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Petr S. Lemeshchenko, Alexander M. Baranov
Belarusian State University (Minsk, Belarus)

FORMATION OF THE EAEU INFORMATION ECONOMY IN THE CONDITION OF THE GLOBAL SOCIO-ECONOMIC TRANSFORMATIONS

Abstract: on the basis of the concept of the national innovative systems (NIS) and methodology of transforming of socio-economic institutions, the model of the correlation of NIS and the main elements of the information economy has been proposed. Theoretical patterns of the influence of socio-technological, cluster and anthropogenic infrastructures on the transformation of the information economic system have been identified. The main legislative acts ensuring the digital transformation of anthropogenic resources in the EAEU countries were systematized, their comparative analysis with similar legislative initiatives of the PRC was carried out. The strengths and weaknesses of the economic policy for the development of the EAEU information economy in terms of training personnel for digital transformation, personal data protection, and public administration are considered. The model for the formation and development of the EAEU information economic system taking into account foreign experience and the peculiarities of the integration association, the innovative environment, the socio-technological infrastructure of clustering, the educational, scientific environment and metasystems of information exchange in integration associations has been developed.

Keywords: anthropogenic capital, national innovation system, information economy, digital transformation.

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列梅辛科 P. S., 巴拉诺夫 A. M.
白俄罗斯国立大学 (白俄罗斯, 明斯克)

在全球社会经济转型条件下欧亚经济联盟的信息经济建设

摘要:作者以国家创新系统概念和社会经济体制转型方法论为基础提出了国家创新系统与信息经济基本成分相互关联的模式。揭示了社会技术方面联盟的人造基础设施对信息经济系统转型影响的理论上的必然性。系统地说明了保障欧亚联盟国家人造资源数字化的基本法律规定,并以中国有关法律为参照对其进行了比较分析。文章从信息化人才培养、个人信息保护以及国家管理角度讨论了经济联盟国家发展信息经济方面的经济政策的优势和弱势。作者指出了建设和发展欧亚经济联盟信息经济的模式并注意到了一体化特点和外国经验。该模式考虑了创新环境、联盟的社会技术基础设施、教育科学和信息交换元系统的情况。

关键词:人造资本、国家创新系统、信息经济、数字化。

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Introduction. Various regional formations and clusters are a distinct trend of the present time. The Eurasian Economic Union (EAEU) is one of the unions whose member countries are attempting to jointly build national socio-economic systems that correspond to the economic interests, as well as the national and cultural characteristics of these countries. This is a form of cooperation among countries, in which it is assumed that when making joint decisions by the union, it should represent the best expression of human capabilities, the potential of human activity, taking into account the achievements of science, technology, natural technological constraints, and also the limitations of capital in its traditional forms. From our standpoint, the use of exclusively *a technocratic approach* in the study of the information economy has significant cognitive limitations, as it does not take into account creativity, invention, and the anthropogenic activity of labor resources as subjects of scientific knowledge, focusing solely on technical and engineering operations. From this point of view, the theory of noonomics [Bodrunov, 2018] has theoretical and practical significance.

Thus, according to *the anthropogenic method of information-time analysis* in the information economy, *mesoinformation*, and *anthropogenic capital* become connecting elements that permeate all institutions of society, resulting in changes in the functions of public administration. This is because an increasing portion of the time of government officials is devoted to creating national and supranational databases and managing the information contained in them. The transformations in the information economy, driven by mesoinformation, lead to the activation of the innovation process and *the active development of education, science, and the generation of anthropogenic capital*. Such integration entities as the EAEU face these challenges particularly acutely.

Main Part. The practical implementation of the concept of socio-economic transformations and the institutional basis of the information economy is the *macroeconomic model of the national innovation system (NIS) of a country*. This model assumes not only the infrastructure aspect of innovation development but also the transfer of knowledge through institutions (government, clusters, research centers, virtual and material enterprises, etc.). Long-term sustainable development (a new quality of economic growth) becomes possible thanks to the innovation-oriented actions of the actors. Furthermore, NIS as a modern institutional model for generating, disseminating, and using knowledge, embodying them in new products, technologies, and services, becomes *the basis of the information economic system* (Figure 1).

