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## **Innovation as the Main Factor for Sustainable Development of a Commercial Bank**

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**Abstract:**

*The article is an original study of the essence of banking innovations and their role in ensuring sustainable development of a commercial bank. The authors make definitive analysis of the term 'innovation' in research works of domestic and foreign authors, reveal their key feature, namely, the novelty that carries energy necessary for sustainable development of economy and a commercial bank.*

*From the point of view of the synergetic approach and using the principles of non-equilibrium thermodynamics, scenario development of an open economic system is considered, a commercial bank being a special case of it; schemes to illustrate it are provided.*

*The analysis made by the authors allows for a conclusion that it is possible to ensure a stable development of a credit institution only if there is a permanent inflow of external energy that compensates for energy losses due to entropic dispersion and a negative influence of internal and external factors thereon.*

*Systemic innovation activity come laden with this energy, which leads to the conclusion that it is innovations that are the main factor ensuring a sustainable development of a commercial bank.*

*A classification of banking innovations into basic (radical), combinatorial, and modifying ones is given.*

**Keywords:** *innovations, sustainable development, commercial bank, credit institution, synergetic approach, non-equilibrium thermodynamics.*

**JEL Classification:** G21, O32

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## 1. Introduction

Analysis of regulatory documents in force in the territory of the Russian Federation, as well as works of leading researchers devoted to the theory and practice of banking, shows that a connection between the innovative activity of credit institutions and their sustainable development can be often traced therein. Thus, according to the concept of long-term social and economic development of the Russian Federation, modern, competitive, and innovative-oriented infrastructure of the banking sector is one of the conditions for a sustainable growth of the domestic economy in the long term, for ensuring its national security in the context of intensifying globalization and deregulation processes (Degtyareva *et al.*, 2013; Thalassinos *et al.*, 2013; Vovchenko *et al.*, 2017; Anikina *et al.*, 2016).

In turn, in the works of such leading scholars as Fetisov, (2006), Maksimov *et al.*, (2010), King (2012), it has been established that at the present stage of the banking system development, it is the innovative activity of credit institutions that will not only increase the resources mobilization efficiency, but will also ensure allocational efficiency of funds attracted by commercial banks. On the contrary, in the work of Shilova (2015), it has been noted that the lack of innovation leads to stagnation in the banking sector and results in destruction of the integral system of a commercial bank (Thalassinos, 2008; Thalassinos *et al.*, 2012).

## 2. Research Background

Nevertheless, in the authors' opinion, the existence of a link between the innovative activity of credit institutions and their sustainable development is not a priori real and needs to be proved. Of course, it should begin with analyzing the existing definitions of the term 'innovation', which, in turn, indicates a current absence of generally accepted terminology in this field, and, depending on a research subject of economists, banking innovations can be defined as a system, a result, a tool, or a process (Table 1).

It has been established that there are two traditional approaches to the definition of the term 'innovation': innovation can be positioned as a dynamic process of new product development and introduction (services, approaches, principles, etc.) (Schumpeter and Opie, 1983; Kulagin, 2004; Lapin *et al.*, 1989; Twiss, 1989; Azgaldov and Kostin, 2008; Massey *et al.*, 1999), or as a static tool, the result of innovative activities (Molchanova, 2001; Borisov, 2000; Vertakova and Simonenko, 2008; Sokolov *et al.*, 1997; Drucker, 2004; Vlasov, 2017; Kormishkin *et al.*, 2016; Thalassinos and Pociovalisteanu, 2009). Considering their certain dialectic nature, please note the need to study the term under consideration in the context of a sustainable development of a credit institution.

Within the study, taking the banking innovation as an integrated combination of a result, an effect, and a permanent process of developing (introducing) innovations in

the banking sector, please note that in the context of a major overhaul of the traditional banking business model, it is innovative activities that will enhance the efficiency of both a single commercial bank and the banking sector of the country as a whole, ensure their sustainable development, since it has a multicomponent nature with the dominance of the monetary nature of a banking service (or product) and the complementary nature of the accompanying innovations that contribute to bringing the service (or product) to the final consumer.

