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Territorial polarisation of the economy and population distribution in post-Soviet Russia

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Abstract. Scientists, experts, and politicians have differing views on polarisation and levelling in the development of regions. Many researchers consider polarisation to be an objective process that benefits the country and the region because labour productivity is higher in larger centres. As for social differences, many states (and the European Union as an organisation) redistribute part of their revenue from more prosperous regions to poorer ones using regional budget policies. The article provides useful data on the regional specificity of polarisation and levelling in Russia at macro-, meso-, and microregional levels based on statistical, economic and cartographic analysis. The article shows that in Russia the polarisation of the economy and population distribution strongly prevails over the levelling of regional differences.

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1. Introduction

There are two competing processes in the spatial organisation of economy and in the development of regions: polarisation and levelling, the former being more widespread. The works of F. Perroux, J. Boudeville, J. Friedmann (Perroux, 1955; Boudeville, 1966; Friedmann, 1967) and later P. Krugman (Krugman, 1991) are a valuable contribution to the development of the theory of polarisation. At the same time, the governments of many countries allocate significant funds to support lagging regions, implementing a levelling policy. The European Union has embarked on a similar regional policy (often referred to as the "cohesion policy") (1). Russia has introduced special support measures for the regions (mainly through its budget policy and federal support programmes) as well.

During the Soviet period in the development of regional studies, there were two opposing schools of thought. In the geography of settlements they were represented, firstly, by the concept of urbanisation, emphasising the advantages of large cities and urbanised settlement systems (Pivovarov, 1976; Lappo, 1978; Gritsay et al., 1991). The other school of thought developed the concept of the unified settlement system (Khorev, 1975; 1981). This held that each region of the Russian Federation had to develop a four-tier hierarchical inter-settlement infrastructure system (the region - the intraregional economic area - the administrative district - intra-district systems). In regional territorial planning (the Soviet analogue of modern spatial planning schemes), these two concepts were often combined. On the one hand, there were urban agglomerations (cities with adjoining and distant suburban areas); on the other hand, there were hierarchically organised inter-settlement infrastructure systems that were created outside agglomerations. However, as a development strategy, urbanisation eventually prevailed. Nowadays, many universities offer a course on geography and urban studies. Yet, there is no course on the geography of urban and rural studies, as though rural settlements did not exist.

When planning the deployment of productive forces, more attention was paid to the formation of agglomerated systems in the form of territorial-industrial complexes. Cities, towns and settlements were grouped according to the functions they had to perform, and their development was aimed at fulfilling these functions.

In the post-Soviet period, in the 1990s, territorial planning and distribution of the economy were left without proper consideration. The strategies then proposed for the socio-economic development of regions had little in common with the regional territorial planning documentation.

In 2017, the government of the Russian Federation adopted several documents that defined the main directions of the country's regional policy (2). The Strategy for the Spatial Development of Russia approved by an order of the Russian Government on February 13, 2019 is of particular importance (3).

Many discussions took place during the preparation of the Strategy. Scholars expressed various, often contradictory, views on the content of the Strategy (Chistobaev, Fedulova, 2018; Kolomak et al., 2018; Kuznetsova, 2018; 2019; Lebedinskaya, 2018; Mikheeva, 2018; Nefedova, Treyvish, 2017; Protsenko, 2019; Zubarevich, 2015). It is particularly important that the Strategy is aimed at reducing the level of interregional differentiation in the socio-economic development of Russian regions, as well as at minimising intra-regional socio-economic differences. The Ministry of Economic Development of Russia, together with the relevant federal authorities are to submit a draft action plan for the implementation of the Strategy to the Government within a period of three months. Upon the approval of the action plan, the federal and regional authorities will then formulate their own strategies and detailed spatial development plans.

In this paper, we continue our work on the statistical analysis of the deployment of economic resources and population, based on the research results published jointly with A. Anokhin (Anokhin, Fedorov, 2017). We hold that these findings can provide useful insights into the elaboration of the existing and new strategic socio-economic and territorial development plans.

