

Retrospective analysis of innovative activity of business entities in the conditions of transformation

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Abstract. Objective. To conduct a theoretical analysis of the categories "innovation" and "innovative activity". To prove, from the standpoint of historical dialectics, that innovation is an endogenous source of economic growth. Methods. The study used a systematic approach, retrospective analysis, abstract-logical analysis, grouping, comparison, factor analysis. Results. In the current conditions of instability of the world economy, the issue of its further development, including from a technological point of view, is relevant. In historical retrospect, the emergence of technological innovations on the market had a positive impact on the process considered in the study. The recognition of innovation as an endogenous source of economic growth is due to the nature of the post-industrial economic structure, characterized by the decline in the role of traditional factors of production in the formation of competitive advantages of individual producers, as well as the formation of a qualitatively new type of progressive macroeconomic dynamics. In these conditions, the innovative activity of business entities becomes particularly relevant. The article considers various approaches of scientists and representatives of various economic schools to the definition of the concepts of "innovation" and "innovative activity". Conclusion. Based on a retrospective analysis of a number of scientific papers devoted to innovation, it is concluded that in order to ensure the successful and dynamic development of an enterprise producing high-tech products, it is necessary first of all to widely apply various methods of innovation management, which should include simultaneous and coordinated use of technological, scientific, personnel, commercial and other policies that provide a systematic solution to the problems of innovative development.

1 Introduction

The analysis of modern processes that take place in the world economy and the economy of the Republic of Uzbekistan indicates that the results of innovative activities initiated by the acceleration of scientific and technological progress significantly affect all aspects of the development of society, contribute to the way out of a difficult economic situation, ensure the stability of economic development, give a new impetus to economic growth [1]. In this

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regard, the innovative model of the development of economic systems is extremely attractive and the most acceptable for the national economy of Uzbekistan, this is especially relevant in the current crisis situation of the world economy.

Based on the theory of long-term cycles of development of the modern world economy, known as Kondratiev's long waves [2], the way out of the economic crisis and a new economic recovery begin with a key innovation, giving rise to a number of derivative innovations in other industries. Thus, an increase in innovation activity is a necessary condition for the start of recovery growth.

Transformation and globalization of the world economy, increasing volatility of prices for natural resources and energy resources are becoming a key factor in the development of socio-economic structures, which is due to their focus on modernization and fundamental innovations. Intensive development and application of innovative solutions allow companies to produce competitive products and strengthen their position, as well as occupy new niches in global and local markets. The development of innovative infrastructure can bring significant advantages to a company in a competitive environment, which determines global trends in the development of companies around the world.

2 Methods

The study used a systematic approach, retrospective analysis, abstract-logical analysis, grouping, comparison, factor analysis.

3 Analysis and results

In order to determine the directions and explore the possibilities of improving the innovation management systems of enterprises, it is necessary to analyze the existing theoretical developments of leading scientists concerning innovation and its management.

Many economists at different times have tried to define and reveal the essence of innovation activity. The issues of defining innovation activity have been considered by many prominent figures of economic science. Among them are J. Schumpeter [3], B. Twiss [4], B. Santo[5], K. Christensen [6], M. Raynor [7], J.J. Lambin [8], G. Mensch [9], S. Kuznets [10], P. Drucker [11], M. Porter [12], Y.V. Yakovets [13], A.I. Prigozhin [14], E.A. Utkin [15], Z.P. Rummyantseva [16], I.T. Balabanov [17], S.D. Ilyenkova [18], N.A. Solomatina [19], A.N. Tsvetkov [20], P.N., N.D. Kondratiev [21], A.V. Vasiliev [22], A.N. Tyurina [23], I.L. Tukkel [24] and others.

The founder of the theory of innovation is considered to be J. Schumpeter, who associated innovation activity primarily with entrepreneurship, i.e. with "the desire to manufacture a new or improve a product, a method of production, introduce a new technology or master new sales markets, get new sources and new forms of supply, as well as optimize production and labor processes" [25].

P. Drucker defines it as follows: "innovative activity is a special tool that allows an entrepreneur to use changes and turn them into new opportunities for, for example, opening a new business or providing new services" [26]. He calls the main principles of successful activity "purposefulness and systematic innovation", emphasizing the importance of "analyzing existing opportunities and thinking about what can be called sources of innovative opportunities" [27]. P. Drucker emphasizes that "innovation is an economic rather than a technological term and covers all the components of an enterprise, all its functions and activities" [28].

B. Twiss includes the following areas in the interpretation of innovation activity - "technical, production and marketing activities aimed at the commercial use of a new (or

improved) product or the first commercial use of a new (or improved) production process or equipment." Noting the need for the permanence of this activity of enterprises, the researcher defines its purpose as "the acquisition of economic content by an invention or idea" [29].

