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DIRECTIONS FOR IMPROVING THE REGULATION OF THE INNOVATION CIRCULATION IN THE EUROPEAN UNION THROUGH THE PRISM OF THE IMPLEMENTATION OF THE EUROPEAN INNOVATION ACT (EIA)

The object of the research is the system of measures and methods of regulatory influence on the processes of innovation circulation in the European Union, through the prism of the prospective agreement EUROPEAN INNOVATION ACT (EIA). The current methods of identifying innovation circulation in the EU are studied, as well as the prospects for development within the framework of the implementation of EIA. The research found that the process of regulating innovation circulation in the EU is not unified. It is proven that the existing regulatory model of state influence in the EU is not focused on simplifying and stimulating its circulation. The main task is to intensify and scale the number of innovations within the EU economic system. It was determined that within the EU there is a need to improve the regulatory approach to determining the rules for the functioning of innovation circulation in the EU. A study of the areas of regulatory influence within the framework of the prospective EUROPEAN INNOVATION ACT was conducted. The results of a public discussion of its possible content were analyzed. Proposals were formulated for making changes to its text. The need to introduce a single definition of innovation, the formation of a preferential tax regime is substantiated. The need to change the object of regulation and its focus on the system of economic relations Innovation Life Cycle is proven.

The research is aimed at formulating proposals for improving the regulatory processes of innovation circulation in the EU. The results of this research can be used to improve the official rules of innovation circulation in the EU, as well as at the level of national systems of EU member states. They can also be used to form strategic public management decisions, state policy on innovation circulation and they can serve as the basis for further scientific research on these issues.

Keywords: *regulatory documents, innovation circulation, international agreements, EU innovations, public relations.*

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1. Introduction

Innovations in the economic relations of the European Union (hereinafter referred to as the "EU") occupy one of the defining places. They have actually become the basis of the processes of economic growth and development of this interstate entity. At the same time, the model of management of relations related to the circulation of innovations provides for active intervention by both the EU institutions and the authorities of the EU member states. The main goal of regulating processes related to the introduction of innovations is to apply support, incentive and scaling measures to them.

However, a systematic analysis of statistical data collected by Eurostat together with the International Organization for Cooperation and Development (hereinafter referred to as the "OECD") allowed to conclude that this method of regulating the circulation of innovations is less effective. As a result, in January 2025, within the EU, a comprehensive program for reforming the EU state policy to increase its competitiveness, "A Competitiveness Compass for the EU", was approved [1]. One of the main directions of further economic growth was identified as a change in the regulatory approach to the circulation of innovations and innovative development. Such a change was announced on a fairly large scale. Thus, it is planned to develop, agree on and implement a special international agreement within the EU framework, which will consolidate a uniform approach to determining the foundations and principles of regulating relations related to the circulation of innovations. Such a document should be the European Innovation Act [1]. Like most other official documents, it is currently undergoing a stage of public discussion and active processing of proposals from key participants in the relations of innovation circulation. Despite the lack of a coherent content of the EU agreement "European Innovation Act", those approaches to changing the process of regulating innovation circulation that have already been voiced and made public allow to understand the general principles of the future regulatory model of influence and to formulate appropriate proposals. Particularly useful in this situation are the published reports of several leading business entities, which were formed based on the results of studying the innovation circulation model fixed in the EU agreement "European Innovation Act". This even allows to make certain predictions regarding the approximate

effectiveness of individual methods and methods of prospective regulation of innovation circulation in the EU.

The issue of improving the essence of regulatory policy in the EU has been the subject of many scientific studies. Various methods, techniques and techniques have been used to conduct them.

Thus, within the framework of scientific work [2], the content and compliance of the means of stimulating innovative development provided for by the provisions of the Horizon Europe Framework Program with the needs of the participants in these relations were studied. The conclusion was substantiated that the provisions of the specified EU regulatory act did not meet the real needs of the participants in innovative relations. Proposals were made to improve existing regulatory structures. However, within the framework of this work, the principles of the updated regulatory influence based on the EU agreement "European Innovation Act" were not studied.

Within the framework of work [3], the compliance of regulatory approaches to stimulating innovative circulation in the EU with the requirements of sustainable development policy was studied. As a research result, a number of proposals were formed to improve the process of regulating means of supporting innovation in the EU. However, only the means of stimulation were studied and the issue of a general regulatory approach to innovative circulation was not studied. In addition, this work did not study the issue of reforming such regulation and the content of the "European Innovation Act".

