

## SPATIAL ASPECTS OF POPULATION DYNAMICS IN RUSSIAN LOCAL ADMINISTRATIVE TERRITORIAL UNITS (1989–2010)

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**ABSTRACT:** *The paper analyses the patterns of demographic dynamics of settlements and districts of various types in Russia within the framework of the core-periphery model. We test the hypotheses stating that population density is growing in regional centres and in their surroundings; variations in the dynamics of population growth (and its components) within regions are not less prominent than those between regions; differences between peripheral territories are less significant than those between regional centres, and these are the differences which define socio-economic inequality of the regions. The paper also looks into the dynamics of population growth in cities, district centres and rural settlements in relation to the proximity of an administrative unit to a regional centre.*

### INTRODUCTION

Countries like Russia, which are undergoing depopulation, confront the vital domestic problem of population change. The population size of most administrative units in countries with stable or increasing populations either increases or remains steady; such a situation rarely poses a problem. However, decreasing populations can pose problems for administrative units covering large territories. As a result, researchers' attention is increasingly drawn to investigating differences in demographic dynamics, looking for models and factors explaining depopulation.

In Russia, inter-regional differentiation is amplified as a result of the following factors:

- The large number of administrative units and inconsistency in the administrative division network.<sup>3</sup>

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- Huge territorial sizes, low population densities and underdeveloped infrastructures.
- A relatively small number of cities (for such large territories), particularly larger cities that have a chance of qualifying as growth poles for adjacent territories.
- Administrative centres almost always receiving more financial resources than the territories surrounding them; this situation directly influencing differences in household income and determining internal migration flows.
- A later start to the process of urbanisation than in many other European countries.
- Social and political transformations, interfering with the flow of evolutionary processes of territories and population development, often affecting different parts of the country in different ways.

The above-mentioned factors demonstrate that the classic socio-economic factors of territorial and population development that can be analysed in detail with regard to most European countries are not present in their 'pure' form in Russia. As a result, these factors determine the specificities of the research presented here.

#### SURVEY OF WESTERN RESEARCH ON INTERACTION BETWEEN TERRITORIAL CENTRES AND TERRITORIES SURROUNDING THEM

From the works of von Thünen (1875) up until the present day, centres and the territories surrounding them have invariably been considered as complementary though different categories. These distinctions are apparent in every respect: psychologically, socially, economically and in infrastructure. Everywhere in the world the same pattern determined by the laws of physics applies – the crystallisation of a mass around a core leading to the spreading over the boundaries of the core and a gain in its force and impact on capacity.

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<sup>3</sup> Russia is characterised by a complicated administrative territorial system. It is divided into 83 constituent entities of different types: regions (*oblast'*), areas (*kray*), republics, one autonomous region (*avtonomnaya oblast'*), autonomous districts (*avtonomny okrug*), and the federal cities of Moscow and St. Petersburg. Hereinafter they are all referred to as regions. Regions consist of 1868 local administrative divisions (*rayon*), 1099 cities and 1295 urban-type settlements. Local administrative districts are represented either by entirely rural populations (rural settlements) or by mixed populations: rural settlements and cities and other urban-type settlements. Federal entities form seven Federal Districts: Central, North-western, Volga, Southern, Ural, Siberian and Far Eastern.

The classical “core–periphery model” (Friedmann 1966) postulated that non-uniformity of economic growth and the process of space polarisation inevitably generate imbalances between the centre and the periphery. The centre is an ‘engine’ of development of the system (because of the constant qualitative transformation to generate innovations) and is simultaneously also the ‘pump’ for extraction of all types of resources, including human capital, from the periphery.

Modern research suggests that regional processes operate more ambiguously than suggested by Friedmann’s theory. Differential urbanisation<sup>4</sup> leads to the appearance of more advanced “centres” and accordingly “peripheries”, and multilayered spaces, multiplicities of cores and peripheries of polarisation.

Research on five Canadian peripheral regions conducted by Polese and Shearmur (2006) showed that a decline in the population of peripheral territories at the end of the period of demographic transition became normal. As a result, peripheral and central regions of the country began to differ in terms of population structure and the young population began to be gradually ‘washed away’ from peripheral regions.

Research by a group of authors headed by Kupiszewski (Kupiszewski et al. 1997, 2001a, 2001b) has shown that in countries with high internal migratory mobility, the young population increasingly gravitates towards capitals, centres of regions and other large cities, while other groups of the population remain and “de-concentrate” (Kupiszewski et al. 2001a, 2001b). While the concept of the “new economic geography” (Krugman 1991, 1993; Fujita et al. 1999, and other works by these authors) has focused on monetary and trade flows, other factors promoting the concentration of economic activity and population in one place in comparison to another have been relatively under-researched.

According to Glaeser and Kohlhase (2004), this tendency reduces the ability of models that use new economic geography to explain regional growth in the twenty-first century, in which the advantages of the living conditions of a place have often played a primary role. Partridge et al. (2006) note that interest in the spatial measurement of population dynamics is unfortunately limited by a lack of empirical research in the field; this is a result of difficulties obtaining and analysing large-scale spatial information (Hanson 2001). Partridge et al. (2006) analysed the results of the dynamics on population changes in a core–periphery context, by looking at the potential relationships between local administrative

<sup>4</sup> The theory of differential urbanisation, developed from 1963 onwards in various publications (Gibbs 1963; Friedmann 1966; Berry 1976; Hall and Hay 1980), argues that urbanisation is not a unified process for the whole territory, but the process of changes of stages of population movements. This theory was discussed with respect to the USSR in the 1980s, when the growth of cities and settlement structures slowed down and Russian scholars’ works on the subject were published (Kummel 1987; Zajonchkovskaya 1991; Grizaj et al. 1991). See Treivish and Nefedova (2002) for a summary of the Russian experience.

units in the USA and cities of different size or rank in the urban system. They revealed that different trends exist in the dynamics of population and migration interaction, with the nearest cities depending on different factors such as the population size of the nearest metropolitan area.

Differences in population dynamics in central, semi-peripheral and peripheral areas have also been noted in studies across Germany (Spangenberg and Kawka 2008). In addition to an analysis of current trends, they provide forecasts based on statistical data for municipalities. According to these forecasts, from 2005 to 2025 the population of the centres and the peripheries will have different dynamics, and population decline will increase as the distance from the centres increases. It has been noted that this situation leads to the ageing of the population (Swiaczny et al. 2008).

#### RESEARCH ON INTER-REGIONAL INTERACTIONS BETWEEN TERRITORIES IN THE USSR AND RUSSIA

The concept of the core–periphery was initially received with some scepticism in the Soviet period: the incompleteness of the process of urbanisation,<sup>5</sup> highly regulated redistributive financial and commodity flows, and also regulated development of dispersed economic activity worked to partially level core–periphery distinctions. Nevertheless, Grizaj, Ioffe and Trejvish’s (1991) study “The centre and periphery in regional development” is partly based on Soviet empirical data. Despite the Soviet government’s guidelines, which aimed to eliminate distinctions between territories, cities and villages, real contrasts between core and periphery were in actual fact quite pronounced.

