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Innovation-digital direction of the development in the context of the regional asymmetry

Інноваційно-цифровий напрям розвитку в контексті регіональної асиметрії

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Abstract

The purpose of the article is to substantiate the directions of state regulation of the processes of information and digital development, which will contribute to the reduction of the processes of differentiation of the development of regional economic systems. The study used an institutional approach that allows with a high degree of subordination, logic and consistency to study the diverse phenomena and processes associated with innovation and digital development, to take into account not only changes in formal and informal institutions, but also changes in global economic processes. self-identification of regions. The tools of state regulation of innovation and digital development of the regions should be singled out. The role and importance of informal institutions of innovation and digital development of regions are outlined. Direct and indirect methods of supporting scientific, technical and innovative activities are identified. The necessity of formation of strategic directions of innovation and digital development of regions is proved.

Анотація

Метою статті виступає обґрунтування напрямів державного регулювання процесів інформаційно-цифрового розвитку, що сприятимуть зменшенню процесів диференціації розвитку регіональних економічних систем. У дослідженні було застосовано інституціональний підхід, що дає можливість з високим ступенем підпорядкованості, логічності та послідовності досліджувати різнохарактерні явища та процеси, що пов'язані із інноваційно-цифровим розвитком, враховувати не тільки зміни формальних та неформальних інститутів, а також зміни глобалізаційних економічних процесів, процеси самоідентифікації регіонів. Виокремлено інструментарій державного регулювання інноваційно-цифрового розвитку регіонів. Окреслено роль та значення неформальних інститутів інноваційно-цифрового розвитку регіонів. Визначено прямі та непрямі методи підтримки науково-технічної та інноваційної діяльності. Доведена необхідність формування стратегічних

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Keywords: state regulation, regional development, region, asymmetry of regional development, innovation and digital development, digitalization.

Ключові слова: державне регулювання, регіональний розвиток, регіон, асиметричність регіонального розвитку, інноваційно-цифровий розвиток, цифровізація.

Introduction

Current trends in socio-economic development of regions at different levels demonstrate the deepening asymmetry of their development. The asymmetry of socio-economic development is seen as an urgent issue of regulating the development of regions and modernizing their structural adjustment. One of the ways to overcome the asymmetry of regional development is innovation and digital development aimed at providing more efficient conditions for economic activity in all areas, including depressed, rational use of production and resource potential and non-renewable resources, achieving sustainable development goals, improving living standards and quality of life. regions, cities and towns. Globalization trends in the world economy show that today the future of the country and its development depends on two main factors: the direct development of high technology, and secondly, the implementation of high technology in all other areas of economic activity.

Also, it should be noted that despite the available scientific, innovative and intellectual potential of Ukraine in the country there is a slow formation of modern and large-scale market of innovative products and infrastructure of innovative activities. There is an inefficiency of the administrative and organizational structure of innovation and digital development management and the lack of a clear strategy for the country's transition to post-industrial development based on the innovation and digital platform.

This and other reasons determine the relevance of the study of state regulation of innovation and digital development as a way to overcome the asymmetry of regional development.

The purpose of the article is to substantiate the areas of state regulation of information and digital development processes that will help reduce the processes of differentiation of regional economic systems. To achieve this goal, the following tasks were solved: the relevance of this study and the work of scientists in this area of research; the application of the institutional approach to the object of research is substantiated; identification of tools for state regulation of innovation and digital development of regions; the role and importance of informal institutions of innovation and digital development of regions are outlined; identified direct and indirect methods of supporting scientific, technical and innovative activities; the necessity of formation of strategic directions of innovation and digital development of regions is proved.

The methodological basis for studying the regulatory aspects of innovation and digital development as a way to overcome the asymmetry of regional development is the institutional approach, which allows with a high degree of subordination, logic and consistency to explore diverse phenomena and processes related to innovation and digital development. Its application makes it possible not only to clarify the current state of regulatory support for innovation and digital processes as a determinant of development and reduce the asymmetry of regions, but also to identify areas for optimization and direction of regulatory changes in this area.

