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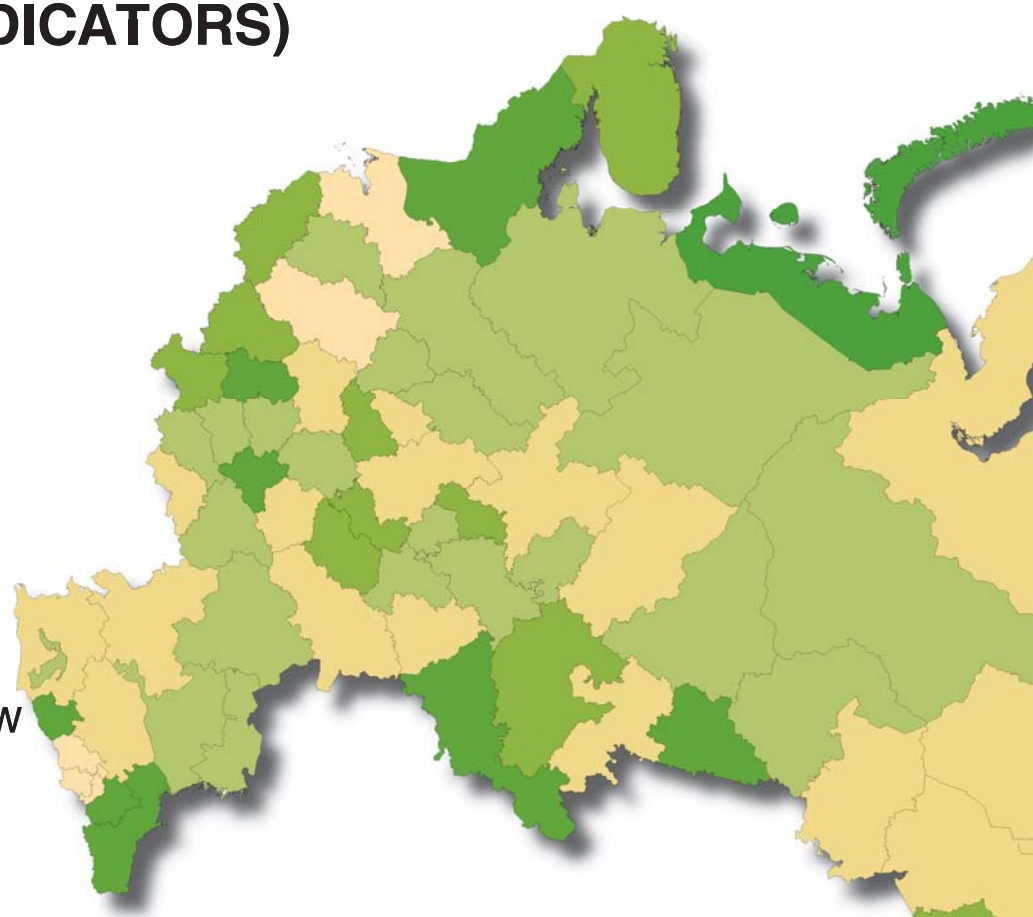
RUSSIAN REGIONAL MARKETS FOR HIGHER EDUCATION (ECONOMIC INDICATORS)



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In the publication we describe Russian regional markets of higher education. We consider the following indicators of the markets: size in terms of students per 10 000 of population; its institutional structure – number of public and private institutions, universities and their local branches; program diversity; level and dynamics of tuition fees during recent years; and levels of market concentration in higher education. For each key indicator we present geographical maps that characterize differentiation of the regional markets. We also analyze indicators of regional markets of higher education in conjunction with clusters of Russian regions outlined by Independent Institute on Social Policy (2006) on the basis of socio-economic indicators and derive meaningful conclusions on differentiation of key indicators of higher education markets. We show that in Russia the level of regional development corresponds to the level of concentration and diversification at regional higher education markets.

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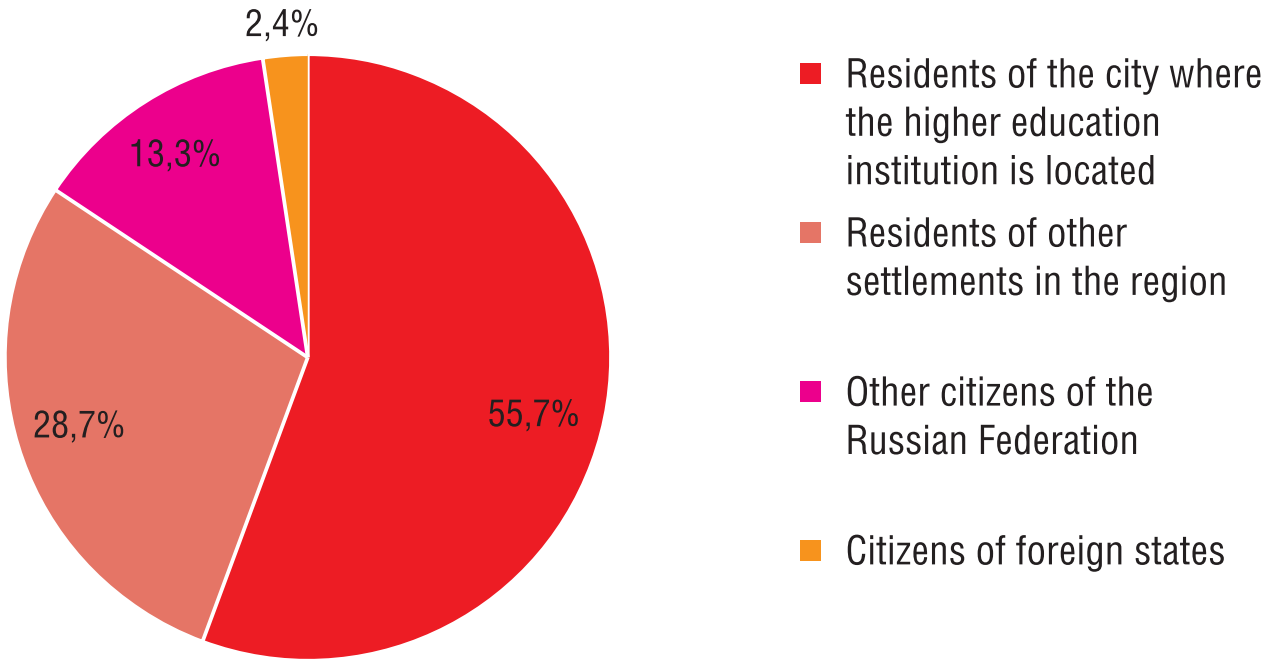
Introduction

In the text we present cross-regional comparison of indicators that describe markets of higher education. The emphasis on regionalization and marketization of higher education has come about as a result of several factors.

First, despite the fact that most of Russian universities are under federal jurisdiction and receive federal funding, in most cases the system of higher education is generally dominated by local regional markets for higher education that in some cases are really isolated from one another. That is, one can speak of local regional systems of higher education. The main regional centers of educational mobility are Moscow and Saint Petersburg. Higher education institutions in other Russian Federation regions are oriented towards local high school graduates. The overwhelming majority of high school graduates in the biggest cities (96%) plan to enter higher education institutions locally. The proportion of students living in dormitories across the whole country in 2008 did not exceed 14.9%[1]. In a number of regions, this figure is 18–30%. At the same time, the proportion of students in these regions constitutes to no more than one fifth of all students in Russian Federation. Thus, regional self-sufficiency and differentiation of higher education systems are observed. Thus, it becomes an interesting task to describe the regional differences in economics of higher education and variations in its structure.

[1] Based on a survey of higher education institutions' leaders in 2008 (Project "Monitoring of Economics of Education", State University – Higher School of Economics, Levada-Center)

Diagram 1. Proportion of students of higher education institutions according to settlement type (%) [2]



Second, in present-day Russia, there is a huge commercial sector of higher education in terms of the numbers of both institutions offering this service and paying students. Currently, Russia is one of the very few countries with dual-track tuition systems, where institutions of higher education simultaneously teach both 'public' students (universities are provided with public funds to teach these students) and students who pay tuition. However, if we examine the proportion of fee-paying students and the programs in which they enroll within each region, we see that this sector is not yet well-developed everywhere across Russia.

The present text describes parameters that characterize size in terms of students per 10 000 of population, its institutional structure – number of public and private institutions, universities and their local branches; program diversity, level and dynamics of tuition fees during recent years, and levels of market concentration in higher education. Such indicatiors as number of students

[2] Data from a survey of higher education institutions' leaders in 2008 (Project "Monitoring on Economics of Education", State University-Higher School of Economics, Levada-Center)

and number of educational institutions and regional branches enable us to single out regions with different proportions of federal budget and commercial sectors in higher education. Relative proportion of public funding transferred to Higher Education (HE) in a is a significant parameter because it indicates the proportions of the 'traditional HE system', which is based on the principles of planning and distribution of public resources, and the proportions of higher education provided for students, who pay tuition, i.e. higher education market. The norm 'per 10 000 inhabitants' is used to evaluate the budget, permitting a direct comparison of the data for different regions.

Index for market concentration reveals relative level of competition within the regional market of higher education. It is especially relevant today due to the 'demographic drop' – a significant decrease in the number of youth of age 17–18 – in the late 2000s and generally decreased demand for higher education. The issues of prices of educational services (tuition fees) and their dynamics (from 2007 to 2009) are becoming essential as a result of the growing competition for applicants as well as the improving understanding of the education economy's performance during the financial crisis. One highly important issue is price segmentation on the higher education market. Regional index of program diversity is relevant to the development of higher education market because it permits the educational possibilities of a region to be summarized, including the presence of alternative educational specialties available to customers.

Shape and size of the higher education system across Russian regions

The size of the higher education market is characterized by the number of students enrolled in higher education institutions. To guarantee the comparability of regional educational systems, the relative size of the higher education system is taken into account, that is, the number of students per 10 000 inhabitants.

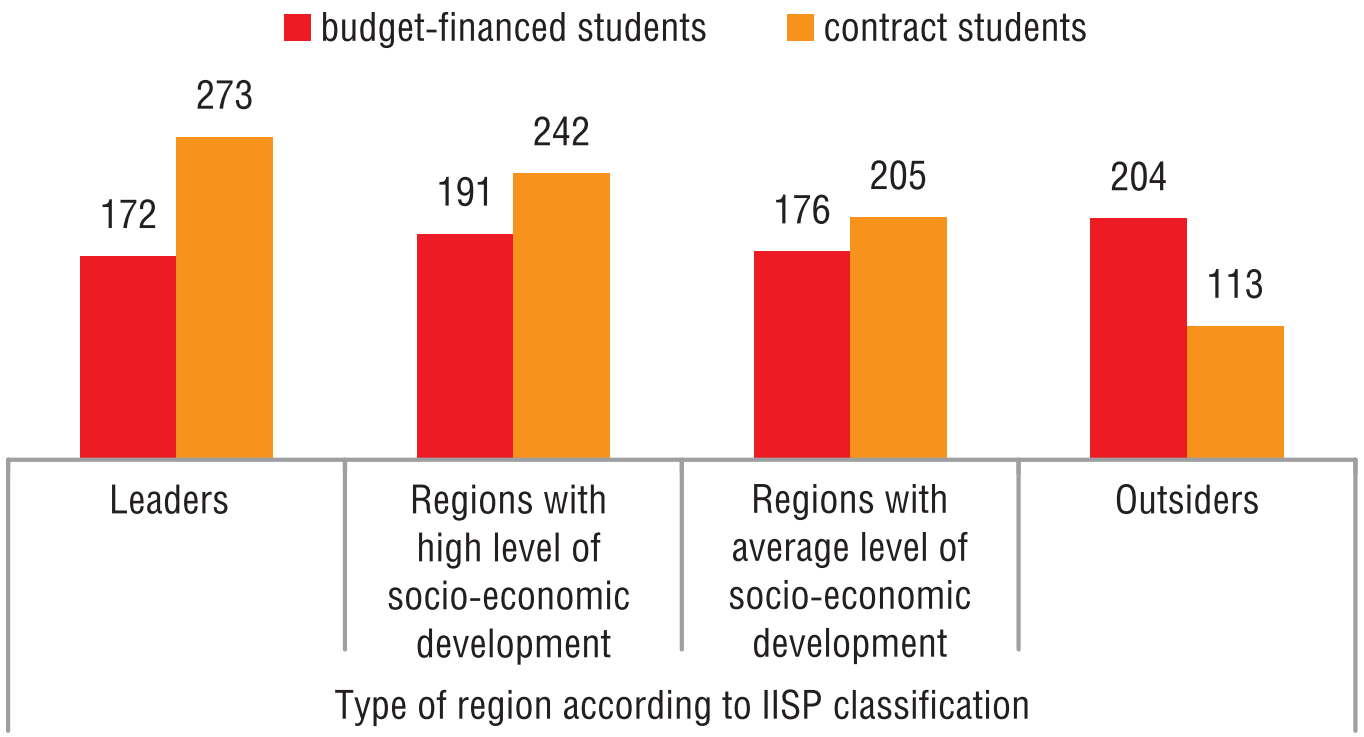
Russian regions show significant differentiation of higher education systems in terms of size. The leaders in terms of the number of budget-financed students per 10 000 inhabitants are Moscow and the Moscow region, the Saint Petersburg and Leningrad region [3], and the Tomsk region (with, on average, slightly more than 400 budget-financed students per 10 000 inhabitants). The regions lagging furthest behind by this parameter are the Sakhalin region, the Kamchatka area, and the Murmansk region (with, on average, slightly fewer than 100 budget-financed students per 10 000 inhabitants). Thus, the regions with the most and fewest budget-financed students per 10 000 inhabitants are separated on this parameter by more than four times.

The average size of the commercial sector in higher education in each region can be estimated by the number of students enrolled on a contract basis per 10 000 inhabitants. According to this parameter, the same regions have the largest commercial higher education sector as had the most budget-financed students per 10 000 inhabitants: Moscow and the Moscow region, the Saint Petersburg and Leningrad region, and the Tomsk region. The number of students enrolled on a contract basis in these regions per 10 000 inhabitants is about 430. Meanwhile, the lowest number of contract students per 10 000 inhabitants is found in the Northern Caucasus republics and the Altay Republic (with, on average, about 30 students per 10 000 inhabitants). The numbers of contract students per 10 000 inhabitants in the regions with the maximum and minimum values of this parameter differ by a factor of 14.

The size of the higher education system financed from the federal budget in each region and the size of the regional higher education market are correlated with regional socio-economic development. Thus, the regionally financed higher education system is largest in outsider regions and smallest in leader regions according to Independent Institute for Social Policy (IISP) classification. On the contrary, the market segment of the regional system of higher education is largest in the leader regions and smallest in the outsider regions (see Diagram 2).

[3] Here and further Moscow and Moscow region are considered as one region, the same with Saint Petersburg and Leningrad region.

Diagram 2. Number of students of higher education institutions per 10 000 inhabitants by region, 2009/2010 academic year



Map 1. Number of students in the state higher education institutions per 10 000 inhabitants (2008, 2009)

Map 2. Number of students in the non-state higher education institutions per 10 000 inhabitants (2008, 2009)

Table 1. Number of higher education students per 10 000 inhabitants by region (2008, 2009)

	Budget-financed students	Contract students
Central Federal District		
Belgorod Region	166	326
Bryansk Region	154	206
Vladimir Region	142	193
Voronezh Region	245	261
Ivanovo Region	260	215
Kaluga Region	125	130
Kostroma Region	199	100
Kursk Region	219	175
Lipetsk Region	169	125
Orel Region	301	234
Ryazan Region	198	183
Smolensk Region	157	182
Tambov Region	212	163
Tver Region	136	116
Tula Region	148	125
Yaroslavl Region	186	146
Moscow and Moscow Region	284	314
Northwestern Federal District		
Republic of Karelia	138	166
Republic of Komi	171	146
Arkhangelsk Region[3]	140	177
Vologda Region	175	179
Kaliningrad Region	157	168
Murmansk Region	107	192
Novgorod Region	141	164
Pskov Region	143	155
St.Petersburg and Leningrad Region	334	335
Southern Federal District (before 2009)		
Republic of Adygeya	319	121
Republic of Kalmykia	224	111
Krasnodar Territory	121	168
Astrakhan Region	125	258
Volgograd Region	190	191
Rostov Region	237	233
Republic of Dagestan	200	183
Republic of Ingushetia	133	28
Republic of Kabardino-Balkaria	213	68
Republic of Karachayevo-Cherkessia	231	126
Republic of North Ossetia-Alania	310	112
Republic of Chechnya	201	52
Stavropol Territory	182	237

[4] Including Nenets autonomous area.

	Budget-financed students	Contract students
Volga Federal District		
Republic of Bashkortostan	144	223
Republic of Marii-El	203	148
Republic of Mordovia	262	202
Republic of Tatarstan	205	238
Republic of Udmurtia	165	279
Republic of Chuvashia	186	351
Perm Territory	133	195
Kirov Region	131	198
Nizhny Novgorod Region	174	307
Orenburg Region	190	151
Penza Region	216	168
Samara Region	198	262
Saratov Region	208	277
Ulyanovsk Region	178	228
Urals Federal District		
Kurgan Region	141	210
Sverdlovsk Region	164	250
Tyumen Region	137	324
Khanty-Mansiisk Autonomous Area	95	213
Yamal-Nenets Autonomous Area	10	165
Chelyabinsk Region	162	322
Siberian Federal District		
Republic of Altai	202	34
Republic of Buryatia	186	238
Republic of Tuva	123	61
Republic of Khakassia	133	203
Altai Territory	178	146
Zabaikalsky Territory	139	210
Krasnoyarsk Territory	212	199
Irkutsk Region	196	285
Kemerovo Region	155	203
Novosibirsk Region	212	370
Omsk Region	244	224
Tomsk Region	387	466
Far Eastern Federal District		
Republic of Sakha-Yakutia	226	202
Kamchatka Territory	105	319
Primorsky Territory	247	238
Khabarovsk Territory	211	381
Amur Region	178	102
Magadan Region	209	260
Sakhalin Region	74	164
Jewish Autonomous Region	117	257

Another indicator characterizing the higher education market is the number of higher education institutions. Maps 3 and 4 show the regional differentiation of the numbers of state and non-state higher education institutions.

