ANALYSIS OF POPULATION CONCENTRATION AND ECONOMIC ACTIVITY IN THE LARGEST REGIONAL CAPITALS OF RUSSIA

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Abstract: This article investigates the changing concentrations of population and economic activity in the largest regional capitals during the socio-economic transformations at the turn of the millennium. The study focuses on million-plus administrative centers of Russian regions (federal subjects). In post-socialist and developing countries, population and economic activities tend to be increasingly concentrated in the regional capitals, which now occupy the leading positions among other second-tier cities in the national settlement system. The authors explore the reasons behind this trend and propose a methodological approach to assess the population concentration and economic activity in the largest regional capitals and compare these figures with those of the national capitals. In the empirical part of the study, the cities' performance is assessed by applying a set of indicators, such as population size, production output, retail turnover, investment, and construction output, and compared with corresponding figures from Moscow and St. Petersburg. As a result, large regional capitals are classified according to their role in the country's socio-economic performance and according to the disparities between these cities and Moscow and St. Petersburg. It was found that none of the largest regional capitals are able to compete with the country's current and former capitals. Moreover, this gap has been widening over the last decade as the role of regional capitals in national economic development has been steadily declining. However, there are some positive dynamics, as some regional capitals have been outperforming the national average in certain spheres of socio-economic development.

Keywords: regional geography; Russia's largest regional capitals; second-tier cities; primary cities; spatial disparities

Introduction

Modern trends in the development of settlement systems are, to some extent, related to the changing roles of large cities in the concentration of population, financial and economic assets, and power. In Russia, the concentration of population and economic activity in second-tier (or secondary) cities is higher than in other countries due to the vast size of the territory, the remoteness of many regions from the national capital, and considerable regional imbalance (Golubchikov & Badyina, 2016; Turgel & Vlasova, 2016; World Bank, 2018). This phenomenon has attracted much scholarly attention, although the approaches applied by such studies are often excessively oversimplified. The assessment of the cities' performance is reduced to estimating their

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share of the national economy (Antonov, 2018; Lyubovny, 2013; Roberts & Hohmann, 2014). This consideration determined the aim of this study: to propose a more comprehensive approach to assessing the concentration of economic activity and population in Russia's largest regional capitals.

Our study focuses on the largest Russian cities, the capitals of the federal subjects of Russia. Russia is a federal state comprising 85 federal subjects with equal rights—republics, regions, krais, cities of federal significance, one autonomous region, and autonomous districts. In 2018, these included 13 cities with over one million inhabitants (with the exception of Moscow and St. Petersburg), or 15.2% of the country's total population (Federal State Statistics Service, 2018a). The highest concentration of regional capitals is found in the Urals and the Volga region (four cities each) and in Siberia (three cities). All the cities in our sample have accumulated considerable experience as administrative centers. In the pre-Soviet era, the majority of the cities under consideration (Voronezh, Perm, Krasnoyarsk, Ufa, Nizhny Novgorod, Omsk, and Samara) were the centers of guberniyas at various points in time. A guberniya was a key administrative and territorial unit in pre-Soviet Russia (since 1708) and in the first years of the Soviet regime. In the modern administrative-territorial division of the country, the equivalent of the 'guberniya' is the 'federal subject'. In Soviet Russia, all the cities in our sample were granted the status of administrative regional centers or capitals of autonomous republics from 1920 to 1937.

Methodology

Our study of Russia's largest regional capitals required us to integrate two conceptual approaches. Firstly, it is necessary to analyze regional capitals as elements of the national settlement system in order to understand the role they play in modern Russia. The criteria for classifying regional capitals as second-tier cities, such as economic performance, population, and so on, are the subjects of active debate (Parkinson et al., 2012; Roberts, 2014). Acknowledging the significance of this discussion, it is worth pointing out that Russian regional capitals occupy the leading positions among the country's second-tier cities. Thus, the key question is whether the leading second-tier cities are able to compete with the current and former capitals of Russia.