The contrasts that existed in Soviet times have grown thanks to the structural economic crisis of the 1990s, when “economically feeble areas became even more feeble, and the strong even stronger”. Research conducted in the 1990s by Nefedova (2003), Trejvish and Nefedova (1994, 2002), Nefedova and Ioffe (2001), and Zubarevich (2000, 2003) has shown that “weakness” was a result not

<sup>5</sup> Our use of the term ‘incomplete’ urbanisation refers to the complex of factors and conditions such as the later start of urbanisation and its high pace in the twentieth century, its low starting point (according to the first all-Russian census in 1897, only 13 per cent of the population lived in urban settlements compared with Germany and France where the same level was reached in the 1850s), and sparseness of networks linking cities, etc. All of these have led to the situation that despite Russia having comparable levels of urbanisation to many Western countries now (73%, as compared with Canada – 80%, USA – 79%, France – 77%, Germany – 73%, Italy – 68%), the qualitative characteristics of urbanisation as urban life-style, and different services, including leisure opportunities and urban commodities are far from comparable with these countries (for example water and gas supply systems). Nefedova, Polian and Treivish (2001) indicate that the level of ‘real’ urbanisation in Russia stands at about 59 per cent.

only of peripheral location. Several dichotomies operate in the Russian territory, such as north vs. south, Russian ethnic regions vs. ethnic republic regions<sup>6</sup>, and old industrialised western regions vs. newly developed eastern ones.

Nevertheless, core–periphery gradients appear to be universal and apply both in the north and the south, in Russian and ethnic regions, and at different levels of administrative units, from the federal level to small municipal units. However, very little research has been done at the most local level. Exceptions are the studies by Nefedova (2003) and Trejvish (2009). In-depth transformational changes at the turn of the 1990–2000s, which coincided with the most serious demographic changes (beginning of depopulation), led to an increase in the dichotomy between centres of economic activity and the provinces.

What is valued by the inhabitant of the capital of a region is not necessarily valued by a person living in a province. Political freedom, democracy, freedom of movement, orientation towards success, according to all-Russia surveys, are emphasised as important by a considerable proportion of inhabitants of the capital and, to a lesser degree, big cities, whereas they are much less valued by inhabitants of the small cities, and especially villages (Hamsina 2004).

Centres and peripheries live in different “social dimensions” to an even greater degree than during the Soviet period. According to Kagansky (2001), in the centres, work is related to tertiary activities (politics, mass media), while in the periphery it relates to industrial production (manufacture, subsistence economy), or according to Trejvish and Nefedova (2002) “in the centre life depends on the dollar exchange rate; in the periphery, on the weather and the potato crop”.

What does it mean when a territory lacks a developed centre? The already existing centres will try to pump different resources from the periphery, including human resources, and this desire will increase, which will also strengthen and consolidate the distinctions between them thereby weakening the periphery. The socio-economic disparity between centres and peripheries contributes, via migration, to forming different dynamics of their population size.

Based on these assumptions, this paper investigates several hypotheses. According to the centre–periphery concept of spatial development, in terms of economic transformation and depopulation one of the most important factors is human resources. The almost total absence of research on these topics at micro-

<sup>6</sup> By “ethnic region” we mean regions that are named after one of the ethnic groups living on the territory of Russia (for example Tatarstan, Bashkortastan and Tuva republics). The name does not mean the majority of the population belongs to those ethnic groups. For example, according to the 2002 census in the Jewish autonomic *oblast'* the percentage of Jews in the total population was 1.2 per cent, in Karelia the Karels made up only 9.2 per cent, etc. Nevertheless, “ethnic regions” in Russia usually have special relationships with the federal centre and enjoy more privileges. That, in turn, can influence the migration process and dynamics of the population in general.

territorial level for all of Russia<sup>7</sup> makes such an analysis a valuable research task. To fill-in this gap, we investigate the following hypotheses:

1. The farther a peripheral region is from the centre, the larger the scale of reduction of its population.
2. Local administrative units located a relatively short distance from the centre (e.g. ‘commuter towns’) do not necessarily lose population when their location is in the zone of influence of the centre.
3. The higher the population of cities that are non-administrative centres of regions, the higher the probability that they will maintain their populations.
4. Local administrative centres of “local administrative divisions” have advantages compared to surrounding rural areas.
5. After the acute social and economic transformation of Russia in the 2000s, the centre–periphery gradients have become more marked.
6. The “distance” from the ordinary town to the centres of the regions plays a more important role than the “urban” status of these towns.
7. The centre–periphery gradient may manifest itself differently in different parts of the country, depending on the characteristics of the regional settlement system, the ethnic structure of the population and other factors.

## DATA AND METHODOLOGY

The data for the study are based on the population censuses of 1989, 2002 and the preliminary results of the 2010 census on cities and local administrative regions of Russia, so-called “small territories” or local administrative territorial units (ATUs). In total, the information was collected from 2341 ATUs.

The data on the population of cities, the administrative centres of ATUs (the local administrative division’s centre<sup>8</sup>) and the rural population of small territories were analysed separately. Several difficulties were identified in the course of analysis of population dynamics:

1. The first difficulty is ‘secret’ cities (*Zakrytye Administrativno-Territorialnie Obrazovania – ZATOs*).<sup>9</sup> In 1994 data on them became

<sup>7</sup> See: Artobolevsky et al. 2004; Makhrova et al. 2008.

<sup>8</sup> The data on the populations of centres of administrative divisions are available for 1989–2002, data for the following inter-census period have not yet been published.

<sup>9</sup> Secret administrative formations (*ZATOs*) were created during the Soviet era, and were under the supervision of the Ministry of Defence or the Ministry of Atomic energy. In 1994, by Governmental Order (4 January 1994 r. № 3-p), they were opened up, including their statistics. In total, 46 such settlements appeared on the map and that resulted in a different

accessible. Analysis is therefore based on population censuses of 2002 and 2010. In the population census of 1989, the population of ZATOs was included in the population of other administrative-territorial units, and the methodology of allocation of the population data was kept secret. It is recognised that the population of a ZATO was sometimes included in the population of another federal unit of the Russian Federation, but more often than not it was included in to the population of the central city of the regional federal unit or capitals of ethnic republics. Owing to these methodological and statistical differences, it was not possible to trace the dynamics of the majority of the ZATO population for the period 1989–2002. There were 33 ZATOs located within the territories of the 18 federal units of the Russian Federation. For the period 2003–2010 this problem is no longer relevant.

