

## NEWS

OF THE NATIONAL ACADEMY OF SCIENCES OF THE REPUBLIC OF KAZAKHSTAN

SERIES OF SOCIAL AND HUMAN SCIENCES

ISSN 2224-5294

<https://doi.org/10.32014/2020.2224-5294.96>

Volume 4, Number 332 (2020), 5 – 11

UDC 330.34 (574) + 338.23..336 (574)

L.A. Myltykbayeva<sup>1</sup>, B.B. Doskaliyeva<sup>2</sup>

<sup>1</sup> JSC Financial Academy, Nur-Sultan, Kazakhstan;

<sup>2</sup> Karaganda Economic University Kazpotrebooyuz, Karaganda, Kazakhstan.

E-mail: [m\\_lyazzat@mail.ru](mailto:m_lyazzat@mail.ru), [doskaliyevab@mail.ru](mailto:doskaliyevab@mail.ru)

## COMMERCIALIZATION OF THE RESULTS OF SCIENTIFIC AND TECHNICAL ACTIVITIES AS A FACTOR OF INNOVATIVE DEVELOPMENT OF THE ECONOMY OF KAZAKHSTAN

**Abstract.** Currently, the industrial and innovative development of the economy of Kazakhstan is aimed at ensuring high rates of economic growth using scientific achievements, investments in the development of advanced technologies and high-tech industries. For Kazakhstan to become one of the 50 competitive countries, it is necessary to ensure the transition of the economy of Kazakhstan to an innovative development path. The article discusses the role of science and the commercialization of the results of scientific and technical activities in the innovative development of the country. On the importance of the adoption of the Law "On the Commercialization of the Results of Scientific and (or) Scientific and Technical Activities", which provides for the provision of grants for the commercialization of scientific and scientific and technological developments. This law is aimed at stimulating business in participating in scientific projects, including the interaction of science and business, increasing the effectiveness of research results and ensuring their implementation in pr The main program documents of the country aimed at the innovative development of the economy are given. The analysis of the process of grant financing of commercialization projects of the Scientific Fund OJSC and its experience in creating an effective technology commercialization system with the aim of introducing an innovative product or technology to the market and turning a scientific idea into a popular product is carried out. An analysis of the results of competitions held by JSC Science Fund, an operator for grant financing of projects for commercializing the results of scientific, scientific and technical activities, showed that the largest number of grant recipients in 2016 and 2017 by legal status are research institutes. The number of projects submitted by representatives of the business structure, namely research and production enterprises, newly created startup companies and private partners, increased significantly in 2017. Data on the distribution of grantees by region and industry are also provided. The most active regions for technology commercialization are Almaty, Astana, Karaganda region, and South Kazakhstan region. The article shows that the creation of an effective system of technology commercialization as the main mechanism for bringing an innovative product or technology of scientific activity to the market and turning a scientific idea into a popular product will increase the interest of representatives of business structures, increase the volume of products sold and tax deductions, the emergence of new types of domestic products with a share of Kazakhstani content, the emergence of new jobs.

**Keywords.** Innovative development, science, scientific and technological activity, grant, commercialization, technology.

In the modern world, all countries pay special attention to science as a strategically important area of human activity, the country's fundamental resource, which largely ensures its economic growth and competitiveness. In the program document of the republic "Strategy of Kazakhstan-2050" the President of the country N. A. Nazarbayev emphasizes the important science role as the basis for the development of human capital and economic growth of the country [1].

Important steps have been taken in Kazakhstan in this direction - the Strategy for Industrial and Innovative Development and the Program for the Formation of a National Innovation System have been adopted. The Message of the President of the Republic of Kazakhstan N.A. Nazarbayev to the people of Kazakhstan "Through the crisis to renewal and development" of March 6, 2009 [2].

The creation of an innovative type of economy is associated with the development of the scientific and technological sphere, broad state support for the advanced development of science and education, the introduction of scientific and technical results, the formation of a modern innovation space and innovation-oriented institutions. Scientific activity is becoming a factor transforming the content and quality of economic growth.

Within the framework of the "100 Concrete Steps" National Plan in order to increase the country's competitiveness, technological modernization and socio-economic development, increase the international authority of Kazakhstan's science, Kazakhstan has set a course to build a knowledge-based economy [3].

