



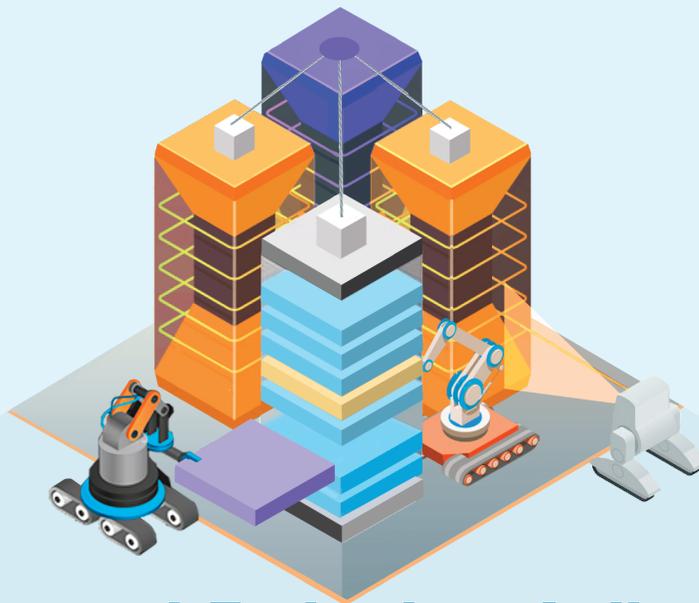
MINISTRY OF SCIENCE
AND HIGHER EDUCATION
OF THE RUSSIAN FEDERATION



Federal State
Statistics Service



HIGHER SCHOOL OF ECONOMICS
NATIONAL RESEARCH UNIVERSITY



Science and Technology Indicators in the Russian Federation

Data Book



MINISTRY OF SCIENCE
AND HIGHER EDUCATION
OF THE RUSSIAN FEDERATION



Federal State
Statistics Service



HIGHER SCHOOL OF ECONOMICS
NATIONAL RESEARCH UNIVERSITY



Science and Technology Indicators in the Russian Federation

Data Book

Moscow 2019

Editorial board: Leonid Gokhberg, Yaroslav Kuzminov, Aleksey Medvedev, and Marina Sabelnikova

Authors: Ekaterina Diachenko, Kirill Ditkovskiy, Svetlana Fridlyanova, Konstantin Fursov, Leonid Gokhberg, Maxim Kotsemir, Irina Kuznetsova, Evgeniya Lukinova, Svetlana Martynova, Alena Nefedova, Tatyana Ratay, Larisa Rosovetskaya, Galina Sagieva, Ekaterina Streltsova, Anton Suslov, and Irina Tarasenko

With the contributions by Sergey Pakhomov and Irina Varzanovtseva

Science and Technology Indicators in the Russian Federation : Data Book / E. Diachenko, K. Ditkovskiy, S. Fridlyanova et al.; National Research University Higher School of Economics. – Moscow : HSE, 2019. – 317 p.

This data book is another publication in the series describing various aspects of scientific development in the Russian Federation. It begins with the tables, where main science and technology indicators are provided alongside the data concerning basic innovative activities. The publication presents statistical data on R&D organisations, personnel, and funding, as well as on material and technical facilities of the Russian science. In some sections, it contains information about intellectual property, commercialisation and usage of technologies, and international comparisons.

The data book includes information of the Russian Federal State Statistics Service, Ministry of Science and Higher Education of the Russian Federation, Federal Service for Intellectual Property (Rospatent), CIS Interstate Statistical Committee, Organisation for Economic Co-operation and Development (OECD), European Commission, Eurostat, UNESCO, World Intellectual Property Organisation (WIPO), and results of own methodological and analytical studies of the HSE Institute for Statistical Studies and Economics of Knowledge.

In some cases, the presented data specify those published earlier.

CONTENTS

Main science and technology indicators.....	15
Main indicators of innovation	17
1. Institutions	23
1.1. R&D institutions by type	24
1.2. Trends in the total number of R&D institutions	25
1.3. Percentage distribution of R&D institutions by type	26
1.4. R&D institutions by ownership	27
1.5. Percentage distribution of R&D institutions by legal structure and status: 2017	29
1.6. R&D institutions by type of economic activity	30
2. R&D personnel	31
2.1. R&D personnel	32
2.2. R&D personnel by occupation	32
2.3. Percentage distribution of R&D personnel by occupation	33
2.4. R&D personnel by ownership of R&D institutions	34
2.5. Percentage distribution of R&D personnel by legal structure and status of institutions: 2017	36
2.6. R&D personnel by type of economic activity: 2017	37
2.7. R&D personnel by educational attainment.....	38
2.8. Researchers by gender and age.....	39
2.9. Percentage distribution of researchers by age	41
2.10. Average age of researchers	42
2.11. Researchers with scientific degrees	43
2.12. Researchers with scientific degrees as a percentage of the total number of researchers	43
2.13. Researchers by field of science and technology	44
2.14. Percentage distribution of researchers by field of science and technology: 2017	44
2.15. Flows of R&D personnel.....	45
2.16. Inflow of higher institution graduates in R&D institutions	46
2.17. Trends in inflow and outflow of R&D personnel	47

Training of R&D personnel	48	2.27. Doctoral enrolment by gender and age: 2017	65
2.18. Main indicators of postgraduate studies	48	2.28. Doctoral enrolment, entrants, and graduates by field of science and technology	66
2.19. Higher education graduates of the reporting year admitted to postgraduate studies by mode of study	51	2.29. Graduates who defended their postgraduate and doctoral thesis during their studies as a percentage of graduates who completed their postgraduate and doctoral studies by field of science and technology: 2017	67
2.20. Higher education graduates of the reporting year as a percentage of the total postgraduate enrolment	52	2.30. Doctoral graduates with defended thesis who have been granted a diploma by the State Commission for Academic Degrees and Titles of the Ministry of Science and Higher Education of the Russian Federation by field of education	68
2.21. Postgraduate enrolment by gender and age: 2017	53	3. R&D funding	71
2.22. Postgraduate enrolment, entrants, and graduates by field of education	54	3.1. Gross domestic expenditure on R&D	72
2.23. Postgraduate enrolment, entrants, and graduates by field of education corresponding to priority areas of economical modernisation and technological development.....	56	3.2. Growth rates of gross domestic expenditure on R&D and gross domestic product	73
2.24. Postgraduate enrolment and graduates by field of science and technology	58	3.3. Federal budget appropriations on civil S&T at current prices	74
2.25. Postgraduate graduates with defended thesis who have been granted a diploma by the state commission for academic degrees and titles of the ministry of science and higher education of the Russian Federation by field of education	59	3.4. Federal budget appropriations on civil S&T at constant 2000 prices	75
2.26. Main indicators of doctoral studies	62	3.5. Federal budget appropriations on civil S&T as a percentage of GDP	76