Secondly, an adequate methodology is required to evaluate the concentration of economic activity and population in the largest regional capitals and to make a justified choice of threshold values in order to assess these cities' capacity to compete with the national capital. The most widespread approach is to compare quantitative indicators such as population size, population density, and urban area (United Nation, 2014; van der Merwe, 1992). UN-Habitat reviews use population numbers (United Nations Centre for Urban Settlements, 2014). Studies of post-Soviet cities usually focus on these cities' contribution to the overall national and/or macro-regional performance (Karachurina & Mkrtchyan, 2015; Zubarevich, 2018). However, it should be noted that the leading positions regional capitals occupy within their respective territories make them to some extent comparable with the official capital (Hodos, 2011; Shagoyan, 2012; Turgel, Bozhko, & Xu, 2016). In absolute terms, the figures characterizing the economic performance of second-tier cities are lower than those of the official capital (or the country's largest city). Nevertheless, some relative 'threshold values' and certain qualitative characteristics might provide evidence for describing the largest regional capitals as leaders on a national scale.

There is a widely accepted view that the population of primary cities is at least twice as large as that of secondary cities (Goodall, 1987; Jefferson, 1939; Zipf, 1949). Roberts and Hohmann (2014) have pointed out that the contemporary situation, where a secondary city may have a population or

economy ranging in size between 10% and 65% of the nation's largest city or capital, makes such comparisons legitimate. Treyvish (2009) maintains that secondary cities are able to compete with primary cities if their socio-economic indicators are at least 50% of those of the national capital. Taking into consideration all of the above, it can be stated that secondary cities become 'visible' in the national space if their indicators are at least 10% of those of the nation's largest city. However, it can be spoken of real competition between a second-tier city and the capital when the indicators of the former are no less than 50% of the latter. Taking into consideration the significant resource and population disparities between Russian regions, it seems reasonable to compare economic indicators normalized in such a way as to take into account population numbers. To calculate the indicators, the following notation will be used:

- i—the indicator of a city's socio-economic performance. In our case, such indicators will include: q—the volume of products shipped (production output); r—retail turnover; f—investment; h—population; and b—construction output;
- V_i— the value of the i-th socio-economic indicator;
- j—the type of a territorial taxon in the settlement system, more specifically, p—a large regional capital, c—national capital, and s—the country in general;
- M_{ij}—the share of the value of a regional capital's performance indicator to the corresponding value of the national capital;
- N_{ij}—the share of the city (regional or national capital) in the corresponding national socio-economic indicator;
- L_{ij}—the share of the per capita value of a regional capital's performance indicator to the corresponding per capita value of the national capital;
- P_{ij}—the regional capital's presence index (the ratio of the city's share in the country's indicator values to its share in the total population of Russia).

The following formulae will be applied to calculate the indicators and assess concentrations of economic activity and population in regional capitals:

- To compare large second-tier cities' socio-economic indicators with those of the national capital, the following formula is used:

$$M_{ij} = V_{ip} / V_{ic} \cdot 100\% \tag{1}$$

- To estimate the contribution of large regional capitals to the country's overall socio-economic performance, the following formula is used:

$$N_{ij} = V_{ip(c)} / V_{is} \cdot 100\% \tag{2}$$

- To compare regional capitals' per capita values of socio-economic indicators with those of the national capital, the following formula was applied:

$$L_{ij} = (V_{ip} / V_{hp})/(V_{ic} / V_{hc}) \cdot 100\% \tag{3}$$

- The index of the city's presence in the country's socio-economic performance was calculated by applying the following formula:

$$P_{ij} = (V_{ip(c)} / V_{is})/(V_{hp(c)} / V_{hs}) \qquad (4)$$

- In order to understand whether the general trends underlying the concentration processes are upward or downward, growth rates were calculated for the corresponding indicators.

