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DETERMINING THE REGULAR IMPACT ON THE PROCESSES OF STIMULATING THE INNOVATION CIRCULATION WITHIN THE LIMITS OF THE EU SUSTAINABLE DEVELOPMENT POLICY

The object of this scientific research is the system of management and regulatory methods of state influence on the processes of stimulating innovation circulation in the European Union (EU), through the prism of the implemented sustainable development policy. The regular influence on the processes of innovative circulation in the EU is studied, as well as its compliance with the goals of sustainable development. During the study, it was established that the process of stimulating innovative development is partially unified with the implemented sustainable development policy in the EU. It is proved that the existing regulatory model of stimulating innovative circulation in the EU is not focused on achieving most of the goals of sustainable development, and those regulatory structures that are used do not take into account the model of applying the sustainable development policy. Most of the incentive tools are aimed exclusively at protecting the personal interests of participants in innovation relations. The feasibility of improving the current approach to regulating and managing innovation circulation in the EU is substantiated, in order to eliminate the identified discrepancies. Proposals are substantiated regarding the directions of improving state policy tools for the processes of regulating innovation circulation in the EU. Proposals are made to amend the provisions of the Horizon Europe framework program in order to bring it into line with the goals of the EU's sustainable development policy.

The study is aimed at forming general theoretical principles for improving the management and regulatory processes of innovation circulation in the EU. The results of this study 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, to form strategic public management decisions, state policy on innovation circulation, and serve as a basis for further scientific research on these issues. The conclusions obtained in the course of this study can be used to address issues and problems of improving international agreements and EU regulatory documents.

Keywords: regulatory documents, innovation circulation, public needs, innovations in the EU, public relations.

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1. Introduction

The economic system of the European Union (hereinafter referred to as the "EU") is largely based on the processes of mass dissemination and implementation of innovations. They were chosen as the main driver of the development of business relations due to their potential ability to ensure the simultaneous satisfaction of the needs of market participants and the public needs of state and interstate institutions. Due to such features of its participation in public relations, innovations will always be simultaneously in the sphere of influence of private and public interests. These features require an appropriate approach to the formation of regulatory policy tools in the field of innovation relations. Over the past decades, it was the EU that became a conditional reference point for many countries of the world regarding the implemented model of management of processes of stimulating innovation circulation.

The current state of development of processes of stimulating innovations in the EU can be characterized as one that is aimed at finding optimal ways to limit absolute private interests in order to ensure the implementation of socially useful goals. This search is taking place in many directions, the leading of which can be identified as antitrust and competition policy and sustainable development policy.

The EU has never stood aside from global globalization economic processes. On the contrary, its role can be defined in many ways as leading and breakthrough. It is because of this that within the framework of the joint global process of overcoming negative social manifestations and preserving general well-being, which is being carried out within the framework of the United Nations (hereinafter referred to as the "UN"), the EU has also taken an active position. Thus, when, within the framework of discussions on the "platforms" of the UN, in 2015, a special way of regulating the world economy was formed, the EU became one of the first to implement it. This approach was defined as "sustainable development" (in English, "sustainable development"), and the system of means of achieving it was identified as "sustainable development policy".

The main purpose of the sustainable development policy (hereinafter referred to as the "SDP") is to form at the level of official regulatory rules of a certain country such restrictive and permissive means that

would ensure the simultaneous implementation of both private and public interests. At the same time, most of the management and regulatory techniques are based on the previous innovative renewal of the relevant sector of the economy. Because of this, innovations have become a key prerequisite for this process. Given the general restrictive and permissive impact of the SDP, the regulatory approach to the processes of innovative development should automatically acquire similar features. This task has already been partially implemented within the framework of management decisions in the EU, but the degree of its implementation was recognized as ineffective. Despite the relatively low level of effectiveness of the processes of regulating innovation circulation in the EU, the necessary prerequisites for achieving sustainable development goals have been provided. Thus, as of the end of 2023, within the EU, it was possible to record a significant degree of achievement of sustainable development goals. And the main prerequisite for this was the preliminary introduction of advanced and knowledge-intensive innovations [1]. Such a level of real implementation of the tasks set within the EU SDP should become the object of detailed study and research, since it represents a unique result that could not be achieved by other countries. In addition, improving the methods and techniques of regulating innovation circulation can accelerate the process of innovative renewal of spheres of public life and sectors of the EU economy. And this, in turn, will provide conditions for an even higher level of implementation of the goals of sustainable development.