2. The second difficulty is that during the inter-census period there were significant administrative–territorial changes in the status of some towns and villages<sup>10</sup>, including changes of the boundaries of some ATUs. For example, in 2004 21 urban settlements changed to village status, one local administrative division was formed and another one abolished. This is related to the fact that during the Soviet period it was favourable and prestigious for a rural settlement to become a town. During the period of transition and the economic crisis of the 1990s the rural settlement status became more of an advantage because of benefits in the cost of electricity, widespread privatisation of land in the countryside, tax privileges, etc. (Borodina 2005). Numerous administrative changes certainly hinder comparison of data on some cities and regions, and of the city and rural population. It was necessary to combine the data of some ATUs in order to carry out the analysis.
3. During inter-census periods the data on four federal units of the Russian Federation were not analysed: the republics of Dagestan, Ingushetia, Kabardino-Balkariya and Chechnya (comprising 97 local ATUs). Research estimations have shown that in these republics serious distortions of population numbers took place at the time of census. According to the population census of 2002 the results of such “irregularities” in these re-

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population distribution system compared with previously. In the Moscow, Chelyabinsk, Sverdlovsk, Murmansk and Krasnoyarsk regions, four to six ‘new’ settlements emerged. Sixteen regions experienced smaller changes. Information about them is still only partly analysed. Some ZATOs still keep the secret regime limitations. The opening of the ZATOs increased the urban population of Russia by 1.1 million people. The majority of ZATOs are cities with a population exceeding 25,000 people, eight of them having more than 50,000 inhabitants at the moment of disclosure. See more: Lappo and Polyan 1997.

<sup>10</sup> See Vserossiiskaya perepis naselenia 2002 tom I Chislennost I razmeschenie naselenia, Prilozania i Izmenenia v administrativno-territorialnom ystroistve cybiektov Rossiiskoi Federatsii za 1989–2002.

publics' census information were evaluated as being as large as one million people (Mkrtchyan 2004; Maksudov 2005; Bogojavlensky 2008); similar problems have been raised concerning the 2010 census. This makes comparing the populations of these republics meaningless and would affect the results at the aggregated level.

4. Information on Moscow and St. Petersburg is not analysed in this article. The population dynamics of these two cities constitute a separate research project that would influence the data of other centres dramatically. This is because the population of Moscow increased from 1989 to 2002 by 1252 thousand people (or by 14.1 per cent), and for 2003–2010 by 1388 thousand people (13.7 per cent). According to the official administrative–territorial division, the Moscow and Leningrad regions (*oblasts*) are governed independently from Moscow's and St. Petersburg's federal units.

To analyse population dynamics for the inter-census period of 1989–2002 and 2003–2010, the local ATUs were grouped as follows:

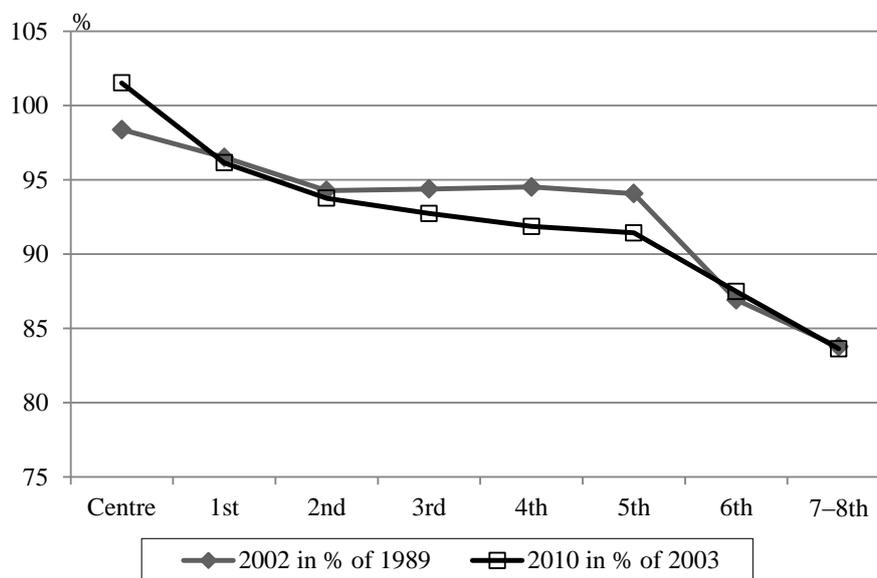
1. Regional centres (republic, *oblast'* and *kray* capitals) were combined with their satellite settlements and the local administrative division for calculation. For example, the city of Kostroma was grouped together with Kostroma administrative division (*Kostromskoy rayon*) of Kostroma region (*Kostromskaya oblast'*). If the territory of the regional centre borders more than one ATU, this population was also included in the data on centres. We offer two reasons for this: firstly, by the existence of a common local labour market within the borders of this agglomerative area with intensive daily commuting. Secondly, because during inter-census periods the most frequent administrative–territorial changes took place between regional centres and the closest local administrative divisions, and these changes are very difficult to calculate. A special approach was taken for the Moscow and Leningrad administrative divisions. Their 'centres' were defined as the sum of the population of ATUs that bordered the officially delimited territories of Moscow and St. Petersburg (while the cities themselves were not included in the analysis).
2. The periphery was subdivided into several belts of distance from the centre, as follows: the regional centre and the closest local administrative division form range (belt) 0; adjacent local administrative divisions neighbouring the 0 range (belt) belong to the periphery of the 1st range (belt), neighbours bordering the 1st range (belt) and not the centre are the 2nd range (belt), etc., up to the 8th range (belt). Therefore, the farther a city is from the regional centre or a local administrative division, the later the peripheral belt it belongs to. The average distance from the re-

gional centre of the 1st range (belt) ATU is 30–50 kilometres. They have, by Russian standards, good commuting, recreational, social and labour connections between them. It should be noted that this characteristic is usually correct for regions located in the European part of Russia. But in the regions of northern and the eastern Russia, neighbours of the 1st range are usually located much farther from regional capitals (about 100 km) and have weaker connections with it. For the evaluation of core–peripheral relations, in addition to the range (belt) order analysis of population changes, the relationship of federal centre to the local ATUs was measured in kilometres (RSFSR 1986). The division of the territory into the centres and the periphery of different range (belt) based on distance in kilometres from the centres allows calculation and analysis of trends in population dynamics in these areas of different ranks and different distance from regional centres.

## KEY FINDINGS

### *Core–Peripheral Gradient and the Dynamics of the Population*

The grouping of local ATUs according to distance from the regional centre in both inter-census periods shows the clear relationship between distance and population dynamics: the farther from the regional centre, the more intensively the population is reduced (Figure I). In the period 1989–2002, the decline in the population from the regional centres to the ATUs of 1st and 2nd ranges of distance increased particularly quickly. By contrast, there are practically no distinctions in the dynamics of the population on other peripheral regions from the 2nd to 5th ranks of distance from the regional centre. In 2003–2010 the decrease in the population continued to intensify the further one travelled from the regional centres.



*Note:* ATUs of the republics of Dagestan, Ingushetia, Kabardino-Balkariya and Chechnya are not included.

Figure I  
*Changes in the populations of local ATUs by distance from the regional centre, Russia, 1989–2010, 1st; 2nd; 3rd; ... 7–8th ranges ATUs from regional centre*

This dependence is typical of the whole country, but some regional peculiarities are visible in Table 1. For example, in 1989–2002 the further an ATU was located from the regional centre in Central, North-western and the Siberian Federal Districts, the more intensively it depopulated. But in the Volga and Ural Federal Districts, for the period of the 1990s<sup>11</sup>, there was no such tendency and federal centres lost their populations more intensively than neighbouring ATUs of the 1st belt. By the next decade (the 2000s) this situation is not observed; the population of the first rank ATUs of the given regions already have better dynamics.

