

## The Baltic macroregion: geographical macrostructures, communication features, innovative potential

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Veröffentlichungsversion / Published Version

Zeitschriftenartikel / journal article

### Empfohlene Zitierung / Suggested Citation:

Pilyasov, A. N., & Klimenko, N. A. (2011). The Baltic macroregion: geographical macrostructures, communication features, innovative potential. *Baltic Region*, 3, 61-75. <https://doi.org/10.5922/2079-8555-2011-3-9>

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# INTERNATIONAL COOPERATION IN THE FIELDS OF INNOVATIONS, EDUCATION, AND RESEARCH

UDK 332.1:001.895(474)

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THE BALTIC MACROREGION:  
GEOGRAPHICAL  
MACROSTRUCTURES,  
COMMUNICATION FEATURES,  
INNOVATIVE POTENTIAL

*The article considers and assesses the influence of macro-geographical factors on communication behaviour of people in the course of transition to innovative economy through the example of the Baltic Sea region.*

**Key words:** *Baltic Sea macroregion, innovative development, communication, geographical factors.*



In the current era of a growing global commodity, information, and energy exchange, earlier concepts of macroregional alliances<sup>1</sup> — territorial integration of the communities of people from different countries residing on a vast territory — are discovered anew and have become relevant again. The restoration of common identity of large communities as a response to the challenges of globalisation can take place in different forms: ethnical and behavioural ones, confessional consolidation, etc. [3; 10].

We place emphasis on the process of consolidation of the neighbouring, belonging to different countries and culturally heterogeneous communities on the basis of geographical macrostructures. The consolidation of these local communities is understood in terms of communication, rather than in terms of politics or economy. These geographical macrostructures are considered not from the landscape, orographic or climate perspectives, but from that of their impact on personal communication between people from neighbouring states and regions.

Communication plays an important role in the generation of new knowledge. In the modern era, economic agents residing in an international macroregion, where geographical factors ensure the convenience of fast personal communication by means of different land and/or air means of transportation, gain an important competitive advantage as a result of the rapid establishment of trust relationships, conclusion of contracts, and an exchange of confidential knowledge.

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<sup>1</sup> Many of these concepts were first developed in the early 20<sup>th</sup> century (Eurasianism, the Subarctic, Baltoscandia etc.).

The convenience of personal communication stemming from the geographical factors does not automatically result in the economic success of companies, regions or countries that enjoy it. Moreover, the innovative success does not automatically convert into the economic success and dynamic economic development of regions and countries.

Geographical factors cement the traditions of communication affecting the rate of dissemination of innovations as well as their development. The role of geographical factors in the emergence and diffusion of innovations is convincingly proven by the American geographer, J. Diamond [11], who studied the advantages of the locations where innovations emerged and spread over thousands of years of human history on different continents.

Obviously, the features of macroregional factors often affect the communication behaviour of people (the way people communicate with each other, transmit and absorb new knowledge), which is often manifested in formal and informal institutions regulating human interaction. Established institutions and communication behaviour, in their turn, affect the rate and efficiency of the process of emergence and dissemination of new knowledge and innovations as its materialised product.

In relation to the geographical factors of communication of expert holders of new knowledge, we are interested, first of all, in the level of macroregions, since large geographical structures act as either catalysers or inhibitors of innovative development on a vast territory. The scale of metropolitan areas will not be sufficient as in their case the effect of physical geographical factors on communication is mitigated by the factors of artificial urbanisation, distribution of productive forces, and the performance of the local labour market.

This approach to the study of macroregions — from the perspective of identification of their potential and prospects in the new knowledge economy — requires synthesis of the elements of both the physical and economic geographical science, and the theory of communication. It is carried out in the framework of a general trend prevalent in modern social science, i. e. close interaction with cognitive sciences, and the introduction of their concepts, terminology, methodology, and research methods into sociology, ethnology, economics, and economic geography [6].

Within a study into the communication features of a territory, an important component is an analysis of current and obsolete transport and trading channels, which shape the communication frame of the territory. Much information can be obtained through a study into the dynamics of population distribution in rural areas, which always shows in detail the features of the territory and terrain, and thus exhibits its communication characteristics. Moreover, an analysis of population distribution in rural areas helps identify the historical traditions of communication, which often survive in cities.

