

Interorganisational networking as the principal form of technological, innovative and research cooperation between Russia and the European Union in the Baltic region

Bolychev, Oleg; Voloshenko, Kseniya

Veröffentlichungsversion / Published Version

Zeitschriftenartikel / journal article

Empfohlene Zitierung / Suggested Citation:

Bolychev, O., & Voloshenko, K. (2013). Interorganisational networking as the principal form of technological, innovative and research cooperation between Russia and the European Union in the Baltic region. *Baltic Region*, 4, 16-28. <https://doi.org/10.5922/2079-8555-2013-4-2>

Nutzungsbedingungen:

Dieser Text wird unter einer Free Digital Peer Publishing Licence zur Verfügung gestellt. Nähere Auskünfte zu den DiPP-Lizenzen finden Sie hier:

<http://www.dipp.nrw.de/lizenzen/dppl/service/dppl/>

Terms of use:

This document is made available under a Free Digital Peer Publishing Licence. For more information see:

<http://www.dipp.nrw.de/lizenzen/dppl/service/dppl/>

**INTERORGANISATIONAL
NETWORKING
AS THE PRINCIPAL FORM
OF TECHNOLOGICAL,
INNOVATIVE
AND RESEARCH
COOPERATION
BETWEEN RUSSIA
AND THE EUROPEAN UNION
IN THE BALTIC REGION**

O. Bolychev^{*}
K. Voloshenko^{*}



This article describes the role of international cooperation in research, technology and innovation in ensuring innovative development and producing an innovative model of the Russian economy. One of the key objectives of the country's integration into international research, technological, and innovative space is the development of Russia-EU cooperation in the Baltic region. The authors come to the conclusion that, with the development of integration and regionalization processes, interorganizational networking takes on special importance in the organization and development of the innovative space. The authors analyze the existing typologies of forms of cooperation in the field of research, technology, and innovation, within which cases of networking are identified. The article gives a definition of interorganizational networks in view of spatial and structural components of networking. The authors introduce the notion of 'international interorganizational networks' as a special form of international cooperation. A study into the spatial form of interorganizational networks helps explain the effect of different levels and types of economic integration. Key areas of research on international interorganizational networks are identified in view of the features of integration processes in the development of network processes and in the framework of network approach in general.

Key words: research and technology, innovation, cooperation forms, interorganizational networks

The Strategy for Innovative Development of the Russian Federation until 2020 [1] and the State Science and Technology Development Programme for 2013—2020 identify the development of international research and cooperation, Russia's integration into the international research and technological space, and the promotion of innovations as key priorities of innovative policy in

^{*} Immanuel Kant Baltic Federal University
14, A. Nevski Str.,
Kaliningrad, 236041, Russia

Submitted on June 5, 2013

doi: 10.5922/2079-8555-2013-4-2

© Bolychev O., Voloshenko K., 2013

achieving the innovation development targets and creating an innovative economic model. As to the development of international research and technological cooperation, the primary objective is “more active participation of Russian research organisations and companies in international research and technological multilateral cooperation programmes, development of international technological platforms, and ensuring Russian membership in the leading international research organisations, networks, and research projects for the purpose of integration into the European research space” [1, c. 97].

Thus, the development of special forms, mechanisms, and tools for supporting interaction in the framework of innovative systems aimed at achieving the objective of Russia’s integration into the European research and technological innovation space is becoming the key aspect of EU-Russia cooperation. Within the Baltic region, this issue is gaining increased relevance and practical significance in view of the fact that it is “the only macroregion, where Russia borders EU member states and where transnational Russian-European ties are supplemented by trans-boundary links... It also contributes to the development of cooperation between the states in the field of innovations, which determines the level and dynamics of economic development of the countries and their position in the global geo-economic system in the age of globalization” [29, c. 7].

It is worth noting that intensive studies into the problems of EU-Russia innovation cooperation are carried out at the Immanuel Kant Baltic Federal University in collaboration with Saint Petersburg State University, Moscow State Institute of International Relations, the Institute of World Economy and International Relations of the Russian Academy of Sciences, and other national and international research centres; a number of collaborative works have been published (see, for example, [19—21; 29]). The results of theoretical and methodological studies are published in special IKBFU’s periodicals — the *Baltic Region* journal, the *Baltic Regions Studies* quarterly newsletter, and the *Region of Cooperation* journal.

