

### Cross-border specialization of interregional interaction: applying new assessment methods

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**CROSS-BORDER  
SPECIALIZATION  
OF INTERREGIONAL  
INTERACTION:  
APPLYING  
NEW ASSESSMENT  
METHODS**

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*Cross-border cooperation as a type of interregional interaction is becoming a significant factor in the development of border regions. It can be viewed as a result of intensification of cross-border contacts and greater economic openness of cross-border regions. Thus, the roots of current development are quite easy to pinpoint. However, assessment of the impact of cross-border cooperation on the development of border regions appears to be a research challenge. In this paper, we offer an approach to the assessment of the role of cross-border cooperation in the system of interregional interaction between border regions. We present a system of indices to describe cross-border specialization of interregional interaction in certain fields, namely investment, international trade, tourism, and migration. Cross-border specialization determines the role of cross-border cooperation in regional external relations. The empiric data we have gathered is used to develop and implement a pilot assessment of cross-border specialization of interregional relations which are characteristic of the border regions of the Northwestern Federal District of the Russian Federation. The article offers cross-border specialization indices for each border region of the Northwestern Federal District. With their help, we were able to identify the spheres of interaction with the highest degree of cross-border specialization, and in particular foreign investment and business activities with the participation of foreign capital.*

**Key words:** interregional interaction, cross-border cooperation, assessment of cross-border specialization

Cross-border cooperation as a type of interregional interaction is becoming a significant factor in socioeconomic development of border regions. It is explained by intensification of contacts between them and greater openness of their economies. Cross-border cooperation is a special kind of interregional interaction

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determined by territorial vicinity (neighbourhood) of regions (administrative units) of different states; it is a combination of interaction within the nature — population — economy triad, as well as corresponding structures relating to adjacent border regions of two states.

It is possible to take advantage of cross-border cooperation opportunities for regional development by adopting a systematic approach to management of the process of cooperation based on the specific features of the border regions involved. This leads to the need for studying modern practices of cross-border cooperation, formulating a relevant regional socioeconomic policy, and developing a methodology for assessing the role of cross-border cooperation in the whole system of external interregional relations of a region.

A qualitative assessment of the significance of cross-border cooperation in the system of interregional ties suggests evaluating such characteristics as cross-border specialisation of certain areas involved in interregional interaction. Cross-border specialisation characterises a degree of territorial specialisation of external interregional relations and in particular the role of cross-border cooperation in the total of the region's external connections, namely the share of its interregional interaction with a certain territory in the total of external interregional interaction.

It is recommended to introduce a coefficient of cross-border specialisation, which makes it possible to identify the role of a certain country in the total of interregional connections of a Russian region within the given areas for the purpose of qualitative assessment of the level of cross-border specialisation of interregional interaction.

A description of a cross-border specialisation coefficient system and its characteristics is presented in table 1.

The key problem of qualitative assessment of the significance of a cross-border cooperation factor is the lack of official statistical information. An analysis of statistical information on the socioeconomic development of Russian regions revealed a number of indices (table 2), which ensures the possibility of objective estimation of cross-border specialisation within interregional interaction. Pilot calculations have been performed for all border constituent entities of the Northwestern Federal District (NWFD) of the Russian Federation.

Despite certain problems with the performance of statistical services, we managed to compile a database for objective calculations. One must emphasise that the system of cross-border specialisation coefficients can be devised for both the current condition (i. e. the current year data), and certain periods (a five-year period). The calculation of indices on the basis of five-year data helps level possible situational fluctuations in the investment activity of individual countries. In such areas as bilateral trade, tourism, and international migration, the use of this approach is also fully justified.

The partial coefficient of cross-border specialisation within a certain area is calculated as a mean value of cross-border cooperation coefficient for the given field within a five-year period (2006—2010).

Integral assessment of the degree of cross-border specialisation of external interregional interaction according to regions requires the calculation of a mean coefficient of cross-border specialisation according to regions.

