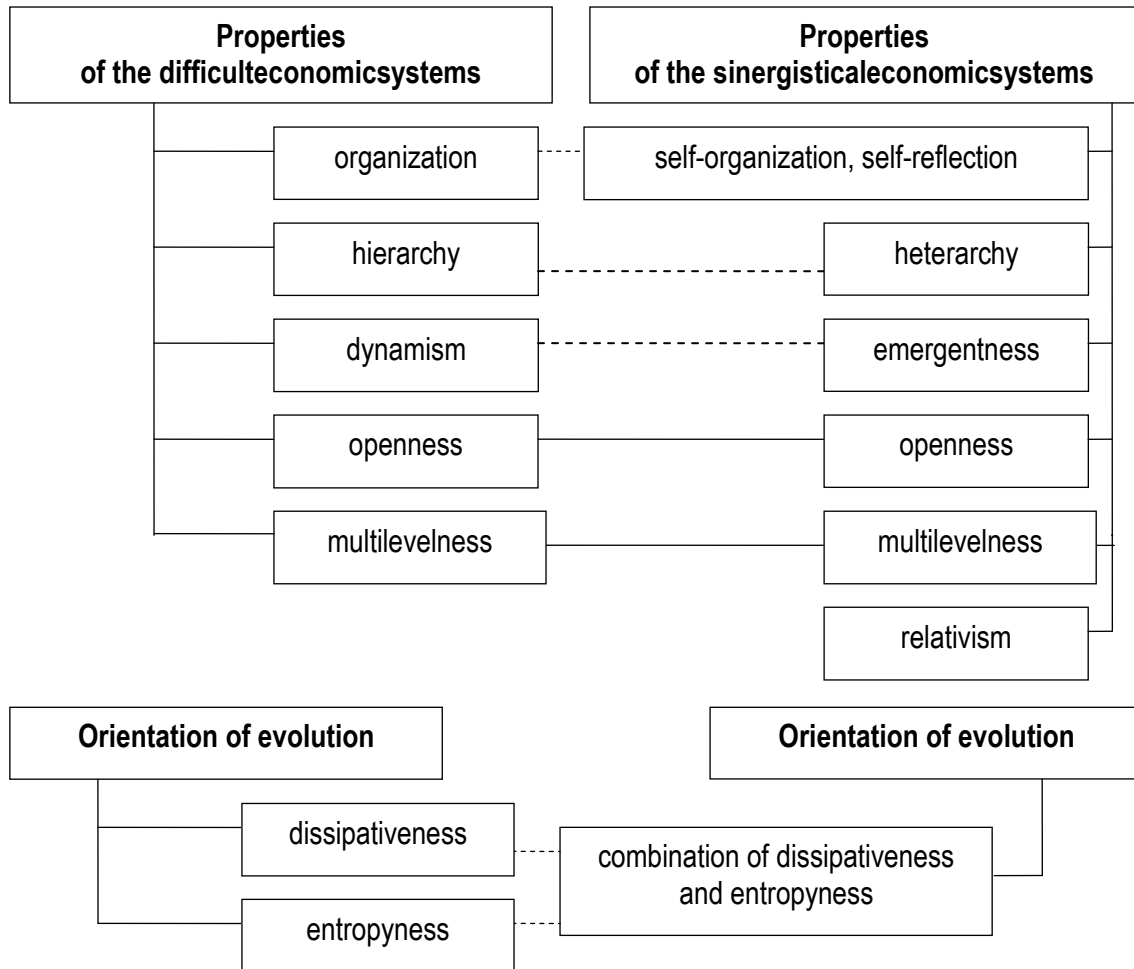
Going back to the system approach we will mark that basic properties of the economic system are its organization, hierarchy, dynamism, openness, multilevel. However the application of system approach is possible and acceptable within the limits of deterministic paradigm of scientific thought, when each of properties of the difficult system acquires the definite value. Thus, although general properties of the system are not folded as a sum of properties of its elements, however they are stipulated by them (Fig. 1).