The Baltic macroregions seems to be an adequate platform for testing the above mentioned approach — “geographical factors — communication — innovations” — because of the relative macrogeographical homogeneity of the territory welded by the Baltic Sea, on the one hand, and significant differences in the macrogeographical structure in the north and south and, hence, significant cultural differences, on the other hand. The unity of the difference always

acts as a stimulating factor for innovations, which have spread easily and promptly in the Baltic region. It is not a coincidence that it was the Baltic region where T. Hägerstrand created the theory of innovation diffusion [16].

As of today, several traditions have developed in the understanding of the Baltic macroregion and the countries constituting it. In the framework of the “geographical factors — features of personal communication — innovative development” sequence, we understand the Baltic macroregion as smaller countries and the territories of larger states that have direct access to the Baltic Sea: Sweden, Finland, Denmark, Lithuania, Latvia, Estonia, maritime constituent entities of the Russian Federation (the Kaliningrad region, Saint Petersburg and the Leningrad region), maritime regions of Poland (the Pomeranian, West Pomeranian and Warmian-Masurian voivodeships), northern states of Germany (Schleswig-Holstein, Mecklenburg-Vorpommern and Hamburg).

Since the Baltic region is the key factor of consolidation of the Baltic macroregion, it is very important to identify its features, which directly affect personal communication, and determine its type, regularity, speed, and other parameters.

First of all, it is worth noting that the Baltic region is swarming with communication lines and contacts — trading, information, energy, and financial ones. Globally, there are few structures of similar convenience in the temperate zone, which ensure regular and close personal interaction of communities of neighbouring countries and regions. For a long time, intensive maritime trade has facilitated the economic integration of coastal territories.

Unlike other sea basins, there are neither borders nor barriers to communication thanks to short distances, shallow waters of the sea, and the convenient unevenness of the shore line. The role of the Baltic Sea as an important communication channel for the peoples of different regions residing in the area is corroborated indirectly by the fact that maritime activities account for the maximum for the EU percentage in gross value added and employment: 9% of GDP and 7% of employment rate in Estonia; 8% and 5% in Latvia; 4% and 5% in Denmark [12]. A significant role on ensuring communication in the Baltic macroregion has always been played by sea transport. Today it cements the cluster of maritime economic activities — navigation, ports, shipbuilding, maritime services, equipment delivery, fishing, etc.

Alongside active internal communication, of importance is the cooperation of the Baltic Sea regions with other territories, their extroversion. Today the share of the Baltic EU countries in terms of trade turnover is higher than that in terms of GDP<sup>2</sup>. Apparently, the Baltic Sea ensures maximum convenience of personal communication for local communities in comparison to the basins of other seas. Today the Baltic Sea boasts the thickest maritime traffic in the world. Approximately two thousand vessels are found in the Baltic Sea at a time, which accounts for 15% of the world cargo fleet [13]. The closed nature of the sea makes navigation safe and ensures active trade rela-

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<sup>2</sup> Hanseatic trade in the Middle Ages proves that the traditions of intensive trade and, hence, information interaction with the outer world has existed in the region for a long time.

tions between the neighbours and effective information exchange between the residents of maritime territories. From the communication point of view, “closed” seas (the Baltic Sea, the Mediterranean Sea, the Caspian Sea, the Black Sea, the Red Sea and other seas) have an advantage over “semi-open” seas, for instance, the North Sea and the Sea of Okhotsk, which are less “friendly” and safe for trade and information contacts.

In comparison to other closed seas, the Baltic Sea is more “interesting” when it comes to communication, since its numerous lagoons and bays, and the uneven shoreline create various microlandscapes and coastal microcultures associated with them. Such semi-isolated coastal areas in the bays and lagoons of the Baltic Sea can be called in the language of contemporary economics a network of isolated intellectual platforms: each is home to a peculiar innovative process, all of them are interconnected, and thus, they enjoy a continuous well-established knowledge exchange.

Another advantage of the Baltic Sea over “closed seas” is the numerous islands, which made it possible to interrupt a journey across the sea. It facilitated the interaction of local communities even residing on distant shores.

The Baltic Sea stretches along the meridian, i. e. the south — north axis from 54 to 66° northern latitude. Its zonal properties also affect the whole Baltic macroregion as well as the features of internal communication. In the north, the water is almost sweet, the sea freezes in winter, whereas in the south, the water is saltier, thus the ports of southern Baltic — from Denmark to Lithuania — are ice free.

