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## FORMING AN INNOVATION ENTREPRENEURSHIP ECOSYSTEM IN UKRAINE

The article considers the essence of forming an innovation entrepreneurship ecosystem in Ukraine, which is an important condition for the successful development of our country in an innovative direction. The concept of an innovation entrepreneurship ecosystem is defined. The connection of components of an innovation entrepreneurship ecosystem in the form of a circle is shown. The composition and role of components of an innovation entrepreneurship ecosystem in Ukraine are described. The rating of Ukraine among other countries of the world is analyzed by the Global Innovation Index and the level of its innovative development is shown. The strengths and weaknesses of Ukraine in the innovation sphere are described. Ways to overcome these problems are suggested. The role of the state in promoting the effective development and functioning of innovation activities and promotion of the innovation market is determined.

**Keywords:** innovative entrepreneurship, innovation entrepreneurship ecosystem, ecosystem elements, Global Innovation Index, level of innovative development.

**Introduction.** The transition of Ukraine to the innovative model of economy requires the formation and development of intellectually innovative business, which will provide competitiveness at the international level. The formation of post-industrial society involves radical changes not only in the technical sphere, but also in all spheres of human life. Today there is a transition to a new type of social development, namely information and innovation society, based on knowledge and innovation. Therefore, the innovation orientation of economic growth is a pressing issue for research in today's world.

The basis of an innovation-type economy is innovative entrepreneurship. It is an important element of Ukraine's national innovation system. Therefore, in order to ensure the efficiency of its activity and successful development, it is necessary to focus its efforts on its logistics, regulatory legal and forming an innovation entrepreneurship ecosystem, which will help to solve the problems of its optimal and effective organization.

**Target setting.** The purpose of this article is to analyze forming an innovation entrepreneurship ecosystem in Ukraine and exploring the conditions for its successful development.

**Research results and discussion.** The process of globalization and the development of information technology contributes to the increased activity of innovative research in the conduct of business activities. The driving force of the modern market economy is entrepreneurship and innovation. Innovative ideas help to create and develop innovative products that need to be further refined and marketed. The successful implementation of new ideas in life will be facilitated by the development of innovative entrepreneurship and the formation of its ecosystem. The environment of innovation development should help them to successfully move from a business idea to a ready-made competitive product that can meet the needs of consumers and bring profit to the entrepreneur. These processes depend on the level of development of innovative entrepreneurship and its ecosystem. Therefore, for the successful development of innovative entrepreneurship, Ukraine needs the formation and development of its ecosystem, which will facilitate the effective introduction and promotion of the innovation market. The innovation entrepreneurship ecosystem is an environment conducive to the development of entities of innovative entrepreneurship, such as: small innovation firms and start-ups that branch into spin-offs and spin-outs; corporations that provide sustainable demand for innovative products; universities; venture capital funds; infrastructure that provides the functioning of innovative companies (technoparks, business incubators, business accelerators, science centers (innovation hubs), innovation parks); NAS of Ukraine and state institutions, which provide the legal framework to create and promotion of innovations and facilitate the commercial use of innovations and non-governmental institutions (NGOs, online communities).

The innovation entrepreneurship ecosystem connects the elements of the infrastructure into one whole, ensures effective interaction, adaptation and cooperation between them, creates close links between its

elements and ensures the promotion of innovations in the market and their successful commercialization. All elements of the ecosystem are closely interconnected, affect each other and the effective activity of some elements, depends on the effective activity of others. Just as the biological ecosystem is a complex natural complex of living things that interact with the inorganic environment and are materially and energy dependent on it, in which the cycle of substances is carried out, so the innovation entrepreneurship ecosystem consists of the elements of infrastructure that interact and create the cycle of innovation.

In our opinion, the innovation entrepreneurship ecosystem is a broader concept than infrastructure and consists of processes of interaction of its elements and promotion and commercialization of innovations. Therefore, the success of innovative entrepreneurship as a whole depends on the long and deep adaptation of the components and their effective interaction. These processes include the forming an innovation entrepreneurship ecosystem.

In view of the above, we can conclude that the effective activity of innovative entrepreneurship depends on the effective formation and activity of all its components as a whole.

The functional sphere and the interaction of the components of the innovation entrepreneurship ecosystem can be represented as Figure 1.

