The development of economic theory as cognitive strategies change: philosophic-methodological analysis

D E Lubomirov*, S O Petrov, O V Sapenok
Department of Philosophy and Law, Saint-Petersburg State Forest Technical University, 5 Institutsky lane, Saint Petersburg 194021, Russian Federation

*Corresponding email: LubomirovDE@mail.ru

Abstract. The logic of development of economic knowledge, changes in its theoretical and methodological grounds are considered in the context of the philosophical analysis of the transformation of the general scientific cognitive strategies. The heuristic value of using of established in post-non-classic science socio-cultural approach to analysis of the study object in investigations of the essence of the economic reality and the human place in it justifies. In this connection, analyzes the evolution of the cultural context of the development of science, its influence on different epochs scientific world views, the concept of world view in the economy as a reflection of the particular reality introduces. The important role of the fundamental principles of modern scientific rationality – hierarchical system organization of the Universe, Synergetics, Anthropologism, Global evolutionism and society-nature Co-evolution is emphasized. Attention is drawn to the renaissance of the interest in holistic, qualitative approach to the world in late 20 - early XXI centuries science, including socio-management strategies, after several centuries of domination by quantitative methodology.

1. Introduction
A special place of philosophy in shaping a holistic worldview stems not only from two and a half thousand years of history of its existence and role in creating public subject. From the first steps of scientific cognition, philosophy reflections on the basic concepts of Western culture has made categorical unity in its mental space, providing the focus of theoretical and practical activities of civilization. The scientific rationality and it-based civilization developed earlier and be able to develop in the future only if mutually agreed combinations of their cognitive and creative (science and technology) and value-orientation (philosophy) components. The systemic crisis that detects itself in economic, socio-political, ideological and socio-environmental aspects of life of modern society, once again draws the gaze of researchers to the human problem as a key subject and object of public administration. Here running means a conscious activity, aimed at regulating the processes taking place in society as a whole, the economy in particular, and their influence on all the components of society [1].

It is obvious that we deal with the next stage of the last century’s anthropological turn, realizing in new civilizational conditions. They require human studies as a so-called "economic man", i.e. a person as a subject of economic activity in the space of economic reality. The study is complicated not only by the apparent complexity of the object, lack of development of the methodology of its cognition, but also by unprecedented speed changing realities of human existence, radically changing during one life cycle instead of several generations.
2. Methods and Materials
Aim of the study. The purpose of this work is to study the logic of the development of economic science in its connection with changes in philosophical and general scientific strategies.

Research methods and Materials. The object of research was economic theory and methodology studied in the context of philosophical analysis of radical changes of value systems and science general cognitive strategies.

3. Results and discussion
Human understanding in the economic reality space first of all is connected with the search of a unified methodology of this cognition – economic science. The history of economic science shows that its methodology was formed by the general scientific methodological standards, reflecting the ideals of the era's leading science. These were physics (mechanics), mathematics, biology (especially evolutionary biology) and in 20-30-ies of XX century – philosophy of science. For example, Adam Smith under the influence of Newton’s mechanics worked out his economic theory as a mirror reflection of real economy considered like machine, ideally a well-functioning clockwork [2].

Starting with the 30-ies of the XX century, the economic knowledge methodology has developed in conjunction with studies in the philosophy of science, its development was significantly influenced by positivism tradition, which evolution can be represented as follows: positivism – neopositivism – postpositivism. The influence of Kuhn’s [3] uncumulative concept of knowledge development in the philosophy of science in 70-80-ies of XX century brought to the fore in the economy methodological discussions the problem of scientific revolutions.

In our country’s philosophical-methodological tradition this problem was studied by W A Kanke [4], who marked out four revolutions in the development of economic knowledge connected with the formation of: the Labour theory of value, Marginalism, Keynesian economic theory and Probabilistic economic theory. Note that all of these revolutionary changes in the theory of economy were accompanied by radical methodological transformations.

