

### On the potential and opportunities for cooperation between the Baltics in the field of innovations

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**ON THE POTENTIAL  
AND OPPORTUNITIES  
FOR COOPERATION  
BETWEEN THE BALTICS  
IN THE FIELD OF INNOVATIONS**



*This article compares the research and innovation potential of Russia in general, the Northwestern federal district and the Baltics (Lithuania, Latvia, and Estonia) and explores the opportunities for cooperation between the Russian Federation and the Baltics in the field of innovations. The authors identify possible areas of cooperation and describe its mechanisms.*

**Key words:** *Russia, Baltics, Lithuania, Latvia, Estonia, innovation, scientific and innovation potential, cooperation.*

Prior to their secession from the Soviet Union, the Baltic republics were deeply integrated in the economic and social space of the USSR. The level of their socioeconomic development was higher than the Soviet Union average, which manifested, inter alia, in a high percentage of specialists with higher and vocational secondary education employed in the economy. However, the number of university students in Latvia and Estonia was lower than the Union average, and the percentage of vocational secondary school students was the lowest in the country in all three republics (table 1). In other words, many students from the Baltic republics studied in other regions of the USSR (first of all, Moscow and Leningrad). Moreover, some specialists came from other republics of the Soviet Union, predominantly the Russian Soviet Federative Socialist Republic (RSFSR).

The Baltic republics had a research potential corresponding to their share in the total population of the USSR. Although percentagewise, the Baltic republics fell behind the Union average number of research staff compared to the total number of the population, the number of highly qualified specialists holding doctoral and postdoctoral degrees was higher than in the Soviet Union.

The number of certificates of invention authorship in the Baltic states was lower than the national average, and the economic impact of introducing inventions to practice in Lithuania was lower than in Latvia and Estonia.

An active cooperation took place between the scholars of the Union republics accompanied by an exchange of research results and the implementation of innovations developed in different parts of the country. Schools of thought were formed bringing together scholars from different republics. However, the technological revolution was taking place in the USSR republics more slowly than in economically developed countries with market economy. Technical and technological backwardness of the USSR and all its republics in comparison to the leading countries was increasing.

**Correlation of research potential of the RSFSR and the Baltic republics  
in comparison to the USSR aggregate as of 1988, %**

Parameter	USSR	RSFSR	Lithuania	Latvia	Estonia
Population	100	51.40	1.29	0.94	0.55
Number of specialists holding a university degree involved in the national economy	100	54.53	1.47	1.07	0.66
Number of specialists with vocational secondary education involved in the national economy	100	57.98	1.54	1.01	0.64
Number of university students	100	56.13	1.32	0.88	0.48
Number of vocational secondary school students	100	55.12	1.27	0.91	0.47
Number of researchers	100	67.80	1.01	0.92	0.47
Number of specialist holding doctoral and postdoctoral degrees	100	64.30	1.31	1.01	0.63
Number of invention authorship certificates	100	64.47	1.00	0.86	0.24
Economic effect of the invention application	100	52.63	1.05	1.33	1.21

*Comment.* Calculated on the basis of the data presented in: [3, p. 19, 48, 198, 199, 278, 283].

After the USSR collapsed, the Baltic republics started an active integration into the economic and social space of the European Union intentionally severing the close ties they had with other ex-Soviet republics. Political considerations prevailed over economic interests in these countries hindering the development of cultural, educational, and research connections. This process manifested itself in a dramatic decrease in cooperation activities in the field of research and technology. Russia can hardly be called active as to cooperation in research and education with the Baltics trying to expand ties with more economically developed countries.

At the same time, many Russian and Baltic scholars cherish the experience of joint research, maintain personal ties and, as much as possible, engage themselves in joint projects. They are linked by the language of scientific communication — Russian — the language many Baltic researchers speak much better than English. The recent years have been marked the restoration of some old and the development of new ties in the sphere of economic research.

One should not ignore the opportunities that the cooperation in the field of research and technology can give; there was a need for a comprehensive analysis of the ways such cooperation can develop.