Table 1

### Methodology for calculating cross-border specialisation coefficients according to cooperation areas

Area of cooperation	Index	Calculation methodology	Meaning of the coefficient
1. Investment interaction	Foreign investment cross-border specialisation coefficient	$FIcbs = \frac{FIr}{FI}$ , where $FIr$ is the amount of foreign investment in the economy of a Russian region made by a neighbouring country, <i>mln USD</i> ; $FI$ is the total amount of foreign investment in the economy of a Russian region, <i>mln USD</i> .	The coefficient describes the investment activity of a neighbouring country in terms of its contribution to the economy of a Russian border region. It is calculated on the basis of data over a five-year period. One can also recommend a coefficient calculated on the basis of the "Amount of cumulative investment" and "Amount of direct investment" indices.
2. Investment interaction	Cross-border specialisation coefficient of foreign-invested organisations	$FIOcbs = \frac{FIOr}{FIO}$ , where $FIOr$ is the number of organisations in a Russian region raising investment from a neighbouring country; $FIO$ is the total number of foreign-invested organisations in a Russian region.	The coefficient describes the business activity of a neighbouring country within the border region's economy. One can also recommend calculation on the basis of the "Turnover of organisations raising investment from a neighbouring country" and "Number of employees at organisations raising investment from the neighbouring country" indices.
3. International migration	Migration exchange cross-border specialisation coefficient	$MEcbs = \frac{MEr}{ME}$ , where $MEr$ is the volume of migration exchange between a Russian region and a neighbouring country; $ME$ is the total volume of the region's migration exchange.	The coefficient describes migration flows between a border region and a neighbouring country. It can be calculated individually for migration inflow and outflow.
4. Foreign trade	Bilateral trade cross-border specialisation coefficient	$BTcbs = \frac{BTr}{BT}$ , where $BTr$ is the volume of bilateral trade with a neighbouring country, <i>mln USD</i> ; $BT$ is the total volume of bilateral trade of a border region.	The coefficient relates to bilateral trade between a border region and a neighbouring country. It can be calculated individually for export and import in order to give a more comprehensive idea of the essence of trade cooperation (including that for certain groups of goods).
5. Tourism	Tourist exchange cross-border specialisation coefficient	$TEcbs = \frac{TEr}{TE}$ , where $TEr$ is the volume of tourist exchange with a neighbouring country, <i>people</i> ; $TE$ is the total volume of a border region's tourist exchange.	The coefficient describes tourist flows between a border region and a neighbouring country. It can be calculated individually for incoming and outgoing tourism.

Table 2

**Values of cross-border specialisation of interregional interaction**

Area of cooperation	Initial value	Source
1. Investment interaction	Volume of the region's foreign investment according to investing countries (2006—2010)	Regional statistical annuals (2011)
2. Investment interaction	Activities of regional foreign-invested organisations according to countries (2010)	Regional statistical annuals (2011). Russian region. Socio-economic indices (2011)
3. Bilateral trade	The Russian region's export and import structure according to partner countries (2006—2010)	Regional statistical annuals (2011), data of the Northwestern Customs Administration (Pskov region), data of the Federal Statistics Service (Central statistics database)
4. International migration	The number of incoming/outgoing migrants according to countries	Data of the Federal Statistics Service (Central statistics database)
5. Tourism	The number of incoming/outgoing tourists according to countries (activities of tourist agencies)	Data of the Federal Statistics Service (Central statistics database)

Border constituent entities of the NWFD — the Kaliningrad region, the Leningrad region, the Murmansk region, the Pskov region, the Republic of Karelia, and St Petersburg — were identified for an experimental assessment of cross-border specialisation of transboundary interregional interactions.

According to the source listed in table 2, we compiled an information base for an experimental assessment. One should emphasise that, due to the lack of statistical data, investment interaction is analysed unilaterally, from the perspective of foreign investment of a neighbouring country in the border region's economy. Owing to the same reason, we omitted relations in the field of education, although the statistics of student exchange, dual diplomas or some other phenomena could be of interest.

It is important to emphasise that the index describing tourist agencies' activities was chosen as the initial one in the field of tourism. One must take into account that the share of individual tourism has increased dramatically over the recent years; however, unfortunately, the statistics does not offer data sufficient for conducting qualitative assessment of this phenomenon. Thus, in case of assessing tourism cross-border specialisation, we used the tourist agency index, which ensures objective assessment and comparison of a situation in the border regions of the NWFD.

