



Munich Personal RePEc Archive

The nature and origin of stability in economic processes

Kuzmin, Evgeny

Ural State University of Economics

June 2013

Online at <https://mpra.ub.uni-muenchen.de/47894/>
MPRA Paper No. 47894, posted 30 Jun 2013 00:22 UTC

THE NATURE AND ORIGINATION OF STABILITY IN ECONOMIC PROCESSES ¹

Evgeny A. Kuzmin

Postgraduate student, E-mail: KuzminEA@gmail.com

Ural State University of Economics

str. March-8, 62, Ekaterinburg, Sverdlovsk Region, Russia, 620219

The article clarifies the substantive aspects of emergence of stability in dynamics of development of economic entities. The condition of stability demonstration in economic processes through the measures of uncertainty and certainty is provided and proved. The tetralistic nature of stability as a property of both state (position) and result of a self-organization mechanism of the economic entity is grounded. The author's position on the non-exclusive role of the rate of transformations in organization and external fluctuations expressed in asynchronous oscillations and responses to them is reasoned. The role of strength and reliability in stability characteristic in the course of adaptation to undesirable deviations from the idealistic path of a life cycle is given.

Keywords: uncertainty, stability, economic entities, reliability, strength, adaptability, “memory effect”.

JEL Classification D80, D81

AGRIS Subject Categories E14, U30, U40

1. Introduction

In today's world of exponential growth of complexity in social and economic interaction, the categories of uncertainty and certainty, stability and self-organization, controllability and steadiness become of particular significance. Many domestic and foreign works and publications that have covered several centuries of development of scientific thinking are devoted to study of them. Herein, uncertainty as instability represents one of the central concepts in various areas. Understanding and first of all knowledge of mechanisms of uncertainty influence on the condition of economic entities allow to realize their effective, rational and optimal control in every respect.

¹ The work was performed by the Ministry of Education and Science of the Russian Federation financial support under the Federal Program “Scientific and scientific-pedagogical personnel of innovative Russia” for 2009-2013 on the event 1.3.2. (XLVI, Lot 2012-1.3.2-12-000-3002) entitled “Combinatorial study distinctions of transaction costs actors organizational and economic systems” application № 2012-1.3.2-12-000-3002-034; and Russian Foundation for Basic Research (RFBR), project № 12-06-31031.

In fact, development of any organizational and economic system mainly depends on how the system adapts to the emerging changes in the internal and external environment, as well as how economic factors achieve the stability condition. However, with a variety of scientific publications covering stability issues, there is still a range of unsolved problems, among which the most important one is to reveal substantial aspects of stability origination in the economic environment and its characteristics.

2. Scientific literature review

The works of such domestic scientists as D.K. Akhmetov and G.N. Chubakov (2000), A.A. Bogdanov (1989), I. Prigogine (1985), G. Nicolis (1978), who have made the most significant contribution to the formation and substantive filling of this research line, are devoted to the study of the nature and essence of stability, study of its influence on economic development, definition of conditions of its origination and many other aspects. The subsequent development of the stability idea is reflected in modern works of V.V. Kosterev (2008), V.B. Sirotkin (2008), V.M. Ryabov (2011), I.V. Bryantseva (2004), V.Ph. Merzlyakov, A.E. Yagunov (2002), etc.

It is worth noting that in the economic thought the category of “stability” can be found long before the first systematic and well-developed researches of the middle - second half of the XX century. In one form or another, the concept of stability is present in periodic publications of the XIX century period and earlier, for example, in “Moscow Government Statistical Yearbook”, where the term is used in the meaning of constancy and invariance: “stability in the difference between ... price ...” (Moscow Government..., 1896: 4). However, the concept of stability is used interchangeably with the category of “strength” as, for example, in “Besʔda” journal concerning the light industry when both strength and stability “... stand to strengthen ...” (Chuprov, 1871: 215) conditions of a company and their independence. In modern works the non-changed definition of stability supplemented by new characteristics that detail its demonstration can be still found after more than a century.

At that, there is practically no uniform definition of the “stability” term in the scientific community. The dualism of this concept underlined in study of O.V. Mikhalev’s (2010) particularly in study of the specific entities and events, strikes a chord and acknowledgment with scientific publications. On the one hand, stability represents a property of organizational and economic system and each of its elements. It, “being an intrinsic property ... depends on both internal and external conditions” (Mikhalev, 2010: 11). On the other hand, it is possible to say that stability is a condition in which the system can either be or experience instability as a sign of excessive influence of uncertainty and risks, their accompanying changes and rate of such changes.

