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**ҚАЗАҚСТАН РЕСПУБЛИКАСЫ
ҰЛТТЫҚ ҒЫЛЫМ АКАДЕМИЯСЫНЫҢ**

БАЯНДАМАЛАРЫ

ДОКЛАДЫ

**НАЦИОНАЛЬНОЙ АКАДЕМИИ НАУК
РЕСПУБЛИКИ КАЗАХСТАН**

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STIMULATING THE DEVELOPMENT OF PUBLIC-PRIVATE PARTNERSHIP IN THE FIELD OF SCIENCE AND INNOVATION

Abstract. Currently, public-private partnership (PPP) is recognized in Kazakhstan as one of the main instruments for the implementation of economic policy, which is noted in many policy documents. However, the level of use of PPP opportunities in the field of science and innovations remains low due to the unsettled processes of interaction of PPP participants. In this regard, this article examines the issues of the expanded use of PPP in the scientific and innovative sphere in Kazakhstan. The work identified the features of the use of PPP in the science and innovation sphere, outlined its principles, and highlighted the incentives of stakeholders to participate in PPP projects. In addition, on the basis of studying the experience of developed countries, measures have been developed to expand the use of public-private partnership mechanisms in science and innovation in Kazakhstan. Prospective directions for the development of the PPP mechanism for innovation are examined through the prism of the needs and objectives of industrial modernization in the context of the sustainable development of Kazakhstan and the characteristics of the global economy, under which this modernization will be carried out.

The main conclusions and proposals formulated in the article can be applied by state bodies in the course of developing state and regional programs supporting scientific and innovative activities. The results of the study can also serve as the basis for more in-depth studies.

Keywords: public-private partnership, science, innovation, stimulation.

Introduction. In XXI century the increment of labor efficiency and GDP in the developed countries is ensured mainly due to issue and sale of science-intensive products and services. The innovation process has gradually transformed from “occasional” economic phenomena to the dominant of economic development.

The relative share of science-intensive products in the world market for the USA is 36-40%, Japan – about 30%, Germany – 16%, China – 6% [1]. Unfortunately, in Kazakhstan the share of innovative products and services is just 1.59% of the GDP [2] due to raw material orientation of the national economy sectors. Starting from 2003 Kazakhstan set to the industrial-innovative development assuming the diversification of economy and transition to the innovative model of economy development. Solving of this task is mainly connected with modernization of scientific-research sector where the important role is given to adoption of the public-private partnership (PPP) as a factor stimulating the development of innovative economy. The positive experience of the public-private partnership development in the developed countries shows that it allows not only optimizing the risks of scientific-research activity implementation, but is an instrument for attraction of large business to creation of new products and technologies.

Along with this, the process of the public-private partnership implementation in the field of science and innovations has a range of problems impeding its widespread introduction; these problems are mainly connected with insufficient methodological elaboration of PPP mechanisms forming regarding the innovation field, underestimation of real influence of PPP institute on the country economy, and, first of

all, on development of integration links of public and business-structures in joint projects that confirms the topicality of the research.

Methods. The research was based on mutually supportive general scientific and private methods of knowledge, systematic, concrete-historical and integrated approaches, instruments of strategic and production management. Each method was used according to its functional possibilities to ensure the representativeness of the research results.

Results and discussion.

The PPP programs in the innovation field differ from traditional concessional and other contractual forms of PPP in infrastructure sectors and include: stimulating of cooperation between scientific and industrial sectors of economy; support of high-technological start-up and "spin-off" companies; assistance for technologies transfer; forming of innovative clusters. Under the PPP projects implementation in scientific and innovation fields the State is a guarantor of risk share especially at initial stages of innovative process.

The PPP in the innovative field can be described as a long-term institutional and organizational alliance between the Sate and business to implement socially important projects and programs in wide range of industrial sectors and scientific researches fields [3].

According to definition of the OECD Committee on scientific and technological policy, the PPP in innovative field means "any official relations or agreements for fixed period of time between public and private participants at which both sides interact in decision making process and co-invest limited resources, such as funds, personnel, equipment and information to achieve particular goals in specific field of science, technologies, and innovations" [4].