2. Macroregional differences in the distribution of the economy and population

Our analysis of the differences in *per capita* GRP at the macroregional level (federal districts) (Fig. 1, Table 1) shows that in 2005–2016 these differences diminished. If in 2005, the *per capita* GRP of the Ural Federal District, which is the main supplier of oil and gas, was twice as high as the average Russian level. Then, by 2016, its *per capita* GRP was 60% above the average GRP level in Russia. However, in the North Caucasus District, this indicator, which initially stood at only 31% of the Russian average, increased to 39%.

Driven by significantly increased state funding, the accelerated development of the social sphere (non-market services) resulted in a substantial reduction in macroregional differences. The proportion of non-market services in the production of GRP increased in all federal districts (Table 1). The share of mining went down, whereas the share of construction increased (Table 2). The share of manufacturing industries declined (although production volumes increased), and the total regional GRP increased by 50% (4).

The second group of indicators that we have included in the macroregional analysis refers to migration growth. The data shown in Fig. 1 indicate that the differences in the migration flow between federal districts almost levelled out. At the same time, our analysis shows that:

- there was high growth in migration during the entire period of 2005–2006 in the Central, North-Western and Southern federal districts;
- the outflow of population changed to a slight and insignificant inflow in the Ural district;
- in the North Caucasus there was an outflow of population;
- the outflow rate in the Volga and Siberian federal districts was not high;
- there was a massive population outflow from the Far East (although the numbers had slightly reduced by the end of the period analysed).

Consequently, differences in population density at the macroregional level increased.

3. Mesoregional differences in the distribution of the economy and population

Across the regions of the Russian Federation, there is an even higher differentiation than at the level of federal districts (since in the latter, data for the regions included in a federal district are averaged). In 2005, the differences in per capita GRP ranged between 13.9% of the average Russian level (Ingushetia) to 536% in the Tyumen region (including autonomous regions). By 2016, the differences between these regions had diminished: Ingushetia accounted for 22.6% of the average level in the Russian Federation, and the Tyumen region (with autonomous districts) - 345%. In 2016, the Nenets autonomous okrug had the highest per capita GRP, at 1,233% of the average for the Russian Federation – as a result of a marked increase in oil production and a relatively small population. However, microregional differences decreased in the majority of the subjects of the Russian Federation.

The growth rate of the physical volume of GRP also differs considerably. The average increase in the total GRP of the regions in 2016 as compared to 2005 was 32% higher, where as in Dagestan, it more than doubled, to 2.19 times its original level, and in the Murmansk region the GRP decreased by 1% (5).

Table 3 presents groups of regions of the Central and North-Western Federal Districts of the Russian Federation formed according to the level of per capita GRP and the dynamics of GRP. Some regions specialising in mining and the most economically developed regions of Russia, with a post-industrial economic structure and advanced manufacturing industries, show the highest level of GRP per capita. Of these, Moscow and such regions as the Komi Republic, the Murmansk region and the Nenets autonomous region developed relatively slowly in 2005-2016, whereas St. Petersburg and the Leningrad Region (which constitute a single territorial system: after all, even the administrative centre of the Leningrad Region is located in St. Petersburg) developed relatively quickly. In the same way, the regions with medium and low figures of per capita GRP differed in the growth rates of GRP. We hold that there is no direct correlation between regions' level of GRP per capita and the dynamics of GRP: the correlation coefficient between the GRP per cap-

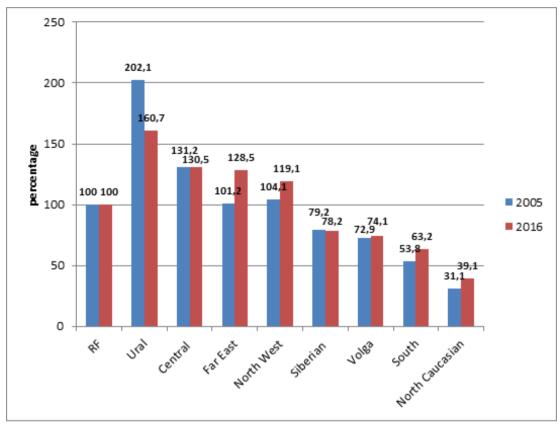


Fig. 1. Gross regional product *per capita* in federal districts (FD) as a percentage of the average for the RF, 2005–2016 (Compiled by the author from the data: Federal State Statistics Service. URL: http://www.gks.ru/ (access date February 12, 2019))