The innovation entrepreneurship ecosystem is a complex open system, formed from interdependent elements, parts, components and represents a constantly changing, evolving and restructuring in a dynamic environment<sup>1</sup>. Based on the systemic paradigm of Y. Kornai, it is possible to determine the principles of research of the innovation entrepreneurship ecosystem as an economic system<sup>1</sup>:

1) the innovation entrepreneurship ecosystem is a multidimensional and multidimensional design and requires identification in a certain structured space and complex perception of all manifestations of its existence and development;

2) the diversity of elements of the environment of the innovation entrepreneurship ecosystem implies the poly-aspect of their spatial existence and the level of saturation, which requires the use of appropriate diagnostic apparatus of their research and development methods;

3) lack of clear positioning of factors of internal and external environment as such that restrain or promote the development of elements of the innovation entrepreneurship ecosystem, causes the migration of sources of opportunities and constraints, which are taken into account when justifying decisions on transformational changes;

4) the informative-cognitive nature of managerial decisions under conditions of information asymmetry enhances the role of informal factors for justifying current and strategic decisions;

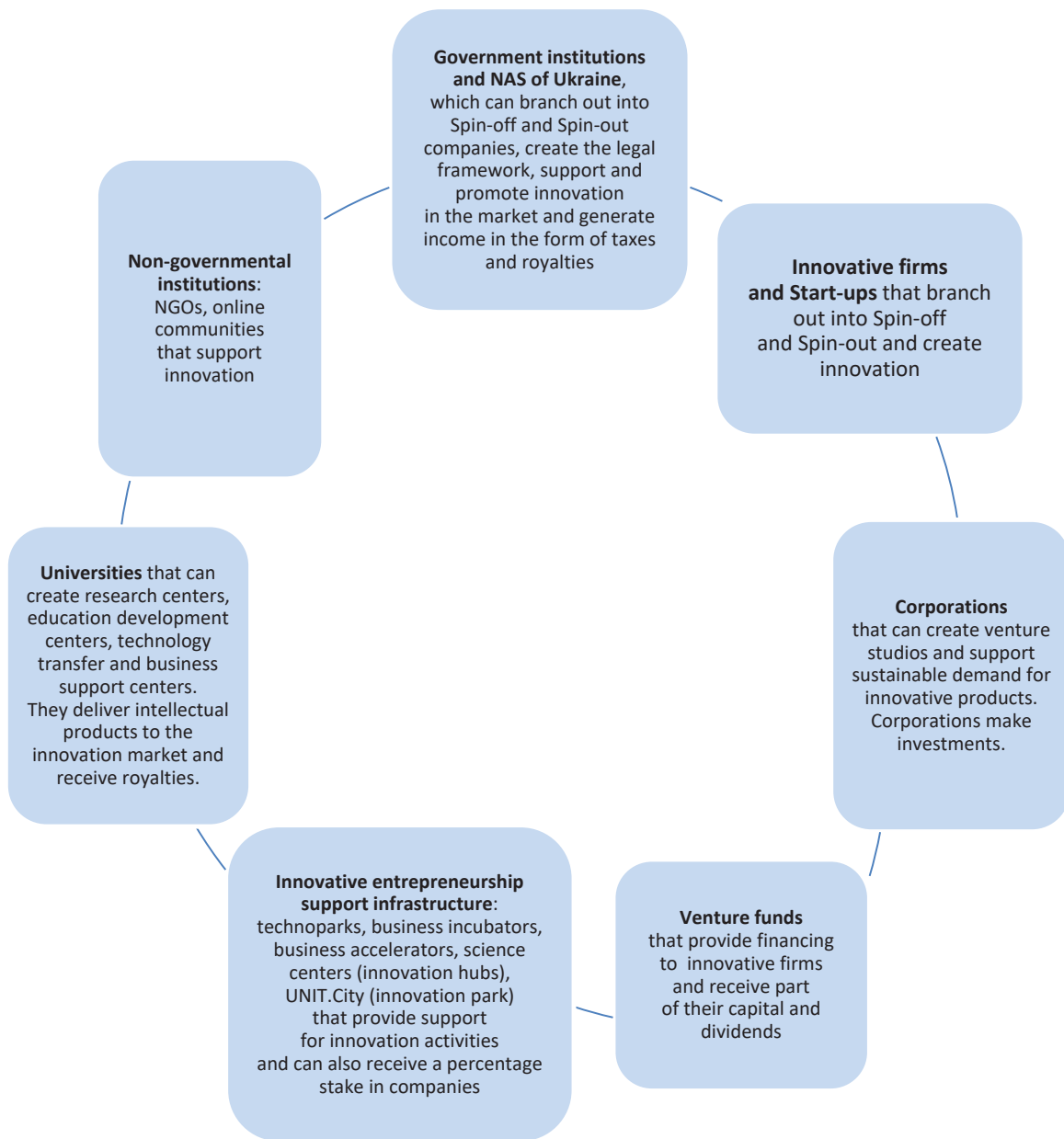
5) analysis of the functioning of units of the innovation entrepreneurship ecosystem goes beyond the detection of cause and effect relationships and deterministic orientation and involves the study of all multidimensional interaction of elements of the ecosystem;