The PPP has firm traditions in a lot of European countries, harks back to the history of the industrial revolution in Europe. Initiation and support of PPP at micro-level and assessment of programs at meso-level is a key part of many European, national, and regional programs. In the beginning of 2000 the issue was set on a new paradigm of PPP in scientific research and development works (R&D) [5].

The PPP was the important part of the industrial policy and programs of postwar Japan, especially in the mid of 1970-80-s. The structural changes favored the State to take the initiative in in assisting the cooperation between the industry and universities as means for mastering technologies to develop local economy, especially in creating of jobs [6].

The PPP in innovative field can be classified depending on the type and characteristics of participants, including:

а) partnership between universities and industry;

б) partnership between the State and industry;

в) partnership between scientific-research institutes and industry;

г) combination of the partnerships mentioned above joining several scientific-research institutes of the government with each other and industry.

The PPP becomes a key component of policy in the field of technologies and an instrument to enhance the national competitiveness. Each of the partnerships participants has its own motivation for cooperation (Figure 1).

Under the PPP the State not only shoulders a part of risk, but invests significant menas into new projects. Its main designation is creation of economy-wide conditions determining the development of innovative activity.

The successfulness of the PPP mechanisms application in the innovative projects can be determined by the following factors:

– Political and institutional base of PPP projects (clear distribution of obligations in the state system, determination of frame conditions for negotiations with private investors);

– Stable political-legal environment (general system of rules, ypical agreements, facilitation of legal system to decrease transaction fees);

