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INTEGRATION OR REGIONALIZATION: REGIONAL INDUSTRIAL SPECIALIZATION IN RUSSIA

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The article is devoted to the trends and determinants of the transformation of Russian regions' industrial specialization during the period of economic growth. Using the methodology of statistic and econometric analysis it is tested whether the tendency of diversification dominates the tendency of regions' industrial specialization in 1997-2004 and whether there is a convergence of Russian regions' industrial structures. The considered factors of industries' development in a particular location include the initial industrial structure, inter- and intraregional technologic links between industries, quality of investment climate, R&D potential, international competition.

Key words*: industrial structure, specialization, diversification, regionalization, Russia*

JEL classification*:* L16, R11, R12

1. Introduction

Market reforms in Russia initiated transformation of industrial structure, since the effectiveness criteria of industrial concentration and location in centrally planned economy had been quite different. The period following the liberalization in 1992 is characterized by increasing number of enterprises virtually in all industries in Russia, by change in their size and range of products. Trade liberalization raised the issue of increasing international competitiveness, requiring searching for new resources, developing new technologies, establishing new export relations, approaching new markets etc. Obviously the phenomenon should have led to changes in spatial structure of production, redeployment of resources between Russian regions, change/reinforcement of production specialization in the regions.

There are still little numerous studies proved that location is an important determinant of industrial firm's competitiveness and growth in Russia. V. Golikova et. al. (Golikova et al., 2007) show that the size of the city of company's location has significant positive effect on it's economic performance. The authors argue that main factors of the result are higher local demand for the company's output, better infrastructure development, lower transport costs and larger local skilled labor market. Similar conclusions are made in the paper of K. Gonchar (Gonchar, 2008). The empirical study reveals that companies that are located in agglomerations demonstrate higher level of productivity relative to the average level in their industry. Many papers are devoted to the study of spatial aspects of

economic development in Russia (see, for example, Avdasheva and Golovanova, 2009; Barry and Gur, 2006; Hanson and Bradshaw, 2000). They prove differences in macroeconomic trends between Russian regions. That is the addition reason to consider location as important factor of companies' and industries' growth.

Path-dependence is among the main determinants of current spatial industrial specialization. In the Soviet time raw material base and production facilities of the regions were established, industrial complex and scientific centers were located throughout the country, determining the development of industrial production specialization of the regions. With the beginning of market reforms the location of new enterprises started to be determined by market forces. Would be reasonable to assume that in the region with more attractive conditions for establishing certain businesses specialization of the regional production focus on manufacturing exactly the kinds of goods. However competitive advantages of the regions and their relative attractiveness for the particular businesses are defined by the initial recourses, production facilities and infrastructure. In this case regional industrial structure should gear toward reinforcing the region's specialization, which will ensure the advancement of competitive advantages of the region.

However, reasons to expect diversification of production activities as the dominating trend of Russian regions development do exist as well. Theoretically they are based on several arguments. The first relates to the idea that diversity of goods increases consumer utility (Glaeser et al, 2001). Since production patterns respond to changes in the structure of demand, preference-based argument is sufficient to generate increasing cross-sector diversification throughout development. Another approach argues that diversification may occur as a result of agents' decisions to invest in a range of imperfectly correlated risky projects or sectors (Acemoglu, Zilibotti, 1997; Kalemli-Ozcan et al., 2003). In this case diversification should help dampen the aggregate effects of sector-specific shocks.

The purpose of the survey is to analyze the transformation of Russian regions' industrial specialization in 1997-2004 and compare the results with the ones found for other countries. The analysis should help answer the following questions:

- whether Russian regions' industrial structures diverge or converge during the period of economic growth

- what tendency is more evident – that of increase or decrease in regional sector-specialization of manufacturing;

- what are the determinants of regional specialization development (the initial industrial structure, intra- and interregional technological links among industries, liberalization of international trade, quality of investment environment, region's research and development potential).

Data on trends in industrial specialization contribute to important discussions on Russian economy. The first topic is scale of restructuring during transition period. Comparison of any structural inductors including those of specialization/diversification show how deep restructuring processes during the economic recovery were. The second topic is connected with the notion of regionalization of Russian economy (Gonchar, Kuznetzov, 2008). If regionalization, which is very important not only for economy but also for politics, had taken place, it affected economic structure of regions. Links between

companies in different regions should be replaced by the links within the same region, and therefore industrial concentration decreased.