The synergistic understanding of the economic systems is at the same time narrower and more widely of understanding the complex economic systems. Each of properties of the synergistic economic systems is generated by the proper property of the complex economic systems, but these properties are shown up in other way, as a rule, far wider. So property of organization shows up as property of self-organization and self-referentiality, a hierarchy is transformed in a heterarchy, dynamism can show up as emergentness. Properties of openness and multilevelness are transformed as a result of heterogeneity of the system. All aggregate of properties of the synergistic system stipulates its relativism.

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Organization finds out itself as a partial case of self-organization, as a moment of fixing of the system becoming (organizations) which arrives at new high-quality properties. In the same queue a management comes forward as an instrument which supports dynamic good organization of the system. At terms, when a management is arbitrary (that is to say such one that according to will of subject heads for fixing an organization on one of the attained levels of the society frame becoming), self-organization is instrumental in overcoming of conservatism of organization by its disorganization and thus again (quite often through overcoming of crises or catastrophes) joins in the process of subsequent development of the difficult system.



**Fig. 1. Lines of germination and differences of the difficult and synergistic systems**

At the same time self-germination and self-organization are dialectically contradictory processes [1, p. 22–24]. It follows also to take into account, that a capacity for self-regulation and self-germination foresees in the economic system a presence of specific subsystem of management as certain mechanisms, organs and institutions. The role of this subsystem is very important: it provides integration and concerted action of all of the tools of the system, support of its integrity and order (antientropyness). It is important to underline that self-germination of the economic systems is determined by their internal (between component elements) and external (between the system and its environment) contradictions which generate the proper factors of change spontaneously.

The presence of processes which are supported themselves is expressed in the capacity of some systems for autoreproduction. It does touch existence of mechanisms which are engendered within the framework of the system and support its functioning due to internal resources.

Any appearance of cyclic organization is property of self-referentiality. Synergistic system or its construct organizes itself, existing dissociated from outward things (supporting the integrity) and built-in it (that is the condition of self-organization). The complex system realize itself through implementation of own operations and self-reproduction (autopoezys). Contradiction does not exist here, as a system is not simply opened to surroundings, but it is operationally reserved, that enables it to support its own identity [7, s. 98–99].

Consequently, in opinion of the known western researcher D. Stark, efficiency of the modern economic systems is based on the principle of heterarchy – a new method of organization, which “is neither a market, nor hierarchical. While a hierarchy foresees the relations of dependence, and markets-relations of independence, heterarchy, foresees the relations of interdependence and it is characterized by the minimum degree of hierarchicalness and organizational heterogeneity [16, p. 55]. In more wide context a heterarchy is determined as a process, in which the separately taken element (organizational block, structure of genetic code, institute) is simultaneously reflected in the great number of networks which intersect. So, for example, the elements of the institutional system are formed by own links, and at the same time they are the inalienable constituents of other subsystems of society.

S. Aleksander and K. L. Morgan selected two types of the system changes [8, p. 151]: resulted changes which are determined by the initial elements of the system; emergentness, ones that are not taken to the changes of the system elements and are not conditioned by them. The process of the development at a prevailing of emergent changes has saltatory, unforeseeable character, and the emergent system differs by the special quality of vagueness, namely: market system which is formed as a result of crash of the command system, and it is emergent one.

Heterogeneity of elements of the difficult system is a determinative sign of its variety. It is foreseen that the system demonstrates interesting properties because of there are high-quality and quantitative differences between the different elements of the system.

Structural organization of the system has been constantly changed as relations of heterarchy are less permanent, than relations of hierarchies, by the same the system becomes relativistic from the point of display of all its other properties. Otherwise there “is nothing absolute and permanent” in description of the synergistic systems. Thus the synergistic system is a relativism aggregate of economic processes, which arise up during a production, exchange, distribution and consumption of commodities and services, and are marked by self-organization and self-referentiality, some heterarchy, emergentness, openness and multilevelness.

In the development of the synergistic systems dissipativeness and entropyness are simultaneously realized. Actually the trajectory of the development of the system depends on prevailing in a that or other period of time one of directions of its evolution.

