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CURRENT STATUS AND FEATURES OF THE DEVELOPMENT OF TECHNOPARKS IN UKRAINE

Introduction. *The R&D potential of innovation infrastructure entities is a key factor in the implementation of innovation-driven development of the national economy, with technology park being precisely the innovation structure that unites it, ensuring the functioning of the model.*

Problem Statement. *Many aspects of regulatory, financial, and information framework of technoparks have been not settled so far. Methodological approaches to assessing the park efficiency have been underdeveloped. In this context, there is the necessity in the theoretical justification and the formation of a holistic view of the status and features of their activity in the conditions of the protracted aggression of the Russian Federation against Ukraine.*

Purpose. *The purpose of the research is to analyze the problems of domestic technology parks, to identify their capabilities, and to determine the trends in their development under the present-day conditions.*

Material and Methods. *The methods of dialectical and complex research have been employed: the empirical evaluation to identify the available methods of evaluating the activity of technoparks; the theoretical and cognitive analysis to determine the essence and to justify the features of technology parks; the general methods to identifymethodological problems of integrating technology parks into the financial system and describing approaches to the concept of an innovation form of business.*

Results. *The development of technology parks in Ukraine, their government support, systematized criteria for evaluating their efficiency have been analyzed. It has been determined that the priority in the creation of technology parks should be given to industries with high export potential. It has been proven that technology parks minimize the duration of the "research-development-implementation" cycle, the main tasks for their improvement in Ukraine have been outlined.*

Conclusions. *Technoparks are the most successful form of integration of science and production, which ensures rapid development, implementation, and use of innovations. Improving the legal framework for their operation in order to create the same operating conditions for all, not only for "selected" technology parks, increases competition between them, while modernizing the tax policy contributes to the growth of in-house sources of financing and their direction to the development of promising innovation projects.*

Keywords: technology park, science and innovation center, innovation-driven development, and innovation infrastructure.

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At the beginning of the 20th century, the system of applied and fundamental research, innovation processes and technologies contributed to the formation of a new type of economy in which innovation was a strategic factor of economic growth. The use of the field of knowledge and high technologies, as well as their effective combination has been reflected in new integrated forms of business organization, such as technopolises, technology parks, industrial parks, business incubators, regional innovation funds, venture firms, which differ in the prerequisites of formation, content of activity, functions, purpose of creation, and other features. Technological parks occupy a special place among such forms, as the most effective tool for forming the innovation structure of the country, which ensures the organization of research and production processes, the rapid introduction of innovation R&Ds into production.

Both Ukrainian and foreign authors have been dealing with technological parks. I. Kaleniuk and O. Sakun [10] have highlighted the main problems of Ukrainian technology parks. I. Antipov [1] has analyzed the impact of technology parks on innovation-driven development. A. Prodius [22] and O. Doroshko [8] have studied the essence and purpose of technological parks. S. Revutskyi [24] has analyzed the development of the innovation structure in general and the activity of technopark innovation structures, in particular. A. Galchynskyi, V. Heyets, V. Kinakh [2], and V. Seminozhenko [27] have outlined shortcomings in the formation of vertical and horizontal integration, interaction of business and R&D institutions and cooperation between them and analyzed the creation and development of regional innovation infrastructure. A. Mazur, V. Shovkalyuk [11], I. Romanets [25], and B. Golovash [3] have identified shortcomings in the formation of technoparks and the problems of their operation. Within the framework of the development of the national innovation system, technoparks have been studied by B. Malitskyi [12], M. Petryna [15], V. Solovyov [28] and others. Among the foreign researchers, the most noticeable are H. Verliet (Belgium), A. Anderson, D. Gibson, W. Owen (USA), I. Dalton (the Great Britain), H. Lacroix (France), E. Standt (Germany), and Sh. Tatsuno, K. Motokashi (Japan). However, despite the great value of these research works, the problem has been still discussed, which determines its choice and relevance.

The term "technopark" appeared for the first time in 1951. An innovation facility in the USA (California, Palo Alto), where there was American Stanford University, was called "technology park". Here, after the Second World War, professor of electrical engineering FrazerivTermai implemented the idea of using part of the university land to create a compact industrial zone, with electronic and aerospace industry firms involved [31].

The "technopark"-type organizations remained a specific American phenomenon, until in the 1970s, such organizations started to appear in Western Europe. Later, the "park wave" covered almost all advanced economies of the world and many developing countries (India, Malaysia, Thailand, etc.), as well as in transition economies. Today, there have been thousands of different parks in the world.

In the economic literature, there are many definitions of technopark structures. Some researchers equate the terms "technology park", "science park", and "research park", believing that the main principle of activity of these structures is the creation of a certain local agglomeration of technological knowledge, as well as the concentration of efforts on a certain technology. They claim that the driving force of technology parks is the successful development of business and the enhancement of employment opportunities in the region or city [27]. Other researchers see certain differences in these concepts, considering that science parks are structures that are exclusively associated with the institution of higher education (IHE) and are engaged in the development of high technologies, while research parks are characterized by a wider range of production activities and less close ties with IHE. Some researchers emphasize that the difference between the science parks and the technology parks is that the sci-

ence parks have close ties with research institutions and universities, while the technology parks require the integration of efforts of research institutes, research departments of concerns, small and medium-sized innovation businesses [30].

Table 1 gives the most meaningful, in our opinion, definitions of the term "technopark", the analysis of which allows us to identify the key parameters of the technoparks, which include as follows:

- communication with a scholarly research center, a higher education institution, and industrial corporations;
- production and commercial development of new innovation products;
- support of small and medium innovation businesses;
- technology transfer and knowledge exchange.

The main characteristics of the technology parks include as follows:

- an organizational form of interaction of participants regarding the creation of knowledge-intensive products, the basis of which is the territorial innovation structure, the possibility of providing the necessary services to enterprises located on the territory of a technology park, promoting the implementation of investment and innovation projects;
- a territorial and infrastructural organization that performs the function of promoting the development of small innovation entrepreneurship, regional integration of science, education and production, creating conditions for technology transfer;
- an organizational form of interaction between participants in knowledge-intensive production regarding the commercialization of technological developments, in which attention is focused on the cooperative interaction of participants in the integration process.

Technopark is a territorial research and production complex, the main task of which is to create the most favorable environment for the development of small and medium-sized science-intensive innovation firms. There are the following components (centers) in the structure of technoparks: innovation and technological, educational, advisory, informational, marketing, legal, financial and economic ones, and industrial zone [9].