Literature Review

Many leading research projects are devoted to regional development issues, including innovation and digital aspects. Among domestic and foreign authors should be noted: Alraja, M.N., et al, (2020); Andriushchenko, K., et al, (2022); da Rocha Teixeira, F., et al, (2022); De Silva, I. (2019); Deineko, L., et al, (2022); Djakona, A., et al, (2020); Garafonova, O., et al, (2021); Khadzhynov, I., et al, (2022); Khanin, S., et al, (2022); Khodakivska, O., et al, (2022); Kholiavko, N., et al, (2021); Kholiavko, N., et al, (2022); Klymenko, E.Y. & Alpeissova, S.E (2021); Krasnonosova, O., et al, (2022); Popadynets, N., et al, (2021); Popelo, O., et al, (2021); Samiilenko, H., et al, (2021); Samoilovych, A., et al, (2021); Tulchinskiy, R., et al, (2021); Tulchynska, S., et al, (2022); Vakhovych, I., et al, (2021); Wang, P., & Cen, C. (2022) and other.

The aim of the article (Khadzhynov et al., 2022) is to study the impact of digitalization on the potential-creating space of regions in the context of sustainable development. The study (Samiilenko et al., 2021) analyzes the innovative development of regions in the digital economy. Scientists (Tulchinskiy et al., 2021) reveal the strategic guidelines for the intensification of regional development under the influence of potential determinants in the context of digitalization. Within the limits of article (Khanin et al., 2022) the organizational and economic mechanism of maintenance of sustainability of development of region on the basis of influence of potential-creating space in the conditions of formation of creative economy is offered.

Scientists (Krasnonosova et al., 2022) have developed an organizational and economic mechanism for attracting investment resources in the innovative development of regions in sustainable development teams. Article (da Rocha Teixeira et al., 2022) considers the impact of higher education institutions on the digital development of regions. The authors (Kholiavko et al., 2021, 2022) analyze the role of higher education and ways to increase the adaptability of universities to the digital economy.

Article (Djakona et al., 2020) demonstrates the adaptability of higher education to the digital economy. Scientists (De Silva, 2019) consider the problems caused by the digitalization of the economy based on the experience of the French antitrust authority. Article (Klymenko & Alpeissova, 2021) considers the experience of Ukraine and Kazakhstan in digitizing education in quarantine. Article (Myovella et al., 2020) is devoted to the comparative analysis of digitalization and economic growth. A study by scientists (Alraja et al., 2020) analyzes the process of digitization in developing countries.

The authors of the study (Khodakivska et al., 2022) developed a methodological approach to assessing the level of economic security of innovative enterprises based on the use of taxonomic analysis of key indicators of their institutional support for optimal management and forecasting of economic development of regions. Researchers claim that the proposed evaluation indicator is universal and its interpretation makes it possible to identify the relationship between the main integrated indicators for the regions, taking into account the unevenness of their economic development.

Researchers (Popadynets et al., 2021) analyzed the main trends in the development and management of eco-innovation in the EU and the role of environmentally friendly innovation for business and society. Taking into account the experience of the European Union, the authors outline the main trends and prospects for strengthening the competitiveness of the regional economy.

The authors (Wang & Cen, 2022) argue that digital technologies play a key role in improving the efficiency of innovation. Researchers have investigated that innovation efficiency has significant positive spatial externalities, and the digital economy has significant positive direct effects and spatial side effects on innovation efficiency, but the above effects are heterogeneous across regions and innovation actors.

The article (Deineko et al., 2022) examines that digital inequality of regions is considered one of the urgent problems of sustainable development in less developed countries. The authors analyze the relationship between the regional digital divide and the level of economic development in Ukraine and the generalization of international practices to promote digitalization in lagging regions.

The authors of the article (Samoilovych et al., 2021) outline the components of digital transformation of the regions of Ukraine, among which the emphasis is on creating an effective digital infrastructure; introduction of Industry 4.0 technologies in industry; e-government and training of the workforce according to the requirements of the digital economy. Scholars argue that the digitization process should be systemic at both the national and regional levels.

The aim of the research (Popelo et al., 2021) is to develop a methodological approach to modeling and forecasting the innovative activities of regional economic systems, as well as its testing on the example of Polish provinces. The authors argue that the developed methodological approach to forecasting the innovation activity of regions will help focus the efforts of regional authorities on the most influential factors of innovation of specific regional economic systems.

Within the framework of scientific work (Garafonova et al., 2021), a methodological approach to determining the impact of public administration on regional development in the context of digital transformation is proposed. The

authors have developed a methodological approach based on the model of a system of differential equations to determine the social, reproductive and mobilization functions of public administration of regional development in the context of digital transformation.

Scientists (Tulchynska et al., 2022) have developed a methodological approach to the qualimetric calculation of innovation activities of regional economic systems, taking into account the processes of digitization. The authors performed a cartographic analysis and identified the leading regions, outsider regions and regions with the average value of the integrated index of innovation activity.