The first revolution is associated with the formation of classic economic theory, especially in the works of A. Smith who, basing on the concept of value, realized the synthesis the whole complex of economic problems.

The initiation of the second revolution, dating back to 1871, connects with the foundation of marginalism. Methodologically the conceptual innovation of neoclassic, based on the replacement of Labour theory of value by the Theory of subjective value of goods, involved implementation of the methodology of limit analysis. Marginalist revolution found its completion in A Marshall conception [5] characterized by understanding of value as a combination of mental value (demand side) and the cost of production (supply side). Such Marshall’s interpretation of the nature of value is caused by the specifics of his treatment of the economic reality consisting of two levels: mental and procedural-objective. Thus, the theoretical foundation of marginalist methodological innovations was economic individualism, which reduced all socio-economic phenomena to the behavior of individuals [6].

The third revolution in the theory of economy was caused by the formation and development of Keynesianism, whose founder John Maynard Keynes [7] criticized both classical and neo-classical schools. His methodological aims, formed under the influence of increasing popularity of the neopositivism in philosophy of science, demanded the verifiable nature of any economic theory, that is, empirical verification of all theoretical positions. Hence, Keynes opposed neoclassic’s conceptual and methodological approaches because of contradictions between their theories and real economic experience.

The foundation of the expected utility theory and the program-game approach initiated the fourth revolution in economic science. It is here that the central position occupies the "economic man" as the active subject, who changes the economic reality for optimization according expected utility. This goal involves access to formal apparatus of mathematics, in particular, to the theory of operations research and its section – the game theory. Its function in the economy is making decisions in the context of the future set by probabilities, and hence in the categories of reliable, defined and undefined [8, 9].
The game approach was introduced into the economy by J von Neumann [10], who made a conclusion about the inadmissibility of the opposition of the gaming approach and the software approach and approved economic reality studies by the united software-game methodology. Methodology researchers in our country note that the latter is a universal methodology for micro- and macroeconomics and the extent of its applicability is considerably higher than that of mathematical analysis [4, 11, 12]. In the context of software-game approach, special attention is paid to the economic subject, its place and role in the economic reality.

One of the modern theoretical and methodological approaches, promoting exploration of essence of economic reality and man’s place in it, is the analysis of economy from the position of socio-cultural concept of science. It allows to expand significantly the presentation about the scientific knowledge structure, its genesis and radical changes of dynamics – scientific revolutions as a historical periods, when the influence of socio-cultural context on science is most noticeable [13]. This approach regards relative autonomy of the science development and indirect influence of socio-cultural factors on it through the root foundations of scientific knowledge. Ideological, methodological, normative and valuable aims, epistemological regulations and ideals, in total form preconditional (metatheoretical) level of scientific knowledge.

Russian philosophical tradition uses such concepts as “the ideology of the era”, “scientific picture of the world”, “scientific thinking style”, “type of rationality”, “values and norms of scientific research” to denote this science knowledge level, while Western philosophy of science denotes it in terms “paradigm” (T Kuhn) [3] and “research program” (I Lakatos) [14]. Various named epistemological phenomena serve as an implicit or explicit research institutions, regulating and directing the process. As the basis of understanding, explanation and justification in science they determine ways of approach to the study of reality, regulate, supervise and direct the scientific research process. A special heuristic significance is typical for an idealized model of the world – the scientific picture of the world – the synthesis of philosophical and scientific perceptions of reality.

The concept "scientific picture of the world", not being the subject of a special methodological analysis, first appeared in the writings of naturalists as a necessary methodological assumption, demonstrating the unity of the science specific historic period. The result of investigations of the processes of scientific research by famous scholars – M Born, V I Vernadsky, N Bohr, V Heisenberg, M Planck, A Einstein and others – was the identification in the composition of scientific knowledge such phenomena as the scientific picture of the world that has not only scientific, but ideological, methodological, normative and valuable aims, epistemological regulations and ideals, in total form preconditional (metatheoretical) level of scientific knowledge.