In many basins of inland seas, two civilizational, cultural and socioeconomic models — northern and southern — have naturally developed: northern European and southern African models in the Mediterranean Sea, northern Orthodox and southern Muslim in the Black Sea, northern Scandinavian and southern Prussian-Slavic and Baltic in the Baltic Sea<sup>3</sup>. The distinction between the northern and southern flank of the Baltic macroregion is emphasised by two geographical macrostructures: the Baltic Shield in the north and the Baltic Ridge in the south.

The construction of land communication channels was more complicated in the north, thus, the communication role of the Baltic Sea was greater in that area. Probably, that is why, two communication models — northern and southern — developed within the Baltic macroregion and later converged, since, due to the small size and closed nature of the Baltic Sea, the numerous trading routes also served as channels of knowledge exchange and military technology transfer (for instance, the routes between Sweden under the rule of Charles XII and Russia under the rule of Peter I). Denmark’s historical cultural and trade connections with Sweden and Finland (later extended to Estonia, Russia, Sweden and Finland) integrated the two models and narrowed the gap between them. It is tempting to call these models as the “networking” model and the “hierarchical” one in order to explain the success of the northern Baltic

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<sup>3</sup> Political scientists traditionally divide the Baltic region into the “capitalistic” West and post-Soviet East. However, this division does not take into account the factors of geographical macrostructures and their communication role.

countries in constructing the foundations for innovative economy, and the slower innovative development on the southern territories. In effect, everything is more complicated: each model apparently includes the elements of both network and subordination, hierarchical communication.

The regions and countries framing the Baltics have actively communicated over many centuries. Close trade and informational cooperation creates prerequisites for the formation of common or similar institutions (rules of conduct) determining the interaction and communication behaviour of local communities and individuals who, in their turn, affect the rate and scale of the formation of innovative economy [9].

The specific feature of the Baltic macroregion is that it consists predominantly of smaller in terms of economy and population countries — Sweden, Finland, Latvia, Lithuania, and Estonia. The maritime territories of Germany, Poland, and Russia are an exception. In many smaller countries, the factor of tangible compact space contributes to a high speed of direct signal transmission and feedback reception creating a natural prerequisite for the formation of institutions ensuring non-hierarchical unsubordinated communication. On the other hand, governing vast spaces often requires institutions of directive hierarchical communication.

The institutions of smaller states encourage maximum openness of economy to the outer world. They stipulate compact and simple (minimum bureaucracy) tools for the control over the observance of regulations, and the structure of interaction between the state and business. The structure of the industrial sector is, as a rule, dispersed rather than monopolised by one or two corporations. Thus, they often boast efficient institutions of support for small and medium enterprises, and intercompany interaction. Driven by the need to ensure the flexibility of local economy and its adaptability to external challenges, the institutions of smaller countries apply soft limitations rather than strict prohibitions, which creates conditions for tolerance within the whole society and its legal system. A significant role is played by municipalities, grassroots democracy and self-development.

During the 2009 crisis, the features of Baltic institutions became more pronounced. First of all, it is their orientation towards strengthening smaller, local rather than large, global economic and political structures. An illustrative example is the behaviour of Swedish government: when the large national car manufacturer SAAB was in need of support, it counted every krona, but when it came to support for communes and landstings, politicians were ready to spend billions without insisting on obligatory reporting [1]. In Finland, the reaction to the crisis was also connected with the adjusting of municipal institutions: redivision of the region network took place in the country. It is the municipalities and their configuration where the national government sought for support in overcoming the global economic crisis.

Another response to the crisis was the mobilisation of the potential of the existing intra-Baltic economic partnerships as well as the formation of new ones. For instance, Danish banks invested in the banks of the Baltic States affected by the crisis. The network institutions and structures, which are

characteristic of the Baltic countries (for instance, consensus democracy in Sweden), have strengthened in the course of the economic crisis.

One of the reactions to the crisis was migration of human capital. For instance, Lithuanian school leavers applied en masse to English universities. Although education values are deep-rooted in many Baltic local communities, any significant change in the external economic situation inevitably affects the institutions (informal rules and standards) determining the education-related processes in the country. There arises the danger of brain drain resulting in the need to constantly “invent” innovative institutions that would support the advanced quality of national education.