As a result, “stability” – is not just a property and not just of a state system, but a property, that demonstrates itself in a state depending on its relationship with the environment” (Mikhalev,

2010: 13). Significant and rather precise definition of stability suggested by O.V. Mikhalev allows us to trace the genesis of stability understanding in processes, interaction between elements, in the internal organization of economic entities and economy as a whole. Among the common points of view, the standpoints of L.I. Arkhipov and his colleagues, who are inclined to believe that the economic stability “reflects the strength and reliability of its elements, vertical, horizontal and other diverse relations within the system, as well as the ability to withstand internal and external loads” (Arkhipov etc., 2009: 791), - are mostly highlighted. It appears that this view is gradually losing its relevance giving way to a new paradigm of preconditions and incentives for development of economic entities, purposes of their existence and activities. According to the author, when the security descriptor in the stability interpretation can be accepted in some way, the situation with strength characteristic is more ambiguous.

3. Substantial characteristics of stability

3.1. Reliability and strength in adaptation, variability and stability of systems

Reliability, as it is believed to be, is associated with probability of performing the specified functions and under certain conditions for a specified period of time (Kosterev, 2008: 14). Economic entities continuously and unavoidably are sometimes affected by a variety of factors different in strength and direction. The ability to adapt to these factors, which inevitably lead to changes in the environment and within the organization by virtue of direct or indirect connections, shows reliability as a consequence of this adaptation. However, in our opinion, the use of the given characteristic in stability interpretation is not quite correct. Reliability is more a consequence than a reason of steady state (position) and property of the organization.

A similar argument can be used with regard to the strength, which is mentioned in the work of L.I. Arkhipov et al. *Strength, according to the author, can be even opposed to stability.* Understanding strength as a property of resistance or resilience of economic entity to destruction, resistance is expressed only in one form – inertness. Invariability as a result of strength excludes any transformation and modification. But *stability is not static; it is a dynamic bilateral characteristic of the property and state of the economic entity.* As a consequence, strength introduces certain “rigidity” in the model of an organizational order. As a result, the most important and significant ability – the ability to develop and adapt – is excluded. Establishment of connections, structure and elements of economic entity and in all other respects does not allow us saying that strength expresses the stability essence. It appears that *strength as well as reliability represents the indirect result of adaptation, when adverse conditions are in opposition with strength, while favorable ones lead to modification of the internal microeconomic mechanism of the organization.* From theoretical and methodological point of view, this very important remark about the need for stability development is confirmed by the words of I.P. Vorobyeva. According to her

vision, the economic system stability is “the ability to withstand adverse internal and external forces, while retaining development parameters, stable indicators and optimal proportions, development dynamism and effective use of conserved and reproduced resources” (Vorobyeva, 2012: 20). In addition, the obvious at first glance indicators with the help of which it is possible to judge about the presence or absence of stability: “sustained economic growth”, “sustainable natural resource potential”, etc., which is not truly correct – are distinguished. The processes of achieving stability are much more complicated than it seems to be, and these indicators cannot be used to describe the fact that stability does occur.

Syneclectically similar discrepancies can be found in the study of stability of companies in the real sector of economy, which has been held by I.V. Bryantseva. The particular static condition manifests the delusion concerning the stability assessment. The stability assessment formation should take into account the fact that deviations and changes represent natural phenomena. Important is the fact that these changes will put into action the self-destruction mechanism, whether this is the economic factor or economy as a whole. Indicators, conditionally lined up in a three-level system according to I.V. Bryantseva (2004: 80), at best give an idea of the company moment state, but cannot be involved in the dynamic assessment of stability, since there is no any key element – a standard or reference sample. In this regard, stability consideration in a management and control context is quite interesting.

Finding connection between uncertainty and stability of the economic entity, the author suggests that *adaptability, directly underlying stability, is one of the versions of self-organization and acts as sublimative management construction including conscious and unconscious management reactions inside the economic entity*. Presence of conscious management components in self-organizational adaptation processes may seem to be strange. However, according to the author, self-organization means not only management actions created as a result of experience and “learning”, but also the reactions and messages that are generated at the time of “correct” understanding of what is happening at the moment. In other words, *self-organization of the economic entity as an adaptation includes management components that occur in response to emerged fluctuations regardless of the source of these reactions and management actions*. This can be confirmed in study held by T.Y. Ivanova and V.I. Prikhodko, who come to the conclusion that “adaptability of the organization to environmental conditions [is carried out] as a result of a certain directed impact on it” (2004: 138).

