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ANALYSIS OF KAZAKHSTAN'S INNOVATON'S STATISTICS DEVELOPMENT

This article discusses forming and development of innovative statistical system in Kazakhstan. Effective management of innovation becomes an important factor in ensuring high rates of economic growth as well as the level of competitiveness of any national economy. It is evidenced by current trends in world development.

There is the significance of informational providing system on innovation is examined, stages of innovation's statistics showed. The current stage of innovation statistics development is characterized by further improvement of system. It is based on the needs of the country's economic development. The main objectives of innovation statistics cover a wide range of issues.

In the article indicators of innovative statistics of Kazakhstan are analyzed, the conclusions about the problems and prospects of the state policy in the field of innovation and promotion of technology upgrading are made. Special attention is paid to the results of the monitoring the main indicators of implementation Kazakhstan's innovative development for the years 2003-20.

Keywords*: innovation, innovative activities, innovative product, innovative statistic, innovative process, monitoring, impact of innovation, indicators, implementation, innovative development.*

Кілт сөздер: *инновация, инновациялық қызмет, инновациялық белсенділік, инновациялық статистика, инновациялық процесс, монитонг, инновациялардың әсері, көрсеткіштер, еңгізу, инновациялық даму.*

Ключевые слова: *инновация, инновационная деятельность, инновационная активность, статистика инноваций, инновационный процесс, мониторинг, эффект инноваций, индикаторы, внедрение, инновационное развитие.*

JEL classification: Q17

Introduction. The level of the science and technology development creates a basis for dynamic economic growth and an opportunity to build an effective innovation system. This system should include mechanisms of interaction between the government, business, science and education to achieve a growth in share of high technology industries in GDP. Regions with accelerated expansion of science and technology such as South-East Asia and Scandinavian countries could take as an example. Modern trends in the world development are competition for high-quality human capital and its mobility, as well as the growing role of information technology, globalization. They make impacts on the formation of the innovative policy of the state.

Evolution of a system for promoting technological upgrading by creating requirement for new technologies as well as by support supply, implementation and proliferation of innovations is the crucial objective for the fulfilment of innovations and the assistance of technological upgrading in the close future. Next issues are creation of own strengths through technological prognostication and planning, directing of practical science to business demands and the forming of innovative area. The second is evolution of the innovation infrastructure by enhancing the management of the countries innovation system units, by promoting innovative activity and improving the legislative framework.

In this respect, the objectives of innovation statistics the mensuration of resources disposed in innovative practises, the evaluation of agents ministerial to innovation or restrictive them, as well as an analysis of the sway of innovation on enterprise productivity.

Current stage of statistics progress is characterized by further improvement of innovation statistics system based on needs of the country's economic development. Examination of drifts and forecasting the evolution of study and practices are impractical without scrutiny the goals and sources of innovation as

well as construction of inside and outside technological swap, without evaluating the actual and primary costs on scientific innovative practices by its classes and financing origins, by the size of innovative outputs.

Effective management of innovative processes becomes a major factor of high rates economic growth, of competitiveness any national economy as evidenced by current trends in world development. Control of innovative progress is a multi-level, complex task, the realization of which requires knowledge on regularities of innovation itself as well as on a basis of innovative development at all levels. Statistical information and their analysis in this context becomes an essential tool for building an effective innovative policy and for managing its implementation.

The aim of the study is to identify the importance of innovation statistics, to examine its formation in Kazakhstan and to analyse indicators of country's innovative development to determine an innovative factors effect on national economic development.

Literature review. Academic literature by domestic and foreign scholars such as Samuelson Paul A., Nodhaus William D. [1], K. Cubaev [2], S. Bishimbaeva [3], R.A. Alshanov [4], D. Bizhanova [5], and others are devoted on various aspects of an innovative development as well as on development of innovation statistics.

