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Influence of innovations on social-economic development: Views of academic economists

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Abstract

The article presents an analytical review of economists' materials, in which the role of innovation in the economy is considered in close relationship with the dynamics of socio-economic development. According to results of the review, the author concludes that the discussions of the global academic economists, including materials of Russian economists, formed the basis of the formation of both the whole science of the innovation theory, and certain areas in scientific fields: innovation management and economic analysis of innovative activity.

Keywords: Innovations, Activity, Management, Economic, Cycles.

Influencia de las innovaciones en el desarrollo socioeconómico: Opiniones de economistas académicos

Resumen

El artículo presenta una revisión analítica de los materiales de los economistas, en la que el papel de la innovación en la economía se

considera en estrecha relación con la dinámica del desarrollo socioeconómico. Según los resultados de la revisión, el autor concluye que las discusiones de los economistas académicos globales, incluidos los materiales de los economistas rusos, formaron la base de la formación de toda la ciencia de la teoría de la innovación y de ciertas áreas en los campos científicos: gestión de la innovación. y análisis económico de la actividad innovadora.

Palabras clave: Innovaciones, Actividad, Gestión, Económicas, Ciclos.

1. INTRODUCTION

Today innovation and innovative development of society play a big role in improving the national economy and living standards. In this regard, national innovation strategies, which include measures for intensification the country's innovation activities, are developed at the state level. For example, the Russian Federation with the aim of increasing the innovative potential has adopted Strategy for the innovative development of Russia 2020, the program Digital Economy of the Russian Federation. Similar methods by increasing the innovative activity of business units are developed by different states for consolidation of national economy position in the world. However, before determining the ways to intensify innovative activity, it is necessary to learn the process of formation of the concept of innovation and innovative activity in the context of their importance for the macroeconomic situation in the country.

The concept of innovation and innovative activity in the modern interpretation formed only in a capitalist society, even though

innovations in one guise or another came around throughout the development society. They are an important factor in scientific and technological progress. In capitalist society, innovations are aimed at the development of living standards and satisfaction of all kinds of needs. At that time inventors obtain personal benefits driven by innovations.

The concept of innovation began to form in the early 20th century when the Russian economist KONDRATIEV (1989) published the concept of cyclical wave dynamics of socio-economic systems. Based on KONDRATIEV'S (1989) concept during the 20th century academic economists tried to explain trends of socio-economic development. In 1939 one of them, Austrian economist SCHUMPETER (1939) suggested naming the cycles Kondratiev waves in his honor and gave birth to search of influence of innovations on socio-economic development. Through research in this field in the latter half of the 20th century there were whole scientific areas. The theory of innovation was formed, within the scientific fields innovation management and economic analysis of innovative activity were formed (KONDRATIEV, 1989).

2. METHODS

Because the article presents an analytical review of economists' materials, led to the formation of new scientific fields based on theory of innovations development, empiric and theoretical research methods

was utilized in the paper. Observation and analysis of academic economists' materials gave to understand their points of view on innovations and innovative activity, which began to be investigated in the early 20th century. Views on innovation and reasons for their implementation changed in time, but one idea remained constant: growth of innovative activity and number of innovations, implemented in time of scientific level increase, is in harmony with social-economic growth (MOSES ET AL, 2018).

3. LITERATURE REVIEW

In the early 20th century Russian scientists put forward various theories about cyclic development of different activity areas: the theory of cyclic development of culture by Danilevsky, theory of cyclic development of nature and society by Chizhevsky, theory of cyclic development of society by Sorokin. However, the work of these scientists could not be combined into a single scientific school due to the lack of some features (MUSTAFIN, 2015).

Among the works of Russian scientists who presented their vision on the repeated conditions, trends in the development of different activity areas, stand apart from the materials of the Russian mathematician KONDRATIEV (1989), who considered the laws of socio-economic development and developed the concept of cyclical wave dynamics of socio-economic systems.

According to KONDRATIEV (1989),

Static theory is powerless to find out changes in the level of economic elements, as well as the mechanism and direction of their change. That is why economic life should be approached from a dynamic point of view to think in terms of the process of change (KONDRATIEV, 1989: 17).