The structure of the national innovation system includes: *the knowledge generation system* (education and science - academic, university, sectoral, corporate); the knowledge application system (commercial and non-commercial organizations, including small and medium-sized innovative businesses; integration entities - clusters, innovation parks, groups, etc.); *innovation infrastructure* (scientific and/or technological parks, technology transfer centers, innovation centers, innovation and venture funds, and other organizations); *the system of state management* (management bodies for scientific, scientific and technical, and innovative activities); *the innovation environment* (regulatory and legal regulation, including aspects of forecasting and planning,

priority setting, stimulation, intellectual property circulation, including its commercialization; innovation culture of society).¹

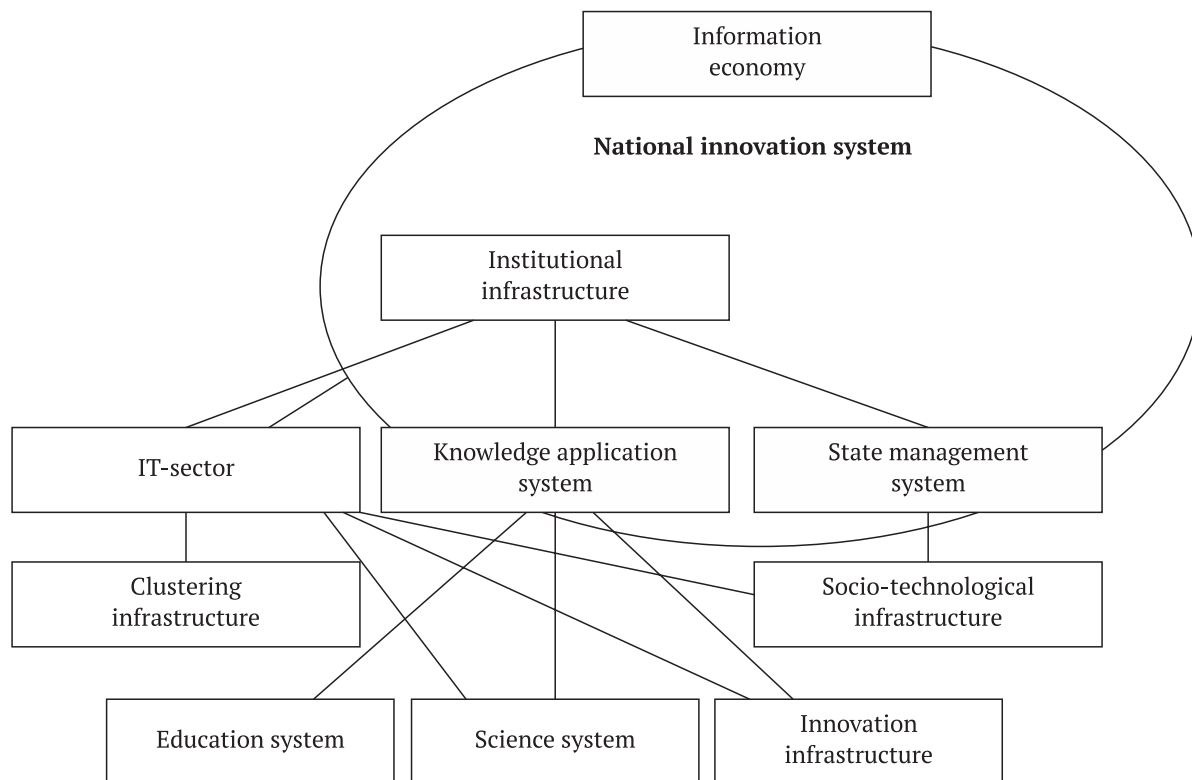


Fig. 1. Model of interrelations between NIS and the main elements of the information economy

The relationship between NIS and the information economy is manifested through *the development of innovative infrastructure, human capital, and mechanisms for knowledge generation and dissemination*. According to a *humanitarian methodological approach and an anthropogenic method of information-time analysis* [Baranov, 2023], the main structural elements of the information economy are as follows:

1. *Innovation Infrastructure*: It facilitates the creation and development of innovations in the information economy. It includes institutional structures that support research and development, technology parks, venture funds, innovation centers, and more. Innovation infrastructure is closely linked to institutional infrastructure, including legislative and legal mechanisms that protect intellectual property and stimulate innovation. Innovation infrastructure should support all stages of the innovation process and the introduction of innovative products to the market. NIS interacts with the IT sector, enabling the effective distribution, replication, analysis, and processing of information.