In the study [4], EU regulation was analyzed in terms of stimulating innovative circulation and technology transfer. The inconsistency of the approach to regulating the process of implementing innovations and technologies with the needs of participants in these economic relations has been proven. A number of conclusions have been drawn regarding the improvement of the processes of stimulating and scaling up innovation circulation and technology transfer. However, this work did not explore the prospects for the development of methods and techniques of regulatory influence on innovation circulation through the prism of the EU agreement European Innovation Act.

In work [5], statistical data on qualitative and quantitative indicators of innovation circulation in the EU were investigated. The presence of a pattern between the level and number of implemented innovations and the degree of complexity of regulatory influence on the part of institutions and EU member states was established. However, within the framework of this work, no conclusions were drawn regarding the improvement of general regulatory structures recorded in official acts. Also, the issue of the impact on the development of methods and techniques of regulatory influence through the introduction of the "European Innovation Act" was not investigated.

Within the framework of the study [6], a thorough analysis of the requirements of the EU countries and other countries was conducted. A pattern has been formed according to which developing countries that have implemented the process of knowledge conversion and entrepreneurship have better economic growth indicators. The mechanism of knowledge transfer to entrepreneurship (KSTE) has been substantiated. However, within the framework of this research, no directions for unification of regulatory influence have been formed. Also, this work did not investigate the issues of reforming the process of regulating innovation circulation through the prism of the "European Innovation Act".

In work [7], the dependence of the efficiency of innovation investment processes on the simplicity and clarity of official regulatory structures used to fix the methods and methods of influencing innovation circulation relations was studied. It was determined that the more effective the regulatory approach, the greater the level of economic growth of the country's economy. It has been proven that the critical level of regulatory influence has a negative impact on the level of economic development. However, within the framework of this work, no proposals were formed to improve the existing regulatory structures contained in official regulatory acts.

All this allows to state that it is advisable to conduct a research aimed at formulating proposals for improving the regulation of innovation circulation in the EU. The proposals formed should be aimed at ensuring a higher level of their effectiveness, since they can be used to form the "European Innovation Act". The conclusions formed within the framework of this research can become the basis for further scientific developments, ensuring the implementation of relevant international and domestic regulatory acts.

The object of this research is the system of managerial and regulatory methods of state influence on innovation circulation in the EU, through the prism of the prospective EU agreement "European Innovation Act".

The aim of research is to form the basic principles of improving the system of managerial and regulatory methods of state influence on innovation circulation in the EU, through the prism of the prospective EU agreement "European Innovation Act". This will allow to form recommendations for EU institutions on the essence of managerial means of influence and proposals for amending EU regulatory acts.

The tasks of research are:

1. Analysis of the essence, content and purpose of the existing regulatory approach to identifying innovations and innovation circulation in the EU and its suitability for the needs of the participants in these relations.

2. Formation of directions for improving the regulatory impact on innovation circulation in the EU.

2. Materials and Methods

During the research, a hypothesis was formed that the existing regulatory methods and techniques for stimulating innovative development in the EU do not meet the needs of participants in innovation relations.

During the research, a simplification was made, within which regional features of the regulation of innovation circulation at the level of national systems of individual EU member states were not taken into account. The basis was taken as approaches that are common and general for the EU.

During the research, decisions of UN institutions, the European Union, statistical information, results of public discussions and other public information were used.

During the research, general scientific methods were used, namely: deduction, induction, synthesis, analysis, comparison, abstraction, generalization, systemic and functional methods, modeling methods, historical method. The methods of deduction, induction, synthesis, analysis and comparison were used in the research of the general system of regulation of innovation circulation in the EU. The method of modeling, abstraction and generalization was used in the formation of general conclusions within the framework of this research. The historical method was used to study the main levels of innovation identification and innovation circulation. Also, a systems method was used to form conclusions and recommendations based on the results of this research.

3. Results and Discussion

3.1. Study of the content and relevance of the existing regulatory approach to identifying innovations and innovation circulation in the EU

Over the past few decades, the EU has faced a number of macroeconomic challenges that have had a rather negative impact on the level of its economic development [2–7]. It is because of this that since 2024, within the framework of this intergovernmental entity, a process of radical reform of the existing relationship between economic processes and state regulation has begun. The main document, which reflects the main vectors of development of economic regulation processes, was the EU state policy reform program to increase its competitiveness "A Competitiveness Compass for the EU" [1].