At the present time development of statistical systems faces challenges are born by globalization. Simplification of trade barriers, using of the Internet for transactions abroad, increasing mobility of workforce complicate the measurement of economic activity in a country. The next challenge in the development of statistics is the growing demand for more modern, and at the same time, reliable data. The demand for indicators of progress and sustainable development of society rises through politicians. Official statistics experiences growing pressure on the enlargement of statistical indicator's set. Modern trends in the world development, related to the transition of society to a higher stage, highlight the need for adequate elaboration of its information system.

Today, Kazakhstan is one of the leaders in Central Asia on the methodology, frequency and timeliness of data distribution. Reforming of a statistics contributed on qualitative improvement of some traditional sections, as well as on appearing new directions in statistics aimed to research as present-day issues of social-economic development so the prospective. Among these is innovative statistics which must reflects the creation, implementation and marketing of new and improved products, services and processes.

In the 1993 -2000 year statistical authorities in Kazakhstan under the influence of the objectives of scientific-technical and innovative policy and informative needs made a cardinal revision of the methodology and tools for statistical observation of research and development. Thus, innovative statistics were developed for the first time in domestic practice.

The implementation of statistical observation for innovative practices performed step by step. At the first phase the overall level of industries innovative practice was based on the results of 1994. At the stage the enumeration of innovative active companies was established. In the second level, starting with the 1995 report, the livelong exam of industrial companies conducted by the broadened program of technological innovation.

The following level was derived from the general supervision and embrace only innovatively active companies for the make of the qualitative assessment of the explored phenomena, comprising the features of an innovation's informational sources, factors that hinder it, etc. Throughout extension of the innovation statistics setup, which grounded on regular methodological precepts, apprehensions and classifications, the interrelated system of statistical monitoring of science and innovation is formed. Statistical tools have taken high assessment by an international expertise of the world's leading organizations. They are offer opportunities to provide direct feedback to the suitable for international comparisons data.

During the adaptation of international experience to the national characteristics of innovative development, the specific economical and institutional factors historically formed by market reorganization, in addition the statistical accounting's and reporting's particularities in the nation were taken into contemplation. This permitted eliminating the straight adopting of external practice, and for several points to propose new methodological ways, which enhanced the international practice.

The current stage of innovation statistics elaboration is characterized by further enhancement of the innovation statistics system based on the needs of economic development.

Main part. Discussion. Tendency analysis and prognosticating of scientific and industrial evolution are impracticable without studding targets and origins of innovation, without investigation forms of interior and exterior technological swap without assessment of actual and primary cost on innovation by its ways and origins of financing as well as without determining of innovative product amount.

It is impossible to analyze and predict the trends of scientific and industrial development without studying the goals of education and the sources of innovations, without studying the forms of internal and

external technological exchange, without evaluating the current and capital costs according to the types and sources of innovations. financing.

The main objectives for a progress in innovation and promotion technology upgrading for the near future are:

- development of technological modernization by creating claim on new technologies, by proposals, explication and dispersion of innovations;
- formation of peculiar competences by means of foresight and gliding as well as bearings of practiced science to the requirements of companies and by creation of innovation spheres;
- fulfillment of innovation infrastructure over enhancing the coordination of the country's innovation setup elements, by promoting innovation as well as enhancing the legal framework.

In this regards the main tasks of innovative statistics include a measurement of resources devoted to innovation, an assessment of factors conducive to innovation or hinder them as well as an analysis the impact of innovation on firm performance.

As a result of solving called issues the country's innovation setup to procure competitiveness of the industry should be established. It could be to achieve through establishing of management innovation and technological progress of the industries, its spheres and regions, developing conditions for the elevation of high-tech small and medium-sized businesses as well as enhancing the scientific and engineering potential.

Statistics explores the quantitative characteristics of the phenomena and processes in the sphere of innovation in enterprise with their qualitative matter. The major task of innovation statistics is to satisfy society's demands for accurate and reliable statistical information regarding size, structure and dynamics of resources and innovation process, furthermore their immixtures for social and economic development. The matter of innovation statistics is a progress of classifications, sets of indicators and the methodology for their estimation.

A set of scientific and innovative capacity indicators are following: science statistics, innovation performance statistics and statistical indicators of science and innovation impact on economic growth.