<sup>11</sup> Hereinafter under “1990s” we refer to the inter-census period of 1989–2002, and under “2000s” the period 2003–2010.

Table 1  
*Change of population of the local ATU by Federal Districts depending on distance from regional centre – gain/decrease in %, from 1989 to 2002 and from 2002 to 2010*

Locale	Federal Districts						
	Central	North-western	Southern*	Volga	Ural	Siberian	Far Eastern
2002 in comparison to 1989, increase/decrease							
Centre	-2.2	-4.0	7.1	-2.8	-2.6	-1.4	-7.7
1 <sup>st</sup> range	-3.6	-8.1	6.5	-0.4	2.3	-6.6	-21.6
2 <sup>nd</sup> range	-6.5	-11.1	8.2	-5.7	-5.5	-9.1	-22.6
3 <sup>rd</sup> range	-6.3	-15.4	6.0	-3.2	-10.5	-10.4	-22.6
4 <sup>th</sup> range	-9.7	-15.2	6.4	0.2	-10.7	-7.3	-24.2
5 <sup>th</sup> range	-4.8	-19.3	1.9	-0.7	-6.1	-9.7	-22.6
6 <sup>th</sup> range	-12.1	-37.2	-5.3	-0.9	-5.7	-10.9	-28.0
7–8 <sup>th</sup> ranges	-21.2	–	-6.3	–	-11.9	-17.9	-5.7
Total	-4.9	-9.7	6.8	-2.5	-3.8	-6.3	-16.7
2010 in comparison to 2002, increase/decrease							
Centre	4.0	-0.1	2.2	-0.7	2.9	2.8	0.3
1 <sup>st</sup> range	-0.9	-6.7	-3.1	-4.6	-2.1	-5.7	-7.9
2 <sup>nd</sup> range	-6.3	-10.5	-0.9	-7.6	-4.5	-8.1	-10.6
3 <sup>rd</sup> range	-6.8	-13.1	-0.4	-7.6	-9.8	-10.5	-13.3
4 <sup>th</sup> range	-10.6	-12.1	-3.9	-6.2	-11.8	-9.0	-13.5
5 <sup>th</sup> range	-9.1	-13.8	-5.8	-8.4	-5.8	-11.5	-9.4
6 <sup>th</sup> range	-10.4	-27.2	-7.7	-8.4	-14.3	-11.0	-17.7
7–8 <sup>th</sup> ranges	-21.3	–	-9.9	–	-14.1	-17.5	-8.9
Total	-2.8	-6.5	-0.5	-4.3	-2.3	-4.3	-5.8

\*Note: ATUs of Republics of Dagestan, Ingushetia, Kabardino-Balkariya and Chechnya are not included.

In the Southern Federal District (SFD) in the 1990s population growth was marked in all groups of ATUs, except ATUs of the 6th and 7th ranges, which included only a few ATUs.

In the 2000s, the population dynamics of the centres of the SFD differed from the periphery of the regions. Thus, after the time of social and economic transformations in the nineties, the core–peripheral gradient of population dynamics increasingly manifested itself and spread its effects to a growing number of territories of Russia.

In comparison with the previous inter-census period, in 2003–2010 the positive dynamics of the centres of population growth is visible in the majority of

regions.<sup>12</sup> In spite of the general population loss in the Central Federal District the population of centres grew by four per cent (bear in mind that the city of Moscow is not included in the analysis). Unlike the previous period, centres increased their populations even in the Siberian and Far Eastern Federal Districts.

The dynamics of the population in the local ATUs depends both on the existing system of settlements<sup>13</sup> and on common regional tendencies. Thus, in the Far Eastern and North-western Federal Districts, which showed the most intensive reduction in population during both inter-census periods, the marked population loss manifested first and foremost in the regional peripheries. In the 2000s, the differences in the dynamics of population change of the centres between Federal Districts were smaller than differences between the peripheries of these regions.

The positive population dynamics of the regional centres are supported by migration inflows of the population from their regions; in many regions this migration has a clear centripetal direction (Mkrtchyan and Karachurina 2006).

Regional centres are especially attractive to youth. Estimates for the 19 administrative *oblasts* of Russia in the 1990s suggest that migration supply provided about 25–30 per cent of the increase in the number of youth of the 15–19 and 20–24 age groups to regional centres. The attractiveness of centres relates to the availability there of different vocational and tertiary education institutions (Karachurina and Mkrtchyan 2012).

The grouping of local ATUs by distance (in kilometres) from regional capitals shows a somewhat different pattern of dependence on the dynamics of a population on a core–periphery gradient (cf. Figs. I and II). The fastest population decline can be observed from the centre to the group of ATUs 30–50 kilometres away, from 250 kilometres and from 500 kilometres away. In ATUs that are mid-distant from the centres (50–250 km) the losses are less evident. This is due to the fact that ‘second-rank’ centres are situated at a distance of 150–250 kilometres, for example, Stary Oskol in the Belgorod region (Belgorodskaya *oblast*) or Pyatigorsk and Mineralnye Vody in the Stavropol region (Stavropolskiy *krai*), Kamyshin in Volgograd region (Volgogradskaya *oblast*), Nakhodka in the Primor’ye region (Primorskaya *oblast*), etc. They often work as centres of attraction for people from surrounding regions, so the loss of population in this belt is less pronounced.

<sup>12</sup> We mean the centres of the regions and their local administrative divisions. For example, in Kostroma region (Kostromskaya *oblast*) the city of Kostroma together with Kostroma administrative division (Kostromskoy *rayon*).

<sup>13</sup> In Russia one can find different types of population settlements: areal in the Northern European and Asian parts of Russia, linear (along with the Volga river in Volga Federal District), dispersed isochronic, continuous (Central Federal District) and agglomerative.

Let us take the Volga Federal District as an example. The peculiarities of the administrative–territorial division of this area (large regional territories, a high number of local ATUs and the settlement network) have led to the formation of important second-rank centres. This is what has happened in the Samara and Saratov, Bashkortostan, Tatarstan and other regions of the Volga Federal District. These cities, with populations of more than 100,000 people, are located a fair distance from the regional centres. So the joint impact of these two factors (population size and distance from regional centres) allows these cities to become centres of gravity for migrants from adjacent areas, while at the same time they fail to ‘donate’ their populations to the regional centres as intensively. This allows second-rank cities to maintain stable population sizes. This stability, however, is maintained as a result of increasing migration inflows or, in the worst case, population balance as a result of the in-migration of young people. This may also be due to the ethnic diversity of the population of the Federal District, where some ethnic groups started the demographic transition a little earlier than others.