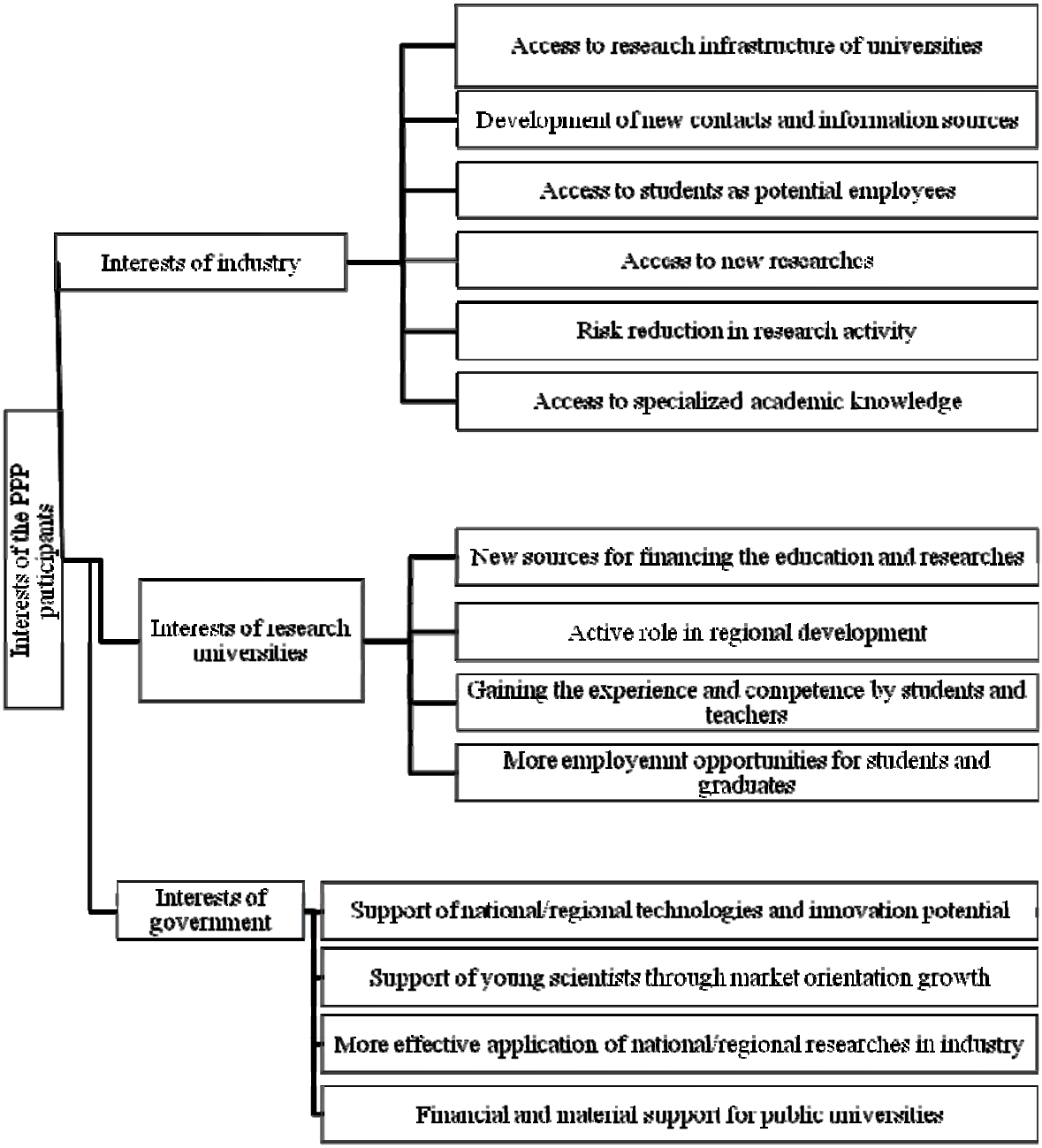

Figure 1 – Motivation for PPP participants in scientific and innovative field

– Effective structure of economy and fair distribution of opportunities and risks;

– Ability for precise calculation of fees and benefits of a project;

– Wide investment opportunities due to availability of adequate mechanisms of distribution and mitigation of risk, and financial structuring if the innovative project;

– Free access to private investment markets;

– Opportunity to optimize the mobilization of private capital per unit of government expenditures;

– Risk management of the governmental sector of economy;

– Development of effective instruments for the governmental management of innovative field.

In scientific-technological and innovative fields the following PPP forms can be applied:

– Co-financing of scientific-research projects at pre-competition stage (motivation for industry is transfer of rights on research results and developments for its further commercialization);

– Co-financing of early stages of commercialization ("seed", venture financing);

– Creation of joint investigative centers at socially important fields (healthcare, protection of environment, defense).

At the present moment a lot of developed countries reduce direct governmental interference into the innovation process and private business increase expenses for R&D [7]. At the same time, the range of indirect encouragement measures extends due to tax relief, soft loans, focused support of small business, forming of necessary innovative infrastructure and commercialization of technologies.

In view of PPP encouragement in the innovative field, interesting is the experience of some European countries. The enterprises of the European Union countries participating actively in developing and adopting of innovations has a right to form innovation not taxable funds from the received income. The size of such fund can be from 16 to 50% of the enterprise income. Tax concessions are also used in the form of tax benefits from the volume or increment of company expenditures for R&D.

The Great Britain applies actively a scheme of government lending implemented through specially created guarantee funds. The system works as follows: an innovation company addresses to a loan office for typical loan, and the State guarantees 70-85% payments of the provided amount of loan.

A lot of developed countries use widely the share form of financing of innovative projects that assumes the participation of government, private business, universities, local authorities, and other structures. This form is mostly used by the USA and such European countries as Great Britain, Greece, Spain, Netherlands, Poland, and Swiss. The application of this form of financing allows for better integration of interests of customers and R&D executors, and favors material encouragement of researchers, rational distribution of attracted funds and risk of its investments among all participants of innovative projects.

Despite some differences in details, the general principles of innovative systems forming in the developed countries assume that the governmental role is to assist in producing fundamental knowledge and a set of strategic technologies, and creation of infrastructure and favorable medium for innovative activity of private companies, and the role of private sector is to create technologies basing on own researches and developments, transfer and market mastering of innovations.

The western models of the public-private partnership in developing the innovative infrastructure assume, as rule, the domineering of the public financing at the early stage of an innovative project when "money for seeding" and reliable guarantee are required for the start.

For example, in Germany, France, Holland, the public share in common investments at creating the innovative infrastructure facilities is about 75%, in the Great Britain – 60 %. At later stages of exploitation and functioning of the facilities, the situation changes to the opposite side – the role of private sector in co-financing increases. The government finances, mainly, the fundamental research implemented by universities, research laboratories, and by institutes, renders selective aid to innovative developments in the private sector. It is interesting to note that the approach to distribution of the governmental resources to support R&D in the private sector differs depending on a country. For example,in contrast with the European Union countries (EU) with prevailing diversified approach to distribution of funds among private companies, in the USA the funds allocated by the government to research and development works are concentrated at small number of companies – only 0.5% of American companies receive 84% governmental assignations for R&D.