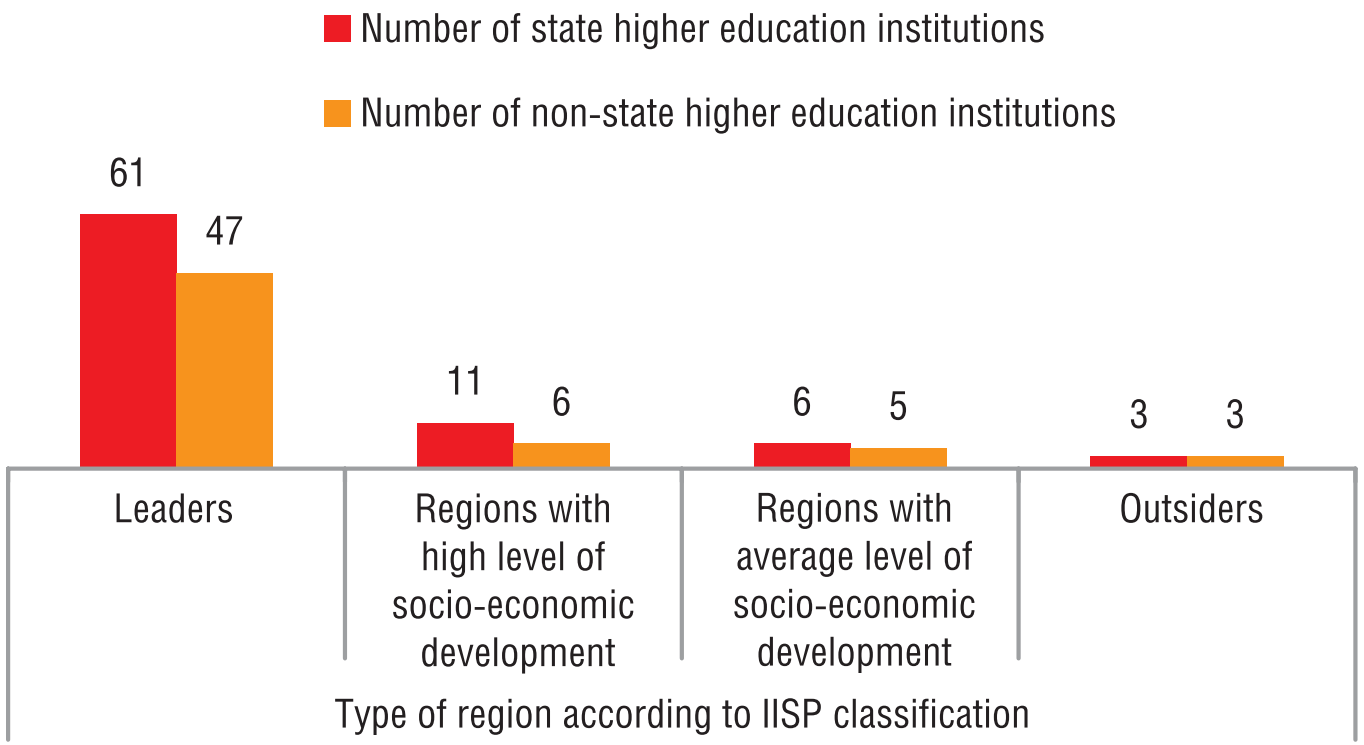
The map 3 shows the differentiation of Russian regions with regard to the number of state higher education institutions. According to the visual data, 11 regions of Russia have two or fewer state higher education institutions, including the Republic of Altai, Novgorod Region, the Republic of Khakassia, the Republic of Ingushetia, Sakhalin Region and the Republic of Kalmykia. More than half of all regions have fewer than six state higher education institutions. In 24 regions, there are more than 9 state higher education institutions. Moscow and Moscow Region, Saint Petersburg and Leningrad Region stand out with the most state higher education institutions. Other regions with many state higher education institutions are the Republic of Tatarstan (23), Rostov Region (19) and Sverdlovsk Region (18).

The map 4 demonstrates the differentiation of Russian regions according to the number of non-state higher education institutions. In 19 Russian regions, as of 2007, there were no non-state higher education institutions [5]. Regions with one or two non-state higher education institutions are the Kemerovo Region, Ivanovo Region, the Republic of Sakha-Yakutia, Orel Region, Smolensk Region, the Republic of Komi, Lipetsk Region, Vladimir Region, Pskov Region, Kostroma Region, Republic of Mordovia, Leningrad Region, Republic of Khakassia, Novgorod Region, and the Republic of Kabardino-Balkaria. The most non-state higher education institutions are found in Moscow and Moscow Region (105), Saint Petersburg and Leningrad Region (43), the Krasnodar Territory (21), the Stavropol Territory (16), Rostov Region (14), Samara Region (14), Sverdlovsk Region (11), Omsk Region (10), and the Republic of Tatarstan (9).

The investigation of the parameters of the size of the higher education market in relation to regional socio-economic development level revealed that the numbers of state and non-state higher education institutions are higher in “Leader” regions. At the same time, in other types of regions, these figures are considerably smaller. Thus, the size of the higher education system is minimal in “Outsiders” and “Regions with average level of socio-economic development”, according to IISP classification. In the majority of cases, there are more state than non-state higher education institutions (see Diagram 3).

[5] Regions with no non-state higher education institutions: Bryansk Region, Tambov Region, Tula Region, the Republic of Karelia, Vologda Region, the Republic of Adygeya, the Republic of Kalmykia, the Republic of North Ossetia-Alania, Penza Region, Ulyanovsk Region, Yamal-Nenets Autonomous Area, the Republic of Altai, the Republic of Buryatia, the Republic of Tuva, Zabaikalsky Territory, Amur Region, Magadan Region, Jewish Autonomous Region, and Chukotka Autonomous Area.

Diagram 3. The numbers of state and non-state higher education institutions by type of region, 2006/2007 academic year



Map 3. Number of state higher education institutions by region (2007)

Map 4. Number of non-state higher education institutions by region (2007)

Table 2. Numbers of state and non-state higher education institutions by region (2007)

	Number of state higher education institutions	Number of non-state higher education institutions
Central Federal District		
Belgorod Region	6	3
Bryansk Region	4	0
Vladimir Region	3	1
Voronezh Region	13	4
Ivanovo Region	8	1
Kaluga Region	2	3
Kostroma Region	3	1
Kursk Region	5	8
Lipetsk Region	4	1
Orel Region	7	1
Ryazan Region	5	3
Smolensk Region	5	1
Tambov Region	5	0
Tver Region	4	4
Tula Region	2	0
Yaroslavl Region	7	3
Moscow and Moscow Region	117	105
Northwestern Federal District		
Republic of Karelia	3	0
Republic of Komi	4	1
Arkhangelsk Region	3	2
Vologda Region	4	0
Kaliningrad Region	4	6
Murmansk Region	2	2
Novgorod Region	1	1
Pskov Region	3	1
St.Petersburg and Leningrad Region	50	43
Southern Federal District (before 2009)		
Republic of Adygeya	2	0
Republic of Kalmykia	2	0
Krasnodar Territory	12	21
Astrakhan Region	5	2
Volgograd Region	12	5
Rostov Region	19	14
Republic of Dagestan	6	9
Republic of Ingushetia	1	2
Republic of Kabardino-Balkaria	1	1
Republic of Karachayevo-Cherkessia	5	5
Republic of North Ossetia-Alania	3	0
Republic of Chechnya	5	2
Stavropol Territory	9	16

	Number of state higher education institutions	Number of non-state higher education institutions
Volga Federal District		
Republic of Bashkortostan	12	5
Republic of Marii-El	3	2
Republic of Mordovia	2	1
Republic of Tatarstan	23	9
Republic of Udmurtia	5	3
Republic of Chuvashia	5	2
Perm Territory	10	4
Kirov Region	4	3
Nizhny Novgorod Region	16	4
Orenburg Region	6	2
Penza Region	4	0
Samara Region	16	14
Saratov Region	10	2
Ulyanovsk Region	5	0
Urals Federal District		
Kurgan Region	3	3
Sverdlovsk Region	18	11
Tyumen Region	10	2
Khanty-Mansiisk Autonomous Area	17	4
Yamal-Nenets Autonomous Area	0	0
Chelyabinsk Region	5	4
Siberian Federal District		
Republic of Altai	1	0
Republic of Buryatia	4	0
Republic of Tuva	1	0
Republic of Khakassia	1	1
Altai Territory	8	2
Zabaikalsky Territory	3	0
Krasnoyarsk Territory	14	2
Irkutsk Region	11	3
Kemerovo Region	10	1
Novosibirsk Region	15	8
Omsk Region	10	10
Tomsk Region	7	2
Far Eastern Federal District		
Republic of Sakha-Yakutia	8	1
Kamchatka Territory	2	2
Primorsky Territory	10	3
Khabarovsk Territory	11	7
Amur Region	4	0
Magadan Region	1	0
Sakhalin Region	2	2
Jewish Autonomous Region	1	0

Average size of higher education institutions

On the two maps that follow, information on the average size of higher education institutions in each Russian region is visualized overall and weighted by the number of students on different forms of education (full-time students, correspondence students). The highest average number of students (more than 5000) per higher education institution is found in the following regions: the Republic of Kabardino-Balkaria, the Republic of Mordovia, Kurgan Region, Nizhny Novgorod Region, the Republic of North Ossetia-Alania, Novosibirsk Region, Chelyabinsk Region, Saint-Petersburg and Leningrad Region, the Republic of Chechnya, Moscow and Moscow Region, and the Republic of Marii-El.

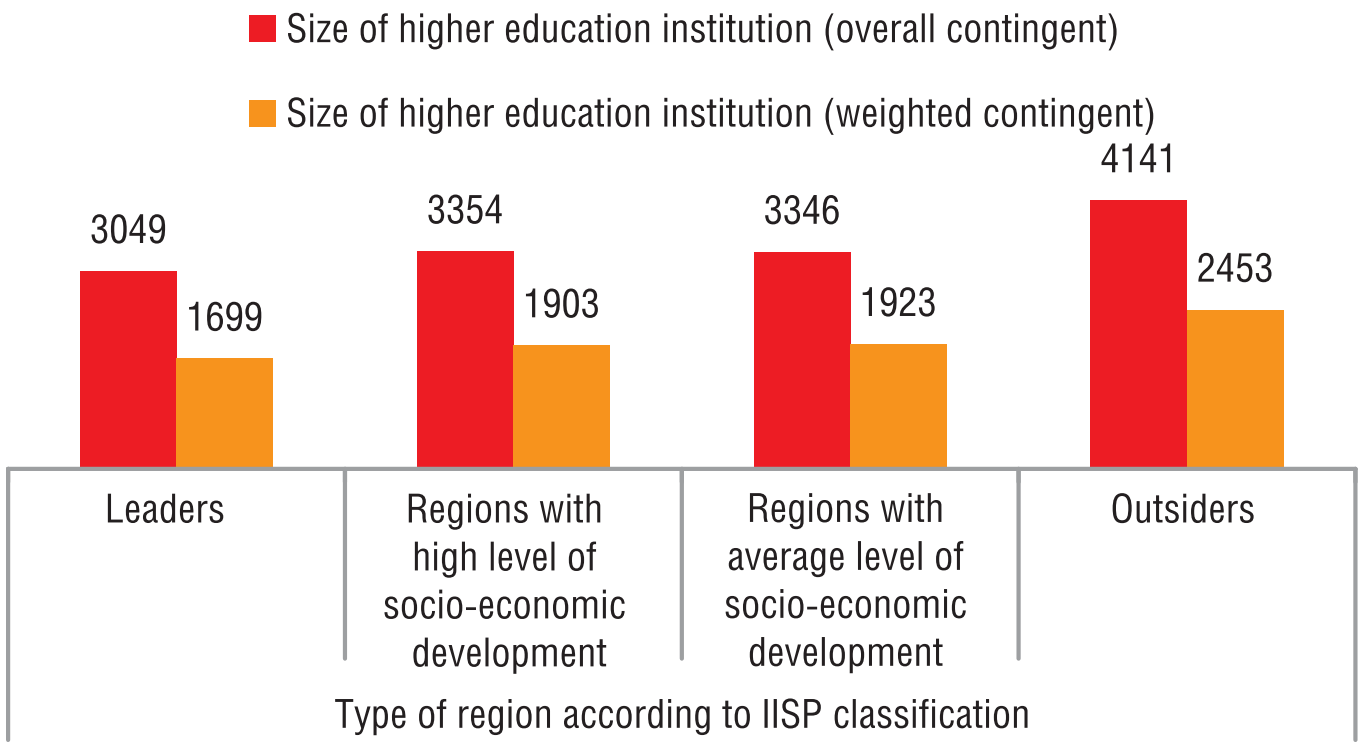
In 27 regions, the average number of students per higher education institution does not exceed 2300. The smallest average size of higher education institutions (less than 1500 students) is found in the following regions: Yamal-Nenets Autonomous Area, Khanty-Mansiisk Autonomous Area, Murmansk Region, the Republic of Tuva, and Tver Region.

As for the average size of higher education institutions weighted by number of students, the results appear different (Map 6). The largest average number of students (over 5000) per higher education institution is found in the following regions: the Republic of Kabardino-Balkaria, Nizhny Novgorod Region, the Republic of Mordovia, Chelyabinsk Region, the Republic of Altai, Novosibirsk Region, the Republic of North Ossetia-Alania, the Republic of Chechnya, Moscow and Moscow Region, Saint-Petersburg and Leningrad Region, and the Republic of Marii-El.

The smallest average number of students (less than 1000) per higher education institution is found in the following regions: Yamal-Nenets Autonomous Area, Khanty-Mansiisk Autonomous Area, Jewish Autonomous Region, Murmansk Region, Sakhalin Region, Smolensk Region, Tver Region, the Republic of Komi, Magadan Region, the Kamchatka Territory, the Republic of Tuva, the Republic of Sakha-Yakutia, Kaluga Region, Pskov Region, and the Republic of Karachayevo-Cherkessia.

Interesting results are obtained when comparing the sizes of higher education institutions according to each region's socio-economic position. As can be seen from Diagram 4, the largest number of students per higher education institution is found in "Outsider" regions (2453 people by weighted contingent) and the smallest in "Leader" regions (1699 people by weighted contingent). It cannot be said that there is a considerable difference between the results obtained using the weighted versus overall parameter for the number of students. Nevertheless, it is apparent that the difference in this parameter between "Leader" and "Outsider" regions is large.

Diagram 4. Average number of students per higher education institution by type of region, 2008



Map 5. Average size of higher education institutions (overall contingent, 2008)

Map 6. Average size of higher education institutions (weighted contingent, 2008)

Table 3. Average size of higher education institutions in terms of number of students by region, 2008

	Average size of higher education institution (overall contingent)	Average size of higher education institution (weighted contingent)
Central Federal District		
Belgorod Region	4408	2451
Bryansk Region	3135	1585
Vladimir Region	3730	1913
Voronezh Region	4260	2564
Ivanovo Region	3650	2072
Kaluga Region	1603	974
Kostroma Region	4144	2667
Kursk Region	4567	2552
Lipetsk Region	3426	2025
Orel Region	3984	2663
Ryazan Region	3691	2159
Smolensk Region	1578	823
Tambov Region	3757	2365
Tver Region	1442	839
Tula Region	4258	2625
Yaroslavl Region	2178	1325
Moscow and Moscow Region	7103	4137
Northwestern Federal District		
Republic of Karelia	2093	1247
Republic of Komi	1697	895
Arkhangelsk Region	2869	1585
Vologda Region	3926	2284
Kaliningrad Region	1900	1152,231
Murmansk Region	1405	726,094
Novgorod Region	2194	1183,711
Pskov Region	1743	979,833
St.Petersburg and Leningrad Region	6901	4484,832
Southern Federal District (before 2009)		
Republic of Adygeya	2775	1723
Republic of Kalmykia	1912	1061
Krasnodar Territory	1948	1105
Astrakhan Region	2562	1544
Volgograd Region	3966	2363
Rostov Region	3024	1671
Republic of Dagestan	2653	1526
Republic of Ingushetia	4063	2350
Republic of Kabardino-Balkaria	5020	3026
Republic of Karachayevo-Cherkessia	1694	1000
Republic of North Ossetia-Alania	5930	4122
Republic of Chechnya	7749	4367
Stavropol Territory	2138	1220

	Average size of higher education institution (overall contingent)	Average size of higher education institution (weighted contingent)
Volga Federal District		
Republic of Bashkortostan	3164	1839
Republic of Marii-El	8227	5223
Republic of Mordovia	5550	3153
Republic of Tatarstan	3401	2117
Republic of Udmurtia	4251	2137
Republic of Chuvashia	4589	2487
Perm Territory	4944	2654
Kirov Region	2315	1177
Nizhny Novgorod Region	5753	3046
Orenburg Region	3276	1822
Penza Region	3128	1820
Samara Region	3944	2245
Saratov Region	4629	2595
Ulyanovsk Region	4836	2872
Urals Federal District		
Kurgan Region	5586	2780
Sverdlovsk Region	3366	1848
Tyumen Region	2184	1153
Khanty-Mansiisk Autonomous Area	782	271
Yamal-Nenets Autonomous Area	462	195
Chelyabinsk Region	6291	3284
Siberian Federal District		
Republic of Altai	4920	3388
Republic of Buryatia	3393	1926
Republic of Tuva	1438	923
Republic of Khakassia	3616	1937
Altai Territory	3683	2195
Zabaikalsky Territory	3905	2101
Krasnoyarsk Territory	3127	1833
Irkutsk Region	4014	2432
Kemerovo Region	2403	1372
Novosibirsk Region	6138	3415
Omsk Region	4499	2669
Tomsk Region	4916	2685
Far Eastern Federal District		
Republic of Sakha-Yakutia	1696	953
Kamchatka Territory	1624	919
Primorsky Territory	2611	1667
Khabarovsk Territory	4886	2670
Amur Region	2699	1826
Magadan Region	1926	900
Sakhalin Region	1539	821
Jewish Autonomous Region	1736	631

Coverage of the branch network of state higher education institutions

In 2008, the number of regional branches of state higher education institutions (higher education institutions of the Ministry of Higher Education) was 1102. A considerable number of state higher education institutions' branches in Russia are regionally differentiated. For example, 26 regions have 13 to 75 branches. Half of all Russian regions have no more than 6.