It should be noted that in views of a number of scientists, whose point of view is shared by the author, there is a certain amount of managerial influence that can either lead the system to stability condition or, on the contrary, move its path of motion to a new development course absolutely different from the ideal one. These thoughts permanently and at the same time

occasionally occur in some scientists' minds including V.I. Avdiysky and V.M. Bezdenezhnykh (2011), V.M. Ryabov (2011), etc. The main argument of such reasoning was that organizational and economic systems are not initially systems possessing self-organization as such. Self-organization and adaptation as one of its forms arise due to intention to preservation of its existence, which leads to the fact that *due to "memory effect" the mechanisms of avoiding undesirable events and phenomena are spontaneously created.*

Scientists in different ways come to the idea of a sufficient or necessary measure of managerial impact on stability. V.I. Avdiysky and V.M. Bezdenezhnykh's study reveals the existence of a "quantum of control action" (2011: 59) as the minimum allowable impact on uncertainty constituting a certain resource, the application of which leads to the changes in the development path. A little bit different is V.M. Ryabov's approach simplifying the understanding of a reaction measure up to "optimal dosed managerial influence" (2011: 272) by means of which the organizational and economic system still remains in a stability condition. However, *the given stability condition has threshold boundaries, where "insufficient or excessive control can bring the system out of this area".*

Thus, *stability including balancing responses to external and internal disturbances involves finding of the organization in such a condition at which the process of following the ideal path will be in no danger, as well as any directed path.* Clarification of the fact that the path or motion vector does not necessarily mean that the economic entity is aimed at progressive evolutionary growth. The behavior strategy of the organization, in some cases, can represent not only the market growth and dominance, but also maintenance of a stable position or even some reduction in their business activities in those moments when it could threaten the existence of the economic entity. Stability as a condition implies the idea that, in any directed motion of the organization this path will be in some way stable, with no significant deviations. *Therefore, it would be incorrect to say that "withering" is the result of an unstable situation.* And that is why the nature of movement process, rather than its direction that can fully correspond to the economic entity's interests, is of great importance.

3.2. Asynchrony in adaptation transformations

Undoubtedly, the process of motion always has a speed which cannot and should not act as a peculiar indicator of stability, which to some extent breaks the settled stereotype of its perception. Concentration in time of changes in the environment and organization faces only one basic limitation associated with the ability to adapt. Even if motion speed together with transformation capacity is relatively large, the economic entity does not lose its stability, when these changes are smooth and quite natural for this life period of the organization.

Smooth and natural transformations in the economic entity are achieved only in the case when there is an “adequate variability allowing to be changed at the same speed as the environment” (Mikhalev, 2010: 14). *In cases when an internal transformation takes place at a slower speed than the environment changes, the likely consequence of this may be a deviation from a certain path, which, by the way, does not allow us saying that “the system (or economic entity – author’s note) is in an unstable condition and can be destroyed in a limit”* (Mikhalev, 2010: 14). This conclusion contradicts the common understanding of stability that stroke a chord with O.V. Mikhaleva’s study. According to the traditional point of view namely comparison of speed in adaptive transformations and modifications of the internal environment of the economic entity at a speed of changes in the external environment indicates presence or absence of potential stability, and finally, of such a condition.

According to the author, the actual path of life cycle and its interchangeability indicates that the speed of life cycle for each economic entity is individual. Only a few organizations follow the pace of ideal “universal” motion, the rest part makes the bulk of “followers”. In addition, changes in the environment are determined by behavior of all participants of the economic mechanism. As a result, motion vector of the organization is either above or below the additive motion vector of the organizational and economic system. As a consequence, the speed, at which internal transformations occur, will be similarly higher or lower than the speed of environment changes. Also it should be added that stability is non-uniform and its position is subjective in a way and depends on the purposes of the economic entity. Thus, conventional establishment of the stereotype regarding the role of the speed and importance in determining stability is, at least, hardly applicable and doubtful.

It is worth noting that forward and backward linkages for the economic entity supported by the memory effect in actions and reactions to them create not only an adaptation mechanism to fluctuations, but also “provide a self-organization and regulation mechanism” (Akhmetov ets, 2000: 32). A distinct result occurs in its implementation – stability of both organizational and economic systems, and economic entity, when both have all the necessary prerequisites for self-organization.