6) the development of the innovation entrepreneurship ecosystem requires the identification of disharmony of system elements to activate analytical processes of finding forms and methods of qualitative improvements.

Thus, the innovation entrepreneurship ecosystem requires a comprehensive and systematic approach to its formation, which includes research and analysis of the interaction of its components.

One of the important elements that make up the innovation entrepreneurship ecosystem is the formation of small innovation firms – Spin-off and Spin-out. These companies are an important element for commercialization and technology transfer. For the successful development of innovative entrepreneurship, they play an important role as they help to create new jobs, ensure the flow of information, human and financial resources between elements of the ecosystem, create attractiveness of territories and tax revenues, and activate the movement of capital and innovative activity of companies. Spin-offs are innovative firms that separate themselves from their parent company in order to become independent in order to further advance the new idea, implement it and commercialize it. They appear when a company wants to develop an idea that is different from the core profile of its business in order to successfully bring it to life. The purpose of creating Spin-off companies may be to introduce a new line of business, commercialize new developments, solve specific problems, or create new businesses. Creating a Spin-off helps companies solve a number of tasks, such as: adapting a business idea to market needs, having a primary market, supporting a parent company in production, distribution channels, etc., creation of a new line of activity, without risking the main one, use of intellectual potential of scientists and support of entrepreneurial spirit. These companies

<sup>1</sup> Верба, В. А. (2011). *Управлінське консультування: концепція, організація, розвиток*. Київ: KHEU.



**Fig. 1. Circle of the innovation entrepreneurship ecosystem**

*Source: by the author.*

help turn intellectual potential into business. Unlike Spin-off, Spin-out companies are separated from their parent company, but retain close links and subordination to the company that created them, namely: they need organizational support, financial and advisory. They are created when a company has a business idea that cannot be implemented within the firm but is of great interest to it. Spin companies provide additional income for the parent company because it has a controlling stake in these companies. These companies are more flexible to manage. The creation of Spin companies will help solve a number of problems: 1) reduce the costs of the parent company for research and development and give it access to new technologies; 2) to control the development of business created on the basis of new ideas and to ensure the growth of innovative business; 3) effective promotion and commercialization of a new business idea.

An important component of the innovation entrepreneurship ecosystem is the ecosystem UNIT.City is an innovation park, which is the largest in Ukraine, "city in city", "innovative city", the center of innovative ideas and their implementation. Elements of the UNIT.City ecosystem are:

- 1) FabLab Fabricator is one of the largest rapid prototyping laboratories in Ukraine;
- 2) UNIT Factory (Ukrainian IT Factory), which uses the innovative Peer-to-Peer (P2P) training method, tested at the French School 42;
- 3) DTEK Academy is the world's best corporate university in the Global CCU 2019 Corporate Responsibility category;
- 4) Coworking Chasopys.UNIT is coworking and event space at UNIT.City;
- 5) UNIT.Home is a residential component of the innovation park, as well as the funds, accelerators and other components of the infrastructure that shape the ecosystem as a whole.

Thus, the UNIT.City ecosystem is a powerful innovation park of Ukraine, which focuses everything necessary for the production of new ideas, their implementation and commercialization.

Today in Ukraine an important element of the ecosystem is the formation of innovation centers (innovation hubs), where support and assistance can be obtained in implementing a new idea. There are iHUB innovation and entrepreneurship support centers in Ukraine in Kyiv, Chernihiv, Vinnitsa and Lviv. They provide convenient location, round-the-clock operation, coworking space, event space, conference rooms, the ability to attend all events in iHUB, wi-fi and other necessary equipment. The following hubs were created in Kyiv: Schastiehub, IdeaHub, DATA hub, FedorivHub, Projector, House of free people who have different directions.