Thus, at this stage we can say that the centre–periphery gradient in population dynamics of territories in Russia is disturbed as a result of the joint impact of factors: a moderate (though not great) distance from the regional centre, a large population size and the social and economic importance of second-rank cities. As far as we know from the literature, in European countries the joint impact of these two factors has had no such effect on population dynamics, since in regions with smaller territories second-rank centres may not be as distinguished. In addition, the distances between centres and peripheries are usually not as great, and this does not allow them to develop as centres that are attractive to migrants. In Russia this is the case with the regions of the Central Federal District, where regions have smaller territories (in comparison to the Volga Federal District) and, as a rule, do not have second-rank cities that are important from a social, economic or population point of view. Here we should also note that all the possible migration flows in the Central Federal District lead to Moscow itself, whose labour market requires constant replenishment.

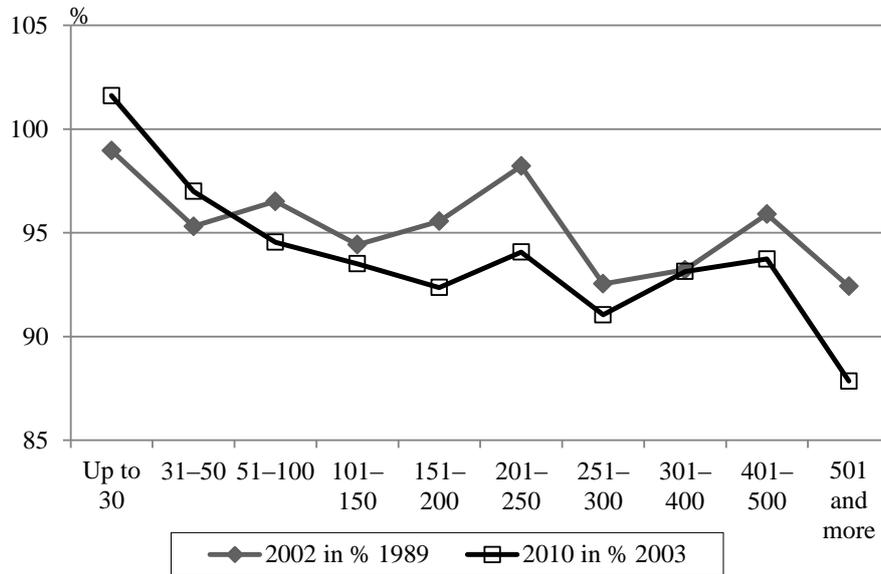


Figure II  
*Change of population of local ATUs, by distance from the regional centre in km, 1989-2010*

The sharpest decline in population in the most distant periphery is explained by the fact that such distant peripheries only exist in the Far Eastern, Siberian and North-western Federal Districts (only a few ATUs in two other Federal Districts belong to that category). They are among the ATUs with the largest population losses because of internal migration to other regions as part of the process known as western drift, which will be expanded upon later on, and because these distant ATUs are also unattractive to international migrants. These ATUs are the most distant (located more than 500 kilometres from the regional centre) and the least populated (according to our estimates, 5.7 million people in 1989, 4.4 million in 2002 and 3.9 million in 2010). They have the largest territories, and in the last two decades have lost one third of their populations (Table 2).

Table 2  
 Change of population of local ATUs by Federal Districts and distance from the regional centre in km, in %

Distance from the regional centre	Federal Districts						
	Central	North-western	Southern	Volga	Ural	Siberian	Far Eastern
2002 in comparison to 1989, increase/decrease							
Up to 30	-1.5	-3.0	7.7	-2.4	-2.0	-1.1	-6.4
31-50	-4.3	-7.8	3.1	-4.9	-6.1	-3.3	-21.3
51-100	-6.0	-5.3	6.1	-0.8	-6.2	-6.5	-19.8
101-150	-9.0	-6.0	8.3	-5.2	-9.1	-9.3	-10.1
151-200	-9.0	-14.4	7.0	-4.9	-5.4	-5.7	-9.2
201-250	-9.3	-19.4	8.8	0.6	3.4	-8.9	-18.0
251-300	-7.0	-22.1	0.2	-0.4	-15.5	-10.9	-19.2
301-400	-8.0	-14.9	4.9	-2.0	-5.7	-10.8	-15.2
401-500	-19.8	-16.5	6.5	5.0	-2.5	-4.2	-20.1
501 and more	-	-22.7	-	-5.3	-2.0	-16.4	-33.4
Average (km)	-4.9	-9.7	6.8	-2.5	-3.8	-6.3	-16.6
2010 in comparison to 2002, increase/decrease							
Up to 30	2.3	-0.2	2.4	-0.8	3.8	3.3	1.4
31-50	-2.1	-3.4	-0.4	-4.1	-4.1	-4.7	-5.9
51-100	-5.7	-7.3	-2.9	-5.3	-6.6	-7.8	-3.7
101-150	-6.8	-5.4	-2.7	-6.8	-8.2	-9.4	-6.7
151-200	-8.3	-12.0	-1.2	-8.9	-7.3	-11.2	-10.2
201-250	-9.5	-14.8	-0.1	-5.8	-4.2	-10.1	-10.5
251-300	-10.4	-16.1	-5.6	-6.9	-9.0	-9.8	-12.2
301-400	-9.9	-12.2	-0.8	-7.7	-6.1	-7.8	-10.1
401-500	-22.1	-13.6	-1.4	-8.5	-1.7	-8.9	-11.1
501 and more	-	-16.9	-	-12.3	1.0	-11.9	-12.8
Average (km)	-2.8	-6.5	-0.5	-4.3	-2.3	-4.3	-5.8

Note: ATUs of Republics of Dagestan, Ingushetia, Kabardino-Balkariya and Chechnya are not included.

Selection of centre and periphery involves a method that ranges the neighbours, and examines the dependence of dynamics of the population on distance from the centre. This clearly demonstrates the interdependence between population decline and distance from the centre, particularly in the Central, North-western and Siberian Federal Districts.

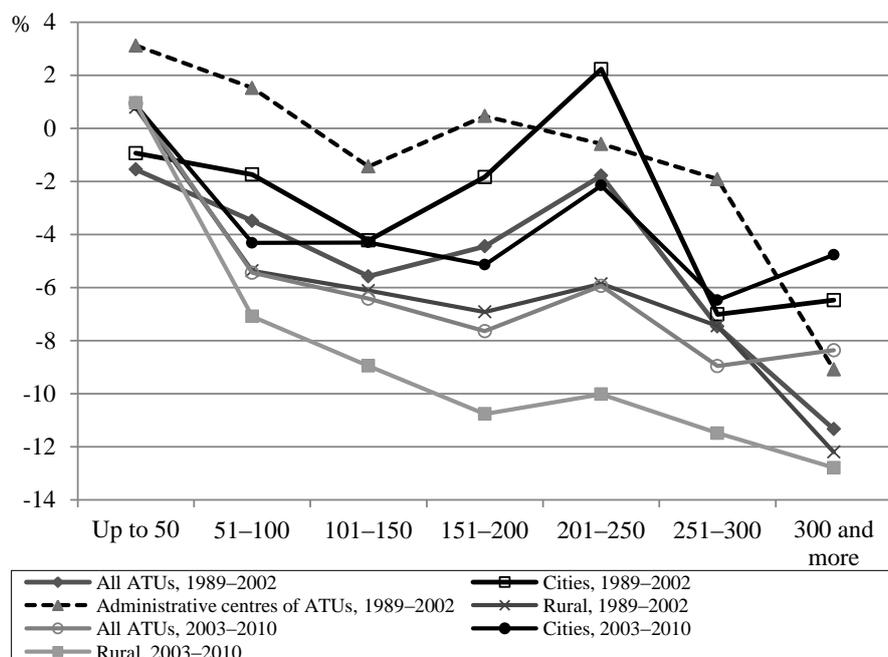
In the Volga Federal District in 1989–2002, the link between population decline and distance from the regional centres was not apparent, but in 2003–2010 it was shown within a distance of 200 kilometres from the centre. However, distinctions in dynamics of population in 1989–2002 and 2003–2010 between distant (over 200 km) and close (30–50 km) regional peripheries were not apparent in the Southern and Ural Federal Districts; their population sizes were declining everywhere except in regional centres.