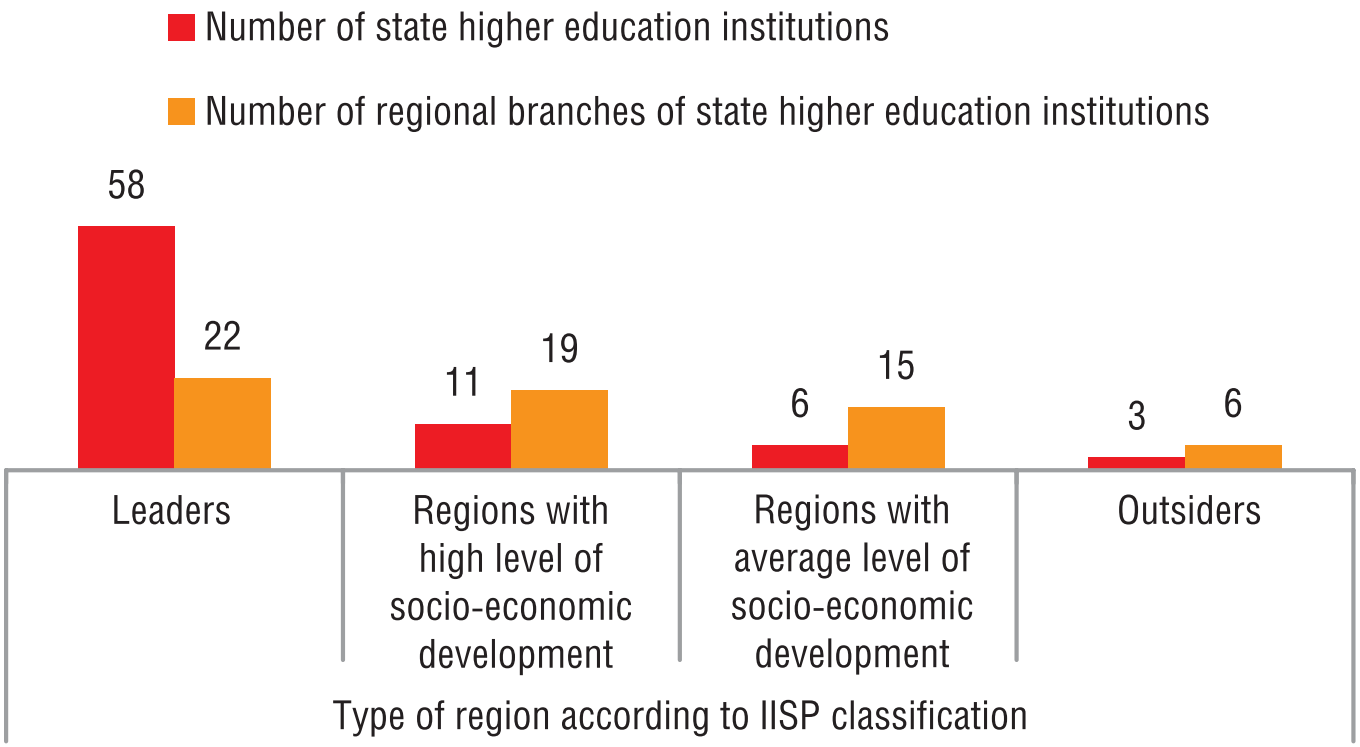
The most regional branches are found in Tyumen Region (75), Moscow and Moscow Region (66), Krasnodar Territory (64), Rostov Region (50), Stavropol Territory (44), Kemerovo Region (31), Republic of Dagestan (33), Sverdlovsk Region (34), Republic of Bashkortostan (35), and Khanty-Mansiisk Autonomous Area (39). Fourteen Russian regions have fewer than five branches. The fewest branches are found today in the Republic of Altai, the Republic of Ingushetia, the Republic of Chechnya, the Republic of North Ossetia-Alania, the Republic of Marii-El, Kostroma Region, and the Republic of Kabardino-Balkaria.

The largest network of state higher education institutions' regional branches is formed by the branches of higher education institutions of Moscow and Saint Petersburg. The largest numbers of branches of these institutions are located in the following regions: Kaluga Region (14), the Krasnodar Territory (15), Moscow and Moscow Region (59), Rostov Region (13), Saint-Petersburg and Leningrad Region (35), Smolensk Region (12), the Stavropol Territory (15), Tver Region (12), Tyumen Region (13). Only one branch of these institutions is found in each of 19 regions: Kostroma Region, Kurgan Region, the Republic of Tuva, Orel Region, Tambov Region, the Republic of Adygeya, Ulyanovsk Region, Republic of Karachayevo-Cherkessia, Sakhalin Region, the Republic of Buryatia, the Republic of Udmurtia, Altai Territory, Irkutsk Region, and Northern Ossetia Republic. In most cases, these regions have few state higher education institutions.

Map 9 shows the regions with the most students attending the branches of the higher education institutions of Moscow and Saint Petersburg. For example, the largest numbers of such students (over 10 000) are located in 10 Russian regions: Smolensk Region, Kursk Region, Kaluga Region, the Stavropol Territory, Republic of Dagestan, the Republic of Bashkortostan, Rostov Region (20561 person), the Krasnodar Territory (23506 people), the Republic of Chuvashia (22487 people), and Moscow and Moscow Region (51605 people).

An analysis of the data by socio-economic classifications of regions revealed contradictory results. Thus, for instance, among leader regions many state higher education institutions are found in Moscow and Moscow Region (117 state higher education institutions), and many state higher education institutions' branches are located in rich oil- and gas-producing areas. There are few state higher education institutions in these areas (5), but many state higher education institutions' branches (32). This means that the value of the parameter is based on the differentiation of regions within the given "cluster". The other types of regions do not demonstrate such differentiation. The most branches of state higher education institutions are found in "Regions with high level of socio-economic development" (19) and in "Regions with average level of socio-economic development" (15).

Diagram 5. Numbers of state higher education institutions and their regional branches according to type of region, 2008



Map 7. Number of regional branches of state higher education institutions (2008)

Map 8. Number of regional branches of Moscow and Saint Petersburg higher education institutions by region (2008)

Map 9. Number of students enrolled at regional branches of Moscow and Saint Petersburg higher education institutions (2008)

Table 4. Number of regional branches of state higher education institutions by region (2008)

	Number of state higher education institutions	Number of branches of state higher education institutions
Central Federal District		
Belgorod Region	6	11
Bryansk Region	4	11
Vladimir Region	4	9
Voronezh Region	16	11
Ivanovo Region	8	6
Kaluga Region	2	14
Kostroma Region	3	2
Kursk Region	5	5
Lipetsk Region	4	6
Orel Region	7	4
Ryazan Region	5	7
Smolensk Region	5	16
Tambov Region	6	5
Tver Region	4	20
Tula Region	2	8
Yaroslavl Region	7	13
Moscow and Moscow Region	124	66
Northwestern Federal District		
Republic of Karelia	3	8
Republic of Komi	4	14
Arkhangelsk Region	3	11
Vologda Region	5	6
Kaliningrad Region	4	12
Murmansk Region	2	16
Novgorod Region	1	8
Pskov Region	5	7
St.Petersburg and Leningrad Region	51	34
Southern Federal District (before 2009)		
Republic of Adygeya	2	5
Republic of Kalmykia	1	4
Krasnodar Territory	12	64
Astrakhan Region	5	10
Volgograd Region	12	13
Rostov Region	16	50
Republic of Dagestan	6	33
Republic of Ingushetia	1	1
Republic of Kabardino-Balkaria	3	2
Republic of Karachayevo-Cherkessia	2	7
Republic of North Ossetia-Alania	5	0
Republic of Chechnya	3	1
Stavropol Territory	9	44

	Number of state higher education institutions	Number of branches of state higher education institutions
Volga Federal District		
Republic of Bashkortostan	12	35
Republic of Marii-El	2	1
Republic of Mordovia	2	5
Republic of Tatarstan	22	27
Republic of Udmurtia	5	11
Republic of Chuvashia	4	11
Perm Territory	10	8
Kirov Region	4	16
Nizhny Novgorod Region	16	12
Orenburg Region	6	16
Penza Region	5	12
Samara Region	17	20
Saratov Region	9	18
Ulyanovsk Region	5	6
Urals Federal District		
Kurgan Region	3	3
Sverdlovsk Region	20	34
Tyumen Region	15	75
Khanty-Mansiisk Autonomous Area	5	39
Yamal-Nenets Autonomous Area	0	24
Chelyabinsk Region	15	10
Siberian Federal District		
Republic of Altai	1	0
Republic of Buryatia	4	8
Republic of Tuva	1	3
Republic of Khakassia	1	4
Altai Territory	8	14
Zabaikalsky Territory	3	7
Krasnoyarsk Territory	11	26
Irkutsk Region	11	19
Kemerovo Region	11	31
Novosibirsk Region	16	9
Omsk Region	10	11
Tomsk Region	7	11
Far Eastern Federal District		
Republic of Sakha-Yakutia	7	17
Kamchatka Territory	2	7
Primorsky Territory	10	27
Khabarovsk Territory	11	6
Amur Region	4	5
Magadan Region	1	3
Sakhalin Region	1	7
Jewish Autonomous Region	1	3

Proportions of students in different training fields (specialties)

Russian regions differ in the proportions of students enrolled in different training fields (specialties). Some regions have larger proportions of students specializing in Engineering, and others in Pedagogy or Natural Sciences. In some regions, no preference is observed in terms of specialties.

Maps 10–17 show the data for extended groups of training fields for the full-time students. In all, eight groups are singled out: Education, Humanities and Culture, Economics, Social Sciences and Law, Natural Sciences, Engineering, Agriculture, Public Health, and Services. These groups follow the international classification of training fields (see Appendix 1).

For each group of training fields, the proportions of full-time and correspondence students in a region were calculated. This allowed us to determine which regions have the maximum and minimum proportions of students in each training field. In addition, separate groups of training fields were compared across regions according to IISP classifications.

Education

The greatest proportion of students in Russia is enrolled in an Education specialty. The Education specialty can be found in all regions of the Russian Federation, but with considerable differences in the proportions of students. The biggest proportions of Education students are observed in Kurgan Region (27.9%), Lipetsk Region (28.4%), Magadan Region (30.0%), Jewish Autonomous Region (53.8%) and the Republic of Tuva (65.7%). The smallest proportions of students specializing in Education are found in Kaliningrad Region (2.2%) and Tver Region (1.6%) as well as in the Republic of Kabardino-Balkaria (3.6%), the Republic of Buryatia (3.0%) and the Republic of North Ossetia-Alania (3.6%).

According to the IISP typology of regions in terms of socio-economic position, the biggest proportion of students specializing in Education is seen in “outsider” regions (21.7%) and the smallest in “Leader” regions (7.7%) (see Diagram 6).

Diagram 6. Proportion of students specializing in Education by region (%), 2008

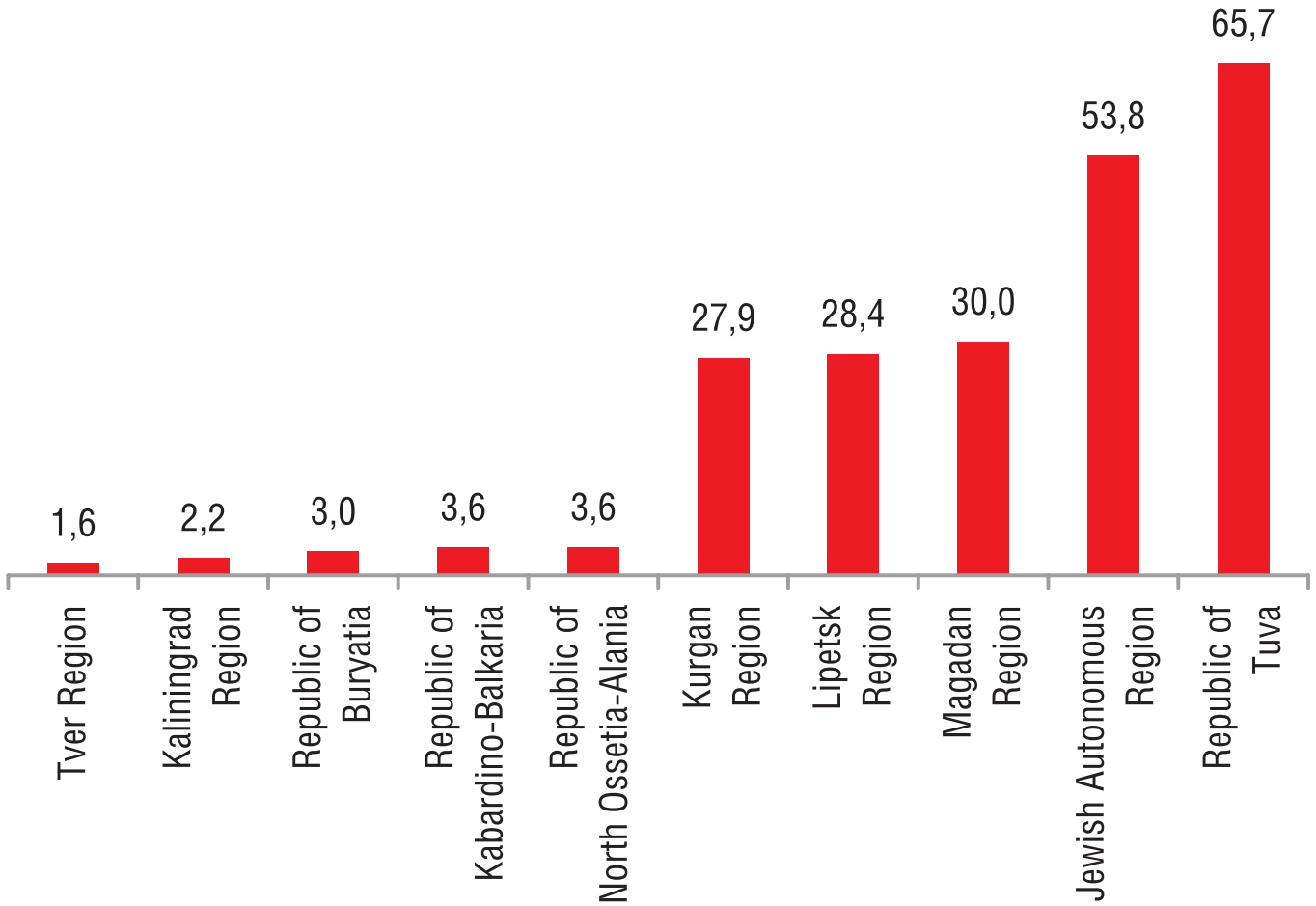
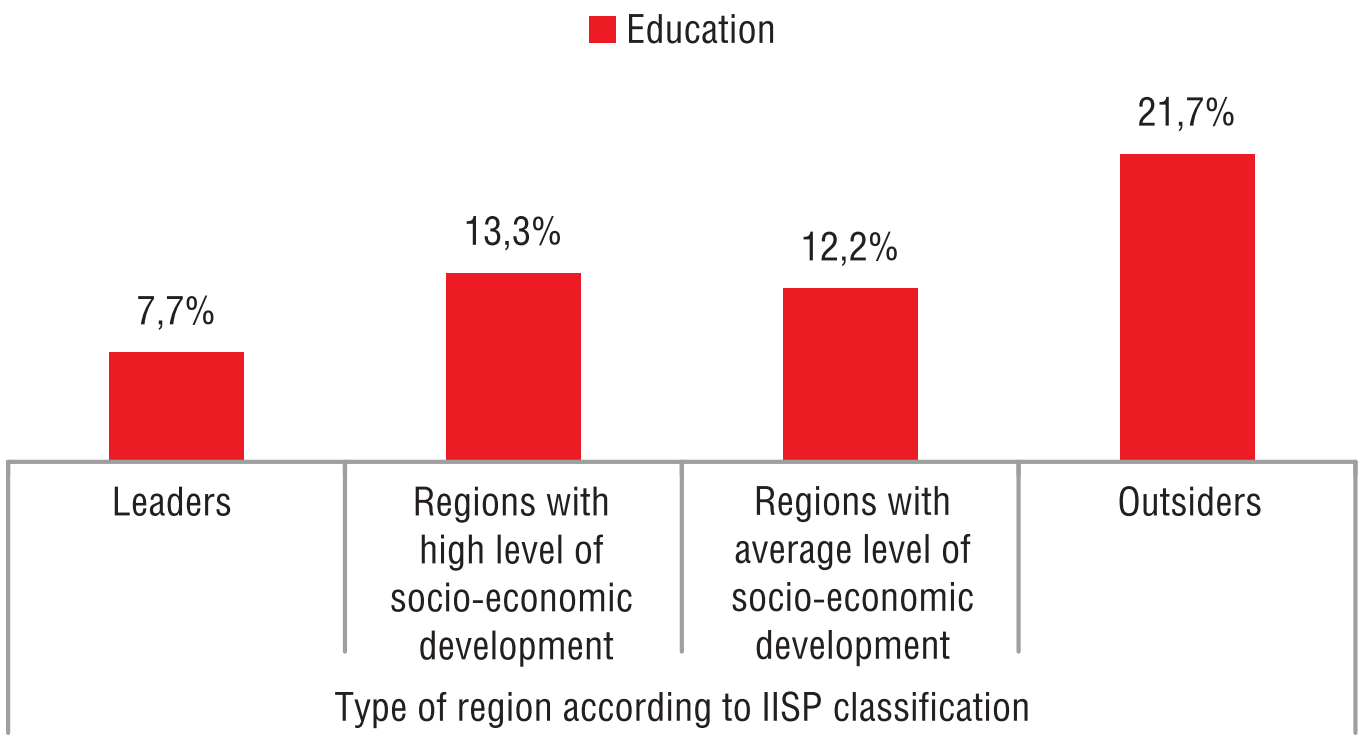


Diagram 7. Proportion of students specializing in Education by type of region, 2008



Map 10. Proportion of students by field of training, Education specialty (full-time students, 2008)

Humanities and Culture

The Humanities and Culture training field involves a small number of students. It is represented in all regions of the Russian Federation with the exception of the Republic of Tuva, the Magadan Region. The smallest proportions of students are found in Bryansk Region (3.5%), Vladimir Region (4.0%), Kaluga Region (1.1%), Penza Region (3.1%), the Republic of Karachayevo-Cherkessia (3.4%). The biggest proportions of students specializing in Humanities and Culture are found in the Republic of Ingushetia (26.9%), the Republic of Buryatia (20.2%), the Republic of Kalmykia (23.5%), the Republic of Sakha-Yakutia (18.8%), and the Republic of Altai (16.2%).

