

THE STATE REGULATION OF INNOVATION ACTIVITY AT THE PRESENT STAGE

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The article discusses the necessity of state regulation in the field of development of innovations and technologies at the present stage. The main directions of the state innovation policies in developed countries of the world are studied and analyzed. Special attention is paid to the objectives of the national strategy for development of science and innovations and to searching the ways for fulfilling this strategy. Apart from these specific problems, the work considers the issue of the state regulation and support of further introduction of innovations and increase of the so called "entrepreneurial" role of the state.

Keywords: innovations, state regulation, technological policy, innovation strategy, innovative product, innovation activity, innovation policy, technological leaders, innovation infrastructure.

Fig.: 2. **Tbl.:** 1. **Bibl.:** 17.

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Кокіаурі Л., Гечбаія Б. Державне регулювання інноваційної діяльності на сучасному етапі

Розглянуто роль і значення державного регулювання інновацій і технологій на сучасному етапі. Вивчено та проаналізовано основні напрямки державної інноваційної політики в розвинених країнах світу. Особливу увагу приділено меті національної стратегії розвитку науки та інновації, а також пошуку шляхів здійснення цієї стратегії. Крім цих проблем, у роботі червоною лінією проходять питання обґрунтування державного регулювання і сприяння подальшого впровадження інновацій, та підвищення так званої «підприємницької» ролі держави.

Ключові слова: інновації, державне регулювання, технологічна політика, інноваційний продукт, інноваційна політика, технологічні лідери, інноваційна інфраструктура.

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Кокіаурі Л., Гечбаія Б. Государственное регулирование инновационной деятельности на современном этапе

Рассмотрены роль и значение государственного регулирования инноваций и технологий на современном этапе. Изучены и проанализированы основные направления государственной инновационной политики в развитых странах мира. Особое внимание уделено цели национальной стратегии развития науки и инновации, а также поиску путей осуществления этой стратегии. Кроме этих проблем, в работе красной линией проходят вопросы обоснования государственного регулирования и способствования последующему внедрению инноваций, и повышения так называемой «предпринимательской» роли государства.

Ключевые слова: инновации, государственное регулирование, технологическая политика, инновационный продукт, инновационная политика, технологические лидеры, инновационная инфраструктура.

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Introduction. Innovation economy is the imperative of economic policies for the world's leading countries. In the 21st century it is impossible to solve the tasks of national safety and dynamic development without creating an innovation system that is competitive on a global scale. The competitiveness of the country itself is defined by the rates of introduction of new scientific and technological solutions, and development of scientific and technological

potential of enterprises, relative effectiveness of innovation processes.

The main task of the modern socio-economic development of the country is the identifying of its own path to innovation, maximum usage of principally new factors of economic growth that is characteristic for post-industrial information age. This task is very important for modern Georgia, where the necessity of transition to the innovation type of economic de-

velopment requires intensification of innovation activity. First of all, it concerns economic subjects, appropriate scientific and technical assistance at the enterprise level, favorable investment environment, etc.

To support innovation development, it is necessary to activate the state regulation of innovation activity, because only the state can ensure an effective development of innovations, science and technologies. Thus, the issues presented in our article are very urgent and require immediate efforts on their solution.

The aim of the article. In the domestic and foreign literature one can find the definition of the notion of innovation, their introduction, effectiveness, evaluation, and the description of methods of their analysis, influence on production, as well as a wide range of research results in the sphere of improving management of measures to promote technological innovations. We studied monographs and scientific works by L. Chikava (2006), Yu. Yakovets (2004), B.-A. Lundvall (1992), A. Eroshkin (2011), M. Mazukato (2016), H. Uzawa (1964), C. Freeman (1992), O. Golichenko (2011), and others. But, in our opinion, we have less information about the state regulation of investment activity, its necessity, role and importance at the present stage. **The aim of our article** is to study the above mentioned problem. Besides, we paid attention to solving the following tasks:

- creating a favorable innovation climate by state;
- encouraging the commercialization of the scientific and innovation activities;
- creating an infrastructure for carrying out innovation activity that meets the requirements of the 21st century;
- forming intellectual capital and labor force that can ensure the continuous development of a knowledge-based economy.