3.6. Federal budget appropriations on civil S&T as a percentage of federal budget expenditure	77	3.18. Percentage distribution of gross domestic expenditure on R&D by priority S&T area and source of funds: 2017	93
3.7. Percentage distribution of federal budget appropriations on civil S&T by subsection of Budget Expenditure Classification and type of R&D activity	78	3.19. Gross domestic expenditure on R&D by socio-economic objective.....	94
3.8. Gross domestic expenditure on R&D by source of funds	79	3.20. Percentage distribution of gross domestic expenditure on R&D by socio-economic objective	96
3.9. Trends in gross domestic expenditure on R&D by source of funds.....	81	3.21. Current expenditure on R&D by type of R&D activity and field of science and technology	97
3.10. Subsidies, grants and other competitive R&D funding: 2017.....	82	3.22. Percentage distribution of current expenditure on R&D by type of R&D activity	99
3.11. Gross domestic expenditure on R&D funded from abroad	83	3.23. Current expenditure on R&D by type of R&D activity as a percentage of GDP	100
3.12. R&D funding by sector of performance: 2017	84	3.24. Average monthly salary of R&D personnel.....	101
3.13. Gross domestic expenditure on R&D by ownership of R&D institutions.....	85	3.25. Tax incentives on R&D by type.....	102
3.14. Percentage distribution of gross domestic expenditure on R&D by legal structure and status of institutions: 2017	87	4. R&D fixed assets.....	103
3.15. Gross domestic expenditure on R&D by type of economic activity: 2017	88	4.1. R&D fixed assets	104
3.16. Gross domestic expenditure on R&D by type	90	4.2. Trends in R&D fixed assets value	106
3.17. Gross domestic expenditure on R&D by priority S&T area and source of funds: 2017.....	92	4.3. Machinery and equipment as a percentage of the total R&D fixed assets value	106
		4.4. R&D fixed assets by ownership of R&D institutions	107

4.5. Percentage distribution of R&D fixed assets by ownership of R&D institutions.....	109
4.6. R&D fixed assets by type of economic activity: 2017	110
5. Sectors of R&D performance	111
5.1. Composite indices	112
5.1.1. R&D institutions by sector of performance	112
5.1.2. Percentage distribution of R&D institutions by sector of performance	113
5.1.3. R&D personnel by sector of performance and occupation	114
5.1.4. R&D personnel by sector of performance and educational attainment	115
5.1.5. Researchers with scientific degrees by sector of performance.....	116
5.1.6. Percentage distribution of researchers with scientific degrees by sector of performance	117
5.1.7. Researchers assigned to work (internship) placements at foreign research institutions by sector of performance: 2017	118
5.1.8. Percentage distribution of researchers assigned to work (internship) placements at foreign research institutions by sector of performance: 2017	118
5.1.9. Gross domestic expenditure on R&D by sector of performance	119
5.1.10. Percentage distribution of gross domestic expenditure on R&D by sector of performance.....	120
5.1.11. Gross domestic expenditure on R&D by sector of performance as a percentage of GDP	121
5.1.12. Gross domestic expenditure on R&D by sector of performance and source of funds	122
5.1.13. Subsidies, grants, and other competitive R&D funding by sector of performance: 2017.....	124
5.1.14. Gross domestic expenditure on R&D by priority S&T area and sector of performance: 2017	125
5.1.15. Percentage distribution of gross domestic expenditure on R&D by priority S&T area and sector of performance: 2017	126
5.1.16. Sources of funds for gross domestic expenditure on R&D by priority S&T area and sector of performance: 2017.....	127
5.1.17. Percentage distribution of gross domestic expenditure on R&D by priority S&T area and source of funds: 2017	128
5.1.18. Gross domestic expenditure on R&D by sector of performance and socio-economic objective	129

5.1.19. Percentage distribution of gross domestic expenditure on R&D by sector of performance and socio-economic objective: 2017	131	5.2.8. Percentage distribution of researchers in the government sector by age	141
5.1.20. Current expenditure on R&D by sector of performance and type of R&D activity	133	5.2.9. Average age of researchers in the government sector	142
5.1.21. Average monthly salary of R&D personnel by sector of performance.....	134	5.2.10. Researchers with scientific degrees in the government sector	142
5.2. Government sector	135	5.2.11. Researchers with scientific degrees as a percentage of the total number of researchers in the government sector	143
5.2.1. R&D institutions in the government sector by type	135	5.2.12. Researchers in the government sector by field of science and technology	144
5.2.2. R&D personnel in the government sector by type of R&D institutions	135	5.2.13. R&D personnel turnover in the government sector by occupation	145
5.2.3. R&D personnel in the government sector by occupation	136	5.2.14. Inflow and outflow of R&D personnel in the government sector	146
5.2.4. Percentage distribution of R&D personnel in the government sector by occupation	136	5.2.15. Inflow of higher education graduates into government sector institutions	147
5.2.5. R&D personnel in the government sector as a percentage of the total number of R&D personnel by occupation	137	5.2.16. Gross domestic expenditure on R&D in the government sector by type of R&D institutions	148
5.2.6. R&D personnel in the government sector by educational attainment	138	5.2.17. Gross domestic expenditure on R&D in the government sector	149
5.2.7. Researchers in the government sector by gender and age	140	5.2.18. Gross domestic expenditure on R&D in the government sector by source of funds.....	150

5.2.19. Government sector as a percentage of gross domestic expenditure on R&D by type of expenditure	152	5.3.4. Percentage distribution of R&D personnel in the business enterprise sector by occupation	160
5.2.20. Gross domestic expenditure on R&D in the government sector by type	153	5.3.5. R&D personnel in the business enterprise sector as a percentage of the total number of R&D personnel by occupation	161
5.2.21. Current expenditure on R&D in the government sector by type of R&D activity and field of science and technology	154	5.3.6. R&D personnel in the business enterprise sector by educational attainment	162
5.2.22. Government sector as a percentage of current expenditure on R&D by type of R&D activity	155	5.3.7. Researchers in the business enterprise sector by gender and age	164
5.2.23. Percentage distribution of current expenditure on R&D in the government sector by type of R&D activity	156	5.3.8. Percentage distribution of researchers in the business enterprise sector by age	165
5.2.24. Average monthly salary of R&D personnel in the government sector	157	5.3.9. Average age of researchers in the business enterprise sector	166
5.3. Business enterprise sector	158	5.3.10. Researchers with scientific degrees in the business enterprise sector	167
5.3.1. R&D institutions in the business enterprise sector by type	158	5.3.11. Researchers with scientific degrees as a percentage of the total number of researchers in the business enterprise sector	167
5.3.2. R&D personnel in the business enterprise sector by type of r&d institutions	159	5.3.12. Researchers in the business enterprise sector by field of science and technology	168
5.3.3. R&D personnel in the business enterprise sector by occupation	159	5.3.13. R&D personnel turnover in the business enterprise sector by occupation	169

5.3.14. Inflow and outflow of researchers in the business enterprise sector	170
5.3.15. Inflow of higher education graduates into business enterprise sector institutions	171
5.3.16. Gross domestic expenditure on R&D in the business enterprise sector by type of R&D institutions	172
5.3.17. Gross domestic expenditure on R&D in the business enterprise sector	173
5.3.18. Gross domestic expenditure on R&D in the business enterprise sector by source of funds.....	174
5.3.19. Business enterprise sector as a percentage of gross domestic expenditure on R&D by type of expenditure	176
5.3.20. Gross domestic expenditure on R&D in the business enterprise sector by type	177
5.3.21. Current expenditure on R&D in the business enterprise sector by type of R&D activity and field of science and technology	178
5.3.22. Business enterprise sector as a percentage of current expenditure on R&D by type of R&D activity.....	179

5.3.23. Percentage distribution of current expenditure on R&D in the business enterprise sector by type of R&D activity	180
5.3.24. Average monthly salary of R&D personnel in the business enterprise sector	181
5.4. Higher education sector	182
5.4.1. R&D institutions in the higher education sector by type	182
5.4.2. R&D personnel in the higher education sector by type of R&D institutions	183
5.4.3. R&D personnel in the higher education sector by occupation	184
5.4.4. Percentage distribution of R&D personnel in the higher education sector by occupation	185
5.4.5. R&D personnel in the higher education sector as a percentage of the total number of R&D personnel by occupation	186
5.4.6. R&D personnel in the higher education sector by educational attainment	187
5.4.7. Researchers in the higher education sector by gender and age.....	189
5.4.8. Percentage distribution of researchers in the higher education sector by age	190