Considering the distribution of students specializing in Humanities and Culture according to the regions' types, the largest proportion is found in "outsider" regions (10.4%). There is no evident difference between the other three types of regions (i.e. "Leaders", "Regions with high level of socio-economic development", "Regions with average level of socio-economic development") (See Diagram 9).

Diagram 8. Proportion of students specializing in Humanities and Culture by region (%), 2008

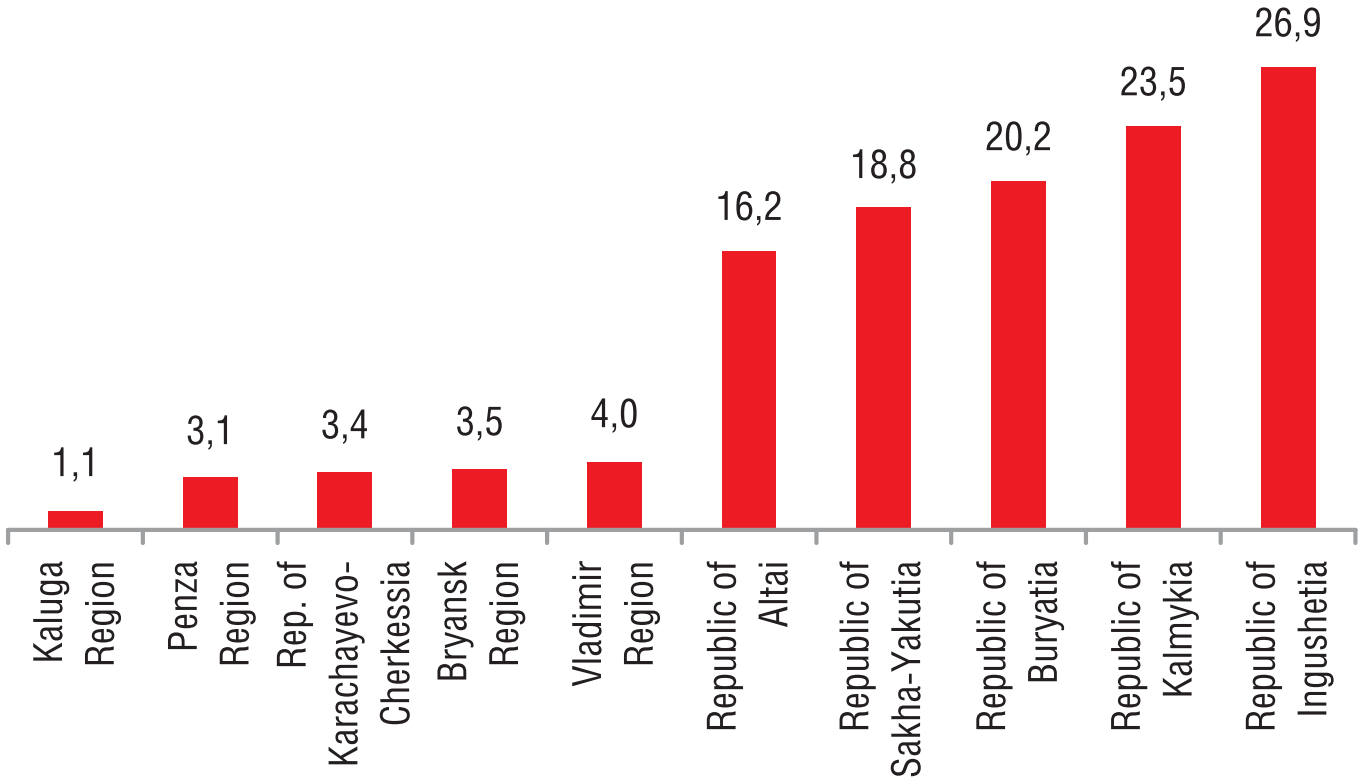
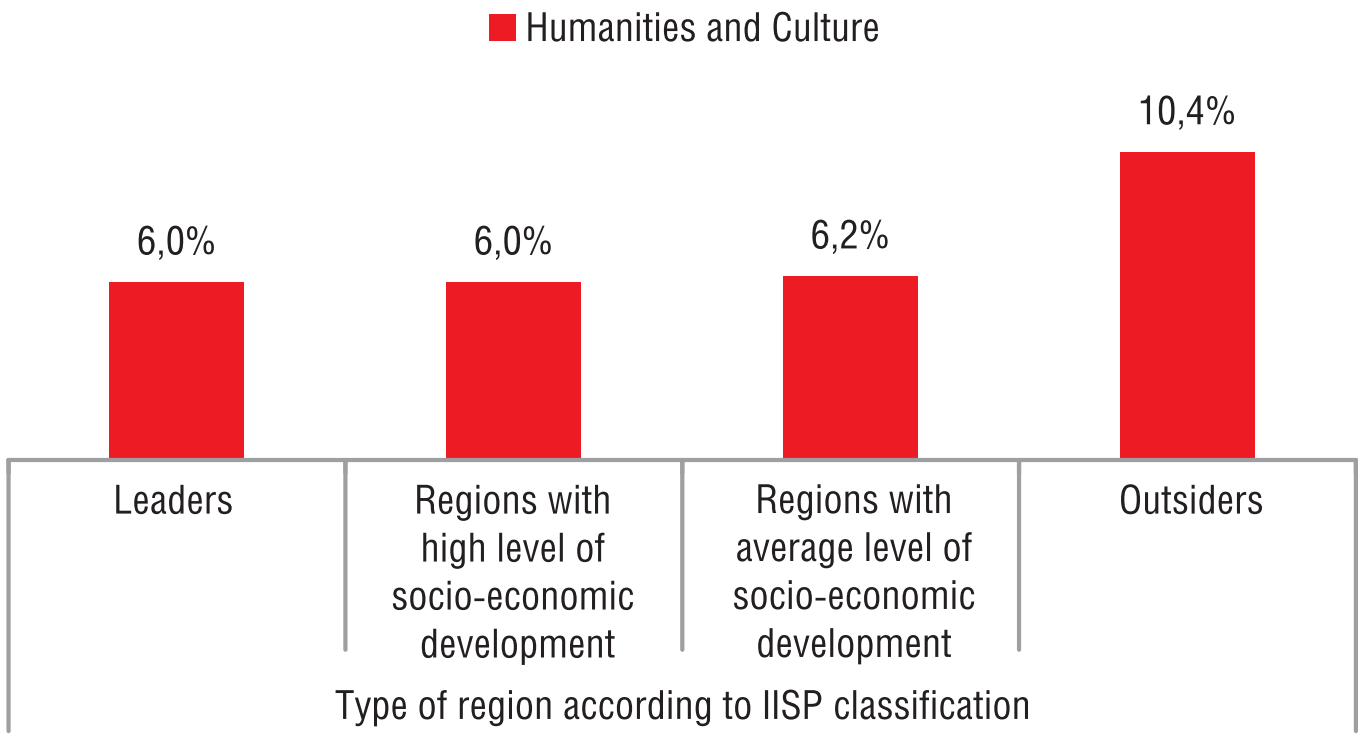


Diagram 9. Proportion of students specializing in Humanities and Culture by type of region (%), 2008



Map 11. Humanities and Culture specialty (full-time students, 2008)

Economics, Social Sciences and Law

The training field of Economics, Social Sciences and Law has developed dynamically in the past 15 years. The number of students enrolled in this specialty has increased greatly, and today it is represented in all Russian regions. The regions with the smallest proportions of students in this training field are the Republic of Tuva (12.8%), the Republic of Karelia (19.3%), the Republic of Altai (20.3%) and Tula Region (23.6%), Amur Region (23.9%). The regions with the largest proportions of students in this training field are Belgorod Region (47.5%), the Kamchatka Territory (49.0%), Sakhalin Region (49.3%), Magadan Region (51.9%) and Yamal-Nenets Autonomous Area (58.9%).

The Economics, Social Sciences and Law specialty is comparatively evenly represented in the four types of regions according to IISP classification. It should be pointed out that, in each type of region, the proportion of coverage is higher as compared with other specialties. "Outsider" regions have the smallest proportion of students specializing in this training field (38%). The largest proportion of students in this training field is found in "Leaders" regions due to the influence of Moscow and Moscow Region (49%). Regions with average level of socio-economic development also demonstrate a high proportion of Economics, Social Sciences and Law students (46.8% - "Regions with average level of socio-economic development", 43.7% - "Regions with high level of socio-economic development").

Diagram 10. Proportion of students in the Economics, Social Sciences and Law training field by region (%), 2008

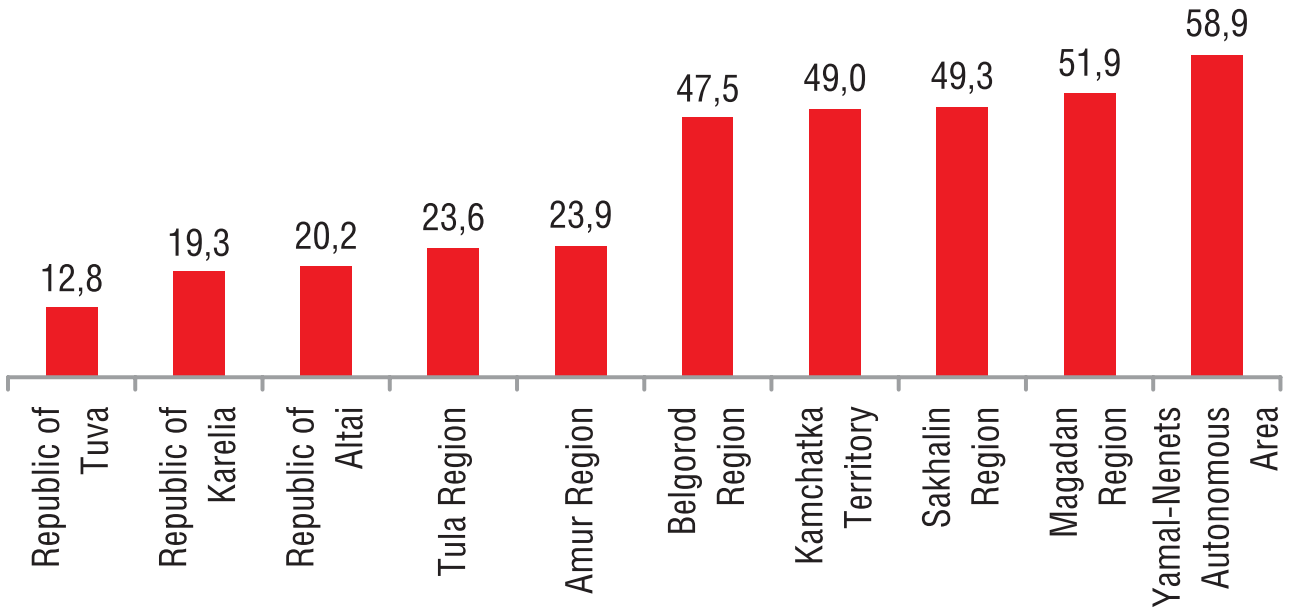
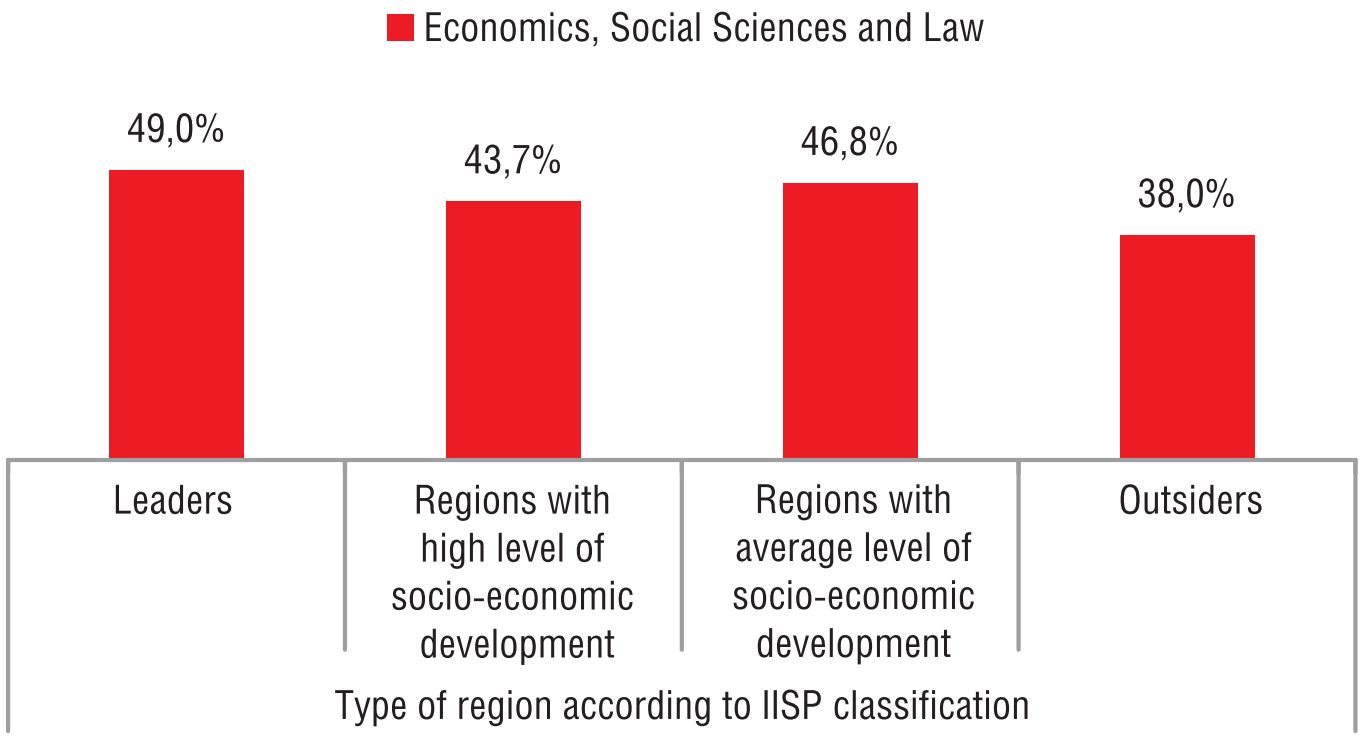


Diagram 11. Proportion of students in the Economics, Social Sciences and Law training field by type of region, 2008



Map 12. Economics, Social Sciences and Law specialty (full-time students, 2008)

Natural Sciences

The Natural Sciences training field includes a smaller proportion of students as compared to other training fields. It is represented in all regions of the Russian Federation with the exception of the Republic of Tuva. The regions with the smallest proportions of students in this training field are the Zabaikalsky Territory (1.8%), the Khabarovsk Territory (4.7%), Yamal-Nenets Autonomous Area (2%), Orel Region (2.6%), Magadan Region (2.8%). The regions with the largest proportions of students in this training field are Kaliningrad Region (13.5%), Voronegh Region (15.5%), Perm Territory (13.8%), the Republic of Kabardino-Balkaria (15.8%), the Republic of Altai (33.9%).

The proportion of students specializing in Natural Sciences is largest in "outsider" regions (7.4%) and smallest in "Leader" regions (4.5%).