According to official data of the Global Competitiveness report (GCR) issued by the World Economic forum [4], Kazakhstan is ranked the 53rd out of 140 countries with a rating of 4.41 in 2016-2017, and the 59th in terms of Innovation, improving the indicator by 13 points compared to the previous period.

In the address to the people of Kazakhstan "New opportunities for development in the fourth industrial revolution", the President of the Republic of Kazakhstan N. A. Nazarbayev stated "ten tasks" [5] that need to be completed in order to enter the 30 developed countries. At the same time, the first task is to bring the Kazakhstan industry to the status of a flagship for the introduction of new technologies.

In this regard, the country needs to accelerate the pace of innovative development, which cannot be achieved without a clearer orientation of applied science to the industrial needs of the country. Special attention is paid to the issues of commercialization of intellectual property as a basis for industrial and innovative development.

In order to stimulate commercial use of results of scientific and technical activities and introducing them to the market, in 2015 the Law "On Commercialization of Results Scientific and (or) Scientifically-Technical Activity" [6] was adopted, which provides grants for commercialization of scientific research and technological developments (hereinafter - RSSTA). This law is aimed at encouraging businesses to participate in scientific projects, including interaction between science and business, improving the effectiveness of research results and ensuring their implementation in production.

For the practical implementation of the provisions of this Law, by the Order of the Minister of Education and Science of the Republic of Kazakhstan dated May 17, 2016, JSC "Science Foundation" was defined as the operator for grant financing of scientific and (or) scientific and technical activities, i.e. the "Science Foundation" is assigned by the task of organizing high-quality and timely selection of projects subject to grant funding.

This fact gave the second life to the "Science Foundation", which in recent years practically has not been engaged in commercialization of scientific developments, despite the fact that it was established in 2006 by the Government Regulation to promote the development of priority, initiative, risk-taking research and development activities to ensure the practical implementation of scientific research in the country.

The "Science Foundation", taking into account the experience of previous years and the world practice of supporting the commercialization of research results, has revised its development strategy. The Foundation has set itself a responsible and important task – to become a Central Office by 2020, providing interaction between scientists and business in solving their problems through:

- Promotion of the results of scientists' activities, including intellectual property, products and services created during the implementation of projects;
- Support of project performers for further promotion of the results obtained on domestic and foreign markets;
- Assistance in attracting investment;
- Partner search;
- Implementation of joint projects;
- increasing competence.

Thus, in 2016, the "Science Foundation" held the first competition for grant funding for projects to commercialize the results of scientific and technical activities. 337 applications were submitted for the contest. A distinctive feature of the projects was that there was great interest not only from scientists, but

also from entrepreneurs. According to the results of the competition, 31 contracts were concluded for the provision of grants for a total amount of 5,757,923,401 tenge. The total amount of co-financing funds raised was 580,261,436.09 tenge, i.e. more than 10% of the grant amount. The project implementation period varies from one year to three years.

During 2016, contracts for 6 projects were terminated by the decision of the National Scientific Councils on the application of grantees. Part of the reason for the closure of projects was the inability to provide collateral, the declared co-financing and the refusal of private partners for the project.

According to the results of the 3rd year of implementation of 25 projects, the following performance indicators were noted:

- Output to the volume of products/services sold 4.4 billion tenge;
- Tax deductions for 384.89 million tenge;
- Creation of 317 new job positions;
- Appearance of more than 77 types of new products;
- The share of local (Kazakhstan) content in new products is 84 %.

In 2017, as a result of the competition for grant financing of projects for the commercialization of scientific and (or) scientific and technical activities, a total of 502 applications were received, of which 72 signed a grant agreement for a total of 16,128,043,583 tenge. The amount of funds co-financing under these agreements is 119 247 2 964 tenge, which is made up 13.14% of the total grant.

Figure 1 shows the distribution of 25 grantees in 2016 and 72 grantees in 2017 by legal status. The largest number of grantees in 2016 and 2017 by legal status are research institutes. The number of projects submitted by representatives of the business structure, namely research and production enterprises, new start-up companies and private partners, increased significantly in 2017.