The model with prevailing governmental financing of R&D (more than 50%) remains in the EU countries – Portugal, Greece, Poland, Hungary, Romania, Bulgaria.

The following forms of PPP development adequate to prospective stages of Kazakhstan economy development can be assumed:

– Activation of the public institutes of developments activity with more precise orientation on the achievement of the industrial modernization goals;

– Foreign investments and assistance in Kazakhstan capital flow to foreign markets including the part of direct and portfolio investments;

– Forming of large vertically integrated companies with participation of governmental assets to create the growth points of high-technological manufactures and clusters;

– Improvement and development of different forms of the governmental protection and patronage of the national companies entering the foreign markets of the end products;

– Forming of the system of accelerated innovative-technological development of economy basing on the public-private partnership.

Considering the directions of the public-private partnership development it can be noted that in this case it is reasonable to search new, more complicated and integrated forms of PPP. This does not imply the abandoning of traditional forms, such as participation of government in business-structures capital, state procurement, rendering of the national guarantees and different types of instruments of administrative-regulatory type. However, taking into account the peculiarities and demands of the industrial modernization, these simple forms of PPP could be insufficient. In addition to the large-scale of the industrial modernization tasks, another important factor influencing on the configuration of the public-private partnership is activation of globalization processes.

It is reasonable to develop and adopt more complicated, multi-component forms and methods of joint actions of the governmental institutes and business-structures allowing for daster and more efficient implementation of the industrial modernization. At this, it is reasonable to focus on disposal of entrepreneurship potential of the government that is currently used to limited extent. Namely the entrepreneurship functions of the state can have the dramatic impact on enhancing the PPP effectiveness and accelerate the process of the industrial modernization.

The public-private partnership should be the base of a new mechanism of science financing. The allocation of the budget finds should be added with flexible mechanisms of co-financing of researches and developments by the government and business. For these purposes, in particular, it is necessary to use widely the opportunities of developing institutes (Investment Fund, Agency on Technological Development, Science Fund) and public holdings created in Kazakhstan. Now, its share is only 0.4% of all expenses on the science.

Considering the prospective trends of the PPP mechanism development regarding the industrial modernization it is necessary to base on two main imperatives: demands and tasks of the industrial modernization in the context of sustainable development of Kazakhstan and features of the global economy under the conditions of which this modernization will be implemented.

Conclusion. The conducted research allowed forming the following main trends of forming and development of the public-private partnership in scientific and innovation spheres:

1. Mutually reinforcing participation of the government and market in the innovation processes. There should be no alternative – either comprehensive regulation of innovative activity on the part of the government, or its forming under the influence of market forces nature. The government assists the market development, but not replaces it. The budget financing should play a role of a start push, be a signal sent by the government to private business encouraging it to more active activities, to attempt to “do a first step”;

2. The division of innovation risks between the government and business. It is necessary to apply an approach at which the government and private sector being the equal partners solve together the problems of innovative-technological development, and share the responsibility while implementing the innovation projects. The programs of public-private partnerships should be developed focusing on assistance of private sector in implementing the advanced and high-risk technologies. These partnerships can be in the form of cooperation agreements joining industrial enterprises, governmental agencies, research institutes, and universities in different combinations for joint achievement of definite science-technological results. While co-financing the projects on the part of the government it is desirable to concentrate the projects management in the hands of business or specialized middleman organizations;

3. Application of decentralized channels of the governmental support for the innovation activity. The governmental support should preferably be implemented not through direct financial subsidizing of budget funds, but through simultaneous use of different channels. Particularly, this requirement is met by improvement of “development institutes” network, and transfer of a part of governmental support functions to private middleman that reduces the risk of corruption;

4. Naturalization of the governmental support for the innovative activity. The transparency of the support channels strengthens is financial subsidies to industrial enterprises are replaced by services of the government. The government could undertake the financing of programs on personnel training,

international certification of small enterprises, information support, etc. For business such programs should be free. Another type of natural grant could be rendering of land sites on the territory of the state research institutes and universities to technological parks, innovation centers.