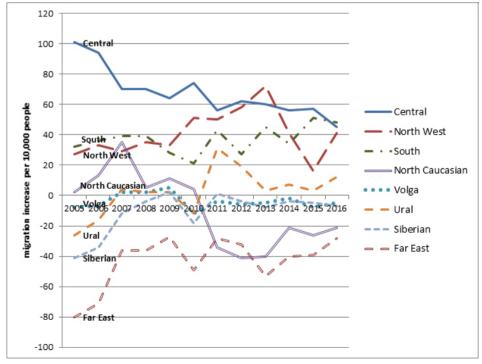


Fig. 2. Migration increase per 10,000 people (Compiled by the author from the data: Federal State Statistics Service. URL: http://www.gks.ru/ (access date February 12, 2019))

Table 1. Production *per capita* and the aggregate sectoral composition of GRP across federal districts of the Russian Federation, 2005 and 2016

		CDD	Share in the production of GRP, intere			
RF, Federal Districts	Years	GRP per capi- ta, RF = 100	Goods	Market services	Non-market services	
Describer Followskins	2016	100.0	43.8	42.6	13.6	
Russian Federation	2005	100.0	46.3	43.4	10.3	
0 1	2016	130,5	30	56.8	13.2	
Central	2005	131.2	29.8	60.8	9.4	
	2016	119.1	39,9	45.4	14.7	
North-West	2005	104.1	46.9	40	13.1	
	2016	160,7	62.4	28.7	8.9	
2.1. Ural	2005	202.1	63.6	30.5	5.9	
	2016	128.5	51,6	32.1	16.3	
2.2. Far East	2005	101,2	47.2	37.4	15.4	
2.1.01	2016	78,2	51.5	33	15.5	
3.1. Siberian	2005	79.2	54	33	13	
	2016	74.1	54.1	32.7	13.2	
3.2. Volga	2005	72.9	57.6	32.1	10.3	
2.2 Courth	2016	63.2	43.3	41.7	15	
3.3. South	2005	53.8	47.1	39.7	13.2	
4. North Caucasian	2016	39,1	41	35.9	23.1	
T. INOI III Caucasiail	2005	31.1	45.1	36.6	18.3	

Compiled by the author on the basis of the data: Federal State Statistics Service. URL: http://www.gks.ru/ (accessed February 12, 2019)

ita in 2005 and the change in GRP from 2005 to 2016 accounts for -0.21.

Moreover, there is no correlation between the change in the GRP in 2005–2016 and migration growth (the correlation coefficient is -0.04).

The linear correlation coefficient between population density (reflecting the development of the territory) and migration growth (0.27) shows a higher value. However, this figure does not mean there is a connection between the two indicators. The distribution of the regions of the Central and the North-Western Federal districts of Russia according to population density and migration growth given in Table 4 suggests that there is a certain connection, though: the more densely populated regions tend to demonstrate an incoming migration growth, and the less populated ones – an outgoing one.

4. Polarisation of settlement within mesoregions

The economic and demographic development of the Russian regions described above has been the subject of numerous research works in geography. Less attention has been paid to the redistribution of the population within the regions of the Russian Federation.

It might seem that, after the demise of the USSR, the deepening contradictions "between the capital of the country and the periphery, between the regional centres and the distant settlements in the regions" were caused by the crisis of the 1990s (Zubarevich, 2001). In the 21st century, the situation did not improve. One more problem appeared: there was a

Table 2. The share of manufacturing-related economic activities in value added created in the regions of the Russian Federation