A science statistics highlight indicators on science resources, research and development, as well as organizational structure of science. The set of innovation statistics indicators divides on indicators of innovations sources, cost of innovation, indicators of technological exchanges level, on results of innovation process as well as innovation activities of enterprises. There are indicators of economy technological structure; export and import of technologies, assessment of an innovations impact on productivity's growth and employment as well as indicators of an integrated assessment of the scientific and technological progress contribution to a growth of gross domestic product are highlighted. Diversified classifications and grouping, reflecting the variety of internal and external relationships of innovation are used to study the various aspects of innovations.

The current statistical standards for data collection developed only for technological innovations, which are the end result of innovation process. They are embodied in the form of a new or improved product, embedded in the market and used in practice.

It's supposed that innovation occurred in the chance that it is switched-on in the market or in the industrial operation. Respectively, there are two ways of technological innovation: product and process innovations. Product innovations include the introduction of new products or improvement of existing one. Process innovations involve the development of new or significantly improved production methods, changes in equipment or in production organization, or both. Innovations in the field of organization and management, information technology, public and social services in technological innovation are not considered till.

According to the degree of novelty the innovation is classified by process parameters, as well as by a market position. Product innovation in terms of the process parameters are classified based on the following: using of new materials, using of new components and semi-finished products, obtaining fundamentally new features. Process innovations are classified on the basis of evidence: a new production technology, more automated, and new methods of production.

Reporting units in the innovation statistics are innovative-active enterprises, which identification is based on an extended range of signs.

The indicators of the innovative activity of the enterprises are calculated on the basis of the selected innovative active companies. They usually show the level of involvement in the realization of innovation generally or definite types during a particular season of time. Thus, in Kazakhstan the system of innovation statistics formed and at present it is improved. It provides a management of an innovative process on scientific bases.

The dynamic development of the innovation area is one of the key concepts of the innovative economy, which requires an efficient innovation system and the creation of institutions to support the innovation process.

The development of innovative activity in Kazakhstan plays a huge role at the present stage. The purpose, priorities, tasks and approaches of innovative development are defined in the Concept of innovative development of Kazakhstan Republic for 2020-25 [6] and The State Program of industrial and innovative development of Kazakhstan Republic for 2020-2025 [7]. Scale and significance of processes make special demands on the management of their implementation and such integral components as monitoring and evaluation. Monitoring and evaluation system is necessary to form a holistic and objective picture of the progress and results of achieving the target indicators at same time to make adequate managerial decisions.

The organizing of large-scale and comprehensive monitoring programs comes with a performance rating of the relevance activities. This is a prerequisite for monitoring qualitative changes in the structure of the economy, and its adaptation to the industrial and innovative changes in all spheres of activity.

The aim of innovative development is to enter the market of competitive products, processes and services. Kazakhstan is in the group with a low level of innovative development near such countries as Mexico, South Africa, and Slovakia. This group of countries is characterized by the creation of innovations mainly by the government with minimal participation of the private sector and universities. This situation is due to factors forming the fundamental basis of the country's innovative development: insufficient level of entrepreneurship development; low access to innovative infrastructure and government support tools.

For a more complete analysis of the dynamics of innovation and promotion of technological modernization, Statistics Committee under ministry of National Economy of Kazakhstan Republic have established and improved database on innovation and promotes technology upgrading [8,9].

Size of innovative products in the country has raised by 17.1 times in 2019 compared with 2003 and amounted to 1.114 billion tenge (picture 1).