Projects of commercialization of the contest results of scientific and technical activities in 2016 have been implemented in the following regions: Almaty, Karaganda Region, Astana, Almaty, South Kazakhstan, North Kazakhstan and Zhambyl Regions.

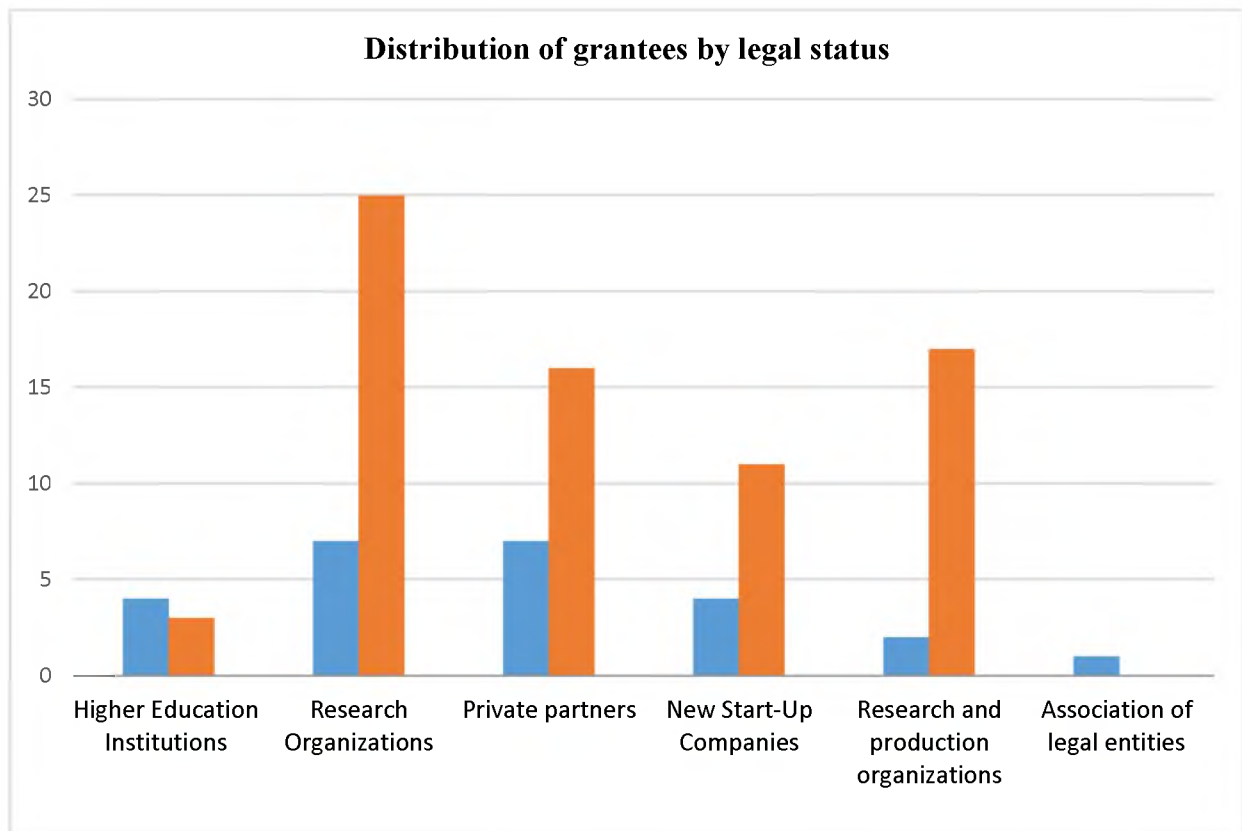


Figure 1

In 2017, the coverage of regions with grants for commercialization projects significantly expanded. Thus, contracts were signed for the provision of grants to finance projects for the commercialization of scientific and technical results with grantees from 13 regions of the country. The maximum number of projects to commercialize the results of scientific and technical activities is in Almaty, where the main scientific potential of the country is concentrated. Figures 2 and 3 also show that scientists from Astana, Almaty, South Kazakhstan, North Kazakhstan and Karaganda regions are active participants in the process of introducing the results of scientific work into production.