Our study relies on the data published by the Federal State Statistics Service in the statistical books 'Russian Regions. The Key Socio-Economic Indicators of Cities' and 'Russian Regions. The Key Socio-Economic Indicators' (Federal State Statistics Service, 2018a, 2018b). These data characterize the role that large regional capitals play in the national economy and cover the period from 2005 to 2015. This period was chosen due to the frequency with which statistical data were published (once in two years).

Results and discussion

The data for comparing the socio-economic performance of Russian regional capitals with that of Moscow are shown in Table 1. In the last decade, regional capitals have lost much of their attraction as places to study and work: for example, the ratio of regional capitals' population size to Moscow's population in 2015 was lower than in 2005 (except for Voronezh, whose ratio grew from 8.1% to 8.4%). As for the output of products and services in regional and national capitals, in 2015, only two cities, Omsk and Ufa, managed to get beyond the threshold value of 10%, which can be regarded as a sign of these cities' potential in this sphere. In contrast, there were seven such cities in 2005, as well as St. Petersburg.

Table 1
Largest regional capitals: share of the cities' indicator values to those of the capital city (%) in 2015 (2005)

City	Population	Output of products and services	Retail turnover	Investment	Construction output
Moscow	—	—	—	—	—
St. Petersburg	42.4 (43.9)	34.5 (37.2)	26.6 (17.9)	32.3 (35.6)	48.3 (37.0)
Novosibirsk	12.8 (13.5)	3.5 (8.1)	3.8 (2.0)	5.6 (5.0)	2.3 (2.0)
Ekaterinburg	11.7 (12.5)	6.3 (8.7)	4.9 (9.8)	6.6 (5.5)	3.4 (4.8)
Nizhny Novgorod	10.3 (12.4)	5.6 (11.1)	3.3 (6.1)	5.9 (3.9)	2.0 (3.3)
Kazan	9.9 (10.6)	4.6 (5.4)	3.6 (5.9)	6.7 (14.4)	3.5 (11.6)
Chelyabinsk	9.7 (10.5)	7.4 (11.6)	2.7 (5.1)	5.1 (4.7)	1.5 (3.8)
Omsk	9.6 (11.0)	10.7 (19.3)	2.5 (4.7)	3.6 (6.1)	2.2 (6.7)
Samara	9.5 (10.9)	4.2 (15.6)	3.3 (6.1)	5.4 (4.8)	2.5 (2.4)
Rostov-on-Don	9.1 (10.1)	4.2 (7.2)	2.6 (6.3)	6.6 (5.7)	7.7 (5.7)
Ufa	9.0 (9.9)	10.5 (23.0)	2.9 (6.0)	6.0 (6.1)	2.7 (9.1)
Krasnoyarsk	8.7 (8.8)	5.5 (8.6)	2.2 (4.4)	4.1 (4.5)	3.7 (2.8)
Perm	8.5 (9.5)	8.5 (21.7)	2.2 (6.0)	7.3 (5.8)	3.2 (4.0)
Voronezh	8.4 (8.1)	2.8 (4.9)	2.4 (3.3)	3.9 (3.7)	1.9 (1.6)
Volgograd	8.2 (9.6)	7.2 (13.0)	2.3 (4.4)	6.3 (2.8)	3.0 (5.1)

Note. Adapted from "Regiony Rossii. Osnovnye social'no-ekonomicheskie pokazateli gorodov" [Russian Regions. The Key Socio-Economic Indicators of Cities] by Federal State Statistics Service, 2018b, Retrieved from https://www.gks.ru/ folder/210/document/13206.

In 2015, the ratio of the retail turnover of all Russian regional capitals compared to that of the primary city, Moscow, was below 10%. In 2005, only Ekaterinburg with its ratio of 9.8% approached the threshold value. The situation in the sphere of investment looks brighter for the regional capitals, although in recent years none of them have managed to overcome the competitiveness threshold. In 2005, only Kazan with its 14% in investment volume and 11.6% in construction output demonstrated sufficient capacity to compete with the capital city. For other large cities, in 2015, the gaping disparity with the capital in terms of construction output was insurmountable: none of them went beyond the 10% threshold.

