

Russian-European Centre for Economic Policy

WORKING PAPER SERIES

**«REGIONAL CONVERGENCE IN RUSSIA?
OR WHEN ECONOMIC GEOGRAPHY CONFIRMS
MACROECONOMIC ANALYSIS»**

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Abstract. The aim of this article is to study, in an accurate way, the Russian regional incomes per capita and productivities during the last Eighties and the Nineties. Following Baumol or Barro and Sala-i-Martin works, this paper extends them first by pointing out the sources of growth stressed by the theories on growth (accumulation of physic capital, education effort, public expenditures), and secondly by the new economic geography underlying the impact of the distance to Moscow and the North-East diagonal on growth. This first application on Russian regional data leads to confirm the regional divergence, which results from the paradox of a beta-divergence (except for the gross regional product), sigma-divergence for 15 years and a feable conditional convergence in the last nineties for macroeconomic and geographic perspectives.

Classification JEL : L00, O41, R1

Introduction

The regional level constitutes an appropriate framework to study convergence, from both empirical and theoretical points of view. Empirically, the comparison of data, stemming from the same sources is easier than in the case of international studies. Theoretically, the assumptions such as the unicity of structures and infrastructures as well as the institutional frame, or of preferences or of available technologies are well built in the measure of the inexistence of impediments but natural to exchanges of goods.

This study of the convergence of the Russian regions is especially interesting since Russia has the secular feature of a center clearly defined through its size, its location and above all its largely admitted leadership in technologies and in industrial commandment: the Moscow region. That is why the analysis of the polarization phenomenons and more generally the existence of spatio-economic asymmetries is very incentive.

We process using three stages. First of all, we introduce data sources and the results of a descriptive analysis of convergence (section I) suggest the existence of regional specificities. We analyze the main sources of the regional growth through the equation of conditional convergence for a macroeconomic (section II), and then for a geographic perspectives (section III). Thus we try to measure the impact of invesment, education and public expenditures on the regional growth, and to stress on the importance of geographic position.

I - Relative performances and absolute convergence

1.1 - Data for Russian regions

The data on gross regional product for 73 regions of Russia for the period 1994-1999. Gross regional product data for autonomous regions (okrugs) and the Chechen republic are not reported by the government statistics. Data on industrial output for 88 Russian regions (excluding Chechen republic) for the period 1995-2000 are from the State Statistical Committee.

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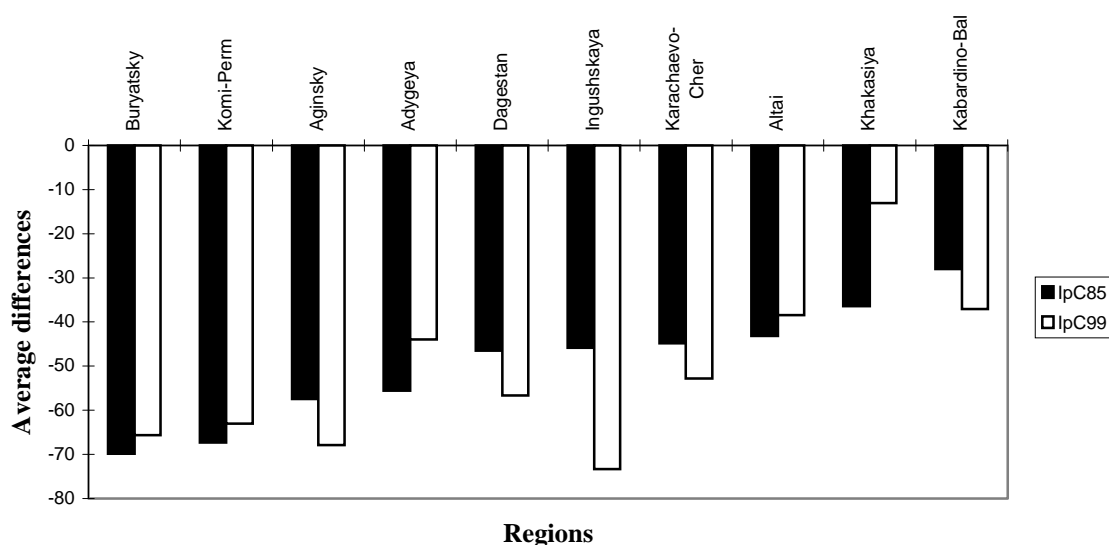
The data on income for 1985 and for the period 1990-1999 are from the State Statistical Committee. For 1985 data are available for 73 regions, from 1993 the amount of regions increased to 77, and since 1999, data on industrial output are available for 88 Russian regions (excluding only Chechen republic). The income concept used is per capita personal income including social transfers.