The areas of activity of the Baltic countries’ institutions are clearly mentioned in the reports and presentations of their representatives at annual congresses of the European Regional Science Association. An analysis of 120 reports held in 2001—2009 by regional scientists from Sweden, Finland, and Latvia made it possible to identify the Baltic features of the research subject and the related institutions. Thus, of considerable importance are priority values of local labour markets and local municipalities. Strong municipal tradition has existed there for a long time. Municipalities play an important role in economy as local employers and sometimes entrepreneurs. The institutions harmonising the municipal structure with household economy and the educational system are well-developed in the region.

Another popular topic is the economic role of the factor of new knowledge and, in particular, universities, in the development of local communities, settlements, and enterprises. Often the possibility of generating new knowledge is linked to the development of social services, which should be easily accessible to the communities of peripheral territories. Scholars discuss institutions bringing together the factors of social capital (trust), communication and dissemination of new knowledge.

A distinctive feature of the reports delivered by the representative of the Baltic macroregion countries is an emphasis on the partnership networks of science, business and the authorities as well as the cooperation of structures and the interdisciplinarity. An increasing efficiency of the small and relatively simple economies of these countries requires new connections, networks, and partnerships in the form of joint ventures, alliances between small enterprises and municipalities, universities and business, etc. Thus, priority is given to the institutions facilitating easy and fast development of such partnerships.

Baltic scholars have a special approach to gender issues. The topic of gender discrimination, popular with researchers from other countries, is paid little attention here, since, in the Baltic macroregion, this problem is less pronounced than in other European countries. The Baltic region is home to research on the gender structure of social capital and intermunicipal economic difference. The “Baltic” gender is not a reason for discrimination, but a factor of economic and social differences in the development of local communities.

Thus, when analysing the connection between the common Baltic institutions shaping the communication between communities and economic entities, and success in the development of local economy of knowledge, it is important to emphasise that, in the Baltic region, of major importance for local eco-

conomic development are networks, alliances, intercompany unions and cooperation institutions in general. The Baltic countries solve coordination problems easier and faster than other world communities and with minimum transaction costs. Probably, it can be explained by the positive features of the Baltic Sea and the local geographical macrostructures of the Baltic Shield and Ridge, which determined the communication type peculiar to this area (an open, almost non-hierarchical, multiactor — network — type). It is no coincidence that today the Baltic macroregion is the leader in the initiatives of complex multiactor cooperation<sup>4</sup>. Innovative types of economic activity benefit most from the development of cooperation and information exchange.

The overall peripheral economic and geographical position of the territory of the Baltic region in relation to the European centre and the centres of home countries turns into an advantage from the perspective of its potential to become a natural platform for experimenting, pilot modelling of institutions, and institutional engineering in small areas. For example, the Kaliningrad region always comes up with ideas of becoming a laboratory for testing European institutions in Russian conditions.

A priority value of many Baltic communities is education. Many local institutions and structures are aimed at a breakthrough in education and training of the population. It is no coincidence that here the level of education is, as a rule, above or equal to the EU average.

The Baltic macroregion is characterised by the constructive dialectics of unity and diversity. On the one hand, the Baltic Sea forms natural prerequisites for communicative unity. On the other hand, two geographical superstructures divide the macroregion into the northern and southern parts (the Baltic Shield and the Baltic Ridge), determining the differences in terrain, climate and soil conditions, which, in its turn, apparently affects the features of communication in the north and in the south of the Baltic area and accounts for the differences in the economic and social parameters of development of the northern and southern territories. In this relation, it is of interest to analyse the indices of development of the Baltic maritime territories not on the basis of the economic (market, transitional) model, i. e. from the perspective of the west-east gradient, but in terms of the geographical macrostructure criterion (north — south).

The total area of the northern part of the Baltic macroregion is almost twice as large as that of the southern one (table 1). On the other hand, the population of the south is more than twice as numerous as that of the northern part of the Baltic area. Within the Baltic Ridge, it is the new independent states and the Russian Baltic regions that stand out in terms of absolute population and area parameters. The aggregate demographic and land potential of both territorial “clusters” is comparable. The total population and territory of the Polish and German Baltic regions and Denmark are also similar.

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<sup>4</sup> The first EU strategy for a macroregion was developed for the Baltic countries (before the Danube Region and the Alps) [5]. The Baltic Sea Region University Network, established in 1991, brings together 225 universities from 13 Baltic countries and is well-known in the world. The Baltic macroregion is the European leader in testing new spatial forms of economic cooperation – Euroregions, growth triangles, etc. [7].