Diagram 12. Proportion of students specializing in the Natural Sciences training field by region (%), 2008

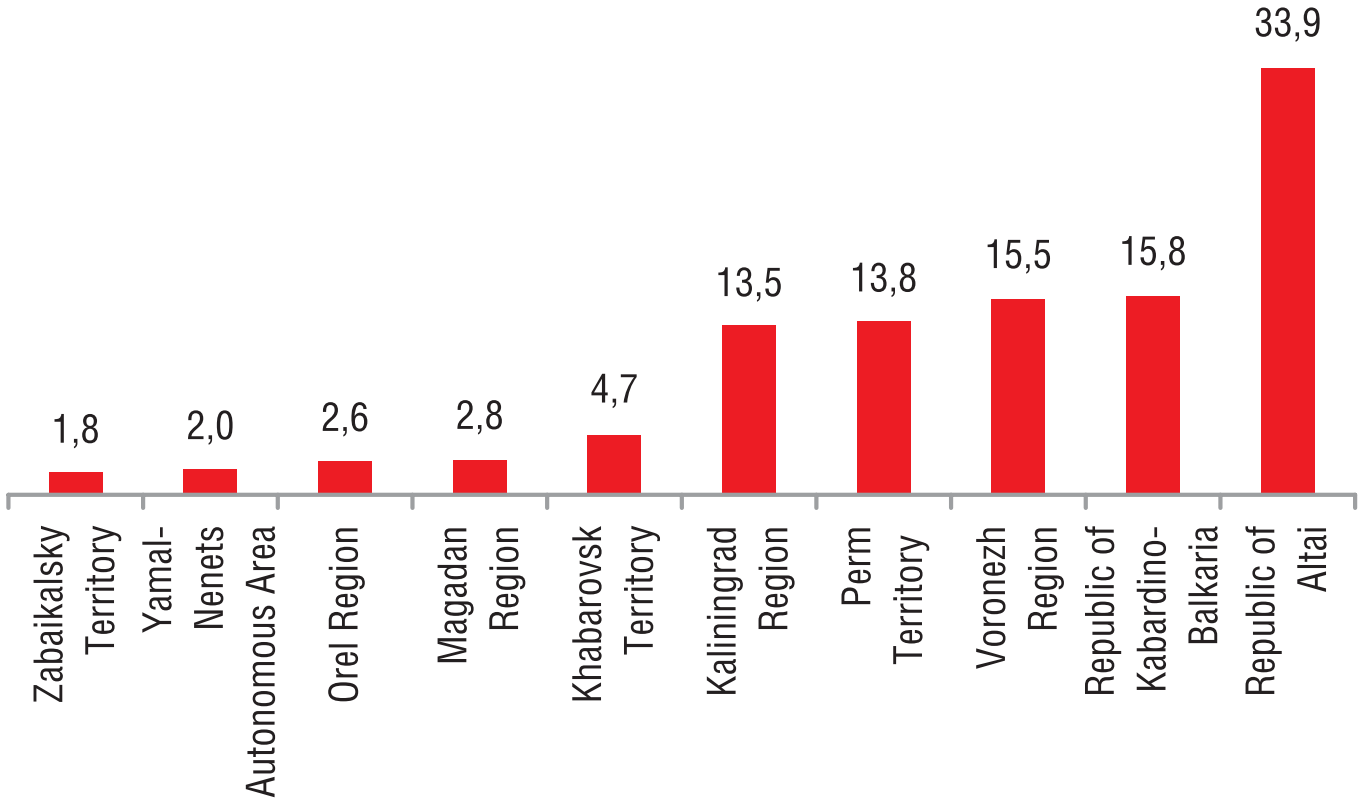
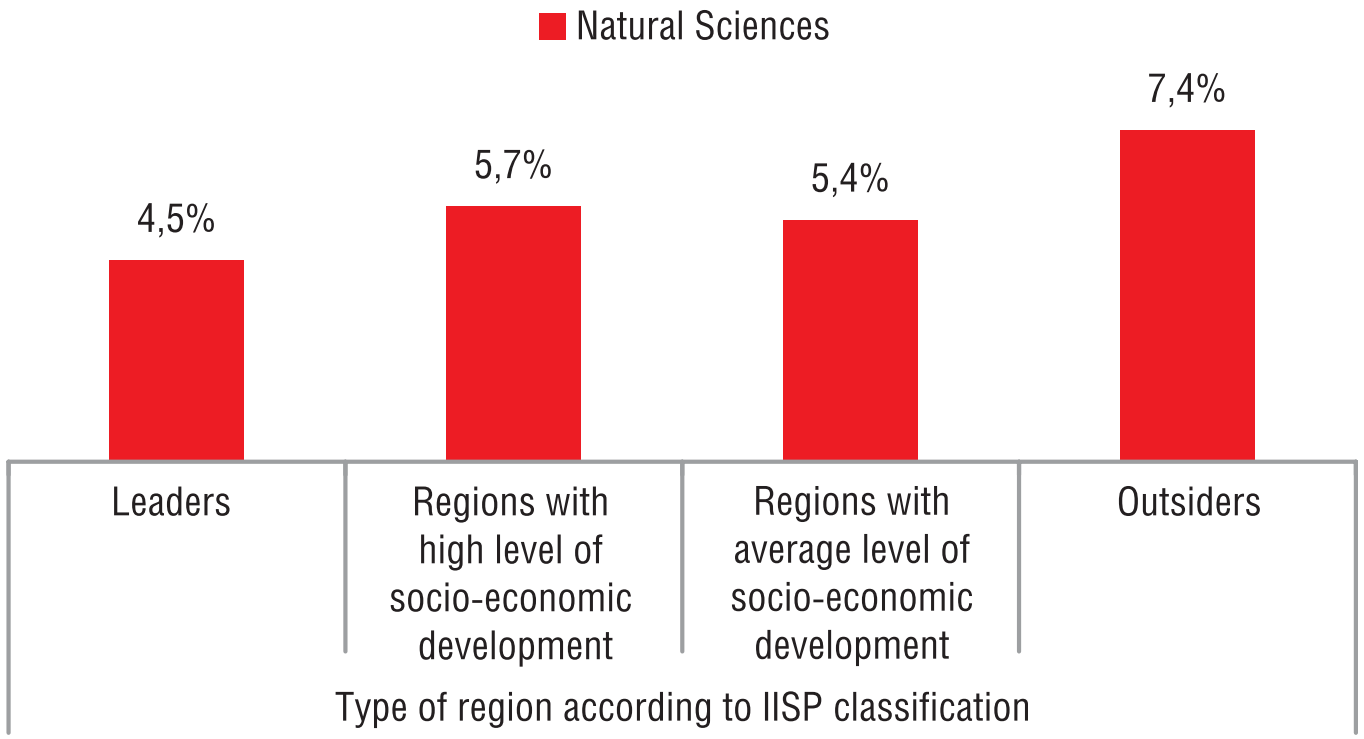


Diagram 13. Proportion of students in the Natural Sciences training field by type of region, 2008



Map 13. Natural Sciences specialty (full-time students, 2008)

Engineering

Engineering is one of the most popular training fields in terms of proportion of students. Still, no full-time students are trained in Engineering in Jewish Autonomous Region, the Republic of Altai, or the Republic of Ingushetia. The regions with the smallest proportions of students specializing in Engineering are the Republic of Kalmykia (6.47%), Sakhalin region (6.5%), the Republic of Dagestan (9.4%), Smolensk Region (10.1%), the Republic of Tuva (10.6%). The regions with the largest proportions of students specializing in Engineering are Samara Region (34.9%), Ivanovo Region (38.1%), Vladimir Region (38.9%), Tula Region (41.1%), the Republic of Tatarstan (35.3%).

Considerable differences in the proportions of students specializing in Engineering are observed between the types of regions classified according to their socio-economic positions. The largest proportion of students specializing in Engineering was found in "Leader" regions: Moscow (city) and Saint Petersburg. The smallest figure was found in "outsider" regions.

Diagram 14. Proportion of students specializing in Engineering by region (%), 2008

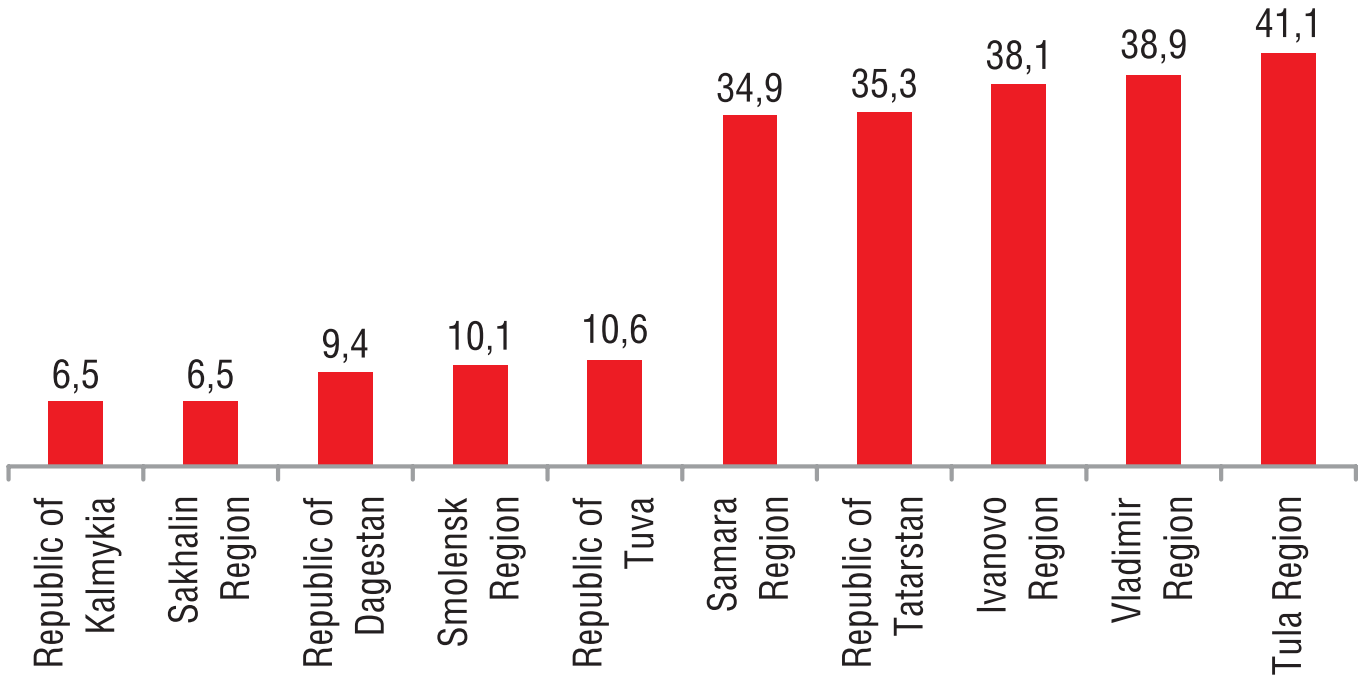
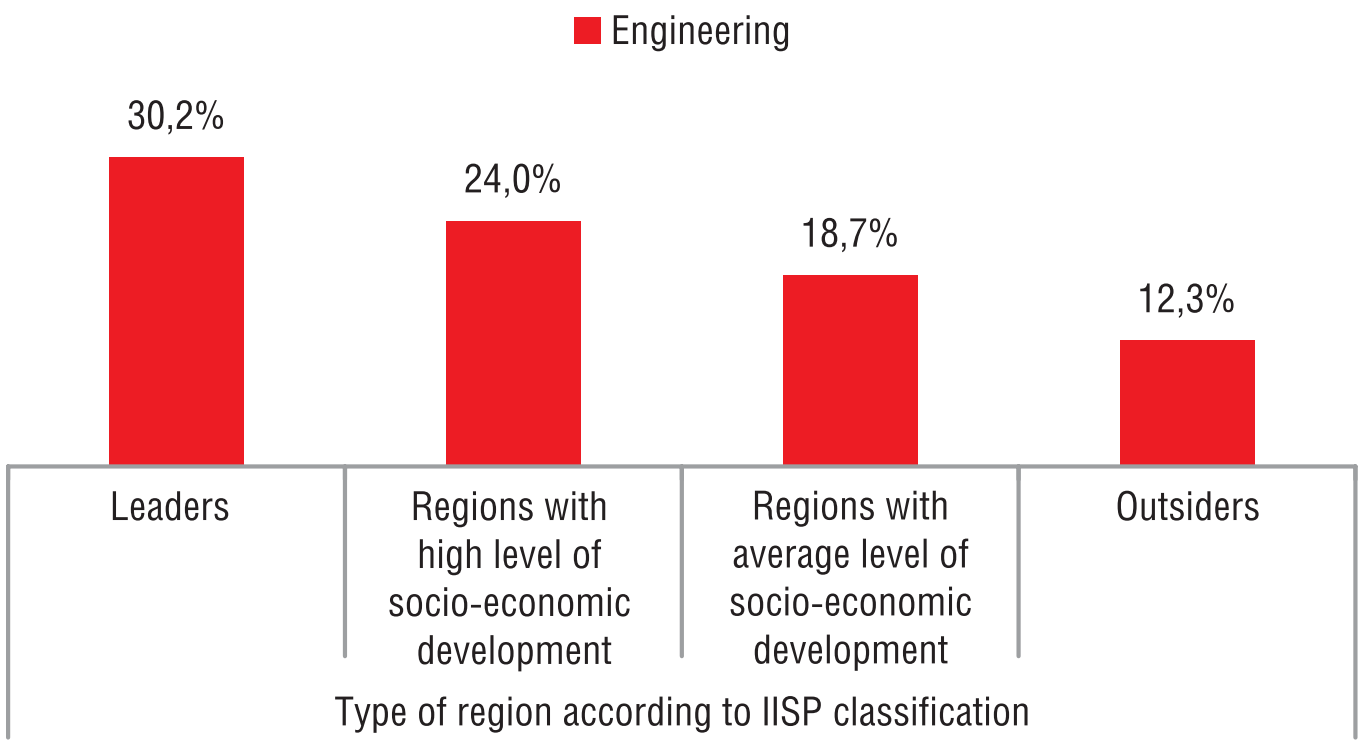


Diagram 15. Proportion of students specializing in Engineering by type of region, 2008



Map 14. Engineering specialty (full-time students, 2008)

Agriculture

There is no full-time training in Agriculture in seven regions: Jewish Autonomous Region, Yamal-Nenets Autonomous Area, Khanty-Mansiisk Autonomous Area, Sakhalin Region, Magadan Region, Murmansk Region and Vladimir region. The smallest proportions of students trained in this specialty are found in Khabarovsk Territory (1.2%), Tula Region (1.3%), Lipetsk Region (1.3%), Tomsk Region (1.6%), the Republic of Dagestan (1.8%). The largest proportions of full-time students specializing in Agriculture are found in Republic of Altai (11.4%), Republic of Marii-El (12.2%), the Republic of Kalmykia (13.1%), Bryansk Region (11.9%), Kostroma Region (16.5%).

The Agriculture training field is not large and is restricted to a few Russian regions. When the regions are compared according to their IISP typology, "Leader" regions (0.5%) have the smallest proportion of students specializing in Agriculture, while "outsider" regions have the largest (7%).

Diagram 16. Proportion of students specializing in Agriculture by region (%), 2008

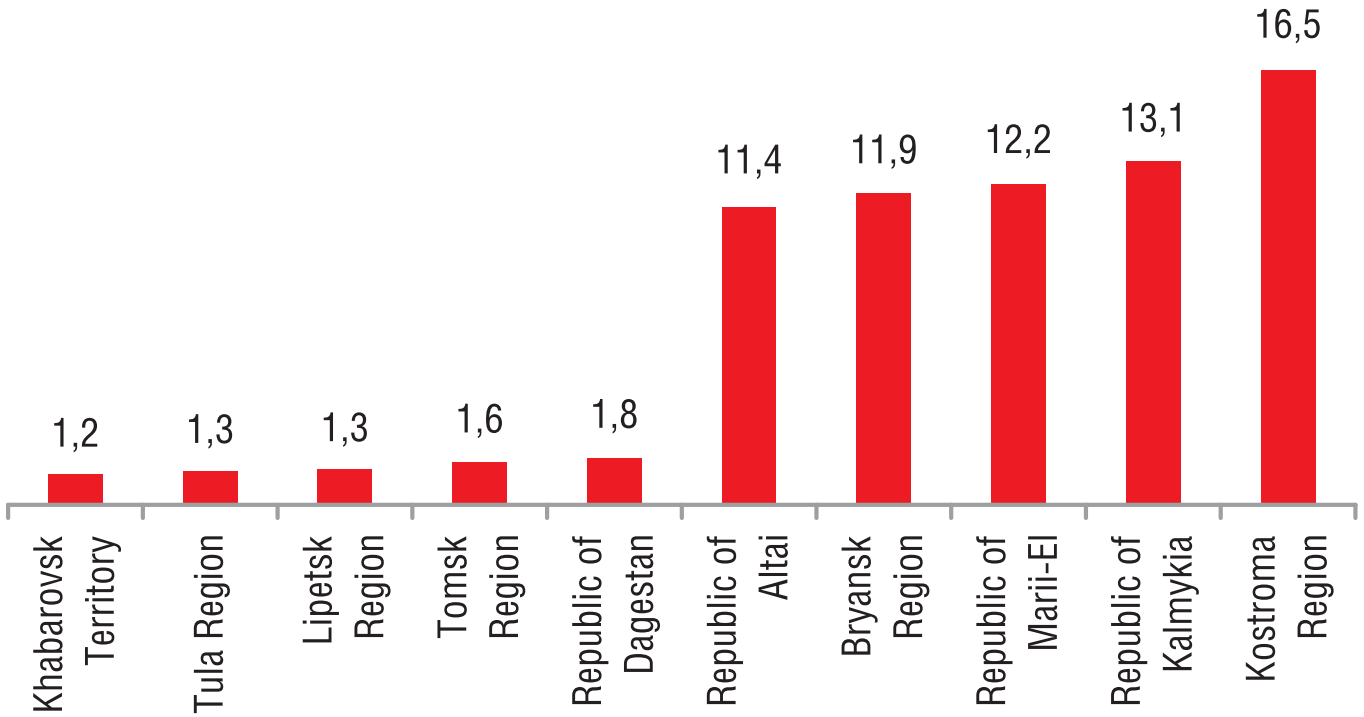
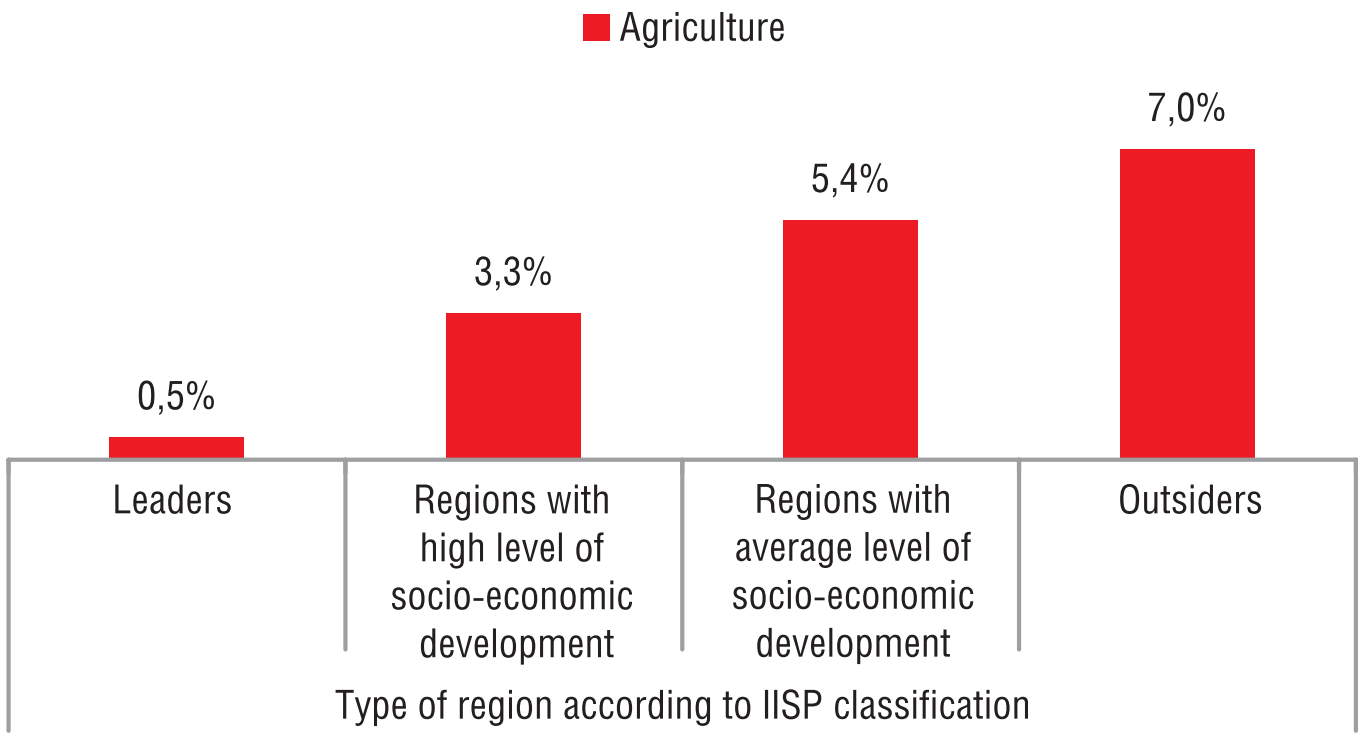