Considering the above, it is appropriate to define technopark centers as voluntary associations

Table 1. **Definitions of "Technology Park" [3, 8, 10]**

Author	Definition
The Law of Ukraine "On the Special Regime of Innovative Activities of Technological Parks"	a legal entity or a group of legal entities (hereinafter referred to as technology park participants) acting in accordance with the agreement on joint activities without creating a legal entity and without pooling contributions in order to create organizational foundations for the implementation of technology park projects for the industrial implementation of science-intensive developments, high technologies and ensuring industrial production of products competitive on the world market
Terminological dictionary on management of innovative projects	a regional system of joint entrepreneurship, based on the combination of the activities of scientific institutions that carry out fundamental research; applied research centers for the organization and implementation of developments in science-intensive industries. Technoparks aim at creating fundamentally new basic technologies and samples of industrial products, contributing to the commercialization of achievements of the technological revolution
General Directorate of the XIII European Commission	represents the territory on which the development project is implemented, which is located near scientific research centers, has conditions favorable for the organization of new science-intensive firms and their further development
International Association of Science Parks	the structure that is managed in accordance with a formal agreement on cooperation with universities and research centers, with the aim of promoting the creation and development of knowledge-intensive enterprises through the transfer of scientific and technical knowledge

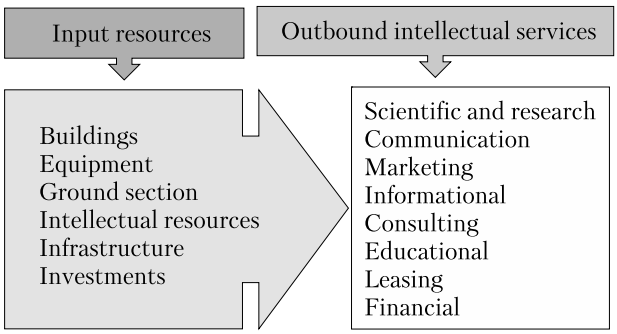

Fig. 1. Transformation of resources by technology parks into innovation services [27, 30]

that specialize in scientific, R&D and entrepreneurial activities and are innovation structures in the form of associations of legal entities acting on the basis of a joint venture agreement.

Let us highlight the following main criteria for the classification of the technology parks [32]:

- the technological one;
- by the management structure;
- by the presence of large-scale premises.

There are the following types of technological parks according to the technological classification:

- the technoparks of a general nature, which include organizations that do not focuson the production of innovation products;
- the technological parks engaged in the production of innovation products.

According to the classification of the management structure, the following types of technology parks are distinguished [24]:

- the technology parks around industrial corporations;
- the technoparks based on a R&D or educational center;
- the independent technoparks.

Each innovation structure is formed given the specific conditions inherent in national economies and individual geographical regions. The world experience of organizing technology parks has indicated the three main categories of active participants in this process: R&D institutions, economic development agencies, and local governments. The level of participation of each participant in the process of creating and managing a technology park determines the form of the organization. Technoparks as an independent economic form transforms resources into original innovation services (Fig. 1).

The creation and operation of technoparks is aimed at achieving the maximum combination of science and production, accelerating the transfer and implementation of the results of research activities in the field of material production for their commercialization. Technological parks are created for the development and promotion of science-intensive technologies, formation and support of new risky projects and companies that implement them [11].

The activities of technoparks cover a wide range of scientific and research, technical and technological, economic, communication and social problems (Fig. 2).

The analysis of the international experience of the creation and development of technology park structures has allowed us to note a rather strong government support for technology parks. In particular, in the USA, the technoparks are created within the framework of technical and economic development programs; the tax credit for growing scholarly research is up to 20%; a reduction in the tax on dividends is 5.95%; there is the system of government orders for scholarly research developments. In Western Europe, there are the practice of creating technoparks at the expense of the budget funds; grants from centralized funds; and infrastructure financing. In the Great Britain, the government's share is 62% of the costs; in Germany, it accounts for 78%; in France, it makes up 74%; there are accelerated depreciation of equipment and facilities and tax incentives to encourage entrepreneurship, etc. In Japan, the government funding is up to 60% of the costs of creating technology parks; preferential depreciation of buildings and equipment is 15% and 30% of the value for the first year, there is preferential tax on land ownership; there are programs for subsidies and loans (at an interest rate of 7–8%), etc. In China, the *Torch* national scientific and industrial

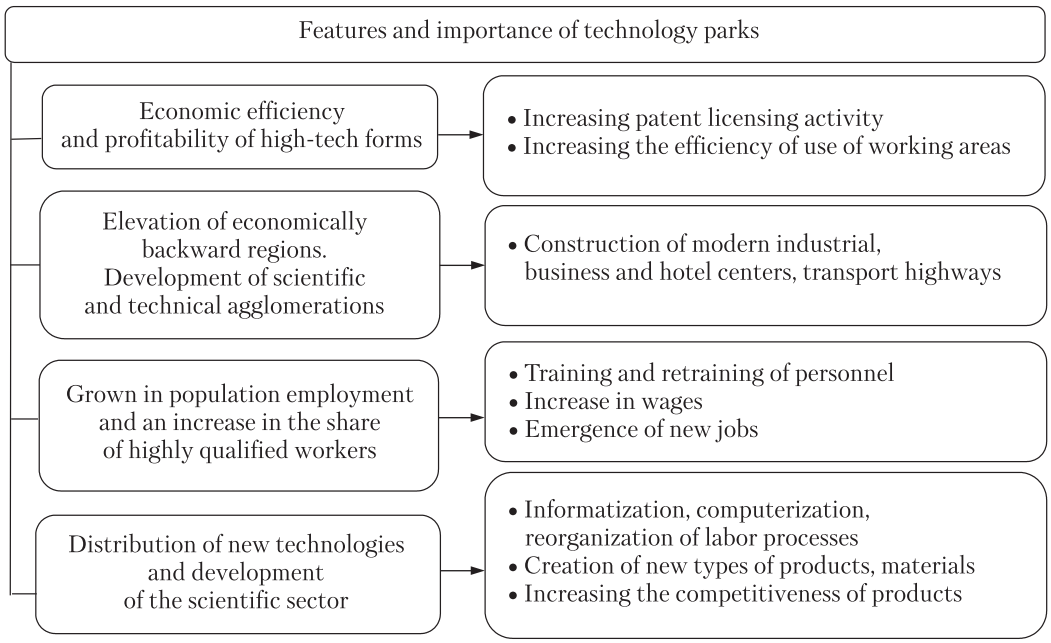

Fig. 2. Features and significance of technology parks [24, 30]

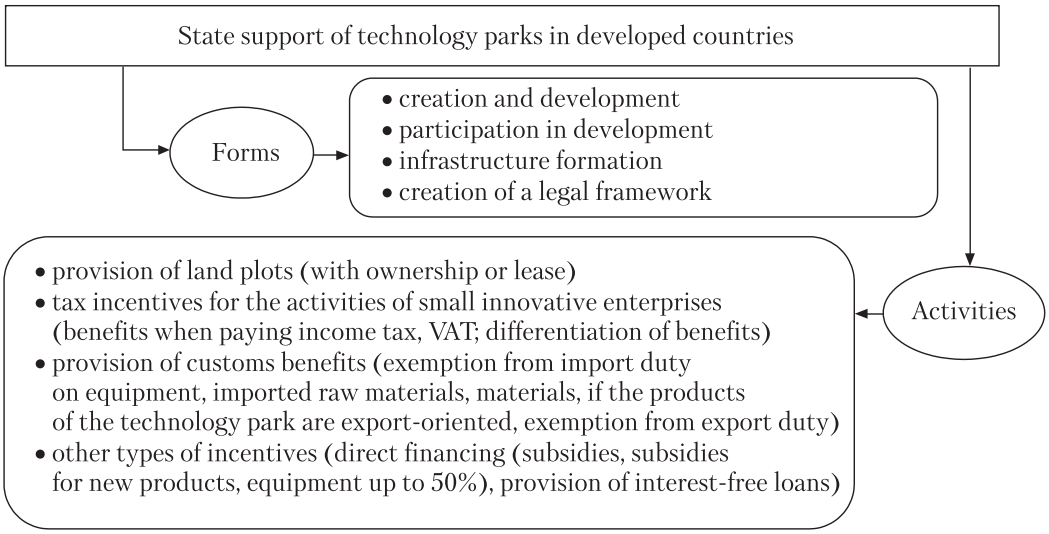

Fig. 3. Government support of technology parks in advanced economies [11, 24]

program has been being implemented, it focuses on the commercialization of science-intensive technologies; income tax is 15%, etc. [3, 7].