Table 1

**Key indicators of the socioeconomic development  
of the Baltic region countries (2010)**  
**[8; 14; 15; 17; 18]**

Territory	Population, 1000 people	Territory, 1000 km <sup>2</sup>	Per capita GDP/GNP, USD	Birth rate, per 1000 residents	Mortality per 1000 residents	Natural increase per 1000 residents	Migration balance, per 1000 residents	Level of urbanisation, %
<i>North</i>								
Sweden	9060	450.3	36 600	10.1	10.2	-0.1	1.7	85
Finland	5250	338.1	34 100	10.4	10.1	0.3	0.7	67
<i>Total</i>	<b>14310</b>	<b>788.4</b>	—	—	—	—	—	—
<i>South</i>								
Denmark	5 501	43.1	36 000	10.5	10.2	0.3	2.5	87
Baltic states of Germany	<b>6219</b>	<b>39.8</b>	—	—	—	—	—	—
Including:								
Schleswig-Holstein	2 742	15.8	39 930	8.0	10.5	-2.5	3.2	—
Mecklenburg-Vor- pommern	1 700	23.2	32 541	7.4	10.2	-2.8	-5.3	—
Hamburg	1 777	0.8	77 031	9.2	10.0	-0.8	4.8	100
Baltic voivodeships of Poland	<b>5314</b>	<b>67.2</b>	—	—	—	—	—	—
Including:								
West Pomeranian	1 694	24.2	8 614	9.7	9.2	0.5	-0.8	69
Pomeranian	2 192	18.3	17 335	11.0	8.5	2.5	0.6	67
Warmian-Masurian	1 428	24.7	14 654	10.6	8.8	1.8	-2.2	60
Baltic regions of Russia	<b>7169</b>	<b>102.5</b>	—	—	—	—	—	—
Including:								
Saint Petersburg	4 600	1.4	19 396	11.3	14.1	-2.8	7.2	100
Leningrad region	1 632	85.9	14 685	9.2	17.0	-7.8	8.3	66
Kaliningrad region	937	15.2	12 106	11.5	14.6	-3.1	3.9	78
New independent Baltic States	<b>7086</b>	<b>175.1</b>	—	—	—	—	—	—
Including:								
Estonia	1 299	45.2	18 500	10.4	13.4	-3.0	-3.3	69
Latvia	2 232	64.6	14 400	9.8	13.6	-3.8	-2.3	68
Lithuania	3 555	65.3	15 500	9.1	11.2	-2.1	-0.7	67
<i>Total</i>	<b>31289</b>	<b>427.7</b>	—	—	—	—	—	—

The countries of the Baltic Shield are, on average, more economically successful than the southern territories. In terms of per capita GDP, they can be compared to Germany and the maritime territories of Germany; however, it is twice as high as that of the Baltic regions of Poland and Russia. The northern countries of the Baltic macroregion demonstrate extreme economic openness — the non-Baltic world accounts for two thirds of their foreign turnover, whereas in “southern” Lithuania, Latvia, and Estonia, only for one third [7].

Such parameters as birth rate, mortality, and natural increase do not exhibit any zonal features: they are comparable on many northern and southern Baltic territories. However, this similarity conceals certain differences in the gender structure. In the north, women account for approximately half of the population (50—51), in the south, for 54% [7]. In the northern communities, where the share of women is lower, the key political and economic positions are easier accessible to them than in the south, where they dominate in terms of numbers, but discrimination proves to be stronger.

The sign of migration balance in the northern countries of the Baltic macroregion has been positive over the last 25 years; in the south, in the new independent states, it has been negative since their foundation, i. e. the early 1990s [7]. One can assume that the total migration balance of the macroregion is positive for the north and negative for the south (i. e. intraregional migration flows move predominantly from the south to the north).

In comparison to the communication behaviour, it is quite easy to identify a significant social and economic difference between the northern and southern parts of the Baltic macroregion. The average indices of Sweden and Finland are much higher than those of the southern Baltic territories.

The northern part of the Baltic macroregion is represented by economically developed countries, whose communities are involved in active communication both within and beyond the Baltic Sea basin. On average, the countries and regions of the southern part of the Baltic macroregion are less successful in terms of economy and less open in terms of communication.

In order to understand the dichotomy of the north and the south of the Baltic macroregion in terms of innovation potential, we conducted an analysis of the integration of four parameters: the number of university students per 1000 people, the percentage of staff involved in research and development in the total population, the share of research and development expenditure in GDP/GRP, and the number of patent applications per 1 mln people (tables 2, 3).