			Types of Economic Activity					
RF, Federal Districts	Pro- duc- Year tion of goods, total	Agricul- ture, hunt- ing and forestry	Fish- ing and fish-farm- ing	Mining	Manufac- turing in- dustries:		Con- struction	
RF	2016	43.8	5.1	0,3	10.9	17.3	3.9	6.3
Kr	2005	46.3	5.2	0,3	12.8	18.5	3.8	5.7
Federal Districts								
0 1	2016	30	3.4	0	0.5	16.8	4	5.3
Central	2005	29.8	2.9	0	0.8	17.1	3.9	5.1
NT (1 TAT	2016	39,9	2.3	1	6.8	19.5	3.7	6.6
North-West	2005	46.9	3.8	0.8	7.6	24	4.1	6.6
	2016	62.4	2.2	0	35	14.2	3.2	7.8
2.1. Ural	2005	63.6	2.4	0	43.5	11,1	2.1	4.5
	2016	51,6	3.4	3.7	28.2	5.4	4.2	6.7
2.2. Far East	2005	47.2	5.7	4.3	14.9	7.7	5.3	9.3
2.1.01	2016	51.5	6.2	0	15.6	19.9	4.5	5.3
3.1. Siberian	2005	54	7,3	0	9.4	27.9	4.7	4.7
0.0 37.1	2016	54.1	7.7	0	12.1	23.9	3.8	6.6
3.2. Volga	2005	57.6	8.3	0	15.1	24	4	6.2
	2016	43.3	13.6	0.1	3.5	15.6	3.4	7,1
3.3. South	2005	47.1	13.1	0.1	2.8	18.6	4.6	7,9
24 N. d. C.	2016	41	16.4	0.1	0.6	9.1	3.7	11,1
3.4. North Caucasian	2005	45.1	18.9	0.1	2.3	10.7	4.7	8.4

Bold type indicates figures higher than the average for the Russian Federation; italics indicate figures increased by 2016 compared to 2005. (Compiled by the author from the data: Federal State Statistics Service. URL: http://www.gks.ru/ (accessed February 12, 2019))

redistribution of population from small and medium cities to large ones. This tendency of redistribution plays a crucial role in the polarisation of the economy and settlement from a regional spatial planning perspective. It is within regions that the phenomenon of population concentrating in large cities (over 100,000 inhabitants) and the depopula-

tion of the rest of the territory occurs. At the same time, if, in the recent past, the population of large cities increased due to an inflow mainly from rural areas, now, medium and small cities are the primary source of population growth. In 1989–2018, the number of residents in cities with a population of more than 100,000 increased by 11.5%, while

Table 3. Distribution of constituent entities of the Russian Federation according to the production of GRP per capita and change in the physical volume of the GRP for 2010–2016, Central and North-Western federal districts

GRP per capita,	The physical volume of GRP in 2016 as a percentage of 2010						
2016	88.0-119.9	120.0-149.9					
500-5999	Moscow; Komi Republic; Nenetzky AD; Murmansk region	St. Petersburg and Leningrad oblast					
300-499	Republic of Karelia, Arkhangelsk region	Belgorod, Voronezh, Kaluga, Kursk, Lipetsk, Moscow, Tula, Yaroslavl, Kaliningrad, Novgorod regions					
100-299	Vladimir, Ivanovo, Kostroma, Ryazan, Smolensk, Tver, Pskov re- gions	Bryansk, Oryol, Tambov regions					

Compiled by the author from the data: Regions of Russia. 2018. M.: Rosstat, 2018. 1162 p.

Table 4. Distribution of subjects of the Russian Federation by population density and migration growth

Population density,	Migration growth per 10,000 population, on average for 2015–2017					
people per sq. km, 2018	from -120 to -0.01	from 0 to 350				
50 and above		Moscow, St. Petersburg				
		Moscow, Belgorod, Tula, Kaliningrad regions				
10.00-49.99	Bryansk, Vladimir, Ivanovo, Kostroma, Tver, Oryol, Tambov, Novgorod, Pskov Regions	Voronezh, Kaluga, Kursk, Lipetsk, Ryazan, Smolensk, Yaroslavl, Leningrad regions				
2.7-9.99	Republic of Karelia, Komi;					
	Arkhangelsk, Vologda, Murmansk regions					
0.2	Nenetzky AD					

Compiled by the author from the data: Regions of Russia. 2018. M.: Rosstat, 2018. 1162 p.

the entire population of the country (in 2002) decreased by 0.1% (Table 5).