2. Data and measurement

The data for the survey was provided by the Russian federal agency of government statistics (Rosstat) based on the annual structural survey of enterprises. The data includes information on vale of output of large and medium Russian enterprises (in value terms) in 321 industries, classified according to the 5-digit codes of the OKONH ("Obsherossiyskiy Klassifikator Otrasley Narodnogo Hozyaystva" – All-Russia classification of products by industries of national economy) over the period of 1997-2004. The time frame of the analysis is limited to the year 2004 due to the fact, that OKONH classification system was replaced by OKVED ("Obsherossiyskiy Klassifikator Vidov Ekonomicheskoy Deyatelnosti" - All-Russia classification of products by kinds of economic activity), which led to discontinuity of the analyzed time series. Data base includes the following information: industry code, enterprise code, code of the region where it is located in accordance with the administrative breakdown of the Russian Federation value of output (revenue). The basic unit of analysis is output of industry i in region s at time t, which we denote as Y_{is}^t. To estimate it the output of all enterprises of one industry located in the same region is summarized. Region's pattern of specialization is characterized by distribution of shares of regional industrial output across industries.

3. Divergence of regions' industrial structure: cross-country comparisons

This section provides the analysis of whether there is convergence/divergence of industrial production structure in the regions of Russia taking place during the period of economic growth. In terms of size the regions of Russia are comparable with many countries in the world. However industrial and trade relations between the regions are much more open than those between different countries. This should inevitably affects their industrial specialization. In this regard it would be useful to compare the specialization trends in Russian regions with those in EU members and the USA States, which also operate at high level of economic integration.

The difference in the sector-specialization of manufacturing between countries or regions can be measured by Krugman specialization index (Krugman, 1991) which is defined as:

$$SI_{ik} = \sum_{s=1}^{S} \left| \frac{Y_{is}}{Y_i} - \frac{Y_{rs}}{Y_r} \right|$$

where Y_{is} (Y_{rs}) is the level of employment in industry $s = 1,…S$ for the region i and the reference region (r); and Y_i (Y_r) is the corresponding region's total industrial employment. The index takes value 0 if region i has an industrial structure identical to the one of the region r, and takes maximum value 2 if the two regions are completely specialized.

Marelli (2007) calculates the index to test sector specialization dynamics for EU countries during the period of economic integration. In this study euro-

zone is considered as a reference region. Analyzing manufacturing the author uses disaggregation into seven sectors. Most European countries showed significant divergence from the early 1980s with the exception of Luxembourg, Greece, Portugal and Sweden that demonstrate the highest initial level of the Krugman specialization index. The author concludes that "neither the single market of 1992 nor the euro seem to have improved homogeneity within the industrial sector".

Interesting results are maintained by Midelfart-Knarvik et al. (2002). The authors analyzed manufacturing sectors only, using disaggregation into 36 industries. In this study a country's industrial structure compares with that of the rest of the EU. Grouping countries according to their date of entry to EU enables the authors to conclude that for the initial entrants there is more or less steady increase in specialization throughout the period while the 1970s' and 1980s' entrants (EC-2 and EC-3) exhibit an increase in specialization from the early 1980s'. The next wave of entrants (EC-4) shows increasing specialization from around 1992 onwards. This suggests that EU membership has been associated with divergence of members' industrial structures.

What we can expect about the regional specialization in Russia? As it was noted above in economic literature there is an opinion that the main trend in Russian regions' economic development in 1990s was regionalization rather then economic integration (Gonchar, Kuznetzov, 2008). However it can appear in different forms. Diversification of regional production might reflect regions' desire not to depend on inter-regional flows of goods and production factors. While regions' politics to use their comparative advantages should lead regional production specialization. In other words interrelation between regionalization and production specialization can be different.

To discover general trends in regional specialization dynamic in Russia we calculate Krugman specialization index for regions and macro-regions of Russia on the basis of 3-digit and 5-digit OKONH industries' output in 1997 and 2004 in comparable prices. In our study region means "oblast", macro-region means "federal okrug". The results of the analysis are presented in the Table 2.

It is seen that 53 of 75 Russian regions exhibit growth of specialization index both for 3-digit and 5-digit OKONH industries. However it is worth mentioningthat the list of the 53 regions in these two instances is different, - that is why their shares in industrial production in Russia differs. The tendency to divergence of industrial production structure is even more evident at the macro-regions level (federal districts) of Russia. The specialization analysis as per both 3-digit and 5-digit industries (OKONH classification) demonstrates that only North-West federal district shows some convergence of its industrial production structure with those of other Russian districts. So the results of the analysis confirm the hypothesis of dominating regional production specialization in Russia during the analyzed period.