However, studies into EU-Russia cooperation focus predominantly on the condition and prospects of interaction from the perspective of their role in the innovative environment of the Baltic region and are based on the analysis of indicators and trends characteristic of innovative process, scientific and technological potential, and the weight of innovative component in the economy. The organization of interaction in the field of innovations, different forms of research, technological, and innovation cooperation between the countries is addressed less often. In particular, insufficient attention is paid to networking, which is assuming considerable significance and playing an important role in the organisation and development of innovative space in the conditions of complication of integration connections and activation of regionalisation processes.

Research on interorganisational networking in the Baltic Sea region taking place in the framework of EU-Russia cooperation requires better understanding of research and technological cooperation mechanisms, features of integration processes related to the development of networking, and the network approach in general.

An overview of academic publications dedicated to the modern condition and development of certain aspects of international cooperation and interaction in the field science, technology, and innovations emphasised the problem of immaturity of the relevant conceptual framework. It results in misuse of terms, ambiguity of definitions and superfluous interpretations and approaches. There is also the problem of developing a typology or producing a classification when describing the types and forms of cooperation and that of a unified understanding of the areas, mechanisms, and tools for supporting and developing cooperation between countries and regions.

First of all, let us define international research, technological and international innovation cooperation, their forms and individual types. Further, let us identify the role of interorganisational interaction.

The initial concept used in studying interaction in the field of science, technology, and innovation at different levels was *international scientific and technological cooperation*. Traditionally, it is one of the forms of international economic relations (IER), which until the 1990s, was considered by many Russian authors¹ as “one of the most important areas of international socialist division of labour. It is manifested in exchange of scientific and technological experience between socialist countries, division of labour and cooperation in research and development, accumulating scientific and technological information, inventions, and academic staff training”² (see also [6; 9; 12]).

During the transition of Russia and other post-Soviet and post-socialist countries to market economy, the elimination of barriers to the interaction with the rest of the world, a dramatic increase in international scientific and technological cooperation took place. Its role in international division of labour was reconsidered. The notion of “international innovative cooperation” was introduced into conceptual and terminological framework of innovative economy. The development of globalisation and economic internationalisation processes urge scholars to pay special attention to the problems of international commercialisation of research results. Certain areas and organisational and economic forms and types of international cooperation in the fields of innovations and technology have gained both scientific and practical significance.

Among the most influential publications on the problems of international scientific, technological, and innovative cooperation are the works of L. E. Mindeli and V. A. Vasin [7], Yu. V. Yakovets and B. N. Kuzyk [6], V. V. Ivanter, V. I. Kushlin, and A. N. Folomyev [14], A. N. Boiko [4], K. G. Borisov [5], S. V. Valdaitsev [6], I. G. Dezhina [11], A. V. Zverev [6], K. I. Pletnev [23], I. P. Potekhin [26], M. V. Shugrov [31], etc.

However, despite numerous publications and various approaches to the interpretation of international scientific, technological, and innovative cooperation, there is neither distinct division between them, nor terminological clarity. Being rather broadly used, these concepts are not defined in any leg-

¹ Foreign literature lacks the duality of understanding science, technology, and innovation cooperation, because the conceptual and terminological framework has been developing since the activation of research in this field that took place in the 1960s—70s.

² *Bol'shaja sovetskaja jenciklopedija* [Great Soviet Encyclopedia], v 30 t. M., 1969—1978. T. 17. S. 1020.

islative documents of the Russian Federation³, foreign states, and international organisations. Neither do programmes and strategic documents relating to science, technology and innovation development give an interpretation of these concepts. In our opinion, the major reason behind it is the volatile changeability of the object of research, namely, its content, areas, forms, and interaction types, which becomes more pronounced as cooperation develops.

In order to eliminate the problem of misuse of terms stemming from the ambiguity of approaches proposed by many authors (see, for example, [5; 10; 11; 17; 18; 26; 31]), international science and technology cooperation will be defined as international interaction in science and technology against the background of joint research and technological activities aimed at the development and solution of scientific and technological problems and exchange of research results and industrial experience. Science and technology cooperation has an innovative and technological component implemented in the framework of international innovation cooperation. It is interpreted as international innovative activities relating to the commercialisation of research and technology aimed at generating a commercial effect of scientific knowledge. At the same time, the concepts of “international science and technology cooperation” and “international innovation cooperation” are closely connected [31]. However, there is no relationship of subordination. The development of a global science, technology and innovation space, the development of the former type of cooperation depends on the demand for and the development stage of the latter.