Diagram 17. Proportion of students specializing in Agriculture by type of region (%), 2008



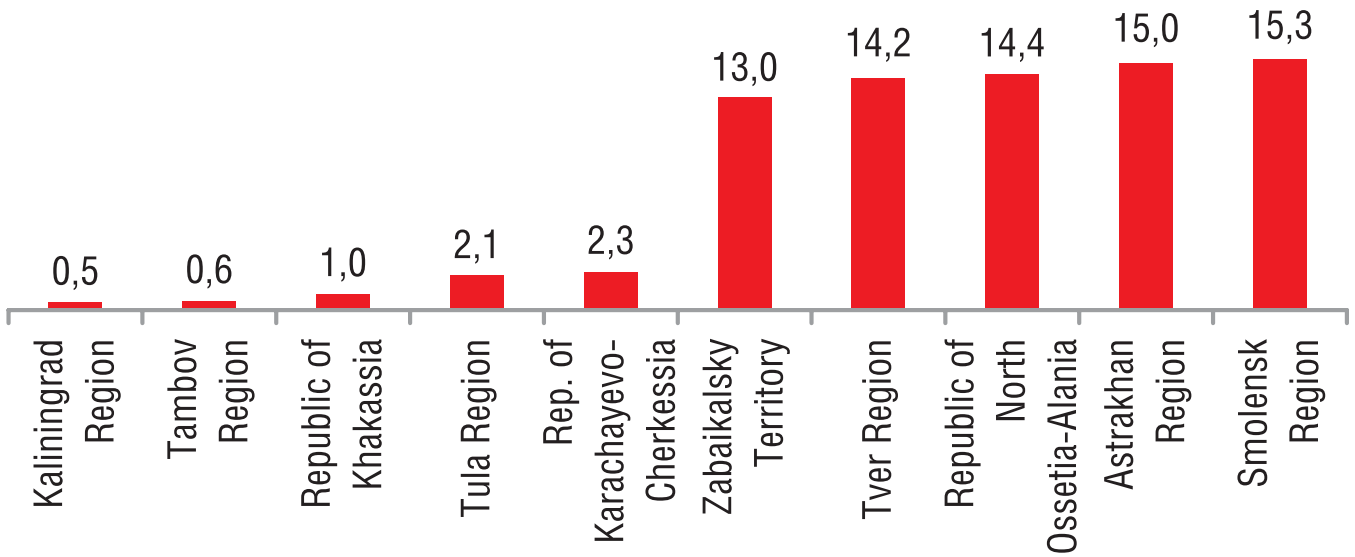
Map 15. Agriculture specialty (full-time students, 2008)

Public Health

The Public Health training field is one of the smallest in terms of its proportion of students. This training field is not offered in 18 Russian regions [6]. At the same time, there is a considerable difference between the proportions of students pursuing this specialty in regions where it is offered. The smallest proportions are found in Kaliningrad Region (0.5%), Tambov region (0.6%), the Republic of Khakassia (1%), Tula Region (2.1%), the Republic of Karachayevo-Cherkessia (2.3%). The largest proportions are in Zabaikalsky Territory (13.0%), Tver Region (14.2%), the Republic of North Ossetia-Alania (14.4%), Astrakhan Region (15.0%), Smolensk Region (15.3%).

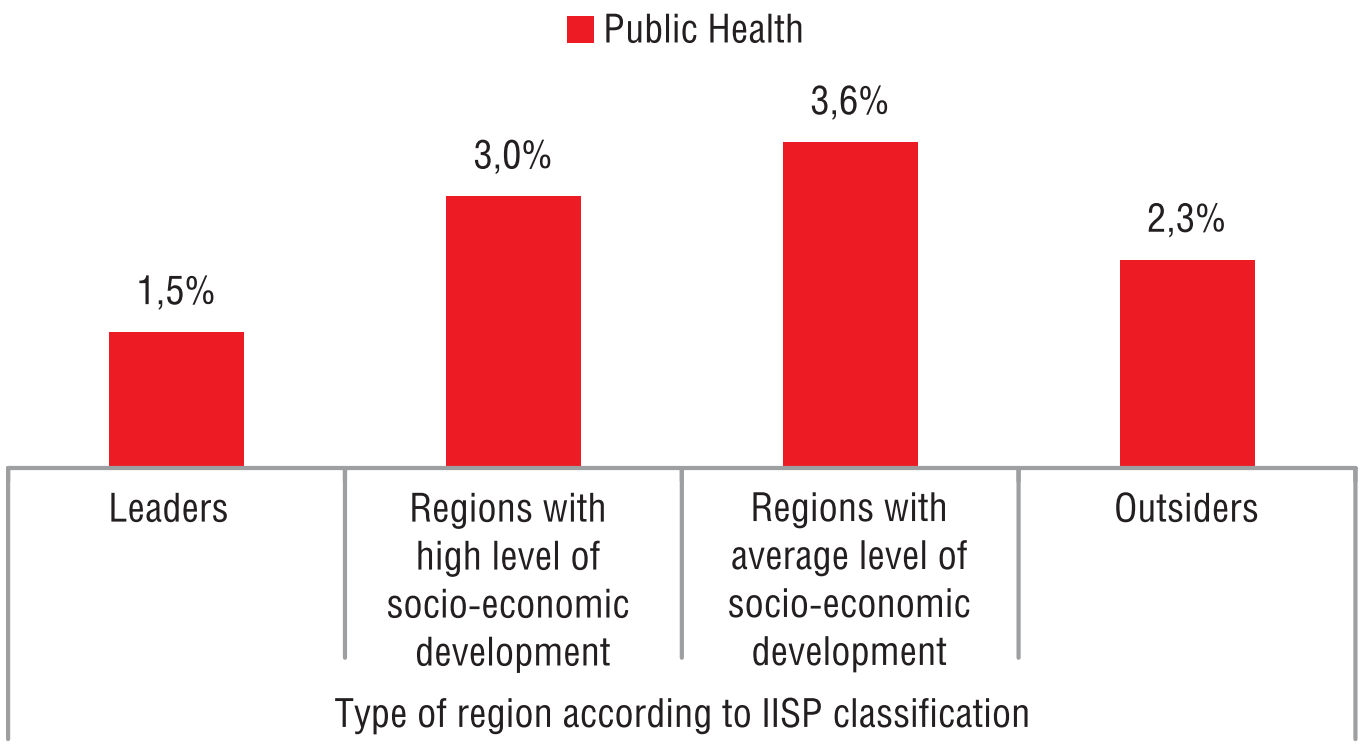
The Public Health specialty is relatively more popular in "Regions with average level of socio-economic development" socio-economic regions. The smallest proportion of students is found in the "Leader" regions.

Diagram 18. Proportion of students specializing in the Public Health training field by region (%), 2008



[6] These are the following: Jewish Autonomous Region, Sakhalin Region, Magadan Region, Yamal-Nenets Autonomous Area, Murmansk Region, Vladimir Region, Lipetsk Region, Kaluga Region, Kamchatka Territory, Vologda Region, the Republic of Altai, Kurgan Region, the Republic of Tuva, the Republic of Marii-El, Pskov Region, Bryansk Region, the Republic of Kalmykia, and Kostroma Region.

Diagram 19. Proportion of students specializing in the Public Health training field by type of region (%), 2008



Map 16. Public Health specialty (full-time students, 2008)

Services

The field of services is a relatively small training field in terms of its proportion of students. Training in this field is not offered in 11 regions. The regions with the smallest proportions of students in this training field are Krasnoyarsk Territory (0.03%), the Republic of Chuvashia (0.09%), Bryansk Region (0.13%), Voronegh Region (0.16%), the Republic of Tatarstan (0.16%). The regions with the largest proportions of students specializing in Services are Yaroslavl Region (3.4%), Krasnodar Territory (3.8%), Stavropol Territory (3.9%), Kaliningrad Region (4.4%) and Smolensk Region (4.7%).

The smallest proportions of students specializing in this field, in terms of regions' socio-economic positions, are found in "Leader" regions (0,6%) and "outsider" regions (0.8%) and the largest in "Regions with average level of socio-economic development" (1.6%).

Diagram 20. Proportion of students specializing in Services (%), 2008

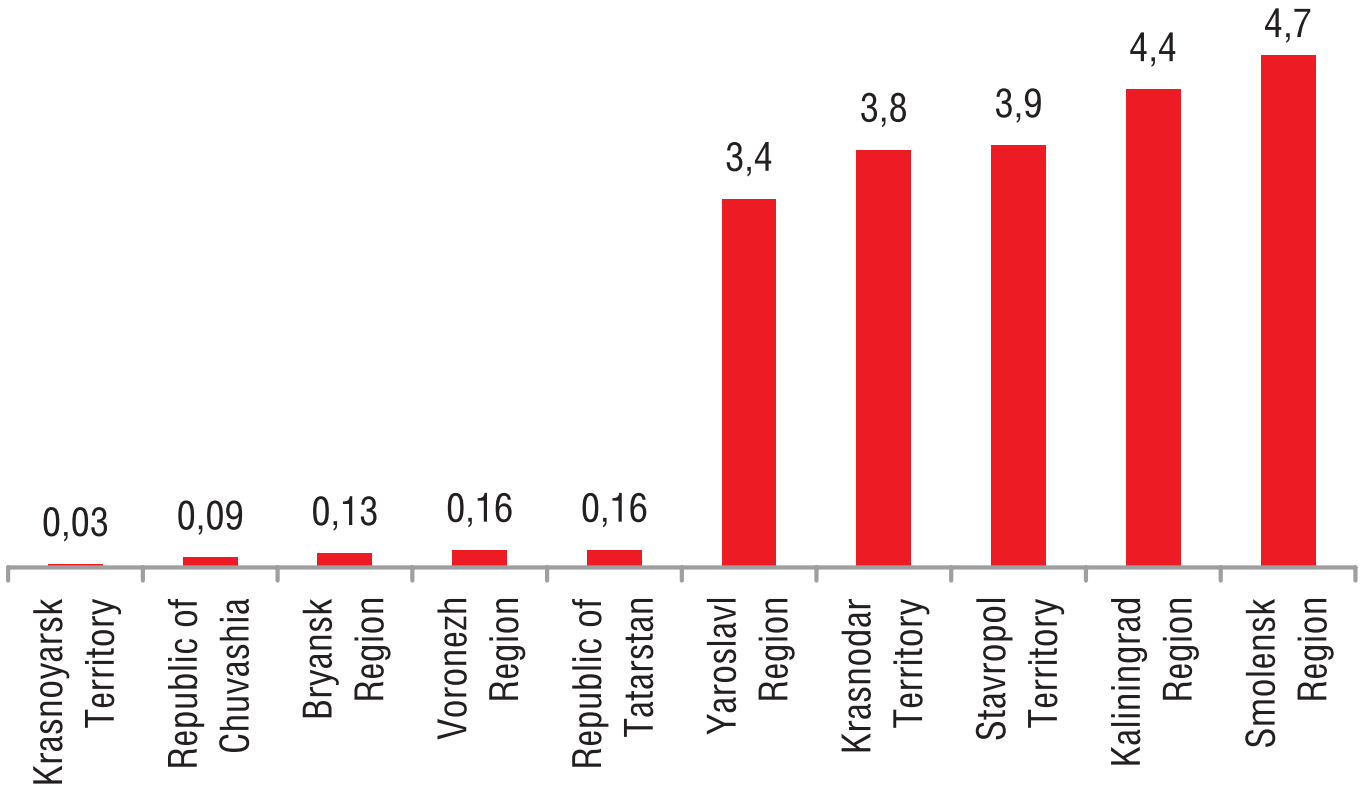
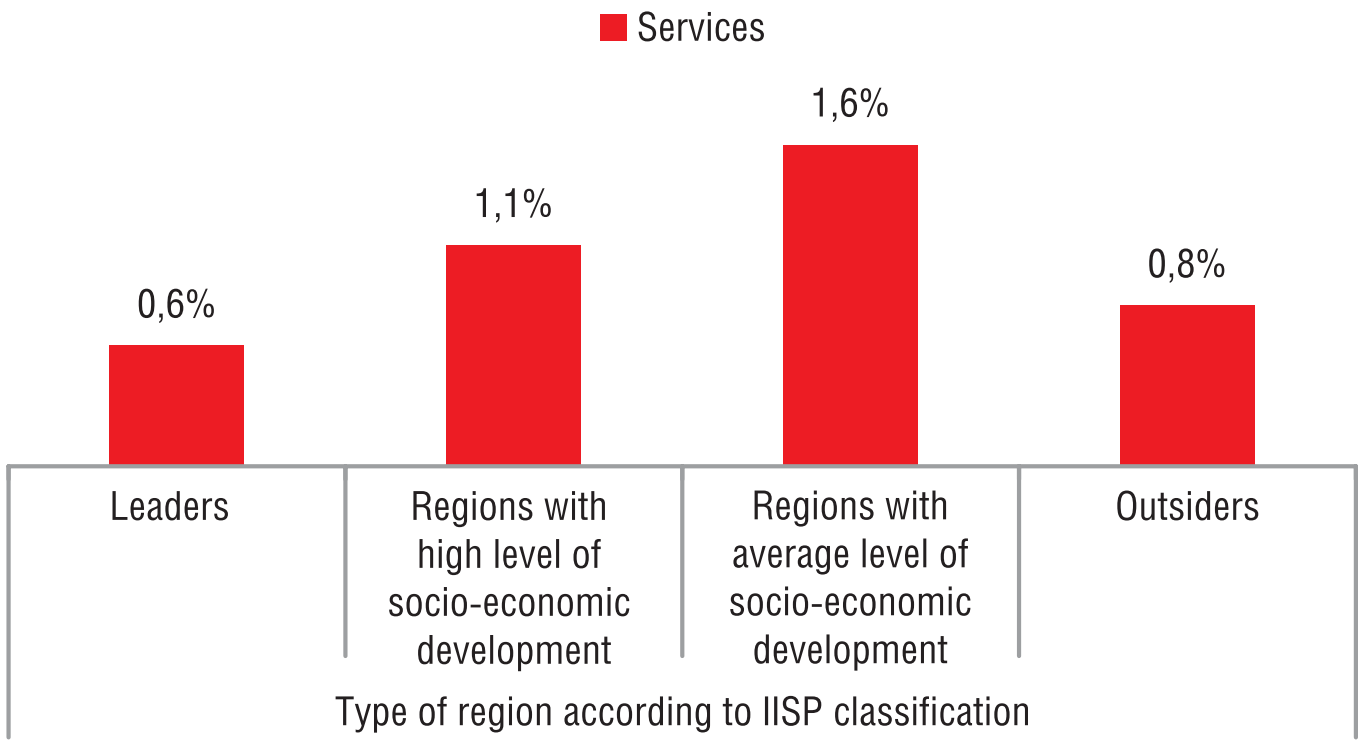


Diagram 21. Proportion of students specializing in Services by type of region (%), 2008



Map 17. Services specialty (full-time students, 2008)

Program diversity index in higher education system across Russian regions

One informative parameter describing the regional higher education market is the variety of educational programs offered to potential customers. It is true that Russian regions vary in the number of specialties offered. Moscow (city), for example, has the maximum number (546), while in Ingushetia Republic there are only 23. In 25 regions, no more than 100 specialties are offered to students. Thus, regions can be separated into those with great variety in terms of specialties and those with little variety.