Another way of looking at specialization is by making bilateral comparisons, comparing the difference between the industrial structures of all possible pairs of countries. In the Kim (1995) study (1995) the bilateral index of regional specialization is calculated using nine USA census divisions at 2-digit and 3-digit manufacturing employment levels. Time trends of the two measures of regional specialization correlates well between 1947 and 1987. It is shown that regional specialization reached its peak during the interwar years before falling

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continuously and substantially through 1987. That means that there is a convergence of industrial structure of the US states.

Table 2. Regional specialization dynamic in Russia: results of estimations based on Krugman specialization index

	Total number of regions	Total number of industries	Regions with increasing specialization		
			Number	Share in gross industrial output, 1997	Share in gross industrial output, 2004
Regions, 3-digit OKONH industries	75	41	53	54,7	48,9
Regions, 5-digit OKONH industries	75	321	53	68,3	60,6
Macro-regions, 3-digit OKONH industries	7	41	6	90,2	87,6
Macro-regions, 5-digit OKONH industries	7	321	6	90,2	87,6

Source: Author's calculation using Rosstat data

The situation is opposite for EU countries. According to the study of Midelfart-Knarvik et al. (2002) the dominant tendency is the divergence of EU-members' industrial structure at least in 1980-90s. 71 of 91 pairs of countries exhibit increasing difference in specialization. The possible explanation of the result is that economic integration process between EU countries enforces growth of their specialization as far as barriers for trade and factor mobility decrease, while this economic mechanism is not in force between the states of US due to the unchanged highest level of economic integration.

Let's consider changes of bilateral regional specialization index calculated both for macro-regions and regions of Russia. The aggregated results of the analysis for 3-digit and 5-digit OKONH industries are presented in the Table 3. It is seen that the macro-regions' average level of the index increases during the analyzed period and more then a half of pairs of macro-regions exhibit specialization index growth. Thus, in general the results confirm the above-mentioned conclusion of Russian macro-regions' industrial structure divergence. However the dominant tendency of change in industrial structure is not obvious when considering Russian regions in contrast to EU. Production structure of regions converges when applying 5-digit OKONH classification of industries and diverges when using 3-digit OKONH industries. It means that the regions diversify their manufacturing structure on the basis of their general initial specialization pattern.

Table 3. Average level of bilateral regional specialization index: manufacturing, Russia

	1997	2004	Number of pairs of regions that exhibit increasing specialization
Macro-regions, 3-digit OKONH industries	0.86	0.94	15 of 28 (53.6%)
Macro-regions, 5-digit OKONH industries	1.14	1.21	16 of 28 (57.1%)
Regions, 3-digit OKONH industries	1.312	1.308	1480 of 2738 (54.1%)
Regions, 5-digit OKONH industries	1.723	1.733	1439 of 2738 (52.6%)

Source: Author's calculations using Rosstat data

4. Changes in Russian regions' industrial specialization patterns

Data on the difference between structure of industrial production in Russian regions presented above are mixed. In any case, they do not allow us to estimate industry specialization of each region. The level of specialization of the region is important both for comparison of Russian regions with EU members and U.S. states, and for determining the distribution of industrial production in the region between the branches.

There is no theoretical consensus as to how sector diversification should evolve as countries/region grows. However there is an opinion that the force of diversification is more at play among low-income countries and the force of sector specialization – among richer economies (Imbs, Wacziarg, 2003). The conclusion is based on the results of examination of the relationship between regional specialization index and GDP per capita for selected countries.

The comparative analysis of the broad trends in specialization development for US states and EU countries is presented in the survey of Midelfart-Knarvik et al. (2002). The authors calculated Gini coefficient of specialization using employment data, which is defined over the relative share measures, r_i^k

$$r_i^s = \frac{Y_{is} / \sum_s Y_{is}}{\sum_{j \neq i} Y_{is} / \sum_s \sum_{j \neq i} Y_{is}},$$

where Y_{is} is the output value of industry $s = 1,…S$ in region i. The higher the index value, the more equal the sector shares, the more diversified an economy.