The agents of international relations in the field of science, technology, and innovations are states, intergovernmental associations, international organisations, transnational corporations, different unions (associations, alliances, industrial groups, etc.), as well as individual organisations involved in cooperation on a contract basis. The prevalence of science and technology or innovation components in the interactions between agents determines the initial type of international cooperation. In the framework of this approach, the forms and types of interaction are identical and applied to the field of innovations, science and technology in general. However, in view of the differences in content and direction of the processes of generation and application of results of intellectual activities, for each type of cooperation we identify most typical forms of interaction that reflect specific features of joint international scientific, technological and innovative activities.

An analysis of publications on international cooperation in the field of science, technology and innovation showed that there is no universal typology of its forms and types. Sometimes, authors consider similar forms of interaction of agents, which are identified as either forms or types of cooperation (see, for instance, [5; 10; 11; 18; 26]), but only in relation to the field of science and technology without taking into account the innovative compo-

³ The concept of international science and technology cooperation and its types (intergovernmental science and technology cooperation (ISTC) and international innovative and technology cooperation (IITC)) is mentioned in the Concept of state policy of the Russian Federation in the field of international science and technology cooperation [3] for 2000—2005.

ment. As a result, the interpretation of the object is both incomplete and ambiguous, hampering a comprehensive analysis of possible areas of cooperation in the field of science, technology and innovations, which is especially pronounced in EU-Russia international relations. Moreover, the authors of the mentioned publications pay little attention to network forms of cooperation, despite the fact that it has gained considerable significance, especially in the field of science, technology, and innovation, where networks fulfil important system and structure building functions.

When identifying possible forms of interaction in international scientific, technological and innovative activities, one should understand a form as a type of organisation of content, a structure, and external features and relations of certain processes and phenomena⁴, whereas the division of cooperation into types should rest on the object composition of interactions and their content [10]. One should not overlook earlier studies into the forms of interaction carried out by K. G. Borisov [5], R. M. Valeev and G. I. Kurdyukov [24], L. A. Gumerov [10], I. G. Dezhina [11], K. A. Zadumkin and S. V. Terebova [13], Yu. M. Kolosov, E. S. Krivchikov and V. I. Kuznetsov [18], V. A. Vasin and L. E. Mindeli [7], I. P. Potekhin [26], etc.

The typology of forms of science, technology and innovation cooperation can be developed according to the following principles⁵.

1. According to the level of internationalisation of international scientific and technological connections and innovative cooperation [5]: coordination; cooperation; association; harmonisation; *integration* (closer cooperation in the field of science, technology and innovations at different territorial levels)⁶; *networkisation* (the development of network structures in the field of science, technology, and innovations as the integration processes accelerate and become more complex).

2. According to the application of the results of scientific and technological development of international production by the state [5]:

- the form of international research connections and cooperation;
- the form of international technical connections and cooperation;
- *the form of international technological connections and cooperation;*
- *the form of integrated international connections (research, technical, and technological ones) and cooperation in the field of science, technology, and innovations;*
- cooperation in the field of HR training as one of special forms of facilitating the development of science and technology.

⁴ See: Savchenko, V. N., Smagin, V. P. 2006, *Nachala sovremennogo estestvoznaniya : tezaurus* [The beginning of modern science: the thesaurus], Rostov-on-Don.

⁵ This study suggests supplementing a number of earlier typologies with new forms of cooperation based on the features of development of international scientific, technological, and innovative activities. They are given in italics.

⁶ K. G. Borisov also identifies “regional integration”. At the same time, the practice of international science, technology, and innovation cooperation is indicative of the development of integration processes on a larger territorial scale.

3. According to the level of organisation and implementation of the types of international scientific, technological, and innovative cooperation [26]:

— forms of international connections and interactions in view of the features of cooperation object: commercial (1) and non-commercial (2) cooperation;

— forms of international connections and interactions in view of the features of mutual relations:

1) forms of non-commercial cooperation: interactions in the framework of agreements, contracts, *science and technology cooperation programmes, projects in the field of science, technology, and innovations*⁷ (1.1) and cooperation in the framework of international organisations and associations⁸ (1.2); 2) forms of commercial cooperation: trade (2.1), lease (2.2), *cooperation and integration*⁹ (2.3);