In the article we have studied the main functions of the state in regulation of innovation activity.

Presentation of basic material of the research. The present stage of economic development is characterized by the strengthening of competition between countries in the global market based on the competitive priorities. The leader in the 20th century will be displaced due to development of an economic system of a qualitatively new technological level, where intellectual resources will play a definitive role.

The innovative type of development of the country today allows ensuring a serious competitive priority. For example, in high-tech domains, such as the aviation and aerospace industries, the share of the USA under modern conditions is 40 %; the share of Japan – 20 %, while the shares of Great Britain and Germany accounts for 9 and 7 %, respectively.

Share of USA in the field of telecommunications and navigation systems at the global market is 20 %; share of Japan – 17 %, Germany – 7 % and Great Britain – 6 %. The share of the USA in the field of scientific instrument engineering makes up 27.5 %, that of Japan – 17.5 %, Germany – 14 % and Great Britain – 6 % [1, p. 376].

The leaders of the modern market – the USA and Japan, were able to progress to the current stage through state regulation of their innovative activities. For example, at the end of the 20th century, the USA moved to the foreground the doctrine of

techno-globalism, the purpose of which was to provide global technological competitiveness of the USA under conditions of the global competition.

The new technological policy of the USA – technologies for economic growth of the USA – is a new course aimed at building its economic strength that includes five principle tasks:

- creating a favorable climate for activities of the private sector in the field of innovations and increasing the competitiveness level;
- encouraging the elaboration and commercialization of the latest technologies;
- creating an infrastructure that meets the requirements of the 21st century, which is necessary for the promotion of the US industrial and trade development;
- integrating the military and civil industries, which provides effective solution of the tasks faced by them;
- forming labor force that can ensure the continuous development of a knowledge-based economy.

Today the state, and not companies or separate inventors, is the initiator of making a basis for scientific and technological progress and represents its main driving force facilitating leadership of the country in the economy.

The high level of innovation activity of the economy is the outcome of the activity of the state in the market for scientific and technical products, determining the national priorities and actively influencing the process of innovation development through the systems of levers and methods (Fig. 1).

If a linear model of innovation development was dominating in the 20th century (fundamental and applied studies, experimental construction works, manufacturing activities, entering the market and production of innovations by companies), in the 21st century, there appeared the concept of the National Innovation System (NIS), which conditions profitability of economic activities of the country. The National Innovative System is the totality of subjects and institutions activities of which are directed towards implementation of innovation activities in the state sector.

The concept of the National Innovative System was developed almost simultaneously by a large group of authors in 1980s. The leaders in this direction were B.-A. Lundvall [7] (Professor of Uppsala University, Sweden), C. Freeman [4] (the Centre of Scientific Policies under Sussex University, Great Britain), R. Nelson [16] (Professor of Columbia University, USA) and others. The first systematic presentation of this concept is attributed to the time of publication of the collective monograph «Technical change and economic theory» in 1988. This concept served as the basis for serious researches in this direction.

The founders of the concept used a common idea of the National Innovative System as the process and outcome of integration of organizations having various purposes and objectives associated with production of scientific knowledge and technologies, as well as structures of the national economy engaged in commercial realization (large and small companies, universities, scientific institutes). They provide a complex of