The results of the analysis signify again that specialization development process is different between EU-countries and US-states. During the analysed period we consider a steady decrease in the specialization index of US states, in contrast to the U shaped performance of the European measures.

To estimate the extent of Russian regions' specialization we use a variety of measures: number of industries in a region, variation of industries' shares in regional industrial output, CR4 (the sum of shares of 4 largest industries in a

region), Gini index, Herfindahl-Hirschman concentration index (HHI). All of them are calculated on the basis of shares of 3-digit and 5-digit OKONH industries in regions' and macro-regions' total manufacturing output in comparable prices for 1997 and 2004. The results of the analysis are reported in Table 5.

Table 5. Coefficients of specialization, Russia

Specialisation index	3-digit OKONH industries		5-digit OKONH industries	
	1997	**2004**	**1997**	**2004**
macro-regions average				
Number of industries	36.6	35.6	226.7	226.0
Variation of shares	0.346	0.372	0.039	0.044
CR4	0.654	0.647	0.481	0.471
Gini index	0.248	0.256	0.146	0.151
HHI	1544.43	1617.56	853.32	938.68
regions average				
Number of industries	22.7	21.9	65.7	64.2
Variation of shares	1.179	1.206	0.486	0.616
CR4	0.780	0.760	0.681	0.641
Gini index	0.254	0.276	0.187	0.208
HHI	1916.90	1772.81	2019.13	1867.36

Source: Author's calculations using Rosstat data

Increase of Gini index as well as decrease of CR4 and HHI coefficients indicate diversification of Russian regions' production during 1997-2004. We can point out that trends in Russian regions' manufacturing structure transformation during the period of economic growth are similar to the ones that are demonstrated by EU-members throughout years of economic integration. It should be mention that during the analyzed period interregional trade barriers in Russia decrease due to the collapse of the state central planning system. To a certain extent this is alike to the process of trade liberalization between EU-members in 1980s-90s. So we could say about similar trends in industrial development in Russia and EU under comparable economic conditions.

It is worth mentioning that diversification is apparently taking place due to equalization of industries' shares in regions' industrial production, as their total number goes down. This conclusion is true both for 3-digit and 5-digit industries.

No clear conclusion can be made based upon the estimation results for macro-regions of Russia. On the one hand, one can observe further variation of industries' shares in gross production value of regions, reduction in average number of industries in the regions and HHI index increase, that signifies macro-regions' further industrial specialization. On the other hand the decrease of CR4 and Gini index escalation indicates that shares of industries in gross production value of regions are matching up i.e. diversification of regional manufacturing structure takes place.

HHI coefficient is used below to delve deeper into the mechanism and scale of industrial specialization change in the regions of Russia. As Table 6 reports, minimal, average and median levels of Russian regions' specialization

dropped. These changes are not significant, however in the aggregate they testify of some decrease of overall level of industrial production specialization in Russia. Highest value of the determinant among Russian regions has notably increased. However it is observed in the region where manufacturing is poorly developed (Tyva republic). Therefore the finding should be ignored as it is stipulated by the fact that statistical data used in this survey takes into account output of only 50 largest enterprises of the industry, not including comparatively small companies.

Table 6. Maximum, average, median and minimal values of HHI specialization index in Russian regions in 1997 and 2004.

	Min	average	median	Max
1997	302,18	2019,13	1839,59	6291,85
2004 (in current prices)	252,92	1983,97	1554,29	8940,01
2004 (in comparable prices)	254,39	1867,36	1407,58	8690,36

Source: Author's calculations using Rosstat data

To characterize the extent of regional specialization we use the scale of the determinant's value, as presented in Table 7. Change of the HHI index value will be considered as "significant" if the level of region's industrial production specialization changes (for instance from "low" to "medium"; from "medium" to "high" etc.) in accordance with the presented scale.

Table 7. Scale of regional specialization level.

Value of the HHI	Region's specialization level
0 – 1000	Low
1000-3000	Medium
3000-10000	High

Calculations prove that there is no clear tendency to either increase or decrease of Russian regions' specialization extent in 1997-2004 (see table 8). A higher number of regions show decrease of specialization level; however considering the share of these regions in Russian gross industrial output the excess is not significant. The data allow to make two important conclusions. First, we can see that in most part of Russian regions level of specialization did not change considerably. It allows to reject the hypothesis on the serious restructuring in the industrial structure, which would result in the noticeable shift in regional industrial specialization.