One of the Russian centres doing research on opportunities of cooperation between the Russian Federation (first of all, the North West Russia)

with the Baltic countries is the Immanuel Kant Baltic Federal University. The research conducted by its scholars in 2010—2011 makes it possible to draw certain conclusion on the potential, problems, and prospects for expanding ties in the field of research and innovations. All in all, the innovation potential of the Russian Federation — due to the incomparable area of the countries — exceeds that of all the three Baltic States taken together. The relative indices calculated per 1000 residents, or in relation to GDP, do not seem to be in favour of Russia. Research indices, however, improve the situation, while those relating to the practical application of research results aggravate it.

In 2009, the leader among the four countries in the number of staff involved in R&D (calculated per 10,000 economically active people) was Estonia (166.2), followed by Lithuania (130.2), Russia (107.0), and Latvia (92.8). If the dynamics of this parameter is positive in the Baltic States, Russia is experiencing a reduction in the number of researchers in the total economically active population.

In 2000—2009, the number of staff involved in research decreased in Russia by 16.4%, whereas in Estonia it increased by 51.6%, in Lithuania — 26.3%, and 11.3% in Latvia<sup>1</sup>.

The expenditure on research and development varied significantly in Russia in 2000—2009 (from 1.05 to 1.28%) reaching 1.18% in 2009 (table 2).

Table 2

**Expenditure on research and development,% of GDP, 2000—2009**  
[6; 12; 15; 16]

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Lithuania	0.59	0.67	0.66	0.67	0.75	0.75	0.79	0.81	0.80	0.84
Latvia	0.44	0.41	0.42	0.38	0.42	0.56	0.70	0.59	0.61	0.46
Estonia	0.60	0.70	0.72	0.77	0.85	0.93	1.13	1.10	1.29	1.42
Russia	1.05	1.18	1.25	1.28	1.15	1.07	1.07	1.12	1.03	1.18

According to Eurostat, in 2010, Estonia ranked 14<sup>th</sup> out of 27 EU countries in terms of innovativeness (outranking all post-Soviet countries, as well as Malta, Greece, Spain, Italy, and Portugal). At the same time the other two Baltic countries ranked last (Lithuania ranked 25<sup>th</sup> and Latvia — 27<sup>th</sup>) [11]. As to the application of innovation in economy, Russia lags behind all the EU countries. According to a study conducted at the Higher School of Economics, only 9.6% of Russian industrial enterprises apply technological innovations, whereas this parameter reaches 14.6% in Latvia, the lowest position among the EU countries, 26.8% in Lithuania, 55.1% in Estonia (in Germany, ranking first, 69.7%) [9].

<sup>1</sup>Based on the data presented in [6; 13; 14; 16].

The number of researchers in the Russian North-western federal district (NWFD) (97.6 thousand people in 2009) is more than 2.5 times as large as that of the three Baltic countries (37.5 thousand people) [6; 13; 14; 16]. As to the number of research staff per 10,000 economically active citizens, it is outranked only by Estonia. The research and development expenditure to GRP ratio in the North-western federal district is higher than a similar ratio in the Baltic States. In 2009, the corresponding indices reached 1.72 % of GRP in the North West Russia (1.18 % of GDP nationwide), 1.42 % of GDP in Estonia, 0.84 % in Lithuania, 0.46 % in Latvia [7; 10]. However, in the dollar equivalent, per capita research expenditure in the North West Russia is a little bit lower than in Estonia.

In terms of innovative activity, the leading region in the North-western federal district of Russia is Saint Petersburg, where the total level of innovative activity of manufacturing industry reaches 15.3 % (against the district average of 10 % and the national average of 10.7 %). Saint Petersburg outranks all other regions of NWFD in terms of other parameters indicative of the development of innovative activity. The NWFD of today is a home to the most promising research organisations. Among the NWFD regions grouped according to some absolute and relative innovative activity parameters, Saint Petersburg comprises an individual group (table 3, 4).