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This program defines the main goals and objectives set for the EU as a whole and its institutions in particular. Among the main tasks, the reform of regulatory processes and centralized influence on innovations and innovation circulation is also highlighted. Given that innovations and their mass implementation are included in the fundamental foundations of the functioning of the EU economic system, reforming their regulation becomes an extremely important task.

As of 2024, a multi-level approach to the identification of innovations and innovation circulation has been formed within the EU [2]. Their structuring is based on a historical method associated with the formation of levels of innovation identification and innovation circulation according to the time of their formation.

The first in time was formed by an approach where innovation was identified with the object of intellectual property rights. Innovation circulation was formed as a process of transferring rights to such objects. It was formed in the Agreement on Trade-Related Aspects of Intellectual Property Rights ("TRIPS") by the World Trade Organization ("WTO") [8]. A similar method of identification was also defined by the World Intellectual Property Organization ("WIPO") [9].

The second was a method of identification where innovation was defined as a new or significantly improved thing that can be acquired by other persons. Innovation circulation was reduced to any transfer (transfer) of such a thing. This approach was defined by the International Organization for Economic Cooperation and Development (OECD) and Eurostat [10].

The third level of identification was the EU Framework Program "Horizon Europe" [11]. In it, innovation is recorded as the result of scientific and research work. And innovation circulation was defined as a form of transfer of scientific and research results [11].

The main aspects, foundations, principles, tasks that will arise after the reform of this area should be enshrined in a new special EU agreement. Such an agreement should be the European Innovation Act [1]. The full text of this agreement has not yet been made public, but the discussion of the principles and principles of the new regulatory impact is already actively underway in scientific and political circles. The existing procedure for amending and introducing new EU regulatory acts, despite the absence of a "European Innovation Act", already allows to identify the general features of the updated concept of regulating innovation circulation.

Thus, the European Commission's information bulletins to the European Parliament and EU committees [1, 12] have already recorded the general directions of reforming the process of regulating innovation circulation in the EU. A systematic analysis of these official documents allows to establish the following:

– the EU plans to eliminate the main drawback of the regulatory impact on innovation circulation, namely 27 different approaches to interpreting the concept of innovation, which are recorded within each of the EU countries (the so-called 28th regime);

– a special classification of innovations will be introduced within the EU, within which defense, strategic and key innovations are distinguished. This classification will be the basis of the system for distributing measures to support and stimulate innovation circulation in the EU. In the future, after the completion of the reform process, priority for support will be given to those innovations that are primarily attributed to the specified categories;

– introduction of such regulation of innovations, under which it will become a free thing (object) in economic circulation, in order to simplify access to financial services and banking products;

– simplification of mechanisms of public (state) procurement of innovations, which will facilitate the inflow of public funds and innovation circulation.

Within the framework of methodological recommendations of the European Institute of Innovation and Technology [13], the following principles of regulatory influence of the EU on innovation circulation were determined:

– within the framework of innovation circulation, special business entities will be identified, the main type of activity of which will be the introduction and implementation of innovations. They will be provided with a special regime of startups and skylaps. This will be a temporary form of organization of economic activity that will fall under the preferential regime of commercial activity for the time while the initial implementation of innovation takes place;

– updated forms of organizational cooperation between scientific and research institutions and representatives of the economic production sphere will be introduced;

– the formation of an updated system of testing infrastructure centers for supporting the implementation of innovations, conventionally called "sandboxes", is being introduced. Their main task will be to provide all available resources, knowledge, and information necessary to maximize the commercial idea to the degree of its industrial suitability;

– reforming the principles of regulating innovation circulation and innovations in the EU will take place without a sharp replacement of existing means of stimulating innovation circulation. In particular, support measures defined by the provisions of the Horizon Europe framework program will not be revised and replaced [11].

Generalized changes within the process of reforming the regulatory impact on innovation circulation in the EU are shown in Fig. 1.

In general, most of the reform directions are justified and appropriate. The need for their application has long been discussed in academic circles [4, 6, 7]. In addition, such a direction as the introduction of a single regulatory approach to the definition of innovation and innovation circulation was welcomed by key participants in innovation circulation.