5.4.9. Average age of researchers in the higher education sector.....	191	5.4.20. Gross domestic expenditure on R&D in the higher education sector by type	202
5.4.10. Researchers with scientific degrees in the higher education sector	191	5.4.21. Current expenditure on R&D in the higher education sector by type of R&D activity and field of science and technology	203
5.4.11. Researchers with scientific degrees as a percentage of the total number of researchers in the higher education sector	192	5.4.22. Higher education sector as a percentage of current expenditure on R&D by type of R&D activity	205
5.4.12. Researchers in the higher education sector by field of science and technology	193	5.4.23. Percentage distribution of current expenditure on R&D in the higher education sector by type of R&D activity	206
5.4.13. R&D personnel turnover in the higher education sector by occupation	194	5.4.24. Average monthly salary of R&D personnel in the higher education sector	206
5.4.14. Inflow and outflow of R&D personnel in the higher education sector	195	6. R&D output	207
5.4.15. Inflow of higher education graduates into higher education sector institutions.....	196	Publication activity	208
5.4.16. Gross domestic expenditure on R&D in the higher education sector by type of R&D institutions	197	6.1. Number of publications by Russian authors in scientific journals indexed in Scopus by document type	208
5.4.17. Gross domestic expenditure on R&D in the higher education sector	198	6.2. Number of publications by Russian authors in scientific journals indexed in Web of Science by document type	209
5.4.18. Gross domestic expenditure on R&D in the higher education sector by source of funds	199	6.3. Percentage distribution of publications in scientific journals indexed in Scopus by field of science and technology	210
5.4.19. Higher education sector as a percentage of gross domestic expenditure on R&D by type of expenditure.....	201		

6.4. Percentage distribution of publications in scientific journals indexed in Web of Science by field of science and technology	211	6.11. Number of publications by Russian authors with international collaboration in scientific journals indexed in Scopus by partner country: 2017	222
6.5. Russia's scientific specialisation indices by publications in scientific journals indexed in Scopus by field of science and technology	212	6.12. Number of publications by Russian authors with international collaboration in scientific journals indexed in Web of Science by partner countries: 2017	223
6.6. Russia's scientific specialisation indices by publication in scientific journals indexed in Web of Science by field of science and technology	214	Patent activity	224
6.7. Main indicators of Russian authors' contribution to the world total number of publications in scientific journals indexed in Scopus by field of research: 2017	216	6.13. Patent applications and patent grants	224
6.8. Main indicators of Russian authors' contribution to the world total number of publications in scientific journals indexed in Web of Science by field of research: 2017	218	6.14. Patent activity indicators	225
6.9. Main citation indicators of publications by Russian authors in scientific journals indexed in Scopus.....	220	6.15. Patent grants received in the Russian Federation by section of the international patent classification	226
6.10. Main citation indicators of publications by Russian authors in scientific journals indexed in Web of Science	221	6.16. Percentage distribution of patent grants received in the Russian Federation by assignee and section of the international patent classification: 2017	227
		6.17. Utility model applications and grants	228
		6.18. Utility model grants received in the Russian Federation by section of the international patent classification	229
		6.19. Registration of intellectual property items in the field of information technology	230

Development and use of advanced manufacturing technologies	231	Commercialisation of technology in domestic market.....	240
6.20. Development of advanced manufacturing technologies by type	231	6.29. State registration of dispositions of the exclusive rights to inventions, utility models, industrial designs by patent assignment and patent licensing contracts	240
6.21. Development of advanced manufacturing technologies by degree of novelty and type	232	6.30. Percentage distribution of dispositions by type of agreement	241
6.22. Development of advanced manufacturing technologies by degree of novelty and type of economic activity	233	6.31. State registration of dispositions under agreements and patents with registered dispositions by type of intellectual property	242
6.23. Use of advanced manufacturing technologies by type	234	6.32. Percentage distribution of agreements and patents with registered dispositions by type of intellectual property: 2017.....	242
6.24. Use of advanced manufacturing technologies by type and duration	235	6.33. State registration of dispositions of exclusive rights to inventions, utility models, and industrial designs by technology field	243
6.25. Use of advanced manufacturing technologies by type of economic activity and duration	236	6.34. Percentage distribution of dispositions of exclusive rights to inventions, utility models, and industrial designs by technology field	244
6.26. Use of advanced manufacturing technologies by type and source of acquisition: 2017	237	6.35. Percentage distribution of dispositions of exclusive rights to inventions, utility models, and industrial designs by category of economic entity	245
6.27. Use of advanced manufacturing technologies by type of economic activity and source of acquisition: 2017	238		
6.28. Use of advanced manufacturing technologies developed on the basis of invention patents by type	239		

International technological exchange	246
6.36. Technology balance of payments by category of contracts	246
6.37. Percentage distribution of technology exports and imports by category of contracts.....	248
6.38. Number and net value of technology exports and imports by category of contracts	249
6.39. Technology balance of payments by country	250
6.40. Percentage distribution of technology exports and imports by country group	253
6.41. Technology balance of payments by sector of performance	253
6.42. Technology balance of payments by type of economic activity: 2017	254
7. Public attitudes towards science and technology	255
7.1. Public opinion about the risks involving the development of science, technology and engineering	256
7.2. Public opinion about the level of awareness about the latest S&T achievements: 2016.....	257
7.3. Digital skills: 2017	258
7.4. Individuals' level of digital skills: 2017	259
7.5. Internet skills: 2017	260

7.6. Individuals' level of internet skills: 2017	261
7.7. Public opinion about science and technology influence on daily life: 2017	262
8. International comparisons	263
8.1. Gross domestic expenditure on R&D	264
8.2. Gross domestic expenditure on R&D as a percentage of GDP: 2017	267
8.3. Percentage distribution of gross domestic expenditure on R&D by sector of performance: 2017	268
8.4. Percentage distribution of gross domestic expenditure on R&D by source of funds: 2017	271
8.5. Percentage distribution of gross domestic expenditure on R&D by field of science and technology: 2017	274
8.6. Percentage distribution of current expenditure on R&D by type of R&D activity: 2017	276
8.7. Government budget appropriations on R&D	279
8.8. R&D personnel: 2017	281
8.9. R&D personnel per 10,000 employment: 2017	284
8.10. Percentage distribution of researchers by sector of performance: 2017	285
8.11. Female researchers as a percentage of the total number of researchers: 2017	288

8.12. Number of publications and citations in scientific journals indexed in Scopus: 2013–2017	289	8.17. Publications co-authored with foreign researchers as a percentage of the total number of country's publications in scientific journals indexed in Web of Science: 2017	300
8.13. Number of publications and citations in scientific journals indexed in Web of Science: 2013–2017	293	8.18. Resident and abroad patent applications by patent office.....	301
8.14. Countries' shares in the world total number of publications in scientific journals indexed in Scopus: 2017	297	8.19. Percentage distribution of patent applications by applicant and country: 2017	304
8.15. Countries' shares in the world total number of publications in scientific journals indexed in Web of Science: 2017	298	8.20. Resident and abroad patent applications by country of origin	305
8.16. Publications co-authored with foreign researchers as a percentage of the total number of country's publications in scientific journals indexed in Scopus: 2017	299	8.21. Number of triadic patent families	308
		8.22. Technology balance of payments: 2017	310
		Technical notes.....	311

SYMBOLS USED IN TABLES ARE:

- ... data not available and not included in the totals,
- data not applicable,
- 0.0 insignificant value.

In some tables, the sum of the breakdown may not add to the total because of rounding.