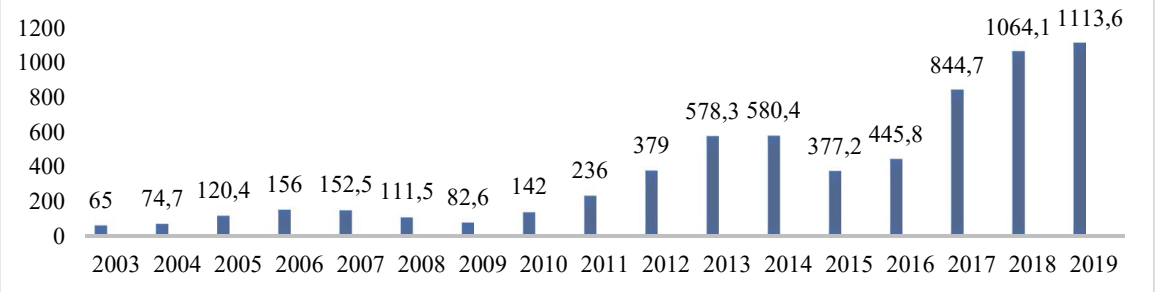

Figure 1. **The volume of innovative products (goods, services) in Kazakhstan for 2003-2019 y.y., mln. tenge***

** Compiled by the author according to the statistics of Kazakhstan Republic*

There is an increase in the share of innovative products in GDP of Kazakhstan during 2004-2019. In 2019 it amounted to 1.6%, which is 0.33 points higher than the 2004 level (Figure 2). Moreover, in the dynamics of this indicator there was a sharp decrease in the periods 2005-2009, as well as 2014-2015. There is an increase in the periods following the fall. So in 2011, the indicator grew by 0.35 points to the level of 2009, in 2018 the growth amounted to 0.99 points to the level of 2015. In 2019 decrease of this indicator compares to previous period is observed.

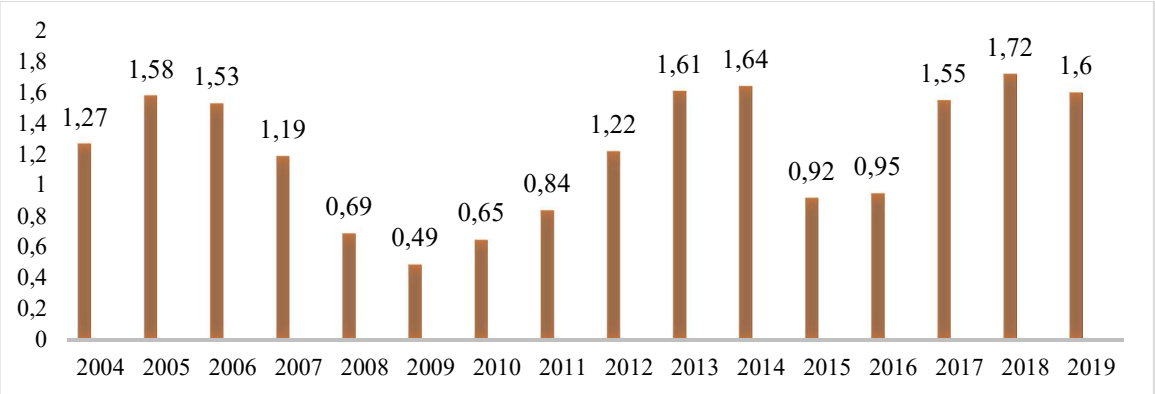

Figure 2. **The share of innovative products in the GDP in 2004-2019 years, %***

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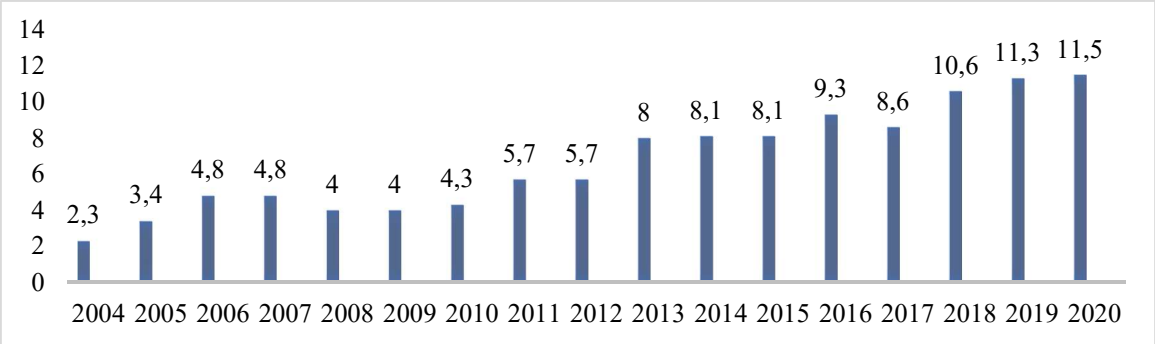