The issue of improving the essence of the means of stimulating innovative development in the EU has been the subject of many scientific studies. Various methods, methods and techniques were used to conduct them. Thus, within the framework of scientific work [1], 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 was studied. The conclusion was substantiated that the provisions of the specified EU regulatory act do not correspond to the real needs of the participants in innovative relations. Proposals were made to improve existing regulatory structures. However, this work did not examine the issues of compliance of innovation policy in the EU, SDP requirements and its compliance with the SDGs.

Within the framework of the work [2], the impact of measures within the framework of sustainable development policy on the processes of innovative investment was investigated. As a result of the study, the conclusion was formed that the introduced regulatory tools are ineffective. The main reason for such inefficiency was identified as the instability of the regulatory impact on the economy, due to the fragmentation of the means of achieving sustainable development goals. The practical experience of the G7, G20, BRICS countries on ways to eliminate the identified shortcoming was analyzed. The conclusion was substantiated about the need to use industrial innovations and advanced marketing management methods in order to eliminate the outlined shortcomings. However, this work did not form unified approaches to changing the regulatory structures of EU law, in terms of means of stimulating innovation circulation.

During the study [3], a system of means of implementing sustainable development goals No. 7–9, 11, 12 within the EU was developed. The conclusion was formed that the main disadvantage of sustainable development policy in the EU is its fragmentation and non-systematicity. It was determined that the sustainable development policy has extremely negative economic consequences for small and medium-sized enterprises in the EU. The need for further development of innovation ecosystems as the main method of supporting business entities within the EU was substantiated.

In work [4], factors influencing the level of efficiency in achieving sustainable development goals in the EU were investigated. The low level of efficiency of sustainable development policy within the EU was determined. One of the reasons for this was the imperfection of regulatory structures. This situation leads to the fact that those participants in economic relations who fall under the influence of the sustainable development economy in the EU cannot understand the essence of the

tasks set before them. In turn, this makes it impossible for public interaction to provide EU management institutions with information about the effectiveness of such influence. The lack of feedback from society leads to further incorrect management decisions. Proposals were made to establish additional mechanisms for providing information from public institutions to EU management bodies. However, no proposals were made to improve regulatory structures.

Within the framework of the study [5], individual aspects of the implementation of the sustainable development goal focused on ensuring access to clean energy are studied. An indicative concept of regulation within the framework of state policy has been formed as a way to achieve the goal of the study. Proposals have been substantiated to improve the regulation of the circulation of innovations. However, the work did not identify general universal regulatory structures on this issue.

In the work [6], the influence of the state's tax and customs policies as a means of achieving sustainable development goals was studied. Also, the level of efficiency of resource provision based on the consumption of renewable energy sources was analyzed. It was concluded that fiscal policy should be subordinated to the policy of sustainable development. However, within the framework of this study, generalized proposals for improving the place of innovations in the mechanism for achieving sustainable development were not formed.

Within the framework of the work [7], an assessment of the obstacles of an organizational, economic and administrative nature that hinder the achievement of sustainable development goals was provided. The main obstacle was the inconsistency of the method of analyzing the level of gross domestic product. An experimental method of determining the prospects and effectiveness in the process of achieving sustainable development goals was proposed. The main goal of the work was only to form an alternative approach. It was based only on the level of theoretical research without practical testing. Within the framework of this work, no proposals were formed to improve the means of regulatory innovation circulation in the EU.