To. Christensen and M. Raynor give the following definition: "innovative activity of an enterprise is an activity aimed at using the results of scientific research and development to update the nomenclature and improve the quality of products, improve the technology of its manufacture" [30]. The authors distinguish two types of innovations: "supportive" and "disruptive". The "supportive" innovation activity is aimed at improving existing products within the current consumer characteristics, while the "disruptive" one is aimed at replacing existing products, technologies, industries and markets by creating "easy-to-use, cheap and not of high quality" new versions of products [31].

B. Santo gives the following definition: "innovation is a socio-economic process that, through the practical use of ideas and inventions, leads to the creation of products and technologies that are the best in their properties, and if innovation is focused on economic benefit (profit), its appearance on the market can bring additional income" [32], thereby determining that the purpose of innovation activity can be not only profit, but also public goods.

G. Mensch proposed to link the nature and intensity of innovation activity with the pace and cycles of economic growth, distinguishing three main types of innovations: "basic, improving and pseudo-innovations" [33]. The author considered the deterioration of the financial situation of the enterprise to be the key driver of the activation of innovation activity, and defined innovation as a key tool for improving the efficiency of investments and overcoming stagnation in economic development, which he defined as "technological stalemate" [34].

R.A. Fatkhutdinov defines innovation activity as "the process of strategic marketing, R&D, organizational and technological preparation of production, production and design of innovations, their implementation (or transformation into innovation) and dissemination to other areas (diffusion)" [35]. According to the author, "innovative activity is primarily characterized by the content, composition of specific actions performed according to a certain technology, procedure."

I.L. Tukkell, together with A.V. Surina and N.B. Kultin, define innovative activity as "activity aimed at using the results of experimental developments, scientific (research) and scientific-technical, inventive activity: for the creation, organization of production and sale on the market of fundamentally new or with new consumer properties products (goods, works, services); creation and application of new or modernization of existing methods (technologies) of its production, distribution and use; the use of product, process, marketing, organizational innovations (innovations) in the development, organization of production, release and sale of products (goods, works, services) that provide them with cost savings, or an increase in production and sales of products in demand on the market" [36]. The authors distinguish product, process, marketing and organizational directions of innovation activity, defining "innovative programs and projects, innovative products" as objects of innovation activity [37].

L. N. Ogoleva presents innovative activity as a "purposeful system of measures for the development, implementation, development, production, diffusion and commercialization of innovations", thereby emphasizing its consistency, complexity, multivariance and alternativeness. The author defines the boundaries of innovation activity "from the birth of a scientific idea to its commercialization" [38].

F.F. Bezdudny, together with G.A. Smirnova and O.D. Nechaeva, associate the concepts of "innovation" and "innovative activity" with "the process of implementing a new idea in any sphere of human activity that contributes to meeting existing needs in the

market and brings economic effect" [39], noting that innovation can only have "a positive result, excluding the possibility of negative consequences, otherwise the innovation will not make sense."

N. M. Tsitsarova defines innovation activity as "a set of works including the search and selection of innovative ideas, the development of innovations based on them, the introduction and replication of innovations" [40]. The author notes the "diversity of organizational forms" involved in innovation activities, linking this to the fact that "the process of innovation covers a variety of fields of activity: scientific and technical, financial, informational, marketing, and various interacting organizations participate in its implementation: research institutes, financial and consulting organizations, venture firms, insurance companies" [41].

I.T. Balabanov defines innovation activity as "a process aimed at developing and implementing the results of completed scientific research and development or other scientific and technical achievements into a new or improved product sold on the market, into a new or improved technological process used in practice, as well as related additional research and development", including in this term all stages "from the emergence of the idea of innovation to the diffusion of the final product or service"[42].

In their work, A.G. Kiryakov and V.A. Maksimov emphasize the social significance of innovation, offering the following definition: "innovation activity is a socio—technical and economic process that, through the practical use of ideas and inventions, leads to the creation of products and technologies that are the best in their properties" [43]. Innovation is assigned the role of "the starting and defining organizational and economic element in the investment process, which forms the system of indicators of the investment project and its ultimate goal."

L.N. Vasilyeva, E.A. Muravyeva believe that "innovation is the final, materialized result of innovation activity obtained from investing capital in discovery, invention, a new method of meeting social needs" [44], thereby defining the project approach as the basis of innovation activity, as well as emphasizing the social and investment orientation of the results innovation activity.

I. Ya. Luzhinsky and M. P. Pereverzev interpret the term "innovation activity" as "an integrated concept that combines scientific and technical and investment activities." At the same time, the authors note that when considering the concept of innovation activity, the idea of "a special type of activity that covers the entire cycle of creation and use of new technologies and goods" comes to the fore, which defines it as "the main factor in the system of factors ensuring the development and improvement of production efficiency" [45].