Table 2

Largest regional capitals: share of the cities in the value of the corresponding national indicator (%) in 2015 (2005)

City	Population	Output of products and services	Retail turnover	Investment	Construction output
Moscow	8.40 (7.30)	12.79 (8.55)	15.65 (22.54)	11.07 (12.24)	13.36 (16.38)
St. Petersburg	3.56 (3.21)	4.41 (3.18)	4.16 (4.03)	3.58 (4.36)	6.46 (6.06)
Novosibirsk	1.08 (0.98)	0.44 (0.69)	0.59 (0.46)	0.62 (0.61)	0.31 (0.33)
Ekaterinburg	0.98 (0.91)	0.81 (0.74)	0.77 (2.20)	0.73 (0.67)	0.46 (0.78)
Nizhny Novgorod	0.86 (0.90)	0.72 (0.95)	0.51 (1.37)	0.66 (0.48)	0.27 (0.55)
Kazan	0.83 (0.78)	0.59 (0.46)	0.57 (1.32)	0.75 (1.76)	0.47 (1.90)
Chelyabinsk	0.81 (0.77)	0.94 (0.99)	0.42 (1.16)	0.56 (0.57)	0.20 (0.62)
Omsk	0.80 (0.80)	1.37 (1.65)	0.39 (1.07)	0.40 (0.74)	0.29 (1.09)
Samara	0.80 (0.79)	0.54 (1.33)	0.52 (1.36)	0.60 (0.58)	0.33 (0.39)
Rostov-on-Don	0.76 (0.74)	0.54 (0.61)	0.41 (1.42)	0.73 (0.69)	1.03 (0.93)
Ufa	0.76 (0.73)	1.34 (1.97)	0.45 (1.35)	0.67 (0.75)	0.37 (1.49)
Krasnoyarsk	0.73 (0.64)	0.71 (0.74)	0.34 (0.99)	0.46 (0.55)	0.49 (0.46)
Perm	0.71 (0.69)	1.08 (1.86)	0.35 (1.36)	0.80 (0.71)	0.43 (0.65)
Voronezh	0.70 (0.59)	0.36 (0.42)	0.38 (0.74)	0.43 (0.45)	0.26 (0.26)
Volgograd	0.69 (0.70)	0.92 (1.11)	0.36 (1.00)	0.69 (0.34)	0.40 (0.83)

Note. Adapted from "Regiony Rossii. Osnovnye social'no-ekonomicheskie pokazateli gorodov" [Russian Regions. The Key Socio-Economic Indicators of Cities] by Federal State Statistics Service, 2018b, Retrieved from https://www.gks.ru/folder/210/document/13206; "Regiony Rossii. Osnovnye social'no-ekonomicheskie pokazateli" [Russian Regions. The Key Socio-Economic Indicators] by Federal State Statistics Service, 2018a, Retrieved from https://www.gks.ru/folder/210/document/13204.

Table 2 shows the contribution of large regional capitals to the country's performance. Our analysis demonstrates that the role of large Russian cities in national socio-economic development is considerably less significant than the role of Moscow and St. Petersburg. In terms of production output, retail turnover, investment, and construction output, there has been a decrease in regional capitals' contribution to the national economic performance in comparison with 2005. This process is accompanied by growing economic disparity between these cities and Moscow and St. Petersburg.

Table 3

Largest regional capitals: share of the cities' per capita indicator values to the per capita indicator values of the Russian capital (%) in 2015 (2005)