5. Support of enterprise networks. The innovations support programs in small and medium business should be focused not on individual enterprises, but on its groups, for example in the form of sectorial or territorial associations. The interaction of the government with enterprise groups will allow, on one hand, to decrease the expenditures on such programs and on another – favor the small enterprises entry into market not as individual manufacturers, but as economic entities joined into the networks by mutual connections, joint use of techniques, resources, etc. Such networks can further transform to innovation clusters.

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ҒЫЛЫМ МЕН ИННОВАЦИЯЛАР САЛАСЫНДАҒЫ МЕМЛЕКЕТТІК-ЖЕКЕ ӘРІПТЕСТІКТІҢ ДАМУЫН ЫНТАЛАНДЫРУ

Аннотация. Қазіргі уақытта Қазақстанда мемлекеттік-жеке әріптестік (МЖӘ) экономикалық саясатты іске асырудың негізгі құралдарының бірі болып табылады, бұл көптеген құжаттық бағдарламаларда белгіленген. Алайда ғылым мен инновациялар саласында МЖӘ мүмкіндіктерін қолдану деңгейі әлі күнге төмен болып отыр, оның себебі МЖӘ қатысушыларының өзара әрекеттесу процестерінің әлсіз ұйымдастырылуында жатыр. Осыған байланысты бұл мақалада Қазақстанның ғылыми және инновациялық саласында МЖӘ құралдарын кеңінен қолдану мәселелері зерттелген. Жұмыста ғылыми-инновациялық салада МЖӘ қолдану ерекшеліктері анықталған, оны қолдану қағидалары белгіленіп, МЖӘ жобаларының қатысушыларын ынталандыратын стимулдары көрсетілген. Одан басқа, дамыған елдердің тәжірибелерін зерттеу негізінде Қазақстандағы ғылыми және инновациялық қызметте МЖӘ тетіктерін қолдану шеңберін кеңейту мақсатында іс-шаралар әзірленген. Инновациялық қызметтегі МЖӘ тетігін дамытудың басым бағыттары Қазақстанның тұрақты дамуы мен жаңғырту іске асырылатын жаһандық экономика ерекшеліктері аясында индустриалдық жаңғырту қажеттіліктері мен міндеттері призмасы арқылы қарастырылған.

Мақалада қалыптастырылған негізгі ұйғарымдар мен ұсыныстар ғылыми және инновациялық қызметті қолдаудың мемлекеттік және аймақтық бағдарламаларын әзірлеу кезінде мемлекеттік органдармен қолданылуы мүмкін. Зерттеу нәтижелері сондай ақ оны ары қарай тереңдете зерттеу үшін негіз бола алады.

Түйін сөздер: мемлекеттік-жеке әріптестік, ғылым, инновациялар, ынталандыру.

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СТИМУЛИРОВАНИЕ РАЗВИТИЯ ГОСУДАРСТВЕННО-ЧАСТНОГО ПАРТНЕРСТВА В СФЕРЕ НАУКИ И ИННОВАЦИЙ

Аннотация. В настоящее время государственно-частное партнерство (ГЧП) признано в Казахстане одним из основных инструментов реализации экономической политики, что отмечается во многих программных документах. Однако уровень использования возможностей ГЧП в сфере науки и инноваций остаётся низким вследствие неналаженности процессов взаимодействия участников ГЧП. В этой связи в данной статье исследуются вопросы расширенного применения ГЧП в научной и инновационной сфере Казахстана. В работе определены особенности применения ГЧП в научно-инновационной сфере, обозначены его принципы, и выделены стимулы заинтересованных сторон от участия в проектах ГЧП. Кроме того, на основе изучения опыта развитых стран, разработаны меры по расширению применения механизмов государственно-частного партнерства в научной и инновационной деятельности в Казахстане. Перспективные направления развития механизма ГЧП в инновационной деятельности рассмотрены через призму потребностей и задач индустриальной модернизации в контексте устойчивого развития Казахстана и особенностей глобальной экономики, в условиях которой будет осуществляться эта модернизация.

Основные выводы и предложения, сформулированные в статье, могут быть применены государственными органами в ходе разработки государственных и региональных программ поддержки научной и инновационной деятельности. Результаты исследования также могут послужить основой для проведения более углубленных исследований.

Ключевые слова: государственно-частное партнёрство, наука, инновации, стимулирование.

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