**Table 1.** *Definitive analysis of the term ‘innovation’ in research works of domestic and foreign authors*

Subject of research work	Author of the work	Definition of the ‘innovation’ concept
System	J. A. Schumpeter, R. Opie (Schumpeter and Opie, 1983)	<ul style="list-style-type: none"> <li>- introduction and use of new types of products, modes, or methods of production;</li> <li>- entry into new markets;</li> <li>- development of new industrial organization forms through reorganization with the aim of further monopolization</li> </ul>
	A.S. Kulagin (Kulagin, 2004)	<ul style="list-style-type: none"> <li>- a new (improved) product line;</li> <li>- a method (technology) of its production or use of new (improved) products;</li> <li>- innovation or improvement in the area of organization and (or) production economics and (or) sale of products that provide economic benefits and (or) create conditions for obtaining such benefits, improve customer appeal of the products (goods, work, services)</li> </ul>
Result	O.P. Molchanova (Molchanova, 2001)	<ul style="list-style-type: none"> <li>- the eventual result of creative activity embodied in the form of new or improved products (technology) practically applicable and able to meet certain needs;</li> <li>- the result of implementing new ideas and knowledge with the view of their practical use to meet certain customer needs.</li> </ul>
	A.V. Borisov (Borisov, 2000)	- the result of creative activity aimed at the invention of a new product.
	Yu.V. Vertakova, E.S. Simonenko (Vertakova and Simonenko, 2008)	- an embodied result from investing in new products, services, equipment.
	D.V. Sokolov, A.B. Titov, M.M. Shabanova (Sokolov <i>et al.</i> , 1997)	- the final result of creation and development of a fundamentally new or modified means meeting specific social needs and producing a number of effects, including: economic, scientific, technical, social ones, etc.
Tool	P.F. Drucker (Drucker, 2004)	- a special tool used by business people for a new type of business or product introduction.

Process	V.N. Lapin (Lapin <i>et al.</i> , 1989)	- an integrated process of developing, distributing, and using a new practical means to better meet the known needs of people.
	B. Twiss (Twiss, 1989)	- a process when an invention or a new idea acquires economic substance.
	A.V. Kostin G.G. Azgaldov (Azgaldov and Kostin, 2008)	- a process that uses the results of intellectual activity and releases products in conformity with international standards;
	D. Massey, P. Quintas, D.Wield, (Massey <i>et al.</i> , 1999)	- a process involving research, design, development, and organization of a new product, process, or system production

It should be noted that the definitive analysis of the term ‘innovation’ has made it possible to highlight its inherent key feature, which is novelty laden with the energy necessary for a sustainable development of institutions. For example, in the work of the American economist Kalecki (1971), the character of any economic system development is defined as a closed cycle, which is due to endogenous effects arising in it. However, an exogenous (otherwise stated, an external) factor, an impulse, can affect a specified economic system at a certain point. The result of this impact is a development of the economic system, while it is innovation that is a case of this exogenous impulse.