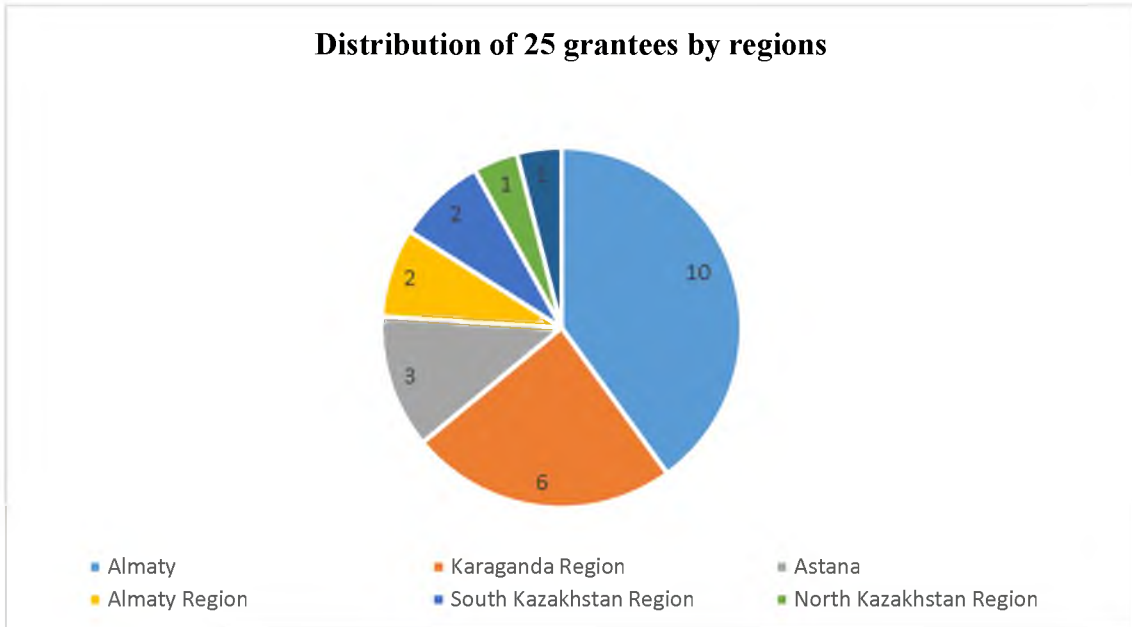


Figure 2

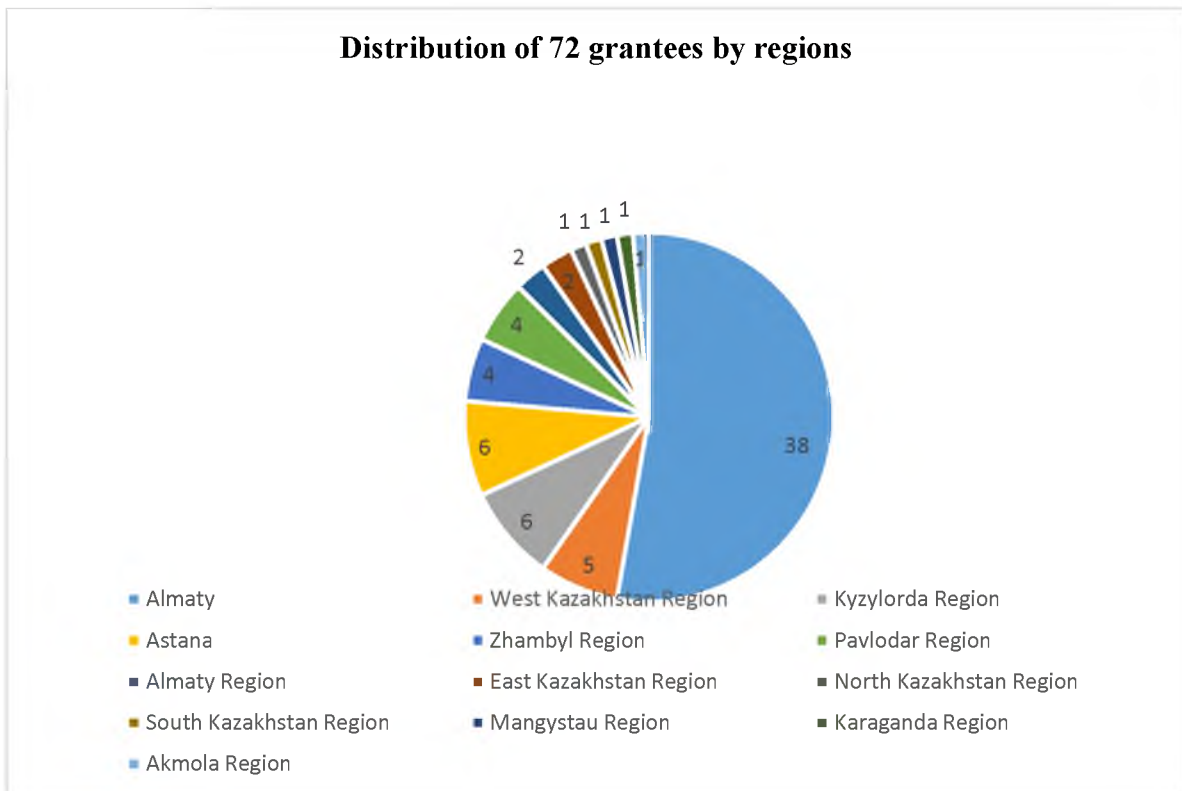


Figure 3

The largest number of projects in 2016 (figure 4) for which grant funding was allocated, namely 6 projects, relate to the direction of food production. The second largest number of projects is for waste collection, processing and disposal, and the third one is for the production of electrical equipment and the metallurgical industry.