Fig. 1. Generalized changes within the process of reforming the regulatory impact on innovation circulation in the EU

Thus, the European Business and Innovation Network (EBN) in a public report on the discussion of the concept of reforming the regulation of innovation circulation identified this as the main achievement of this agreement [14]. Thus, it was noted that the fragmentation of legal bases in the Member States is the biggest obstacle to scaling European innovations. Every day, promising European startups waste precious resources, navigating in 27 different legal systems, instead of focusing on product development and market expansion. Meanwhile, their American and Chinese competitors benefit from unified regulatory frameworks that allow them to scale up quickly in continental markets [14].

The European Commission has identified the "European Innovation Act" as one of the most anticipated events for participants in the innovation circulation relations in the EU [15]. The basis for this was an assessment of the potential ability of the mechanisms of test innovation centers to accelerate and scale the processes of innovation circulation. As well as the simplification of the mechanisms of state financing of the private law sphere of innovation circulation and the introduction of a system of centralized incentives for employees of enterprises for their innovative renewal [15].

3.2. Research on the directions of improving the regulatory impact on innovation circulation in the EU

Analysis of the directions of reforming the sphere of innovation circulation in the EU allows to determine the following:

1. Centralization and unification of regulatory impact is the right decision, which can bring a positive effect to the development and spread of innovation relations. In order to understand the positive effect of this, it is simply necessary to compare how innovations are defined today and how they will be identified within the framework of the "European Innovation Act". Thus, the basic principles of regulating innovation circulation are determined by the Agreement on Trade-Related Aspects of Intellectual Property Rights (hereinafter referred to as the "TRIPS Agreement"), which was adopted within the framework of the World Trade Organization (hereinafter referred to as the "WTO") [8].

Within the framework of this approach, innovation is identified with objects of intellectual property rights. And innovation circulation, because of this, must meet all the requirements relating to the process of transferring rights to objects of intellectual property rights. Similar principles of regulation are recorded within the recommendations of the World Intellectual Property Organization (hereinafter referred to as "WIPO") [16]. Another approach is recorded within the framework of the Horizon Europe framework program, where innovations were tried to be defined as a certain new product that is better than the previous ones and which is accessible to consumers [11].

For the purposes of regulation, a single approach is much more effective than the existing one, according to which there are several levels of influence [6]. However, within the framework of such an approach, it is advisable to more specify the indicative model of the regulatory definition of innovation. A greater degree of specification of the content will allow to increase the degree of awareness of the purpose and objectives of regulation, which in turn will increase its effectiveness. Within the EU, there is one institutional entity that systematically works to improve the essence of innovation regulation and innovation circulation in the EU. It is a joint working group of the International Organization for Economic Cooperation and Development (hereinafter referred to as "OECD") and Eurostat. This working group develops methodological recommendations for identifying the essence of the main regulatory structures in the EU.

These recommendations are subsequently used by both EU member states and business representatives. The definitions developed are used both within the framework of state regulation and in the formation of self-regulatory market mechanisms and agreements. It is about the "Oslo Manual" (hereinafter referred to as the "OSLO-MANUAL") [10]. Within the framework of these recommendations, innovation is defined as:

– a new or improved product or process (or their combination);
– which is significantly different from previous products or processes of a statistical observation unit (enterprise, organization, institution, etc.);
– which has become available to potential users (product) or has been introduced into production (process) [10]. These recommendations have served as a leading guideline for defining innovations and innovation circulation in the EU over the past 7 years. Ignoring them will certainly lead to an increase in the level of chaotic regulation of innovation relations in the EU. That is why, when forming the "European Innovation Act", the OSLO-MANUAL recommendations should be the basis for the regulation of innovations and innovation circulation. At the time of forming the basic principles and principles of reforming the sphere of innovation circulation in the EU, this was not recorded either in the framework of "A Competitiveness Compass for the EU" or in the "European Innovation Act". However, the unification of these regulatory acts with the "OSLO-MANUAL" will significantly increase the level of efficiency of the regulatory process, since it will be associated with the introduction of already known regulatory approaches. This makes it advisable to carry out such unification. Thus, the formation of a single detailed definition of innovations, based on the conclusions of the "OSLO-MANUAL", should become the first direction for improving the process of regulating innovations and innovation circulation in the EU.