Drawing attention to economic research of C. Juglar industrial-capitalist cycles which are in progress for 7-11 years KONDRATIEV (1989) paid attention to the fact that the economy is characterized by crises that have a well-marked periodicity. The scientist found that crises are one of the stages of the economic cycle, consisting of three main phases: recovery, crisis, depression.

Taking as the basis of the study the main macroeconomic indicators of England, France, the United States, the economist revealed the presence of large economic cycles lasting 48-60 years, on which the economy is developed.

In the study FREEMAN (1982) identified 4 empirical rules associated with large economic cycles:

- Before or at the beginning of the upward wave, there are significant changes in the economic life of society: changes in technologies, changes in the conditions of monetary circulation, the strengthening of the role of new countries in world economic life.

• During periods of rising waves, there has been a significant increase in major social upheavals and other major changes in the societal order.

• The downward waves of large cycles are characterized by significant decline and stagnation in agriculture.

• Average economic cycles, so-called industrial-capitalist cycles, are superimposed on the curve of large economic cycles, creating short-term ups and downs during periods of long-term economic periods (KONDRATIEV, 1989: SAREGAR ET AL, 2018).

There is a debate about whether changes in the technological way of life of society are the cause of economic growth, or technological development is a consequence of the impact of economic life. In the process of studying long economic waves, scientists identified certain patterns in the development of technology. Thus, the industrial revolution (1764 – 1795) was the precursor of the first cycle's upward wave (from the late 1780s – early 1790s to 1810 – 1817). Before the rising wave of the second cycle (from 1844 – 1855 to 1870 – 1875), significant inventions in the field of production techniques were made (1824 – 1848). Before the rising wave of the third cycle (from 1891 – 1896. before 1914 – 1920) important discoveries were made in the field of technology, especially transport and electrical engineering (1870 – 1898) (KONDRATIEV, 1989).

Assumption of KONDRATIEV (1989) that technical and technological novelties are an important factor in socio-economic development further was developed by the Austrian economist SCHUMPETER (1939) in his work Theory of economic development. His conclusions made it possible to identify separate areas in Science related to the development of innovations. As a theoretical scientist in the field of economic analysis, SCHUMPETER (1939) considered various factors affecting the development of the economy in general through the prism of the economic development of individual subjects.

As KONDRATIEV (1989), SCHUMPETER (1939) also noticed the fact that the economy is characterized by crises, recessions and booms. In his works, the scientist paid great attention to the work of Kondratiev (1989) and his cycles of conjuncture. SCHUMPETER (1939) introduced the concept of KONDRATIEV (1989) waves, named K-waves. Taking as a basis the assumption that innovation is one of the main concomitant signs of change, SCHUMPETER (1939) introduced the concept of innovation and identified 5 typical changes that contribute to economic development:

- Use of new machinery, new processes or new market support for production;

- Introduction of products with new properties;

- Use of new raw materials;

• Changes in the organization of production and its logistics;

• The emergence of new markets (SCHUMPETER, 1939).

In addition, SCHUMPETER (1939) has developed his model of business cycles laying the average cycles of C. Juglar for a period of 7-11 years and the short cycles J Kitchin for a period of 3-3,5 years on K-waves. Thus, SCHUMPETER (1939) showed that in the phases of a long cycle the economy develops unevenly, with regular jerks caused by shorter recessions and recoveries. Moreover, according to SCHUMPETER (1939), all these cycles are generated by innovation (MAMATOVA, 2017). SCHUMPETER (1939) defined the enterprise as an important factor of production and socio-economic development. In the future, through the diffusion of innovation (the term diffusion of innovation was defined in 1962 by E. ROGERS) and the widespread dissemination of technology is improving the socio-economic conditions on all levels of society.

Based on the consideration of entrepreneurship as a factor in obtaining innovation, SCHUMPETER (1939) explained why innovations are distributed unevenly over time and appear in bundles or clusters. In his opinion, this is due to the fact that the entrepreneur does not always introduce completely new and untested basic innovations. Through diffusion, an undertaking can use innovation in the same form but within its business, improve borrowed innovation, or make products similar to borrowed innovation in similar directions. The last two types of innovation SCHUMPETER (1939) named as

induced innovations. They lead to the growth of medium and small cycles. The first type of innovation leads to a decline in medium and small cycles (MAMATOVA, 2017).