Another important component of the innovation entrepreneurship ecosystem is venture studios, which are advisable to create on the basis of corporations, large companies. They are more flexible and effective than investment, venture funds and business angels. They are created by businesses that already own a working business or large technology companies that can devote resources to market research and new ideas.

Universities should be actively involved in the development of innovative entrepreneurship. The creation of university-based science parks will be appropriate for the effective development of innovative entrepreneurship and commercialization of innovations. Science parks should include: research centers, technology transfer and business support centers, education development centers. Higher education institutions in innovation should provide the following functions: mentoring support, expansion of innovation infrastructure, initial investment, educational activities, information support, investor relations.

The operation of university-based science parks will help create support and funding programs for specific projects. University-based startup entrepreneurship will help facilitate the commercialization of innovation. Establishing a Research Support Fund, a National Startup Fund will help effectively promote business projects and commercialize them.

Following the implementation of the proposed elements of the innovation entrepreneurship ecosystem, the following results are expected: increasing number of commercial developments; expansion of infrastructure units; increase in extrabudgetary financing; strengthening the autonomy of the elements of the innovation entrepreneurship ecosystem in carrying out innovative activity.

An important step towards the innovative growth of Ukraine will be to increase the level of competitiveness of products, to improve production technologies, to improve the standard of living of the majority of the population, to increase the legal protection of intellectual property. Therefore, in Ukraine it is necessary to focus on the implementation of reforms that will affect the innovative activity of entrepreneurs, create an atmosphere of respect for the subjects of innovative activity, provide incentives for innovation, willingness to take risks, create an effective system of cooperation between universities, the state and business.

For a better understanding of Ukraine's innovation development, we propose to analyze Ukraine's ranking according to the Global Innovation Index (GII), which surveys the innovative climate of the countries of the world INSEAD International Business School, the World Intellectual Property Organization and Cornell University. The study analyzes the level of innovation implementation in institutions, education, infrastructure, business and generates an appropriate rating. The research evaluates innovative processes in the economies of countries, in particular taking into account the level of market and business development, research activity, the level of infrastructure development, the research of institutions and human capital. More than 80 parameters are analyzed to calculate the indexes, among which are the following: the number

of applications for intellectual property rights, the creation of mobile applications, the amount of education costs, scientific and technical publications and others. The options allow you to see a complete picture of innovative development, the political situation, the state of education, the level of development of infrastructure and business.

In order to better show the level of innovative development of Ukraine among other countries of the world, we give the data of the Global Innovation Index (GII) from 2015 to 2019 presented in the Table 1<sup>1,2,3,4,5</sup>.

Table 1

**Global Innovation Index 2019 rankings**

Country	Rank					Trend
	2015	2016	2017	2018	2019	
Switzerland	1	1	1	1	1	Const.
Sweden	3	2	2	3	2	↑
United States of America	5	4	4	6	3	↑
Netherlands	4	9	3	2	4	↓
United Kingdom	2	3	5	4	5	↓
Finland	6	5	8	7	6	↓
Denmark	10	8	6	8	7	↑
Singapore	7	6	7	5	8	↓
Germany	12	10	9	9	9	↑
Israel	22	21	17	11	10	↑
Ukraine	64	56	50	43	47	↑

As Table 1 shows, Switzerland is the most innovative country. It is followed by Sweden, the United States, the Netherlands and the United Kingdom. Ukraine ranked 47th in the ranking in 2019 and entered in Top 3 innovation economies by lower-middle income group<sup>6</sup>:

1. Viet Nam ↑.
2. Ukraine ↓.
3. Georgia \*.

↑↓ indicates the movement of rank within the top 3 relative to 2018, and \* indicates a new entrant into the top 3 in 2019.

<sup>1</sup> The World Intellectual Property Organization (2015). *The Global Innovation Index 2015* <[https://www.wipo.int/edocs/pubdocs/en/wipo\\_pub\\_gii\\_2015.pdf](https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2015.pdf)> (2020, March, 04).