An index was calculated to capture the proportion of specialties offered to the students in the higher education institutions of a particular region compared to the total number of specialties offered by all regions [7]. This index reflects the diversity of educational offerings in a particular region.

On the basis of this index, the regions with the greatest variety of educational offerings can be singled out. They are Moscow (city), Saint Petersburg, Rostov Region, Sverdlovsk region, the Republic of Tatarstan, Krasnoyarsk Territory, the Republic of Bashkortostan, Primorsky Territory, Tomsk Region, Chelyabinsk Region, Nizhny Novgorod Region, Novosibirsk Region, and Samara Region.

These regions can be considered as centers that offer a wide variety of options to realize the educational ambitions of potential students. More than half of these regions are the locations of Federal universities and higher education institutions' consortiums. The exceptions are some regions that are important industrial centers. Thus, a wide variety of programs is typical of Russian megacities.

On the basis of the calculated index, the regions with the least variety of educational programs were also identified. Regions offering up to 10% of the specialties available nationwide are: the Republic of Karachayevo-Cherkessia, the Republic of Adygeya, Kamchatka Territory, Sakhalin Region, Pskov region, the Republic of Kalmykia, Jewish Autonomous Region, the Republic of Tuva, Magadan Region, the Republic of Altai, and the Republic of Ingushetia. These are predominantly poorly developed regions with small proportions of students enrolled in state higher education institutions per 10 000 inhabitants. Still, among them are some relatively more developed regions, namely Pskov Region and Magadan Region.

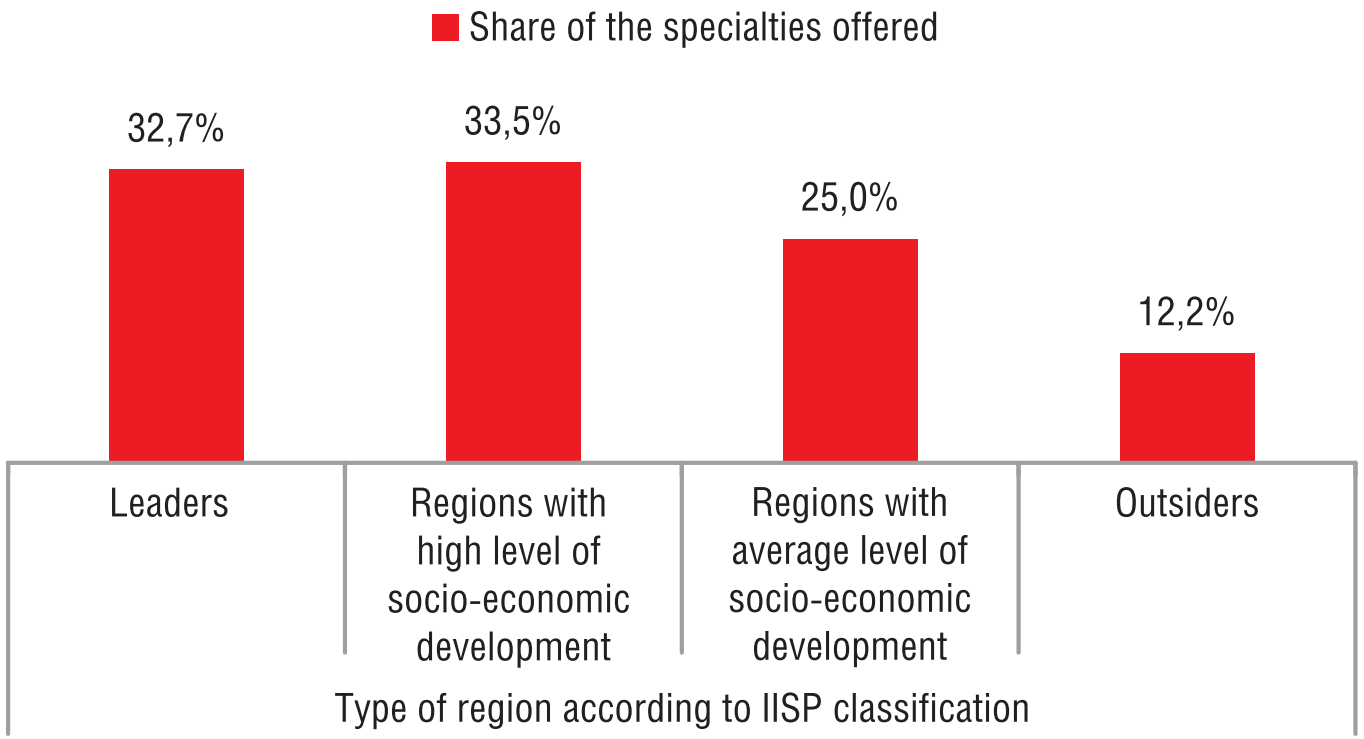
If we consider the ratings of regions in light of the calculated index of "education potential variety" as compared to the index of "regions' innovativeness" calculated by IISP [8], we see that the sets of regions at the top and at the bottom coincide, with a few exceptions.

[7] Calculation by LIA, Higher School of Economics. Research Laboratory for Institutional Analysis of Economic Reforms (LIA) was set up in the HSE in January 2005 under the direction of Prof. Yaroslav Kouzminov and Dr. Maria Yudkevich. LIA carries out research on request from a number of ministries and administrative departments of the Russian Federation government including the Ministry of Education and Science and the Ministry of Economic Development. LIA has carried out projects devoted to the efficiency assessment of higher education institutions, and of budget expenditures in education; analysis of education policies and analysis of dynamics of regional higher education markets.

[8] The index was introduced by the Independent Institute of Social Policy (IISP) and is calculated based on five parameters: number of workers involved in research as a percentage of the overall number of workers, the number of higher education students per 1000 inhabitants, the number of registered patents per 1000 workers, technology innovation expenditures in rubles/person, and level of Internet coverage (%) (more details on the index can be obtained from: http://www.socpol.ru/atlas/indexes/index_innov.shtml).

The comparison of the regions in terms of their socio-economic position shows that the greatest variety of specialties is found in “Leader” regions (32.7%) and “Regions with high level of socio-economic development” (33.5%). The least variety of educational offerings is observed in “outsider” regions (12.2%).

Diagram 22. Proportion of the specialties that are offered by regions of each type, 2008



Map 18. Proportions of specialties offered in the region (2008)

Level and dynamics of tuition fees

The characteristics of tuition fees [9] shown on maps 19 and 20 demonstrate the fee differentiation of the higher education market as well as the dynamics of tuition fees. In more than half of the regions, the average tuition fees do not exceed 48 000 rubles per year. In 15 regions, the average tuition fee is over 53 000 rubles. The most expensive regions in terms of tuition fees are Saratov Region, the Republic of Kabardino-Balkaria, Krasnodar Territory, Belgorod Region, the Republic of Udmurtia, the Republic of Chuvashia, Smolensk Region, the Republic of Tatarstan, Saint Petersburg and Leningrad Region, the Republic of Bashkortostan, and Omsk Region. This unexpected list of regions (for example, Moscow is not included) can be explained by the existence of different price segments within the local markets of education services. For example, there can be both higher education institutions offering their services at 300 000 rubles per year as well as a considerable segment of education services offered at 30 000 rubles per year.

The regions in which the average tuition fees do not exceed 30 000 rubles per year are the Republic of Ingushetia, the Republic of Buryatia, the Republic of Tuva, Kamchatka Territory, the Republic of Adygeya, the Republic of Karachayevo-Cherkessia, the Republic of Dagestan, the Republic of Sakha-Yakutia, Magadan Region, Orel Region, Amur Region, and Jewish Autonomous Region. The majority of these regions have very few students per 10 000 inhabitants.

The level of tuition fees differs depending on the socio-economic position of the region. Thus, the lowest average tuition fees are found in "outsider" regions (36 750 rubles/year), while the highest are found in "Regions with high level of socio-economic development" (47 367 rubles/year). A slightly lower figure is found in "Leader" regions (45 362 rubles/year), which must be related to the considerable differentiation in the level of fees within the given cluster of regions.

As for the dynamics of tuition fees from 2007 to 2009 (Map 20), only four regions exhibited a decrease in average tuition fees, and in seven regions they increased by up to 10%. In most regions, the increases in fees did not exceed 30% over two years. Still, in 17 Russian regions, the fees increased by up to 50%, and in 7 more regions to 118%. The maximum increases in fees were found in Saratov Region, Khabarovsk Territory, Kaliningrad Region, the Republic of North Ossetia-Alania, Volgograd Region, the Republic of Tuva, the Republic of Chuvashia, Tula Region, and the Republic of Kabardino-Balkaria.

The comparison of fees' dynamics in terms of regions' IISP classification yields quite interesting results. The smallest increase in tuition fees in 2007–2009 was found in "Leader" regions (115,2%), while the largest increase took place in "outsider" regions (132.5%). Surprisingly, similar results are obtained for the index of concentration level, which will be examined later. For example, institutions located in "Regions with high level of socio-economic development", with the smallest increase in tuition fees over a period of two years, are at the same time situated in a more competitive environment as compared to the institutions located in outsider regions, where the largest increase in tuition fees was observed.

[9] The fees data are shown with reference to the regional differentiation of the cost of "consumer basket".

Diagram 23. Average yearly tuition fees by type of region, 2009

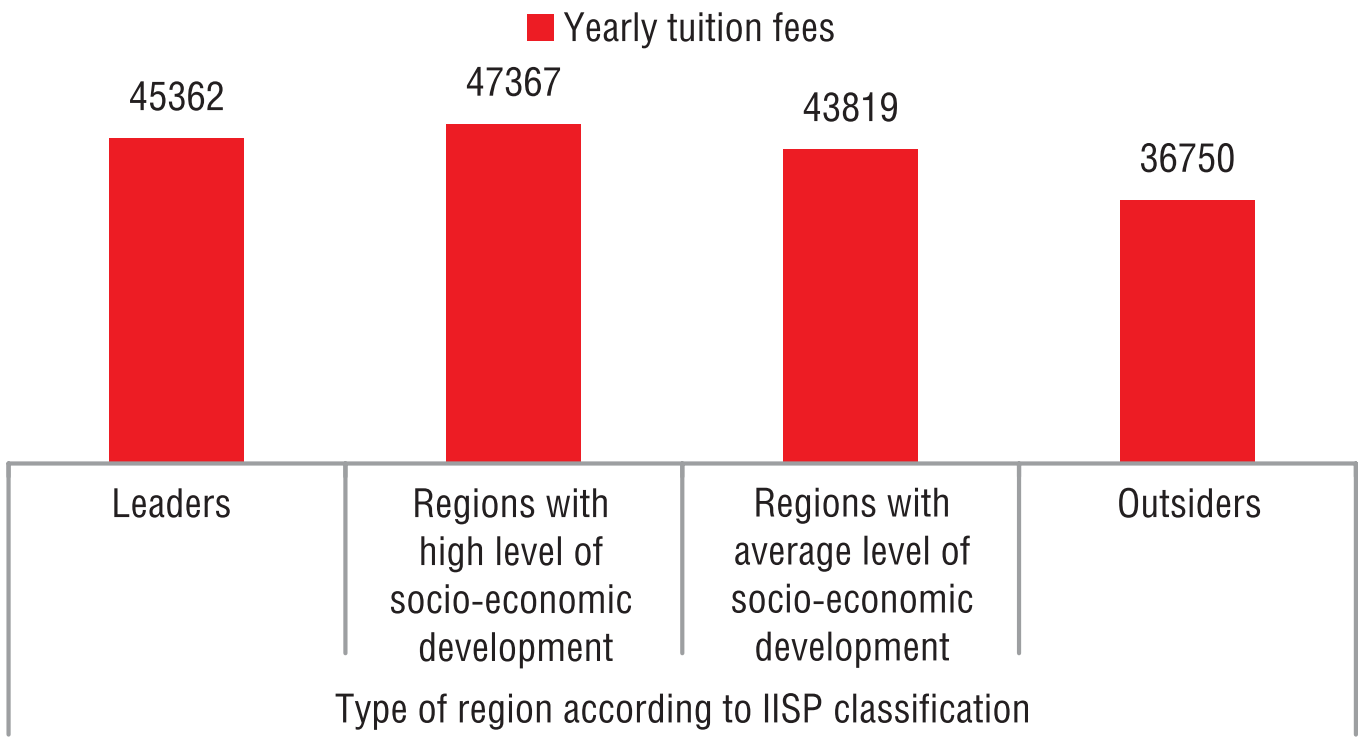
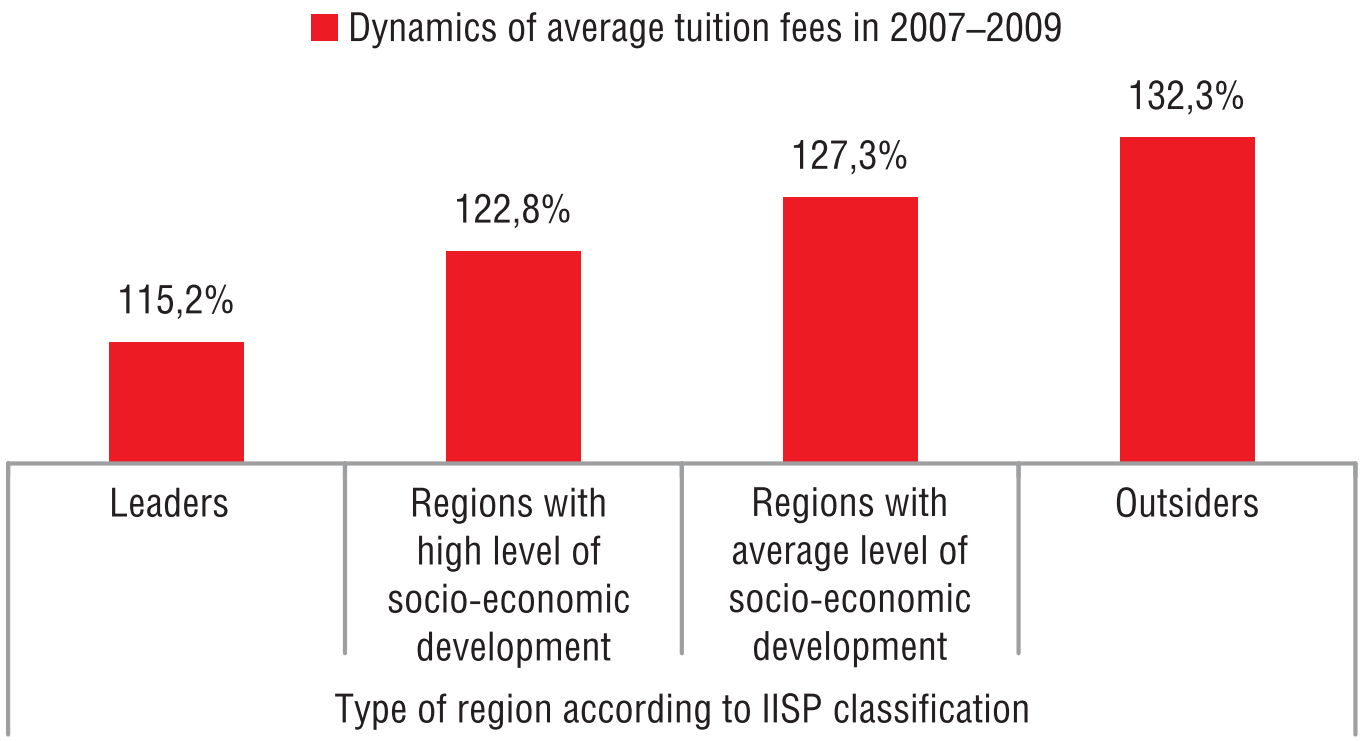


Diagram 24. Dynamics of average tuition fees (%), 2007–2009



Map 19. Average yearly tuition fees (with regard to regional differentiation, 2009)

Map 20. Tuition fees' dynamics, 2007–2008, showing fees' growth over 2 years

Table 5. Average tuition fees and their dynamics (rubles/year)

	Average yearly tuition fees (with respect to regional differentiation)	Dynamics of average tuition fees (%), 2007–2009
Central Federal District		
Belgorod Region	56790	1,27
Bryansk Region	30893	1,24
Vladimir Region	43941	1,39
Voronezh Region	38112	1,19
Ivanovo Region	48771	1,31
Kaluga Region	36759	1,06
Kostroma Region	34633	1,24
Kursk Region	44447	1,21
Lipetsk Region	50646	1,16
Orel Region	29745	1,24
Ryazan Region	53388	1,26
Smolensk Region	59350	1,37
Tambov Region	43613	1,37
Tver Region	46607	1,22
Tula Region	47601	1,70
Yaroslavl Region	51506	1,35
Moscow and Moscow Region	49936	1,25
Northwestern Federal District		
Republic of Karelia	35798	1,22
Republic of Komi	35611	1,04
Arkhangelsk Region	44210	1,19
Vologda Region	43205	1,28
Kaliningrad Region	54958	1,48
Murmansk Region	41352	1,19
Novgorod Region	35462	1,22
Pskov Region	30758	1,24
St.Petersburg and Leningrad Region	60345	1,28
Southern Federal District (before 2009)		
Republic of Adygeya	27496	1,00
Republic of Kalmykia	33423	1,14
Krasnodar Territory	56765	1,19
Astrakhan Region	49298	1,33
Volgograd Region	55211	1,52
Rostov Region	50408	1,16
Republic of Dagestan	28412	1,21
Republic of Ingushetia	20276	1,27
Republic of Kabardino-Balkaria	56654	2,17
Republic of Karachayevo-Cherkessia	27633	1,23
Republic of North Ossetia-Alania	49623	1,50
Republic of Chechnya	50645	н.д.
Stavropol Territory	38623	0,95

	Average yearly tuition fees (with respect to regional differentiation)	Dynamics of average tuition fees (%), 2007–2009
Volga Federal District		
Republic of Bashkortostan	61921	1,20
Republic of Marii-El	47588	1,14
Republic of Mordovia	42501	1,18
Republic of Tatarstan	60009	1,25
Republic of Udmurtia	56843	1,36
Republic of Chuvashia	58301	1,63
Perm Territory	43307	1,21
Kirov Region	38134	1,27
Nizhny Novgorod Region	48094	1,35
Orenburg Region	40429	1,16
Penza Region	45808	0,97
Samara Region	51282	1,15
Saratov Region	56496	1,42
Ulyanovsk Region	49717	1,30
Urals Federal District		
Kurgan Region	38101	1,17
Sverdlovsk Region	52403	1,18
Tyumen Region	50975	1,23
Khanty-Mansiisk Autonomous Area	46748	1,19
Yamal-Nenets Autonomous Area	37457	1,03
Chelyabinsk Region	40307	1,27
Siberian Federal District		
Republic of Altai	34677	1,11
Republic of Buryatia	25375	1,15
Republic of Tuva	27325	1,60
Republic of Khakassia	45189	1,08
Altai Territory	46286	1,28
Zabaikalsky Territory	45687	1,24
Krasnoyarsk Territory	48204	1,30
Irkutsk Region	45687	1,24
Kemerovo Region	55038	1,26
Novosibirsk Region	53587	1,31
Omsk Region	66322	1,16
Tomsk Region	53382	1,33
Far Eastern Federal District		
Republic of Sakha-Yakutia	40076	1,09
Kamchatka Territory	49473	1,13
Primorsky Territory	52362	1,27
Khabarovsk Territory	61832	1,45
Amur Region	33474	1,13
Magadan Region	43287	1,22
Sakhalin Region	45943	1,32
Jewish Autonomous Region	34447	1,05

Concentration indices in higher education system across Russian regions

Regional concentration indices are used as indicators of the competitive environment for state higher education institutions [10]. The calculation of such indicators is especially relevant today with "demographic drop" and the associated decline in the number of applicants to state higher education institutions. The calculated concentration index varies from 0 to 1. The closer it is to 1, the lower the concentration level, and vice versa. The indices were calculated separately for full-time students and correspondence students.