The problem of special scientific pictures of the world, and first of all within the framework of humanitarian knowledge, still remains the subject of philosophical and methodological discussions. The opinion that Humanities and social sciences are themselves pictures of reality currently dominates. Thus, on the one hand, special scientific picture of the world is treated as a holistic vision of this science subject, on the other hand, it is recognized that the scientific picture of the world – in our case the picture of the world in economics is an independent picture of economic reality. Hierarchical links of various scientific types of pictures the world are organized in such a way, that fundamental principles of general scientific picture as a holistic view of all reality refract in special pictures, in particular in economics.

In the structure of economic knowledge scientific picture of the world forms the normative set of the latter, which includes the fundamental concepts and language of the theory, as well as methods and rules system, controlling and directing the course of study. It is on this basis that scientific research trends, schools and traditions arise.

The most important component of modern commonly called synergetic post-non-classic scientific picture of the world is its integrity, directing holistic perception of the world, nature, society and human culture. If you look at the history and formation of the dominant Western civilization at the present moment, it should be noted that in its origins was founded integrity, the interconnectedness of perception of human existence and the world (Cosmos) [17]. At the heart of the European
"universally-conceptual" sociokode lies "permanent attraction to universals of any nature." [18] The ancient Greeks understanding of the universe is characterized by the following sequence of high quality chain – "fate of the gods – Cosmos – Polis – people” [18]. Integrity of the ancient perception of the world was expressed in syncretic interpretation of wisdom as the combination of truth, goodness and beauty in the dominance of an ethical component [19]. And for a long time it was philosophy (“the absolutely perfect science” – Aristotle) that carried out the role of guarantor of this unity [20].

Departure from a holistic, with a characteristic emphasis on qualitative rather than quantitative characteristics of things, worldview of ancient Greece began already in the Middle ages as a result of introduction of the scale of ranks of the world according to the degree of closeness to God – dividing the highest and the lowest levels of existence. The process continued in the Renaissance transformation value system from theocentrism to anthropocentrism. Note the contradictions in this process – distinctly manifested rehabilitation of human nature component and the adoption of a coherent interpretation of man as harmonic corporal and spiritual unity accompanied by society atomization, initiated by decomposition of corporative medieval way of life. Renaissance humanism, reflecting the individualism of the early-bourgeois relationships, built on a pedestal bright unique individuality, creating himself and his destiny. The formation of Protestantism, leaving a man one on one with God in a world became a kind of ideological and institutional expression of profound transformations in the social and cultural life of the late Renaissance and Reformation.

Ontological ideas of the reformers, demolishing the basic for Catholicism aristoteliko-scholastic picture of the world, eliminated the qualitative differences in God’s creation. Profanization of nature equaled the individual modes of being by making available their quantitative studies [18]. Thus the theology of the Reformation prepared the ground for the adoption of consumer attitudes towards created world and the formation of a corresponding new value settings type of knowledge – New time science, called the classic science.

The scientific revolution of the 17th century unfolded against the background of the active introduction of the experimental methods in natural sciences research (G Galilei) and processing empirical data with a help of specially crafted (I Newton, G Leibnitz) mathematical apparatus — differential and integral equations. According to the Renaissance point of view: “the book of nature is written in the language of Mathematics”, but the latter was able to fix primarily quantitative parameters, inevitably reducing the quality features of subjects, processes and phenomena to its lower level.

Within the framework of established for centuries mechanistic world view went the parallel separation of kinds of subject-practical and theoretical (scientific) activities. The latter, in particular, led to the formation, besides previously differed socio-humanities, natural and exact sciences – technical sciences, actively accompanied by differentiation within each of these types of knowledge.