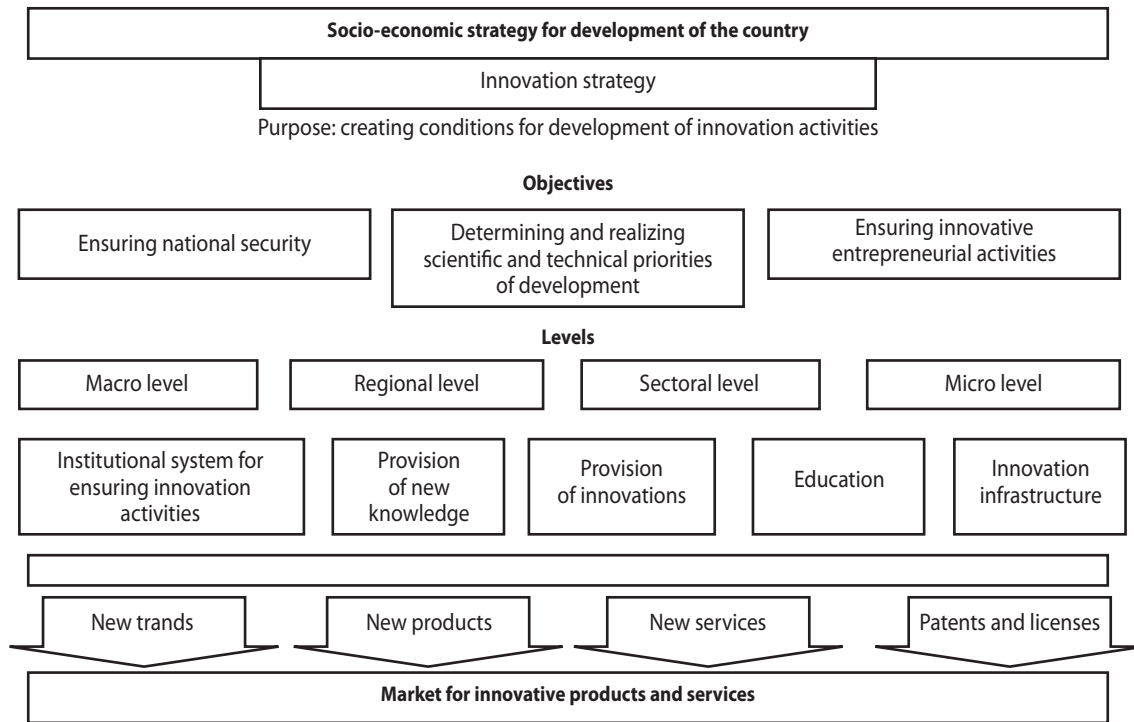


Fig. 1. State regulation of innovation activities

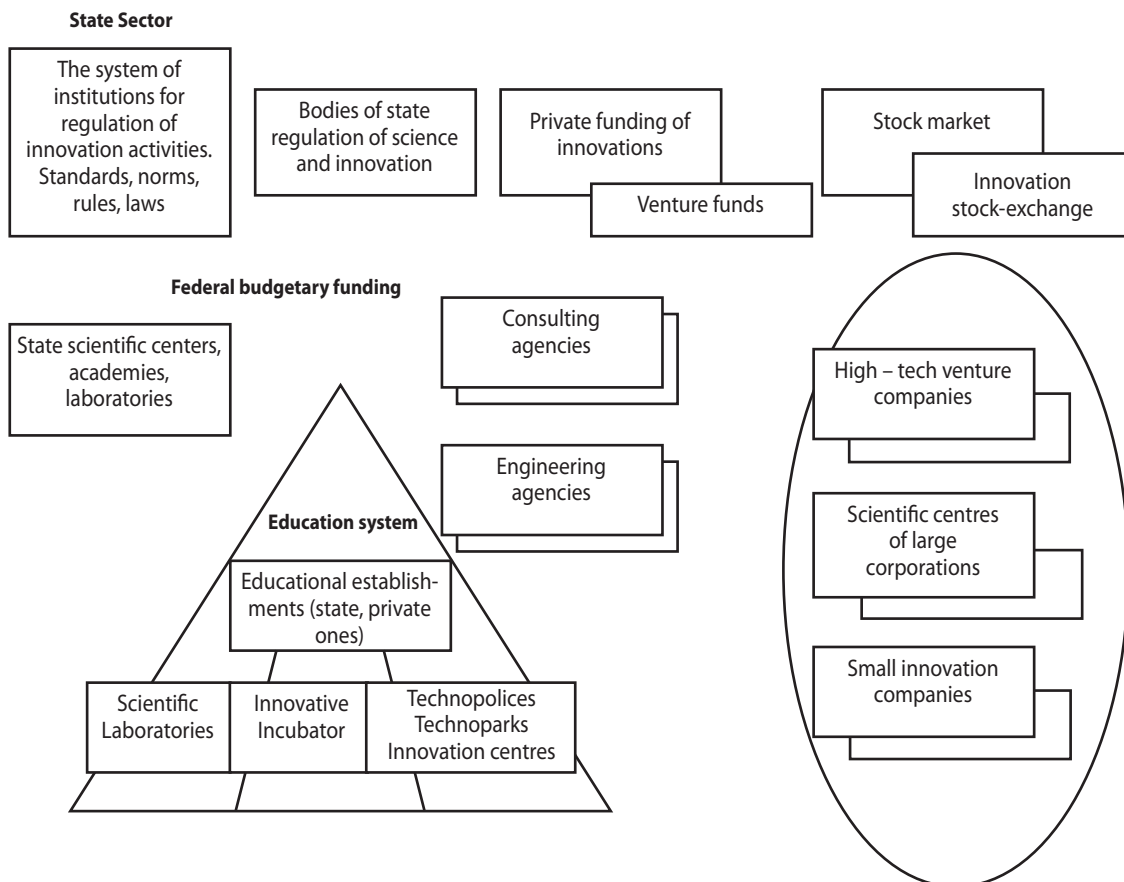


Fig. 2. Structure of the National Innovative System

legal, financial and social interaction institutes having firm national roots, political and cultural peculiarities.

The concept of the National Innovation System is grounded on the following principal ideas:

1. The main factor of economic dynamics is the competition based on innovative and scientific studies in corporations.
2. A special role in economic development at the modern stage is performed by knowledge as an economic resource.
3. The content, structure and outcome of scientific activities are mostly influenced by its institutional climate. Institutional system determines the principal directions according to which knowledge and skills are obtained and which can be decisive for a long-term development of society.

Thus, the National Innovative System provides for interaction between private business (the role of which is in the formation and development of a market for innovations) and the state, which will assist the development of fundamental studies and preferable strategic technologies and creation of a favorable institutional climate and infrastructure for innovative activities of private business.

Innovative activity appears to be an intermediate link between the interests of pure sciences and those of private capital, the driving force of which is profitability of the entrepreneur. In

addition to the direct participation in the innovative process in the form of budget financing, the state, which is interested in the development of the innovation process, supports the creation of a favorable economic climate for innovation development through financial, legal, tax, social and innovative assistance through indirect leverages.

The flexibility and diversified nature of innovation activity significantly promotes the formation of multiple types of cooperation between the state and the private sector, and private and foreign investors, stimulates direct and indirect forms of participation of the state in innovative activities, for example, through project funding in case of existence of state grants. Thus, an internal encouraging motive of all participants of innovative business emerges.

Distinctions between the levels of socio-economic development as well as national and cultural features condition the existence of various types of models for state regulation of innovation development of the country.

Every country forms its own National Innovation System by forecasting objectives of the innovation development and considering the existing opportunities for their achievement, selecting lines of activities, leverages of impact, methods and instruments that will provide the required efficiency of its development.