Relatively high indices are shown by the Leningrad region which is bordering on Estonia. Unfortunately, the two other constituent entities of the Russian Federation bordering on the Baltic States and exhibiting favourable prerequisites for the development of transborder cooperation, including that in the field of research and innovations — the Kaliningrad and, especially, the Pskov region — are less active in innovations. Thus, it is of special importance to develop cross-cooperation in this field.

Table 3

**Grouping of NWFD entities according  
to absolute parameters of innovative activity, 2008 [5]**

Group	NWFD constituent entities	Number of research staff, people	Expenditure on technological innovations, mln roubles	Patents issued
1	Saint Petersburg	81654	11877	2053
2	Murmansk region	2071	4411	69
3	Vologda, Leningrad, Novgorod region, Republic of Karelia	483—6374	2050—3250	16—126
4	Arkhangelsk, Kaliningrad region, Komi Republic	1897—2971	772—1474	45—92
5	Pskov region	230	233	56
6	Neenets autonomous district	43	0.1	—

Table 4

**Grouping of NWFD entities according  
to relative parameters of innovative activity, 2008 [5]**

Group	NWFD entities	Number of research staff per 1,000 people	Technology and innovation expenditure per 1,000 people, roubles	Patents issued per 10,000 people
1	Saint Petersburg	17.8	2592	4.5
2	Leningrad region	3.9	1283	0.8
3	Republic of Karelia, Murmansk region	1.4—2.4	4570—5210	0.2—0.8
4	Vologda, Novgorod region	0.4—1.3	2166—3245	0.6—0.7
5	Arkhangelsk, Kaliningrad region, Komi Republic	0.3—2.3	783—1163	0.5—0.9
6	Pskov region	0.3	332	0.8
7	Neenets autonomous district	1	2.4	—

Active international cooperation in the Baltic region in research and innovations, despite the difference in the scale of research and innovation potential, can be beneficial for both the Russian Federation (first of all, the NWFD) and the Baltic states. Firstly, Russia in general and the NWFD in particular have faced problems relating to the reforms of research and innovation spheres, which are similar to those faced by the Baltic states, and solving them is of great interest for Russia. Secondly, Russia, due to its vast territory and research and innovation potential differentiation, could act as a knowledge generator, whereas the Baltic partners apparently excel at transforming new ideas into technologies and launching new start-ups. Latvia, Lithuania, and Estonia have the necessary logistical and communication resources and are ready to develop new promising technologies on the premises of their science parks, where the establishment of companies with the participation of Russian capital can take place. Thirdly, despite the fact that the three Baltic countries lag behind the world leaders in terms of research and technological development, they have research and technological groundwork, including that of the world level and above it. Research and technological cooperation with the Baltic countries could be of use for such branches of Russian economy as energy, certain subindustries of mechanical engineering (in particular, transport and power engineering, electronics and power industry), IT, certain subindustries of the chemical industry (cosmetic, pharmaceuticals, heavy chemicals), the lumber and woodwork industries, agriculture, transport, etc. In their turn, Russian research and educational institutions have something to offer to the Baltic partners.

So, cooperation with Lithuania is particularly promising in the implementation of mid- and long-term innovation projects in the following areas<sup>2</sup>:

- biotechnologies,

<sup>2</sup> For more detail see [1; 2; 8].

- laser technologies,
- nanotechnologies and new materials,
- semiconductor physics and electronics,
- information and telecommunication technologies,
- microbiology,
- marine technologies,
- environmental protection and sustainable nature management,
- process and technology in agriculture, etc.

Research and educational institutions of Lithuania, such as Lithuanian Academy of Sciences, Kaunas University, Kaunas University of Technology, Klaipeda University, Vilnius Pedagogical University, Lithuanian University of Health Sciences, etc., could be considered as possible cooperation partners. Moreover, different research institutes and science park show potential for cooperation.

Russia could develop cooperation with Latvian research and educational structures in the following fields:

- basic industrial technologies,
- material science (composites, nanocomposites, ceramic and polymeric materials),
- alternative energy sources (biofuel, hydrogen energy),
- biomedicine and pharmaceuticals,
- biocompatible materials,
- agrobiotechnologies,
- environmental protection and sustainable nature management,
- forest resource management.