One of the most well-known scholars researching innovation infrastructure as the basis of the modern economy is *Paul Romer*, the 2018 Nobel laureate in economics. He is known for his work on economic growth, human capital, and innovations, including the concept of “endogenous growth theory.” Similar views are held by his followers *R. Jedwab, P. Romer, A. Islam, and R. Sa-*

¹ National Innovation System (2023). Belarus in the Information Space. URL: <https://infocenter.nlb.by/nauka-i-innovatsii/natsionalnaya-innovatsionnaya-sistema/> (Access date: 21.05.2023).

maniego [Jedwab et al., 2023]. Significant contributions to the study of the impact of innovation infrastructure on the information economy and economic growth have been made by various scholars. For example, C. Perez, a professor at the London School of Economics, developed the concepts of “techno-economic paradigms” and “long waves theory.” In her work *Technological Revolutions and Financial Capital: The Dynamics of Bubbles and Golden Ages* [Perez, 2013], she emphasizes the role of innovation infrastructure in the development of the new economy and society. Similar views are held by E. Brynjolfsson, director of the Stanford Digital Economy Lab, and E. McAfee, executive director of the MIT Initiative on the Digital Economy. They study the impact of innovation infrastructure on the development of the digital economy, including productivity growth and the quality of anthropogenic potential [Brynjolfsson, McAfee, 2016].

There is a positive feedback loop between the development of innovation infrastructure and the formation of the information economy. Analysis of the U.S. experience in this area has shown that *U.S. government policy* in the development of innovation infrastructure focuses on several key areas, including building an information and knowledge-based economy, improving the efficiency of education and workforce retraining, enhancing the activities of government bodies responsible for this sector of the economy, and more. American experts note that the development of relevant subsystems of the information economy significantly affects labor productivity and GDP growth in the country [Zolotykh, 2015].

2. *Institutional Structure*: This is closely related to innovation infrastructure and includes institutions and organizations that establish rules and regulate the functioning of the information economy. This category includes government agencies, specialized organizations, trade unions, and other institutions that create an institutional and legal environment for businesses and consumers.

Peter Drucker, a renowned scholar who researched the influence of institutional infrastructure on the new economic system, emphasized the importance of effective institutional infrastructure for the successful operation of the knowledge economy. In his work *Challenges of Management in the 21st Century*, he underscored the role of the state in creating rules of the game that provide stability and predictability in the business environment, as well as the need to develop institutions that promote innovation and the generation of new knowledge [Drucker, 2007]. Similar views are held by S. Law and A. Bany-Ariffin, who, based on empirical research, studied the relationship between institutional infrastructure and innovation activity in the information economy. They noted that well-developed institutions that protect property rights, ensure access to information, and stimulate competition contribute to the development of IT and innovation [Law, Bany-Ariffin, 2008]. Likewise, I.N. Benson analyzed the impact of the quality of the institutional environment on the economic growth of 74 countries, including countries with high levels of information development. She examined countries' positions on indicators such as the *Rule of Law Index*, *Property Rights Index*, *Corruption Perceptions Index*, *Knowledge Index*, and *Economic Freedom Index*. The research showed that countries with strong institutional and information development demonstrate the highest growth rates [Benson, 2016].

3. *Social-technological infrastructure* comprises social and technological elements that enable the functioning of the information economy. It encompasses various communication technologies, network infrastructure, Internet access, e-government, and more. Social infrastructure also includes norms, values, and behavioral models that develop within society and influence the use of information technology.

Manuel Castells, the most prominent advocate of socio-informational development, in his work *The Information Age: Economy, Society, and Culture*, analyzes the social role of information technologies in shaping the information society and their impact on the economy [Castells, 2000]. *W. Arthur* examines institutional issues related to the influence of social-technological infrastructure on economic development [Arthur, 1996]. *Michael Mandel*, in his work *Can the Internet Revive the Economy's Growth?* analyzes the socio-technological aspects of informatization and their connection to economic growth in the United States [Mandel, 2023].

