

INSTRUMENTS FOR GOVERNMENT SUPPORT FOR INNOVATION: INTERNATIONAL EXPERIENCE AND OPTIONS FOR KAZAKHSTAN

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Abstract. The article analyzes the instruments of government support for innovation activities in foreign countries and Kazakhstan. The innovation policy of any country is based on government support. In Kazakhstan, factors such as the insignificant effectiveness of reforms, a low level of innovation in the basic sectors of the economy, and weak positions in international innovation rankings make the issue of revising existing government support instruments very relevant. The article summarizes and analyzes the most common instruments of government support from the point of view of effectiveness. A comparative analysis of international and domestic experience in implementing these tools was carried out. An analysis of international experience in the implementation of government support instruments shows that the active role of the government plays a key role in building an effective state innovation policy. The article identified gaps and attempted to identify problems of low efficiency of existing instruments of government support for innovation in Kazakhstan. Based on the research, have been proposed measures to improve existing instruments of government support for innovation.

Keywords: innovation, innovation policy, instruments of government support for innovation, innovation potential, innovative development.

Аңдатпа. Мақалада шет елдердегі және Қазақстандағы инновация саласындағы мемлекеттік қолдау құралдары талданады. Кез келген елдің инновациялық саясаты мемлекеттік қолдауға негізделген. Қазақстанда жүргізіліп жатқан реформалар тиімділігінің жеткіліксіздігі, экономиканың негізгі салаларындағы инновациялардың төмен деңгейі, халықаралық инновациялық рейтингтердегі әлсіз позициялар сияқты факторлар мемлекеттік қолдаудың қолданыстағы құралдарын қайта қарау мәселесінің өзектілігін арттыра түседі. Бұл шығарылымда мемлекеттік қолдаудың тиімділік тұрғысынан кең таралған шаралары жинақталған және талданған. Халықаралық және отандық тәжірибе бойынша әдіс-тәсілдерді енгізуге салыстырмалы талдау жүргізілді. Мемлекеттік қолдау құралдарын енгізудің халықаралық тәжірибесін талдау тиімді мемлекеттік инновациялық саясатты құруда үкіметтің белсенділігі шешуші рөл атқаратынын көрсетеді. Зерттеу барысында авторлар олқылықтарды анықтап, Қазақстандағы инновацияны мемлекеттік қолдауға қатысты қолданыстағы құралдардың төмен тиімділігі бойынша проблемаларды анықтауға әрекеттенді. Талдау негізінде инновацияны мемлекеттік қолдаудың қолданыстағы құралдарын жетілдіру бойынша шаралар ұсынылды.

Түйін сөздер: инновация, инновациялық саясат, инновацияны мемлекеттік қолдау құралдары, инновациялық әлеует, инновациялық даму.

Аннотация. В статье проведен анализ инструментов государственной поддержки инновационной деятельности в зарубежных странах и Казахстане. Инновационная политика любой страны основывается на государственной поддержке. В Казахстане такие факторы, как незначительная эффективность проводимых реформ, низкий уровень внедрения инноваций в базовые сектора экономики, слабые позиции в международных рейтингах по инновациям делают вопрос пересмотра действующих инструментов государственной поддержки весьма актуальным. В статье обобщены и проанализированы наиболее распространенные меры государственной поддержки с точки зрения эффективности. Проведен сравнительный анализ международного и отечественного

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опыта реализации этих инструментов. Анализ международного опыта в реализации инструментов государственной поддержки показывает, что активная роль государства играет ключевую роль в построении эффективной государственной инновационной политики. В ходе исследования выявлены пробелы и предпринята попытка определить проблемы низкой эффективности действующих инструментов государственной поддержки инновационной деятельности в Казахстане. На основании проведенного анализа предложены меры по совершенствованию действующих инструментов государственной поддержки инноваций.

Ключевые слова: инновация, инновационная политика, инструменты государственной поддержки инноваций, инновационный потенциал, инновационное развитие.

Introduction

According to global practice, the state plays the primary role in shaping the directions and scale of innovation. Government support for innovation drives economic growth, social development, and technological advancements. A well-structured innovation policy strengthens the country's competitiveness in the global economy through research, creative entrepreneurship, and knowledge dissemination. At the same time, the objectives of the innovation support policy are quite diverse.

Regardless of the type of instrument being considered, implementing business support is a complex task that necessitates increasing internal capacity in government agencies as well as improving beneficiary innovation planning. The role of the state, first of all, is in the form of forming a policy that promotes competition, protects intellectual property and eliminates bureaucratic barriers.

Currently, there are more than 100 instruments of government support for innovation in the world, from the "idea" stage to the "scaling" stage. This article discusses the most common instruments of government support for innovation on a global scale, based on OECD studies that confirm the importance of government support for innovation [1].