2. Providing a special status for startups and skylaps is an appropriate and justified measure of regulatory influence. Innovative activity is high-risk, since it is always associated with the introduction of a new subject (object) into the production economic process. This necessitates the need for constant and systematic support for the business entity that directly carries out such implementation [4]. Given that small and medium-sized enterprises in the EU form the basis of their economic system [17], providing certain preferences for those participants in innovation relations who introduce innovations is a justified step. It is advisable to implement the formation of certain preferences for startups and skylaps at the system level and in a holistic form. Such tasks require the formation of a holistic system of incentive measures similar to the type of special tax regime [18]. So far, when forming the main principles of the "European Innovation Act", it is exclusively about providing certain benefits regarding the fiscal burden. There is no talk of forming a separate tax regime. Thus, the proposal to apply equal innovative relations for all participants, a special preferential tax regime for the implementation of innovative activities, should become another direction for improving this process.

3. Ensuring conditional "heredity" between existing regulatory approaches and future uniform rules for regulating innovation circulation and innovations in the EU will ensure their more organic implementation. This is also evidenced by the fact that within the EU there is already a fairly effective regulatory system of measures for the circulation of innovations. It is based on the Horizon Europe framework program, the implementation of which is already giving a positive economic effect. Thus, in recent years there has been a significant increase in the financial support of innovation processes. The change in the level (increase) of financial stimulation of innovation circulation is indicated in Table 1.

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Table 1

Change in the level (increase) of financial stimulation of innovation circulation in the EU (unit of measurement – millions of euros) [19]

Countries (Territories)	Time period	
	2022	2023
	Million EUR	
European Union – 27 countries (from 2020)	238,964.475	259,525.296
Euro area – 20 countries (from 2023)	205,414.591	223,090.141
Euro area – 19 countries (2015–2022)	204,893.971	222,498.729
Bulgaria	438.866	482.538
Czechia	3,484.369	3,766.184
Denmark	6,726.141	7,139.839
Germany	81,809.385	90,407.703
Estonia	360.727	405.609
Ireland	6,994.975	7,003.745
Greece	1,505.488	1,657.942
Spain	10,901.728	12,615.739
France	38,964.886	40,629.523
Croatia	520.621	591.412
Italy	16,270.234	17,155.883
Cyprus	86.479	89.601
Latvia	105.898	118.11
Lithuania	354.401	322.308
Luxembourg	399.12	402.181
Hungary	1,689.829	1,982.343
Malta	65.245	77.654
Netherlands	14,805.849	16,710.895
Austria	9,804.062	10,618.189
Poland	6,285.632	7,549.249
Portugal	2,566.389	2,843.724
Romania	810.719	1,033.278
Slovenia	839.89	938.471
Slovakia	615.047	713.729
Finland	5,396.934	5,703.063
Sweden	14,104.965	14,471.747
Iceland	513.223	575.165

At the same time, the increase in financial support for innovation circulation provides a significant increase in the number of participants in innovation relations during the same period of time (2020–2022). The change in the number (increase) of participants in innovation relations for the period 2020–2022 is shown in Table 2, [20, 21].

Table 2

The level of change (increase) in the number of participants in innovation circulation in the EU (units of measurement – thousands of pieces) [20, 21]

Number of innovatively active enterprises/ Distribution area	Innovatively active enterprises in 2020 (thousands of units)	Innovatively active enterprises in 2022	Difference (+thousands of units)	Percentage of growth
European zone	314,119	315,918	1,799	+0.57%

At the same time, the implementation and further implementation of the European Innovation Act is impossible without changing the provisions of the Horizon Europe framework program. The introduction of a special classification of innovations, changes in the mechanisms of public (state) procurement provided for by the European Innovation Act will certainly require changes to the Horizon Europe framework program. And such changes should be determined at the stage of forming the basic principles of the updated regulation of innovation circulation, for their greater predictability. All of the above allows to form another direction for improving the process of regulating innovation circulation and innovations in the EU. It can be defined as the formation of a system of responsive changes between the European Innovation Act and the Horizon Europe framework program, to ensure their simultaneous application.

4. In addition, it is advisable to enlarge the object of regulation. Traditional within the EU is the regulation of a certain type of social relations. They are the main object of regulatory influence. At the same time, due to the special nature of innovations, they require systemic regulation in all its manifestations and features. Such a need can be satisfied only when the object of regulatory influence is a holistic system of relations, and not their individual varieties. As a proposal in this regard, it is possible to propose to define the Innovation Life Cycle as an object of prospective regulation of innovation circulation in the EU. It is a process (i. e. a system of relations) that encompasses all stages of the emergence, functioning and termination of innovations. Based on this, it is possible to talk about another direction for improving the process of regulating innovation circulation in the EU. Namely, the formation of such a system of regulatory influence, where instead of individual varieties of social relations, the object of influence will be a holistic system of Innovation Life Cycle.