Second, results of calculations *in comparable prices* show that tendency to diversification of regions' manufacturing slightly dominates over the tendency to increase of specialization level. Therefore there is evidence in favour of regionalization hypothesis insofar diversification of industrial production in the region decreases the role of economic links with other regions in Russia. Shares of corresponding groups of regions in gross production value in 1997 came up to 18,5% and 1,1% accordingly. Comparing the results based on the current or comparable prices we come to conclusion that significant changes of relative prices, happening during the analyzed period, inflate the level of Russian regions' specialization. This fact stresses the requirement to use data in comparable prices when implementing further regression analysis of industries' development factors

in Russian regions; ignoring the change of relative prices may lead to distortion of the results.

Table 8. Relative number of regions, demonstrating change of industrial production specialization level: 1997-2004

Change of regional specialization level		Number of regions	Regions' share in gross industrial output of Russia	
			1997	2004
Increase of regional specialization level	In current prices	8	15,3%	14,2%
	In comparable prices	4	1,1%	0,8%
Decrease of regional specialization level	In current prices	19	20,6%	16,1%
	In comparable prices	16	18,5%	16,8%
Absence of significant changes in regional specialization level	In current prices	48	64,0%	69,8%
	In comparable prices	55	80,4%	82,4%

Source: Author's calculations using Rosstat data

5. The determinants of industries' development in Russian regions

In the previous two sections we have compared the industrial structures of Russian regions, and considered whether or not they were becoming more or less different and more or less specialized during the analyzed period. We did not find evidence in favour of hypothesis that shifts in industrial specialization during the period under analysis reflects deep structural changes. However the evidence on regionalization in contrast remains to be controversial. On the one hand, Russian regions remain to be relatively highly specialized, and the distribution of industrial output in the region among different branches in most regions does not modify. On the other, if there are substantial changed in the level of concentration of industrial output in some regions, these changes are associated with the decrease of share of largest branch and development of new branches.

The purpose of further analysis is to identify the factors, encouraging the development of different industries in Russian regions including the impact of technological links between branches. The evidence that the very presence of branch in the region contributes to the development of related branches (upstream or downstream in technological chain) would support the hypothesis on the replacement of economic ties on the all-Russian level for supply within the region.

In the modern location theory the factors of industrial location include such territory characteristics as established production facilities, existing infrastructure, localized natural resources, labor resources, scientific and R&D

potential, social environment etc. Below we use econometric estimations to test hypothesis about the most significant determinants of industries' development in Russian regions

Change of industry's share in region's total manufacturing output (variable DShare), is selected as dependent variable. Its estimation is based on the data on output of 321 industries (according to 5-digit OKONH classification) in 75 Russian regions in 1997 and 2004 (in comparable prices). The hypotheses of econometric analysis are presented below.

Hypothesis 1 (Path-dependence hypothesis). Industrial structure established in the past years should affect region's specialization development. Here two contrary development strategies are possible: a) strengthening of region's specialization, observed in increased share of leading industries in region's total manufacturing output; b) diversification of region's manufacturing through more intensive development of industries, which have low starting share in region's total manufacturing output. In the further analysis we use independent variable of industry's share in region's total manufacturing output in 1997 (variable Share97) to test the influence of initial industrial structure on industries' development.

Hypothesis 2 (Technological links within the region hypothesis). Development of upstream industry induces development of downstream and vice versa in the same region. To consider this fact the regression includes binary variable D1, that takes on value 1 for technologically related industries – first three code figures of which (in OKONH codes) are congruent with first three figures of region's leading industries. The latter include the industries which share in region's total manufacturing output exceeds 7%.

Hypothesis 3 (Neighbourhood hypothesis). In case interregional manufacturing relations are growing stronger, an existing and well-developed industry in the neighboring region is likely to produce a limiting effect on the development of the same industry in the analyzed region (competition factor) and at the same time it should encourage development of technologically related industries. In case the regions are trying to establish industrial structure independent of interregional flow of goods and factors, the dependence nature should be reverse. To consider interregional manufacturing relations factor for each region we compile a list of leading industries of the neighboring regions (value 1 of binary variable D2), and also a list of industries, related to the ones included in the first list (value 1 of binary variable D3).