N. N. Khanchuk in his article gives an idea of innovation activity as a "complex categorical structure" [46] and identifies the following categories of innovation activity: historical, economic, instrumental, philosophical, legal, commercial, entrepreneurial, economic, organizational and managerial, thereby further expanding the boundaries of innovation activity.

Having a common semantic similarity, the interpretations of the concept of "innovation activity" among various scientists also have differences concerning, for the most part, the definition of the boundaries of innovation activity, that is, indications of where innovation activity begins and ends.

A more precise formulation of the concept of "innovative activity" is presented in Russian and international regulatory documents.

Currently, a number of guidelines have been developed under the auspices of the Organization for Economic Cooperation and Development (OECD) in order to solve the problems of obtaining and analyzing data related to science, technology and innovation. According to Frascati's Guidelines, innovation is defined as "the final result of innovative

activity, embodied in the form of a new or improved product introduced on the market, a new or improved technological process used in practice, or in a new approach to social services" [47].

According to the Oslo Manual, innovation activity means "any scientific, organizational, technological, commercial and financial actions that actually lead to the implementation of innovations or are conceived for this purpose" [48]. At the same time, the manual clarifies that "innovative activity also includes research and development not directly related to the preparation of any particular innovation" [49]. The authors of the Manual distinguish four types of innovations: product, process, marketing and organizational.

Stating the fact that neither science, nor international organizations and the state have adopted a single interpretation of the term "innovation activity", the definitions presented above are used in practice and by complementing each other sufficiently fully reveal the essence and meaning of innovation activity in the modern world. The theoretical works described above explore the origins and nature of innovation processes, fundamental problems of scientific, technical and innovation management.

Thus, the term "innovative activity" of the enterprise in this paper will mean the activity of the enterprise aimed at creating and implementing innovations in order to improve the socio-economic situation of the enterprise, namely, the emergence of new and improving the properties of existing products and services, technological lines, enterprise management systems, production and sale of products and services, improving safety and environmental friendliness of production. The concept of "innovation process" denotes an ordered set of actions that transform an innovative idea into a final result (the emergence of new and improving the properties of existing products and services, technological lines, enterprise management systems, production and sale of products and services, improving the safety and environmental friendliness of production). According to the accepted definitions, the innovative activity of an enterprise consists of innovative processes. The peculiarity of innovation activity is the focus on obtaining the final result, which has certain characteristics. Therefore, the main form of innovation activity is currently an innovative project, within the framework of which the specified values of target indicators should be achieved based on the use of a certain set of resources and tools in a given time.

Currently, innovation activity is an integral part of the socio-economic development of industries and states, therefore, issues related to the management of innovation activities come to the fore.

In his work, G. Wulfen [50] defined the FORTH method (the abbreviation stands for: Full Steam Ahead ("Full Steam Ahead!"), Observe & Learn ("Observations and Conclusions"), Raise Ideas ("Development of ideas"), Test Ideas ("Testing ideas") and Homecoming ("Returning home")), which offers a clear sequence of actions for each stage of the innovation process, and also, according to the author, includes all the necessary tools for the effective creation of new products and services. The work of this author is more of a psychological orientation and is aimed at the personal growth of innovators, rather than at the creation of specific mechanisms.

G. Pisano defines the main problem of innovation management as the inconsistency between innovation strategies and other activities in the company, the difficulty of determining priorities between innovative projects for their financing. As a possible solution to these problems, he suggests the development of tools of the following functionality: "ensuring consistency and interconnectedness between innovation strategy, processes, organizational structures and procedures for the allocation of financial resources; formulation of clear goals of the company aimed at ensuring sustainable competitive advantages; development of value creation plans; introduction of parallel procedures for the

selection and implementation of various types of innovations; finding a balance between different innovation strategies" [51].

R. Foster and S. Kaplan call the main problem of innovation activity "dependence on the behavior of the external environment, offering to solve it for by changing the approach to strategic planning and taking into account alternative ways of obtaining innovations" [52].

According to the point of view of V.P. Barancheev, N.P. Maslennikova and V.M. Mishin, the peculiarity of innovation management is that "the object of management is the life cycle of an innovation or an innovative product that arises on the basis of previous knowledge of highly qualified specialists concentrated in one place, and design is carried out by creating new knowledge and this knowledge is the product of the process" [53].