SCHUMPETER (1939) defined innovation not just as a novelty, but as a novelty which is introduced by an entrepreneur into his business in order to obtain personal benefits. Although in the future there were other opinions about the appearance of innovative activity in different phases of long waves (AVAGYAN, 2012). The fact that innovation precedes the upward wave clearly demonstrates the statistics of innovation, highlighted by Kondratyev. However, there are disputes whether a crisis the reason for the activation of innovation activity or innovation largely contributes to the exit from the crisis. In this regard, it should be noted that the allocation of innovations as an important factor in economic development has led to the formation of an approach to the competent management of innovation.

4. RESULTS AND DISCUSSION

Paradoxically, the concept of cyclical social development had the greatest impact on the definition of innovation and innovative activity. In particular, representatives of Russian cyclicism played a big role in this. Thus, formed in the early 20th century Russian scientist by KONDRATIEV'S (1989) concept of cyclical wave dynamics became the basis for the study of the impact of innovation in the development of the economy and society. Having studied the basic

provisions of the existing schools of economic theory, KONDRATIEV (1989) came to the conclusion that economic theory should not be exclusively static. Since economic phenomena can change over time, economic science must be dynamic also (HOOMANFARD Et al, 2018).

Despite some contradiction and further discussions, modern researchers due to study of macroeconomic indicators confirm the presence of K-waves (KOROTAYEV AND TSIREL, 2010). Identified KONDRATIEV (1989) coincidence of the points of the economic crisis and a great update of technical and technological conditions has become a catalyst for the study of the dependence of the state of the economy on technological progress. On the basis of this principle KONDRATIEV (1989) developed the theory of large economic cycles of conjuncture, which considered the causes of changes in macroeconomic processes, which helped to develop scientific and technical levels in the globe. KONDRATIEV (1989) considered innovations the main feature of social development. the Scientist identified two conditions leading to changes in technology and production technology:

- "Availability of relevant scientific and technical discoveries and inventions;

- Economic possibilities of applying these discoveries in practice" (KONDRATIEV, 1989: 10).

Further, various academic scientists have contributed to innovation activity development as well as into social-economic development due to searches of innovations' influence on the social-economic environment. Their views led to formation of new scientific fields as theory of innovations, innovation management, economic analysis of innovative activity. The deepening of SCHUMPETER (1939) search in the area of innovations impacts on the macroeconomic processes drove to the research of the essence of innovations and their uses. SCHUMPETER (1939) noted that innovation is one of the important signs of fluctuations in the direction of economic growth, which is the most evident in times of crisis. He described this feature as an important factor of socio-economic development in his work on the theory of innovative development.

So, his ideas were picked up in the future by MENSCH (1979), who created the first classification of innovation, as well as KLEINKNECHT (1987), who became the founder of the theory of innovation. In his works, KLEINKNECHT (1987) took into account the sharp remarks of KUZNETS (1930), who criticized certain views of SCHUMPETER (1939), considered in a different key prerequisite to development of innovations in the enterprise.

SCHUMPETER (1939) introduced the concept of innovation and identified 5 typical changes that contribute to economic development, which are considered as the first innovations the first patterns of innovations sciences. Also, the economist noted that an entrepreneur should be an innovator in its essence, as due to

innovations, an entrepreneur-innovator is able to get a monopoly profit, what was the first real attempt to highlight innovations as accelerator of the economic progress. Moreover, SCHUMPETER (1939) stated that the most successful entrepreneurs are innovators: they linked innovation with entrepreneurship closely. Further attempts to substantiate influence on the global progress were extensively discussed but the minority of them was successful and developed by next scientists.

The next economist which was successful in the learning of innovations and their influence on the technological level was (KUZNETS, 1930). According to KUZNETS (1930), innovation processes are nothing more than the renewal of obsolete capital. And the renewal of capital in all industrial sectors occurs only with a significant renewal of the capital of the leading sector (extractive industries and agriculture) (KUZNETS, 1930). Despite materials of Kuzhets has no direct control on theory of innovations, his materials provided the impetus to modern definitions of innovative activity, because his work was extensively discussed by (MENSCH, 1979).