The offered assessment methodology — as one describing objective processes — suggests a certain degree of simplification. However, against the background of absence of qualitative evaluation of cross-border cooperation processes, it seems logical to assess the significance of cross-border cooperation for border regions and identify the areas of cooperation, within which cross-border cooperation processes are of high intensity.

As a result of the experimental assessment, we obtained partial coefficients of cross-border specialisation according to certain areas of interaction for each border region of the NWFD (table 3).

The obtained cross-border specialisation coefficients of external interregional interaction of the NWFD border regions according to cooperation areas can serve a basis for identifying the areas exhibiting a high degree of cross-border specialisation, as well as a marker for a more thorough analysis of certain interaction areas.

The cross-border specialisation coefficients of external interregional interaction of the NWFD regions according to cooperation areas were used in an integral assessment of the coefficient of cross-border specialisation of external interregional interaction according to specific cooperation areas typical of each NWFD region. The results of this assessment are presented in table 4.

Table 3

**Cross-border specialisation coefficients of external interregional interaction  
of the NWFD regions according to cooperation areas\***

NWFD region	Investing country	FIcbs (foreign investment)	FIOcbs (foreign-invested organisations)	BTcbs (bilateral trade)	MEcbs (international migration)	TEcbs (tourism)
1. Kaliningrad region	Lithuania, Poland	0.23	0.411	0.115	0.031	0.128*
	Lithuania	0.104	0.325	0.043	0.028	—
	Poland	0.126	0.086	0.072	0.004	0.128
2. Republic of Karelia	Finland	0.203	0.448	0.261	0.263	0.491
3. Leningrad region	Finland, Estonia	0.185	0.126**	0.132	0.051	—
	Finland	0.174	0.126	0.121	0.033	—
	Estonia	0.011	—	0.011	0.026	—
4. Murmansk region	Norway, Finland	0.109	0.372	0.156	0.051	0.100
	Norway	0.108	0.355	0.101	0.038	0.033
	Finland	0.001	0.017	0.055	0.014	0.067
5. Pskov region	Latvia, Estonia, Belarus	0.677	0.72	0.103	0.265	—
	Latvia	0.509	0.506	0.075	0.048	—
	Estonia	0.155	0.128	0.028	0.082	—
	Belarus	0.013	0.085	—	0.136	—

End of table 3

NWFD region	Investing country	FIcbs (foreign investment)	FIOcbs (foreign-invested organisations)	BTcbs (bilateral trade)	MEcbs (international migration)	TEcbs (tourism)
6. St Petersburg	Finland, Estonia	0.051	0.126**	0.068	0.03	0.045*
	Finland	0.048	0.126	0.061	0.015	0.045
	Estonia	0.003	—	0.067	0.015	—

*Comment:* Calculated by the author on the basis of the data presented in the Regional statistical annual (2011) and “Russian regions. Socioeconomic indices” (2011), as well as the data provided by the Northwestern Customs Administration, and the Federal Statistical Service (Central statistics database).

\* Data is calculated per each neighbouring country.

\*\* In statistics, this index is calculated for two regions at a time.

Table 4

**The results of an integral assessment of cross-border specialisation coefficients of external interregional interaction**

NWFD region	Integral assessment	
	four cooperation areas (a mean coefficient)	five cooperation areas, including tourism* (a mean coefficient)
1. Kaliningrad region	0.197	0.183
2. Republic of Karelia	0.294	0.333
3. Leningrad region	0.125	—
4. Murmansk region	0.172	0.158
5. Pskov region	0.441	—
6. St Petersburg	0.070	0.065

- Statistical data for the “Number of incoming/outgoing tourists according to countries (tourist agency activities)” index are not available for the Leningrad and Pskov regions.

The integral index can serve a basis for a comparative analysis of the degree of cross-border specialisation of interregional interaction of a border NWFD region, as well as a group of regions in terms of their cross-border specialisation.

The system of cross-border specialisation coefficients can be improved in the following directions:

— the improvement of cross-border specialisation coefficients (the development of additional coefficients describing cross-border specialisation according to certain areas), as well as the development of integral indices of the region’s cross-border specialisation according to cooperation areas;

- the calculation of threshold values for cross-border specialisation coefficients from the perspective of regional economic security;
- the improvement of statistical support for the process of regional cross-border specialisation assessment.