The formation of the mechanism of government support for technological parks, as evidenced by the experience of advanced economies, is related to the implementation of the main functions of public administration in terms of activity planning, as well as stimulation and control over the implementation of innovation projects. Let us summarize the main forms of support for technology parks in advanced economies (see Fig. 3).

There have been more than 500 technology park structures operating in the world: more than 160, in the USA; about 50, in Japan; more than 50, in China; 46, in the Great Britain; more than 50, in France; 16, in Sweden; and 17, in Finland. There are more than 100 science and technology parks in the countries of Central and Eastern Europe [7, 14].

The Ukrainian practice of establishing technoparks differs from the general model, which is interesting and needs to be studied. The first idea was creating a technology park on the basis of a disbanded missile base near the city of Brody, Lviv Oblast. However, this first step to create a technological park failed because of the following reasons: the change of government in the city; lack of a powerful scientific center and investments, primarily foreign ones [3].

For the first time, the legislative regulation of the creation of technology parks in Ukraine was made by the order of the President of Ukraine № 17/96-rp the Creation of Technology Parks and Innovation Structures of Other Types, which was supplemented by the Resolution of the Cabinet of Ministers of Ukraine № 549 of May 22, 1996 the Regulations on the Procedure for the Creation and Operation of Technology Parks and Innovation Structures of Other Types [25].

Thus, the history of the formation of technoparks in Ukraine dates back to 1997, when, for stimulating innovation and introducing R&D results into production, approving mechanisms for supporting the implementation of research results, the Law of Ukraine on the Yavoriv Special Economic Zone [19] was adopted, and the Yavoriv technological park was created.

In 1999, the Law of Ukraine on the *Kurortopolis Truskavets* Special Economic Zone of the Tourist and Recreational Type [18] and the Law of Ukraine on the Special Regime of Innovation Activity of Technological Parks were adopted. The latter governed and regulated the operation of 8 technological parks [17]. On January 1, 2005, the Law of Ukraine on Amendments to Certain Laws of Ukraine Regarding the Special Regime of Investment and Innovation Activities of Technology Parks entered into force, as a result of which, 7 new structures joined the 9 technology parks created in 1997—1999 [14].

So, it is possible to distinguish the three stages of the development of technology parks in Ukraine:

1) the establishment and formation of the legislative framework for their operation (1997—1999);

2) the rise period (2000—2005);

3) the decline period that began in 2006 and continues until now.

In accordance with the Law of Ukraine on the Special Regime of Innovation at Technology Parks, technology park (technopark) is a legal entity or a group of legal entities acting on the basis of a joint venture agreement without creating a legal entity and without pooling contributions in order to create organizational foundations for the implementation of technology park projects for the production implementation of science-intensive developments, high technologies and ensuring the industrial manufacture of products competitive in the world market [17].

As of the beginning of 2014, in accordance with the Law of Ukraine on the Special Regime of Innovation at Technology Parks, 16 technology parks had been created in Ukraine: *Semiconductor Technologies and Materials, Optoelectronics, and Sensor Technology* (Kyiv); *the Paton Electric Welding Institute* (Kyiv); *the Institute of Single Crystals* (Kharkov); *Vuglemash* (Donetsk); *Institute of Engineering Thermophysics* (Kyiv); *Kyiv Polytechnics* (Kyiv); *Intelligent Information Technologies* (Kyiv); *Ukrinfotech* (Kyiv); *Agrotechnopark* (Kyiv); *Eco-Ukraine* (Donetsk); *Research and Educational Devices* (Sumy); *Textile* (Kherson); *Donbas Resources* (Donetsk); *Ukrainian Microbiological Center* of *Synthesis* and *New Technologies* (UMBICENT) (Odesa); *Yavoriv* (Lviv Oblast); and *Engineering Technologies* (Dnipropetrovsk) [14]. Of the 16 technology parks defined in the Law of Ukraine on the Special Regime of Investment and Innovation at Technology Parks, only 8 were active: *the Paton Electric Welding Institute*, *the Institute of Single Crystals*, *Vuglemash*, *Semiconductor Technologies and*

Materials, Optoelectronics, and Sensor Technology, *Institute of Engineering Thermophysics*, *Ukrinfotech*, *Kyiv Polytechnic*s, and *Intellectual Information Technologies* [24].

The real conditions of the domestic economy at the time of the creation of technology parks excluded the possibility of direct financial support from government [24]. In addition, the Ukrainian technoparks were created in the conditions of the R&D products market that was formed in the state under the influence of the following unfavorable factors [26]:

- limited demand for innovation products because of the economic crises;
- low payment capacity of Ukrainian consumers of new equipment;
- strong competition with Western technology developers, manufacturers and suppliers of materials, equipment and technologies in general, in the domestic market;
- lack of interest of financial, bank, and credit systems in supporting innovation projects;
- limited opportunities for financing innovation activities from the state budget;
- the desire of Western customers to commercialize Ukraine's available R&D potential, primarily dual purpose technologies, without significant investments;
- political instability in the country.

The development of technoparks in Ukraine was influenced by several other problems, including: the instability of the government policy on supporting technoparks, which affected their efficiency, the imperfect legal framework of innovation, the lack of adjacent infrastructure that would allow investors, researchers, and potential customers to find each other, the lack of competent management, as well as the need to strengthen the organizational and legal form in order to secure the position and role of technoparks in the innovation-driven development of the country [32].

The domestic technology parks, which were created in accordance with the Law of Ukraine on Amendments to Certain Laws of Ukraine Regarding the Special Regime of Investment and Innovation at Technology Parks [20], are significantly different from the classic technology parks in foreign countries. After all, the Ukrainian state created hothouse conditions for selected technological parks, as they were organized on the basis of research centers, had a clear profile specialization, and were given tax benefits as free economic zones. Instead, the Western countries follow a different path, as they create favorable conditions for everyone who is doing innovation.

The importance of technoparks and the expediency of their creation in Ukraine is justified by the fact that [23, 29]:

- technopark is an effective form of convergence of science and production in which the duration of the research-development-implementation cycle is minimized;
- they have a concentration of highly qualified personnel in various fields: scientists, researchers, analysts, developers, engineers, specialists of various profiles, which enables interdisciplinary research;
- they have unique equipment, computing centers, laboratories, which allows conducting research experiments;
- their financial capital is presented in the most developed form – venture capital;
- they form a "reference environment" from the point of view of economic, organizational, and geographical conditions for the creation of new knowledge-intensive industries that meet the modern requirements of the development of society.