The data on public outlays and main spending items for 88 regions of Russia for the period 1996-2000 are from the Ministry of Finance of the Russian Federation. We use total public expenditure in regions, outlays on educations and health, expenses on social policy and financial aid to regions from the central government.

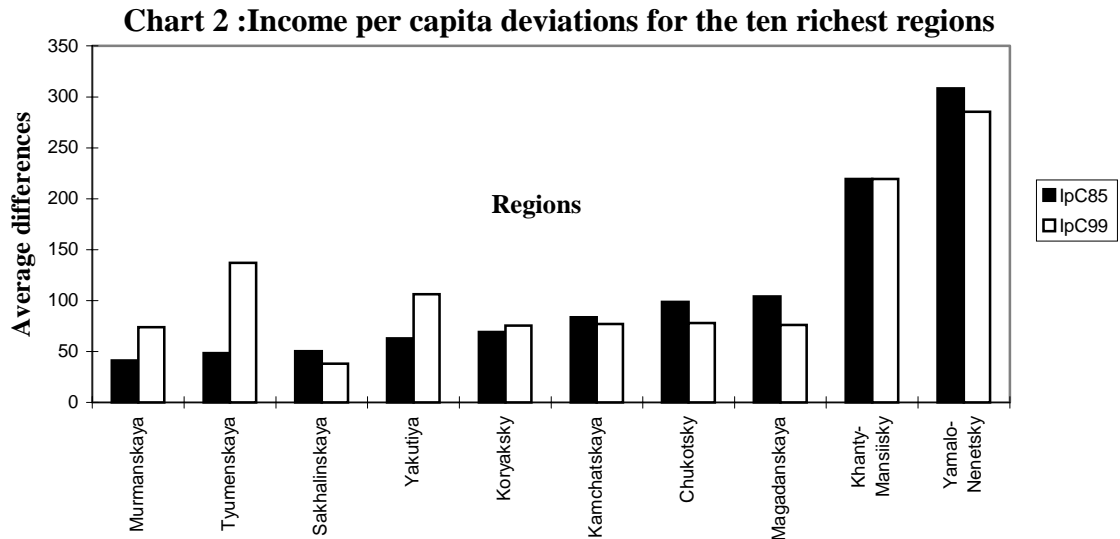
1.2 - Descriptive study of regional income per capita

In terms of income per capita, the last ten under-performed regions are mainly localized in the Caucasus (South-West) and near the Mongolian frontier (South). We can notice a real stability, from 1985 to 1999, of these positions : six of the ten laggard regions are always in the bottom ten. Only one region known a genuine soaring : Khakasiya, which won nearly 50 places (the 88 Russian regions are presently analyzed). Except this spectacular leapfrogging, no process of convergence is highlighted.

Income per capita deviations for the ten laggard regions



As far as the top ten is concerned, the greater stability is put in evidence : eight of the ten richest maintain their superiority and five increase their advance. It is mainly the Eastern and the Northern regions which are upper-performed. A special mention could be given to the East-band of the Urals : Tyumenskaya, Khanty-Mansiiky and Yamalo-Nenetsky. Thus the richest regions encounter with the poorest such as Komi-Permyatsky. Lastly, it should be noted the fantastic movig forward of Moscow which earns ten places from the eleventh (so it was not present in the chart 2) to the first one. Henceforth, there is a capital appeal.



1.3 - Beta-convergence

In order to evaluate more precisely the convergence of income per capita or productivities we must apply the two concepts of beta and sigma-convergence. The former refers to the existence of a negative relationship between the initial level of productivity and the further growth. The beta-convergence is a necessary but not sufficient condition for the sigma-convergence to be verified. The latter sketches merely the variance reduction of productivities in cross section between two dates. Note that in the case of strong asymmetrical regional shocks, the productivities dispersion cannot diminish even in the presence of the beta-convergence. The following results illustrate such situations.