As a result, MENSCH (1979) developed the first classification of innovations which were classified as innovations on the basics, improving innovations and pseudo-innovations. MENSCH (1979) determined that in the period of depression the most important role play basic innovations that create a springboard for changing the macroeconomic situation and transition to the stage of recovery. In the period of the upward wave, there is a sharp increase in improving

innovation, correcting a particular situation in the markets. At a time when markets are oversaturated with improving innovations, pseudo-innovations come into play, which is a sign of stagnation in economic development and gradually translate the economy into a downward wave (MENSCH, 1979). In the future, the hypothesis of depression as a trigger has been criticized repeatedly. It has been suggested that the period of depression has a negative impact on innovation.

KLEINKNECHT (1987) laid the foundations of the theory of innovation, special branches of social sciences: innovation management and economic analysis of innovative activity were created. According to KLEINKNECHT (1987), basic and complementary innovations move the economy forward, but economic crises affect them in different ways. So as KLEINKNECHT (1987) developed his classification of innovation which is similar to MENSCH (1979) theory. So he divided innovations into basic innovations, complementary innovations and pseudo-innovations (KLEINKNECHT, 1987).

Zueva and MOLCHANOVA (2016) in the work the Role of innovations in the economic development of the national economy on the basis of KLEINKNECHT'S (1987) materials described the interaction of the real and financial sectors of the economy for basic and complementary innovations:

Investments in basic innovations contribute to the growth of production of the real sector, causing the introduction of

complementary innovations that replace obsolete technologies. The introduction of secondary innovations is accompanied by the attraction of capital from the own resources of the real sector entities and borrowed resources of the credit subsector, which stimulate the subsequent growth of production of the real sector (ZUEVA AND MOLCHANOVA, 2016: 14).

As a result, a whole direction of management appeared which is named innovation management. Despite the fact that the final conclusions about the positive impact of innovation on socio-economic development were made in the second half of the 20th century, the beginning of innovation management is associated with the period of the Great Depression of the 20 – 30s of the 20th century. During this period, the phrase innovation policy of the company became popular as a symbol of the qualification of an entrepreneur or Manager, his ability to bring the company out of depression (LAPIN, 2008). From that moment, innovation management began to pay great attention, as competent management of innovation processes in the enterprise can have a positive impact on business development.

And during the 20th century, the concept of innovation management was created an independent scientific direction as a result of awareness of importance of innovative activity growth for improvement of an economic situation. A huge role in this was played by the pioneers in the field of innovation management, in particular, Drucker. His work has great importance, both in the study of the theory of innovation management, and in the practice of innovation in business. And later, with the increased awareness of the importance of managing innovation processes, there was a need to study the impact

of innovation on the results of the organization. Thus, the economic analysis of innovative activity is formed.

Nowadays (the later of the 20th century), based on K-waves the concept of Technological Revolutions was formed by Perez. According to the concept technological basis change in time, forming certain cycles (PEREZ, 2002). The similar theory of technological paradigm was developed by (GLAZYEV, 1993). Changes of technological paradigms align with K-waves, which allows to predict new technological boom (today society stands on the cusp of NBIC convergence).

As a result, innovations began to be defined as an extremely important category in socio-economic development and this process is dictated by time. Influence became most noticeable in the period of the increasing weight of international cooperation, strengthening of globalization and significant growth of the role of science in society. Consequently, the importance of technology created on the basis of scientific discoveries and inventions has grown. In this regard, enterprises that implement innovations actively receive competitive advantages not only in competition for market share, but also in terms of long-term planning of their activities. The findings can be used by individual business units to determine the most favorable period for accumulation of innovative activity, and the state in determining measures to artificially increasing and maximization of innovative activity.

The development of theory of innovations led to situation when economic analysis of innovation activity plays an important role in the development of society in the future. Economic analysis determines whether innovations bring economic benefits, whether force quit for them.

5. CONCLUSION

Despite the results of KONDRATIEV (1989) search are very ambiguous, his work became a basis for the study of the innovation role for the socio-economic development. His theory gave impetus to the study of innovations and innovative activity and discussions about the role of innovations in social and economic life. In this way during the 20th century new branches of science innovation management and economic analysis of innovative activity were formed as a result the evolution of views on the impact of innovations on socio-economic development,

Taking into account the research presented in the article, it can be said that innovation management is becoming extremely important today, having an impact on social and economic development not only at the micro, but also at the macro level. Therefore, for the qualitative implementation of the innovation strategy of the enterprise, there are high requirements for the functions of innovation management.

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