For example, Map 21 shows that in 18 regions this index does not exceed 0.1, which means that the competitive environment is potentially tough. In 4 regions, the index is above 0.6, which indicates a weak competitive environment. The smallest concentration index values are found in the megacities of Moscow and Saint Petersburg as well as in Rostov Region, the Republic of Tatarstan, Samara Region, Stavropol Territory, the Republic of Bashkortostan, and Krasnodar Territory. In these regions there is an established dense environment, which is reflected in the high level of competition between higher education institutions for potential applicants as well as in the segmentation of local higher education markets. The largest values of the index (more than 0.5) are found in Sakhalin, Magadan, and Novgorod Regions, the Republic of Mordovia, the Republic of Khakassia, the Republic of Kalmykia, Jewish Autonomous Region, the Jewish Autonomous Region, the Republic of Altai, and the Republic of Tuva. In these regions, there is a high density of full-time students per higher education institution.

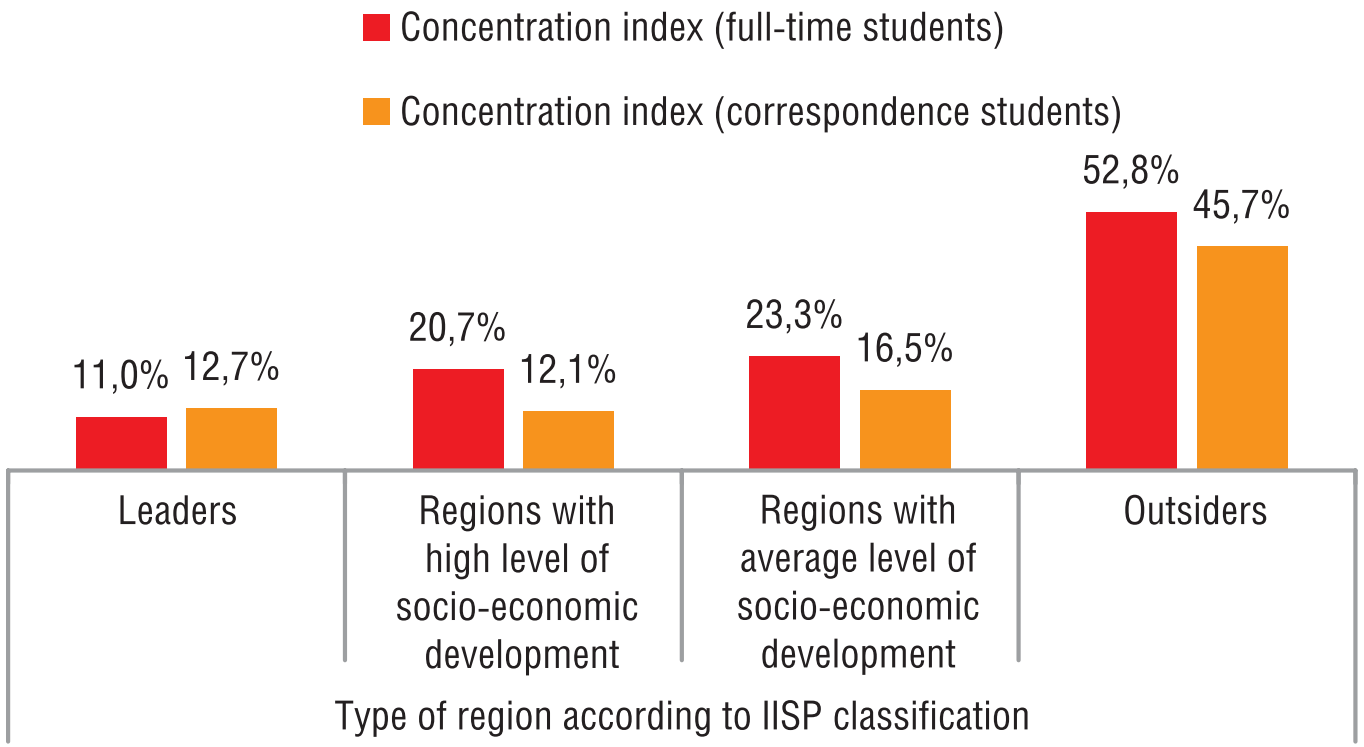
Map 22 shows the index values for correspondence students. As can be seen, for the majority of regions, the index values do not exceed 0.4. For example, the smallest index values are found in Chukotka Autonomous Area [11], Moscow and Moscow Region, Saint Petersburg and Leningrad Region, Rostov Region, Krasnodar Territory, the Republic of Tatarstan, the Republic of Bashkortostan, Kemerovo Region, Stavropol Territory and Samara Region. The largest index values are in Novgorod Region, Kurgan Region, the Republic of Adygeya, the Republic of Chechnya, the Republic of Marii-El, the Republic of Kalmykia, the Republic of Khakassia, the Republic of Tuva, the Republic of Ingushetia, and the Republic of Altai.

It may be quite interesting to compare the concentration index values within the frame of the regions' IISP socio-economic classification. The biggest index values are found in outsider regions, while the smallest values are observed in leader regions. This may mean that in leader regions there is the potential for competition between higher education institutions for state budget students as well as segmentation of the regional education services market. In outsider regions, on the contrary, the competitive environment is weak, and the market is split among several major universities (see Diagram 25).

[10] To calculate the concentration index, the data for full-time and correspondence students enrolled in state higher education institutions were used. Calculations by the authors.

[11] This can be explained by a small number of students.

Diagram 25. Concentration indices for full-time and correspondence students by type of region



Map 21. Herfindahl-Hirschman Index for full-time students (2008, calculations by State University – Higher School of Economics)

Map 22. Herfindahl-Hirschman Index for correspondence students
(2008, calculations by State University – Higher School of Economics)

Table 6. Concentration indices for full-time and correspondence students by region (%)

	Herfindahl-Hirschman Index (%), full-time students	Herfindahl-Hirschman Index (%), correspondence students
Central Federal District		
Belgorod Region	19,2	15,1
Bryansk Region	23,2	15,5
Vladimir Region	22,1	14,1
Voronezh Region	11,0	8,9
Ivanovo Region	12,2	10,8
Kaluga Region	16,7	12,7
Kostroma Region	33,9	27,8
Kursk Region	19,0	14,6
Lipetsk Region	26,7	15,4
Orel Region	21,2	14,9
Ryazan Region	17,1	15,2
Smolensk Region	13,5	7,1
Tambov Region	26,9	15,5
Tver Region	22,7	17,4
Tula Region	44,9	14,4
Yaroslavl Region	16,8	10,8
Moscow and Moscow Region	2,3	12,8
Northwestern Federal District		
Republic of Karelia	49,9	21,5
Republic of Komi	21,5	11,1
Arkhangelsk Region	23,3	14,5
Vologda Region	19,6	12,0
Kaliningrad Region	29,5	14,8
Murmansk Region	28,4	12,9
Novgorod Region	68,0	34,7
Pskov Region	22,9	14,3
St.Petersburg and Leningrad Region	3,8	5,8
Southern Federal District (before 2009)		
Republic of Adygeya	38,7	41,0
Republic of Kalmykia	79,5	49,8
Krasnodar Territory	7,8	4,2
Astrakhan Region	24,1	31,5
Volgograd Region	8,2	6,7
Rostov Region	5,5	4,2
Republic of Dagestan	9,8	6,8
Republic of Ingushetia	91,8	91,6
Republic of Kabardino-Balkaria	42,9	31,6
Republic of Karachayevo-Cherkessia	35,4	27,1
Republic of North Ossetia-Alania	28,8	28,3
Republic of Chechnya	41,1	43,6
Stavropol Territory	7,3	6,4

	Herfindahl-Hirschman Index (%), full-time students	Herfindahl-Hirschman Index (%), correspondence students
Volga Federal District		
Republic of Bashkortostan	7,7	5,0
Republic of Marii-El	48,6	48,2
Republic of Mordovia	55,5	30,8
Republic of Tatarstan	6,8	4,8
Republic of Udmurtia	20,8	22,4
Republic of Chuvashia	19,2	11,6
Perm Territory	19,0	16,3
Kirov Region	24,6	15,4
Nizhny Novgorod Region	12,6	12,3
Orenburg Region	18,7	10,6
Penza Region	20,6	13,5
Samara Region	7,1	6,6
Saratov Region	11,4	10,5
Ulyanovsk Region	21,6	18,7
Urals Federal District		
Kurgan Region	33,9	34,9
Sverdlovsk Region	9,2	7,1
Tyumen Region	9,6	9,2
Khanty-Mansiisk Autonomous Area	13,4	12,6
Yamal-Nenets Autonomous Area	17,8	11,9
Chelyabinsk Region	20,4	12,0
Siberian Federal District		
Republic of Altai	100	100
Republic of Buryatia	26,6	22,9
Republic of Tuva	100	63,4
Republic of Khakassia	56,9	53,1
Altai Territory	13,1	8,4
Zabaikalsky Territory	21,4	21,7
Krasnoyarsk Territory	18,3	9,8
Irkutsk Region	21,4	21,7
Kemerovo Region	8,5	5,7
Novosibirsk Region	8,1	12,0
Omsk Region	10,6	7,7
Tomsk Region	20,1	16,8
Far Eastern Federal District		
Republic of Sakha-Yakutia	34,5	15,0
Kamchatka Territory	24,7	18,6
Primorsky Territory	10,6	11,4
Khabarovsk Territory	14,0	13,7
Amur Region	26,9	21,2
Magadan Region	65,9	27,6
Sakhalin Region	51,9	23,4
Jewish Autonomous Region	83,3	27,5

Appendix 1

Classification	Comprehensive groups of training fields	
Education	050000	Education and Pedagogy
Humanities and Culture	030100, 030200, 030400, 030700–032400	Culture and Art
	070000	Humanities
Economics, Social Sciences and Law	030300	Humanities (Psychology)
	030500	Humanities (Law, judicial expertise and law enforcement activity)
	030600	Humanities (Journalism and public relations)
	040000	Social Sciences
	080000	Economics and Management
Natural Sciences	010000	Physics and Mathematics
	020000	Natural Sciences
	230000	Informatics and computing technology
Engineering	090000	Information security
	120000	Geodesy and land management
	130000	Geology, prospecting and development of minerals
	140000	Energetics, energetics machine building and electrical engineering
	150000	Metallurgy, machine building and material processing
	160000	Aviation and rocket-space engineering
	170000	Weaponry and armory systems
	180000	Marine engineering
	190000	Transport
	200000	Instrument making and Optotechnics
	210000	Electronic technology, radio technology and communication
	220000	Automatics and Management
	240000	Chemical and Biological technologies

Classification	Comprehensive groups of training fields	
	260000	Technology of Foods and consumer goods
	270000	Building and Architecture
	280000	Personal and social security, nature development and environment protection
Agriculture	110000	Agriculture and Fishery
	250000	Reproduction and processing of wood resources
Public Health	060000	Public health
Services	100000	Services

Appendix 2

Measures of competition on goods and services markets [12]

Annotation

In the empirical literature, there are many examples of studies of competition in different goods and services markets: for example, traditional production, bank services, and communication services. At the end of the 1990s, publications appeared on the topics of competition on the education services market and its influence on the instructional quality and tuition fees at American schools.

Traditionally, to characterize the level of market competition, the following data are used: the number of organizations offering the relevant goods or services and the distribution of their market shares in terms of the scope of realized products in their natural or cost equivalent. On the basis of this information, market concentration indices are calculated that, in the general aspect, present the weighted sums of market shares of an organization:

$$(1) \quad CR = \sum_{i=1}^{N} w_i s_i \ ,$$

where s_i represents the market share of a corresponding organization and w_i represents the value of this share in the index calculation; N equals the number of organizations on the market.

Economists have offered more than 15 variant methods of calculating the market concentration index. In what follows, the best known of them are examined: the *simple market concentration index* (*Concentration Ratio*) and *Herfindahl-Hirschmann Index*. The given indices are examples of market concentration characteristics with relatively high sensitivities to the variation in market shares of the big organizations on the given market.

1. Some – as a rule, the biggest – organizations are assigned one-unit weights; the rest of the organizations are assigned zero-unit weights. The corresponding market concentration index is quite commonly used and labeled as the simple concentration index *(Concentration Ratio)*.

There is no universal rule to define the number of organizations M with non-zero-unit weights. The index value tends to zero when there are many similar organizations on the market. If the market is monopolized, the index value is one unit.

2. Each organization is ascribed a weight equal to its market share. The corresponding index is called the *Herfindahl-Hirschmann*

[12] After Bikker J.A., Haaf K. (2002), "Measures of Competition and Concentration in the Banking Industry: a Review of the Literature", Economic and Financial Modelling [Bulletin of] Central Bank of the Netherlands

Index, and it is broadly utilized in both theoretical and empirical research. The Herfindahl-Hirschmann Index is probably the most frequently used concentration index besides the *Concentration Ratio*. Its frequent application is mainly a result of the fact that it is one of the key indicators in US antimonopoly legislation regarding the merging of organizations and enterprises.

The value of the Herfindahl-Hirschmann Index can vary from $1/N$ to 1, where N is the number of organizations on the market. In the Herfindahl-Hirschmann Index calculation, the weights of organizations with large market shares exceed those of organizations with smaller market shares. Thus, when several markets are analyzed, the variety of the index value will mainly be determined by the differences in market shares of bigger organizations and not those of smaller organizations on these markets.

The Herfindahl-Hirschmann Index can be presented as

(2) $HHI = (1/N) + N\sigma^2$,

where σ^2 stands for the variation of the market shares of organizations calculated with respect to average market share, $1/N$. This equation shows that the Herfindahl-Hirschmann Index increases with increasing variation in the market shares of organizations.

Appendix 3

Regions of the Russian Federation marked by figures on the maps

1	Astrakhan region
2	Belgorod region
3	Bryansk region
4	Chelyabinsk region
5	Ivanovo region
6	Jewish Autonomous Region
7	Kaliningrad region
8	Kaluga region
9	Kemerovo region
10	Kirov region
11	Kostroma region
12	Krasnodar territory
13	Kurgan region
14	Kursk region
15	Lipetsk region
16	Moscow and Moscow region
17	Nizhny Novgorod Region
18	Novgorod region
19	Orel region
20	Orenburg region
21	Penza region
22	Perm territory
23	Pskov region
24	Republic of Adygeya
25	Republic of Altai
26	Republic of Bashkortostan
27	Republic of Chechnya
28	Republic of Chuvashia
29	Republic of Dagestan
30	Republic of Ingushetia
31	Republic of Kabardino-Balkaria
32	Republic of Kalmykia
33	Republic of Karachayevo-Cherkessia
34	Republic of Khakassia
35	Republic of Marii-El
36	Republic of Mordovia
37	Republic of North Ossetia-Alania
38	Republic of Tatarstan
39	Republic of Udmurtia
40	Rostov region
41	Ryazan region
42	Samara region
43	Saratov region
44	Smolensk region
45	St.Petersburg and Leningrad region
46	Stavropol territory
47	Sverdlovsk region
48	Tambov region
49	Tula region
50	Tver region
51	Ulyanovsk region
52	Vladimir region
53	Volgograd region
54	Vologda region
55	Voronezh region
56	Yaroslavl Region

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