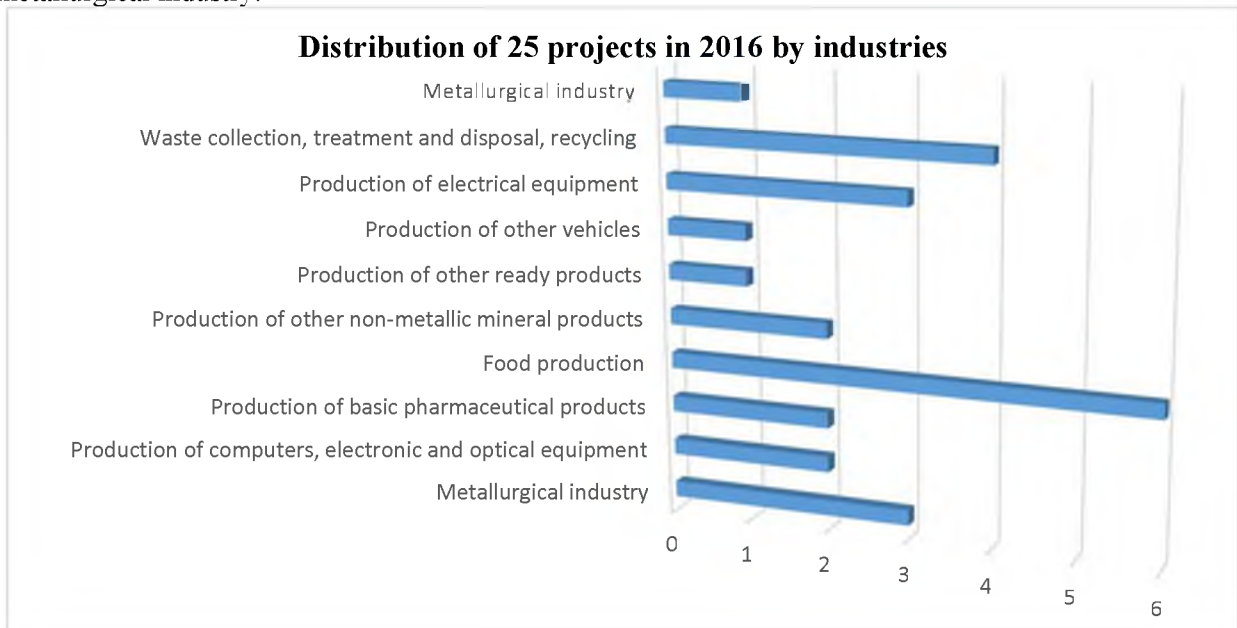


Figure 4

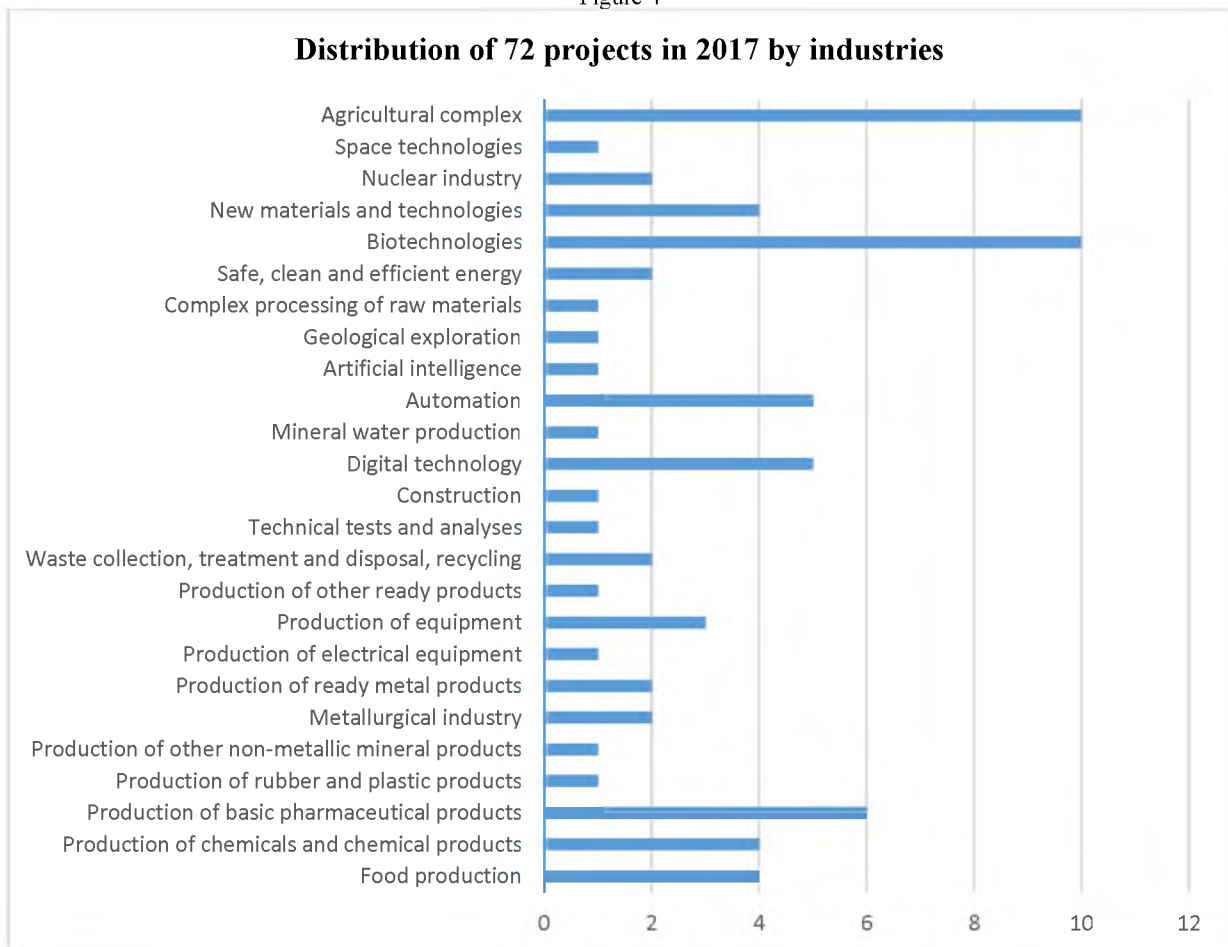


Figure 5

The distribution of 72 projects in 2017 by industry is shown in figure 5. The largest number of projects implemented in 2017 is represented in the areas of biotechnology and agro-industrial complex. There is an increase in the number of projects submitted in the direction of production of basic pharmaceutical products and preparations. Taking into account the breakthrough in technological development in the world, it is worth noting that a sufficient number of projects have also been selected in such areas as digital technologies (3D printing; online trading; mobile banking; digital services, including in healthcare and education), automation, new materials and technologies.