The results of calculating cross-border specialisation coefficients according to cooperation areas help identify the areas of interregional interaction exhibiting a high degree of cross-border specialisation for each NWF region (table 5).

Table 5

**Areas of interregional interaction exhibiting the highest degree of cross-border specialisation**

NWFD region	Investing country	Area of cooperation	Coefficient value
1. Kaliningrad region	Lithuania, Poland	Activities of foreign-invested organisations	0.411
2. Republic of Karelia	Finland	Activities of foreign-invested organisations	0.448
		Tourism	0.491
3. Leningrad region	Finland, Estonia	Foreign investment	0.185
4. Murmansk region	Norway, Finland	Activities of foreign-invested organisations	0.372
5. Pskov region	Latvia, Estonia, Belarus	Foreign investment	0.677
		Activities of foreign-invested organisations	0.720

Table 5 shows that the highest cross-border specialisation coefficient values are observed in the field of investment interaction, as well as those of foreign investment cross-border specialisation and activities of foreign-invested organisations.

A high level of business and investment activities of neighbouring countries in border regions' economies can be explained, to a certain degree, by the features of cross-border cooperation manifested in the cumulative effect of interregional interaction. Given close neighbourly relations and favourable external conditions, the processes of cross-border cooperation are gradually evolving, new areas of cooperation are emerging, a spectrum of possible forms of interaction is increasing, and network structures, including those supporting internationalisation of companies, are rapidly developing. All in all, it leads to a higher level of trust and the improved investment climate in the neighbouring region. In combination with the geographical vicinity and transport accessibility, these factors make the neighbouring region attractive for investment. The economic effect manifests itself through a decrease in transaction costs borne in the course of internationalisation of a company, which distinguishes cross-border cooperation among other types of external interaction.

Of great interest is also the analysis of cross-border specialisation of certain cooperation areas as it can serve a basis for adjusting certain lines of re-

gional policy. So, the Republic of Karelia demonstrates a high level of cross-border specialisation in the field of tourism (0.491). Moreover, the incoming tourism cross-border specialisation coefficient (the correlation between the number of Finnish tourists and the total number of foreign tourists) amounts to 0.968 (a mean five-year value). It means that almost 100% of international tourists come to the region from one neighbouring country — Finland. It is easy to understand why it is tourism that is identified as the key priority of the “Karelia” cross-border cooperation programme. One can speak of a serious dependence of the region’s tourism industry on the inflow of tourists from Finland. It should serve a basis for a more comprehensive analysis and the formulation of recommendations for assessing the efficiency of potential tourism development, as well as the diversification of tourist inflow.

We would suggest considering a statement on the external influence exerted on the region, which is mentioned below. From the perspective of the objectives of this study, it is rather valuable for defining the processes of Russia-EU cross-border cooperation: “As a result of economic development disparities, Russia’s northern regions act as counteragents of the Nordic countries because they tend to accept rather than to formulate the agenda on the issues, within which Russia seems to be a “minor” partner. Thus, to a great degree, international communication makes the Murmansk region an object of cooperation and a sales market. On the other hand, it serves a source of ideas, experience and best practices necessary for modernisation of the Russian region” [20].

Therefore, the conclusions identified in the framework of the pilot assessment of cross-border specialisation can form a basis for a more detailed analysis and the adjustment of certain lines of regional policy in order to reinforce the positive effects of interregional interaction between border regions and diminish the risk of possible negative effects relating to a high level of cross-border specialisation.

The developed methodology provides a framework for a more comprehensive analysis of the processes of cross-border cooperation at national, macroregional, and regional levels. It is evident that the situation identified in the pilot assessment of cross-border specialisation requires further research, and a thorough analysis of the structure and dynamics of interaction, including that in view of the risks to regional economic security. A potential promising line of research could envisage the analysis of the spatial aspect of cross-border specialisation, the search for cause-effect relations between the features of regional socioeconomic development and the level of cross-border specialisation, and the identification of factors affecting the intensity of cross-border specialisation.

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