<sup>2</sup> The World Intellectual Property Organization (2016). *The Global Innovation Index 2016* <[https://www.wipo.int/edocs/pubdocs/en/wipo\\_pub\\_gii\\_2016.pdf](https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2016.pdf)> (2020, March, 04).

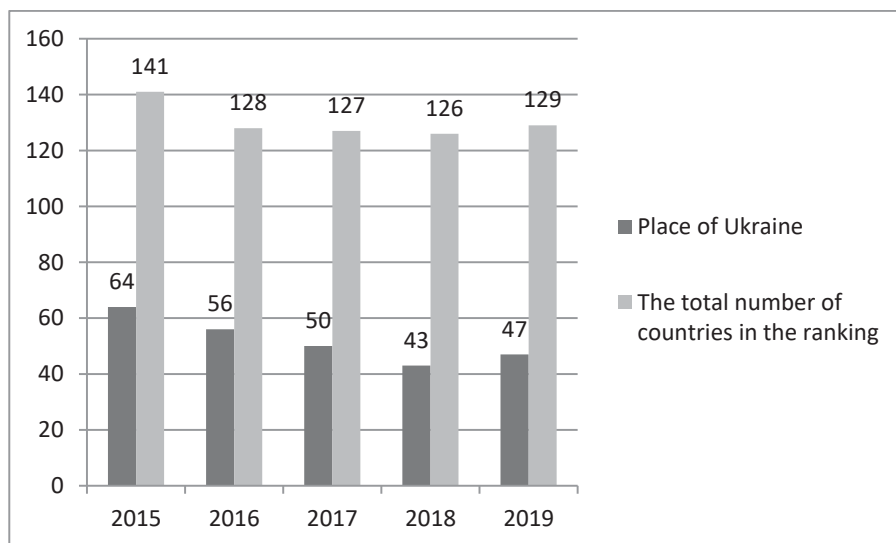
<sup>3</sup> The World Intellectual Property Organization (2017). *The Global Innovation Index 2017* <[https://www.wipo.int/edocs/pubdocs/en/wipo\\_pub\\_gii\\_2017.pdf](https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2017.pdf)> (2020, March, 04).

<sup>4</sup> The World Intellectual Property Organization (2018). *The Global Innovation Index 2018* <[https://www.wipo.int/edocs/pubdocs/en/wipo\\_pub\\_gii\\_2018.pdf](https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2018.pdf)> (2020, March, 04).

<sup>5</sup> Ukrpatent (2019). *Global Innovation Index 2019* <<http://ukrpatent.org/uk/news/main/wipo-gii-2019-25072019>> (2020, March, 04).

<sup>6</sup> Ibid.

Let us analyze the rating of Ukraine according to the Global Innovation Index for 2015 – 2019. Research results are represented as Figure 2<sup>1 2 3 4 5</sup>.



**Fig. 2. Ukraine's place in the Global Innovation Index rating for 2015-2019**

From the analysis of Global Innovation Index (GII) data for 2015 – 2019, we can conclude that Ukraine has a tendency to improve innovation activity and improved its position from 2015 to 2018 from 64 places to 43 places. Although in 2019 Ukraine's rating dropped to 47 positions, the overall situation in the innovation sphere is improving. Thus, increasing the financing of innovative entrepreneurship, improving the legislative sphere, intellectual property rights protection, stimulating innovative activity of entrepreneurs, creating guarantees for the protection of foreign investors' rights and stimulating domestic investors to invest in Ukraine will allow innovative entrepreneurship to develop at a faster pace.

Therefore, in order to support the direction of innovative growth in Ukraine it is necessary to make a number of changes in the field of innovative entrepreneurship, which is the basis for the development of an economy of an innovative type. The Global Innovation Index helps us to see the various aspects of the country's innovation activities and to promote long-term growth, productivity and employment policies.

Consider the strengths and weaknesses of Ukraine, which have a significant impact on the development and formation of the innovation entrepreneurship ecosystem. Strengths of Ukraine are pupil-teacher ratio, knowledge creation, patents by origin, utility models by origin, ICT services exports та інші. Weaknesses of Ukraine are political environment, rule of law, investment, ease of resolving insolvency, venture capital deals, ecological sustainability and other.

In view of the above, it can be said that creating a favorable environment for the development of innovative entrepreneurship will enable Ukraine to improve its innovation activity indices and raise our country's rating among the countries of the world.