These days, the following concerns are the main focus of the state's innovation policy implementation:

1. A combination of tax incentives and grant financing for innovations.
2. Establishment of advanced innovation centers, also known as think-tanks, innovation parks, incubators, research hubs, and digital platforms, to form an innovation infrastructure.
3. Provision for preferential lending.
4. Direct financial support in the form of innovation vouchers.
5. Government orders promote innovation.

6. Public-private partnership (PPP) – collaboration between government, academia, and industry to commercialize research.

This article will analyze the international experience of government support for innovation in this context. The study's goal is to systematize international experience in the implementation of state-sponsored innovation instruments and to examine the possibilities for improving Kazakhstan's existing support instruments.

The article addresses the following research questions:

What instruments of government support for innovation exist around the world, and how effective are they?

What approaches can be tailored to Kazakhstan's specific conditions in order to improve the country's innovation policy?

To accomplish this goal, the following tasks will be completed:

- Analyze international experience of government support for innovation.
- Describe current measures of government support for innovation in Kazakhstan.
- Make recommendations for adapting international experience to Kazakhstan's specific conditions.

The study's relevance stems from Kazakhstan's low level of innovative development, as evidenced by its poor international standing. Kazakhstan ranked 81st out of 132 countries on the 2023 Global Innovation Index (GII). Furthermore, the primary sources of funding for research and development (R&D) are the state budget (more than half of R&D funding), enterprise own funds, and foreign investment. Public spending on R&D continues to rise, but the share of R&D costs borne by enterprises' own funds is decreasing. Foreign investment in R&D remains low.

Clearly, the state's efforts to promote innovation are insufficient to propel the country toward an innovative economy. The revision and optimization of state innovation support

measures will enable Kazakhstan to demonstrate its innovative potential.

The issue of analyzing the various instruments of government support used around the world is extremely important and is widely discussed in scientific circles. Thus, Zuniga P. investigates how public policy can foster innovation and create conducive conditions for research activity. Defining innovation as a fundamental driver of long-term productivity and economic growth, he observes that innovative development is influenced not only by government support for innovation, but also by the country's political structure, civic awareness and activity, corruption levels, and social disunity [2]. Hicks D. examines the influence of government institutions on stimulating innovation and their role in the development of new technologies, and demonstrates how effective policy change introduces structural changes into the innovation process [3]. Ding H. investigates how a variety of factors (e.g., R&D investment, human capital, social freedom, democracy, globalization, and national welfare) contribute to high national innovation efficiency. Thus, the author connects innovation to economic growth and the fight against social problem.

Materials and methods

The study compares international experience in government support for innovation to identify the most appropriate instruments in Kazakhstan's context. The authors analyze previous studies to consider theoretical approaches and analyze the effectiveness of certain government support instruments used in various countries. Important elements include the work of OECD experts who identified key issues in the effectiveness of government-supported innovation measures used in different countries. The comparative analysis method is used to compare various government support instruments in different countries and determine their applicability to Kazakhstan.

Furthermore, the statistical analysis method is used, and data on various indicators of government support for innovation in Kazakhstan and other countries are provided. Data from the OECD, the Bureau of National Statistics of the Republic of Kazakhstan, and the authorized body in the field of innovation are used, allowing for an assessment of

Kazakhstan's current innovation environment. Thus, the research methods include an analytical approach with an emphasis on international comparison and analysis of statistical data, which allows the authors to make recommendations for Kazakhstan based on the successful experience of other countries.

Results

The state stimulates innovation activities, which yields excellent results. In all developed countries, the state, through its support instruments, facilitates innovation development. According to global experience, the volume of government support should continue until income from innovation activities exceeds expenses.

There are generally two types of innovation support instruments: direct and indirect. Grants, preferential lending, partial interest rate subsidies, government orders, and so on are examples of direct interventions. Indirect ones include the establishment of conditions for the implementation of innovative ideas, such as tax incentives.

According to OECD experts, **tax incentives** are the primary and most effective measure of government support for innovation globally. According to the OECD Database, the share of tax incentives in total government support for innovation has increased in the member countries from 36% in 2006 to 56% in 2018, while in the EU countries this figure has doubled from 26% to 57%, respectively [5]. This is due to the requirements of the World Trade Organization Rules, which do not welcome direct government support for specific organizations or industries.