Unfortunately, over the last decade (from 2010 to 2020), the real scope of R&D in Ukraine has decreased by 45% (in international dollars, at purchasing power parity). A sharp reduction in the R&D production took place in 2015–2017, as part of the so-called policy of consolidation of public expenditure, which, actually, was the destruction of entire sectors of the economy, which received government orders for their services. The discriminatory salary policy in the budget funded sphere has led to the outflow of R&D personnel: over the past 10 years, the number of researchers in

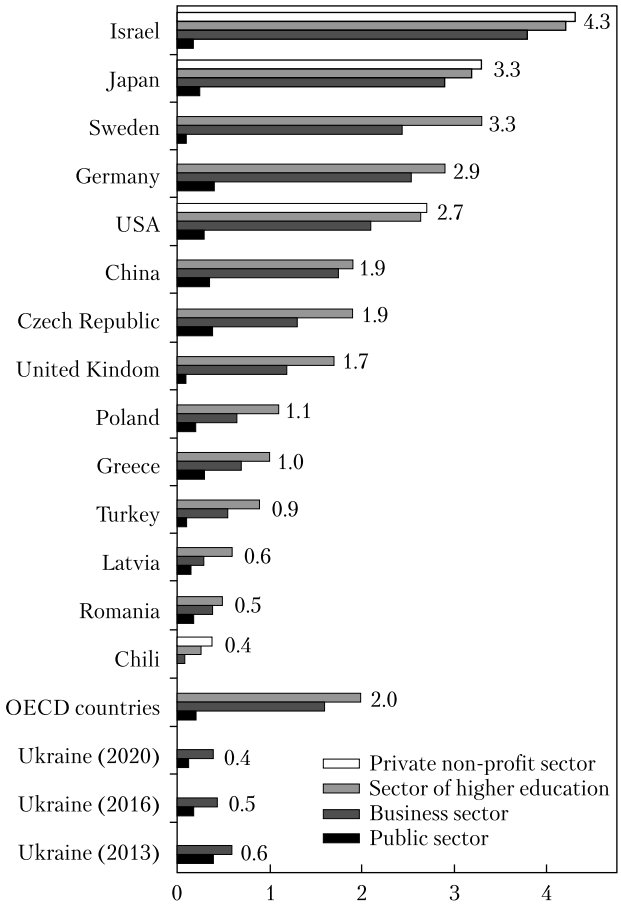

Fig. 4. R&D performance, in % of GDP [6, 8, and 14]

Ukraine has more than halved (decreased by 62%). Ukraine was among the countries with the lowest concentration of researchers (11 people per 10,000 population as compared with 55 in European and OECD countries) [6, 8, 9].

The World Intellectual Property Organization published the *Global Innovation Index 2021* annual report that analyzes innovation in 132 countries of the world. The Global Innovation Index (GII) ranks world economies according to their innovation capabilities. It consists of 80 indicators grouped by input and output innovation resources and reflects different aspects of innovation. Switzerland was recognized as the most innovation country in 2021, followed by Sweden, the USA, the Great Britain, and the Republic of Korea. The regional leaders are as follows:

- North America: the USA and Canada;
- Europe: Switzerland, Sweden, and Great Britain;
- North Africa and Western Asia: Israel, the United Arab Emirates, and Turkey;
- Central and South Asia: India, the Islamic Republic of Iran, and Kazakhstan;
- Latin America and the Caribbean: Chile, Mexico, and Costa Rica;
- Southeast Asia, East Asia, and Oceania: Republic of Korea, Singapore, and China;
- Africa (south of the Sahara): South Africa, Kenya, and United Republic of Tanzania.

The three leading innovation-driven economies among the countries, as classified by income are as follows:

- high income countries: Switzerland, Sweden, and the USA;
- above the average income: China, Bulgaria, and Malaysia;
- below the average income: Vietnam, India, and Ukraine;
- low income countries: Rwanda, Tajikistan, and Malawi.

Ukraine ranks 49th among 132 economies, 76th in terms of innovation implementation, 37th in terms of innovation achievements. The Global Innovation Index has proven itself as a reliable "innovation guide" and "tool for action" [4].

On the eve of the full-scale war with the Russian Federation, Ukraine was among the countries with the lowest research capitalization of GDP. Thus, R&D works done in Ukraine, in 2020, amounted to as little as 0.4% of GDP, while on average, this indicator is equal to 2% of GDP, in OECD countries; 2.9%, in Germany; 2.7%, in the USA, 1.9%, in China, 3.3%, in Sweden; 3.3%, in Japan; 4.3%, in Israel (Fig. 4).

The review of the scholarly research literature has allowed us to generalize the factors that contribute to the creation and development of various types of technology parks abroad [3, 11, 31]:

- a reduction of resources directed to industrial development, the need to modernize traditional branches of industry and to increase their scientific intensity, while reducing energy intensity, labor costs, and resources;

- the need to develop new knowledge-intensive production technologies and new industries created on the basis of such technologies as electronics, biotechnology, IT industry, special chemistry, optics, etc.;
- the need to reorganize some large enterprises and to create small and medium-sized innovation companies on their basis for a more dynamic and flexible economic sector;
- promoting, with the help of technoparks, a more rational placement of productive forces, in particular, the decentralization of industry and the equalization of economic development level.

The successful formation and development of the science-intensive sector of economy largely depends on a defined system of measures and mechanisms of government regulation of innovation processes aimed at increasing the efficiency of science-intensive activities, strengthening its economic, including commercial, and social returns.

Among the most effective measures to stimulate innovation, which have spread abroad, are as follows:

- implementation of government programs for the development of innovation entrepreneurship;
- creation of a favorable investment environment;
- tax benefits and concessional loans to knowledge-intensive firms;
- investor risk insurance; and
- partial reimbursement of investment losses [8, 24].

Stimulating the activity of technology parks with the help of tax levers, one should take into account the advantages and possibilities of the tools (introduction of differentiated tax rates, discounts, etc.). The profit that remains in the technology park after paying tax determines the organization's ability to carry out innovation, and tax savings contribute to the intensification of the renewal of the scientific and industrial apparatus, the development and design of new types of science-intensive products. Obviously, the tax policy for technoparks should be aimed at stimulating innovation and investments, growth in in-house sources of financing, initiating the development and implementation of achievements of R&D progress.

Technoparks are created to accelerate the adaptation of participating companies to the market economy, the formation of centers of innovation and entrepreneurship in the regions, and the restructuring of production. However, the mechanisms for the creation and operation of such structures in Ukraine are imperfect. It should be noted that, according to the world statistics, 45% of experts and researchers believe that the main goal of creating technoparks is regional and local development, 40% think that it is strengthening the connection between universities and industry, and as few as 10% suppose that it national development. About 33% of the technological parks in the world were created by regional and local authorities, while as few as 26% were established by central ones [7, 13].

The world practice has shown that the main principles of the activity of technological parks and organizational formations equated to them are as follows:

- financial and organizational support for innovating businesses, encouraging the development and production of fundamentally new types of high-tech products, promoting the introduction of new technologies and inventions into practice;
- promoting the formation of market relations in the R&D sphere, encouraging competition between innovating entities by attracting free financial resources for their targeted and effective use within the framework of the implementation of programs (projects) for the production of science-intensive products;
- participating in evaluation and competitions for the selection and implementation of local, regional, and industry programs, which would ensure demonopolization of the creation and development of new technologies, saturation of the market with competitive products based on them;
- involving small business entities, domestic and foreign investors in the implementation of government R&D programs and projects on a competitive basis;

- support for the development and implementation of new technologies and know-how using patents and licenses [3, 11, 29].