Summarizing the above, it is possible to form four main directions for improving the process of regulating innovations and innovation circulation in the EU, namely:

– introduction of a single detailed definition of innovations with the characteristics formed in the OSLO-MANUAL recommendations;

– fixing a special preferential tax regime for startups and skyloops in contrast to individual fiscal benefits;

– ensuring a system of responsive changes between the European Innovation Act and the Horizon Europe framework program, to ensure their simultaneous application;

– modeling such a system of regulatory influence, where instead of individual types of social relations, the object of influence will be the holistic Innovation Life Cycle system.

The main advantage of the proposed approaches to changing the regulatory impact on innovation circulation is that they contain universal recommendations for changing the general regulatory approach. It can be implemented without reservations for industry and sectoral features of innovation circulation.

The main disadvantage of the identified areas of improvement of the process of regulation of innovation circulation is a rather high degree of abstraction. Under such conditions, during the practical implementation of these structures within the framework of EU law acts, certain problems of their implementation may arise.

These proposals, for their effective use, must be implemented as official regulatory structures. Only in this way, these restrictions can become measures that will create the prerequisites for increasing the efficiency of innovation circulation. As such an EU regulatory act, the content of which should include these proposals, it is appropriate to define the "European Innovation Act". The expediency of such a step is determined by the fact that this act is the main regulatory document that determines the methods and forms of innovation circulation in the EU.

A significant obstacle to assessing the possibility of achieving the results of this research is the objective impossibility of verifying them experimentally. Because of this, only scientific modeling methods remain available. As a result, it is not possible to assess the possible results of this scientific research in quantitative and qualitative terms.

In order to compensate for the negative impact of such shortcomings, an approximate forecast of the impact of the results of the implementation of updated regulatory structures is proposed. This forecast is based on an assessment of the possible positive impact on innovation turnover indicators, compared to a similar period of time. This method is based on mathematical calculations based on a comparison of statistical data for two different periods of time. This will allow testing the research results and assessing the potential positive effect of their implementation.

The base period of time for comparison should be the time period during which conditions similar to the conditions of the updated regulatory impact from the implementation of the European Innovation Act prevailed. This conditionally "base" period of time is taken as the moment when previously (preliminarily) the updated regulation of innovations and innovation circulation was implemented within the EU within the framework of the Horizon Europe Framework Program. Its impact is seen as being as similar as possible to the impact of the implementation of the European Innovation Act. Within the history of the development of the EU's regulatory influence on innovation circulation, there is no other time period during which such a radical change in regulatory influence on innovation circulation occurred. Before the implementation of the Horizon Europe Framework Program, innovation circulation was identified exclusively with the circulation (transfer) of intellectual property rights. This EU agreement established innovation as the result of scientific and research work. And innovation circulation was defined as a form of transferring the results of scientific and research work [11]. The regulatory impact of the European Innovation Act should be just as radical. The expected result of its implementation should be an updated concept of innovation and innovation circulation, which will be based on broader forms of their transfer and implementation.

The Horizon Europe Framework Program was implemented in 2013 [11]. Thus, the base period for comparison should be 2012 (the year before the impact of changes in this framework program) and 2014 (the year after the impact of such changes). In other words, during the assessment of statistical indicators of development for 2012, an assessment is made for the period of time when the previous regulation of innovation circulation relations was in effect. The previous one is that on which the regulatory influence of the Horizon Europe Framework Program is not exercised. At the same time, when assessing statistical data for 2014, the basis of analysis is taken as the innovation circulation that is already carried out according to the rules established by the updated regulation of these relations. The regulatory influence of the Horizon Europe Framework Program has already been exercised on innovation circulation within the period of 2014. If, based on the results of comparing these two periods (2012 and 2014), an increase in the number of statistical indicators (increase) is established, this makes it possible to conclude that such an impact is positive. Conversely, if a decrease in the number of statistical indicators is detected, it is possible to conclude that such regulation has a negative impact.

The first criterion for assessing the potential impact is the number of economic entities within the EU that use on a permanent basis the results of scientific and research (research and development) works for 2012 and 2014 [22, 23]. The level of change (increase) of economic entities within the EU that use the results of scientific research (research and development) on a permanent basis is shown in Table 3.