As a result, the number of people living in big cities is increasing rapidly, reaching 51.6% of the total population of the Russian Federation by 2018 (Table 6). At the same time, since the 1990s, medium and small cities have been becoming an increasingly important source of population growth in large cities.

In particular, the capital cities of Moscow and St. Petersburg are growing very fast, though the increase in their population as well as in the population of other big cities with populations over 1 million occurs partly due to the integration of their neighbouring settlements. In 2002–2017, the population of Moscow and St. Petersburg increased by 19.4%. However, the total increase in the population of other cities of a million people was "only" 7.8%, which is less than the average for the cities

Table 5. The dynamics of the number of urban (cities with a population of up to and more than 100,000 inhabitants) and the rural population of Russia, 1989–2018 (for the beginning of the year)

	1989	2002	2010	2017	2018
Total population	100.0	98.7	97.2	99.9	99.9
cities of 100,000 or more inhabitants	100.0	99.6	103.6	111.0	111.5

Compiled by the author from the data: Federal State Statistics Service. URL: http://www.gks.ru/ (accessed February 12, 2019)

Table 6. Changes in the structure of settlement development, the Russian Federation, 1979–2018 (for the beginning of the year)

	1979	1989	2002	2010	2017	2018
Total population	100.0	100.0	100.0	100.0	100.0	100.0
cities 100,000 or more inhabitants	43.6	46.3	46.7	49.3	51.4	51,6

Compiled by the author from the data: Federal State Statistics Service. URL: http://www.gks.ru/ (accessed February 12, 2019)

with a population of more than 100,000, where it reached 12%. In 2018, cities with a population of over 1 million accounted for 44% of the population of all large (with a population of over 100,000) cities (in 2002, 43%).

Three-quarters of the population (in 2018, 75.3%) of cities with a population of more than 100,000 live in regional centres. The growth rates of their population are approximately the same as the average growth rates of "hundred thousand people" cities, though it seems that due to their more complex economic structure, the location of government bodies and their more developed social infrastructure, these cities should have been more attractive to entrepreneurs, investors and migrants.

To assess the territorial characteristics of population growth in large cities, we turn to the data in Table 7 and Fig. 3. Regions are grouped according to population dynamics (total population, cities with a population of 100,000 or more, the population of regions minus these cities), as well as population density, and the number of people living in cities with a population of 100,000 or more. Table 7 summarises the structure and regional differences in the settlement development system of the regions of the Central and North-Western federal districts of the Russian Federation and the changes that occurred in 2002–2017.

In all the considered regions, except those belonging to types 1, 2 and 7, the total population decreased. However, the population of large cities

increased everywhere due to a decrease in the number of inhabitants in settlements with a population of less than 100,000 (6).

At the same time, the differences between regions in the dynamics of population size and the rate of population redistribution within the regions are quite significant. The number of residents of large cities in the so-called "metropolitan" regions – Moscow (Moscow + the Moscow region) and St. Petersburg (St. Petersburg + the Leningrad region), representing the two largest urban agglomerations in Russia – is growing especially rapidly. Intensive migration of the population to large cities from other parts of the country resulted in an increase in total population.

The situation in the Belgorod and Kaliningrad regions is more favourable since the total number of the population increased, and the population residing in settlements located outside big cities is decreasing more slowly compared with the regions from groups 4–6. These three groups differ in degree of urbanisation and, especially, in the development of the territory (characterised by population density). However, the rate of population growth decline and the distribution of population between settlements of different sizes in favour of large cities look quite similar.

Russian regions with similar population distribution characteristics (belonging to different groups in Table 7) require similar measures of population distribution management. Regions belonging to dif-

Table 7. Structure of settlement development of the regions of Central and North-Western Federal Districts of the Russian Federation and its changes for 2002–2017.