The largest, highly effective and relatively diversified na-

Table 1

Main lines of the state innovation policy in different countries of the world

	Lines of the innovation policy	Specificity	Country
1	2	3	4
1	Optimization of the national innovation system	Optimization of the state system of management and planning in the field of innovations	Japan, Norway, India, Chile
2	Optimization of the state funding in the field of science and innovation	-	USA, France, Great Britain, Norway, Denmark, Sweden, Taiwan, Austria
3	Development of fundamental studies	-	Great Britain, Sweden, Slovenia
4	Inter-country stimulation of the innovation cooperation of business and science (universities)	Stimulation of the symmetric convergence of corporations and universities	USA, Finland
5	Large state capital investments in the field of science and innovation and attraction of national private capital	-	Israel, Finland
6	Stimulation of the activity of the private sector in field of innovation by attraction of foreign capital	-	Great Britain, Ireland, China, Korea, Malaysia, India, Israel
7	Stimulation of innovation initiatives of the scientific sector	-	Germany, Japan, New Zealand, Denmark.
8	Integration in international innovation networks	Complex integration	Finland, Israel, Netherlands, China
9	Technological specialization	-	Korea, Malaysia, Singapore, Taiwan, India
10	Arrangement of internal innovation networks	Creation of special conditions for formation of ties in the innovative domain	USA, Norway, Ireland
11	Stimulation of initiatives of national regions	-	France, Germany, Finland

1	2	3	4
12	Formation of the national innovation system	Restructuring the state sector of science	Bulgaria, Poland, Czech Republic
13	Attraction of small and medium-sized businesses to the innovative domain	-	Romania, Czech Republic, Slovenia, Latvia, Estonia, Turkey, Chile
14	Determination of preferable export directions in the field of high technologies	-	Czech Republic, Romania, Chile, Turkey

Source: [2]

tional innovation system operates in the USA. It is based on more than ten thousand scientific structures (scientific centers and laboratories of large corporations, state centers and laboratories, research laboratories of universities and thousands of small science-consuming companies), conducting researches of fundamental nature, developing new technologies or scientific products and infrastructure giving rise to the efficiency of the innovative process.

The innovation strategy of the country envisages significant investments in higher education, creation of research and processing centers. As an example, we can mention Michigan Life Sciences and Innovation Centre, the Indiana 21st Century Research and Technology Fund, Pennsylvania Technology Investment Authority.

The government of the United States of America actively supports business partnership with local higher educational establishments and universities, which, on the one hand, contributes to increasing the scientific potential of students and, on the other hand, to creating new work places under rapidly changing economic conditions.

Active efforts of the state aimed at attracting private capital into science-consuming industries have been facilitating the turning of this process into a self-acting one for more than 30 years, and the state continues supporting innovation across the economy.

Other states formed their own models of the national innovation system, which differ in the directions of development, quality of the attempts carried out in this sphere and their efficiency.

For example, in Germany, the funding of innovation activities is provided through combined industrial structures – funds and societies, which partially fund state scientific establishments and the state allocates funds for private studies. The federal system allows participation in the funding of science of central and regional governments. Only the Fund for Assistance to German Sciences is comprised of more than 300 funds providing business financing. The State stimulates their activities through tax benefits.

The basis for the Swedish model, which implies general goodwill and full employment of able-bodied population, is the achievements of technological progress. Technological achievements are primarily characteristic for several large transnational corporations functioning in the formed industrial fields and representing grounds for the Swedish economy: car manufacturing, electrical engineering, etc. No gaps are ob-

served in some new fields: electronics, informatics, and communications. The innovation activity of small and medium-sized companies is low.

At present Finland occupies the top position in the World Competitiveness Ranking. In the country there established an independent public foundation «Sitra», which is subordinated to the Parliament of Finland. It is intended for particular strategic lines (target programs). The activities of Sitra are funded from the revenues of its own charter capital and the objects of investment of venture capital.

Innovation programs of Sitra make it possible to respond rapidly on the factors determining economic growth and competitiveness of Finland. The programs are implemented based on the close cooperation of Finland and international parties concerned.