4. *Cluster infrastructure* refers to spatially and non-spatially concentrated groups of organizations that operate in related or interconnected industries. Cluster infrastructure encompasses various resources, services, and institutions that support the development and growth of clusters. It may include specialized educational institutions, research centers, business incubators, and other entities that facilitate interaction and innovation within the cluster.

Research on the impact of cluster infrastructure on the development of the information economy is a relatively new and less-studied area. *Michael Porter* is considered a classic proponent of cluster development concepts. According to his research, assessing a country's competitiveness should not only occur at the micro-level but also at the level of cluster associations. The importance of clusters lies in their ability to effectively leverage the advantages of competition and cooperation within a unified institutional structure [Porter, 2005]. These issues are explored by various authors. For example, *David Audretsch* examines the influence of clusters on regional competitiveness and the role of infrastructure in supporting such clusters [Audretsch, 1995]. *M. Tvaronaviciene, K. Razminiene, and L. Piccinetti* investigate the impact of cluster infrastructure on economic activity [Tvaronaviciene, Razminiene, Piccinetti, 2015]. The role of knowledge cluster infrastructure in regional economic development is illustrated in the research conducted by *H. Evers, S. Gerke, and T. Menkhoff* [Evers, Gerke, Menkhoff, 2010].

5. *The education system* is closely interconnected with the formation of the information type of economy. On the one hand, the education system contributes to increasing the intellectual potential of society, which is a necessary condition for the transition to the information economy. On the other hand, the economic environment of the information society creates conditions for expanding the opportunities of the education system and strengthening the positive external effects, such as: synergetic effect for the enterprise from each employee; increased mobility of labour force and productive forces; accumulation of knowledge that is used in practice and is a way of producing goods and services; saving resources by improving the quality and volume of knowledge; improving the quality of decisions made by the authorities. [Evers, Gerke, Menkhoff, 2010]. The role of the education system in the formation of the information economy is studied by *R. Bekkers, I. Bodas Freitas* [Bekkers, Bodas Freitas, 2008], *K. Cosmulese, V. Grosu, E. Glachuk, A. Zhavoronk* [Cosmulese et al., 2019], *G.A. Sosedov* [Sosedov, 2010], *A.A. Andreev* [Andreev, 2010], *S.E. Savzikhanova, V.N. Kosinova* [Savzikhanova, Kosinova, 2011] and other scientists.

6. *The science system* plays a key role in the development of the information economy by providing the basis for innovation, technological progress and the creation of new knowledge. The impact of the science system on the information economy can be described as follows:

- Scientific research is the basis for the creation of new knowledge, technologies and innovations; it contributes to the development of new products, services and processes that can be used in the information economy; scientific discoveries and innovations in the field of information

technology, artificial intelligence and other related fields have a direct impact on the development of the information economy [Amirova, 2022].

- The system of science facilitates the transfer of technologies from the academic environment to industry and the business sector, which makes it possible to turn scientific research into commercial products and services that can be used in the information economy, with cluster infrastructure playing an important role in this process [Karpov, 2017].

- The system of science contributes to the development of human capital, which is a key resource for the information economy; research and education in science, technology, engineering and mathematics (Science, Technology, Engineering and Mathematics - STEM) help to form highly qualified specialists who can work in information industries and contribute to their development [Kivarina, Makarevich, 2020].

Modern scientists consider practical aspects of the influence of science and education on the information economic system. Thus, *M. Kivarina, A. Makarevich* consider the mutual influence of science and education on digital transformations in the modern society [Kivarina, Makarevich, 2020].

Social aspects of the information economy are considered by *V. Nikiforova, L. Achba, A. Nikiforov, A. Kovalenko* [Nikiforova et al., 2019]. Similar studies are conducted by international research institutes and within individual countries and regions [Salazar-Xirinachs J.M. et al., 2023].

Considering the practical aspects of formation of the information type of economy for such an integration association as the EAEU, it should be noted that the main legislative support for the formation and *development of the information economy*, first of all, includes the formation of institutional infrastructure, which is envisaged by the legislative documents of Russia, Belarus, Armenia, Kazakhstan and Kyrgyzstan. However, in accordance *with the experience of similar projects in the People's Republic of China* "One Belt, One Road" ("一带一路") and the EU "Global Gateway" projects, the EAEU needs to ensure not only investment in high-technology and high technology, but *also the development of new technologies*.