Many well-known scientists have tried to reveal the nature of the emergence of innovations and the forms of organization of enterprises that are most favorable for the implementation of innovative activities. Currently, among the models describing innovative processes, the most widespread are:

- the "technological push" model. This model was considered classical for a long time, since it was developed in their works by M.I. Tugan-Baranovsky [54], J. Schumpeter, G. Mensch. In this model, the latest achievements of science and technology are considered as a source of innovation. The "technological push" model is presented in the form of a sequence of linearly and cyclically repeating stages. This model was based on linearly sequential processes related to R&D, while the market is considered only as a consumer of innovations;

- the "demand call" model (market pull). Supporters of this model were K. Freeman [55] and D. Roman [56]. Within the framework of this model, it is assumed that commercially successful innovations appear as a result of timely and adequate response of knowledge-intensive industries to consumer requests. Market demand, which determines the directions of R&D, is considered as the basis of innovation processes. The sequence of stages that make up the innovation process is linear;

- coupled model of innovation activity (coupling). It is based on the works of R. Rothwell [57], D. Moveri [58] and other scientists. This model combines the presence of stages that have the following characteristics: consistency, interaction with each other, functional isolation, which allows us to talk about the nonlinearity of the processes of creating innovations. The basis of the model is built around the development and design processes as the most resource-intensive stages of innovation activity. During the engineering and design stage, small but constant changes occur, which, as a cumulative result, have a high impact on the result;

- integrated model of innovation processes. M. Aoki is considered to be the founder of this model [59]. It is based on the integration of the ideas of several groups of specialists working in different directions. This approach leads to an acceleration of the process. Thus, the introduction of a new product to the market is most effective with the close cooperation of research, production, marketing, financial and other departments of the company. This process should be supervised by a special intersectoral working group;

- innovation process in the model of strategic networks. The main representatives are such scientists as R. Cooper [60], K. Oppenlander [61]. Unlike the previous model, it is not only inter-functional, but also inter-institutional, or network, in nature. The model considers the company's interaction with external agents (suppliers, consumers, competitors), the ultimate goal of which is innovation.

M.N. Rukavitsyna identifies two directions of creating an innovation management system: "integration of the full cycle of innovation activity into a continuous process and the allocation of innovation management into an independent management object" [62].

Based on the analysis of a number of scientific papers devoted to innovation, it can be concluded that in order to ensure the successful and dynamic development of an enterprise producing high-tech products, it is necessary first of all to widely apply various methods of innovation management, which should include simultaneous and coordinated use of technological, scientific, personnel, commercial and other policies that ensure system solution of innovative development tasks.

4 Conclusions and suggestions

The main focus of the considered theoretical works is to provide conditions favorable for the creation of innovations, as well as to study the mechanisms that transform innovation from the idea stage to the final product. At the same time, in most of the considered works, insufficient attention is paid to the problems that have a negative impact on obtaining the results of innovative activity. The main risk accompanying innovation activity is considered to be market risk, however, the economic situation of recent years has shown that the feasibility of innovative projects to a large extent depends on the external economic environment of the project. Despite the large number of works in economics devoted to innovations and everything related to them, it should be noted a significant gap in the methodological support of the management of innovative activities of enterprises [63].

A significant number of publications have been devoted to the analysis of the specifics of the functioning of knowledge-intensive industries, however, the analysis of these works showed the absence of a unified methodology that allows identifying knowledge-intensive industries, and the very attribution of industries to knowledge-intensive is rather conditional. At the same time, it is possible to determine the main directions of the criteria for classifying industries as knowledge-intensive.

One of these areas is associated with linking the attribution of the industry to knowledge-intensive in terms of the ratio of R&D costs and the corresponding output volumes. Thus, A.E. Varshavsky classifies an industry as knowledge-intensive if "the indicator of knowledge intensity, calculated as the ratio of R&D costs to the resulting indicator of the industry's activity, exceeds the average or some level specific to the industry as a whole" [64]. When forming a criterion for classifying an industry as a knowledge-intensive K. Kurpayanidi refers to the knowledge-intensive industries in which "the ratio of R&D costs to the corresponding output is 1.2-1.5 times higher than the global average in the manufacturing industry of developed countries and is 3.5-4.5%" [65].

Another area of classification of industries as knowledge-intensive is the assessment of the personnel characteristics of the enterprise. Thus, according to V.L. Makarov, A.E. Varshavsky and L.A. Fedorova, the knowledge intensity of the industry can be determined on the basis of the following relations: "the number of people employed in science and scientific services to industrial and production personnel of the industry; R&D costs to industrial and production personnel, the volume of the main production assets of the industry" [66-70].

In modern conditions of economic instability, deep modernization of industry, including the restructuring of many enterprises of knowledge-intensive industries, the problem of increasing the efficiency of innovative activities of enterprises comes to the fore. It is the productive innovative activity of enterprises of knowledge-intensive industries producing products and services with high added value that should play one of the key roles in making a breakthrough from the raw material model of the economy to the innovative one. The ongoing and planned reorganization and modernization of knowledge-intensive industries will require enormous costs, so mistakes in planning and decision-making within the framework of innovation management can entail costly consequences. Hence, there is a need to improve the methodological apparatus for managing innovation activities of

knowledge-intensive industries, the purpose of which is to support management decision-making. To do this, it is advisable to make an analysis of the existing practice of managing innovation activities of knowledge-intensive industries.

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