— forms of international connections and interactions in view of the features of cooperation implementation: unilateral assistance (1.1.1) and exchange (1.1.2); information and consulting organisational activities (1.2.1), investment (1.2.2), implementation (1.2.3); license trade (2.1.1), purchase and sale (2.1.2), exchange on a compensation basis (2.1.3), tenders (2.1.4); short-term lease (2.2.1), mid-term lease (2.2.2), long-term lease (2.2.3); contracting cooperation (2.3.1), contract specialisation (cooperation) (2.3.2), joint efforts on the basis of *cooperation and integration*¹⁰ (joint ventures; cartels; consortia; associations; unions; partnerships; research centres, offices, laboratories, etc.) (2.3.3), *networking and interorganisational networks* (clusters, network structures, and different types of networks — innovative networks, strategic alliances, value networks, focal networks, virtual and other organisations (a good example is the functioning of the National Nanotechnology Network (NNN)¹¹ and the Russian Technology Transfer Network¹² (2.3.4).

⁷ We suggest that in the classification, contractual relations be supplemented with the conclusion of special agreements and implementation of programmes in the field of science, technology and innovations (they are especially relevant to different forms of organisation of transboundary cooperation, in particular, Euroregions).

⁸ In science, technology and innovation cooperation, the concept of international organisation is supplemented with the activities of various international associations.

⁹ K.G. Borisov also identifies another type of interaction - cooperation without considering special forms of interaction emerging in the course of agent integration (horizontal, vertical, and universal).

¹⁰ The classification considers only the creation of joint ventures.

¹¹ It brings together 50 organisations: 10 leading institutes working in different fields and 40 universities equipped with modern equipment purchased in the framework of the federal target programme “The development of nanoindustry infrastructure in the Russian Federation” for 2008—2011. — See: *O razvitií nauchno-innovacionnoj kooperacii v Rossii/ L. Je. Mindeli [I dr.]*. URL: http://www.issras.ru/papers/Microecon_Mindely2013.pdf (accessed on 13.04.2013).

¹² The Russian Technology Transfer Network (RTTN) established in 2002 brings together more than 70 Russian innovative centres (from 29 Russian regions and CIS countries) specialising in the field of technology transfer. — See: Russian Technology Transfer Network: [website]. URL: <http://www.rttm.ru/about> (accessed on 13.04.2013).

4. According to the content of science, technology, and innovation cooperation, one can identify certain forms that combine *various types of interactions* [13; 17; 26]¹³:

— the form of cooperation and research and technological ties through joint R&D, research programmes, and innovation projects (international agreements, contracts, and programmes);

— the form of cooperation and interactions between the suppliers and consumers of scientific and technological knowledge and innovative products: technology transfer, technology cooperation, industrial agreements, commercial technical assistance agreements, investment, participation in international construction projects and production and technological process, types of cooperation in the framework of individual organisational forms of interaction (funds, associations, union, joint ventures, etc.) and others;

— the form of cooperation and connections through organising and developing the science, technology, and innovation infrastructure: support for cluster initiatives, science parks, industrial parks, network structures, etc.;

— exchange of information, research, and achievements through different channels for studying and sharing research, technological, and industrial experience, including exchange of technical documentation, samples and materials, and technological processes, organisation of international fairs, development of shared research facilities, etc.;

— the form of cooperation in the framework of popularising scientific and technological knowledge and information: visiting sessions, summits, forums, conferences, symposia, meetings; transfer, joint preparation and publication of encyclopaedias, monographs, research articles, textbooks, etc.;

— the form of cooperation and connections through information and consulting activities: submission of research and technological information, technical assistance, facilitation of standardisation and certification, consulting, engineering, etc.

— the form of cooperation through establishing contacts between scholars and experts (academic exchange, mutual visits, consultations, etc.);

— the form of cooperation in the field of staff (advanced) training (joint training programmes, advanced training centres, etc.): specialists of different qualifications, research fellows, PhD students, etc.

5. *According to the types of spatial organisation of science, technology, and innovation cooperation*¹⁴:

— the cluster form of cooperation organisation in the course of science, technology, and innovation cooperation (first of all, the development of innovation clusters);

¹³ When studying the organisation and content of science, technology, and innovation cooperation, the authors often address the object composition of interaction. As a result, the typology of forms is replaced with the identification and analysis of individual types of cooperation. Here, one comes across a large number of contradictions.

¹⁴ As one can see, these forms of science, technology, and innovation cooperation are identified on the basis of interorganisational interactions.