Training of personnel for digital transformation has become a common institutional and legal direction for Russia, Belarus and Kazakhstan, but in Armenia and Kyrgyzstan the legislation implements *its narrower interpretation - development of competences and skills for the digital economy*. The protection of personal data is also a common institutional and legal aspect that unites all EAEU countries. The relevant legislation has been updated in recent years in Russia, Belarus and Kazakhstan. At the same time, the Federal Law of the Russian Federation of 31 July 2020 No. 258-FZ "On experimental legal regimes in the field of digital innovation in the Russian Federation" has become the benchmark¹.

A common aspect of information economy development for all EAEU member countries is *public administration based on information economy technologies*. The differences include approaches to its implementation. Thus, in Russia the priority is *the development of digital public administration*; in Belarus - improvement of the state information policy; in Kazakhstan - *transition to a proactive state on the basis of improving the system of electronic and mobile government, development of public information services*; in Armenia - *attraction of investments in the digital sphere to ensure maximum national economic security*; in Kyrgyzstan - *development of the state based on the data industry, technology and digital economy*; in Kyrgyzstan - *development of the state based on the data industry, technology and digital economy*. In this aspect, the development of personal data protection insti-

¹ Eurasian Economic Union Digital Agenda 2025: Prospects and Recommendations (2023). Overview. World Bank Group. URL: http://www.eurasiancommission.org/ru/Documents/digital_agenda_eaeu.pdf (Access date: 06.21.2023).

tutions and state regulation of the information economy will make it possible, following China's experience, to create meta-systems of information exchange between the state and business, business and business, individuals and the state in order to provide innovative entrepreneurship with more accessible and better quality data from the public sector.

In contrast to the EU system, the Eurasian Economic Union requires the application of Chinese experience in direct public funding of R&D and cooperation between science and industry through public-private partnerships. China's experience also implies the use of a significant regulatory function for information sectors of the market, implementation of technical standardization, including mapping and codification of existing and emerging standards, their linkage with business processes based on best industry practices and methodological guidelines (e.g. cyber security standards, cyber-physical systems, etc.).