During the study [8], the place of innovations in sustainable development policy was studied. Different definitions of sustainable development goals were proven in different countries. The main common feature is the gap between practical management decisions and the goals of sustainable development policy. These differences negatively affect the effectiveness of sustainable development policy. Innovations are proposed to be used as the main and main way to achieve sustainable development goals. However, no conclusions were drawn regarding the improvement of regulatory structures for the circulation of innovations.

All this allows to state that it is advisable to conduct a study aimed at formulating proposals for improving the regulation of means of stimulating innovation circulation in the EU. The proposals formed should be aimed at ensuring a higher level of their effectiveness, precisely through the prism of the ability to achieve sustainable development goals (hereinafter referred to as the "SDGs"). The conclusions formed within the framework of this study can become the basis for further scientific developments, ensure the implementation of relevant international and domestic regulatory acts.

The aim of research is to form directions for improving the system of managerial and regulatory methods of state influence on the processes of stimulating innovation circulation in the European Union (EU), through the prism of the implemented sustainable development policy. This will allow to formulate recommendations for EU institutions regarding the essence of managerial means of influence and proposals for amending EU regulatory acts.

2. Materials and Methods

The object of this scientific research is the system of management and regulatory methods of state influence on the processes of stimulating innovation circulation in the European Union (EU), through the prism

of the implemented sustainable development policy. The object of the research is studied from the point of view of its compliance with the policy and goals of sustainable development.

During the research, a hypothesis was formed that the existing regulatory methods and methods of stimulating innovative development in the EU do not comply with the principles of sustainable development policy.

During the research, a simplification was made, within which regional features of the implementation of sustainable development policy at the level of national systems of individual countries were not taken into account. The basis was taken approaches that are common and common to the EU.

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

When conducting the study, general scientific methods were used, namely: deduction, induction, synthesis, analysis, comparison, abstraction, generalization, systemic and functional methods, modeling methods. The methods of deduction, induction, synthesis, analysis and comparison were used in the study of the general system of regulatory techniques for identifying the concept of innovation in EU law. The method of modeling, abstraction and generalization was used in the formation of general conclusions within the framework of this study. Also, in the formation of conclusions and recommendations based on the results of this study, the systemic method was used.

3. Results and Discussion

Regulation of innovation processes within the EU takes place at several management levels. The first level can be called international agreements, the second EU acts, the third level recommendations of individual institutions of this intergovernmental entity. A feature of this system of regulatory influence is that the main and key definitions that allow identifying the features of the main objects of social relations related to the circulation of innovations are placed at the last (third) level of regulatory influence. On the one hand, this makes it possible not to stop working on constantly improving the essence of key concepts, and on the other hand, it has an extremely negative impact on understanding the general purpose of the regulation and management process.

Thus, the place of innovation circulation within the EU economic system is determined by the provisions of the Agreement on Trade-Related Aspects of Intellectual Property Rights (hereinafter referred to as the "TRIPS Agreement"), which was adopted within the World Trade Organization (hereinafter referred to as the "WTO") [5]. Article 7 of the

General Provisions section of the TRIPS Agreement states that innovation relations are closely related to the circulation of intellectual property rights, and the transfer of such objects should be oriented towards their further implementation as innovations [9]. Such regulatory approaches determine that innovation relations are part of intellectual objects and should be oriented towards the real (production) sphere of the economy. At the same time, they were defined as independent and independent objects.

This approach was also reflected within the recommendations that were formed at the level of the World Intellectual Property Organization (hereinafter referred to as "WIPO"). Thus, in the course of the activities of this international organization, a management approach was formed, which assesses the effectiveness of the implementation of intellectual property rights from the point of view of their fulfillment of the role defined by the TRIPS Agreement. Thus, activities related to the formation of the Global Innovation Index, a report in the context of the world economy, on the degree of use and impact of innovations on the economic systems of different countries were initiated. The basis of this analysis and observation were the following criteria:

- regulatory environment;
- business environment;

- human capital and research;
- education;
- R&D;
- information and communication technologies;
- knowledge and results of scientific research [10].