The estimation will be performed in cross section (88 regions) as it is customary to do (these results are confirmed by a time series estimation). Given that the sigma-convergence is the strongest and the most intuitive¹ definition of the convergence, we will refer to this concept to decide on the presence or the absence of convergence.

Clearly, there is no absolute convergence on the period 1985-99 for the regional incomes per capita (Table 1). A divergence process is nearly put in evidence. The thing is obvious for the industrial output for the last years of the century. On the contrary a strong beta-convergence could be noted for the gross regional product for a similar period.

¹ However a sole statistics cannot sum up the evolutions of the regional productivities spread. An extended study, stressing on the emergence of convergence clubs for example, will require the use of tools developed by Quah (1996 a,b; 1997), Durlauf and Quah (1998).

Table 1 : Beta-convergence of income, gross regional product and industrial output per capita

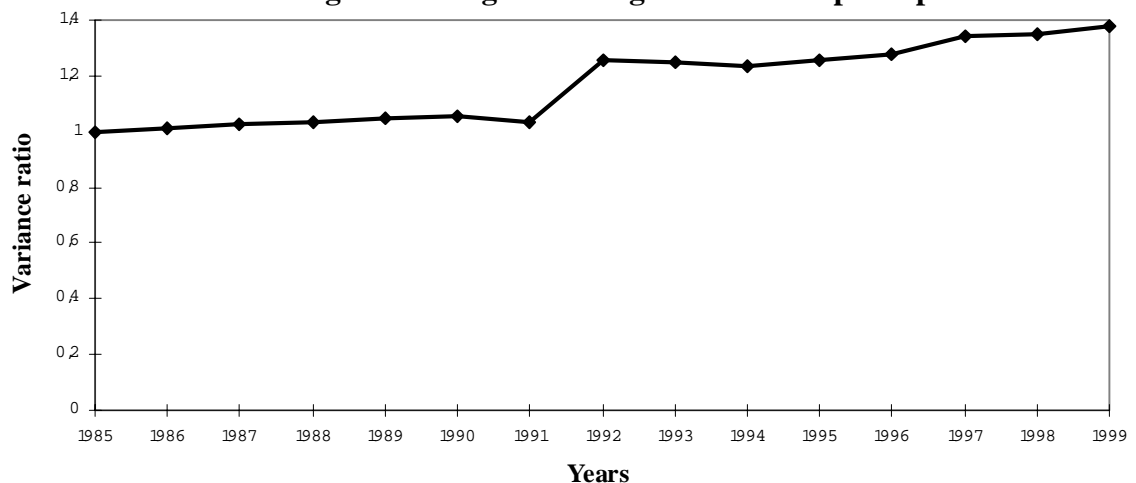
	Period	Beta	Constant	DW	R ²
Income	1985-99	+0.78 % (1.41) [0.161]	+0.66 (59.64) [0.000]	2.083	0.151
Gross regional product	1994-99	-13.6 % (-7.94) [0.000]	0.52 (23.85) [0.000]	1.793	0.651
Industrial output	1995-2000	+0.92 % (2.64) [0.010]	-0.013 (-2.21) [0.030]	1.882	0.274

(.) = Student ; [.] = p-value.

1.3 - Sigma-convergence

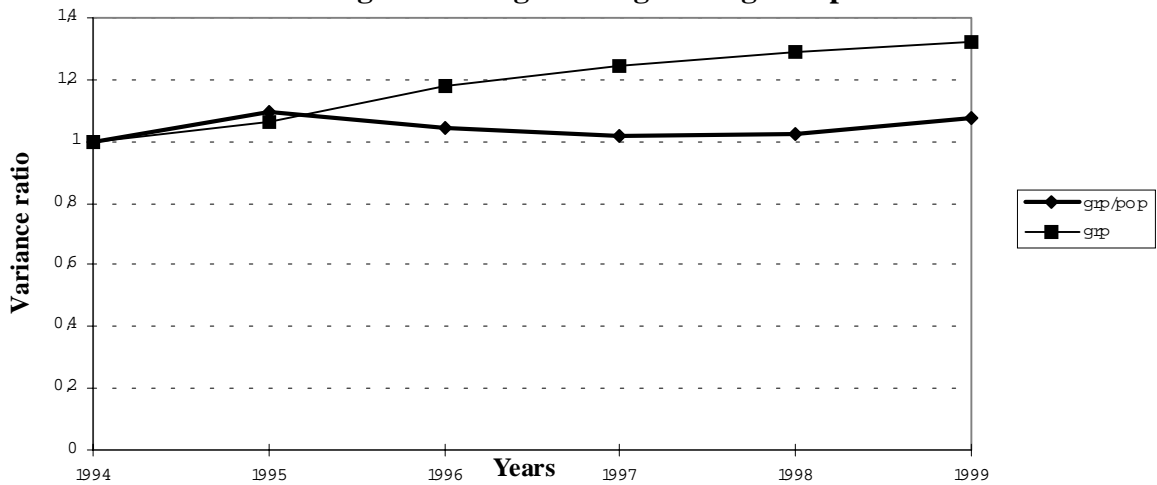
To confirm this preliminary diagnosis, the study of sigma-convergence is necessary. The verdict is without appeal for the regional incomes per capita. The variance ratio increases for nearly 40% during the nineties, and no inflexion appears.