### 3. Methodology

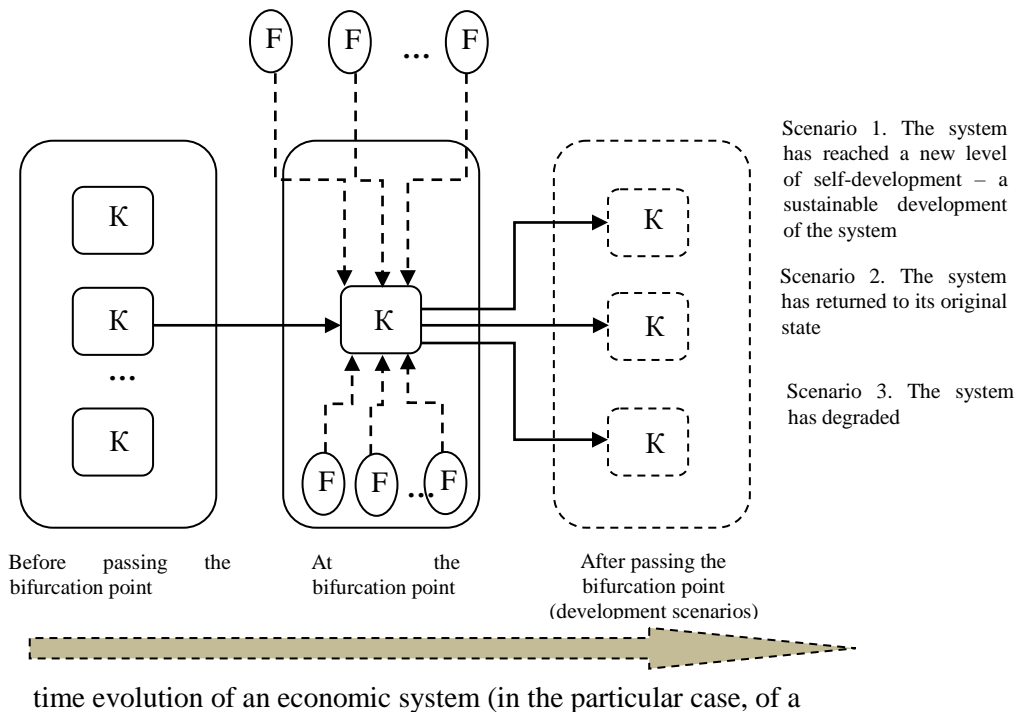
In the authors’ opinion, this idea behind the work of Kalecki (1971) should be taken further projected into the banking sector ere in the context of a sustainable development of credit institutions, since any commercial bank represents a special case of an open economic system, and, therefore, is subject to the laws of its functioning. For this purpose, it is expedient to use the synergetic approach set forth in the work by Lubkov (2008). According to this approach, open economic systems, in addition to a dynamic stability, that is, the ability to follow the initially plotted development vector, are characterized by a statistical stability (or the ability to restore their activities in the context of a negative impact of external and internal factors at a time). An analyzed system is evaluated by an expert as dynamically and statically stable if it has the potential for regeneration subject to occurrence of a crisis (otherwise, while the system is passing through a bifurcation point), that is, characterized by the presence of relaxation stability (stability of relaxation) with immediate approximation to the point of bifurcation or straight after passing it.

### 4. Results and Discussion

It follows from the foregoing that the development of an open economic system after passing through another bifurcation point during its functioning, depending on the degree of its stability, takes course in accordance with one of the three scenarios known in advance:

- 1) if the open economic system is characterized by a low dynamic and static stability, after passing through the bifurcation point, it degrades;
- 2) if the open economic system is characterized by an acceptable dynamic and static stability, after passing through the bifurcation point, it will return to its original state;
- 3) if the the open economic system is characterized by a high dynamic and static stability, after passing through the bifurcation point, it will move to a new level of self-organization. This variational process is schematized in Figure 1.

**Figure 1.** The scheme defining the authors' idea of the relaxation stability of an open economic system (of a commercial bank, in this case)



$K_1, K_2 \dots K_n$  – a set of coefficients used by an on-looker to characterize the stability of an economic system

$F_1, F_2 \dots F_m$  – external factors affecting the system at the point of bifurcation

$F'_1, F'_2 \dots F'_k$  – internal factors affecting the system at the point of bifurcation





—————> - transition of the system from one state to another

.....> - impact of factors

Thus, as a particular case of an open economic system, a commercial bank, in the course of its functioning at the bifurcation point, is exposed to numerous factors of

the environment that is internal and external with respect to it. Depending on to which of the above scenarios it will further develop, an on-looker is to describe it as a credit institution subject to destruction (in the event the first of the proposed scenarios has been executed), as a developing credit institution (in the case of the second one of the proposed scenarios), or as a steadily developing credit institution (within the third of the proposed scenarios). Taking this into account, one can prove that a necessary element of a sustainable development of a commercial bank is its innovative activity. To this end, let us continue to take the first approximation that internal and external factors affect the development of a credit institution only when it passes through the bifurcation point. In addition, given the fact that in order to ensure the effective functioning of a commercial bank, its system must be of certain energy at any time, the value  $E_0$  is assigned to it at the reference time before passing through the bifurcation point  $t_0$ , (Figure 2).

**Figure 2.** *Presentation/CONCEPTION of a commercial bank evolution from standpoint of non-equilibrium thermodynamic*

Legend	
commercial bank development in the absence of innovations	
commercial bank development with simultaneous implementation of	
basic innovations	
combinatorial innovations	
modifying innovations	

During further reasoning, the authors will be guided by the principles of non-equilibrium thermodynamics, whereby any system is characterized by the presence of entropy (the term ‘entropy’ was introduced into thermodynamics as a function of state of a thermodynamic system that determines the measure of irreversible energy dissipation). Furthermore, in accordance with the second law of thermodynamics in closed systems, entropy either remains unchanged or increases reaching a maximum when thermodynamic equilibrium is attained. In turn, as consistent with Boltzmann’s statement, entropy cannot decrease in closed systems, that is, in those that do not receive an external energy feed. The second law of thermodynamics establishes a definite evolutionary trend of all natural processes towards energy attenuation and entropy increment.