These studies are the most effective guide when making management decisions within the framework of regulatory processes regarding the circulation of innovations. They can be defined as a certain "basis" for the formation of further directions for improving regulatory mechanisms. However, in the course of WIPO's activities, regulatory structures of innovations are not determined. This international institution borrows this category within another means of regulating the circulation of innovations.

This tool is the recommendations formed in the course of joint activities of the International Organization for Economic Cooperation and Development (hereinafter referred to as the "OECD") and Eurostat. Several such recommendations have been formed. As of the time of this study, the 2018 edition of such recommendations is in force and is being used, with its own name "Oslo Manual" [11]. It is in this regulatory act that the definition of innovation was formed in the form in which it is used both by EU business entities and when making management decisions within this intergovernmental entity. Thus, innovation is:

- 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) [11].

The means of stimulating innovation circulation in the EU are regulated by a special regulatory act. It is the Horizon Europe Framework Program (hereinafter referred to as "Horizon Europe" [12]. Within the framework of this framework program, a system of means of stimulating innovation development is determined, based mainly on financial instruments. All means of stimulating innovation circulation in the EU under "Horizon Europe" can be divided into 3 main categories:

- 1) financing;
- 2) indirect financial support;
- 3) means of individual support.

In addition to pan-European means, it is also necessary to take into account those means of support that are provided at the level and on the initiative of EU member states. The general system of levels and means of stimulating innovation circulation in the EU is shown in Fig. 1.

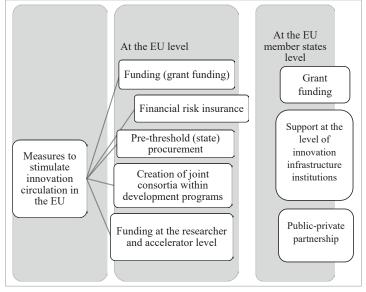


Fig. 1. Levels and measures of stimulating innovation circulation in the EU [8]

In the preamble to Horizon Europe, the EU declared the objectives towards which the implementation of the entire system of means of stimulating innovation circulation is aimed. These included the following:

- ensuring scientific, technological, economic and social impact from Union investments in research and innovation in order to strengthen the scientific and technological basis of the Union;
- promoting the competitiveness of the Union in all Member States, including its industry, achieving the strategic priorities of the Union and contributing to the implementation of the objectives and policies of the Union;
- addressing global challenges, including the SDGs.

As can be seen from the above, the EU, by introducing a system of means of stimulating innovation circulation, pursues the goal of achieving the Sustainable Development Goals (SDGs). What is the SDG and what goals were set for it within the EU?

For the first time, the idea of sustainable development began to be discussed in the 60s of the twentieth century. The first attempts at its formalization date back to 1972 and are associated with the Stockholm UN Conference on the Human Environment [3]. Later, in 1987, the UN established the World Commission on Environment and Development (hereinafter referred to as the "WCED") [4]. The final understanding of the SDGs was formed at the New York session of the UN General Assembly, which formed 17 main SDGs and 169 tasks for their implementation [13].

If to characterize the SDG concept as a whole, it is a system of coordinated and optimal restrictive means. The main purpose of these measures is to achieve the public good by limiting the absolute interests of individual subjects [14]. The main disadvantage of such a concept is that the methods of such restriction must be extremely balanced. Even the smallest flaw in their system can lead to extremely negative economic consequences and disruption of economic growth mechanisms.

As already defined, the EU did not stand aside from the process of forming the SDP. Rather, on the contrary, it became a conditional experimental platform on which the restrictive means of the SDP were first introduced. Thus, in 2010, the EU approved a 10-year development strategy – "Europe 2020: a strategy for smart, sustainable and inclusive growth" [15].