The authors' article (Andriushchenko et al., 2022) is based on the development of tools for managing the innovation potential of the region based on the use of the mapping process. Scientists have proposed a scheme for forming a roadmap for the development of innovation potential of the region, which includes a SWOT-analysis of the development of innovation potential of the region, as well as an algorithm for assessing regional innovation potential.

The aim of the article (Vakhovych et al., 2021) is to analyze the European unity policy and EU regional policy and substantiate the feasibility of implementing a model of smart specialization of regions to ensure sustainable regional development on an innovative basis and improve the living conditions of households. The authors offer recommendations for improving the processes of forming innovative regional strategies taking into account the principles of the concept of "smart specialization", substantiated the need to form a map of unique, innovative competencies of regions and clusters of the country.

Despite the significant number of publications on innovation and digital regional development, the issues of regulatory aspects of innovation and digital development and the problem of overcoming the asymmetry of regional development need further research and analysis.

Methodology

The methodology of the institutional approach to the regulatory aspects of innovation and digital development makes it possible to highlight the functioning of institutions and their role in reducing the asymmetry of regional development through innovation and digital development. Such institutions include both formal rules enshrined in official regulations and regulations, and informal institutions in the form of certain mechanisms of coercion, restrictions, traditions, mentality, rules, and so on. In addition to formal and informal institutions, the methodology of this approach makes it possible to take into account regional multifunctional institutions, which under the policy of decentralization act as a platform for innovation and digital development, forming a certain institutional set. The validity of the institutional approach to the regulatory aspects of innovation and digital development to overcome the asymmetry of regional development is due to the fact that driving changes in socio-economic development to overcome asymmetry and innovation and digital progress is impossible without institutional change. and the most effective use of local potential to achieve the goals of improving the quality of life, socio-economic and environmental development, gaining competitive advantage in the world market, improving economic security, etc.

The importance of institutions is to reduce uncertainty in the innovation and digital direction of regional economic systems by establishing a stable structure of interaction between regional actors, which contributes to sustainable economic growth and reduce the asymmetry of development between regions. The methodology of using the institutional approach makes it possible to take into account not only changes in formal and informal institutions, but also changes in globalization economic processes, processes of self-identification of regions and so on.

Results and Discussion

The current stage of social development involves the formation of the digital economy and the implementation of digitalization in all spheres of life, it raises the issue of not only state but also regional regulation of digitalization processes. Digital "inequality" between regions is one of the reasons for the deepening asymmetry of regional development. Some regions are actively involved in the processes of formation and implementation of tasks of digitalization of the economic space, which helps them to use resources more efficiently, to provide competitive advantages. Other regions that are more inertly involved in digitalization processes are losing some opportunities to boost economic growth and increase social development. This requires state regional management of the processes of digitalization of regional economies and their inclusion in the priorities of state regional policy.

To date, taking into account the implementation of world best practices in Ukraine, the basic principles of digitalization of economic processes and social development in general have been established, which includes the development of information and communication technologies and economics, education, science, health care, public administration, etc.

The tools of state regulation of innovation and digital development of the regions should include (Fig. 1):

Firstly, the institutional and legal tools that provide for the adoption of a number of laws on digital innovation, strategies and targeted programs aimed at digitalization and innovation development of regions, implementation of concepts for transformation and formation of a single digital space with the European Union, intellectual property rights and stimulation of scientific and innovative activity;

Secondly, economic tools that provide for the improvement of tax, customs, investment, innovation policy in the direction of intensifying innovation development and digitization of the economy. Introduction of concession models for financing innovation projects in the regions, development of innovation infrastructure and information and communication technology systems, state support for digitalization development projects. Intensifying the use of public-private partnership models by establishing close cooperation between government and business;

Thirdly, the administrative and organizational tools provide for the transition to e-government; providing access to broadband Internet; licensing of technologies and digital services, standardization and certification of technologies in accordance with international standards; development of innovation-industrial and digital infrastructure; cyber security; implementation of regulations for the transition to electronic document management and digitization of technical and other documentation, etc.;

Fourthly, information tools, providing wide access to broadband Internet connections, intensifying the use of digital platforms, means and devices of communication and information transfer, spreading awareness of the population of the regions about the possibilities of digitalization;

Fifthly, socio-psychological tools, the formation of new educational programs and competencies of higher education in the direction of innovation and digital development; advanced training and ensuring the acquisition of new competencies of employees in all spheres of economic activity; development of digital culture and digital skills of ordinary citizens; introduction of digitalization processes in the social sphere and public administration;

Sixthly, technical and technological tools, stimulating the introduction of devices of mobile technology for control and operational management of business processes; introduction of cloud technologies; digitalization of the real sector of the economy and public administration; development of e-commerce technologies and e-business processes.