Under modern conditions, we can identify the following models of innovation development of high-developed countries:

1. Technologic leaders – the revenues from the newest technologies sold to the international unions represent the largest share in GDP of the countries oriented towards leadership in fundamental studies. These countries have developed innovation infrastructure, and on the basis of the state innovation strategy they provide continuous structural and technological modernization. The USA is an undisputed leader in this area. Many countries prioritize technical leadership (Japan, China) and guide their National Innovation System in this direction.
2. Countries oriented towards global innovation leadership in particular fields and domains (Germany, Sweden, Switzerland, Finland, Norway, South Korea, India, etc.)
3. The countries oriented towards creation and distribution of innovations, stimulating novelties through development of innovative infrastructure, provision of adopting achievements of global scientific and technological progress, and coordination of actions of various sectors in technical domain. Here great attention is paid to the issues of stimulating activities of abled innovators, as well as education, standardization of production, and joint target programs of state and private sectors (South Korea, Taiwan, etc.)
4. The developing countries oriented towards catching up include those having no opportunity for development of scientific and research, and experimental

construction works. Hence, what can assist to diffusion of innovations? They are moving in the direction of development of the industrial innovative domain and stimulation of innovation activity.

Every country moves through the formation of a developed socio-economic environment, which is the only ground for the formation of innovative environment.

Despite the distinctions between countries, state regulation of innovation activities is carried out with consideration for initial conditions by performing the following main functions [17, p. 432]:

- Determination of state development preferences – management of activities of each participant of the innovation system, determination of their role and functions in the system, and determination of directions and purposes of the development, which should be achieved by the country, state support of federal and regional innovative projects.
- Accumulation of resources for scientific studies and innovations, organization of innovation activities – development of approaches for effective application of methods of resource mobilization for funding science and innovation development of the industrial sector. Introduction of such budgetary policy of providing the funding of innovation activities, allocating direct state investments for implementation of important innovative programs and projects, forming favorable investment climate, issuing donations, soft loans, warranties for investors in the field of innovation.
- Legal regulation of innovation activity, protection of copyrights, protection of intellectual property, protection of the rights and interests of the subjects of innovation activities, protection of the rights for holding, applying and disposing investments, protection of industrial and intellectual property, creation of regulatory acts and draft laws forming just and transparent environment for the activities of each participant of the system.
- Staff provision for innovation activities – supporting preparation, training and qualification of staff for innovation activities, and investments in human capital – these are the long-term strategic decisions forming a ground for innovative development. For example, the number of scientists and researchers in the USA per each 1000 workers is by 50 % more than in the European Union, giving the country advantages in innovation development. No other participant of the system is able to reach the mentioned level.
- Stimulation of competition in the field of innovation activity in developing priority directions; initiating state sanctions for manufacturing obsolete products, incentives for achievement of particular results by different participants of innovation process in view of development priorities and innovation strategy of the country.
- Establishment of scientific and innovative infrastructure by preparing information, engineering, consulting, financial and credit, marketing, international ties, innovative staff, and other innovation interme-

diating services for expertise and certification of the infrastructure.

- Regulation of international aspects of innovative processes – supporting integrated processes, extending interaction and international cooperation in the field of innovation; protection of subjects of innovation activities in the international organizations.
- Information provision of innovation activities – provision of accessibility of information on priorities of the state policy in the field of innovation, as well as on the completed scientific and technical studies, which may make grounds for innovation activities, completed innovative projects and those being performed, and data of programs in the field, etc.

The basis for development of state regulation of innovation activity is supporting development of innovative projects.

Conclusion. The state plays an important «entrepreneurial» role. It took active part in discovering new scientific spheres and financing the creation in the world famous innovation centers, beginning with informational technologies and to biotechnology, nanotechnology and «green» technology.

The authors categorically disagree with the opinions of academic economists about the «decrease» of the state role in regulating innovation and investment after the transition to a market economy, especially in post-socialist countries.

The government should help the total innovation sphere by fulfilling investments in innovations, defining the priorities of state innovation development, ensuring legal regulation of innovation activities, supporting the innovation sphere staffing, creating scientific and innovative infrastructure, providing information support of innovation activity, etc. In general, state regulation of innovations should play defining role in development of innovations and technologies.

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