Within the framework of this program, the following SDGs were defined for the EU for the period from 2010 to 2020. These goals are shown in Fig. 2.

Starting in 2021, the EU adopted the SGP model approved by the UN [1, 3, 4]. According to the results of the study of the regulation of innovation circulation in the EU, as well as the established SDGs of this intergovernmental entity, it can be concluded that they are closely interconnected. Analysis of EU statistical data allows to determine a direct dependence on the level of financial stimulation of innovations and the degree of achievement of the SDGs.

Thus, for the period from 2014 to 2023, the total amount of financial support (support) for innovation circulation in the EU increased from 159,607.928 million EUR to 253,100.768 million EUR [16].

Detailed information on the dynamics of change (growth) of financial incentives for innovation circulation is given in Table 1.

Table 1

Dynamics of change (growth) of financial incentives for innovation circulation in the EU [16]

[]		
GEO (Labels)	Time	
	2014	2023
	millions of euros	
European Union – 27 countries (from 2020)	159607.928	253100.768
Euro area – 20 countries (from 2023)	140542.325	217085.864
Euro area – 19 countries (2015–2022)	140378.337	216495.336
Belgium	6675.968	14676.151
Bulgaria	223.416	482.538
Czechia	1706.149	3766.184
Denmark	4938.429	6883.521
Germany	56996.5	88707
Estonia	124.829	405.609
Ireland	2106.8	-
Greece	504.37	1657.949
Spain	6784.311	12615.739
France	31132.941	40516.876
Croatia	163.987	590.528
Italy	12343.773	16222.979
Cyprus	20.009	88.5
Latvia	57.8	117.344
Lithuania	116.336	323.264
Luxembourg	331.9	379.966
Hungary	1021.992	1982.343
Netherlands	9444	15390.784
Austria	7324.679	10729.518
Poland	1800.086	7549.249
Portugal	1035.966	2833.962
Romania	238.41	1033.278
Slovenia	688.518	938.471
Slovakia	246.678	713.729
Finland	4409.5	5703.1
Sweden	9125.79	14307.863
Iceland	159.299	540.495
Bosnia and Herzegovina	6.81	-
Montenegro	4.839	-
Serbia	76.053	287.177

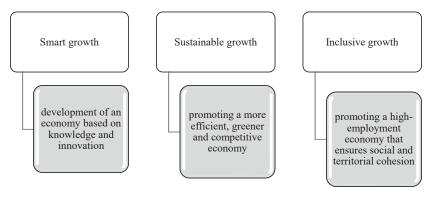


Fig. 2. Sustainable Development Goals are formulated in the European Union strategy "Europe 2020: a strategy for smart, sustainable and inclusive growth"

During the same period, according to the official Eurostat report, a high degree of growth in SDG achievement indicators within the EU was recorded [17]. The dynamics of the degree of SDG achievement are shown in detail in Fig. 3.

Despite the key role of innovations in achieving the SDGs, as well as the declaration of the goal of stimulating them for the sake of achieving the SDGs, the means of supporting the innovation cycle actually do not take into account the outlined features [1]. As was determined in the course of this study, the SGP is a model in which the personal interests of an individual participant are limited for the sake of achieving public goods.

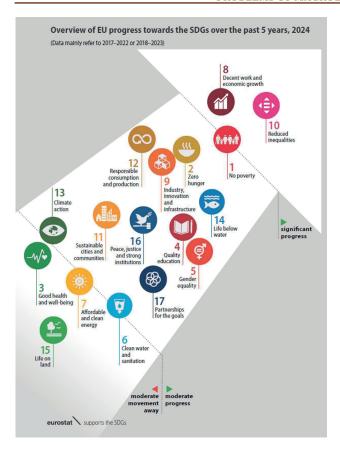


Fig. 3. Dynamics of the degree of achievement of the SDGs in the EU [17]