MAIN SCIENCE AND TECHNOLOGY INDICATORS

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Gross domestic expenditure on R&D, <i>million roubles, 1995 – billion roubles:</i>										
at current prices	12149.5	76697.1	230785.2	523377.2	699869.8	749797.6	847527.0	914669.1	943815.2	1019152.4
at constant 1989 prices	2.49	3.32	4.55	5.72	6.05	6.15	6.47	6.46	6.44	6.61
Gross domestic expenditure on R&D:										
as a percentage of GDP	0.85	1.05	1.07	1.13	1.03	1.03	1.07	1.10	1.10	1.11
as a percentage of the previous year at constant 1989 prices	84.9	116.0	98.7	94.3	105.1	101.6	105.1	99.9	99.7	102.6
Gross domestic expenditure on R&D per R&D institution, <i>thousand roubles, 1995 – million roubles:</i>	2993.2	18711.2	64718.2	149878.9	196261.9	207988.2	235162.9	219082.4	234081.2	258405.8
Gross domestic expenditure on R&D per R&D employee, <i>thousand roubles, 1995 – million roubles</i>	11.5	86.4	283.8	710.6	963.6	1031.3	1157.4	1238.0	1306.7	1439.7
Gross domestic expenditure on R&D per researcher, <i>thousand roubles, 1995 – million roubles</i>	23.4	180.1	590.1	1418.7	1878.2	2031.9	2266.7	2410.8	2548.2	2832.6
Federal budget appropriations on civil S&T, <i>million roubles, 1995 – billion roubles:</i>										
at current prices	4413.6	17091.7	76909.0	237644.0	355921.1	425301.7	437273.3	439392.8	402722.3	377882.2
at constant 1995 prices	2.48	2.03	4.16	7.13	8.44	9.57	9.16	8.52	7.54	6.73
Federal budget appropriations on civil S&T as a percentage of GDP	0.31	0.23	0.36	0.51	0.52	0.58	0.55	0.53	0.47	0.41
R&D personnel, <i>thousand persons</i>	1061.0	887.7	813.2	736.5	726.3	727.0	732.3	738.9	722.3	707.9
As a percentage of the previous year	95.9	101.8	96.9	99.2	98.8	100.1	100.7	100.9	97.8	98.0
R&D personnel per R&D institution, <i>headcount</i>	261	217	228	211	204	202	203	177	179	179
R&D personnel per 10,000 employment, <i>headcount</i>	160	138	122	109	107	107	108	102	100	99

(continued)

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Researchers, <i>thousand</i>	518.7	426.0	391.1	368.9	372.6	369.0	373.9	379.4	370.4	359.8
As a percentage of the previous year	98.7	101.4	97.4	99.9	99.4	99.0	101.3	101.5	97.6	97.1
Researchers per R&D institution, <i>headcount</i>	128	104	110	106	104	102	104	91	92	91
Researchers per 10,000 employment, <i>headcount</i>	78	66	59	55	55	54	55	52	51	50
Patent applications filed in the Russian Federation	22202	28688	32254	42500	44211	44914	40308	45517	41587	36454
Patent grants received in the Russian Federation	31556*	17592	23390	30322	32880	31638	33950	34706	33536	34254
Number of developed advanced manufacturing technologies	...	688	637	864	1323	1429	1409	1398	1534	1402
Number of advanced manufacturing technologies in use	...	70069	140983	203330	191372	193830	204546	218018	232388	240054
Total receipts from technology exports, <i>thousand USD</i>	...	203493.5	389396.4	627887.5	688469.9	770584.8	1279213.1	1654732.1	1277023.5	1181183.9
Total payments for technology imports, <i>thousand USD</i>	...	182908.0	954199.2	1425983.3	2043187.9	2463626.3	2455830.7	2207406.8	2498677.8	3305202.5

* Taking into account patents granted in exchange for author's certificates.

MAIN INDICATORS OF INNOVATION

	2005	2010	2011	2012	2013	2014	2015	2016	2017
Enterprises engaged in technological innovation as a percentage of the total number of enterprises:									
industrial production ¹	9.3	9.3	9.6	9.9	9.7	9.7	9.5	9.2	9.6
telecommunications; computer programming, consultancy and related activities; IT industry ²	15.3	10.8	9.9	10.3	10.3	9.5	9.4	7.7	8.0
construction ³	...	...	...	...	...	...	2.0	1.1	1.1
agriculture ⁴	...	...	...	...	...	...	...	3.4	3.1
Sales of innovative goods and services, <i>million roubles</i> :									
industrial production									
at current prices	545540.0	1165747.6	1847370.4	2509604.4	3072530.8	3037407.3	3258254.6	3723693.4	3403055.2
at constant 1995 prices	52546.2	62312.8	85200.6	106088.8	123231.0	113323.0	112558.2	124286.8	107970.4
telecommunications; computer programming, consultancy and related activities; IT industry									
at current prices	43465.3	62636.4	74437.8	56092.2	71094.4	62928.5	86048.9	80955.8	111254.6
at constant 1995 prices	4186.6	3348.1	3433.1	2371.2	2851.4	2347.8	2972.6	2702.1	3529.8
construction									
at current prices	...	...	...	...	...	...	600.3	2351.0	152.9
at constant 1995 prices	...	...	...	...	...	...	20.7	78.5	4.9
agriculture									
at current prices	...	...	...	...	...	...	...	22222.9	28446.0
at constant 1995 prices	...	...	...	...	...	...	...	741.7	902.5

(continued)

	2005	2010	2011	2012	2013	2014	2015	2016	2017
Innovative goods and services as a percentage of total sales:									
industrial production	5.0	4.9	6.1	7.8	8.9	8.2	7.9	8.4	6.7
telecommunications; computer programming, consultancy and related activities; IT industry	8.6	4.7	4.8	3.0	3.9	3.3	4.3	3.5	4.8
construction	...	...	...	...	...	...	0.6	1.7	0.1
agriculture	...	...	...	...	...	...	...	1.4	1.8
Expenditure on technological innovation, <i>million roubles</i> :									
industrial production									
at current prices	125678.2	349763.3	469442.2	583660.6	746778.2	762774.1	735757.7	777518.6	848045.9
at constant 1995 prices	12105.3	18695.9	21650.6	24673.1	29951.3	28458.4	25417.1	25951.5	26906.4
telecommunications; computer programming, consultancy and related activities; IT industry									
at current prices	17544.4	38684.0	137754.0	83230.6	66133.4	47066.3	66722.8	52733.5	54625.5
at constant 1995 prices	1689.9	2067.8	6353.2	3518.4	2652.4	1756.0	2305.0	1760.1	1733.1
construction									
at current prices	...	...	...	...	...	...	13.4	6.3	196.0
at constant 1995 prices	...	...	...	...	...	...	0.5	0.2	6.2
agriculture									
at current prices	...	...	...	...	...	...	...	14963.3	15806.0
at constant 1995 prices	...	...	...	...	...	...	...	499.4	501.5

(continued)

	2005	2010	2011	2012	2013	2014	2015	2016	2017
Expenditure on technological innovation as a percentage of total sales:									
industrial production	1.2	1.5	1.5	1.8	2.2	2.1	1.8	1.8	1.7
telecommunications; computer programming, consultancy and related activities; IT industry	3.5	2.9	8.8	4.4	3.6	2.4	3.3	2.3	2.3
construction	...	...	...	...	...	...	0.01	0.0	0.2
agriculture	...	...	...	...	...	...	...	0.9	1.0
Innovation activity of enterprises (enterprises engaged in technological, marketing, organisational innovation as a percentage of the total number of enterprises), <i>percentage:</i>									
industrial production	...	10.8	11.1	11.1	10.9	10.9	10.6	10.5	10.6
telecommunications; computer programming, consultancy and related activities; IT industry	...	13.6	12.1	11.7	12.2	10.7	10.8	9.3	9.9
construction	...	...	...	...	...	...	2.0	1.5	1.8
agriculture	...	...	...	...	...	...	...	4.0	3.7
Enterprises engaged in marketing innovation as a percentage of the total number of enterprises:									
industrial production	...	2.5	2.5	2.2	2.1	2.0	2.0	1.9	1.8
telecommunications; computer programming, consultancy and related activities; IT industry	...	4.7	3.9	3.2	3.1	2.3	3.4	2.1	2.2
construction	...	...	...	...	...	...	-	0.4	0.7
agriculture	...	...	...	...	...	...	...	0.4	0.5