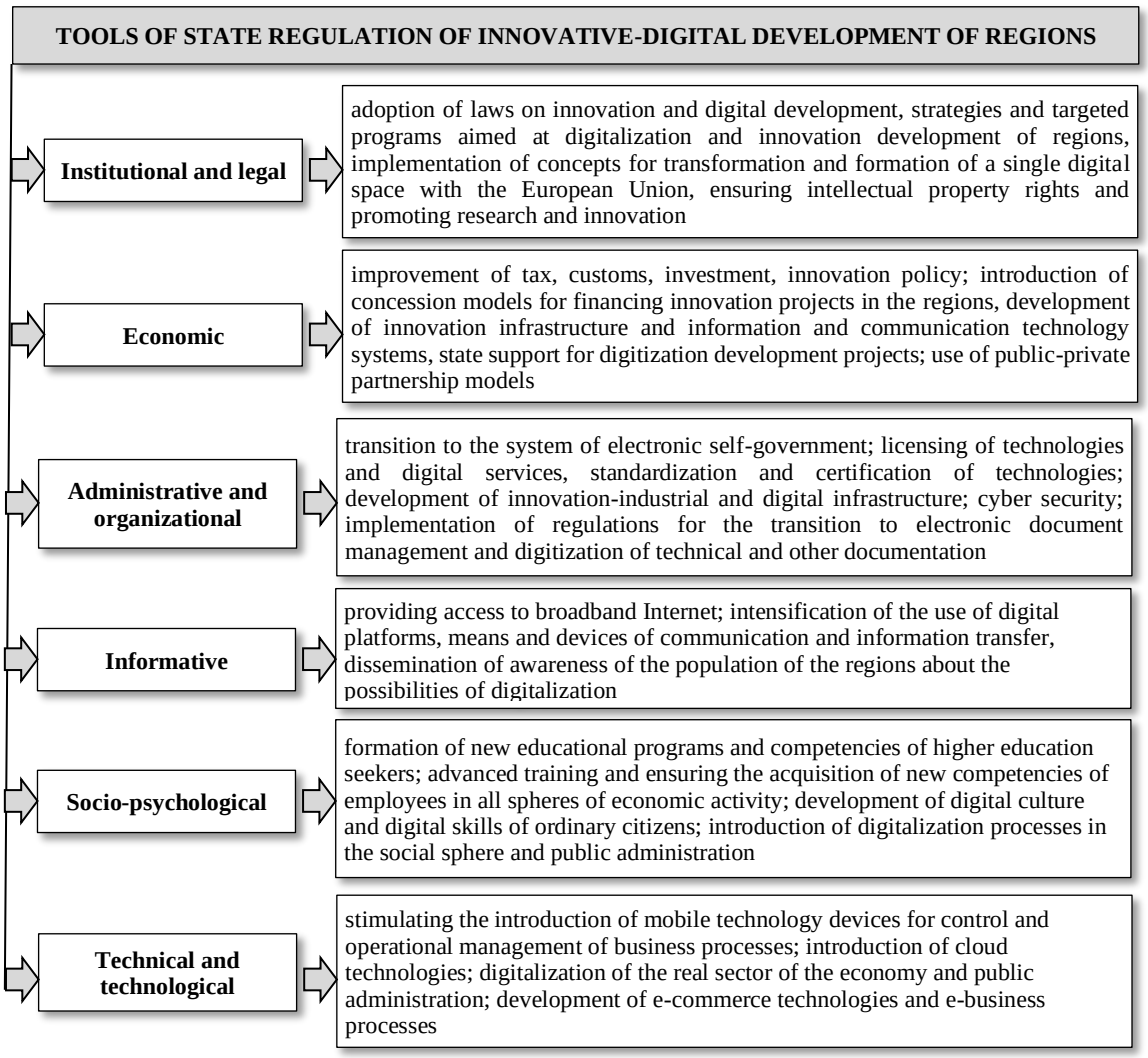

Figure 1. Tools for state regulation of innovation and digital development of regions.
Source: suggested by the authors

The use of the tools of state regulation will help to intensify the development of the regions, taking into account the existing potential opportunities in the innovation and digital direction, which will reduce the asymmetry of regional development.