Chart 3 : Sigma-convergence of regional incomes per capita



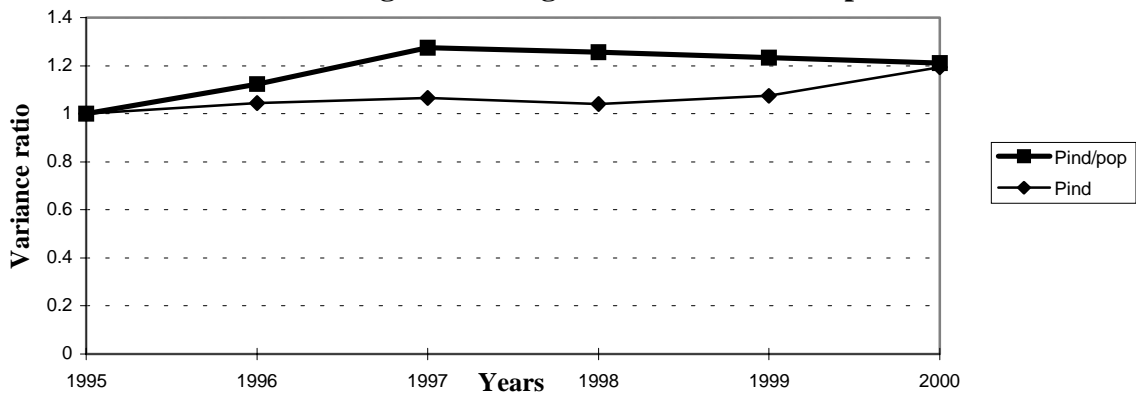
The tendency is lower, but still obvious, for the gross regional product, even if the gross regional product per capita seems to know a relative stability (for six years only!).

Chart 4 : Sigma-convergence of gross regional product



Lastly, and conversely to the precedents indicators, the divergence process is about 20 percent on the six years of the century, and nearly equal for both indicators : industrial output and industrial output per head.

Chart 5 : Sigma-convergence of industrial output



II - Macroeconomic analysis

2.1 - Conditional convergence

When initial conditions are « controlled » (regional similar structures are supposed), especially the role of physical and human capital, the divergence process disappears, even for the larger period. We lay stress on a conditional convergence for the industrial output and the convergence speed of grp per head is over 15% per year! The investment and the education efforts, but also the public expenditures have a strong impact on growth, whereas the judgement is more complex for the financial aid. Moreover, the negative influence of the health level and of the social policy on growth must be interpreted as the better quality of life of the richest regions which growth is relatively feasible and as a genuine aid to the unfavoured regions which have a low dynamics respectively.