City	Output of products and services	Retail turnover	Investment	Construction output
Moscow	—	—	—	—
St. Petersburg	81.4 (84.6)	62.7 (40.7)	76.3 (81.1)	114.1 (84.2)
Novosibirsk	27.0 (59.7)	29.3 (15.1)	43.7 (37.2)	18.1 (14.8)
Ekaterinburg	53.8 (69.2)	41.9 (78.0)	56.0 (44.0)	29.3 (38.0)
Nizhny Novgorod	54.8 (89.6)	31.9 (49.3)	57.8 (31.9)	20.0 (27.0)
Kazan	46.5 (50.9)	36.6 (55.2)	68.4 (135.2)	35.5 (108.9)
Chelyabinsk	76.1 (110.2)	27.8 (48.8)	52.5 (44.6)	15.6 (36.2)
Omsk	112.7 (176.1)	26.0 (43.2)	37.5 (55.9)	22.8 (60.8)
Samara	44.2 (143.5)	34.9 (55.7)	56.9 (43.9)	25.9 (22.1)
Rostov-on-Don	46.1 (70.6)	29.1 (62.1)	72.7 (55.8)	85.2 (56.2)
Ufa	116.0 (231.3)	31.6 (60.5)	67.0 (61.3)	30.5 (91.8)
Krasnoyarsk	63.7 (98.3)	25.1 (49.7)	47.7 (50.7)	42.3 (31.6)
Perm	100.2 (228.9)	26.1 (63.5)	86.0 (60.8)	38.0 (41.9)
Voronezh	34.0 (60.0)	29.0 (40.4)	46.9 (45.5)	23.1 (19.3)
Volgograd	87.1 (135.3)	27.8 (46.4)	76.1 (29.3)	36.1 (52.9)

Note. Adapted from "Regiony Rossii. Osnovnye social'no-ekonomicheskie pokazateli gorodov" [Russian Regions. The Key Socio-Economic Indicators of Cities] by Federal State Statistics Service, 2018b, Retrieved from https://www.gks.ru/folder/210/document/13206.

Comparison of the regional capitals' population dynamics in the given decade (2005-2015) shows that there has been a growth in the population concentrations in all large cities except for Nizhny Novgorod, whose share has shrunk. In Volgograd, Samara, and Omsk, the population concentrations are almost unchanged. The broad range of per capita values can be explained by the differences in the development models followed by the regional capitals. In Table 3 there are comparisons of the per capita values of these cities' socio-economic indicators in 2015 with those of Moscow brings us to the following conclusions:

- In three regional capitals, Omsk, Ufa, and Perm, the per capita values of production output in 2015 exceeded those of Moscow by 12.4%, 16.0%, respectively, and 0.2%, while in 2005 there were six such cities (plus Samara, Volgograd and Chelyabinsk). It can be concluded that these cities' economies are still predominantly industry-based.
- Cities such as Kazan, Rostov-on-Don, Ufa, Perm, and Volgograd had the per capita investment volume higher than the average. As for the other indicators, if the city's values exceeded the national average, this could be interpreted as a sign of a certain functional specialization in this city's economy: for instance, in Kazan, the retail turnover reveals the city's orientation towards the service economy; in Rostov-on-Don, the construction output reveals it is more orientated toward industrial development, as do the production outputs of Perm, Ufa, and Volgograd.
- In Novosibirsk, Voronezh, and Nizhny Novgorod, the per capita figures did not exceed the average values, which can signify that at the current stage these cities are lacking any definite functional specialization.

Table 4

Largest regional capitals: index of the cities' presence in the overall national performance in 2015 (2005)