Ukrainian regional authorities and administrations, within the framework of their power, can take the lead in creating conditions for the growth of technology parks, since such forms of business organization contribute to the development of the regional economy due to:

- stimulation of economic growth;
- diversification of the local economy, which contributes to its sustainable development;
- development of successful small and medium businesses;
- increase in revenues to local and regional budgets.

We consider it necessary to define the priority industries in which national technoparks can be created. Let us select the following criteria for their identification:

- promising industries whose development is important for ensuring the future competitiveness of Ukraine's economy;
- multiplier effect: system-forming industries, the development of which in the long term will lead to a multiplier economic effect — thrust forward the development of interconnected industries and create a basis for the development of production;
- export potential: enterprises should develop in technology parks in those industries that can potentially become a source of diversification of the economy [28, 32].

It should be noted that technological parks shall be created through coordination of activities and cooperation between such key links as science, institutions of higher education, the public sector, industry, private business, local and regional authorities.

For the successful operation of technology parks, we consider the following prerequisites to be the key ones:

- research institutions in the region;
- qualified specialists in the production sphere with experience in introducing new technologies and creating new equipment;
- the possibility of buying or renting land plots and industrial premises on preferential terms;
- technological infrastructure, well-developed commercial services;
- risk capital [25, 26].

To evaluate technology parks, the researchers have suggested [3, 8, 13] to single out components that can be grouped by the effects obtained in the R&D, economic, social, ecological, and organizational spheres. Each of these components is expressed by a certain system of qualitative and quantitative indicators that show the effect of the technology park's activities in this direction. The qualitative criteria include the criteria for maintaining the target orientation of the technology park, effective interaction between its organizers and residents and for evaluating the management of this structure. The quantitative criteria are market and commercial success and socio-economic efficiency for the community. In addition, it is worth to highlight the criteria for assessing the technology park risks: market, financial, operational risks and risks of non-target use [30].

Accordingly, the infrastructural, social, and macroeconomic aspects of its activity can be analyzed by the qualitative criteria for evaluating the efficiency of the operation of technoparks, with conclusions about the compliance of the actual results with the planned ones. The market, commercial and socio-economic efficiency can be determined by the quantitative criteria for evaluating the technology park efficiency. The level of risks in the technology park activity and trends in these risks for the future can be determined by the risk assessment criteria. Here, we note that innovation, as compared with other activities, is more risky, since there is practically no full guarantee of a positive result. As a result, technopark structures are dependent on uncertainty factors that cause the risks. The risk assessment consists of a complex of actions: the analysis of possible sources of their appearance, the determination of probable losses from the occurrence of risks and the extent of the impact of their various risks on the activities of technology park structures.The

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risk assessment should be based on comprehensive study of the internal and external environment of the technology park, probable and real risks, building of a chain of negative and undesirable actions during the implementation of risks, as well as analysis of the interrelationships of indicators and factors that determine risks in the long term. In this context, an important component is the risk management and prevention. The achieve efficiency in this process, it is necessary to follow the sequence of actions:

- the identification of possible risks;
- the qualitative and quantitative risk assessment;
- the development of preventive measures regarding the risks; and
- the creation of a system of actions for minimizing losses from realized risks.

Separately, it should be noted that the risk management in the activity of technology parks is complicated by the multidirectional influence of its structural components. It means, there is no linear influence that allows determining which element, how, and when the risk will affect the next one. The following risks can have a significant impact on the activity of technology parks:

- the market risk(changes in the market conditions for the innovation project, supply and demand);
- the financial risk (fluctuations in the price of resources, deterioration of the financial conditions);
- the operational risk (losses as a result of shortcomings or errors in the implementation of internal processes, new difficulties of an operational nature, associated with the need to restrain the growth of costs, as well as due to external events);
- the risks of misuse, which indicate that the amount of funding shall be determined based on the specifics of the operation of each technology park, so the main condition for preventing a repetition of the mistakes of the past is the development of a strict mechanism for registering and monitoring the activity of technology parks.

According to the authors, in the current conditions, the following risks have a significant impact on the results of the implementation of innovation projects. They are manageable and can be reduced by implementing an effective innovation policy. Such risks include:

- the economic and political risks caused by changes in the economic and political situation in Ukraine and the countries with which the technology park cooperate, which may lead to instability of operation;
- the technological risk that is related to the development of R&D progress. Changes in this environment may lead to the loss of competitiveness by the technology park;
- the environment risk that manifests itself as possible losses of technology park structures because of deteriorating ecological state as a result of their production activities (for example, the sizes of environmental payments is proportional to the sizes of pollutant emissions).

There is an objective need to develop ways to prevent, reduce or compensate for possible negative consequences of risks. To do this, it is necessary first to assess a specific risk (both the probability of negative consequences and the value of possible losses), separate and study the impact of each risk factor on the total amount of possible losses.

The risk assessment results should be taken into account in technology park's decisions regarding the choice of strategies and tactics of innovation-driven development and the planning of R&D, production, marketing, and financial activities. The policy of risk management in the activities of technology parks should take into account the sequence of general instructions regarding actions and the adoption of tasks that contribute to the achievement of goals related to the limitation of a certain risk, including the following areas:

- description of risks and risk situation;
- obtainment of additional information;
- analysis, processing, and assessment of a specific risk;
- making decision on avoidance or assumption of the risk;

- studying the possibilities of preventing the existing risk;
- evaluation of methods and prospects for risk limitation;
- optimization of decisions regarding the technology park operation in risk conditions;
- analysis of the impact of diversification on reducing the economic risk;
- limitation of involved resources;
- development of management strategies, tactics, and policy of economic risk management.

Risks can be reduced by analyzing possible influencing factors, quantifying the amount of existing risks in value terms (possible losses) and developing measures to minimize them. Such an assessment should be carried out with a consistent review of the main stages of the technology park's activity, which allow identifying and analyzing the factors that lead to risks, assessing their degree of influence at each stage of the studied process. In general, the reduction of risk contributes to reducing the probable losses.

At the same time, the experience of technology parks in Ukraine has proven that their operation is associated with many problems. First, the imperfection of the legal framework for the innovation activity of technoparks today is exacerbated by the practice of suspending the effect of certain articles of applicable laws by legislative or by-law acts. After the adoption of the Tax Code, the subsidies related to income tax and VAT for technology parks were canceled, the only targeted subsidy remained in the form of the release from import duty as charged in accordance with the customs legislation of Ukraine, for imported new equipment, machinery, components, and materialsto be used for the implementation of technology park projects, which are not produced in Ukraine. In 2005, the articles defining the specifics of taxation and customs regulation of innovation activities were excluded on the basis of Law No. 2505-IV simultaneously with the cancellation of benefits for technology parks. As a result, the tactics of implementing norms for stimulating innovation activity were modified from the improvement of the framework law to the segmentation of aid beneficiaries and the establishment of special additional norms for them. According to Article 16 of the Law of Ukraine on Innovation, innovation enterprise can operate as an innovation center, business incubator, technopolis, technology park, etc. [16]. Therefore, in the future, the incentive system started to develop specifically in relation to certain segments of the national innovation system, both at the level of certain types of innovation structures and individual innovation entities.

As a result of the inconsistency of the government policy of support for the stimulation of the innovation sphere: the tax benefits provided for by the legislation did not work for a long time, were blocked or canceled, and upon the adoption of the Tax Code of Ukraine, the scope and list of fiscal instruments that stimulated innovation was significantly narrowed. So, currently, there are separate benefits related to income tax, VAT, customs duties and land fees for some investment and innovation entities.