**Conclusions.** Thus, the complex economic system is an aggregate of economic processes, which arise up during a production, exchange, distribution and consumption of commodities and services, and they are marked by organization, hierarchy, dynamism, openness, multilevelness. The complex economic systems can be dissipative or entropynical.

The synergistic economic system is the case of the complex economic system. It is a relativism aggregate of economic processes, which arise up during a production, exchange, distribution and consumption of commodities and services. And they are marked by self-organization and self-referentiality, some heterarchy, emergentness, openness, multilevelness. The synergistic economic system is simultaneously entropynical and dissipative, that is why there is some hardness to carry out it in the complete formalized description which determines the necessity of system construct formation.

### *Literature*

1. Bases of steady development: Academic enchiridion / For general edition of prof. L.G. Melnik. Sumy : VTD the "University book", 2005. – P. 22–24.
2. Buzgalin A. V. Comparative analysis of the economic systems: methodology and theory (materials of the special course) / A. V. Buzgalin, A. I. Kolganov // Announcer of the Moscow university. – series. 6. "Economy", part. 1. – 2002. – № 3. – P. 94–113.
3. Economic reference-dictionary / under editor S. V. Mocherny. – K. : Femina, 1995. – P. 88.
4. Grabchuk O. M. Tipology formation of regional economies / O. M. Grabchuk, S. O. Smirnov // State and problems of innovational building-up of Ukraine : Materials of the International scientific-practical conference. – v. 1. – Dnipropetrovsk, 2008. – P. 60–61.
5. Gricenko A. A. Method of "Capital" by K. Marks and political economy in wide sense of world / A. A. Gricenko. – Kh. : Higher school, 1998. – 160 p.
6. Kindzerskiy Yu. Institutional aspects of recreation in a context structural transformations / Yu. Kindzerskiy // Economy of Ukraine. – K. : of Press of Ukraine, 2007. – № 1. – P. 4–13.
7. Kniazeva E. N. Constructivist epistemology / E. N. Kniazeva // Philosophic sciences. – 2010. – № 11. – P. 88–103.
8. Kolomic G. M. The harnessing together of vaguenesses of the economic systems and their reformation. Diss. ... doc. econ. sciences after speciality 08.01.01 "Economic theory" / G. M. Kolomic. – Kharkiv, 2006. – 340 p.
9. Landa P. S. Nonlinear vibrations and waves / P. S. Landa. – M. : Fizmatlit, 1997. – 495 p.
10. Large economic dictionary/ under red. A. N. Izrailyan. – M. : Institute of new economy, 1998. – P. 615, 623.
11. Maksishko N. K. Modelling economies by the methods of discrete nonlinear dynamics : Monograph / N. K. Maksishko. – Zaporizhzhya : Poligraf, 2009. – P. 416.



12. Mocherniy S. Models of transformation processes of economy (theoretic-methodological aspects) / S. Mocherniy // Economy of Ukraine. – 2005. – № 2. – P. 13–21.
13. Philosophical encyclopaedic dictionary. M. : the Soviet encyclopaedia, 1983. – P. 610.
14. Pilipenko G. M. Methodological pre-conditions of forming intitutional theory/ G. M. Pilipenko // Academic review: economy and enterprise. – 2008. – № 2. – P. 30–36.
15. Rayzberg B. A. Modern economic dictionary/ B. A. Rayzberg, L. Sh. Lozovskiy, E. B. Starodubceva. – M. : Infra-M, 1997. – P. 395.
16. Stark D. Heterarchy: ambiguousness of assets and organization of variety in postsocialist countries / D. Stark // Economic sociology: new approaches to institutional and network analysis. – M., 2002. – P. 55.

Отримано 14.08.2012

#### *Анотація*

У статті подано розуміння сутності та властивостей економічних систем з точки зору системного та синергетичного підходів. Наведено результати порівняльного аналізу властивостей синергетичної та складної економічних систем та відтворено їх взаємозв'язок.