Thus, even taking into account the first approximation, that is, in the context of total absence of a negative external and internal influence, the system under investigation – a commercial bank – will not last arbitrarily long, since the initial energy characterizing its system –  $E_0$  – is dissipated in the process of its functioning, while the entropy characterizing its system increases. This slow destruction in the absence of an external effect on the object under study is schematized in Figure 2 ( $E_1 < E_0$ ,  $E_2 < E_1$ ). In turn, at the bifurcation point, the open system of a commercial bank gives some of its internal energy to the external environment to compensate for the

negative impact of external and internal factors affecting it (in the scheme shown in Figure 2, the energy dissipated because of influence of the internal and external environment is denoted by  $\Delta E$ ). As a result, an abrupt destruction occurs, affecting the stability of a commercial bank.

Thus, the destruction of the open economic system of a commercial bank is a natural phenomenon, to overcome which, thereby ensuring a sustainable development of a credit institution, is possible only subject to the availability of a permanent inflow of external energy that compensates for energy losses due to entropic attenuation, as well as due to the negative influence of internal and external factors thereon. It is banking innovations that come laden with the external energy.

In the light of the foregoing, it is undisguised that each credit institution is forced to change in accordance with the current circumstances of the banking business to remain a full-fledged participant in the banking market while permanently displaying a systemic innovation attitude.

Let us also draw attention to the fact that at present, there are several principles of classification of banking innovations in the economic literature. From the authors' point of view, a classification by the degree of innovation potential contained therein is the most important; whereby researchers traditionally distinguish basic, combinatorial, and modifying innovations (Molchanova, 2011; Maslanchenkov and Tavasiyev, 2000; Gunyakov and Gunyakov, 2013; Lukasevicius and Lapinskaite, 2014), in particular:

- 1) basic (or radical) innovations, namely:
  - introduction of game changing, previously unknown banking products (services);
  - use of conceptually new technologies to promote banking products (services);
  - application of breakthrough methods of management (regulation);
- 2) combinatorial innovations, basically combining a lot of elements already used in the banking sector (techniques, methods);
- 3) modifying innovations introducing certain changes into the existing banking products (services) and, as a result, increasing the qualitative characteristics of their life cycle.

At the same time, both the success of the planned changes and the stability of a credit institution depend exactly on the ratio of basic and other innovations in the activity of the credit institution. This is since only radical basic innovations lay a reliable groundwork for sustainable development of any social system including credit institutions, while combinatorial and modifying innovations bring energy into an open economic system exclusively for its routine functioning, preventing it from moving to a new level of self-development (this is schematized in Figure 2). The special value of basic innovations resides in the fact that their introduction has a meaningful effect, bringing something fundamentally new into the functioning mechanism of a credit institution. However, as practice shows, in most of cases, the

innovative activity of credit institutions focuses mainly on combinatorial and modifying innovations that do not carry so much energy. This is partly due to the activity specifics of the latter, as well as to a special procedure for regulating their activities by the supervision authorities. At the same time, it should be noted that, while not being the main factor of a sustainable development of credit institutions like basic innovations, these innovation groups are equally important for their effective functioning due to their purpose consisting in adjusting and adapting the basic transformations already put into banking practices to a specific market situation.

## 5. Conclusion

Thus, banking innovations based on previously created products are primarily aimed at increasing the efficiency and improving the performance of products and services already in the market. Combinatorial and modifying innovations are more widespread in the practice of banking activity since, according to business administration of credit institutions, their development is cheaper, implementation costs are defined as acceptable, and the risks of implementation failure are much lower. That is why at present, the following trend is observed: in large multidivisional credit institutions, preconditions have been created, and financial capacity and clientele have been accumulated for the introduction of basic innovations. Accordingly, they play key roles in the development of institutional, structural, technological, product-technological innovations.

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