The effectiveness of tax incentives was studied within the framework of the OECD microBeRD Project. The main policy findings of the microBeRD project include the following:

- the impact of tax incentives on experimental research is approximately twice as large as that on fundamental and applied research;
- R&D tax incentives increase not only expenditure but also the level of human resources. In addition, tax incentives stimulate additional commercial R&D both because existing R&D performers increase their R&D expenditures (intensive margin) and because additional firms begin to conduct R&D (extensive margin);

– heterogeneity of business response: the additional contribution of R&D tax incentives is larger for small (1.4 units) and medium (1 unit) firms compared to large companies (0.4 units). This reflects the fact that smaller firms, on average, conduct less R&D than larger firms, while introducing economic resources. A small additional contribution of input resources (0.3 units) is also characteristic of firms engaged in industries with high R&D intensity (pharmaceuticals, computer manufacturing, scientific research);

– policy mix: the analysis shows the same level of additional costs for direct R&D funding measures (1.4 units) compared to tax incentives, which indicates the need for complementarity between direct and indirect support measures. Over the past decade, expenditure-based R&D tax incentives have become the main instrument for supporting R&D in many OECD countries. More precisely, 55% of all public support for R&D in OECD countries was provided through tax incentives.

For example, most OECD countries provide R&D tax breaks, with Spain and France providing the most generous subsidies. Brazil, India, South Africa, and China all offer attractive R&D tax incentives. Singapore stands out for nanotechnology, while Ireland, Belgium, Canada, and the United States are leaders in biotechnology. Some countries provide incentives for incremental investment (above a required baseline) in R&D, while others consider all investments. Tax breaks are also popular for attracting new investment into innovative or knowledge-intensive businesses.

In China, for example, the first year of income is completely tax-free (two to five years), followed by a 50% rate (three to five years). In India, the exemption is valid for ten years after the start of production in a specific zone for software, hardware, or export-oriented production. In Israel, exemptions are provided for seven years from the first income and up to ten years in a special economic zone. China, Malaysia and Singapore offer direct incentives for venture capital companies. In China, venture investors in high-tech projects can offset 70% of their investments against future income. Investors in Malaysia who finance start-ups have an exemption from certain income through deductions for 10 years. The company's investment losses can be offset against other taxable income in Singapore [7]. Furthermore, the primary indirect taxes worldwide are value added tax (VAT) and customs and excise duties. There are numerous taxes levied at almost every stage of product production (goods or services), which can increase or decrease the country's attractiveness. Their application may include the use of free trade zones, the reduction of VAT rates on consumer transactions, and the simplification of compliance with requirements for non-resident organizations.

Table 1 shows examples of countries from various sources that have implemented mechanisms to provide tax incentives to entities engaged in innovation activities and enterprises conducting research and development

Table 1. Examples of tax incentives around the world

Tax incentives	Countries
Super deduction for R&D expenses (including 150%)	China, India, Malaysia, Singapore, UK
R&D tax credits	Ireland, Japan, Korea, UK, USA
Accelerated depreciation for R&D investments	China, Finland, Germany, Singapore, UK
Deduction of capital expenditures used for R&D	Finland, Germany, India, Ireland, Malaysia, Singapore, UK
Reducing the social tax on R&D personnel	China, Netherlands
Tax breaks for income related to R&D.	China, Ireland, Israel, Korea, Malaysia, Netherlands, Singapore
Special tax incentives for R&D companies.	Israel, Malaysia, Singapore
Reduction of property tax for property used in research and development	India
Tax breaks tailored to geographic location, industry, size, and other factors.	Finland, Germany, India, Israel, Japan, Korea, Malaysia, Singapore, UK
Subfederal tax incentives	China, India, Israel, Korea, USA
Investment tax credit for investments in "high-tech" hardware and/or software	China, India, Japan, Korea, Singapore

Customs incentives	China, India, Malaysia, USA
Tax breaks for businesses	China, India, Israel, Korea, Malaysia, Singapore
Special economic zones	China, Germany, India, Japan, Korea, Malaysia, UK

Note: Compiled based on [8]

Thus, government incentives for new innovative companies encourage existing market participants to compete by modernizing and innovating. As a result, tax breaks are advantageous to both new and established businesses. Existing players may have little incentive to innovate if they know the government will bail them out to keep jobs. At the same time, forms of support for start-ups are frequently less relevant (available) for established businesses. They may also require government assistance, such as funding to cover the costs of acquiring and protecting intellectual property. Obviously, existing companies are more frequently confronted with the challenge of modernizing production. As a result, they will respond more positively to investment tax breaks for equipment purchases and information technology implementation. Furthermore, because multinational enterprises spend a significant amount on R&D, many countries can use tax breaks to encourage them. For example, in Ireland, Belgium, and Israel, foreign company branches accounted for more than 60% of total business R&D. Global R&D corporations and their subsidiaries own a significant number of patents, including in the field of ICT. Several OECD and BRICS countries allow for increased depreciation, which allows for more than 100% reimbursement of R&D costs. This lowers the cost of investment and the effective tax rate on income, resulting in an interest-free loan from the government to the taxpayer.