*Distinctions in the Dynamics of the Population in Settlements of Different Sizes and Statuses*

Other than distance from the regional centre, what else could explain the non-uniform dynamics of population change of local ATUs during the intercensus periods of 1989–2002 and 2003–2010? In order to answer this question we clustered the data. Among ATUs the following were grouped: a) cities (except Moscow and St. Petersburg); b) the rural population of ATUs (administrative divisions without urban population); c) administrative centres of ATUs (centres of local administrative divisions). These could be of various population and urban statuses, the main principle being the administrative function of the settlement. All the above-stated three groups of ATUs have been ranked and analysed based on their distance from the regional centre (Figure III).

It turns out that the hypothesis concerning the influence of proximity/distance of local ATUs from the regional centre on population dynamics of the cities (group a) does not fully explain the observed population dynamics. The population of all cities (except regional centres) for the period 1989–2002 fell by three per cent. However, the population of cities increased within the range of 200–250 kilometres distance from the centre.

Analysis of population changes of Federal Districts shows that at this distance from the centre, population growth was marked in the cities of the Volga (4.6 per cent), Ural (2.4 per cent) and Central (0.9 per cent). So there was an increase in population in the Volga Federal District in several middle and large cities, and in the big cities of Tatarstan and Bashkortostan (Belebey, Salavat, Meleuz, Elabuga, Neftekamsk, Nizhnekamsk), as well as among small and recently established towns with a relatively young population such as Janaul and Nurlat.



Note: data on the population of regional centres (administrative centres of ATUs) according to the 2010 census has not yet been published at the time of writing.

Figure III  
 Change of population of selected groups (cities, administrative centres of ATUs and rural ATUs), by distance from regional centre in km, Russia, 1989–2010, %

In the Ural Federal District, ‘oil cities’ such as Pyt’-Yach, Nefteyugansk, Lyantor and Surgut, which enjoyed significant investments in their development, grew quickly. In the Central Federal District on the border with the Ukraine, the dynamically developing metallurgical centre of Sary Oskol also grew. In the next decade (2003–2010) the population of these cities fell, but more slowly than in distant cities (50–150 kilometres).

The reasons for the more positive dynamics of the population in the above-mentioned cities differ. Ural’s cities increased in population thanks to the oil economy and an inflow of people from across the country; their growth is not connected in any way to them being regional centres as such. We would suggest that the cities of Tatarstan and Bashkiria are vivid examples of formation of centres of gravity that may be called second-rank centres, as described earlier. The analysis of population dynamics of cities by size shows that changes in

the population of small towns (less than 50,000 people) nevertheless depends on distance from the regional centre (Table 3).

The population dynamics of larger cities (over 100,000 people) during both analysed decades did not depend on their relationships to the regional centres. These cities, with large populations, were able to compete with regional centres and to some extent mitigate the core–periphery trend in population dynamics in the region. The population of middle-sized cities (from 50,000 to 100,000 inhabitants) in the 1990s also did not depend on their relationship to the centres of ATUs, but in the 2000s these cities also began to follow consistent patterns of the connection between the spatial position of the ATU and the dynamics of its population.

Table 3  
*Share of cities with an increase in population, by size and distance from regional centre, Russia, 1989–2010, in %, from total number of cities in the given group*

Population at beginning of year (thousand)	Distance from regional centre (km)		
	Up to 50	50–100	100 and more
	1989–2002		
Less than 50	49.5	36.4	26.7
From 50 to 100	33.3	26.9	37.1
More than 100	52.6	15.8	43.1
	2003–2010		
Less than 50	36.8	23.3	13.2
From 50 to 100	52.9	24.1	21.1
More than 100	47.8	15.8	26.9

The population decline of cities far from regional centres (e.g. more than 100 kilometres) amplified in the 2000s in comparison with the 1990s. For example, in 1989–2002, the positive population dynamics could be seen in a quarter of the small towns, in a third of middle-sized cities and in 43 per cent of the large ones. In 2003–2010, the share of such cities with positive dynamics in each group almost halved. Nevertheless, the larger the city, the more possibilities it had of retaining or even increasing its population in a situation of regional depopulation, independent of its location in the region. In 1989–2002, the population dynamics of the administrative centres of ATUs depended on their distance from regional centres (Figure III). However, in the Volga and Southern Federal Districts the situation was different. For example, in the Volga Federal District population growth was only seen in the administrative centres of the ATUs and it was not related to distance from the regional centre. In the Southern Federal District visible population growth was observed in all types of settlements. Growth of these administrative centres, as well as the peripheral cities

in the Volga Federal District, appears to be related to the quite favourable demographic situation seen in ‘ethnic Republics’ (Tatarstan, Bashkortostan and the Chuvash Republic<sup>14</sup>), and to opportunities for rural–urban migration from their rural areas directed not only towards regional centres but also towards other cities. This tendency was noted in a study on the Volga Federal District some years ago (Artobolevsky et al. 2004).

On the contrary, the rural population of ATUs, except for settlements adjacent to the regional centre decreased everywhere (Table 4). In order to avoid possible distortions caused by widely differing sizes of rural ATUs and the share of the population that is located in these distant peripheries<sup>15</sup>, the dynamics of rural populations were analysed depending on the distance from centres of the regions, defined not in kilometres but in the ranges (belts) of the neighbours. Results show similarities with those obtained using calculations on the distance in kilometres. Sharp differences in the dynamics of rural populations are visible in the 1<sup>st</sup> range from the regional centre (the 1<sup>st</sup> range); decline in population for neighbours of the 2<sup>nd</sup> range is more visible. In more distant regions (3<sup>rd</sup> and higher ranges) population losses practically stop. It seems that at such distance the distinction in the distance from the regional centre is not as influential.

Despite the fact that the total rural population of Russia<sup>16</sup> fell by 5.8 per cent from 1989–2002, and by 7.6 per cent from 2003–2010, rural populations nearest to regional centres increased. According to our calculations<sup>17</sup>, rural populations up to 50 kilometres from regional centres increased during both decades (by 0.8 per cent from 1989–2002, and by one per cent from 2003–2010). The rural population of the local administrative divisions adjacent to the regional centres also grew by 2.7 and 4.5 per cent respectively.