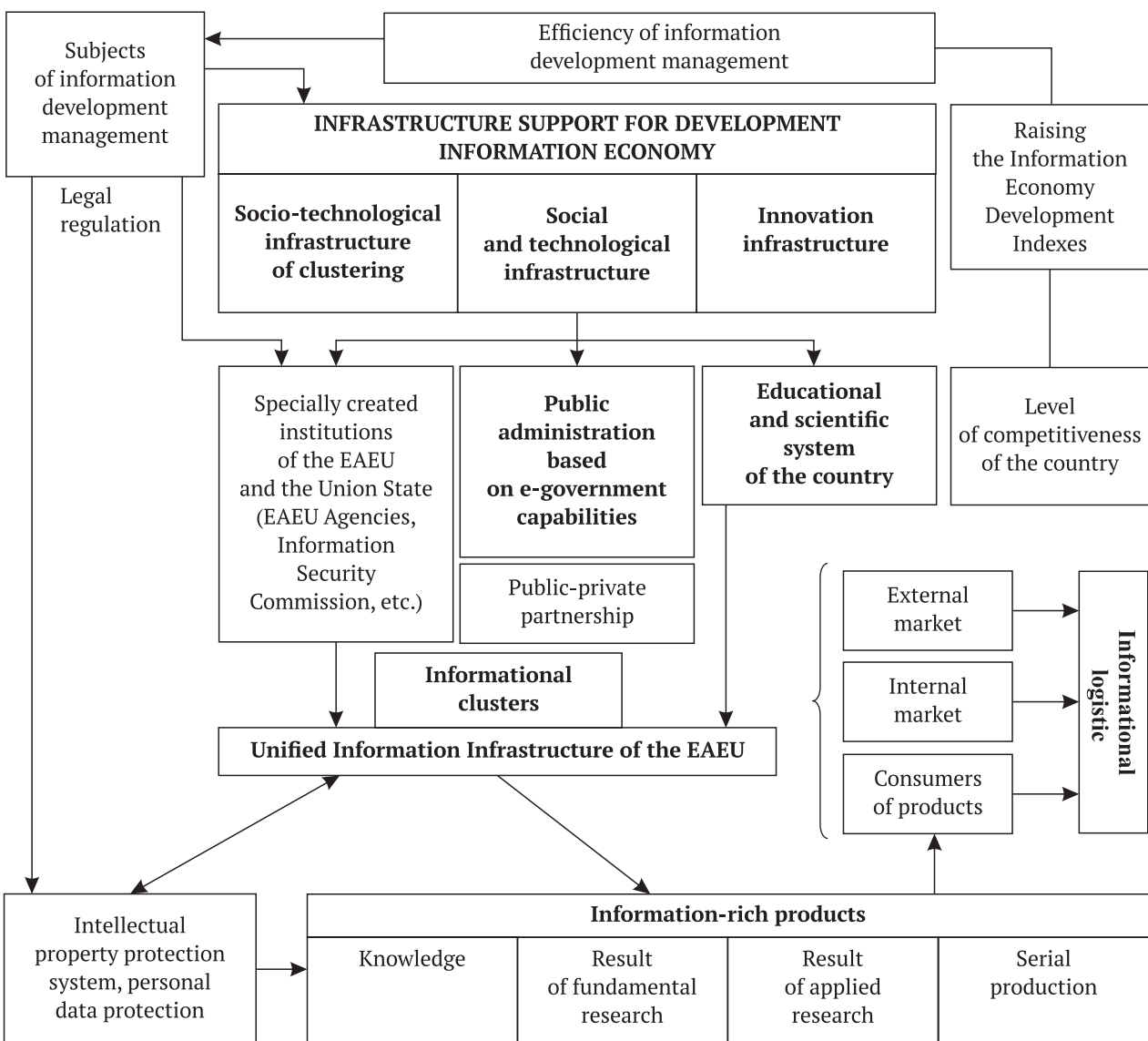


Fig. 2. Model of formation and development of the EAEU information economic system taking into account foreign experience

In the EAEU, it is necessary not only to invest in high-tech and intellectual infrastructure for the development of supply chains, logistics, and IT, but also to link them with the educational and scientific systems of the countries. *This will require an appropriate infrastructure based on information clusters and distributed university complexes* (Figure 2).

In addition to adapting China's useful experience in the field of institutional and legal regulation of information economy development, full-fledged economic cooperation is important through the formation of a digital environment of interaction that eliminates trade barriers and simplifies customs and administrative procedures. Such cooperation is established through trade agreements with China within the framework of the Customs Code and the EAEU Digital Agenda [Khalova, Khalov, 2021].

Additional institutions are needed in *the Eurasian Economic Union*, including representatives of both official authorities and big business in the IT sector, *the Eurasian Union Agencies* to fulfil individual tasks in the field of information and scientific and technological development [Kapus-tin, Kucherov, Chernogor, 2019]. They should be empowered to provide R&D funding for *advanced technologies, which has been realized in the PRC and has not been formed in the European Union*.

Conclusion. *The formation of the information economy in both theoretical and practical terms is based on the increasing role of education, the formation of a common scientific space, common digital standards and the evolution of socio-technological infrastructure. A comprehensive analysis of these factors will make it possible to determine the level of influence of socio-economic transformations of the information economy on the economic development of the EAEU and identify the main directions of its further development. The first step for this is a competent institutional and legal regulation of information economy building, including cooperation at the national and regional levels within the framework of information cluster formations and innovation ecosystems. The resulting indicators should be both an increase in the Information Economy Development Index according to international institutional structures and, as a result, an increase in the competitiveness of the integration association in the world markets and economic growth.*

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Information about the authors

Petr S. Lemeshchenko

Head of the Department of International political economy, Belarusian State University (4 Nezavisimosti Avenue, Minsk 220030, Belarus), Doctor of Economics, Professor

E-mail: liamp@bsu.by

Alexander M. Baranov

Doctoral student of the Department of International political economy, Belarusian State University (4 Nezavisimosti Avenue, Minsk 220030, Belarus), Ph.D in Economics, Associate Professor

E-mail: axmbaranov@inbox.ru