In Kazakhstan, until today, the Tax Code provided only one norm for stimulating innovation. According to Article 254 of the Tax Code, R&D expenses, except for capital expenses, and expenses on the acquisition of exclusive rights to intellectual property for their further commercialization, are deductible. However, these rules have not had a significant impact on the growth of innovation activity. In addition, from January 2025, a package of amendments will come into force on the deduction of expenses for the creation of scientific centers at research universities and corporate income tax benefits. The right to reduce taxable income by 50% of the amount of

deductions for R&D and the acquisition of intellectual property rights for the commercialization of R&D results will be granted [9]. The next most common and effective measure of government support is the **Centers of Excellence (Growth Centers)**. The main goal of the Growth Centers is to unite the potential of science and business to reveal their commercial opportunities and stimulate the implementation and creation of innovations. In many countries, a network of specialized organizations is being created that perform the functions of industry Growth Centers. For example, in the UK, 10 such centers are successfully operating, in Australia and Finland - 6 Centers, and in Sweden - 19. These Centers are created in a specific priority industry for the country and their main task is the innovative development of this industry, including productivity growth, export development and entry into value chains.

For example, in Australia, the Centers are created by industry: cybersecurity, medical technology and pharmaceuticals, energy resources, advanced technologies, agro-industry, mining technologies. And from 2017 to 2021, the government, represented by the Department of Industry, Innovation and Science, invested 238 million dollars in these 6 industry growth centers. These centers also help Australian industry implement local research and development, as well as align policies and programs in the field of industry and innovation. In Sweden, the Ministry of Enterprise and Innovation and the Swedish Agency for Innovation Systems (VINNOVA) have created 19 Centers in such areas as anti-diabetic food, bionanocomposites, biomaterials, bicycles of the future, ICT, wireless communications, technologies for education and healthcare, industrial materials engineering, smart use of packaging and paper, mobile life, innovative logistics, protein technologies, wireless sensor networks, etc. The main result, in addition to the creation of centers, is the emergence of new spin-off companies, patents, publications, and technology transfer to production. In the UK, the Catapult Centers aim to unite enterprises and

the scientific community to jointly solve key problems in industries and create new products and services. Their task is to help the best "academic" ideas be realized and embodied in a commercial product. These centers have been created in the following areas: high-tech manufacturing, satellite programs/technologies, cell and gene therapy, digitalization, renewable energy sources, energy systems, applied semiconductor applications, medicines, cities of the future, transport systems and an economy based on digital technologies. The UK government has determined that these areas are strategic for the country. The centers have two permanent sources of funding: public investment and commercialization of their projects. According to information available in open sources, the amount of public and private investment to date has amounted to more than 2 billion pounds sterling.

In Finland, 6 Science, Technology and Innovation Centers (SHOK) have been created in such areas as energy and the environment, bioeconomics, mechanical engineering, construction, healthcare and well-being, infocommunications. They position themselves as a platform for interaction between industry and advanced research. The main goal of these centers is the innovative development of industry clusters and the creation of radical innovations. The centers have test and experimental sites for testing.

In Norway, the SFF Norwegian Center's of Excellence scheme is a funding instrument of the Research Council of Norway (RCN) established in 2000 to enhance the quality of Norwegian research [10]. The research conducted in the centres must be innovative and have high potential to produce groundbreaking results that will expand the boundaries of international research. SFF centers can receive support for a total of ten years (an initial period of six years with the possibility of a four-year extension) [11]. Currently operating are: Birkeland Centre for Space Science, Centre for Arctic Gas Hydrates, Environment and Climate, Centre for Autonomous Marine Operations and Systems, Centre for Biodiversity Dynamics, Centre for Multilingualism in Society across the Life Course, Centre for the Study of the Legitimate Role of the Judiciary in Global Order, Norwegian Centre for Mental Disorders Research, Centre for Interventional Research

in Maternal and Child Health, Centre for Evolution and Earth Dynamics, Centre for Cancer Biomarkers, Centre for Molecular Inflammation Research, and the Frederick Institute for Systems Neuroscience. Kavli, Center for Environmental Radioactivity. The centers have provided new knowledge, created important innovations for Norwegian and global industry, the public sector and, in general, increased the international reputation and authority of Norwegian science. Kazakhstan is also on the way to implementing this idea of creating similar centers. Considerable work has been done to legislatively enshrine the norms for the formation of Industry Technological Competence Centers (ITCC) in the Entrepreneurial Code of the Republic of Kazakhstan, defining their tasks and sources of funding. Moreover, at the Council on Technology Policy under the Prime Minister of the Republic of Kazakhstan in 2023, 8 ITCs were approved in the oil and gas industry, in the areas of the electronics industry, the agro-industrial complex, electric power, nuclear energy and technology, healthcare, in the field of green and in the direction of Industry 4.0. However, it should be noted that these ITCs are not provided with funding and do not fully implement their functionality provided for in the legislation.

The next measure of government support for innovation, which has become widespread in the world, is the **instruments of lending and project guarantees**.