Thus, the results of the work of JSC "Science Foundation" over the past two years show that its activity has made a significant contribution to the innovative development of the country.

Based on the above, it can be noted that the creation of an effective system of technology commercialization as the main mechanism for bringing an innovative product or technology of scientific activity to the market and turning a scientific idea into a popular product will increase the interest of business representatives, increase the volume of products sold and tax deductions, the appearance of new types of domestic products with a share of Kazakhstan content, and the emergence of new jobs.

**Л.А. Мылтықбаева<sup>1</sup>, Б.Б. Досқалиева<sup>2</sup>**

<sup>1</sup>«Қаржы академиясы» АҚ, Нұр-сұлтан, Қазақстан;

<sup>2</sup>Қазтұтыну одағы Қарағанды экономикалық университеті, Қарағанды, Қазақстан

#### **ҒЫЛЫМИ-ТЕХНИКАЛЫҚ ҚЫЗМЕТ НӘТИЖЕЛЕРІН КОММЕРЦИЯЛАНДЫРУ ҚАЗАҚСТАН ЭКОНОМИКАСЫНЫҢ ИННОВАЦИЯЛЫҚ ДАМУЫНЫҢ ФАКТОРЫ РЕТІНДЕ**

**Аннотация.** Қазіргі уақытта Қазақстан экономикасының индустриалды-инновациялық дамуы ғылыми жетістіктерді, алдысғы қатарлы технологиялар мен жоғары технологиялық өндірістерді дамытуға салынған инвестицияларды пайдалана отырып, экономикалық өсудің жоғары қарқынын қамтамасыз етуге бағытталған. Қазақстан бәсекеге қабілетті 50 елдің қатарына енуі үшін Қазақстан экономикасының инновациялық даму жолына өтуін қамтамасыз ету қажет. Мақалада елдің инновациялық дамуындағы ғылымның және ғылыми-техникалық қызмет нәтижелерін коммерциудың рөлі туралы айтылады. Ғылыми және ғылыми-техникалық әзірлемелерді коммерцияландыруға гранттар беруді көздейтін «Ғылыми және (немесе) ғылыми-техникалық қызмет нәтижелерін коммерцияландыру туралы» Заңды қабылдаудың маңыздылығы туралы бағамдалады. Бұл заң ғылыми жобаларға қатысуға бизнесті ынталандыруға, оның ішінде ғылым мен бизнестің өзара әрекеттесуіне, зерттеу нәтижелерінің тиімділігін арттыруға және олардың өндіріске енгізілуін қамтамасыз етуге бағытталған.

Экономиканың инновациялық дамуына бағытталған елдің негізгі бағдарламалық құжаттары келтірілген. Инновациялық өнімді немесе технологияны нарыққа енгізу және ғылыми идеяны танымал өнімге айналдыру мақсатында «Ғылым қоры» АҚ коммерцияландыру жобаларын гранттық қаржыландыру үдерісі мен оның тиімді технологияларды коммерцияландыру жүйесін құру тәжірибесіне талдау жасалды. Ғылыми және ғылыми-техникалық қызмет нәтижелерін коммерцияландыру бойынша жобаларды гранттық қаржыландыру операторы болып саналатын «Ғылым қоры» АҚ өткізген конкурстардың нәтижелерін талдау 2016 және 2017 жылдары құқықтық мәртебесі бойынша грант алушылардың ең көп саны ғылыми-зерттеу институттары болып саналатындығын көрсетті. 2017 жылы бизнес құрылымының, атап айтқанда ғылыми-өндірістік кәсіпорындардың, жаңадан құрылған стартап-компаниялар мен жеке серіктестердің ұсынған жобаларының саны айтарлықтай өсті. Грант алушылардың аймақ пен сала бойынша бөлінуі туралы мәліметтер келтірілген. Технологияларды коммерцияландыру үшін белсенді аймақтар болып Алматы, Астана, Қарағанды облыстары және Оңтүстік Қазақстан облысы саналады. Мақалада инновациялық өнімді немесе технологияны нарыққа шығарудың негізгі тетігі ретінде ғылыми коммерцияландырудың тиімді жүйесін құру және ғылыми идеяны танымал өнімге айналдыру бизнес құрылым өкілдерінің қызығушылығын арттыратыны, сатылатын өнімнің көлемі және салықтық жеңілдіктер, қазақстандық қамтудың үлесі негізінде отандық өнімдердің жаңа түрлерінің пайда болуы, жаңа жұмыс орындарының пайда болатындығы көрсетілген.