On the basis of the integration of the values of the four parameters (table 3), the territories were divided into three groups:

Group 1 — regions with a relatively high level of innovation potential development. This group is represented by Sweden and Finland as the northern Baltic countries, whose leading position is explained by their openness and active communication, and the southern territories — Saint Petersburg and Denmark, which owe their leading position to the agglomeration effect

— the large centres attract significant economic, demographical, and research potential of the Baltic macroregion. The development of higher education infrastructures strengthens the leading positions of these regions in terms of the number of university students. The predominantly post-industrial profile of the economy gives priority to the development of knowledge intensive and innovative industries and branches, which manifests itself in high expenditure on research and development in the structure of GDP and the percentage of researchers in the total population. The development of creative and investment activity in the field of innovation promotion explains, to a certain degree, the considerable number of patent applications.

Table 2

**Key indicators of the creative and innovation potential  
of the Baltic region territories  
[8; 14; 18]**

Territory	Number of university students per 1000 residents	Research and development expenditure, % of GDP/GRP	Share of the staff involved in research and development, % the total population	Number of patent application per 1 mln people
<i>North</i>				
Sweden	258.8	2.7	0.5	146
Finland	262.5	2.5	0.7	111
<i>South</i>				
Denmark	254.5	1.8	0.5	114
Maritime states of Germany:				
Mecklenburg-Vorpommern	23.3	0.4	0.4	35
Schleswig-Holstein	21.0	0.5	0.1	101
Hamburg	42.6	1.2	0.2	119
Polish maritime voivodeships:				
West-Pomeranian	46.2	0.01	0.1	3
Pomeranian	47.2	0.2	0.2	4
Warmian-Masurian	38.2	0.1	0.1	1
New independent Baltic States:				
Estonia	228.7	0.5	0.3	8
Latvia	220.7	0.2	0.2	4
Lithuania	246.4	0.2	0.3	2
Russian Baltic territories:				
Saint Petersburg	91.7	3.4	1.0	584
Leningrad region	8.7	0.8	0.1	93
Kaliningrad region	31.4	0.5	0.1	103

**Integral rating of the Baltic region territories  
in terms of innovation potential**

Territory	Number of university students per 1000 residents	Research and development expenditure, % of GDP/GRP	Share of the staff involved in research and development, % the total population	Number of patent application per 1 mln people	Integral rating
<i>North</i>					
Sweden	2	3	2	2	1
Finland	1	2	3	5	3
<i>South</i>					
Saint Petersburg	7	1	1	1	2
Denmark	3	3	4	4	4
Hamburg	10	8	5	3	5
Estonia	5	6	8	10	6
Lithuania	4	6	13	14	7
Latvia	6	8	12	12	9
Schleswig-Holstein	14	11	7	7	12
Mecklenburg-Vorpommern	13	5	10	9	8
Pomeranian Voivodeship	8	8	11	11	10
Leningrad region	15	11	6	8	13
Kaliningrad region	12	11	9	6	11
West Pomeranian Voivodeship	9	11	15	13	14
Warmian-Masurian Voivodeship	11	11	14	15	15

Group 2 consists of the regions with an average level of innovation potential development. One can distinguish between two subgroups: “smaller economies” of the Baltic States (Estonia, Lithuania, Latvia) and the states of the northern German periphery (Hamburg, Schleswig-Holstein, Mecklenburg-Vorpommern). The relative “provincialism” of the universities characteristic of this group in comparison to the regional average explains a lower share of students in the total population. These regions do not boast any large research centres, the expenditure on research and development accounts for a small share of GDP/GRP, the percentage of the staff involved in research is also low. As to the northern states of Germany, it is explained by the industry structure of regional economies oriented towards knowledge non-intensive production; in the Baltic countries, the reasons are the principles and strategies of the economic policy in the framework of EU integration and an emphasis on the transit nature of economic ties. The principal difference between the subgroups lies in the number of patent applications: only a few in the Baltic States and more than one hundred (comparable to the highly developed regions) in the northern states of Germany.

Group 3 is represented by the regions with a relatively low level of innovation potential (the northern voivodeships of Poland, the Russian Kaliningrad

and Leningrad regions), and an insignificant share of students and research staff in the total population. In the Kaliningrad and Leningrad regions, limited financing of research and development, and a small number of researchers against the background of a high level of inventive activity and patenting (85% applications for trademarks and inventions) are indicative of the generation of innovations in the framework of the economic entities, rather than of the inventive productivity of these regions. The import substitution economic policy carried out in the Kaliningrad region results in a higher research and development expenditure to the GDP ratio and a larger number of patent applications.