A striking example is the Small Business Administration (SBA) in the United States, which provides businesses with government guarantees for loans of up to 90%. This is an excellent incentive for start-up businesses to implement innovative solutions.

The UK also has the Loan Guarantee Scheme, which provides guarantees to banks when financing start-up businesses. The state guarantees from 70% to 85% depending on the region.

Germany also has a program of government investment allowances/subsidies, as well as preferential lending for small and medium-sized businesses. In addition, assistance is provided with initial capital to businesses in the event of their investments in the modernization and expansion or transformation of production.

Instruments for subsidizing interest rates on loans and guaranteeing loans have

also been actively developed in Japan. The Small Business Corporation, created with the participation of the Japanese government, provides government guarantees for loans as part of its activities, and, if necessary, attracts private credit institutions. Along with the Corporation, credit guarantees for small businesses are also provided by associations - public organizations that operate on a commercial basis, there are about 50 of them. The activities of these associations are carried out in a similar way to insurance funds, for the issued guarantee from small businesses a contribution of 1% of the loan amount is due, additional membership fees are provided. The Association guarantees up to 80% of the loan in case of its insolvency. These associations have had a huge positive effect in increasing the innovative activity of entrepreneurs. Small businesses have the opportunity to get loans even without collateral. The business lending tool is also well developed in France. Such companies as the National Credit Guarantee Fund, the Regional Development Society, the Institute for Industrial Development, the Innovation Financing Company, which issue loans for specific purposes as part of their activities, operate successfully. In addition, there is a special Bank for the Development of Small and Medium-Sized Enterprises, which was created using the mechanism of public-private partnership, and financial organizations are also among the shareholders. The bank provides small and medium-sized businesses with interest-free loans, and in some cases subsidies of up to 30 thousand francs.

In Italy, in order to reduce the debt burden during the formation period, loans are given for up to 15 years when creating a company, and for 10 years when modernizing or expanding existing companies. In addition, young entrepreneurs are given special benefits subject to periodic audits.

In South Korea, such business support tools as lending and interest rate subsidies are implemented through the Fund for Structural Changes in Small and Medium-Sized Enterprises, the Industrial Development Fund, the Social Support Fund, the Civil Investment Fund and other funds. In addition, preferential conditions are provided for companies in the event of equipment upgrades.

In Israel, the Small Business Support Fund operates successfully, which directly

provides preferential loans to small businesses, also issues a state guarantee of up to 40% of the loan amount to entrepreneurs and additionally makes payments of up to 75% of the costs of business support of projects. The condition for preferential lending is that the enterprise contributes at least 25% of its own funds from the loan amount. It is interesting that when financing an export-oriented business, funds are also provided for marketing research and an advertising campaign. Also in Israel, a system has been built for providing state guarantees to private banks for their risks when lending to small businesses. In the Czech Republic, the Czech-Moravian Bank for Guarantees and Development has also been operating since 1992, which guarantees up to 70% of the loan amount for small and medium-sized businesses and subsidizes interest rates on existing loans. Thus, as world practice shows, the above-described measures of lending and guaranteeing loans for enterprises with the highest level of risk, that is, those starting or implementing innovative solutions, are an excellent incentive for development.

There are no instruments for lending to innovative activities in Kazakhstan. There are separate lending mechanisms within the framework of the programs for the development of the agro-industrial complex and through the NCE "Atameken" and Damu. However, these measures do not apply exclusively to innovative products and solutions; these are measures to support entrepreneurship, not necessarily innovative. Moreover, beginning entrepreneurs who would like to implement innovative solutions face the problem of providing collateral when lending in second-tier banks, which is their mandatory requirement. These facts have a negative impact on the innovative activity of businesses.

The next common instrument of government support is **innovation vouchers**.

Strategic planning of innovative development of small and medium-sized businesses based on the use of an innovation voucher guarantees the targeted spending of funds. As an example, we will give the scheme for issuing an innovation voucher in Denmark. The voucher is issued for a specific study. At the same time, network cooperation with technology and innovation centers is encouraged when conducting research and

development. Projects are financed within 2 million euros, subject to co-financing from businesses up to 50%, and from a scientific organization up to 25%. The research institute is responsible for preparing the study, and the Danish Agency for Science, Technology and Innovation is responsible for the assessment and final decision on the application. Organizations participating in the project must provide an annual financial report on expenses. It should be noted that vouchers are allocated mainly for projects to develop new products or processes in SMEs.

According to the OECD, the most innovatively developed country in the post-Soviet space is Estonia. In Estonia, the innovation voucher tool, co-financed by the European Regional Development Fund, has become widespread. Vouchers are mainly allocated for the modernization of production and the creation and implementation of new products. The program for the provision of innovation vouchers aimed at the modernization of production is aimed at technology transfer, protection of intellectual property, and expansion of cooperation between business and the scientific community. The funds allocated under the innovation voucher can be used for the development of design solutions, feasibility studies and feasibility studies, testing, patent analysis, patent registration, etc. The voucher is provided for an amount of up to 4,000 euros, but not more than 80% of the project costs, 20% must be contributed by the company itself. The duration of the project should not exceed 18 months [12].