<sup>14</sup> This happened because local ethnic groups were still undergoing demographic transition and therefore had a younger population, higher demographic indices (Karachurina 2006) and developed agriculture (see Nefedova 2003).

<sup>15</sup> For example, in the Central Federal District the share of the rural population living more than 300 kilometres from the regional centre in 1989 was less than three per cent, while in Siberia it was 33 per cent.

<sup>16</sup> Excluding Chechnya, Ingushetia, Dagestan and Kabardino-Balkaria.

<sup>17</sup> With administrative–territorial unit changes.

Table 4  
*Change in rural population in Federal Districts, by distance  
 from regional centre, gain/decrease in %*

Federal districts	Centre	1st range	2nd range	3rd range	4th range	5 <sup>th</sup> + range
2002 in % to 1989						
Central	-3.7	-7.3	-10.8	-13.1	-13.2	-9.8
North-western	-2.3	-9.0	-13.1	-14.8	-15.0	-15.4
South	14.2	8.2	7.4	10.1	7.3	-1.9
Volga	0.4	-3.8	-6.9	-6.0	-5.1	-5.4
Ural	1.7	-2.0	-8.1	-13.0	-13.6	-6.7
Siberian	8.5	-6.3	-8.8	-11.6	-10.1	-8.0
Far Eastern	-2.9	-23.7	-23.7	-25.9	-24.2	-30.1
Total average	2.7	-4.9	-7.3	-7.4	-7.2	-7.4
2010 in % to 2002						
Central,	0.9	-5.2	-9.0	-12.0	-12.6	-13.1
North-western	4.4	-11.7	-18.6	-19.3	-20.1	-23.9
South	6.4	-2.3	-2.1	-0.4	-4.6	-7.3
Volga	5.8	-7.7	-8.9	-11.7	-10.8	-11.7
Ural	0.7	-6.9	-12.4	-14.4	-17.2	-12.1
Siberian	13.2	-7.0	-12.1	-14.5	-12.5	-14.5
Far Eastern	-0.7	-8.1	-13.6	-13.7	-14.4	-13.8
Total average	4.5	-6.4	-9.2	-10.4	-11.1	-12.3

According to these data, 4.7 million rural inhabitants moved to regional centres in 2010. Proximity to the regional city prevented migration and even attracted people. This closeness allowed people to benefit from a mixed rural–urban lifestyle (e.g. working in the regional city yet cultivating household plots in the suburbs). Such a lifestyle, specific to Russian people formed during the systemic economic crisis of the 1990s. It has been described by Nefedova (2003) and her collaborators (Treivish and Nefedova 2002). At the same time, losses of rural populations in distant peripheries exceeded ten per cent in 2000–2010 almost everywhere else.

#### *Internal Migration as a Factor Defining the Population Dynamics of Local ATUs*

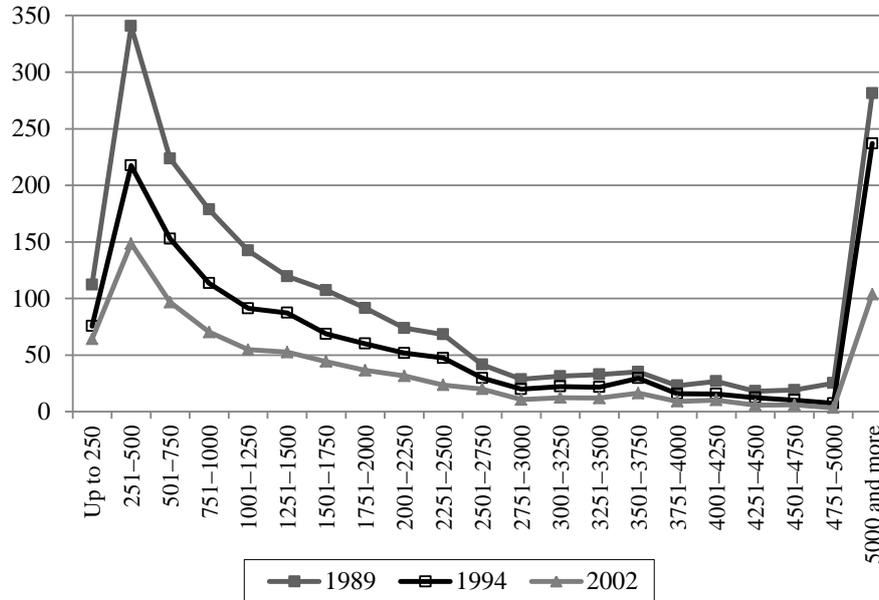
The factors that change the population dynamics of ATUs are mainly social and economic in character. Migration is a process that is sensitive to changes taking place in the economy and society. Thus, migration is the mechanism determining whether population is lost in one ATU or gained in another.

In general, the volume of internal permanent relocations in Russia in the 1990–2000s decreased significantly (from 4.3 million in 1990 to 1.8 million in 2010). Although it has decreased in volume, migration continues to play a role in determining the population size of local ATUs. The migration component in population dynamics increased in the 1990s, as many regions and local ATUs started to experience balanced (zero) or negative population growth. Internal short-distance migration had an impact mainly on cities and administrative subdivisions, and not the regions. Their impact cannot often be seen in statistical data, but their results are revealed in this study.

Over 100 years ago, Ravenstein (1885, 1889) discovered consistency in the short distances moved by most migrants. In a country like Russia with a large territory it is idiosyncratic: many internal migrants are forced to move long distances and participate in the western drift (Mkrtchyan 2005). By this, we mean the flow moving from the Far Eastern and Siberian regions towards the western and south-western parts of the country.

The studies we conducted in the mid-2000s, which analysed migratory distances in inter-regional relocations, showed that the overall internal migration volume decreased in Russia while long-distance migrations actually increased (Figure IV).

It may seem that the above-mentioned research does not relate to the subject of our study, the interaction between regional centres and the periphery. However, when a person living in the Eastern part of Russia decides to migrate he or she faces a dilemma: whether to relocate to the regional centre or to the West of the country; in fact, many decide to go to the European parts of Russia. According to our estimates, in 1990 24 per cent of all migrants from Siberian and Far Eastern Federal Districts moved to the Federal Districts located in the European part of Russia and in 2010 it stood at 21 per cent. The peripheral population in these Federal Districts was declining faster because it was affected by western drift and people were leaving to regional centres and the West of the country. Regional centres could not compete with the West and received a smaller inflow of migrants. As a result, even big cities in the eastern regions often lacked strong migration inflows from their peripheries. Only the most successful of them, like Novosibirsk, Krasnoyarsk and Irkutsk, attracted migrants.



Source: Mkrtchyan and Karachurina 2004.