(continued)

	2005	2010	2011	2012	2013	2014	2015	2016	2017
Enterprises engaged in organisational innovation as a percentage of the total number of enterprises:									
industrial production	...	3.4	3.5	3.2	3.1	3.0	2.9	2.8	2.8
telecommunications; computer programming, consultancy and related activities; IT industry	...	5.1	3.9	3.6	3.5	3.4	3.8	3.2	2.0
construction	–	1.1	1.1
agriculture	0.9	0.9
Expenditure on technological, marketing and organisational innovation, <i>million roubles</i> :									
industrial production									
at current prices	...	356163.5	474587.1	590341.6	756183.9	778263.5	741283.8	787232.5	856794.0
at constant 1995 prices	...	19038.0	21887.9	24955.6	30328.5	29036.3	25608.0	26275.7	27183.9
telecommunications; computer programming, consultancy and related activities; IT industry									
at current prices	...	40223.1	146419.4	86002.9	68115.1	48612.3	67749.9	54681.7	55565.9
at constant 1995 prices	...	2150.0	6752.9	3635.6	2731.9	1813.7	2340.5	1825.1	1763.0
construction									
at current prices	13.4	7.3	196.4
at constant 1995 prices	0.5	0.2	6.2
agriculture									
at current prices	15073.6	15942.0
at constant 1995 prices	503.1	505.8

(continued)

	2005	2010	2011	2012	2013	2014	2015	2016	2017
Expenditure on technological, marketing and organisational innovation as a percentage of total sales:									
industrial production	...	1.5	1.6	1.8	2.2	2.1	1.8	1.8	1.7
telecommunications; computer programming, consultancy and related activities; IT industry	...	3.0	9.4	8.6	3.7	2.5	3.4	2.4	2.4
construction	...	...	...	...	...	...	0.01	0.01	0.2
agriculture	...	...	...	...	...	...	...	0.9	1.0
Small enterprises engaged in technological innovation as a percentage of the total number of small enterprises:									
industrial production	1.6	...	5.1	...	4.8	...	4.5	...	5.2
Innovative goods and services as a percentage of total sales in small enterprises:									
industrial production	0.3	...	1.5	...	2.1	...	1.6	...	1.6
Expenditure on technological innovation in small enterprises, <i>million roubles</i> .:									
industrial production									
at current prices	1932.7	...	9479.3	...	13510.5	...	12151.8	...	19220.4
at constant 1995 prices	186.2	...	437.2	...	541.9	...	419.8	...	609.8

(continued)

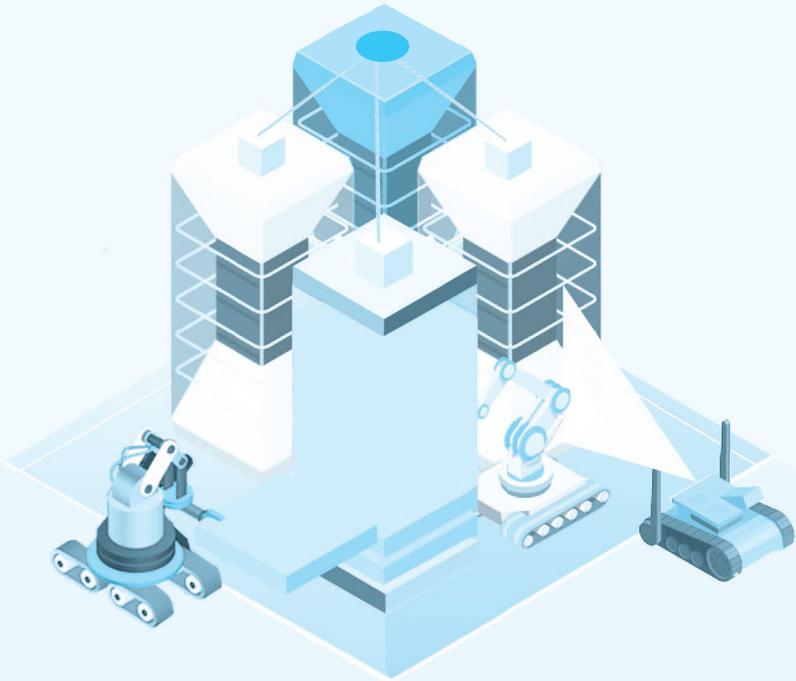
	2005	2010	2011	2012	2013	2014	2015	2016	2017
Expenditure on technological innovation as a percentage of total sales in small enterprises:									
industrial production	0.2	...	0.9	...	1.0	...	0.6	...	0.8

¹ Hereinafter, summary data on organisations engaged in the following activities are provided: in 2017 – mining and quarrying; manufacturing; electricity, gas, steam and air conditioning supply; water supply; sewerage, waste management and remediation activities; until 2017 – mining and quarrying, manufacturing, electricity, gas and water supply.

² Hereinafter, the target objects of statistical observation of the services sector's innovative activity throughout the reporting period. Until 2017 – communication, computer and information technology-related activities.

³ Hereinafter, summary data on organisations engaged in the following activities are provided: in 2017 – roofing activities; other specialised construction activities, not included in other groups; until 2017 – erection of prefabricated buildings and constructions; coating of buildings and structures; performance of other construction works, the statistical observation of which has been carried out since 2015.

⁴ Hereinafter, summary data on organisations engaged in the following activities are provided: in 2017 – growing of non-perennial crops; growing of perennial crops; plant propagation; animal production, mixed farming, support activities to agriculture and and post-harvest processing activities; until 2017 – crop production, animal production, crop production in combination with animal production (mixed agriculture), support activities in crop production, horticulture, and animal production (except for veterinary services), the statistical observation of which has been carried out since 2016.