For example, in global practice, innovation orientation is provided by the norms regarding accelerated depreciation and norms that allow attributing 100% or more of research and development costs to the gross costs of the enterprise. In addition, such measures of tax stimulation of innovation in the form of tax research credits or discounts are an established global practice.

We consider tax discount advantageous, since it is cheaper for the budget (as compared with tax credit of the same size). The tax credit does not affect the financial result of the business entity, as it reduces the accrued taxinstead of the profit. However, because of transparency and convenience, benefits are the most acceptable option. The restoration of tax benefits, given new operating conditions of technology parks, allows restoring the complex of economic and legal incentives in the sphere of innovation.

On paper, the activity of technology parks in Ukraine has long been regulated by Law No. 991-XIV on the Special Regime of Innovation at Techno-

logy Parks [17]. However, the situation is complicated, the list of technology parks is fixed in the relevant law, but only a few of them are physically active. Technological parks are not in high demand among businesses and investors, they are not supported by the government, despite the fact that according to the law they are entitled to preferential financing at the expense of budget funds, including by reducing the price of bank loans, and there are no tax benefits either. The only thing that participants of technoparks can claim is targeted subsidies in the form of the release from customs duty for imported new equipment, machinery, components, and materials, which are not produced in Ukraine, as we have mentioned above. For the state innovation infrastructure to develop, it is necessary to change the legislation, ideally to adopt a new law on technology parks or, at least, to amend applicable law No. 991-XIV. An important problem of the domestic technology parks legislation is that the activity of a specific list of technology parks is regulated by specific law, therefore, each time when a new technology park is registered, it is necessary to amend the law so that its effect extends to the newly created technology park.

According to Art. 8 of the Law of Ukraine on the Special Regime of Innovation at Technological Parks, the funds of targeted subsidies are credited to the special accounts of technological parks, their participants and joint ventures and are used by technological parks for the implementation of projects [17]. The implementation of the technology park project cannot be the basis for reducing tax obligations for the main activity of the contractor that implements a technology park project. Such an approach is quite logical given the fact that technology parks are already provided with government support in various forms. It should be noted that one of the forms of support for technology parks is the provision of loans for the implementation of technology park projects. However, the conditions under which technoparks can receive loans for the implementation of their own projects and the procedure for loan issue have not been legally defined. In our opinion, this approach needs certain adjustments, as currently there are no other legal acts that would regulate the issue of loans to technology parks as innovating entities. According to this approach, the mentioned form of government support for technology parks remains fictitious and does not work in practice, so we propose to introduce a special tax regime for technology parks, which would comprehensively ensure the exemption of entities carrying out such activities from paying taxes and fees.

For Ukraine, the further development of technoparks can become a basis for the formation of an innovation mechanism that combines identifying scientific ideas, doing innovation developments based on them, and further implementing the results in production. In hard times for the country, it is important not only to preserve and restore the existing scientific and industrial potential, but also to ensure the further R&D development. The world experience has shown that among the main elements of the government innovation policy of advanced economies is the operation of technological parks as main innovation centers, as even peripheral regions with a weak economy transform into highly developed regions equipped with high technologies in various fields, simultaneously solving the tasks of social development in the form of creating additional jobs, training specialists in new fields, creating and developing the innovation infrastructure.

In this context, we consider it expedient to improve the marketing component of technology park structures, which should take into account their essence: after all, it is not only the accumulation of certain real estate, the unity of the territory, infrastructure, developed service, a specialized tool for the commercialization and the introduction of technologies, but a complex resource based on the creation of conditions for business development, and therefore, when marketing the technology park, we suggest focusing on the following specific measures:

- developing a special logo to be used not only by the holding company of the technology park, but also by all other companies that are part of its structure;

- supporting the concept of technology park structures by popularizing them, holding press conferences, webinars, innovation exhibitions, expanding relations with the public, publishing leaflets about the activities of technology parks;
- implementing databases on the development of companies within the technology park, the number of jobs created, sources of their financing, government and international programs supporting technology parks;
- cooperating with international organizations, such as International Association of Science Parks (IASP), Innovation Centers of Eastern and Southern Europe (ICECE), European Venture Capital Association (EVCA), etc.;
- creating an image and strengthening the marketing prestige and business reputation of technoparks;
- technoparks should be marketed with the help of bona fide information, advertising and logo, as well as the natural, cultural, political, communicative, economic and entrepreneurial advantages, and results of economic activity.

The pragmatic aspects of the key tasks of technoparks are the implementation of integration mechanisms of interaction between education, science, industry, government, and consumers (following the chain «applied research — R&D-production») for the effective commercialization of the results of scholarly research in the interests of the socio-economic development of regions and the state in general. Contributing to the transfer of technologies into the economy, the technology park acts as an amplifier of the influence of, for example, a university or a research center on the economic and social development of a region or a city.

The development of technology parks in Ukraine will contribute to:

- accelerating the transfer of R&D results and knowledge obtained as a result of fundamental and applied research into production;
- intensifying the formation and development of small innovation and manufacture enterprises;
- mobilizing financial resources of the private sector, corporations, banks, authorities for the development of innovation activities;
- optimizing the location of production, labor, and capital in regions where technoparks are developed;
- creating new jobs in the manufacture of knowledge-intensive products even in regions where there are no technoparks [25, 31].

There have been reported the following improvements in the mechanism of government support of technopark innovation structures, with the aim of their further development, in such areas as:

- strengthening of strategic planning for the development of technoparks;
- regulatory and legal support for planning the creation of technology parks and delineating priorities;
- fundamental researchfunding;
- tax preferences;
- creating a system for monitoring the activity of technoparks;
- developing the venture financing system;
- protecting intellectual property, etc. [8, 15, 22].

Therefore, the creation of special conditions for the development of new promising industries in Ukraine is extremely important for ensuring the technological competitiveness of the economy. In this regard, as a direction for the development of technoparks, it has been proposed to create national technoparks in promising industries, the main purpose of which is to ensure favorable socio-economic conditions for the development of new branches of industry, science, new industries, new types and directions of economic activity.

The operation of technoparks at the regional level should contribute to the development of small and medium-sized enterprises based on cooperation with the industries in this region and to the enhancement of technological equipment of small and medium-sized enterprises. The creation of technoparks in the regions should be a joint effort of local authorities, universities, and regional industry. The territories for the creation of technology parks shall be chosen based on the following criteria: the level of regional industrial development; the presence of large scientific and educational centers; and the presence of regional initiative [23, 24, 26].

It should be noted that the existing types of structures of domestic technoparks almost do not take into account regional features, which makes the process of their creation in the territory of many regions impossible or time-consuming and complicates the activation of innovation processes. Since each region has a unique set of innovation resources, it is necessary to develop such a structure of the technological park that would allow the development of the regional economy based on the rational use of regional innovation resources.

Thus, the prospects for including technoparks in the toolkit for Ukraine's innovation-driven economic development are indisputable, but the conceptual and legislative framework for the creation of new and modernization of existing technoparks shall be improved. It is expedient to actively use relevant foreign experience, to create working groups to get acquainted with the service structures that accompany the activities of technoparks. It is also worth continuing the efforts on developing the capacity of domestic personnel as innovation managers, creating mechanisms for finding and supporting ideas, and applying IT outsourcing. In general, in the post-war period, emphasis should be placed on the reorientation of Ukraine's economy from a raw material economy to an intellectual economy of knowledge and innovation, which will contribute to increasing the consumption potential of innovation products and enhancing the domestic economy.