Hypothesis 4 (International market incentives hypothesis). Effect of international trade on regions' production specialization. Development of international trade relations should contribute to development of export industries in Russia. But then again increased international competition, determined by appearance of foreign goods similar to home-produced in the domestic market, may lead to decrease of output of Russian industries with high import share. To consider international trade factor we introduce two binary variables: D4 – takes on value 1 for export industries; D5 – takes on value 1 for the industries with high share of import. To check the hypothesis that international trade factor is especially important for the border regions, we introduce additional binary variable 'Border', which takes on value 1 for the regions on the Russian border and regions which have access to sea.

Hypothesis 5 (Investment climate hypothesis). Industrial structure of the regions with better investment climate is expected to become more and more diversified. Particularly, we test the hypothesis that these regions more than others develop "new" industries (i.e. industries with zero share in region's total manufacturing output at the starting year). Two determinants are used to estimate region's investment attractiveness: investment risk and investment potential of the region; these determinants are estimated by the rating agency "Expert Ra"[2] on the basis of official Russian statistics and expert evaluation. Final index of region's investment risk represents weighted average rating of seven components: legislative, political, economic, financial, social, criminal and ecological risks. Final index of region's investment potential represents weighted average rating of eight components: manufacturing, consumer, labor, infrastructure, financial, innovation, institutional and natural resources potential. Within the regression analysis as independent variables we take an average (for the period 1997-2004) value of the region's share in Russian potential (variable Potent) and Russian regions' risk index (variable Risk) multiplied by binary variable New, which takes on value 1 for industries whose share in region's total manufacturing output in 1997 equaled zero.

Hypothesis 6 (Innovation infrastructure hypothesis). Diversification of production (emergence of new industries) should more likely take place in the more scientifically developed regions. To verify the hypothesis we compare growth rates of "new" industries in the regions. The number of organizations involved in research work (variable Research) serves as criterion of region's scientific potential.

Within the following analysis we estimate coefficient of regression equations of the following basic specification:

$$DShare = C_0 + C_1 Share97 + C_2 D1 + C_3 D2 + C_4 D3 + C_5 [D4 * Border] + C_6 [D5 * Border]$$
$$+ C_7 [\ln(Risk) * New] + C_8 [\ln(Potent) * New] + C_9 [\ln(Research) * New]$$

OLS method is used for estimation of the regression equations coefficient. In accordance with the hypotheses mentioned above the regressions coefficient estimates are expected to have the following signs: C_1 – any, $C_2>0$, $C_3<0$, $C_4>0$, $C_5>0$, $C_6<0$, $C_7<0$, $C_8>0$, $C_9>0$.

Dependent variable value is calculated on the basis of 321 industries' output (according to 5-digit OKONH classification) for 75 regions of Russia in comparable prices. Total number of observations came up to 6479. Table 9 reports the results of regression models coefficient estimates. Here we should note that irrespective of estimated regression model's specification, statistical significance/insignificance of independent variable as well as signs and means of coefficient estimates hold true, which makes the results more credible.

The results received within the econometric analysis allow for the following conclusions regarding the consistence of the abovementioned hypotheses:

- the hypothesis that industry's high starting share in region's total manufacturing output is negatively related to its further growth proves true. The industries having technological links with the leading ones receive additional impact towards development. Thus the results support the conclusion about the

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[2] http://www.raexpert.ru

decrease of Russian regions' production specialization level during the analyzed period. It is worth mentioning that diversification is taking place on the basis of industrial structure established in the past years, so the region's common production specialization maintains.

Table 9. Factors of industries' development in Russian regions

Dependent variable – change of industry's share in region's total manufacturing output in comparable prices, percents. Number of observations – 6479				
Independent variable	Estimated model			
	(1)	(2)	(3)	(4)
Constant	0,001**	0,002**	0,002**	-0,000
Industry's initial share	-0,28**	-0,28**	-0,28**	-0,27**
Technological links with the region's leading industry	0,007**	0,007**	0,007**	0,007**
Leading industry in the neighboring region	0,010**	0,011**	0,010**	0,010**
Technological links with the neighboring region's leading industry	0,001	0,001		
Export industry	0,005**		0,005**	0,005**
Export industry × border region		0,005*		
Industry with high share of import	0,002			
Industry with high share of import × border region		0,003		
Region's investment risk × new industry			0,02**	0,01*
Region's investment potential × new industry			-0,003**	-0,008**
Scientific center × new industry				0,002**
Adj. R^2	0,17	0,16	0,17	0,18
F-stat	216,09	213,05	224,08	204,87
Probability	0,0000	0,0000	0,0000	0,0000

OLS regression
* - significant at 5%; ** - significant at 1%

- test results of the hypothesis that interregional manufacturing links have an impact on the development of the region's industrial structure prove that the region sees emergence of industries, that play a key role in the neighboring regions' manufacturing. Along with the result showing that the factor of industrial development in the neighboring regions has no power in explaining development of related industries in the region under examination, it testifies of the regions' desire to substitute interregional manufacturing relations for intra-regional even if the products of corresponding industries can be supplied from neighboring region with comparatively low costs.