In Bulgaria, the project "Financial scheme for supporting knowledge transfer in enterprises - voucher system" is being implemented, for which the Government has approved additional expenses. The project provides financial resources to small and medium-sized businesses for the implementation of innovative solutions and technologies [13]. In the UK, the Innovate UK Technology Strategy Board fund issues innovation vouchers for the use of external expert services [14]. The main types of expert activities subject to payment by voucher are the development of approaches to improving a product, process, service, design, as well as business management systems and intellectual property. Universities, research organizations, consulting centers can act as

experts. In Kazakhstan, there is no tool for providing an innovation voucher. Only within the framework of the Tech Orda program, launched by the Ministry of Digital Development, Innovation and Aerospace Industry of the Republic of Kazakhstan and the international technopark of IT startups Astana Hub, vouchers are allocated to private IT schools for the training of Kazakhstani specialists [15]. The next effective instrument of government support for innovation is grant funding. To ensure government support for innovation in most countries, grant funding and subsidies, which cover a significant portion of project costs, have become the most widespread. For example, one of the largest funding programs in the world is provided by the European Commission within the framework of its Framework Programs for Research and Technological Development [16]. The principle of funding projects in the framework program is co-financing. The standard reimbursement rate is 50%, while it can reach 75% for non-profit government agencies, SMEs, research organizations or universities. For advanced research, the reimbursement rate can even be 100%. Funding is provided through competitions for universities, research institutes, companies and researchers from EU member states, as well as associated and candidate countries.

Enterprise Ireland's Research, Development and Innovation (RD&I) Fund provides R&D and proof-of-concept grants of 45% (small), 35% (medium) and 25% (large) to companies with no maximum limit, and up to 50% for digital process innovation projects of €150,000 [17]. In the UK, the main source of available innovation grants is Innovate UK, which supports funding of up to £1 billion per year to address four key industry challenges: clean growth, future mobility, artificial intelligence and healthcare [18]. Financial grants are provided to support and encourage businesses to undertake research and development, including testing innovative ideas. The main requirement for most UK grants is that the project must be completed in the UK. To solve these problems, various competitions are held, for example: Innovation UK – Biomedical Catalyst with a funding share of 25 million pounds sterling per project, NHS Future Hospital initiatives with a funding share of 50-80%, ESA Business Applications - with a funding share of 50-80% and in the amount of

500 thousand pounds sterling and others. In addition, it is possible to note the grants of the Small Business Research Initiative (SBI) are contractual grants from the government with a 100% funding rate.

In Germany, the costs of setting up an investment facility can be significantly reduced by financial incentives provided in the form of grants under certain conditions [19]. The program "Joint Task for Improving Regional Economic Structures" (Gemeinschafts Aufgabe - GRW) is supervised by the Federal Ministry for Economic Affairs and Climate Action. The actual number of incentives provided varies from region to region depending on the economic indicators. For example, subsidies of up to 25 to 45% are offered for small companies, 10-35% for medium-sized companies, and from €200,000 to 25% for large companies. Another central innovation program for SMEs (ZIM - "Zentrales Innovationsprogramm Mittelstand") in Germany stimulates market-oriented technological research and development in German SMEs. Within the framework of the ZIM, companies and research institutes can receive grants for ambitious projects without any restrictions on the field of technology application. The key criterion is the innovativeness of the project and the level of demand for its results [20]. Singapore's enterprise development agency Spring implements the Start Up SG program to provide financial support to startups [21]. Thus, for breakthrough technologies, a grant of up to \$250,000 is allocated to confirm the project's concept and up to \$500,000 to confirm its viability. The following requirements are set: registration in Singapore for less than 5 years, implementation in Singapore, at least 30% local participation, annual revenue of less than \$100 million or a company with fewer than 200 employees. Another program, Start Up SG Founder, is designed for new innovative businesses, which are provided up to \$30,000 with 30% co-financing from the startup. The program also provides mentoring and business guidance from Singaporean incubators through an accredited partner. This program is for Singapore citizens and permanent residents who must adhere to the following conditions: plans to own at least 30% of the shares of the new company, devote reasonable time to the business and make key decisions in the company, no funding from other government organizations. Australia's national science