Thus, we can conclude that *stability is rather a tetralistic category than a dualistic one*. Besides the fact that stability represents a property and a condition of the organizational and economic system, it also demonstrates presence of the process of self-organization in the life of the economic entity. This emphasizes the connection of the category of diversified stability with such descriptors as uncertainty and certainty, stability and controllability. T.Y. Ivanova and V.I. Prikhodko’s work, where ““stability” is close in meaning with “controllability”” (2004: 138), mentions about the indirect demonstration of stability as an intermediate link of adaptability of the organization. However, the author distinguishes these two terms specifying that management

includes control and opportunity of influence and feedback. At the same time, stability determines the development nature of the economic entity in accordance with its goals and objectives.

3.3. Uncertainty in stability

Behavior of organizations is often not coordinated, and that is why in stochastic systems it is reduced to the basic principle and condition due to which these systems reflect the realities of social and economic interaction. Both for the system and for the economic entity, stability affects several positions at the same time. Firstly, *stability of the structure*. Certainly, changes in the course of adaptation can lead to the fact that the internal features of relations and connections between elements, their number and hierarchical subordination, will also undergo changes. Secondly, *functional stability*. Substantial and functional (process), as well as structural stability are identical; the difference lies only in the object on which assessment and definition of stability are made.

There are a lot of publications devoted to structural stability. Thus, G. Nicolis and I. Prigogine's study reveals the well-known condition for stability observation, when "all the solutions describing the changed system remain in a vicinity of the solution corresponding to the "initial" system" (Nicolis ets, 1978: 79). But difficulty lies not in the solutions themselves, but in the area where they do not change the system so far as to bring it out of the stability position. This study held by G. Nicolis and I. Prigogine points out that in absence of such vicinity, the system or its element is structurally unstable. However, the main conclusion of the study is that "in a structurally stable system the topological structure of phase path (if it is possible to create space of the phase) remains unchanged". This indirectly confirms the hypothesis made by the author that the *motion vector of the economic entity in a steady state corresponds to a target direction of such a motion*.

While structural stability focuses on variability of positions of the elements in the organizational and economic system, as well as their hierarchical and interdependent connections, implementation of decisions in a general perspective, functional or process stability is aimed at allowable variability of mechanisms and decisions that are focused on directed transformations. Complexity and diversity of stability in its obvious demonstrations lead to the need of searching a universal measure for variation and adaptation (self-organization).

Linking of variability and adaptation has a certain result for the economic entity. *The adaptation "quality" becomes the decisive factor in stability emergence and maintenance, when the influence on changes is impossible*. Naturally, the scale and scope of changes are not constant values and often change, testing the strength of solution selection mechanism for new tasks and problems, which represent the pure organizational adaptation. V.R. Vesnin's study rightly points out that selection represents "creation and improvement in accordance with the objectives set in any system ... on the basis of regulating adaptive mechanism" (2007: 22-23). In this case, the process of

adaptation mechanism includes on the one hand, the emergence of new elements and relations that improve the reaction of the economic entity to the changes in the environment, and also leads to “complexity, new properties ... as a result of which ... ingression occurs” (Vesnin, 2007: 22-23); on the other hand, braking structures that cannot make correct selection of solutions regarding the changes emerged, which leads to simplification of the organization, are excluded from mechanics or are modernized. Based on simplicity and complexity characteristics, the assumption that *in the adaptation process two opposite tendencies face each other – simultaneous increase of uncertainty and certainty, and on the contrary their reduction* – becomes quite logical. In this regard, it should be pointed out that the selection can be demonstrated in different ways, which eventually creates a certain result of the linking changes and adaptations.

According to the author, internally conflicting tendencies for growth or decrease in entropy and negative entropy in the course of adaptation creates changes in the status quo in relation to the level of aggregate uncertainty and certainty. Apparently, the heuristic correlation potential of relative quantitative changes in the environment (both internal and external) with absolute or specific quantitative change of uncertainty or certainty give the opportunity to lift the veil over the question of identifying the stability condition and its assessment.

4. Conclusion

Thus, we can say with certainty that to the very extent of uncertainty and certainty the content and nature of stability, not only as a property or state (position), but also as a result and one of self-organization forms are focused. Therefore, in the adaptation mechanism two opposite tendencies – *of uncertainty or certainty growth / decrease* – develop at the same time. *The strength of each tendency in their coincidence or non-coincidence of “solutions” and “answers” to the emerging changes in the environment will give the opportunity to determine the tendency to loss or stability restoration.* Stability in this context will reflect the risk norms of management responses, through which it is possible to admit the acceptability measure of risk for the economic entity. However, for the solution of this scientific task not only substantial stability aspects should be clarified, but also a methodological approach to its assessment and determination should be introduced.