Figure 3. **The level of activity in the sphere of innovation in Kazakhstan for 2004-2020 y.y.***
** Compiled by the author according to [8, 9]*

The latest drift in innovation progress is shrinkage in the proportion of the common sector in the scope of settling or shortening of the "state order" for science from country's budget. The research departments of large companies as well as small and medium-sized high-tech enterprises intensify their stances in country's scientific and technological evolution. They took advantage of an educational system, infrastructure and some economic benefits established with the help of the state.

In most mature countries additional budgetary financing for research and development to a degree surpass the amount of budgetary distributions in this sphere. In countries members of Organization for Economic Cooperation and Development, it increased on average from 55% in 1991 to 65% still.

The main source of extra budgetary funds is the business sector, where large national and transnational corporations are leaders. Business corporations in developed countries have historically cultivated as the major significant patterns of country's innovation setups. They fund research and transform scientific performances and artifices into tangible products and technologies, at the identical time accept economic liability for the primary zones of scientific and technological evolution. Large companies fund major portion of the investment in science by the partial sector.

The business sector is and will continue to be the largest contributor to research both in terms of consumable funds and in the number of researchers and engineers involved in scientific research.

The total cost of innovative product and process innovations in 2019 amounted to 535918.1 million tenge (figure 4).

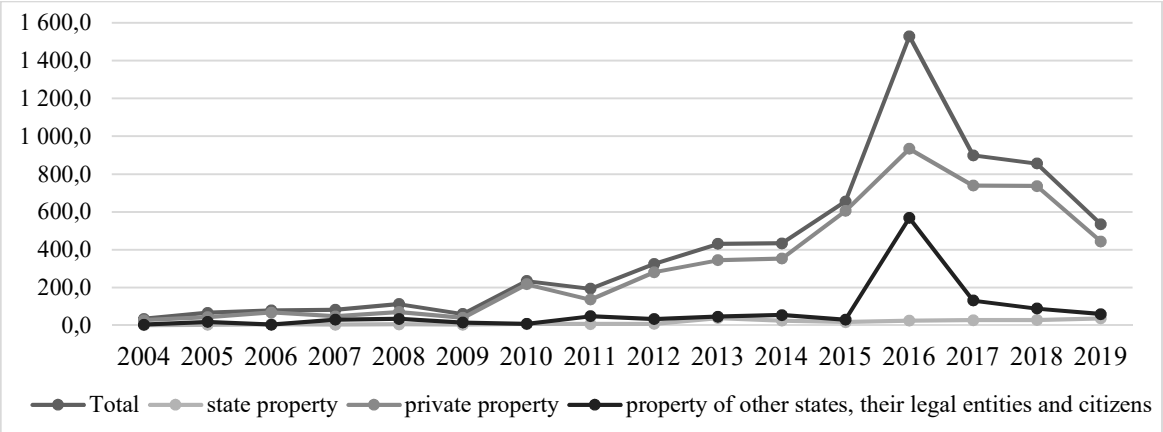

Figure 4. **Costs on innovative product and process innovations by type of ownership in Kazakhstan for 2003-2019 y.y., bln. tenge***
** Compiled by the author according to [8, 9]*

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Conclusion. The analysis is innovative development shows that innovations play a big role in Kazakhstan.However, it should be noted that this is not yet a source of increasing the country`s competitiveness in the world market. Despite the positive experience of many startups, there has not been a significant breakthrough in innovative development.

Studies by scientists within the EU have shown that internationalization and innovation are closely related. It follows that policies supporting innovation and internationalization should be linked and stimulate innovation and internationalization.