Table 2 : Regional growth and convergence determinants

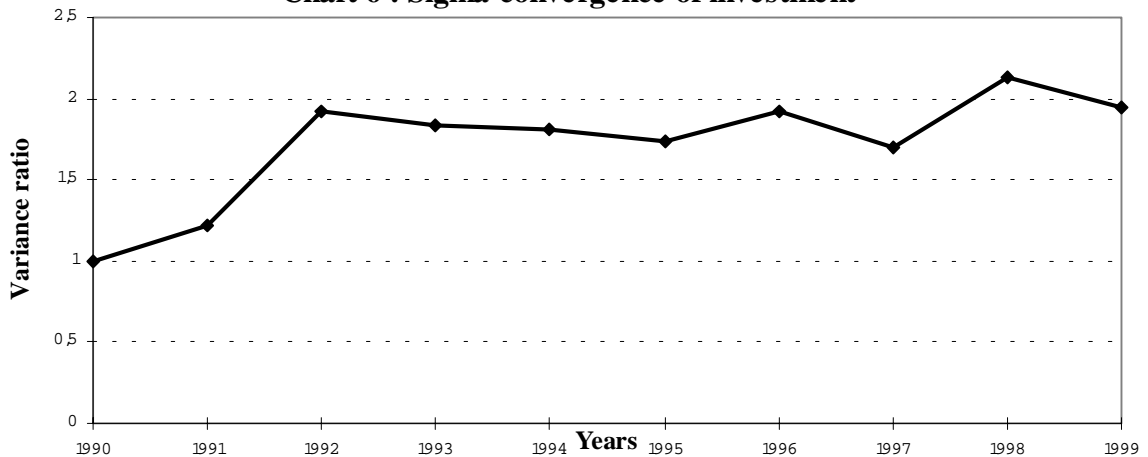
	Period	Beta	INV	EDUC	PUBEXP	FINAID	SOCPOL	HEALTH	Cste	DW	R ²
Income	1985-99	-0.45 (-0.74) [0.46]		0.0094 (4.03) [0.000]	0.0092 (3.52) [0.001]	-0.0043 (-2.24) [0.028]			0.56 (14.6) [0.00]	2.00	0.398
Gross regional product	1994-99	-17.8 (-16.1) [0.00]	0.324 (8.77) [0.00]	0.086 (2.51) [0.014]		-0.019 (2.65) [0.010]		-0.078 (-2.58) [0.012]	0.658 (4.77) [0.00]	1.57	0.899
Industrial output	1995-2000	-4.89 (-4.69) [0.00]	0.249 (6.36) [0.00]			0.0062 (2.22) [0.029]	-0.0063 (-1.8) [0.075]		0.037 (0.8) [0.43]	1.78	0.631

INV = Investment, EDUC = Education, PUBEXP = Public expenditures, FINAID = Financial aid, SOCPOL = Social policy, HEALTH = Health, Cste = Constant, DW = Durbin-Watson.

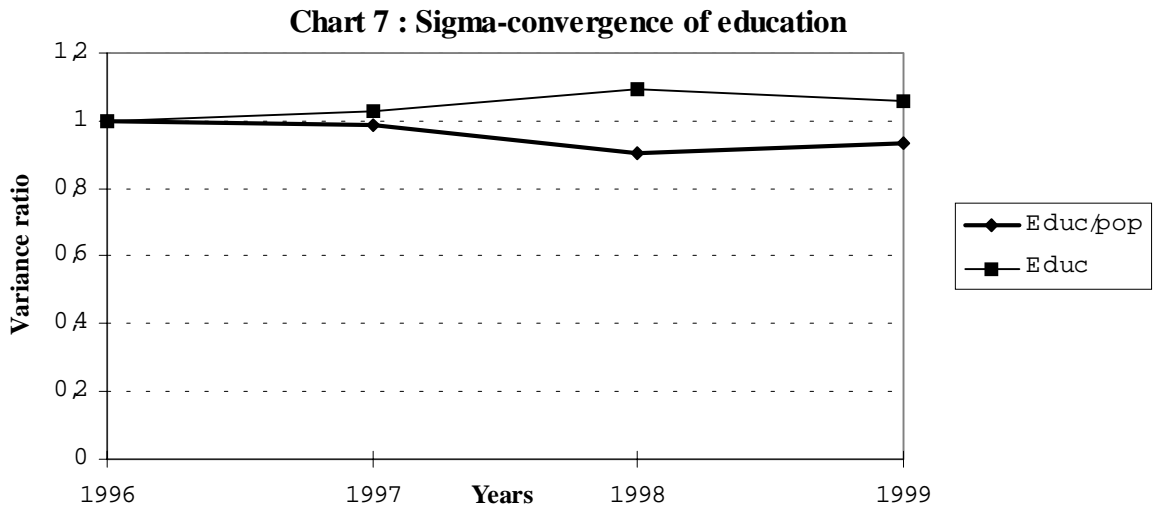
2.2 - The role of physic and human capital

When the attention is focused on the convergence of the both main determinants of regional growth, no sign of a possible catching-up appears. The sigma-divergence remains the reality, and especially for investment which evolution is spectacular during the Nineties.