City	Output of products and services	Retail turnover	Investment	Construction output
Moscow	1.52 (1.17)	1.86 (0.32)	1.32 (1.68)	1.59(2.24)
St. Petersburg	1.24 (0.99)	1.17 (0.80)	1.01 (1.36)	1.81 (1.89)
Novosibirsk	0.41 (0.70)	0.55 (2.14)	0.58 (0.62)	0.29 (0.33)
Ekaterinburg	0.82 (0.81)	0.78 (0.42)	0.74 (0.74)	0.47 (0.85)
Nizhny Novgorod	0.83 (1.05)	0.59 (0.66)	0.76 (0.53)	0.32 (0.60)
Kazan	0.71 (0.60)	0.68 (0.59)	0.90 (2.27)	0.56 (2.44)
Chelyabinsk	1.16 (1.29)	0.52 (0.66)	0.69 (0.75)	0.25 (0.81)
Omsk	1.71 (2.06)	0.48 (0.75)	0.49 (0.94)	0.36 (1.36)
Samara	0.67 (1.68)	0.65 (0.58)	0.75 (0.74)	0.41 (0.50)
Rostov-on-Don	0.70 (0.83)	0.54 (0.52)	0.96 (0.93)	1.36 (1.26)
Ufa	1.77 (2.71)	0.59 (0.54)	0.88 (1.03)	0.48 (2.06)
Krasnoyarsk	0.97 (1.15)	0.47 (0.65)	0.63 (0.85)	0.67 (0.71)
Perm	1.53 (2.68)	0.49 (0.51)	1.13 (1.02)	0.60 (0.94)
Voronezh	0.52 (0.70)	0.54 (0.80)	0.62 (0.76)	0.37 (0.43)
Volgograd	1.33 (1.58)	0.52 (0.70)	1.00 (0.49)	0.58 (1.19)

Note. Adapted from "Regiony Rossii. Osnovnye social'no-ekonomicheskie pokazateli gorodov" [Russian Regions. The Key Socio-Economic Indicators of Cities] by Federal State Statistics Service, 2018b, Retrieved from https://www.gks.ru/folder/210/document/13206; "Regiony Rossii. Osnovnye social'no-ekonomicheskie pokazateli" [Russian Regions. The Key Socio-Economic Indicators] by Federal State Statistics Service, 2018a, Retrieved from https://www.gks.ru/folder/210/document/13204.

As for the cities' output of products and services (Table 4), they can be divided into two distinct groups. The first group comprises cities that lost their industrial specialization in the post-Soviet period and are now actively developing their post-industrial service sectors. However, the presence indices of Chelyabinsk, Omsk, Ufa, Volgograd, and Perm exceed 1, which means that they have kept their industrial specialization. Ekaterinburg demonstrates the maximum value of the presence index in terms of retail turnover, which is far ahead of other regional capitals in this sphere. Nevertheless, even for Ekaterinburg the index is only 0.78. In terms of investment, five cities have a presence index exceeding or equal to 1. The median share of a regional capital in Moscow's per capita investment volume is slightly higher than for the per capita indicator of retail turnover.

As for construction output, only Rostov-on-Don has a presence index exceeding 1. This disparity between large regional cities and Moscow can be explained by the extremely high construction rates in the capital: in Moscow, construction rates are now on the rise due to the increased demand for housing, which has been stimulated by favorable price conditions. Another factor that determines this trend is the privileged treatment the capital receives from the federal government and the close connection between government officials and top executives of construction and development companies. The federal government decided to expand Moscow's territory 2.4 times. Moscow thus absorbed the surrounding municipalities with low population densities. Moscow is a city of federal significance, which means that its construction programs are partially funded from the federal budget: this is distinct from the programs of the regional capitals, which have the status of municipalities.

Table 5

National growth rates, growth rates of federal cities and large regional capitals (%) between 2005 and 2015

City	Population	Production output	Investment	Construction output	Retail turnover
Russia	2.8	260.3	311.9	259.2	291.3
Moscow	18.3	438.9	272.7	193.0	171.7
St. Petersburg	14.1	400.2	238.2	283.1	303.6
Novosibirsk	12.7[b]	132.1	317.4[b]	242.7	401.3[b]
Ekaterinburg	10.7[b]	292.1[b]	343.7[b]	111.1	36.8
Nizhny Novgorod	-1.8[a]	173.7	461.1[b]	80.2	46.0
Kazan	9.6[b]	356.2[b]	74.6[a]	-11.6	67.1
Chelyabinsk	8.8[b]	242.4	303.6	16.3	42.6
Omsk	3.1[b]	199.6	117.7	-4.3	42.5
Samara	3.3[b]	44.9[a]	321.1[b]	199.6	48.8
Rostov-on-Don	5.9[b]	215.1	334.9[b]	297.6[b]	14.0
Ufa	7.2[b]	145.1	269.4	-11.7[a]	29.0
Krasnoyarsk	16.3[b]	243.6	244.7	285.4[b]	35.1
Perm	5.3[b]	109.9	369.5[b]	136.5	-0.4[a]
Voronezh	21.6[b]	213.7	295.2	261.3[b]	101.2
Volgograd	1.7	198.3	733.2[b]	71.9	40.0