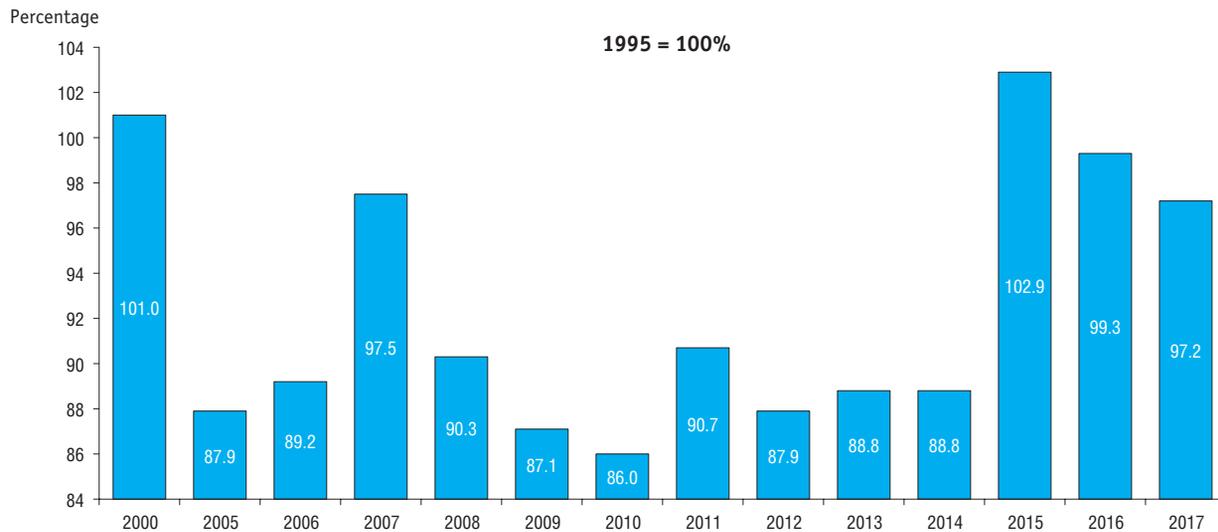
1. Institutions

1.1. R&D INSTITUTIONS BY TYPE

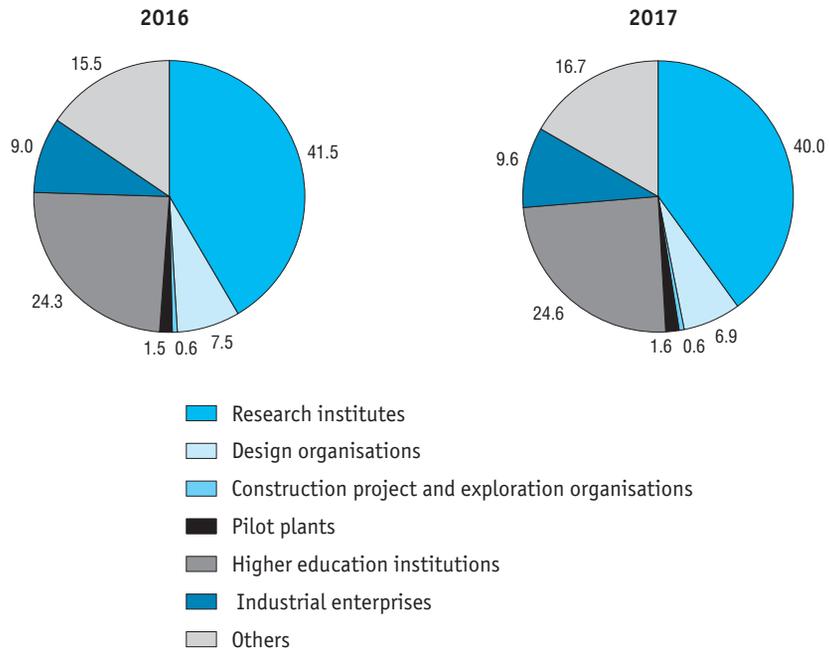
	1995	2000	2005*	2010	2012	2013	2014	2015	2016	2017
Total	4059	4099	3566	3492	3566	3605	3604	4175	4032	3944
Research Institutes	2284	2686	2115	1840	1744	1719	1689	1708	1673	1577
Design organisations	548	318	489	362	338	331	317	322	304	273
Construction project and exploration organisations	207	85	61	36	33	33	32	29	26	23
Pilot plants	23	33	30	47	60	53	53	61	62	63
Higher education institutions	395	390	406	517	562	673	702	1040	979	970
Industrial enterprises	325	284	231	238	274	266	275	371	363	380
Others	277	303	234	452	555	530	536	644	625	658

* In 2005, the R&D institutions classification by type was changed due to the abolition of the 'All-Russia Classifier of Economy Branches.'

1.2. TRENDS IN THE TOTAL NUMBER OF R&D INSTITUTIONS



1.3. PERCENTAGE DISTRIBUTION OF R&D INSTITUTIONS BY TYPE

(percentage)

1.4. R&D INSTITUTIONS BY OWNERSHIP

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Total	4059	4099	3566	3492	3566	3605	3604	4175	4032	3944
Russian ownership	4034	4035	3513	3436	3506	3542	3538	4077	3940	3859
Public ownership	2979	2938*	2632	2610	2561	2526	2520	2684	2592	2520
Federal	2783	2755	2483	2467	2390	2363	2351	2494	2414	2343
Regional	196	181	149	140	170	163	169	190	178	177
Municipal ownership	9	11	6	14	14	14	13	15	14	14
Ownership by voluntary associations	16	60	27	28	25	27	28	43	44	41
Private ownership	198	388	422	470	545	607	614	881	865	875
Ownership by Russian citizens permanently living abroad	...	...	...	...	1	1	1	1	1	1
Ownership by consumers' cooperatives**	...	3	4	4	2	2	2	5	6	6
Mixed ownership	832	635	422	304	298	300	296	358	326	296
Mixed ownership with a share of public ownership	...	...	...	268	247	236	231	275	248	221
Other mixed ownership	...	...	...	...	51	64	65	83	78	75
Ownership by state corporations	...	...	...	6	60	65	64	90	92	106
Foreign ownership	1	6	7	16	16	16	17	36	39	43
Joint ownership (with both Russian and foreign participation)	24	58	46	40	44	47	49	62	53	42

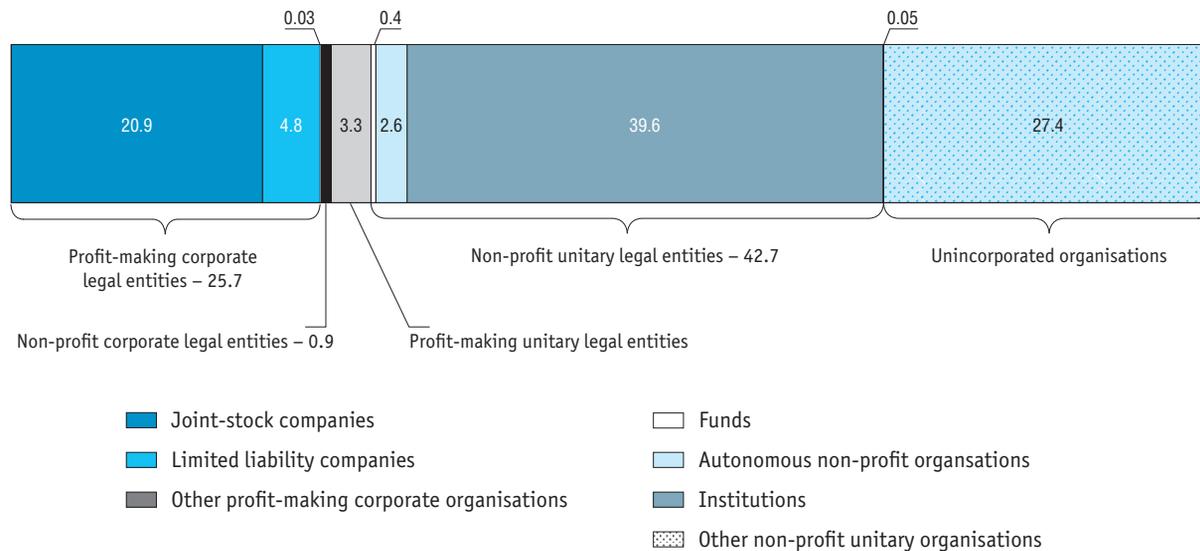
(continued)