Today the Baltic macroregion, which became home to an original theory of innovation diffusion several decades ago, is in need of active redistribution of knowledge from the economically and innovatively successful northern countries to the southern regions and states.

The shifting of the innovative development emphasis to the regional level is an important step towards overcoming the historical specialisation of the regions, which does not always contribute to their sustainable development, since such economies are more susceptible to risks during fundamental changes and crises. This aspect of development is highly relevant to the Baltic region, which was significantly affected by the 2008 financial and economic crisis<sup>5</sup>.

The territorial localisation between Russia and the EU attaches special significance to the Baltic macroregion. It is a platform for different paradigmatic activities, including cross-border cooperation. Analytical and prognostic support for the international integration of the Russian Federation and the Baltic countries in the fields of education, research, technology, and innovations should take into account international practices, possibilities for exporting Russian technologies and prospects for greater involvement of the Russian Federation in international cooperation.

Despite intensive integration and well-developed partner interaction and cooperation in the Baltic macroregion, the field of innovative development is hardly involved in these processes. So, a research on the potential and prospects of cooperation between Russia and the Baltic region countries conducted in 2010 at the Immanuel Kant Baltic University of Russia (today, the Immanuel Kant Baltic Federal University) showed that the field of technology and innovation is one of the least developed in the framework of cross-border cooperation between the regions of the Northwestern federal district of Russia and the Baltic countries. The reason is the incomplete development of innovative infrastructure of the territories as well as the relative weakness and inertness of the development of technology transfer networks.

An analysis of the innovative, research and technological potential of the Northwestern federal district of Russia in view of the prospects of cooperation with the Baltic regions states helps identify 19 priority areas of research and development:

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<sup>5</sup> The region exhibited the highest rates of a decrease in GDP growth (–6.5% in 2009 at the world average of –1.3%) and inflation (7.6% against the world average of 6%) [2].

- 1) nanotechnologies,
- 2) mineral resource forecasting and assessment,
- 3) fossil fuel extraction and processing,
- 4) environmental protection and sustainable land use,
- 5) energy saving technologies,
- 6) chemical technologies,
- 7) manufacturing technologies in mechanical engineering,
- 8) information and telecommunication technologies and intellectual systems,
- 9) construction materials,
- 10) lumbering and woodworking,
- 11) space technologies,
- 12) defence technologies,
- 13) technologies and equipment in the field of mechanical and technical processing,
- 14) agricultural technologies,
- 15) navigation, industrial fishery, and fleet maintenance,
- 16) nuclear energy and nuclear physics,
- 17) instrument engineering (including laser and radiolocation equipment design),
- 18) new medical technologies and medical instrument engineering,
- 19) new technologies for industrial modernisation.

The areas listed above correspond to the priorities of research and technology development in the Russian Federation. Saint Petersburg is promoted as a promising innovation capital of Russia, the coordinating link in the network of innovation generation and transfer connecting the Northwestern federal district with other Russian territories, showing research and innovation potential.

Intrabaltic differences can be used constructively in order to become the driving force of innovative development of the maritime territories of Poland, Russia, and the Baltics. A localised transfer of knowledge and experience should take place, first of all, in the areas related to knowledge economy: education system, innovation infrastructure, knowledge intensive small and medium business. There is a need for special cooperation institutions aimed at the simplification of intellectual exchange of all types. Today, transaction costs of crossing the Russian-EU border remain rather high. For instance, the time of border crossing for the passengers of the Kaliningrad-Klaipeda bus route can amount to 50% of the time of the journey. The establishment and development of innovation and technological centres for a more efficient transfer of information and technologies is suggested as the principal mechanism of cooperation between universities, research organisations and enterprises. The model of cooperation between Russian innovation centres and organisations of the Enterprise Europe Network (EEN) is being developed on the basis of pilot centres.

Obviously, in the conditions of globalisation and regionalisation, the modern innovative infrastructure is linked to the level of development of communication in the region, which is affected by the macrogeographical

factors, including physical geographical ones. In this relation, the macro-regional level of research seems to be the most suitable for the assessment of the potential and prospects of developing the innovation sphere in individual countries and regions, since it makes it possible to look at a comprehensive picture of communication space and the set of regional development factors.

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