Based on the results of comprehensive justification, generalization, and analysis of theoretical aspects and pragmatic approaches in the context of the Ukrainian realities and the world trends, we may make the following conclusions on the development of technology parks in Ukraine:

1. It has been substantiated that in the modern conditions, technology park is an informal organizational and economic structure that unites universities and organizations for doing research, development and production activities, with the aim of accelerating the promotion of the goods and services developed by them — from their creation to commercialization. The technological park is the main element of the innovation infrastructure and a key factor that ensures the innovation-driven development of the national economy. Technoparks are created to accelerate the adaptation of participating companies to the market economy, the formation of centers of innovation and entrepreneurship in regions, and the restructuring of production.

2. It has been proven that technology parks operate based on the relationship of purchase and sale of objects of intellectual property and property created by representatives of science and industry in the form of joint ventures. Technopark unites startups and companies with well-established production and a stable market niche, promotes the commercialization of R&Ds and accelerates the application of innovations in various branches of the national economy. These basic criteria determine the technology park efficiency.

3. The developments of researchers, which serve as a scientific and methodological basis for the establishment and development of technoparks as a modern form of integration of science and business in the implementation of the government innovation policy, have been analyzed. It has been found that the issues related to the essence and mission of technology parks in the system of infrastructural support of the government innovation policy in Ukraine have been understudied in the domestic research.

4. It has been stated that the main mission of technoparks is to contribute to the emergence of new innovation enterprises; to stimulate the restructuring of the economy within the territory where they are organized; to contribute to the development of the real sector of the economy; to accelerate the commercialization of achievements in the innovation sphere; to contribute to raising the efficiency of small and medium-sized enterprises and improving their technological equipment; to provide job places for highly qualified workers of various specialties, which helps to prevent or reduce their outflow abroad.

5. The stages of the development of technology parks in Ukraine have been outlined and a list of

created technology parks organized on the basis of research centers has been given. The Ukrainian technology parks differ from the classic technology parks of foreign countries where they have a clear profile specialization and are given tax benefits as free economic zones. On this basis, it has been proposed: to improve the legal basis of innovation by creating the same preferential operating conditions not only for selected, but for all technological parks in order to strengthen economic competition between them; to improve the marketing component of technology park structures to eliminate imbalances in their activities; to improve the tax policy for technology parks, which should contribute to growing in-house sources of financing and directing the funds to the development and implementation of promising innovation projects.

6. It has been noted that the conceptual approach to the structuring of the technology park network consists of the introduction of a two-level classification of technology park structures, namely: oriented to support the national innovation policy in priority directions, which contributes to competitiveness on international markets; aimed at supporting the government innovation policy in regional segments of the economy, which is due to the peculiarities of the external environment.

7. Based on the comparative analysis and summarized foreign experience of supporting the creation and operation of technology park structures, the main criteria that are inherent in all technology parks have been highlighted. They are as follows: connection with higher education institutions, research centers, and industrial enterprises; support of innovation firms; technology transfer, knowledge exchange; production and development of new innovation products. The world experience has demonstrated the three main categories of participants in the organization of technology parks: scientific institutions, economic development agencies, and local executive bodies. The level of participation of each participant in the creation and management of the technology park determines the organization form.

8. It has been established that the methodological toolkit for evaluating the efficiency of the creation and operation of technoparks is based on the use, as evaluation procedure, of a system of effects by the following main components: economic effect, social effect, R&D effect, ecological and integral (organizational) effect.

9. The unfavorable factors for the creation of Ukrainian technology parks have been identified. They are as follows: limited demand for innovation products because of the economic crisis; low ability of Ukrainian consumers to pay for new equipment; competition with Western firms in the domestic market; lack of interest of the financial, bank, and credit system in supporting innovation projects; limited financing of innovation from the state budget, etc.

10. It has been shown that on the eve of the full-scale war with the Russian Federation, Ukraine was among the countries with the lowest research capitalization of GDP. In 2020, Ukraine's R&D amounted to only 0.4% of GDP, while, on average, this indicator accounts for 2% of GDP, in OECD countries; 2.9%, in Germany; 2.7%, in the USA; 1.9%, in China; 3.3%, in Sweden; 3.3%, in Japan; 4.3%, in Israel. Over the last decade (from 2010 to 2020), the real R&D in Ukraine decreased by 45% (in international dollars, at purchasing power parity).

11. It has been established that the most effective measures to stimulate innovation, which have spread abroad, are as follows: the development and implementation of government programs for the development of innovation entrepreneurship; the creation of a favorable investment environment; the provision of knowledge-intensive firms with tax benefits and soft loans; investor risk insurance; and partial reimbursement of investment losses.

There have been reported the following improvements in the mechanism of government support of technopark innovation structures, with the aim of their further development, in such areas as strengthening of strategic planning for the development of technoparks; regulatory and legal support for planning the creation of technology parks

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and delineating priorities; fundamental research funding; tax preferences; creating a system for monitoring the activity of technoparks; developing the venture financing system; protecting intellectual property, etc. The prerequisites for the development of technoparks are R&D potential, highly qualified personnel, and venture capital market in the country.