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Total	100	100	100	100	100	100	100	100	100	100
Russian ownership	99.4	98.4	98.5	98.4	98.3	98.3	98.2	97.7	97.7	97.8
Public ownership	73.4	71.7	73.8	74.7	71.8	70.1	69.9	64.3	64.3	63.9
Federal	68.6	67.2	69.6	70.6	67.0	65.5	65.2	59.7	59.9	59.4
Regional	4.8	4.4	4.2	4.0	4.8	4.5	4.7	4.6	4.4	4.5
Municipal ownership	0.2	0.3	0.2	0.4	0.4	0.4	0.4	0.4	0.3	0.4
Ownership by voluntary associations	0.4	1.5	0.8	0.8	0.7	0.7	0.8	1.0	1.1	1.0
Private ownership	4.9	9.5	11.8	13.5	15.3	16.8	17.0	21.1	21.5	22.2
Ownership by Russian citizens permanently living abroad	...	...	...	...	0.03	0.03	0.03	0.02	0.02	0.0
Ownership by consumers' cooperatives**	...	0.07	0.1	0.1	0.1	0.06	0.1	0.1	0.1	0.2
Mixed ownership	20.5	15.5	11.8	8.7	8.4	8.3	8.2	8.6	8.1	7.5
Mixed ownership with a share of public ownership	...	...	...	7.7	6.9	6.5	6.4	6.6	6.2	5.6
Other mixed ownership	...	...	...	...	1.4	1.8	1.8	2.0	1.9	1.9
Ownership by state corporations	...	...	...	0.2	1.7	1.8	1.8	2.2	2.3	2.7
Foreign ownership	0.02	0.1	0.2	0.5	0.4	0.4	0.5	0.9	1.0	1.1
Joint ownership (with both Russian and foreign participation)	0.6	1.4	1.3	1.1	1.2	1.3	1.4	1.5	1.3	1.1

* The sum of the breakdown may not add to the total because some institutions have shared ownership.

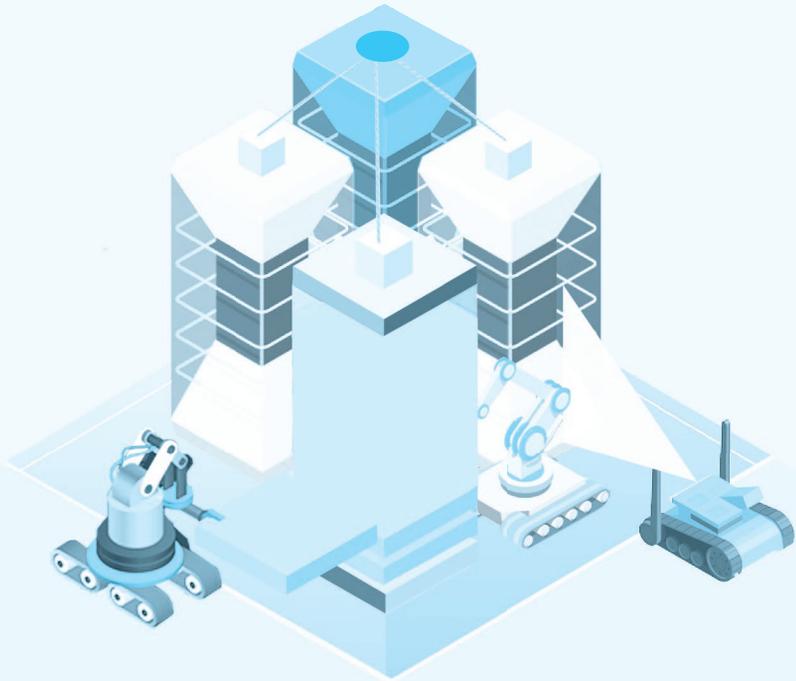
** Up to the year 2000, it was included into private and mixed Russian ownership.

1.5. PERCENTAGE DISTRIBUTION OF R&D INSTITUTIONS BY LEGAL STRUCTURE AND STATUS: 2017



1.6. R&D INSTITUTIONS BY TYPE OF ECONOMIC ACTIVITY

	2017
Total	3944
Agriculture, forestry and fishing	32
Mining and quarrying	3
Manufacturing	453
Electricity, gas, steam and air-conditioning supply	5
Water supply; sewerage, waste management, and remediation activities	2
Construction	3
Wholesale and retail trade; repair of motor vehicles and motorcycles	7
Transportation and storage	4
Accommodation and food service activities	1
Information and communication	39
Financial and insurance activities	4
Real estate activities	11
Professional, scientific and technical activities	2164
Of which research and development	2089
Administrative and support service activities	4
Public administration and defence; compulsory social security	2
Education	1030
Of which higher education	986
Human health and social work activities	38
Art, entertainment and recreation	132
Other service activities	10



2. R&D Personnel

2.1. R&D PERSONNEL

(headcount)

	1995	2000	2005*	2010	2012	2013	2014	2015	2016	2017
Total	1061044	887729	813207	736540	726318	727029	732274	738857	722291	707887
Research institutes	753253	718434	510523	435304	430677	434243	435129	435502	427158	407962
Design organisations	129689	56488	184785	157146	138295	137098	139608	136263	133742	125272
Construction project and exploration organisations	20870	6811	5443	6324	6772	4907	4776	2849	1801	1537
Pilot plants	13640	6145	1232	1558	2330	2383	2653	3023	2996	6030
Higher education institutions	40015	31110	33942	46776	53699	54092	58573	60151	59124	56571
Industrial enterprises	89030	54721	43524	51807	52071	52232	49358	53868	50740	59421
Others	14547	14020	33758	37625	42474	42074	42177	47201	46730	51094

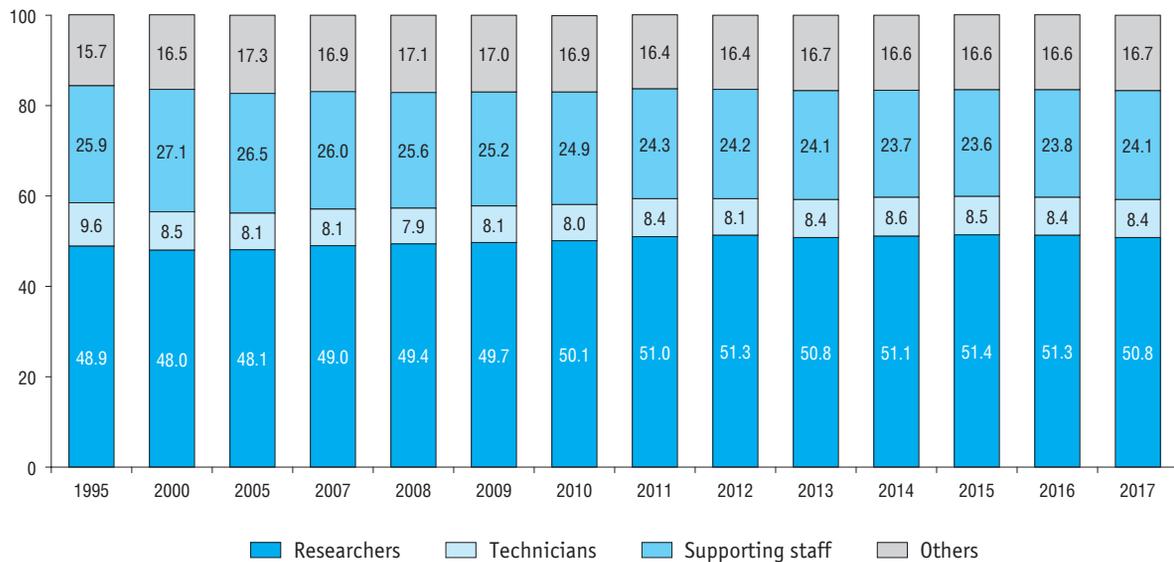
* In 2005, the R&D institutions classification by type was changed due to the abolition of the 'All-Russian Classifier of Economy Branches'.