Chart 6 : Sigma-convergence of investment



Only, the human capital evolution let a small positive message for lagging regions.



III - An economic geography perspective

From a geographic point of view, the trends and the conclusions are relatively similar. This time, there is no convergence process for the grp per head but the result is stronger for industrial output. The localization of the Russian industrial apparatus obeys to a strategic country planning which favours convergence. It is likely bound to a less polarized and a reduction of the industrial production. Otherwise, the regions located far from Moscow have known a stronger growth (vampire effect of the Russian capital or growth opportunities for the frontier regions ?). The Northern and Eastern regions are the fgreat winners of the decade, whereas the South but also the West meet some problems to stay on a balanced growth.

Table 3 : Geography and growth

	Period	Beta	DIST	FRONTIER	NORTH	EAST	SOUTH	WEST	Cste	DW	R ²
Income	1985-99	-0.44 (-0.95) [0.38]	0.0006 (1.59) [0.11]						0.55 (13.5) [0.00]	2.08	0.411
Gross regional product	1994-99	-0.46 (1.34) [0.18]		0.034 (1.73) [0.088]	0.034 (2.72) [0.008]	0.035 (1.63) [0.106]	-0.025 (-1.35) [0.18]	-0.041 (-1.98) [0.051]	-0.008 (-1.04) [0.30]	1.76	0.534
Industrial output	1995-2000	-14.0 (-9.45) [0.00]			0.162 (4.26) [0.00]		-0.077 (-3.14) [0.002]	-0.055 (-1.83) [0.07]	0.55 (23.6) [0.00]	1.79	0.772

Dist = Distance to Moscow (kilometers), Frontier, North, East, South, West = dummies.

It should be noted, that for the second equation, only the North and the West variables (positive and negative impacts on growth) are robust, and for the third equation, the distance to Moscow added to the investment variable have a clear influence on convergence.

Conclusion

The existence of a regional divergence process is a real thing in Russia. The study of various indicators confirms the difficulty for lagging regions to catch the leaders : Moscow and the Northern and Eastern regions. For a large period (1985-99), no convergence appears even if macroeconomic and geographic variables are added. The conditional convergence perspective confirms the strategic roles of investment and human capital (then a small convergence process could appear), but their trends go towards multiple equilibria : there is several Russia and the global tendency seems to reinforce itself.

Annex

List of regions

	REGIONS	EAST	WEST	Frontier	SUD	NORD	DIST
1	Aginsky-Buryatsky avtonomny okrug	0	0	0	0	0	15,1
2	Altaisky krai	0	0	1	1	0	9,4
3	Amurskaya oblast	0	0	1	1	0	17,4
4	Arkhangelskaya oblast	0	0	0	0	1	3,2
5	Astrakhanskaya oblast	0	0	1	1	0	4,1
6	Belgorodskaya oblast	0	1	1	0	0	1,7
7	Bryansk oblast	0	1	1	0	0	1,2
8	Vladimirskaya oblast	0	0	0	0	0	0,6
9	Volgogradskaya oblast	0	0	1	1	0	2,9
10	Vologodskaya oblast	0	0	0	0	0	1,4
11	Voronezhskaya oblast	0	1	1	0	0	1,6
12	Evreiskaya avtonomnaya oblast	0	0	1	1	0	18,5
13	Ivanovskaya oblast	0	0	0	0	0	0,9
14	Republic of Ingushetiya	0	0	1	1	0	4,9
15	Irkutskaya oblast	0	0	0	0	0	13
16	Kabardino-Balkarskaya Republic	0	0	1	1	0	4,7
17	Kaliningrad economic region	0	1	1	0	0	3,4
18	Kaluzhskaya oblast	0	0	0	0	0	0,4
19	Kamchatskaya oblast	1	0	1	0	0	21,4
20	Karachaevo-Cherkesskaya Republic	0	0	1	1	0	4,4
21	Kemerovskaya oblast	0	0	0	0	0	9,4
22	Kirovskaya oblast	0	0	0	0	0	2,5
23	Komi-Permyatsky avtonomny okrug	0	0	0	0	0	3,5
24	Koryaksky avtonomny okrug	1	0	1	0	0	20
25	Kostromskaya oblast	0	0	0	0	0	1
26	Krasnodarsky krai	0	1	1	0	0	3,6
27	Krasnoyarsky krai	0	0	0	0	0	10,8
28	Kurganskaya oblast	0	0	1	1	0	5,4
29	Kurskaya oblast	0	1	1	0	0	1,4
30	Leningradskaya oblast	0	1	1	0	0	2,5
31	Lipetskaya oblast	0	0	0	0	0	1,2
32	Magadanskaya oblast	1	0	1	0	0	18,8
33	Moskva	0	0	0	0	0	0,01