Note. [a] minimal values; [b] values of regional capitals that exceed national level; Adapted from "Regiony Rossii. Osnovnye social'no-ekonomicheskie pokazateli gorodov" [Russian Regions. The Key Socio-Economic Indicators of Cities] by Federal State Statistics Service, 2018b, Retrieved from https://www.gks.ru/folder/210/document/13206; "Regiony Rossii. Osnovnye social'no-ekonomicheskie pokazateli" [Russian Regions. The Key Socio-Economic Indicators] by Federal State Statistics Service, 2018a, Retrieved from https://www.gks.ru/folder/210/document/13204.

Our analysis of the absolute values of the key socio-economic indicators in the 10-year period (2005-2015) has brought to light the regional capitals' contribution to the national development and has enabled us to compare these values with those of the "federal" cities Moscow and St. Petersburg. Since 2005, the population growth rates have exceeded the national level for almost all the regional capitals (Table 5). Voronezh, at 21.6%, is the leader. The only city with negative dynamics is Nizhny Novgorod, which has a population outflow of 1.8%. As for production output, the highest growth rates, exceeding the national level, were demonstrated by Ekaterinburg and Kazan, both of which boast prominent manufacturing sectors. Samara had the lowest growth rate—about 45%.

In more than half of the regional capitals, the investment growth rate exceeded the national average. Volgograd was the top performer in this respect with 733%, which is probably due to the low base level. It is remarkable that the investment growth rates of Moscow and St. Petersburg have lagged behind the national average. In 2015, the top outperformers in terms of construction output were Rostov-on-Don, Krasnoyarsk, and Voronezh, while Ufa, Kazan, and Omsk went below the levels of 2005.

The leader in terms of retail turnover growth rates compared with the national average is Novosibirsk (401%), which is well ahead of other cities, including the cities of federal significance. Perm has the lowest retail growth rate. It should be noted that all large regional capitals except for Novosibirsk and Voronezh had an average growth rate of 40%, 7 times lower than the national level.

Figure 1 illustrates the growth rates in the key socio-economic indicators of regional capitals in comparison with national levels. The growth rates were calculated by taking the overall national growth rates as 100%. A dash-dotted line was used to show this 100%-level of national growth rates.
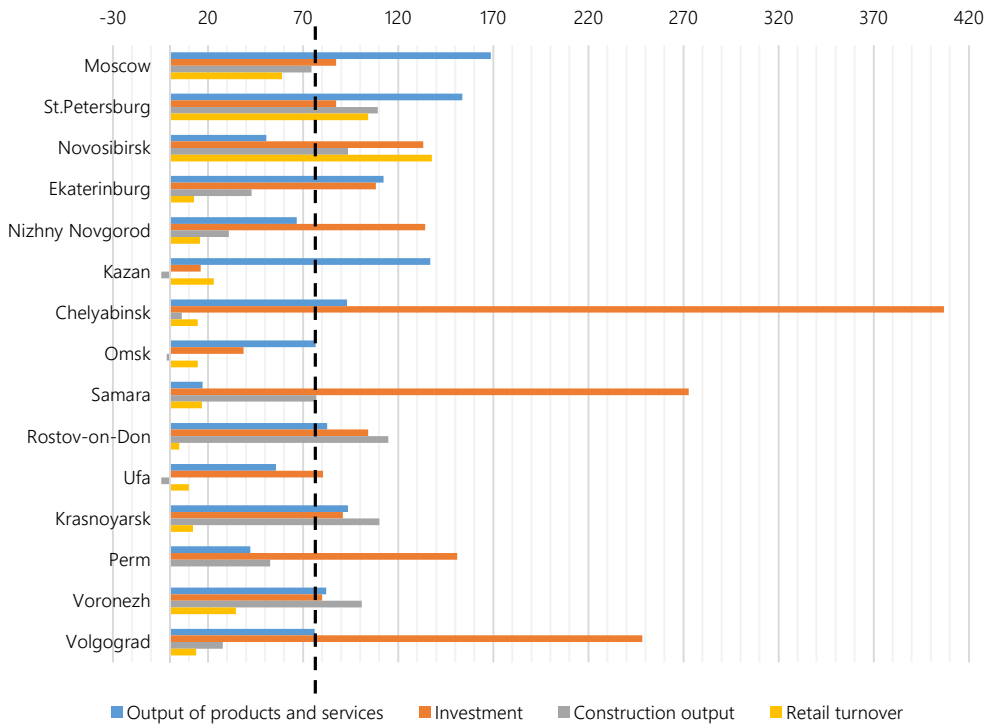