A systematic analysis of the Horizon Europe program allows to establish that its regulatory structures almost do not contain any restrictive means. On the contrary, the general approach can be characterized as permissive, which fixes absolute guarantees for an individual subject, and not restrictions for public interests [12]. Thus, it is in this aspect that the inconsistency of regulatory approaches to stimulating the innovation cycle, the essence of the SDP and the SDGs that were approved in the EU is seen. Such a discrepancy can be eliminated in only one way, namely by changing the regulatory structures of the Horizon Europe program. Given that the issue of improving the provisions of EU regulatory acts is not adequately covered in the scientific literature, it is considered appropriate to formulate our own proposals for their improvement. As a basis for such proposals, it is advisable to take the results of scientific research [2, 5, 6], where it is substantiated that the most effective way to eliminate the low level of efficiency is to change the regulatory structure used within the framework of the relevant state policy. Based on this direction and the method of eliminating the identified shortcomings, the main directions of such improvement should be the following:

- the division of those innovations that claim to apply measures to stimulate innovation turnover to those that contribute to the achievement of the SDGs and are not aimed at this;
- the formation of special rules for the public (public) dissemination of information about such innovations that will be created as a result of applying measures to stimulate innovation turnover;
- restriction of the exclusive rights of the innovation developer to use those innovations that contribute to the achievement of the SDGs.

The main advantage of the proposed approaches to changing the regulatory impact on innovation circulation is that they will act on all innovations without exception. Such an approach allows to level out the industry and sectoral features of innovation circulation in the EU. Unlike other methods of compensating for these shortcomings, such as those indicated in [7], the proposed methods allow to eliminate the pedestrian

problem, and not to level out the negative economic consequences. The main disadvantage of the identified areas of improvement of the process of regulating 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 problems are due to a rather broad approach to defining innovations within the EU. As a way to solve these shortcomings, further work on improving the concept of innovation within the framework of official EU regulatory acts can be identified.

These proposals, for their effective use, should be implemented as official regulatory structures. Only in this way, these restrictions can become measures that will create the prerequisites for achieving the SDGs. As such an EU regulatory act, the content of which should include these proposals, it is advisable to identify the Horizon Europe Framework Program. The feasibility of such a step is determined by the fact that this act is the main regulatory document that determines the methods and forms of stimulating innovation circulation in the EU.

A significant obstacle to assessing the possibility of achieving the results of this study 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 study in quantitative and qualitative dimensions.

The impact of martial law conditions. This scientific study was conducted within the territory of Ukraine, under the influence of restrictive martial law conditions. As a result, more statistical information published in open sources and fewer scientific studies on similar issues were used in its conduct, 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.

4. Conclusions

It was determined that the system of management and regulatory methods of state influence on the processes of stimulating innovation circulation in the European Union (EU) does not correlate with the approved SDGs.

The need to improve the current management and regulatory methods of state influence on the processes of stimulating innovation circulation is proven, in order to bring them into line with the design of the SDGs in the EU.

The following directions for improving management and regulatory methods of state influence on the processes of stimulating innovation circulation in the EU are formed, in order to bring it into line with the existing SDGs, namely:

- division of innovations into those that contribute to the achievement of the SDGs and those that are not aimed at this;
- formation of the obligation to publicly (publicly) disseminate information about innovations that contribute to the achievement of the SDGs;
- limitation of guarantees of the innovation developer on the use of innovations that contribute to the achievement of the SDGs.

The proposed directions for improving the management and regulatory methods of state influence on the processes of stimulating innovation circulation in the EU were formed for the first time and they can be identified at the level of absolute novelty. In the case of implementing the identified directions for improving innovation circulation, prerequisites are created for focusing and centralizing incentive measures on those innovations that will ensure the achievement of the SDGs within the framework of the SDP in the EU.

Conflict of interest

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

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The study was conducted without financial support.

Data availability

The manuscript has no related data.

Use of artificial intelligence

The authors confirm that they did not use artificial intelligence technologies when creating the presented work.

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