<sup>1</sup> Вісник. Офіційно про податки (2015). *Глобальний інноваційний індекс – 2015* <<http://www.visnuk.com.ua/ua/pubs/id/9160>> (2020, March, 04).

<sup>2</sup> Левківський, О. В. (2017). Міжнародні індикатори оцінки інноваційного потенціалу України та його реалізації. *Інвестиційно-інноваційна діяльність. Чернігівський національний технологічний університет. Інтелект XXI*, 4, 78-82. <[http://www.intellect21.nuft.org.ua/journal/2019/2019\\_2/14.pdf](http://www.intellect21.nuft.org.ua/journal/2019/2019_2/14.pdf)> (2020, March, 04).

<sup>3</sup> Писаренко, Т. В. Кваша, Т. К. (2017). Стан інноваційної діяльності та діяльності у сфері трансферу технологій в Україні у 2017 році: аналітична довідка. *УкрІНТЕІ* <<http://mon.gov.ua/media/stan-id-2017-f.pdf>> (2020, March, 04).

<sup>4</sup> Eurosvita (2018). *Глобальний інноваційний індекс – 2018* <<http://www.eurosvita.net/prog/print.php/prog/print.php?id=5702>> (2020, March, 04).

<sup>5</sup> Слово і діло (2019). *Глобальний інноваційний індекс – 2019* <<https://ru.slovoidilo.ua/2019/07/25/novost/jekonomika/ukraina-opustilas-rejtinge-innovacionnyx-stran>> (2020, March, 04).



There are a number of problems that impede the successful the forming the innovation entrepreneurship ecosystem. In particular, such as:

- 1) Separation of science from production.
- 2) There is no effective mechanism of state support.
- 3) Imperfect legislative framework governing innovation.
- 4) Insufficient professional level of innovators, imperfect system of motivation of scientists.
- 5) Insufficient development of components of the innovation entrepreneurship ecosystem, which does not cover all links of innovation processes.
- 6) Technology transfer is not fully ensured.
- 7) Low level of spending on research and development in GDP.
- 8) Low technological readiness.
- 9) Insufficient innovation activity of business entities.
- 10) Lack of budget financing for the development of the activity of the entities of innovative entrepreneurship.
- 11) A burdensome tax and reporting system.
- 12) Low innovative culture in the state.

We can offer the following ways to overcome these problems:

- 1) Allocation of funds into priority areas.
- 2) Development of education in order to fully realize the scientific potential.
- 3) Introducing incentives for investment activities and creating a favorable investment climate.
- 4) Commercialization of research through the creation of Spin-off and Spin-out companies.
- 5) Form a developed of the innovation entrepreneurship ecosystem.
- 6) Establish an effective system of motivation and provide state financial support for scientific personnel in order to mobilize more scientific potential of the country and stop the outflow of scientists abroad.
- 7) Provide financial support to small businesses, introducing preferential lending.
- 8) Reduce tax pressure.
- 9) Create a favorable investment climate.

The implementation of the proposed recommendations will give the entities of the innovation entrepreneurship ecosystem the opportunity to successfully introduce and commercialize business ideas and innovations.

**Conclusions.** The effective development and functioning of innovation activities and the promotion of innovations in the market require the support of the state in the field of legislation, reporting and taxes, which would facilitate the activity of the entities of the innovation entrepreneurship ecosystem. The state should give more autonomy and freedom of activity to the entities of the innovation entrepreneurship ecosystem and create conditions for their self-development and self-regulation. Ecosystem actors must respond promptly and quickly to cooperate with each other. The innovation entrepreneurship ecosystem is based on the concept of a free market, not government regulation and partnerships, not competition, which will allow the ecosystem to effectively generate public goods based on the new nature of the ecosystem. The innovation entrepreneurship ecosystem is an open and flexible system that is constantly changing and moving. The state should create appropriate conditions for facilitating the activity and interaction of the entities of the innovation entrepreneurship ecosystem. With the active participation of the state in the legislative sphere and implementation of the relevant reforms, successful changes in innovative entrepreneurship can be achieved in the coming years, which will help to embark on the path of development of the innovative type of economy of the state.

Therefore, introduction of the mechanism of the forming an innovation entrepreneurship ecosystem and overcoming of these problems will create conditions for successful development of innovative entrepreneurship in Ukraine.

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