Figure 1. Regional capitals' growth rates in key socio-economic indicators between 2005 and 2015 (%) in relation to the national level (national growth rates are taken as 100%).

Conclusion

The increasingly centralized system of government and the changing configurations of relations between cities from different hierarchical levels of the urban settlement system enhance the role of large regional capitals. Their growing significance leads to a rise in the concentration of economic activity and population and in the increasing contribution these cities make to the country's overall performance. This process is accompanied by changes in the ratio of regional capitals' indicator values to those of the national capital.

In terms of population concentration, large regional capitals occupy the leading positions among other second-tier cities. The share of the population of regional capitals in the country's overall population is growing at a fast pace. In terms of population growth rates, this group of cities is only outperformed by cities of federal significance (Moscow and St. Petersburg). Interestingly enough, the share of other groups of cities (with populations from 10,000 to 1 million people) has been declining steadily throughout the entire post-Soviet period.

Our analysis of the concentration of economic activity and socio-economic dynamics of large regional capitals has brought to light some tendencies in the way these cities retain or abandon their former specializations. The resulting classification comprises four groups of cities: the first group comprises cities such as Ekaterinburg, Kazan, and Samara, former industrial centers which have now turned into actively developing "post-industrial" service centers; the second group includes Chelyabinsk, Omsk, Ufa, Perm, and Volgograd, which have retained their status as centers of production; the third group, Rostov-on-Don and Krasnoyarsk, are enjoying a construction boom; and, finally, the fourth group consists of Novosibirsk, Nizhny Novgorod, and Voronezh—the cities without any clearly defined functional specialization model.

None of the regional capitals have the capacity to compete with Moscow or St. Petersburg, since none of them have managed to get over the threshold value of 10% if the largest regional capital's economic indicators are compared with the corresponding indicators of Moscow. The only exceptions were Omsk and Ufa, which succeeded in overcoming the threshold value in one of the indicators—the output of products and services.

Our analysis of regional capitals' socio-economic performance in 2005–2015 has demonstrated an increase in population concentrations in all the cities except for Nizhny Novgorod and Volgograd. At the same time, it was found that the significance of all regional capitals is declining, which, consequently, widens the gap between these cities and Moscow and St. Petersburg. The regional capitals that outperform the national average include the following: in terms of investment, Ekaterinburg, Novosibirsk, Nizhny Novgorod, Chelyabinsk, Samara, Rostov-on-Don, Perm and Volgograd; production output—Ekaterinburg and Kazan; retail turnover—Novosibirsk; and construction output—Krasnoyarsk and Rostov-on-Don.

It should be also noted that the concentration effect is determined by a complex of institutional factors, such as the degree of independent decision-making, stable connections with the federal center, the location of the headquarters and top branches of major international financial, industrial, and trade organizations, and, finally, the city's ability to attract large corporate projects. The authors will explore the impact of these factors on the development of regional capitals in subsequent research.

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