

Liechtenstein V.E., doctor of Economics, Professor,  
Ross G.V., doctor of Economics, Professor

## **ROLE OF THE EQUILIBRIUM STOCHASTIC PROCESSES IN THE DEVELOPMENT OF THE ECONOMY**

### **Abstract**

The article gives a brief summary of the theorems that prove the inviability of the two presently known economic systems - liberal and socialist. We examine the role of the Equilibrium Stochastic Processes (ESP) for the development of new mixed economy, capable to take the all best of capitalism and socialism, leaving all the bad and criminal in the past. Are given the reference to the original sources, where these issues are discussed more fully and in detail.

### **Keywords**

Liberal economy, Socialism, The Evolutionary-Simulation Methodology, The Equilibrium Stochastic Processes, Theorem.

### **Authors**

Liechtenstein V.E., doctor of Economics, Professor, Head of sector of Allrussian research Institute of problems of computer science and Informatization, phone 89264744814, [liht2004@mail.ru](mailto:liht2004@mail.ru)

Ross G.V., doctor of Economics, Professor Deputy Director of Allrussian research Institute of problems of computer science and Informatization, phone 89057566028, [ross@pvti.ru](mailto:ross@pvti.ru)

Лихтенштейн В.Е., д.э.н., проф.,  
Росс Г.В., д.э.н., проф.

## **РОЛЬ РАВНОВЕСНЫХ СЛУЧАЙНЫХ ПРОЦЕССОВ В РАЗВИТИИ ЭКОНОМИКИ**

### **Аннотация**

В статье дано краткое изложение содержания теорем, доказывающих нежизнеспособность обеих известных на сегодня экономических систем – либеральной и социалистической. Рассматривается роль равновесных случайных процессов для развития новой экономики смешанного типа, способной взять все лучшее от капитализма и социализма, оставив все плохое и преступное в прошлом. Даны ссылки на первоисточники, где данные вопросы рассматриваются более полно и подробно.

### **Ключевые слова**

Либеральная экономика, социализм, эволюционно-симулятивный метод, равновесные случайные процессы, теорема.

### **Авторы**

Лихтенштейн В.Е., д.э.н., проф., зав сектором Всероссийского научно-исследовательского института проблем вычислительной техники и информатизации (ВНИИПВТИ), тел. 89264744814, [liht2004@mail.ru](mailto:liht2004@mail.ru)

Росс Г.В., д.э.н., проф., зам директора Всероссийского научно-исследовательского института проблем вычислительной техники и информатизации (ВНИИПВТИ), тел. 89057566028, [ross@pvti.ru](mailto:ross@pvti.ru)

Liechtenstein V.E., doctor of Economics, Professor,  
Ross G.V., doctor of Economics, Professor

## **ROLE OF THE EQUILIBRIUM STOCHASTIC PROCESSES IN THE DEVELOPMENT OF THE ECONOMY**

Today the question is not whether there should be to do the changes in the global economy! The question is how to achieve the desired change? It is necessary a deep rethinking of capitalism and socialism, in order to take the best of these two systems, leaving all the bad and criminal in the past. We need to clearly understand, what should be the general line of the modernization of the system of economic relations. Theory of Equilibrium Stochastic Processes (ESP) is able to identify specific goals and give the tools to achieve them.

It is known, that the market is a set of economic relations, arising from the voluntary, massive and regular exchange of goods. If we selected a sector of the market of a product on which there are no monopolies and cartels, there is no legal and technical obstacles to free exchange, if the product is homogeneous, in other words, if the conditions have been created close to the so-called «perfect competition» (for example, the exchange), on this sector of the market is automatically started the mechanism of formation of market equilibrium. This mechanism is in many ways a very good or simply irreplaceable.

Economic liberalism is that wherever it is possible, create the conditions for the normal functioning of the market mechanism. The role of the state - to create conditions for the operation of the market, but do not be a party to it.

The causes of origin and wide spread of liberalism in the economy are quite objective. It is, on the one hand, the achievements of science in the study of the market and, on the other hand, the collapse of the planned economies of the Soviet Union and the socialist countries.

We turn to science. Back in 1959 the Anglo-American economist Ronald Coase proposed the idea of broadcasting market. It seemed exotic, because it was about the invisible products, which not appreciable physically - the radio waves. Coase argued, that it importantly clearly define property rights. Many believed that the introduction of the market in this area will lead to chaos. But Coase's prediction came true - the market mechanism started working! Next, Coase showed that the market mechanism can be extended even for the "externals", ie, indirect effects of one good to another. Moreover, he explained that even relationship between the market and the command structures also automatically set by the market, and is set in such a way to minimize transaction costs. For these works, in 1991, Ronald Coase was awarded the Nobel Prize.