**Түйін сөздер:** инновациялық даму, ғылым, ғылыми-техникалық қызмет, грант, коммерцияландыру, технология.

Л.А. Мылтыкбаева<sup>1</sup>, Б.Б. Досқалиева<sup>2</sup>

<sup>1</sup>АО «Финансовая академия», Нур-Султан, Казахстан;

<sup>2</sup>Карагандинский экономический университет Казпотребсоюза, Караганда, Казахстан

## КОММЕРЦИАЛИЗАЦИЯ РЕЗУЛЬТАТОВ НАУЧНО-ТЕХНИЧЕСКОЙ ДЕЯТЕЛЬНОСТИ КАК ФАКТОР ИННОВАЦИОННОГО РАЗВИТИЯ ЭКОНОМИКИ КАЗАХСТАНА

**Аннотация.** В настоящее время индустриально-инновационное развитие экономики Казахстана направлено на обеспечение высоких темпов экономического роста с использованием научных достижений, инвестиций в развитие передовых технологий и наукоемких производств. Для вхождения Казахстана в число 50-ти конкурентоспособных стран необходимо обеспечить переход экономики Казахстана на инновационный путь развития.

В статье рассматривается роль науки и коммерциализации результатов научно-технической деятельности в инновационном развитии страны, о важности принятия Закона «О коммерциализации результатов научной и (или) научно-технической деятельности», который предусматривает предоставление грантов на коммерциализацию научных и научно-технических разработок. Данный закон направлен на стимулирование бизнеса в участии в научных проектах, в том числе взаимодействия науки и бизнеса, повышение эффективности результатов научных исследований и обеспечение внедрения их в производство. Приведены основные программные документы страны, направленные на инновационное развитие экономики. Проведен анализ процесса грантового финансирования проектов коммерциализации ОАО «Научный фонд» и его опыта по созданию эффективной системы коммерциализации технологий с целью вывода инновационного продукта или технологии на рынок и превращения научной идеи в востребованный продукт. Анализ результатов конкурсов проведенных АО «Фонд науки» – оператором по грантовому финансированию проектов коммерциализации результатов научной и научно-технической деятельности показал, что наибольшее количество грантополучателей 2016 и 2017 года по юридическому статусу являются научно-исследовательскими институтами. Количество проектов, поданных от представителей бизнес структуры, а именно научно-производственных предприятий, вновь созданных стартап компаний и частных партнеров, значительно увеличилось в 2017 году. Также приведены данные по распределению грантополучателей по регионам и отраслям промышленности. Самыми активными регионами по коммерциализации технологий являются г. Алматы, Астана, Карагандинская область, Южно-Казахстанская область. В статье показано, что создание эффективной системы коммерциализации технологий как основного механизма вывода инновационного продукта или технологии на рынок и превращения научной идеи в востребованный продукт будет способствовать увеличению заинтересованности представителей бизнес структур, возрастанию объемов реализуемой продукции и налоговых отчислений, появлению новых видов отечественной продукции с долей казахстанского содержания, появлению новых рабочих мест.

**Ключевые слова:** инновационное развитие, наука, научно-техническая деятельность, грант, коммерциализация, технология.

### Information about authors:

Mylytkbayeva L.A., Doctoral student, JSC Financial Academy, Nur-Sultan, Kazakhstan, [m\\_lyazzat@mail.ru](mailto:m_lyazzat@mail.ru), <https://orcid.org/0000-0001-8172-4956>;

Doskaliyeva B.B., Doctor of Economics, professor, Karaganda Economic University Kazpotrebsoyuz, Karaganda, Kazakhstan, [doskaliyevab@mail.ru](mailto:doskaliyevab@mail.ru), <https://orcid.org/0000-0002-3074-0523>

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