REFERENCES

1. Antipov, I. (2010). Innovative development of the national economy in the context of creating innovative infrastructures in the educational sector. *Collection of Scientific Works of the Donetsk State University of Management,* 148, 1—8 [in Ukrainian].
2. Galchynsky, A. S., Geets, V. M., Kinakh, A. K. (2002). *Innovative strategy of Ukrainian reforms*. Kyiv [in Ukrainian].
3. Golovash, B. E. (2011). Peculiarities of functioning of the European model of technology parks. *Problems of the systemic approach in economics*. URL: https://www.nbuv.gov.ua/e-journals/PSPE/2011_4/Golovash_411.htm (Last accessed: 09.07.2022).
4. Global Innovation Index 2021. *National depository of academic texts*. URL: https://nrat.ukrintei.ua/globalnyj-innovaczijnyj-indeks-2021 (Last accessed: 05.07.2022) [in Ukrainian].
5. Danylyshyn, B. (2022). About the role of national science in the revival of Ukraine. URL: https://lb.ua/blog/bogdan_danylysyn/515894_pro_rol_natsionalnoi_nauki.html (Last accessed: 09.07.2022) [in Ukrainian].
6. Danylyshyn, B. (2022). Structural reforms that can change Ukraine. URL: https://www.epravda.com.ua/columns/2022/05/31/687649/ (Last accessed: 05.07.2022) [in Ukrainian].
7. Denysenko, M. P., Kolisnichenko, P. T., Gomon, N. M. (2022). Innovative principles of ensuring the economic security of small and medium-sized enterprises. *Economy & state*. https://doi.org/10.32702/2306-6806.2022.1.4 (Last accessed: 10.07.2022) [in Ukrainian].
8. Doroshko, O. (2011). Technoparks as a means of stimulating innovative activity. *Efficient economy.* URL: http://www.economy.nayka.com.ua/?op=1&z=507 (Last accessed: 11.07.2022) [in Ukrainian].
9. Ilyina, A. (2013). Technoparks as a stimulating factor of innovation and investment development in Ukraine. *Economist. Ukrainian Journal*, 10, 31—34 [in Ukrainian].
10. Kaleniuk, I., Sakun, O. (2011). Development of technoparks in Ukraine: history and problems of formation. *ChDIEU Scientific Bulletin*, 2(10), 9—15 [in Ukrainian].
11. Mazur, O. A., Shovkalyuk V. S. (2009). *Technological parks. World and Ukrainian experience:* monograph. Kyiv [in Ukrainian].
12. Malitsky, B. A. (2014). *Science, technology, innovation and national security: theoretical and applied aspects*. Kyiv [in Ukrainian].
13. Olekseenko, L. V. (2021). Development of the infrastructure of the national innovation system. *Economic Herald of Donbass*, 1(63), 108—122 [in Ukrainian].
14. Official page of the Ministry of Education and Science of Ukraine. *Science. Innovative activity and technology transfer.* Technoparks. URL: https://mon.gov.ua/ua/nauka/innovacijna-diyalnist-tatransfer-tehnologij/tehnologichni-parki (Last accessed: 12.07.2022) [in Ukrainian].
15. Petryna, M. Yu. (2013). Ways to improve the financial support of technology parks in Ukraine. *Finances of Ukraine*, 8, 97—112 [in Ukrainian].
16. On innovative activity: *Law of Ukraine*. URL: http://zakon2.rada.gov.ua/laws/show/40-15 (Last accessed: 12.07.2022) [in Ukrainian].
17. On the special mode of innovative activity of technology parks: *Law of Ukraine*. URL: http://zakon1.rada.gov.ua/laws/show/991-14 (Last accessed: 11.07.2022) [in Ukrainian].
18. On the special economic zone of tourist and recreational type "Kurortopolis "Truskavets": *Law of Ukraine*. URL: http://zakon1.rada.gov.ua/laws/show/514-14 (Last accessed: 13.07.2022) [in Ukrainian].
19. On the Yavoriv special economic zone: *Law of Ukraine*. URL: http://zakon2.rada.gov.ua/laws/show/402-14. (Last accessed: 10.07.2022) [in Ukrainian].
20. On making changes to some laws of Ukraine regarding the special regime of investment and innovation activities of technology parks: *Law of Ukraine*. URL: https://zakon.rada.gov.ua/laws/show/1702-15#Text (Last accessed: 13.07.2022) [in Ukrainian].
21. Tax Code of Ukraine: Law of Ukraine. URL: https://ips.ligazakon.net/document/T10_2755 (Last accessed: 13.07.2022)

22. Prodius, O. (2010). Innovative development of industry: realities and prospects. *Bulletin of the Khmelnytskyi National University*, 1, 106—109 [in Ukrainian].
23. Pyatnytska, G., Grigorenko, O., Dolzhenko, T. (2021). Dichotomy of innovative transformations of enterprises. *Innovative Economy*, 2, 30—43 [in Ukrainian].
24. Revutsky, S. (2011). *Technological parks in Ukraine as an important form of innovative infrastructure. Innovative infrastructure in the context of the national innovation system* (*economic and legal problems*): monograph (Ed. O. Butnik-Siverskyi). Kyiv [in Ukrainian].
25. Romanets, I. V. (2019). Improvement of the national model of technological parks of Ukraine. *Regional Business Economics and Management*, 3(39), 31—38 [in Ukrainian].
26. Svynarenko, T. I., Gladkova, O. V. (2020). Formation and development of regional innovation systems: theory, practice. *Modern Economics*, 20, 239—245. https://doi.org/10.31521/modecon.V20(2020)-37 [in Ukrainian].
27. Seminozhenko, V. (2004). Technological parks in Ukraine: the first experience of forming an innovative economy. *Economy of Ukraine*, 1, 16—21 [in Ukrainian].
28. Solovyov, V.P. (2014). Technology parks in Ukraine: from initial concept to real practice. *Science and scientific studies*, 1(83), 16—22 [in Ukrainian].
29. Stoyanova, M. M. (2019). Development of innovative entrepreneurship in Ukraine. *Business Economics*, 1, 15—18 [in Ukrainian].
30. Ukhanova, I. O. (2011). Technological parks as a factor stimulating the development of the innovative economy in modern conditions. *Theoretical and practical aspects of economics and intellectual property: a collection of scientific papers* (*Mariupol, 2011*). https://doi.org/10.32782/2524-0072/2022-38-18 (Last accessed: 15.07.2022) [in Ukrainian].
31. Ukhanova, I. O. (2012). *Development and functioning of technoparks: world experience and specifics in Ukraine:* monograph. Odesa [in Ukrainian].
32. Ukhanova, I. O. (2012). Creation and functioning of technoparks in the region: socio-economic effects. *Bulletin of socio-economic research*, 4. URL: http://surl.li/kwbut (Last accessed: 18.07.2022) [in Ukrainian].
33. Shvets, G. O. (2013). The essence of the formation of innovative infrastructure as part of the national innovation system. *Theoretical and practical aspects of economics and intellectual property*. URL: http://nbuv.gov.ua/UJRN/Tpaeiv_2013_1%283%29__40 (Last accessed: 18.07.2022) [in Ukrainian].

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СУЧАСНИЙ СТАН ТА ОСОБЛИВОСТІ РОЗВИТКУ ТЕХНОПАРКІВ В УКРАЇНІ

Вступ. Науково-технічний потенціал суб'єктів інноваційної інфраструктури є ключовим чинником упровадження інноваційної моделі розвитку національної економіки, а технопарк — саме та інноваційна структура, яка його об'єднує, забезпечуючи функціонування моделі.

Проблематика. Проблеми нормативно-правового, фінансового й інформаційного забезпечення технопарків, недостатня розробленість методичних підходів до оцінки їхньої ефективності, актуалізують теоретичне обґрунтування і формування цілісного уявлення про стан та особливості їхньої діяльності в умовах затяжної загарбницької війни РФ в Україні.

Мета. Аналіз проблем вітчизняних технопарків, виявлення їхніх можливостей та визначення тенденцій в сучасних умовах.

Матеріали й методи. Застосовано методи діалектичного і комплексного дослідження: емпіричне оцінювання для виявлення наявних методів оцінювання діяльності технопарків; теоретико-когнітивний аналіз для визначення суті й обґрунтування особливостей технопарку; загально логічні методи для виявлення методологічних проблем інтеграції технопарків у фінансову систему і опису підходів до концепту інноваційної форми бізнесу.

Результати. Проаналізовано розвиток технопарків в Україні, їх державну підтримку, систематизовано критерії оцінювання їхньої ефективності. Визначено, що пріоритет у створенні технопарків має бути за галузями з високим експортним потенціалом. Доведено, що технопарки мінімізують тривалість циклу «дослідження—розробка—впровадження», окреслено основні завдання з їх удосконалення в Україні.

Висновки. Технопарки — найуспішніша форма інтеграції науки і виробництва, яка забезпечує швидку розробку, впровадження і використання інновацій. Удосконалення правової бази їх функціонування з метою створення однакових умов функціонування для всіх, а не лише для «вибраних» технопарків, посилить між ними конкуренцію, а осучаснення податкової політики сприятиме зростанню власних джерел фінансування технопарків та їх спрямуванню на розробку перспективних інноваційних проєктів.

Ключові слова: технопарк, науково-інноваційний центр, інноваційний розвиток, інноваційна інфраструктура.