— network forms of organising interaction in the field of science, technology, and innovations (the development of innovative networks: research, technology transfer, cooperation in R&D, competence transfer, etc.¹⁵);

— science-driven and innovative integrative forms of cooperation: science cities; science parks; technopolises; science parks; industrial and innovation parks; industrial parks; innovative free economic zones; innovation, innovation and technology, and business and technology centres; technology transfer centres; other science-driven and innovative spatial forms;

— new and emerging forms of spatial organisation of science, technology, and innovation cooperation (for example, a form cooperation and interaction in the framework of в рамках technology platforms, in particular, research, technology, and innovation cooperation between Russia and the EU)¹⁶.

One can see that this typology places emphasis on interorganisational networking among other forms of science, technology, and innovation cooperation.

Most Russian and international network studies focus on certain aspects of either network organisation of economic activities, or network interactions of business partners; as a result, there is no common understanding of network process and related categories. A complicated situation is observed as early as the stage of studying network forms and interactions: the number of concepts and interpretations is increasing exponentially; their application in the analysis of network processes is becoming more frequent, also through the interdisciplinary approach. However, the problem of terminological precision persists. As a result, each area and aspect of application of the network approach generates a bulk of still unsolved research problems. The current level of network studies and the situation in the field of network approach application is deteriorated by the dynamic nature of the environment, in which network processes emerge and develop. The continuing and accelerating economic internationalisation and globalisation contribute to the genesis of new network phenomena and corresponding forms and processes. It is worth noting that researchers pay more attention to the problems of inter-company interactions in the framework of “closed” economic systems (see, for example, [16; 22; 24; 25; 27; 28; 30; 32—40]), whereas interorganisational networking in view

¹⁵ See: Ratner, S. V. 2009, *Metodologicheskie problemy razvitija konkurentosposobnyh nauchno-innovacionnyh setej: organizacionno-jekonomicheskoe i instrumental'noe obespechenie* [Methodological problems in the development of competitive research and innovation networks: the organizational, economic and tool maintenance], Rostov-on-Don.

¹⁶ Quite often, technology platforms are considered as tools of inter-clusters interaction, which can take place between regions and countries. — See: Dezhina, I. G. 2013, *Tehnologicheskie platformy i innovacionnye klastery: vmeste ili porozn'?* [Technology platforms and innovation clusters: together or separately?], available at: http://www.iep.ru/files/text/working_papers/Nauchnie_trudi_No164.pdf (accessed on 13.04.2013).

of spatial and structural aspects of cooperation at different territorial levels remains poorly studied.

On the basis of certain networks studies, we will define interorganisational networking as a system of contracts¹⁷ between economic agents within one (or more) socioeconomic system. The contract system is stable, coordinated, and aimed at achieving common long-term objectives through mobilising, combining, and using resources, competences, and knowledge¹⁸.

This definition employs the institutional approach followed by many authors when analysing the phenomenon of development of interorganisational networks, since they pay attention to the rules of economic behaviour and contracting types, the features of relations between the parties and the degree of their autonomy from the perspective of transfer of ownership, management, and information rights, which makes it possible to distinguish interorganisational networks from other forms of cooperation emerging as a result of integration process development. In this approach to defining the interorganisational network, of special importance is the identification of the spatial and structural component of interaction, which suggests the development of multilateral relations between economic agents both within and beyond the economic system. It elucidates the prospects and possibilities of emergence of different interorganisational network formation at the local, regional, and global level of a common space, also in the field of innovations, science, and technology. Finally, one can claim that the process of international cooperation development is closely connected with the emergence of different forms of interorganisational network interactions, which are brought together in the concept of “international interorganisational network”.

Spatial forms of interorganisational network interactions — both prospective and already existing in the Baltic region — have an immediate bearing on the ongoing integration processes, whose intensity has recently played the decisive role in the socioeconomic development of these territories. All in all, these forms serve as a condition for the qualitative growth of science, technology, and innovation cooperation between Russia and the EU. To a great degree, it is a result of the comparability and dynamics of scientific, technological, and innovative potentials of the Baltic region territories¹⁹. Despite a relatively low level of scientific, technological, and innovative development

¹⁷Contract is understood as an aggregate of rules that structure the exchange between two (and more) economic agents in space and time through defining the rights exchanges and obligations assumed, as well as the mechanism of their enforcement. — See: Auzan, A. A. (society. ed.), 2005, *Institucional'naja jekonomika: novaja institucional'naja jekonomicheskaja teorija* [Institutional Economics: A New Institutional Economics], Moscow, p. 328.