If the term «liberal economy» understood in the above sense, with the fullness of proven rules and exceptions of them, then arise the idea that a

liberal economy - it is only generally possible economy and that no other economy can not be. It is this idea now dominates.

At the same time, the liberals from the economy have good understanding that the market is not omnipresent. In particular, the work of Coase on the transactional costs show, that not only without the market, but without command methods, that operate within firms and the government, the economy can not be effective. One of the founders of monetarism, Nobel Laureate Milton Friedman argued, that the potential damage from the action of market forces is doing the state intervention fundamentally necessary in the form of budget financing of the related measures, development of admissible norms of pollution, penalties and taxes. Without the methods of planning it is impossible to manage natural monopolies.

Why is the economy based on the principles of liberalism, so far from ideal? Why, in spite of this, the most successful socialist economy of China increasingly becomes like a liberal? Why is no one else offers effective methods to solve the obvious problems? The answer is: it is no knowledge of some very important Laws of economy and, as a consequence, absence of tools of economy management, with which we can to solve urgent problems. It means, we need a new economic theory, which will formulate the new, yet unknown Laws, systematize them, will allow to monitor what is happening, diagnose problems and create tools for their solution. Until the theory will not give a clear understanding of the nature of the problem, it is meaningless to speak of any kind of the political, institutional and legislative measures. In the absence of the theory we are forced to look on what is happening as a natural disaster, like a tragic fate, which hanging over humanity, which can not be changed.

It should consider, that since the time of Coase and, especially, from the time of Marx, the economy radically has changed, and the laws which they discovered, do not cover the new phenomena which have acquired the currently prevailing significance. Theory should be clear, verifiable and systematic application. It must point to the best possible way out of this impasse.

The opportunity to create such a theory emerged in connection with the opening of the Equilibrium Stochastic Processes (ESP), with working out universal methodology of mathematical modeling of ESP in the form of the Evolutionary-Simulation Methodology (ESM) and with the creation of instrumental system "Decision" for the software implementation of mathematical models, developed on the basis of the ESM (see [2-5]). The mentioned scientific results are the consequence of the long-term study (the first work dedicated to the ESM, appeared in 1970).

Theory of ESP for the first time gave the opportunity not only to formulate and justify theoretically the efficiency of joint use of market and

planned strategies the management of the economy, but also to create tools to manage such processes, which previously could not be managed.

In this regard, a particularly great interest is the proof of the set of the interrelated theorems, which given in [1]. These theorems open the mechanisms of occurrence of problems liberal and socialist economies, and suggest ways to overcome them.

According to these theorems the liberal economy, even if it was arranged ideally, will inevitably lead to the collapse. In particular, theorems 3 and 4 are examining the economy, initially consisting of identical by size and efficiency of market sectors, where on each of sector of market created conditions of a «perfect competition» and where all subjects of the market absolutely honest. Of these theorems follows, that even in these conditions arise a division of sectors by size and profitability, and then start automatically the **rule of capital flows**, which says: capital is flowing from the sector with lower average income of unit on capital taking into account risk to the sector with greater average income of unit on capital taking into account risk. This rule gradually but inevitably covers all sectors and leads to the fact that capital starts to flow from all sectors of the market to one of the sectors. This creates an imbalance that has been steadily increasing and will certainly lead to the collapse of the economy.

Thus, from this it follows that the very market system is not able to get rid of the oligarchy and that the market can not be separated from social inequality and political tension. In these circumstances, in order to avoid a general economic collapse it is necessary to manage flow of capital.

**Rule of capital flows** clarifies and summarizes the approval of Marx about inevitability of crises and approval of Lenin about the origin of the financial oligarchy. The problems of a market economy, which are indicated by Marx and Lenin, have not gone away. It is recognized by well-respected and competent people today. For example, the Nobel Prize winning economist Paul Krugman writes that "The capitalist mankind decided that tamed the business cycle and was punished for the arrogance of the return of depression Economics sample of the 1930s».<sup>1</sup>

From the above, it would seem, is inevitably followed by the conclusion, that for not the overall economy, but at least for the some of sectors, planned economy should dominate. It turns out that this conclusion is also not true. By theorems 7 - 9 (see [1]) long-term operation of the planned economic system in any form its localization, leads to the continuation of inefficiency, flow of capital from the effective sectors to ineffective, the emergence and rise of deficiency, excess reserves and imbalances. We saw all of this in the USSR and in the countries of the socialist community.

What can be and what should be the economy in the foreseeable future? Economic science, if we assume that it does not include the theory

---

<sup>1</sup> <http://www.finansy.ru/publ/mirec/009krugman.htm>

of ESP, not able to answer this crucial and burning question! With this, apparently, will be agree majority of both domestic and foreign specialists.