The creation of an institutional and legal field will help ensure favorable conditions for the development of digital networks and the introduction of innovations through the adoption of legislative changes and the development of the necessary public institutions that will promote innovation and digital development of the regions. The use of economic methods to improve tax and other policies, as evidenced by world practice, promotes innovation, for example, through the operation of industrial parks and other types of innovation infrastructure, which allows to intensify economic processes in backward regions. This is facilitated by the processes of digitalization of the economy using a wide range of economic tools aimed at maximizing the growth potential of digitalization of economic processes in accordance with the principles of creating a single digital space. Of great importance for economic development is the introduction of digital technologies in production processes in accordance with the principles of the program "Industry 4.0". Administrative methods make it possible to provide better conditions for all economic entities to digital goods and services, which stimulates consumption and has a positive effect on stimulating production processes. Forecasting and diagnosing problems and needs in knowledge and skills of digitalization makes it possible to focus on the formation of skills, knowledge and competencies in this area and provide the necessary changes in education and training to provide certain necessary knowledge of employees, which improves staff quality

capacity and reducing the backlog of demand in the labor market and the supply of specialists with relevant digital competencies.

In addition to formal institutions that provide innovation and digital development, which include various legislative acts, regional, departmental, instructional, administrative and other documents important for overcoming the asymmetry of regional development using innovation and digital base are informal institutions of social development. Such informal institutions of innovation and digital development of regional economic systems should include customs, values, traditions, rules of conduct of economic entities, etc. Directing informal institutions towards the need and promoting innovation and digital principles of economic development is very important because they form values and mentality, create an internal component of the scientist and innovator, form an attitude to the environment and promote digitalization and information. Thus, in addition to the development of formal institutions in the direction of innovation and digital development of regions to reduce their asymmetry in development, it is important to develop informal institutions that will promote the mental acceptance of innovation and digital development.

In turn, to obtain a positive effect from digitalization requires intensifying the innovative development of regions. Traditionally, state regulation of innovation development involves direct and indirect methods. Direct regulation is designed to directly influence the processes of scientific and technological development and innovation, which provides (Fig. 2):

– determination in accordance with world trends of scientific and technical development of priorities for the development of science and technology, as well as the direction of state scientific and technical programs;
– direct state order in the field of science and technology and innovation;
– formation of measures to encourage scientific and technical personnel and young scientists;
– conducting state scientific and scientific-technical examination, and state policy in the field of patents and licenses;
– budget funding of research and scientific works in accordance with the priorities of scientific and innovative activities.

Indirect methods of regulation have a significant impact on the innovative development of regions. These include:

– tax benefits and other preferences for innovative projects and innovative enterprises and their associations;
stimulating financial and credit and depreciation policy in relation to the subjects of innovation activity;
stimulating international scientific and technical cooperation;
legal protection of intellectual property, etc.