¹⁸ The definition of spatial and structural components employs the approach proposed by M.Yu. Shersheva [30] in a study into the ontological aspects of networking terminology.

¹⁹ A comparative analysis of the scientific, technological, and innovative potential of the North-Western Federal District and the Baltic region countries is offered in [8].

of the North-Western Federal District²⁰, the mobilisation and combination of the existing human and technological resources and the use of the transformation ability of the country's potential makes it possible to organise joint research, technological, and innovative activities aimed at the development and solution of research and technological problems.

When identifying spatial forms of interorganisational networks, one should take into account different levels and types of economic integration: interaction between organisations as economic entities and that between regional socioeconomic systems and national economies. At the same time, most research works focus on the issues of economic integration of organisations and its impact on the development of interorganisational networking, in particular, inter-company networks. So, in the case of organisation integration, interorganisational networks of the following types are formed: strategic alliances, value chains (networks), focal supply networks, dynamic focal networks, virtual organisations [30]. As to interregional economic integration, one can identify certain types of networking based on international inter-organisation cooperation (for example, clusters) and relating to different types of interregional associations, including those in the framework of current agreements, programmes, and projects. In the case of international economic integration, the study object is the forms of networking at the level of intergovernmental alliances and agreements, including those in the field of science, technology, and innovations.

In view of the complex nature of the research problem, at the moment, one can identify the following key areas of studying international interorganisational networks:

- research on stable structural parameters and practices;
- theoretical interpretation of the development of international interorganisational networks, including those in the Baltic region;
- theoretical and methodological justification of network processes: the identification of factors and conditions ensuring network stability, the development of a typology of network interactions, development strategies, and interactions between network participants.

References

1. *Strategija innovacionnogo razvitija Rossijskoj Federacii na period do 2020 goda: Rasporjazhenie Pravitel'stva Rossijskoj Federacii ot 8 dekabnja 2011 g. № 2227-r* [The strategy of innovative development of the Russian Federation for the period up to 2020: Government of the Russian Federation from December 8, 2011 №2227-r], 2011.
2. *Gosudarstvennaja programma Rossijskoj Federacii «Razvitie nauki i tehnologij» na 2013—2020 gody: Rasporjazhenie Pravitel'stva Rossijskoj Federacii ot 20 dekabnja 2012 g. № 2433-r* [The State Program of the Russian Federation "Development of Science and Technology" for 2013—2020: Government of the Russian Federation of December 20, 2012 №2433-r], 2012.
3. *O koncepcii gosudarstvennoj politiki Rossijskoj Federacii v oblasti mezhduнародnogo nauchno-tehnicheskogo sotrudnichestva: Prikaz Minnauki RF ot 04 fev-*

²⁰ However, the North-Western Federal District has a high scientific, technological, and innovative potential in comparison to the Russian average.

ralja 2000 g. № 25 [On the Concept of State Policy of the Russian Federation in the field of international scientific and technical cooperation: Order of the Ministry of Science of the Russian Federation dated February 4, 2000, no. 25], 2000.

4. Boyko, A. N. 2006, Opyt innovacionnogo sotrudnichestva stran ES i SNG [Experience innovative cooperation of the EU and the CIS]. In: Boyko, A. N., Vlas-kin, G. A., Lenchuk, E. B., Ovchinnikov, V. V., Zuckerman, V. A. *XII Mezhduna-rodnaja nauchno-prakticheskaja konferencija "Problemy i perspektivy innovacion-nogo razvitija jekonomiki"* [XII International scientific-practical conference "Prob-lems and perspectives of innovation development of economy"], Alushta, Ukraine, 11—16 September 2006.

5. Borisov, K. G. 1988, *Mehanizm pravovogo regulirovanija processa interna-cionalizacii mnogostoronnih nauchno-tehnicheskikh svjazej v sovremennoj vseob-shhej sisteme gosudarstv* [The mechanism of legal regulation of the internationaliza-tion process of multilateral scientific and technical relations in the modern system of universal], Moscow.

6. Valdaitsev, S. V. 1986, *Organizacionno-jekonomicheskie formy mezhduna-rodного nauchno-tehnicheskogo sotrudnichestva* [Organizational and economic forms of international scientific and technical cooperation], JL, A. A. Zhdanov Le-ningrad State University.