Figure IV

*Distribution of immigrants by zones of distance, hundreds of thousands of people, all of Russia, 1989, 1994 and 2002*

At the other extreme, both centres and peripheries of the Western part of Russia received additional ‘feeding’ by migrants from the East of the country. This process contributed to muting all sharp centre–periphery contrasts. This was particularly relevant in the 1990s, when western drift was stronger and the migrants from the East of Russia were settling down extensively in the periphery, since big cities lacked jobs and the cost of housing was high.

## CONCLUSIONS

Differences in the development of the centres and peripheries in Russia today manifest in many ways, including the dynamics of the population, population age structure, fertility and characteristics of mortality. In a situation where one sees general depopulation as the defining characteristic, opportunities for growth only exist in certain areas – often regional centres – as these are increasingly the most dynamic and therefore the most attractive cities. A key factor in the replenishment of their populations is migration from the periphery.

Specifically, we can conclude that:

1. The assumption that decline in population increases with increased distance from the centre is confirmed. At the same time the most significant gradient is observed from the centre to the administrative units of the 1st and 2nd range of distance. The fall in population between the 2nd and up to the 5th range of distance is insignificant. That means that the population dynamics of the 2nd to 5th ranges is negative and almost identical.

2. The hypothesis that the territories located close to the regional centres (30–50 kilometres) are not subject to population outflow is partially proved. Our calculations show that the most dramatic decline in the population occurs at very near distance (up to 30–50 kilometres) from the regional centre and at the greatest distance from the regional centres (over 500 kilometres). The periphery located between 200 and 500 kilometres from the centre is characterised by attraction of its own population to their respective centres. In the most distant areas, which exist only in the large regions of Siberia and the Far East, negative dynamics are associated with migration from the periphery in the direction of ‘their’ regional centre, and to an even greater extent to other western regions of Russia. Here, the influence of the western drift may be observed, rather than outflow of population from periphery to centre.

3. The attractiveness of the largest centres (with more than 100,000 inhabitants) increased in the 2000s in comparison with the 1990s. Despite a tendency towards natural demographic decline, these centres have shown stable growth in the last decade.

4. In some Federal Districts, such as Volga and Southern, the centres of ATUs are characterised by stable population growth, and this tendency is not related to their distance from the regional centre.

5. The tested core–periphery model is more pronounced in the period 2003–2010. In the 2000s the dynamics of regional centres became more positive than in the 1990s. This means that in the second period, under conditions of depopulation, the centres became stronger due to migration from the periphery and external migration.

6. The factors affecting centre–periphery relations in different regions depend on the arrangement of population settlements, the stage of demographic transition of the local population, the development of social infrastructure, connections between territories (for example whether a developed transport system exists) and economic factors (such as the industrial sector or investment climate). Core–periphery tendencies sometimes do not work as expected at a distance of 150–200 km. Specific reasons for this differ in each case, but ultimately relate to the centres of gravity of a second rank located at these distances.

7. In general, the larger the city the greater its capacity under conditions of depopulation to maintain or increase its population, regardless of the position of the centre or the periphery of that region. During the period under review, rural

areas showed a constant trend: villages closest to the centres experienced an increase, and in villages more than 300 kilometres from the centre the population declined by an average of 12–13 per cent for each inter-census period.

As mentioned above, there is inter-dependence between the population dynamics of the local ATUs and their distance from regional capitals in most but not all cases. In 1989–2002 the strongest contrasts between core and periphery were visible in the Central, North-western and Siberian Federal Districts. Their regional peripheries were most strongly subject to depopulation, the consequences of which were not mitigated even by the inflow of population from CIS countries.

Regional centres are therefore so strong that they spread their influence of attraction over a considerable distance; this also applies to the federal cities of Moscow and St. Petersburg, which are not included in this study. In addition, in the Central Federal District there are few poles of attraction of the second order (cities with a population more than 100,000). In other words, in the intraregional semi-periphery, back-up centres of gravity are weak or absent. In the next inter-census period (2003–2010) the core–periphery gradient amplified and spread to practically all territories of the country, and inter-regional contrasts became even less apparent than intraregional ones.

In 1989–2002 in Siberia (especially in the Far Eastern Federal District) and the Nordic part of the North-western Federal District, the all-country migratory trend of western drift prevailed, as well as a migratory outflow from these regions. Intra-country migration, rather than natural decline of the population, served as the principal component of negative dynamics of the population for all types of ATUs. In the following inter-census period, migratory outflow from these regions reduced, but negative demographic tendencies amplified.

The periphery only appeared viable in the Southern and Volga Federal Districts. In the 1990s, stabilisation and even a small growth in the population was apparent, with a better demographic structure of the agricultural population and positive indices of natural population movement. The inflow of migrants from other post-Soviet countries in the 1990s influenced population dynamics considerably. In the 2000s, the population of the peripheral ATUs began to decline. In the remaining regions, the population of peripheral regions for the whole period under consideration fell faster than the central regions, which led to the internal regional polarisation of population and the activation of centripetal tendencies. In spite of this the basic tested hypothesis, that depopulation increases with increased distance from regional centres, appears only partially valid. There are several other factors which contribute to infringement of the core–periphery model. In particular, exchange with CIS countries, especially during the inter-census period 1989–2002 was considerable and spread differentially across Russia. A considerable part of this migration inflow occurred in

the countryside (which during these years had 37 per cent net migration). This is a result of improved possibilities for returning Russian migrants to purchase affordable housing. In addition, government policy at the time encouraged return migration to rural areas. In the latest inter-census period (2003–2010), the official migratory increase was lower than in the 1990s, and also more city-oriented.

The contrast in population dynamics between the centre and the periphery increased during the period under consideration. The migratory attractiveness of regional centres contributed to population decline of the regional periphery.

- The huge distances and the sparse settlement structure, referred to in many papers analysing social and economic dynamics (Grizaj et al. 1991; Zubarevich 2003; Rodoman 2002) make it impossible to develop “ideal” core–peripheral gradients. The horizontal coherence of territory in Russia is low. The periphery of one region interacts extremely weakly with the periphery of another, and the force of their coherence actually declined during the transition period.
- The qualitative characteristics of the population in the periphery are distinctive, for example consisting of older and less educated people who accept the way of life of the distant provinces. Their lifestyle depends on the potato crop or having a farmstead of their own, and this to some extent determines their low migratory mobility.

In the years under study, the social and economic situation in the vast majority of cases was negative (Zubarevich 2003), opportunities in the labour market were limited, and production efficiency poor.<sup>18</sup> Stagnation has been encouraged through the poor development of regional infrastructure. The migration of youth (aged 17–25) is extremely limited, because their number is very low. This has restricted the chances of internal migration influencing changes in population in the peripheral regions.

Finally, it is worth mentioning that the impact of internal regional differences on population dynamics (and its components) in some ATUs is not weaker than between regions. Heightened core–periphery differences in the 2000s, compared to the 1990s, led to an increase in the concentration of population in some centres and regions. As a result, the inhabited populated space is shrinking.

<sup>18</sup> Gonchar (2010) suggests that in Russia average productivity per employed person decreases as the settlement size decreases. However, this effect is not so bad as to stimulate the mass migration of a population whose mentality is half rural and half urban.

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