The second criterion for assessing the potential impact is the number of participants in innovation relations within the EU, for 2012 and 2014 [24, 25]. The growth rate of economic entities within the EU that use the results of scientific research (research and development) on a permanent basis is shown in Table 4.

Thus, the data presented in Table 3 and Table 4 indicate the overall positive effect of the implementation of the Horizon Europe Framework Program. Thus, within one year from the moment of its adoption, the total number of participants in innovation circulation within the EU increased by 5.5% (on average).

Considering the method of regulatory impact of the future European Innovation Act, one should expect a similar increase in efficiency from its implementation, as in the case of the implementation of the Horizon Europe Framework Program. Thus, the potential effectiveness of changing the regulatory structures of innovation and innovation circulation in the EU is capable of increasing (scaling) the number of participants in innovation circulation by 5.5%.

In general, as a result of the forecast of the impact on innovation circulation from the implementation of the European Innovation Act, it can be concluded that there will be an increase (growth) of participants in innovation circulation and, accordingly, innovative business operations at the level of 5.5% of the existing one.

Research limitations. This scientific research was conducted within the territory of Ukraine, under the influence of the restrictive conditions of martial law. As a result, more statistical information was used in its conduct, which is placed in open sources, and fewer scientific studies on similar issues, due to the lack of free and open access to them.

Prospects for further research. The conclusions obtained as a result of this scientific research can be used as the basis for further scientific research on the formation of directions for improving the means of innovation stimulation and sustainable development policy. Thus, in particular, it is considered appropriate to further study the system of methods and means of innovation stimulation and means of achieving sustainable development goals within the EU.

Table 3

The level of change (increase) of economic entities within the EU that use the results of scientific research (research and development) on a permanent basis (unit of measurement – thousand units) [22, 23]

Number of business entities/ Distribution area	Number of economic entities within the EU that use on a permanent basis the results of scientific research (research and development) works in 2012 (thousands of units)	Economic entities within the EU that use on a permanent basis the results of scientific research (research and development) works in 2014 (thousands of units)	Difference (+thousands of units)	Percentage of increase
European zone	75.443	79.601	4.158	+5.51%

Table 4

The growth rate of participants in innovation relations within the EU (unit of measurement – thousand units) [24, 25]

Number of participants in the innovation circulation/Distribution area	Number of participants in innovative circulation in 2012 (thousands of pieces)	Number of participants in innovative circulation in 2014 (thousands of pieces)	Difference (+thousands of pieces)	Percentage of increase
European zone	12.932	13.649	717	+5.54%

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4. Conclusions

1. It is determined that the existing system of regulation of innovation circulation and innovations in the EU does not meet the needs of the participants in these relations. The need to improve the current regulatory methods of innovation circulation is proven, in order to bring them into line with real needs.

2. The following directions for improving regulatory methods of influencing the innovation circulation in the EU have been formed, namely:

– formation of a single detailed definition of innovations with the characteristics formed in the recommendations of the "OSLO-MANUAL";

– formation of a special preferential tax regime for startups and skylaps in contrast to individual fiscal benefits;

– formation of a system of responsive changes between the "European Innovation Act" and the framework program "Horizon Europe", to ensure their simultaneous application;

– formation of such a system of regulatory influence, where instead of individual types of social relations, the object of influence will be the holistic Innovation Life Cycle system.

Conflict of interest

The authors declare that they have no conflict of interest regarding this research, including financial, personal, authorship or other nature, which could affect the research and its results presented in this article.

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Data availability

The manuscript has no associated data.

Use of artificial intelligence

The authors confirm that they did not use artificial intelligence technologies in the creation of the submitted work.

Authors' contributions

Oleksandr Davydiuk: Conceptualization, Methodology, Formal analysis, Writing – preparation of draft, Writing – review and editing; ***Hanna Shovkoplias***: Conceptualization, Methodology, Formal analysis, Writing – preparation of draft, Writing – review and editing; ***Igor Borysov***: Conceptualization, Methodology, Formal analysis, Writing – preparation of draft, Writing – review and editing; ***Olena Holina***: Conceptualization, Methodology, Formal analysis, Writing – preparation of draft, Writing – review and editing; ***Irina Sokolova***: Conceptualization, Methodology, Formal analysis, Writing – preparation of draft, Writing – review and editing.

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