agency, CSIRO, offers a range of grant programs for small and medium-sized businesses [22]. In particular, the Innovation Connections program supports businesses in R&D projects with leading researchers from Australian universities with grants of up to \$50,000, STEM+Business sends young STEM researchers to businesses to conduct a research project with grant support of up to \$115,000 per year, and the CSIRO Kick-Start program connects startups and small businesses with CSIRO's research expertise and capabilities to conduct research with grants of up to \$50,000. Malaysia's leading agency for digital transformation launched the Global Technology Grant in 2021, which aims to support Malaysian technology companies to enter the global arena by enhancing their capabilities to innovate, develop and commercialise products and services. The grant is open to local and foreign technology companies registered in Malaysia [23]. The grant offers two types of incentives: 1) for technology companies (to help local technology companies scale up), 2) for technology accelerators (aims foreign technology companies to set up centres of excellence focused on marketing innovative products and services for the global market). The first type of grant covers up to 50 per cent of the total project cost or up to RM2 million, and up to 30 per cent of the total project cost or up to RM2 million for foreign companies. The second type of grant covers up to 30 per cent of the project cost or up to RM2 million.

The Global Innovation and Technology Alliance (GITA) of India, established on the recommendation of the Prime Minister's Council on Trade and Industry in 2010, offers up to 50% of R&D expenditure to develop new technologies/products in partnership with industries from Canada, Israel, Korea, Italy, Spain, Sweden [24]. GITA is a "not-for-profit" public-private partnership jointly promoted by the Technology Development Council, the Department of Science and Technology, Government of India, and the Confederation of Indian Industry to professionally manage public funds to provide flexibility to industries to undertake R&D with global partners. In Canada, the CanExport Innovation program offers innovation grants to domestic companies as they enter international markets and work with foreign organizations to develop partnership agreements [25]. CanExport

Innovation does not cover the R&D costs themselves, but supports the conclusion of agreements. Companies can receive up to 75% of eligible travel, accommodation, meetings and translation expenses up to a maximum of \$75,000 in Canadian Government Innovation Grants.

In Kazakhstan, grant funding is the most common tool for supporting both R&D and the implementation of innovative solutions and technologies. Thus, the Science Committee provides program-targeted and grant funding. The Science Fund provides grants for the commercialization of scientific and technical activity results. QazInnovations JSC provides three types of grants for the commercialization of technologies, technological development of enterprises and industries. According to the Science Fund, following the results of the competition for grant funding for 2023-2025, 72 grant agreements were concluded for the commercialization of scientific and (or) scientific and technical activity results. The approved grant amount for the entire implementation period (2023-2025) is 21.4 billion tenge. The volume of co-financing for the entire implementation period (2023-2025) is 7.5 billion tenge [26]. From 2011 to 2021, QazInnovation JSC concluded 324 agreements on the provision of innovation grants for a total of more than 13.3 billion tenge. In the context of considering the instruments of government support for innovation, the authors also propose to consider public procurement. Since public procurement is an important part of economic activity, and in most countries it accounts for an average of 10-15 percent of the gross domestic product (GDP) [28]. Public procurement can become a key means of activating innovation activities that develop the potential to stimulate new technologies to achieve socio-economic goals.

For example, the Build in Canada innovation program helps innovators bridge the "pre-commercial gap" in government testing and trial contract competitions. In Ireland, the Small Business Innovation Study has the status of a national innovative pre-commercial procurement initiative. Government procurement is actively used to stimulate demand for innovation in developed countries [29]. In the United States, government procurement is developing areas such as large passenger aircraft, semiconductors, and the Internet. In France, the development of nuclear

energy and technologies in the construction of the railway industry is stimulated. In Germany, in accordance with a special Agreement, a number of ministries purchase innovative products in traditional areas and are required to publish long-term procurement plans. In Russia, priority is given to innovative products, and a quota of less than 10% of the total procurement volume is set. In Croatia, the procurement requirement is linked to environmental innovation, while the UK has a procurement program with advance commitments, under which government agencies undertake to purchase unproduced products or services at a certain time in the future. The historical experience of South Korea is also interesting, when in 1982 the government introduced a policy of public procurement of personal computers for public schools to promote the development of a new computer industry, and later for public administrative services. As part of these programs, the government introduced technical specifications and local content requirements. In general, governments of developed countries have recently focused on a number of demand-side innovation policies - from public procurement of innovations to standards that stimulate innovation. At the same time, in addition to the implementation of these mechanisms, an important component is training for government agencies on their practical application. The Law of the Republic of Kazakhstan "On Public Procurement" (clause 2, Article 5 of the Republic of Kazakhstan) also provides for a norm that customers, when planning and implementing public procurement, must proceed from the priority of acquiring innovative and high-tech goods and services [30]. However, the procedure for determining these goods and services is not provided for by law, and the procurement system and the process of selecting suppliers do not sufficiently stimulate their development.