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34	Moskovskaya oblast	0	0	0	0	0	0,1
35	Murmanskaya oblast	0	1	1	0	1	4,8
36	Nenetsky avtonomny okrug	0	0	0	0	1	5
37	Nizhegorodskaya oblast	0	0	0	0	0	1,2
38	Novgorodskaya oblast	0	0	0	0	0	1,4
39	Novosibirskaya oblast	0	0	1	1	0	9
40	Omskaya oblast	0	0	1	1	0	7
41	Orenburgskaya oblast	0	0	1	1	0	3,8
42	Orlovskaya oblast	0	0	0	0	0	1,1
43	Penzenskaya oblast	0	0	0	0	0	1,9
44	Permskaya oblast	0	0	0	0	0	3,6
45	Primorsky krai	1	0	1	1	0	20
46	Pskovskaya oblast	0	1	1	0	0	1,8
47	Republic of Adygeya	0	1	1	1	0	4,2
48	Republic Altai	0	0	1	1	0	10,3
49	Republic of Bashkortastan	0	0	1	1	0	4,6
50	Republic Buryatiya	0	0	1	1	0	13,9
51	Republic of Dagestan	0	0	0	1	0	5
52	Republic of Kalmykiya	0	0	1	1	0	3,8
53	Republic of Kareliya	0	1	1	0	1	3,1
54	Republic of Komi	0	0	0	0	0	3,5
55	Republic of Mariy-El	0	0	0	0	0	2,2
56	Republic of Mordoviya	0	0	0	0	0	1,7
57	Republic of Sakha (Yakutiya)	0	0	0	0	1	15,2
58	Republic of Severnaya Osetiya-Alaniya	0	0	1	1	0	4,8
59	Republic of Tatarstan	0	0	0	0	0	2,7
60	Republic Tyva	0	0	1	1	0	11,2
61	Republic Khakasiya	0	0	0	0	0	10,5
62	Rostovskaya oblast	0	1	1	0	0	3
63	Ryazanskaya oblast	0	0	0	0	0	0,7
64	Samarskaya oblast	0	0	1	1	0	2,7
65	Saint-Petersburg	0	1	1	0	0	2,1
66	Saratovskaya oblast	0	0	1	1	0	2,4
67	Sakhalinskaya oblast	1	0	1	0	0	20,8
68	Sverdlovskaya oblast	0	0	0	0	0	4,5
69	Smolenskaya oblast	0	1	1	0	0	1,1
70	Stavropolsky krai	0	0	0	0	0	4,1
71	Taimyrsky avtonomny okrug	0	0	0	0	1	8,7
72	Tambobskaya oblast	0	0	0	0	0	1,4
73	Tverskaya oblast	0	0	0	0	0	0,6
74	Tomskaya oblast	0	0	0	0	0	8,9
75	Tulskaya oblast	0	0	0	0	0	0,6
76	Tyumenskaya oblast	0	0	1	1	0	5,5
77	Udmurtskaya Republic	0	0	0	0	0	3
78	Ulyanovskaya oblast	0	0	0	0	0	2,2

79	Ust-Ordynsky Buryatsky avtonomny okrug	0	0	0	0	0	13
80	Khabarovsky krai	1	0	1	1	0	18,9
81	Khanty-Mansiisky avtonomny okrug	0	0	0	0	0	6,9
82	Chelyabinskaya oblast	0	0	0	0	0	3,6
83	Chitinskaya oblast	0	0	1	1	0	14,9
84	Chuvashskaya Republic	0	0	0	0	0	1,8
85	Chukotsky avtonomny okrug	1	0	1	0	1	18,1
86	Evenkiisky avtonomny okrug	0	0	0	0	0	10,6
87	Yamalo-Nenetsky avtonomny okrug	0	0	0	0	1	7,4
88	Yaroslavskaaya oblast	0	0	0	0	0	0,8

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