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**INTRA-INDUSTRY TRADE IN BORDER REGION'S ECONOMY
IN RUSSIAN FEDERATION (THE CASE OF SIBERIAN BORDER REGIONS)**

N. S. Epifanova

*Candidate of Economic Sciences,
assistant professor,
Siberian Institute of Management – branch
of the Russian Academy of National Economy
and Public Administration, Novosibirsk, Russia*

Summary. The article describes the impact of intra-industry trade to regional economies for border regions in Russia. The indicators of intra-industry trade allow to identify the qualitative characteristics of international trade, and thus to assess the vulnerability and dependence of regional economy. The author calculated the index of Grubel-Lloyd index and overlapping trade index for the border regions of the Siberian Federal District (as an example). It is shown that the share of intra-industry trade characterizes the technological structure of regional exports and indirectly indicates the level of technological development of the border region. The analysis of intra-industry trade indices allows us to estimate how much the region's economy depends on the situation on world commodity markets and is able to resist the negative externality.

Keywords: international trade; intra-industry trade; regional economy; economic security.

To present time international trade theory has significantly changed and cannot be explained in the framework of the neoclassical approach. One of these changes was growth of intra-industry trade in spite of inter-industry trade according to comparative advantages and neoclassical theories. Intra-industry trade means the international trade in goods belonging to the same industry or a group of products [7].

An important aspect of intra-industry trade is the higher economic development the deeper intra-industry trade. Research of intra-industry trade show that the intensity of intra-industry trade for the more reach regions or countries deeper than for the poor [8]. The study of this issue will allow us to evaluate not only the quantitative characteristic of the region's foreign trade,

but the quality of foreign trade structure, both at the level of individual sectors and the regional economy as a whole. Another aspect is a high level of intra-industry trade reflects the mutual integration of the countries [1; 5]. With regard to border regions, it can be assumed that the higher the proportion of intra-industry trade in foreign trade structure of the border region, the more its economy integrated into international trade. More intensive development of intra-industry trade suggests that the economy is based on a growing stream of innovation, permanent technological improvement, and regional production and exports are focused on high-tech products with a relatively larger share of the value added. At the same time low level of intra-industry trade shows technological backwardness of regional economies [2].



Also intra-industry research show its importance increases with the level of economic development (GDP per capita), the size of national markets and trade openness for given economies [1]. The presence of common borders and geographical proximity as a factor are positively correlated with the intensity of intra-industry trade between trading partners. Thus, we can assume that the intensity of intra-industry trade indicators for the border regions reflects both the indirect signs of economic development and particularity of the participation in international trade. And also we can allocate intra-industry trade as one of the most important indicators of foreign security of the border region.

To measure the share of intra-industry trade is a difficult task due to different features of definition and commodity classification in different countries. One of the ways to measure the share of intra-industry trade in the total foreign trade is the Grubel-Lloyd index [4]. It is calculated as a ratio of the absolute value of net exports to the volume of foreign trade:

$$IIT = 1 - \frac{|X_i - M_i|}{X_i + M_i},$$

where X_i and M_i denote the export and import of good i respectively. The index ranges from 0 to 1, and the closer the value to 1, the more share of intra-industry and the less share of inter-industry trade. For the region (country) is generally Grubel-Lloyd index is calculated as a weighted value, in which the weights are the relative volumes of exports and imports of a particular product group.

Another indicator to measure the intensity of intra-industry trade is an index of overlapping trade [3]. It shows the relative intensity of intra-industry trade in comparison with the inter-industry. The value of the index belongs to the interval [0, 1], and the higher it is and closer

to 1, the more the international trade is dominated by intra-industry trade.

$$TOI = \frac{2 \sum_{i=1}^n \min(X_i, M_i)}{\sum_{i=1}^n (X_i + M_i)},$$

where X_i and M_i denote the export and import of good i respectively. The calculation of these indices is made for the regions of the Siberian Federal District (SFD) of Russian Federation according to the Siberian Customs Department for the first 9 months of 2014. The highest values of the Grubel-Lloyd index and the index of trade overlap observed for some border regions of the Siberian Federal District, such as the Novosibirsk Region, the Omsk Region, partially Altai region. For all the non-border (internal) regions of the Siberian Federal District, this indicator is a very small (close to zero) or insignificant (maximum value is 15–16%). There is a coincidence index values of Grubel-Lloyd and overlapping trade for almost all regions of the Siberian Federal District.

There're two dominant items in the structure of export according to the measurement of intra-industry trade in individual sectors of SFO's border regions. These sectors are

- 1) fuel and energy products;
- 2) mineral products.

For both of these sectors the intensity of intra-industry trade is the lowest. This result confirms the general trend in intra-industry trade research, according to which for the primary products and raw materials with low value added intra-industry trade is usually not typical. This means that the indices of intra-industry trade, as indicators of the quality characteristics of foreign trade, allow us to identify potential threats to the economic security of the regional development in foreign trade and to assess how the region's economy depends on the situation on world commodity markets.



Grubel-Lloyd and overlapping trade indices
for the border regions of the Siberian Federal District

Region	The value of Grubel-Lloyd index ¹	The value of overlapping trade index ²	The ratio of revenues from export of technologies to gross domestic product ³
Border regions			
Altai region	0,36	0,36	0,000
Transbaikal region	0,05	0,05	0,000
Novosibirsk region	0,49	0,49	0,644
Omsk region	0,56	0,56	0,554
Altai Republic	0,12	0,12	0,000
Buryatia Republic	0,16	0,16	0,000
Tyva Republic	0,007	0,01	0,000
Non-border (internal) regions			
Irkutsk region	0,07	0,07	0,583
Krasnoyarsk region	0,16	0,16	0,440
Kemerovo region	0,02	0,02	0,218
Khakassia Republic	0,02	0,16	0,000
Tomsk region	0,15	0,15	0,000

Deepening intra-industry trade essentially depends on the economic structure of the region and, consequently, the structure of regional exports. Technological and innovation development of industrial production is a positive factor contributing to the deepening of intra-industry specialization. It is therefore logical to assume that indicators of intra-industry trade may indirectly indicate the level of technological development of the border region.

Now compare the indices Grubel-Lloyd (overlapping trade) with the index as the ratio of revenues from the export of technology to GRP (per 1 thousand of rubles). It is clear the share of intra-industry trade is a qualitative characteristic international trade for the border regions and characterizes the technological structure of regional exports (table). For all border regions of

the Siberian Federal District, where the index Grubel-Lloyd are low or close to zero, the ratio of revenue from the export of technology to GRP is equal to zero. Just two regions show relatively high values of this index. There are Novosibirsk Oblast and Omsk region. Likewise, the index of Grubel-Lloyd (trading floors) it is this region is characterized by relatively high intensity of intra-industry trade. This one confirms the idea that the low levels of intra-industry trade show of raw specialization of the regional economy and the low share of parts and components in the export of regional products.

Thus, indicators of intra-industry trade are very important in the analysis of the regional economy. Our calculations also show that with regard to the assessment of threats to economic security of intra-regional trade

¹ Calculated by the author on the basis of the statistics of the Siberian Customs Department.

² Calculated by the author on the basis of the statistics of the Siberian Customs Department.

³ Data in terms of «the ratio of export earnings from technology to GRP» are taken from the data from research of the National Research University «Higher School of Economics» [6].



is an important factor only for the border regions. For non-border (inland) regions the relationship between indicators of intra-industry trade and the quality and level of socio-economic development is minimal. It seems that further studies of the factor as intra-industry trade in the assessment of the economic security of Russian border regions are very relevant and necessary.

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