An important mark in the transformation process of holistically-syncretic worldview into its fragmented variant in the 19th century was A Komte’s [21] extension of principle: "Science is philosophy in itself." Increasing and differentiating knowledge lost its traditional integrator – philosophy, had been performing this role for centuries. Only in the mid-20th century the further development of the positivist tradition as a result of the collapse of the project the demarcation of science and philosophy led postpositivism to the recognition of the fallacy of Komte’s position and the symbiotic relationship of science and culture in general. At the same time within the formation of post-non-classic rationality the influence of ideas of hot widening Universe, Synergetics, Anthropologism, Global evolutionism and society-nature Co-evolution increased among scientists and philosophers.

A new cognitive installation, considering man as an organic part of the world, the result of cosmic evolution has established in post-non-classic science of the late twentieth century, demanding from modern means of knowledge necessary take into account human presence in this world. Replacing the typical for classical science approval of Man random appearance on the Earth and denial of his privileged place in the Universe (N Copernicus), the anthropologic principle of post-non-classic world picture gives the Universe "human dimension". Modern science, focused on the study of complicated self-developing objects – biosphere, noosphere, includes man into its context instead of his earlier
elimination. Position of external observer does not exist in this kind of objects ("humandementioned") investigations.

In the context of post-non-classic rationality their comes the economic methodology transformations, implying that the development of economic knowledge cannot be described as a straight line and should be seen as a dynamic process including moments of stability and variability [22, 23]. "New methodology" mainly manifested itself in economic systems like the heterodoxy Keynesian or postkejnsian economics (A Lejonhufvud [24], R Klaujer [25], G L S Shakle [26]) and the neo-austrian school with the most consistent expression of knowledge subjectivity idea. Representatives of this proclaiming methodological pluralism trend acknowledge the possibility and inevitability of existence of multiple, incomparable among themselves pictures of reality, reflecting different sides of a subject study. And selection of these pictures allows and even involves a fraction of researcher’s subjectivism.

Accordingly, within the framework of the “new methodology” the traditional regulatory function of the latter and necessity to conduct researches negates. Methodology of economics becomes descriptively-analytical studies of actual generation of new knowledge, ways of researches, modes of scientific community functioning. It incorporates philosophic-methodological and scientific material. For example, according to B Caldwell, any study in economic science must begin with "rational reconstruction of works on the methodology of economy as well as of different research programs" [23].

Note that the "new methodology" shows its function of professional ethics in situation of methodological pluralism and growing differentiation of knowledge directed to improve inter-scientific communication and promote mutual understanding between economists of different specializations and research directions.

The above trends of scientific and philosophical thought were consistent with profound socio-political, techno-economic and socio-environmental realities of the second half of the 20th century. Affecting almost all aspects of society, globalization has actualized the need of humankind unification in the face of new problems that, in turn, entailed a return to a holistic view of the world, society, man.

In a number of works by contemporary authors [27, 28] it is qualitativist that comes forward as alternative to mechanistic description and explanation of the world. This methodology is treated as essential feature of primarily humanitarian knowledge, that does not reduce qualitative characteristics to mechanical-structural and quantitatively defined factors. In this understanding, qualitativism is close to holism methodology, emphasizing high-integrity of objects [29].

4. Conclusion

Modern evolution of economic knowledge strongly calls for Synergetics to establish new economic management strategies as a complex hierarchical self organizing system, developing in principal coevolution with culture. In this sense, the amendment of even a small portion of the cultural energy (e.g., values such as a public good sovereignty) in certain point of the economic reality at the decisive moment of the civilizational competition on the global scale can lead to high-speed self-transformation, which cannot be achieved otherwise, even with the help of many billion investments. This thesis is also relevant to the management of the forest. An imperative precondition for receiving increasing long-time economic effects of human interaction with forest is our attitude to him not just as an economic system and a critical subsystem of the biosphere, but as an integral component of the entire human culture Organization in its integrity throughout all its history.

Acknowledgements

The authors express their gratitude to the Russian Foundation for Basic Research (RFBR) – grant 18-011-01171 «Qualitativist phenomenon in interdisciplinary studies» helped to obtain material used when writing this article.