The most promising partners from Latvia are the University of Latvia (Riga), Riga Technical University, Riga Stradiņš University, Latvian Institute of Organic Synthesis (Riga), Latvia University of Agriculture (Jelgava).

As to Estonia, the implementation of mid- and long-term innovation project seems to be the most beneficial in the following fields:

- information technologies — the introduction, adaptation, and integration of new information technologies developed in other countries (infosociety);
- alternative energy sources (biogas, hydrogen energy);
- new materials (including new generation energy saving materials);
- medicine,
- agricultural raw material and food processing;
- environmental protection and sustainable nature management.

Tallinn University, Tallinn University of Technology, the University of Tartu, Estonian University of Life Sciences (Tartu), Centre of Excellence in Computer Sciences (Tallinn), Competence Centre for Cancer Research (Tallinn), Centre of Excellence in Chemical Biology (Tartu) are particularly interesting as prospective partners.

Promising mechanisms for the introduction of innovations and development of transborder international integration are growth triangles, Euroregions, transborder innovation clusters, etc. Unfortunately, innovations have not been seen as a key priority of transborder cooperation between Russia

and the neighbouring European states (including the three Baltic states) so far, but they attract an increasing attention and are capable of facilitating the development of efficient transborder networks of research and educational institutions, science and innovation parks, business, and authorities.

Another propitious tool for cooperation in innovations (also with the Baltic states) is the formation of the “Bay of Finland growth triangle”<sup>3</sup> and a Russian-Estonian transborder cluster, as well as the development of a tripolar research space in the framework of the “Tricity”<sup>4</sup> — Kaliningrad — Klaipėda” tripolar territorial system.

As an efficient mechanism of intergovernmental cooperation in the field of research and technology, we suggest concluding intergovernmental agreements on cooperation in the field of research and technology with each Baltic country (Lithuania, Latvia, and Estonia). Cooperation can include joint projects, free access to research equipment, data collection, organisation of study visits and exchange programmes, different forms of information exchange. It is necessary to establish committees on cooperation in the field of research and technology designed to coordinate cooperation in the framework of agreements.

Universities and other higher educational institutions should play an active role in developing cooperation in the field of innovations between Russia and the Baltic states. HEIs should actively collaborate with business, generating innovations, and forming a proper environment for innovative activity. However, today the prerequisites created in the framework of the established partnerships between Russian and Baltic universities have not been used to their full extent.

Saint Petersburg State University and the Immanuel Kant Baltic Federal universities have a good potential for the intensification and expansion of international cooperation with the Baltic States in the field of innovations<sup>5</sup>. The Immanuel Kant Baltic Federal University, aiming at the promotion of Russian national interests in the Baltic region (see the University development programme for 2011—2020 [4]) actively develops research, including research in innovation and education in the Baltic Sea region. The university implements a number of projects in the framework of the *Research and teaching staff of innovative Russia* federal programme for 2009—2013.

A comprehensive study of the Baltic Sea region, including its innovative potential is in the focus of attention of two research bodies within the I. Kant Baltic Federal University — the Institute for Social Sciences and the Humanities (the Baltic Region Institute being part of it) and the Baltic Centre for Advanced Studies and Education (Baltic CASE). The university’s international cooperation in research and education, including that with the Baltic countries, is actively developing (cooperation agreements were concluded

<sup>3</sup> The southern regions of Finland, Estonian countries (first of all, Harjumaa and da-Virumaa), Saint Petersburg and the Leningrad region.

<sup>4</sup> Gdansk-Gdynia-Sopot.

<sup>5</sup> The university was established in the early 2011 on the basis of the Immanuel Kant State University of Russia (until 2005 Kaliningrad State University).



with Latvian and Lithuanian universities). There are good prerequisites for the transformation of IKBFU into one of the leading Russian centres for the development of international cooperation in the field of innovations both with the Baltic states and other countries. The University is to play an important role in transferring advanced international innovative practices and technologies to Russia as well as transferring Russian innovations and technologies abroad in a longer perspective.

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