	Chan	nge for 2002-20			
Constituent entities of the Russian Federation	General population	Cities of 100,000 or more, 2017	Population, excluding cities of 100,000 or more, 2017	Share of cities of 100,000 or more, %, 2017	Density (persons per sq. km), 2018
Russian Federation	-0.8	9.7	-11.4	51.2	8.6
1. Moscow + Moscow region, St. Petersburg + Leningrad region	5 – 16	13 - 25	-209	75 - 80	84 - 427
2. Belgorod, Kaliningrad regions	3	2 - 3	-21	40 - 47	57 - 66
3. Voronezh, Vladimir, Kaluga, Kursk, Lipetsk, Ryazan, Yaroslavl regions	-92	13	-257	44 - 63	28 - 48
4. Bryansk, Ivanovo, Oryol, Tambov, Tula regions	-1012	2.0	-14	28 - 42	30 - 58
 Vologda, Kostroma, Novgorod, Pskov, Smolensk, Tver regions 	16 – -7	4 - 6	-2314	35 – 55	8 - 19
6. Republics: Kare- lia, Komi; Murmansk, Arkhangelsk regions (without Nenetzky Au- tonomous District)	-1712	2 - 7	-1823	29 - 48	2 - 5
7. Nenetzky Autonomous District	6	-	6	0	0.2

Compiled by the author from the data: Federal State Statistics Service. URL: http://www.gks.ru/ (accessed March 18, 2019)

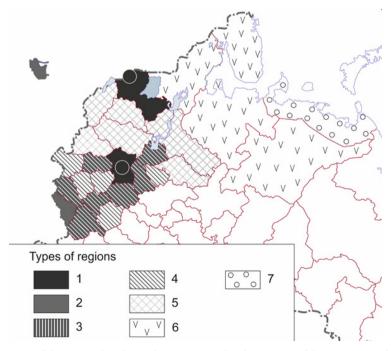


Fig. 3. Types of mesoregions of the Central and North-Western Federal Districts of the Russian Federation according to settlement development structure (See Table 7)

ferent groups have a different territorial structure and demonstrate different population settlement dynamics. Consequently, they require their own, specific approaches to population distribution.

5. Conclusion

In Russia, regional differences in the distribution of the economy and population are very pronounced at all territorial levels – the macro-, meso- and microregional. Although in the 21st century, macro- and mesoregional differences in the level of economic and social development of regions have diminished, they still remain noticeable, and the population continues to concentrate in more developed regions boasting a higher economic and cultural potential. At the microregional level, within almost all the subjects of the Russian Federation, the population is concentrated in large cities as a result of migration outflow from rural areas and small towns.

The previous and present regional policy helped to level out interregional differences by redistributing revenues between Russian regions in favour of less developed territories. However, inside mesoregions, the effect of concentration and agglomeration of production and settlement turned out to be stronger compared with the limited state funding received by villages, and small and medium cities. Big cities are more attractive to investors because of their size and, for the same reason, they have considerable advantages in the level and complexity of social development, which is vital for retaining their population and attracting migrants. Therefore, these cities strive to concentrate production and people coming from their own region, from small and medium-sized cities, and not from the rural areas, as before.

At the same time, each settlement performs specific functions in the production, social and settlement systems of the region. The weakening of a single link reduces the efficiency of the entire settlement system. Besides, regional territorial planning does not take into account technological shifts in the production of goods and services, nor too in urban construction. Thus, modern trends in technology determine the development of industries

within a certain territory, forming dispersed clusters. In small and medium-sized cities and in rural areas, there are prerequisites for creating a clean and healthy environment and comfortable living conditions that can satisfy the increasing demands of residents.

Territorial development and planning should take into account the development potential of settlements of various sizes. The new Strategy for the Spatial Development of Russia gives an additional impetus to growth centres and provides support to geo-strategically important regions of the country. The document contains measures aimed at reducing regional socio-economic imbalances. The authors hope that the implementation of the provisions of this document will help reduce territorial disparities and facilitate the development of large cities and agglomerations as well as medium and small cities, and rural settlements. However, the Strategy for Spatial Development of Russia should be supplemented with documents at the regional level that would take into account the territorial differentiation of the economy and population within regions (republics, regions, autonomous okrugs). That is, regional authorities should pay special attention to reducing territorial differences within the constituent entities of the Russian Federation while developing strategies for socio-economic development of regions and territorial planning schemes, as well as preparing special programmes for the development of lagging peripheral regions (for example, the "East" programme is already being developed in the Kaliningrad region; according to this programme, in 2020, concessional financing of business in lagging eastern municipalities is provided for).

6. Notes

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