7. Vasin, V. A., Mindeli, L. E. 2011, Prostranstvennye aspekty formirovanija i raz-vitija nacional'noj innovacionnoj sistemy [Spatial aspects of the formation and devel-opment of the national innovation system], *Innovacii* [Innovations], no. 11 (157), p. 24—34.

8. Voloshenko, K. Yu. 2012, The methodological bases of comparative evaluation of scientific and technological potential of Russia and the EU: regional and interna-tional aspects, *Balt. Reg.*, no. 4(14), p. 16—28. doi: 10.5922/2079-8555-2012-4-2.

9. *Vsemirnaja istorija ekonomicheskoy mysli* [World History of Economic Thought], 1997, Moscow, T. 6, p. 1, available at: <http://www.booksite.ru/fulltext/oie/mys/ly/15.htm> (accessed 12 April 2013).

10. Gumerov, L. A. 2005, *Mezhdunarodno-pravovoe regulirovanie nauchno-tehnicheskogo sotrudnichestva gosudarstv-uchastnikov SNG* [International legal reg-ulation of scientific and technical cooperation of the CIS], Moscow, RAP.

11. Dezhina, I. G. 2010, Menjajushhiesja priority mezhhdunarodного nauchno-tehnologicheskogo sotrudnichestva Rossii [Changing priorities of international sci-entific and technological cooperation between Russia], *Ekonomicheskaja politika* [Economic policy], no. 5, p. 143—155, available at: www.iep.ru/files/text/policy/2010_5/dezhina.pdf (accessed 08 April 2013).

12. Ezhkov, V. V. 1990, *Mezhdunarodnoe nauchno-tehnicheskoe sotrudnichestvo SSSR* [International scientific and technological cooperation between the USSR], Moscow.

13. Zadumkin, K. A., Terebova, S. V. 2009, *Mezhdunarodnoe nauchno-tehni-cheskoe sotrudnichestvo: sushhnost', sodержanie i formy* [International scientific and technological cooperation: the nature, content and form], *Problemy razvitija ter-ritorii* [Problems of development of the area], no. 1 (47), July — September 2009, p. 22—30.

14. Ivanter, V. V., Kuzyk, B. N. 2005, *Budushhee Rossii: inercionnoe razvitie ili innovacionnyj proryv?* [The future of Russia: the inertial development or break-through innovation?], Moscow, Economic Strategy Institute.

15. Kuzyk, B. N., Yakovets, Yu. B. 2004, *Rossija 2050 strategija innovacion-nogo proryva* [Russia 2050 strategy is an innovative breakthrough], Moscow.

16. Kouchtch, S. P., Rafinejad, D., Afanasiev, A. A. 2002, Network Approach in Marketing: the Russian Experience, *Vestnik of Saint Petersburg University. Management Series*, no. 1, p. 81—107.

17. Valeev, R. M., Kurdyukov, G. I. (ans. ed.), 2010, *Mezhdunarodnoe pravo. Osobennaja chast'* [International law. The special part], Moscow, Statut.

18. Kolosov, Yu. M., Krivchikova, E. S. (ans. ed.), 2005, *Mezhdunarodnoe pravo* [International law], Moscow, Mezhdunarodnye otnoshenija.

19. Mezhevich N., Pribyshin T. 2012, Innovative economy in the Baltic Sea region, *Balt. Reg.*, no. 3, p. 44—54. doi: 10.5922/2079-8555-2012-3-4.

20. Mäkinen, H. 2012, The innovative process in the Baltic Sea region, *Balt. Reg.*, no. 3, p. 55—65. doi: 10.5922/2079-8555-2012-3-5.

21. Palmowski, T. 2004, Novaja Baltijskaja bipoljarnaja model' mezhtsional'nogo sotrudnichestva [New Baltic bipolar model of inter-regional cooperation], *Vestnik Kaliningradskogo gosudarstvennogo universiteta*, no. 6. p. 66—75.

22. Powell, W. W., Smith-Doerr, L. 2003, Networks and Economic Life. In: *The Handbook of Economic Sociology*, Second Edition, edited by N. J. Smelser and R. Swedberg. Princeton, NJ, Russell Sage Foundation/Princeton University Press. Laurel Smith-Doerr and Walter W. Powell, p. 379—402.

23. Pletnev, K. I. 2006, *Mezhdunarodnoe nauchno-tehnicheskoe sotrudnichestvo* [The international scientific and technical cooperation], Moscow, RAGS.