In [2] is a brief, systematic, rigorous and rather simple exposition of the Theory of ESP, which shows the importance of this theory for the economy, are given the basic characteristics of the instrumental system "Decision". This book gives detailed references to primary sources and documents, proving the existence of discoveries, patents, licenses, authorship and practical results. The book published online on the website <http://www.decision-online.ru/> in the section «Publications». To understand the book requires no special mathematical or economic training. Of course, the book [2] is not a set of ready-made recipe for solving all the problems of the modern economy (as a cookbook solves all problems of the preparation of delicious and healthy food). In [2] it is shown, how to formulate the problems so that they can be resolved and will can bring the desired result; in the book describes the main fields of application ESM and "Decision" to create innovative tools for economic management.

Based on the decision of the International Association of authors of scientific discoveries and inventions, the members of which at various times has been to 28 Nobel Prize winners, the Presidium of the Russian Academy of natural Sciences recognized the instrumental system of optimal decision-making in conditions of uncertainty and risk "Decision" as discovery. The message about system "Decision" have placed on the website of high-tech of Russia <http://www.rushightech.com>.

With the use of ESM and "Decision" made numerous studies on the orders of small and medium-sized enterprises, research and educational organizations, large corporations, banks, government agencies, with the results of the practical application of which have confirmed their effectiveness.

From the Theory ESP follows, that economy may be effective only in that case, when on the majority of sectors of the market managed switching from market to plan and back is realizing. The peculiarity of the current state of the domestic and global economies is that there is a principal possibility to carry out such a switching, without violating the rights of property. ESP theory tells how to do it technically. A situation in which on some of the sectors of the market there are self-regulation, and on the other sectors of the market at the same time operates planning, or when in one period of time in the sector's there is self-regulation and in the other time period - planning is permissible.

Theory of ESP allows detect new areas of activities, on which should be extended public administration. In particular, as already noted, it is necessary to manage the flow of capital between sectors of the market and classes of capital.

In accordance with the Theory of ESP, the state should managed only by changing the ratio of the risk of overstating and the risk of understating.

Such a control is equally applicable when in the sector on the market there is self-regulation and when on it take place planning. It does not infringe upon the freedom of action of market participants, is highly effective. Variants of management for the economy based on the ratio of the risk of overstating and the risk of understating infinitely varied on possible means of implementation. These management practices can always be adapted to the specific conditions and can be one of the fundamental means of combating corruption.

In general, from the Theory of ESP emerges a new vision of the economy of the future, which can, in our opinion, get rid of vices and crimes of capitalism and socialism, and is able to take all the best of these systems.

For the practical implementation of new methods of management, for distribution of management on new spheres of activity necessary to create the appropriate management tools. We clarify, that under the "management tool", we mean a set of economic indicators, methods of quantitative evaluation, forecasting and planning control figures, as well as the means of influence of the governing body for the control object. The theory of the ESP and the instrumental system "Decision" is the necessary base for the creation of such tools.

The creation of an economy of the future, based on the knowledge of the laws that governed ESP, appears not as a revolutionary coup (such a revolution is necessary only in the heads of specialists), and as a systematic, phased process of modernization of the state and corporate management. This process on each step should be experimentally verified, and secure a improvement, but not the deterioration of the situation in each particular can be very local case.

Research ESP refer to the area of convergence of science, because ESP are observed in the physical, biological, economic, large technical and social systems. So far, Russia has absolute priority in this area.

We think that the time, when a small group of scientists has worked in the field of ESP quietly, without external interference, completed successfully. Now is the time when the need to expand and intensify work on this scientific area. We mean not only the creation, testing and implementation of new management technologies. No less important is the development of training courses on the Theory of ESP for students and pupils of the senior classes, creation of educational games, development and implementation for open market commercial software products, advertising to attract the students and schoolchildren.

### **Literature**

1. Лихтенштейн В.Е., Росс Г.В. Математическое доказательство необходимости перемен в экономике. // Информатизация и связь, № 1'2013, с. 37 – 46.

2. Лихтенштейн В.Е., Росс Г.В. Новые подходы в экономике. М.: Финансы и статистика, 2013.
3. Лихтенштейн В.Е., Росс Г.В. Введение в теорию развития. М.: Финансы и статистика, 2011.
4. Лихтенштейн В.Е., Росс Г.В. Информационные технологии в бизнесе. Применение инструментальной системы Decision в микро- и макроэкономике М.: Финансы и статистика, 2008.
5. Лихтенштейн В.Е., Росс Г.В. Информационные технологии в бизнесе. Применение инструментальной системы Decision в решении прикладных экономических задач. М.: Финансы и статистика, 2009.