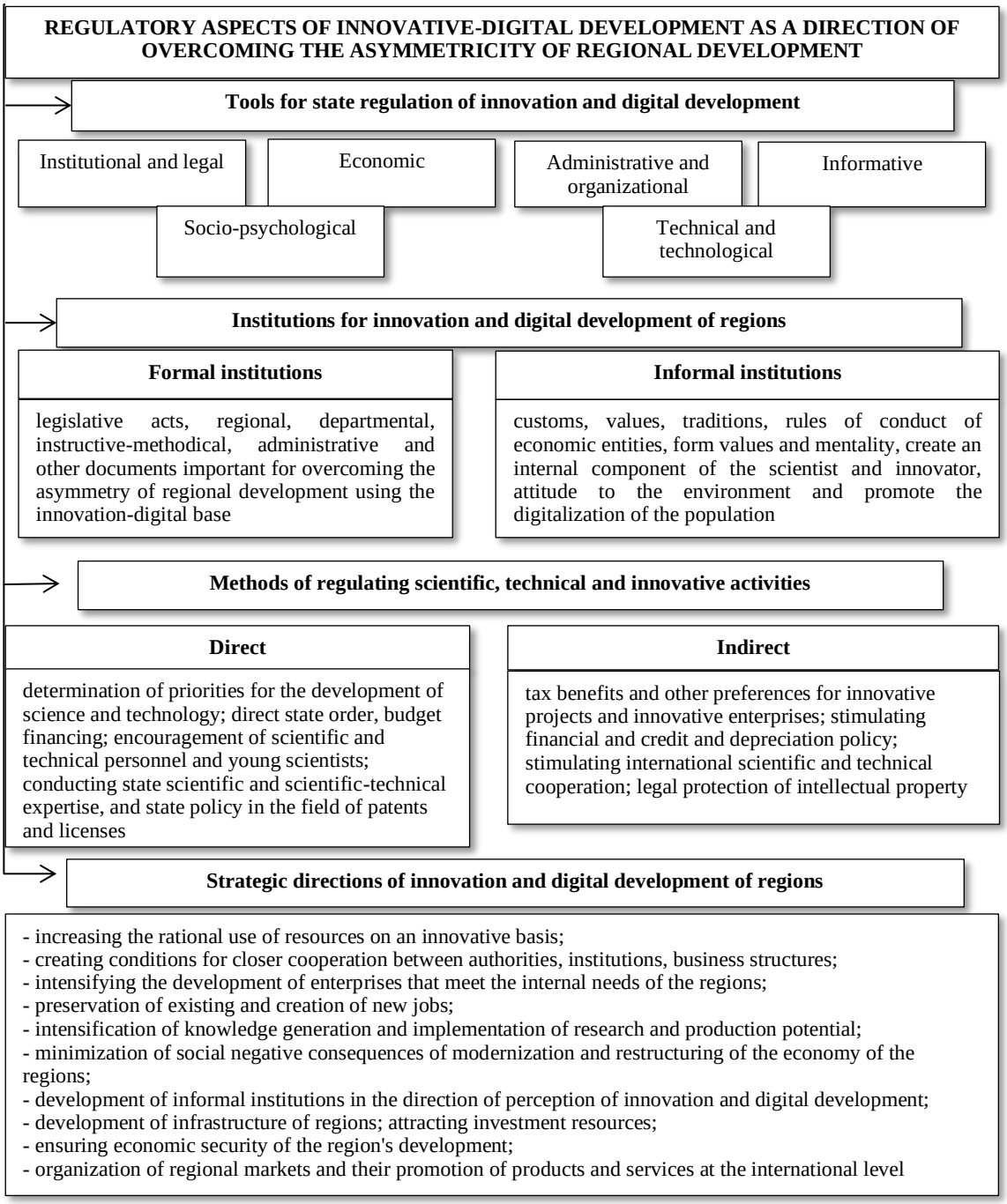

Figure 2. Regulatory aspects of innovation and digital development as a direction of overcoming the asymmetry of regional development
Source: developed by the authors

Comprehensive use of direct and indirect methods of state regulation stimulates innovation in the regions. State regulation of the innovation sphere is conditioned by the need to direct scientific research from the raw material type of development to innovation, taking into account the digitalization of economic processes. Inclusion of the intellectual and innovative component in the production potential, which makes it possible to increase resource efficiency and competitiveness of production and regions in general, both in domestic and foreign markets.

In turn, the innovation and digital development of the regions requires the formation of strategic directions for the development of the regions in relation to:

– increasing the rational use of resources on an innovative basis;

- creating conditions for closer cooperation between regional and local authorities, institutions, business structures using digital technologies, which allows more timely receipt of necessary information and use it to ensure economic development;
- intensifying the development of enterprises that meet the internal needs of the regions, which will increase employment;
- preservation of existing and creation of new jobs using digital technologies, especially in relation to the population in rural areas and depressed areas;
- intensification of knowledge generation and implementation of research and production potential of the region;
- minimization of social negative consequences of modernization and restructuring of the economy of the regions;
- development of informal institutions in the direction of perception of innovation and digital development;
- development of infrastructure of regions;
- attracting investment resources, including through public-private partnerships to ensure socio-economic development of the region;
- ensuring economic security of the region's development;
- organization of regional markets and their promotion of products and services at the international level, etc.

Conclusions

The study provided an opportunity to substantiate the tools of state regulation of innovation and digital development of regions as a way to overcome the asymmetry of regional development, which includes institutional, legal, economic, administrative, organizational, informational and socio-psychological tools. innovation and digital direction, which will reduce the asymmetry of regional development.

The scientific novelty of the study is the substantiation of regulatory aspects of innovation and circular development as a way to overcome the asymmetry of regional development, which involves the use of an institutional approach to identify tools for state regulation of innovation and digital development of regions; outlining the role and importance of informal institutions, defining direct and indirect methods of supporting scientific, technical and innovative activities; as well as the formation of strategic directions of innovation and digital development of the regions.

Further research is required on the development of informal institutions for the development of innovation and digital space, which will help overcome the growing trends of asymmetry of regional development.

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