Discussion and Conclusion

Thus, comparing the instruments of government support for innovations in Kazakhstan to international experience in implementing similar instruments leads us to the conclusion that the country has the main elements of government support for innovation activities, which include certain tax incentives, created infrastructure, and financial support measures. Despite legislative regulation of

most measures, these standards remain inoperative. In this regard, the authors see the need to strengthen monitoring of legislative norm implementation, raise the status of innovation policy, and strengthen innovators' active civic roles. The instruments of government support for innovation activities currently in place in Kazakhstan are distinguished by a formal approach, a disregard for cause-and-effect relationships,

and an inconsistency between the instruments' objectives and the country's strategic goals. All of these factors point to the need for improved measures, a more flexible mechanism for planning, and an evaluation of the effectiveness of government support for innovation. In this regard, Kazakhstan accepts the following approaches to government support for innovation.

Table 2. Possibilities for applying best practices in Kazakhstan

Tax incentives	<ul style="list-style-type: none"> - standard tax preferences, including low corporate tax rates instead of incentives for certain types of targeted investments - predictability of the tax regime - tax platform
Centers of excellence	<ul style="list-style-type: none"> - Growth centers/ Competence centers/ Centers of excellence - financing instruments – programs to support research institutes, universities, startups, enterprises; consortia - balanced ecosystem
Innovation vouchers	<ul style="list-style-type: none"> - to conduct research - to modernize production - to create and implement new products - at the same time, network cooperation with technology and innovation centers
Grant programs	Evaluation of the effectiveness of programs in terms of their contribution to the economy, assistance in strengthening interaction between business and science, development of innovative infrastructure, establishment of international partnerships and promotion of exports
Government procurement	Offtake contract mechanism for companies to plan production activities with a focus on implementing innovations and improving employee competencies

Note: compiled by the author

In terms of tax incentives for innovators, the authors conclude that the country's tax legislation should be thoroughly reviewed with the goal of stimulating innovative activity. In this regard, OECD analysts believe that enterprises prefer standard tax preferences, such as low corporate tax rates, over incentives for specific types of targeted investments. Corporations value predictability in their tax regimes. Fiscal incentives for innovation should be considered as part of a comprehensive innovation strategy and investment climate. It is important to understand that tax incentives lower the costs of innovation, which stimulates its stimulation. Countries that have been successful in encouraging innovation develop a tax platform that includes a number of elements for corporations: low taxes (via tax breaks, a general low tax rate, or industry-specific low tax rates); an R&D tax regime; an innovation system tax regime; and a holding company regime. Furthermore, these countries focus on investor taxation, such as eliminating double

taxation. A formal implementation strategy for Centers of Excellence has also been identified. It is considered necessary to review the implementation paths taking into account the following systematized features:

- Growth Centers/Competence Centers/Excellence Centers created in the world are of an industry nature;
- financing instruments are clearly regulated and interconnected with programs to support research institutes, universities, startups, enterprises and, in some cases, their consortiums;
- the main tasks of the Centers are to consolidate efforts, including through the creation of an ecosystem of breakthrough innovations, conducting advanced research, assisting in the commercialization of developments, testing technology, improving knowledge and competencies, ensuring access to global supply chains, eliminating barriers and obstacles.

Given the demonstrated effectiveness of project lending and guaranteeing

instruments, as well as the provision of innovation vouchers, Kazakhstan should consider introducing them as state innovation support instruments.

In terms of grant programs, it appears appropriate to conduct an audit of the various types of grants available in Kazakhstan in order to assess their effectiveness and contribution to the economy. As international experience shows, grant programs are widely used to address a variety of barriers and problems. They can aim, for example, at lowering costs in order to stimulate innovation, promoting stronger interaction between business and science, developing innovation infrastructure, forming international partnerships, and promoting exports. In this regard, it is proposed to consider the possibility of introducing grant programs that are currently

unavailable in Kazakhstan, based on their proven high efficiency in international practice.

In terms of public procurement, it appears appropriate to universally implement the offtake contract mechanism, which will allow businesses to plan production activities and direct investments toward innovation implementation and employee competency improvement.

Finally, we note that in order to advance to a new level of technological development, Kazakhstan will need to significantly reform its current policy, not only in the area of innovative development, but also in all basic sectors of the economy. Since innovations are cross-sectoral, innovation policy cannot be considered in isolation from other policies.

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ИННОВАЦИЯЛАРДЫ МЕМЛЕКЕТТІК ҚОЛДАУ ҚҰРАЛДАРЫ: ХАЛЫҚАРАЛЫҚ ТӘЖІРИБЕ МЕН ҚАЗАҚСТАН ҮШІН МҮМКІНДІКТЕР

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ИНСТРУМЕНТЫ ГОСУДАРСТВЕННОЙ ПОДДЕРЖКИ ИННОВАЦИЙ: МЕЖДУНАРОДНЫЙ ОПЫТ И ВОЗМОЖНОСТИ ДЛЯ КАЗАХСТАНА

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