Referencies

- [01]. Avdiysky, V.I., Bezdenezhnykh, V.M. (2011) Uncertainty, variability and inconsistency in risk analysis problems of economic systems' behavior [Neopredelennost', izmenchivost' i protivorechivost' v zadachah analiza riskov povedenija jekonomicheskikh sistem]. *Effective crisis management*, 3(66), 46–61.
- [02]. Akhmetov, D.K., Chubakov, G.N. *Stability problems of social and economic development of the region* [Problemy ustojchivosti social'no-jekonomicheskogo razvitija regiona]. Moscow. Institute of Economics, RAS, 2000. 295 p.
- [03]. Bogdanov A.A. *Tectology (Universal Organizational Science)* [Tektologija (Vseobshhaja organizacionnaja nauka)]: [in 2 books] / [edit. collective L.I.Abalkin (Executive Editor), etc; Economics Department of ASUSSR. Institute of Economics ASUSSR]. Moscow. Economics, 1989. Book 1. 304 p.
- [04]. Bryantseva, I.V. (2004) Criteria assessment system of economic stability of a company [Sistema kriterial'noj ocenki jekonomicheskoy ustojchivosti predpriyatija]. *Bulletin of Saint-Petersburg State University of Economics and Finance*, 2, 79–90.
- [05]. Vesnin, V.R. *General theory of organization: study guide* [Obshhaja teorija organizacii : ucheb. posobie]. Moscow. MSIU, 2007. 156 p.
- [06]. Vorobyeva, I.P. (2012) Economy stability and problems of its ensuring in the modern Russia [Ustojchivost' jekonomiki i problemy ee obespechenija v sovremennoj Rossii]. *Vestnik of Tomsk State University*, 1(17), 17–25.
- [07]. Kosterev, V.V. *Reliability of technical systems and risk management* [Nadezhnost' tehnicheskikh sistem i upravlenie riskom]. Moscow. MEPhI, 2008. 280 p.
- [08]. Merzlyakov, V.Ph., Yagunov, A.E. (2002) The impact of economic stability in the development process of a company [Vlijanie jekonomicheskoy ustojchivosti na process razvitija firmy]. *Vestnik of Nizhni Novgorod State University. Economics and Finance Edition*, 1(4), 163–166
- [09]. Mikhalev, O.V. *Economic stability of managerial systems: methodology and practice of scientific research and application analysis* [Jekonomicheskaja ustojchivost' hozjajstvennyh sistem : metodologija i praktika nauchnyh issledovanij i prikladnogo analiza]. St-Petersburg. Edition of St-Petersburg Academy of Management and Economics, 2010. 200 p.
- [10]. Nicolis, G., Prigogine, I. *Self-organization in non-equilibrium systems* [Samoorganizacija v neravnovesnyh sistemah]. Moscow. Mir, 1978. 512 p.
- [11]. Prigogine, I. *From Being to Becoming* [Ot sushhestvujushhego k vznikajushhemu]. Moscow. Nauka, 1985. 328 p.

- [12]. Ryabov, V.M. (2011) Sustainable development of industrial establishments under current conditions [Ustojchivoe razvitie promyshlennyh predpriyatij v sovremennyh uslovijah]. *Vector of Science TSU*, 4 (18), 271–273.
- [13]. Sirotkin, V.B. *Ensuring stability of economic growth* [Obespechenie ustojchivosti jekonomicheskogo rosta]. Moscow. GUAP, 2008. 277 p.
- [14]. Moscow Government Statistical Yearbook. Moscow. Printed by S.P. Yakovleva, 1896.
- [15]. Ivanova, T.Yu., Prikhodko, V.I. Organization theory [Teorija organizacii]. St-Petersburg. Peter, 2004. 272 p.
- [16]. Chuprov, A.I. (1871) Light industry in connection with craft beginning and land community. *Besńda: scientific, literary and political journal*, [first year, the V-th book. Printing house of A.I.Mamontov and Co], 5 (5), 215.
- [17]. Arkhipov, L.I. [etc.] under editorship of Arkhipov, L.I., Bolyshakov, L.K.. Economics [Jekonomika]. Moscow. Prospect, 2009. 839 p.