Another factor holding back the modernization of the Kazakhstani economy and the dynamics of innovation process is the low level of investment in R&D. In this regard, government policy aimed at encouraging companies to invest in innovation is very significant. In addition, it is necessary to further improve the science management system in order to concentrate financial resources as well as human, scientific and technical potential in priority areas of science. First of all, it is for meeting needs to develop effectively of economy’s real sector, especially in those areas where Kazakhstan already has competitive results. It should be noted that the pace of financial investments in R&D should be compatible with the pace of development of human resources that can effectively use investments. Conditions for the transfer and commercialization of the scientific developments results and their introduction into economic circulation should be created. One of the current problems of innovative development is the incompleteness of scientific research, its separation from production, low commercialization and implementation in production.

Today, Kazakhstan needs to look for new areas of economic development. In order to increase the country’s competitiveness in the world market, high-tech industries should be actively developed as well as an effective national innovation system should be built. In this regards the role of statistics increase as a way to improve management of innovative development.

Further development of innovation statistics puts forward as priorities to improve the tools of statistical observation. The specifics of particular sectors of science, an organizing of statistical monitoring on condition and movement of scientific and technical personnel, a collection of data on innovation in the rapidly growing service sector, a study of the mechanisms for indirect regulation of research and innovation activities require attention.

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ҚАЗАҚСТАННЫҢ ИННОВАЦИЯЛЫҚ ДАМУ СТАТИСТИКАСЫН ТАЛДАУ

Аңдатпа

Бұл мақалада Қазақстандағы инновациялық статистика жүйесінің қалыптасуы мен дамуы қарастырылған. Инновациялық процестерді тиімді басқару экономикалық өсудің жоғары қарқынын және кез-келген ұлттық экономиканың бәсекеге қабілеттілік деңгейін қамтамасыз етудің маңызды факторына айналады, бұған әлемдік дамудың қазіргі тенденциялары дәлел бола алады. Инновациялық дамуды басқару көп деңгейлі, күрделі міндет. Оны жүзеге асыру үшін инновациялық процестердің жүру заңдылықтарын, барлық деңгейлердегі инновациялық дамуды басқару негіздерін білу қажет.

Инновациялық статистика дамуының қазіргі кезеңі елдің экономикалық даму қажеттіліктеріне негізделген инновациялық статистика жүйесін одан әрі жетілдірумен сипатталады. Инновациялық статистиканың негізгі міндеттері көптеген мәселелерді қамтиды. Мұндай жағдайларда статистикалық ақпарат және оны талдау тиімді инновациялық мемлекеттік саясатты құрудың және оны іске асыруды басқарудың маңызды құралы болып табылады.

Мақалада Қазақстан Республикасының инновациялық статистикасының көрсеткіштері талданады, инновация және технологиялық модернизацияны ілгерілету саласындағы мемлекеттік саясатты іске асыру

мәселелері мен болашағы туралы қорытынды жасалады. Қазақстанның 2003-2020 жылдардағы инновациялық дамуының іске асыруының негізгі көрсеткіштерін бақылау нәтижелеріне ерекше назар аударылады.

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АНАЛИЗ СТАТИСТИКИ ИННОВАЦИОННОГО РАЗВИТИЯ КАЗАХСТАНА

Аннотация

В данной научной статье рассмотрено становление и развитие системы инновационной статистики в Казахстане. Эффективное управление инновационными процессами становится важнейшим фактором обеспечения высоких темпов экономического роста и уровня конкурентоспособности любой национальной экономики, о чем свидетельствуют современные тенденции мирового развития.

Современный этап развития статистики инноваций характеризуется дальнейшим совершенствованием системы инновационной статистики исходя из потребностей экономического развития страны. Основные задачи статистики инноваций охватывают широкий спектр вопросов.

В статье продставлен анализ показателей статистики инноваций Республики Казахстан, сделаны выводы о проблемах и перспективах реализации государственной политики в области развития инноваций и содействия технологической модернизации. Особое внимание в статье уделено внимание результатам мониторинга основных показателей реализации инновационного развития Казахстана на 2003-2020 годы.