The authors are also grateful to the staff of the SPbSFTU Division of Congress activities for assistance in preparing material for publication.
References

[1] Petrov S 2018 Public management and ecology of culture. Proc. of the inter. sci.-pract. conf. «Modern management and economy: problems and prospects of development» (St. Petersburg: Asterion) 206-211

[2] Smith A 2006 Theory of Moral Sentiments. (Published by МетаЛибр) 322

[3] Kuhn T S 1962 The Structure of Scientific Revolutions (Chicago: University of Chicago Press) 210

[4] Kanke V A 2009 Philosophy of economic science (Moscow: INFRA) 384

[5] Marshall A 1920 Principles of economics (London: Macmillan and Co) 1-3 627

[6] Avtonomov B C 1998 Human Model in economic science (St. Petersburg: School of Economics) 229

[7] Keynes J M 1936 The General Theory of Employment, Interest and Money (London: Macmillan) 263

[8] Grinjeujeja D, Blini M and Stewart I 2002 Panorama of economic thought of the end of the 20th century Sec 1: Methodological perspectives. (St. Petersburg: Economic school) 686

[9] Economic theory on the threshold of the twenty-first century 1996 ed Yu M Osipova and V T Puljaeva (St. Petersburg: TC Petrópolis) 415

[10] Neumann J von, Morgenstem O 1944 Theory of Games and Behavior (Princeton: Princeton University Press) 46

[11] Ananin O I 2005 Economical Structure of theoretical knowledge: a methodological analysis (Moscow: Science) 244

[12] Samsin A I 2003 Basis of Philosophy of economics (Moscow: Unity) 547

[13] Sapenok O V 2014 Philosophical and methodological problems of the economy Forest sector of Russia: problems and solutions. Coll. of sci. pap. (St. Petersburg: SPbGLTU) 149-156

[14] Lakatos I 1970 History of Science and its Rational Reconstructions (Boston Studies in the Philosophy of Science) 8 91 - 135

[15] Vernadsky V I 1981 Selected works on the history of science (Moscow: Science) 360

[16] Heisenberg W 1953 Philosophical problems of atomic physics. (Moscow: Publishing house of foreign lit.) 133

[17] Lubomirov D E 2018 Role of philosophy in the realization of the principle of qualitativizm in higher education Proc. of the inter. sci.-pract. conf. «Modern management and economy: problems and prospects of development» (St. Petersburg: Asterion) 67-72

[18] Lapitsky V V 1994 Science culture system. Philosophical library teachers (Pskov: Pskov state pedagogical university) 4 136

[19] Antiquity as a type of culture. Articles 1988 ed. A F Losev (Moscow: Science) 333

[20] Vizgin V P 1982 Genesis and structure of the qualitativizm of Aristotle (Moscow: Science) 429

[21] Comte A 1865 A General View of Positivism (Trubner and Co) 444

[22] Blaug M 2004 Methodology of economic science, or how economists explain J.Economy questions 416

[23] Caldwell B J 1982 Beyond Positivism: Economic Methodology in the twentieth century (London: George Allen and Unwin. Google Scholar) 245

[24] Leijonhufyud A 1968 On Keynesian Economics and the Economics of Keynes: A Study in Monetary Theory (New York: Oxford University Press) 450

[25] Clower R and Leijonhufyud A The Coordination of Economic Activities: A Keynesian Perspective American Economic Review (American Economic Association) 65(2) 182-188

[26] Shackle G L S 1972 Epistemics and Economics: A Critique of Economic Doctrines (London: Cambridge University Press) 246

[27] Solonin U N 2015 Integrity of humanitarian knowledge (St. Petersburg: Science) 639

[28] Subetto A I 2009 Works. Noosferizm: in 13 volumes (Qualitativizm: philosophy and theory of quality, qualitology, quality of life, human quality and quality education. Vol 8) ed L A Zelenov (St. Petersburg: Asterion) 726
[29] Matrosova N K 2016 Typological modus of integrity (St. Petersburg.: Nestor-history) 288