- based on the results a conclusion can also be made regarding the effect of international trade on the regions' production specialization. The share of export industries in the region's total manufacturing output is increasing more rapidly than other industries' share. We should reject the hypothesis that the significance of this factor is more relevant for the border regions and regions that have access to the sea. The hypothesis that international competition has negative impact on the development of the industries which face strong international competition is also rejected in all estimated models.

- significant positive relation was identified between the quality of investment climate in the region and its industrial production specialization growth. It has been observed that high potential and low level of investment risks have negative impact on the development of "new" industries. Possible explanation of the result is that poor investment environment may be stipulated by "wrong" industrial structure of the region. If the region's production specialization is effective, the investment attractiveness of the region grows and outward investment is channeled first of all to historically well-developed industries of the region.

- large number of research organizations in the region has a positive and significant impact on the development of "new" industries. Thus the diversification of manufacturing occurs more actively in the regions with high innovation potential.

Conclusion

With the beginning of economic growth spatial structure of manufacturing in Russia changes despite the high costs of redeployment of resources between the regions. Firms start considering location as a factor of economic performance. Reallocation of resources and production facilities between the regions has led to changes in industrial production specialization of regions of Russia however not very significant. There is no confirmation of considerable structural changes in industries' location and therefore there is no evidence in favor of deep restructuring hypothesis. We can conclude that allocation of Russian industry remain the features inherited from the pre-reform period. In the medium term path-dependence seems to remain the most important determinant of industrial production allocation across the regions. As far as regionalization is concerned, the evidence is more complex and ambiguous.

The results of the analysis demonstrate decrease in the level of regional production specialization during the period of economic recovery. The diversification of region's manufacturing to a great extent takes place on the production base established in the previous years (mainly in the years of central planning) and it often leads to replacement of interregional manufacturing relations with intra-regional ones. At the same time diversification of Russian regions' manufacturing does not lead to convergence of their industrial structures. In fact the opposite is truth as the findings reflect the decreasing similarity in regional specialization according to 5-digit OKONH classification. To a certain extent this process is similar to the one that is considered for EU-members in 1980s-90s when the countries' industrial structure diverged. It can be viewed as a development of countries'/regions' comparative advantages under the conditions

of trade barriers decrease. As for Russia the liberalization of inter-regional trade is determined by the collapse of the state central planning system and appearance of market forces rather then increasing economic integration between the regions.

Increase of industrial production specialization is more evident in the regions with high investment potential and low level of investment risks. Taking into account the abovementioned results of the dominating tendency to diversification of industrial structure, this result reflects the transitivity of the observed processes. During the analyzed period we observe the replacement of the inherited soviet industrial structure (non-optimality of which in the new economic environment determines low investment attractiveness of the region) with the one, more appropriate for the regions' comparative advantages. The regions that have overcome this transitional period continue developing their competitive advantages through industrial production specialization. We should note that active development of new industries is more typical of the regions with high scientific and research potential. That is, the speed of adaptation to the new economic environment largely depends on the level of innovative activity in the region.

Another important result is that the liberalization of international trade has had significant impact on the regions' industrial structure change. During the analyzed period we can observe active development of export industries in all regions of Russia. Thus, the regions' industrial structure changes toward developing international trade relations and enhancing integration of Russia into the world economy. On the other hand, it is obvious that international competition did not provide negative effect on the development of industries with high import share; this fact can be explained by common active development of processing industries in the period of economic growth.

To conclude, there is evidence both in favor and against the regionalization of economic ties in Russian industries. On the one hand, downstream (correspondingly upstream) industries grew faster if there is supplier (correspondingly, buyer) in the same region. The shares of new, 'smaller' branches in regional industrial production increased at the expense of 'larger' branches and therefore industrial production became more diversified. On the other, industries remain to be allocated unevenly across Russian regions, and regions are still more specialized than most member states in EU and US states.

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