24. Popov, N. I., Tretiak, O. A. 2008, Upravlenie setjami: novye napravlenija issledovanij [Network management: new directions for research], *Rossiiskij zhurnal menedzhmenta* [Russian Management Journal], T. 6, Vol. 4, p. 75—82.

25. Popova, Yu. F. 2008, Razvitie setevyh form mezhfirmernoj kooperacii v rossijskoj jekonomike [The development of network forms of inter-firm cooperation in the Russian economy], *Kreativnaja ekonomika* [Creativ Economy], no. 9 (21), p. 36—42.

26. Potekhin, I. P. 1994, *Mezhdunarodnoe nauchno-tehnicheskoe sotrudnichestvo: vidy, formy realizacii* [International scientific and technological cooperation: forms, forms of implementation], Izhevsk.

27. Sterlin, A., Ardishvili, A. 1991, Predprinimatel'skie seti — novaja forma organizacii mezhfirmer'nogo vzaimodejstvija [Business networks — a new form of organization of inter-firm cooperation], *Mirovaja ekonomika i mezhdunarodnye otnoshenija* [World Economy and International Relations], no. 4, p. 70—80.

28. Tretiak, O. A. Rummyantsev, M. N. 2003, Setevye formy mezhfirmernoj kooperacii: podhody k objasneniju fenomena [Network forms of inter-firm cooperation: approaches to the explanation of the phenomenon], *Rossiiskij zhurnal menedzhmenta* [Russian Management Journal], no. 1, p. 77—102

29. Fedorov, G. M. 2013, Innovations in the Baltic Sea Region and Network Cooperation between Russia and the EU, *Balt. Reg.*, no. 1, p. 4—18. doi: 10.5922/2079-8555-2013-1-1.

30. Sheresheva, M. Yu. 2010, *Formy setevogo vzaimodejstvija kompanij: kurs lekcij* [Forms of networking companies: a course of lectures], Moscow, Publishing house HSE.

31. Shugurov, M. V. 2010, Gosudarstvennaja politika Rossijskoj Federacii v sfere mezhdunarodnogo nauchno-tehnologicheskogo sotrudnichestva: konceptual'no — strategicheskie osnovanija [State Policy of the Russian Federation in the field of international scientific and technological cooperation: conceptual — strategic base], *Politika i obshchestvo* [Politics and Society], no. 9, p. 4—22.

32. Bradach, J. L., Eccles, R. G. 1989, Price, authority and trust: From ideal types to plural forms, *Annual Review of Sociology*, Vol. 15, p. 97—118.



33. Ford, D., Gadde, L.-E., Hakansson, H., Snehota, F. 2003, *Managing Business Relationships: A Network Perspective*, 2nd ed., Chichester, Wiley & Sons.
34. Forsgren, M., Johanson, J. 1992, Managing Internationalization in Business Networks. In: Forsgren, M. Johanson, J. (eds.) *Managing Networks in International Business*, Philadelphia, Gordon & Breach, p. 1—16.
35. Gadde, F.-E., Araujo, F. 2006, Business Recipes, Historical Narratives and the Discovery of Networks, *IMP Journal*, Vol. 1, no. 1.
36. Hagedoorn, J., van Kranenburg, H. 2003, Grown Patterns in R&D Partnerships: An Exploratory Statistical Study, *International Journal of Industrial Organization*, Vol. 21.
37. MacGregor, S. P., Carleton, T. (eds). 2012, *Sustaining Innovation. Collaboration Models for a Complex World*, New York, Springer.
38. Miles, R., Snow, C. 1986, Organizations: New Concepts for New Forms, *California Management Review*, no. 27, p. 62—73.
39. Osborn, R. N., Hagedoorn, J. 1997, The institutionalization and evolutionary dynamics of interorganizational alliances and networks, *Academy of Management Journal*, Vol. 40, no. 2, p. 617—638.
40. Powell, W. W. 1990, Neither market, nor hierarchy: Network forms of organization, *Research in Organizational Behavior*, Vol. 12, p. 295—336.

About the authors

Dr Oleg Bolychev, Research Supervisor, Laboratory for Network Studies, Centre for Socioeconomic Studies, Immanuel Kant Baltic Federal University, Russia.

E-mail: obolychev@vester.ru

Dr Kseniya Voloshenko, Director of the “Socioeconomic and Innovative Development of the Region” research and education centre, Immanuel Kant Baltic Federal University.

E-mail: KVoloshenko@kantiana.ru