2.2. R&D PERSONNEL BY OCCUPATION

(headcount)

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Total	1061044	887729	813207	736540	726318	727029	732274	738857	722291	707887
Researchers	518690	425954	391121	368915	372620	369015	373905	379411	370379	359793
Technicians	101371	75184	65982	59276	58905	61401	63168	62805	60441	59690
Supporting staff	274925	240506	215555	183713	175790	175365	173554	174056	171915	170347
Others	166058	146085	140549	124636	119003	121248	121647	122585	119556	118057

2.3. PERCENTAGE DISTRIBUTION OF R&D PERSONNEL BY OCCUPATION



2.4. R&D PERSONNEL BY OWNERSHIP OF R&D INSTITUTIONS

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
	Headcount									
Total	1061044	887729	813207	736540	726318	727029	732274	738857	722291	707887
Russian ownership	1060480	866386	797394	726234	715691	710336	723101	729121	714043	699449
Public ownership	816799	673658*	641310	575035	536212	518460	522994	485424	458989	424666
Federal	795299	657696	629207	564238	525200	508083	508938	472548	447382	415705
Regional	21500	15957	12103	10450	10947	10377	14056	12876	11607	8961
Municipal ownership	738	725	77	170	142	208	155	141	150	142
Ownership by voluntary associations	1036	1207	231	512	600	740	821	1010	959	1144
Private ownership	26238	53408	58480	66906	73260	77830	76920	85798	99312	104995
Ownership by Russian citizens permanently living abroad	...	...	...	...	25	...***	...***	...***	...***	...***
Ownership by consumers' cooperatives**	...	16	27	268	2	...***	...***	20	23	28
Mixed ownership	215669	137372	97269	78464	82862	87532	95863	124661	121142	124785
Mixed ownership with a share of public ownership	...	...	...	66574	59406	67452	75024	90907	91932	93247
Other mixed ownership	...	...	...	...	23456	20080	20839	33754	29210	31538
Ownership by state corporations	...	...	...	4879	22588	25560	26324	32063	33464	43685
Foreign ownership	–	146	1145	1130	1233	1955	2344	2898	2881	3030
Joint ownership (with both Russian and foreign participation)	564	21197	14668	9176	9394	14738	6829	6838	5367	5408

(continued)

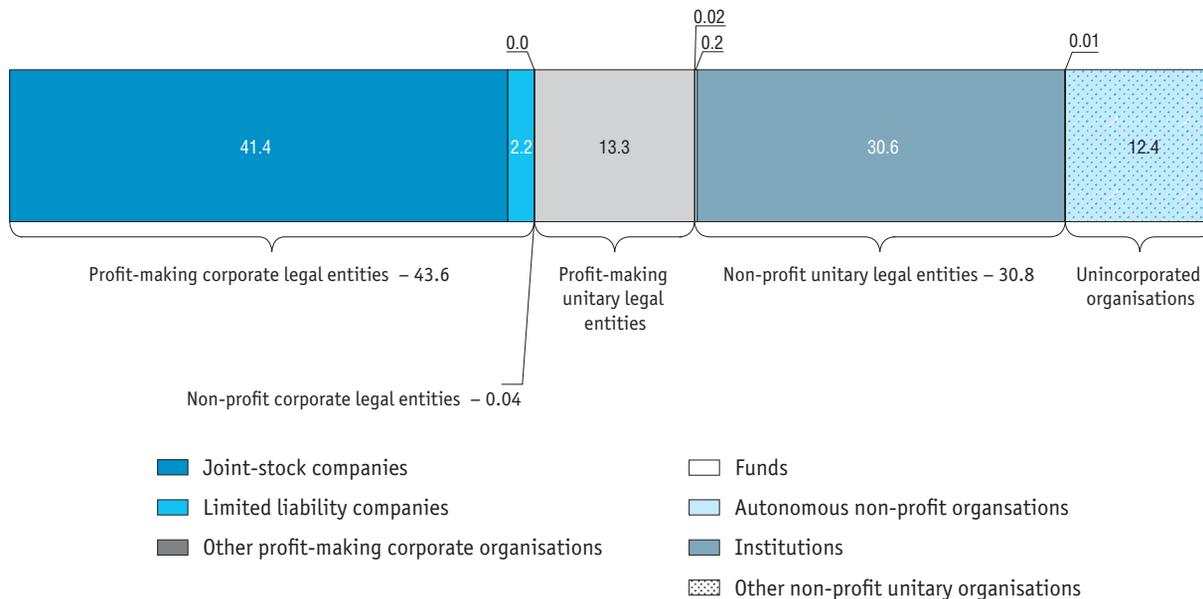
	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
	Percentage									
Total	100	100	100	100	100	100	100	100	100	100
Russian ownership	99.9	97.6	98.1	98.6	98.5	97.7	98.7	98.7	98.9	98.8
Public ownership	77.0	75.9	78.9	78.1	73.8	71.3	71.4	65.7	63.5	60.0
Federal	75.0	74.1	77.4	76.6	72.3	69.9	69.5	64.0	61.9	58.7
Regional	2.0	1.8	1.49	1.4	1.5	1.4	1.9	1.7	1.6	1.3
Municipal ownership	0.07	0.08	0.01	0.02	0.02	0.03	0.02	0.02	0.0	0.0
Ownership by voluntary associations	0.1	0.1	0.028	0.1	0.1	0.1	0.1	0.1	0.1	0.2
Private ownership	2.5	6.0	7.19	9.1	10.1	10.7	10.5	11.6	13.7	14.8
Ownership by Russian citizens permanently living abroad	...	...	...	...	0.003	...***	...***	...***	...***	...***
Ownership by consumers' cooperatives**	...	0.002	0.003	0.04	0.0	...***	...***	0.003	0.003	0.0
Mixed ownership	20.3	15.5	11.96	10.7	11.4	12.0	13.1	16.9	16.8	17.6
Mixed ownership with a share of public ownership	...	...	...	9.0	8.2	9.3	10.2	12.3	12.7	13.2
Other mixed ownership	...	...	...	...	3.2	2.8	2.8	4.6	4.0	4.5
Ownership by state corporations	...	...	...	0.7	3.1	3.5	3.6	4.3	4.6	6.2
Foreign ownership	–	0.02	0.14	0.2	0.2	0.3	0.3	0.4	0.4	0.4
Joint ownership (with both Russian and foreign participation)	0.05	2.4	1.8	1.2	1.3	2.0	0.9	0.9	0.7	0.8

* The sum of the breakdown may not add to the total because some institutions have shared ownership.

** Up to the year 2000, it was included into private and mixed Russian ownership.

*** The data are not published in order to ensure the confidentiality of primary statistics received from organisations, 'On the Official Statistical Accounting and State Statistics System of the Russian Federation' (art. 4, para. 5; art.in accordance with Federal Law no. 282-FL of 29.11.2007 9, para. 1).

2.5. PERCENTAGE DISTRIBUTION OF R&D PERSONNEL BY LEGAL STRUCTURE AND STATUS OF INSTITUTIONS: 2017



2.6. R&D PERSONNEL BY TYPE OF ECONOMIC ACTIVITY: 2017*

(headcount)

	R&D personnel	Researchers
Total	707887	359793
Agriculture, forestry, and fishing	821	242
Mining and quarrying	429	372
Manufacturing	70598	37420
Electricity, gas, steam and air-conditioning supply	146	127
Water supply; sewerage, waste management, and remediation activities	... **	... **
Construction	75	41
Wholesale and retail trade; repair of motor vehicles and motorcycles	358	277
Transportation and storage	128	72
Accommodation and food service activities	... **	... **
Information and communication	3538	2354
Financial and insurance activities	22	21
Real estate activities	688	533
Professional, scientific and technical activities	564623	272400
Of which research and development	559836	268884
Administrative and support service activities	37	28
Public administration and defence; compulsory social security	... **	... **
Education	58297	41890
Of which higher education	57482	41222
Human health and social work activities	3796	1795
Art, entertainment and recreation	3102	1730
Other service activities	73	38

* In accordance with All-Russian Classifier of Economic Activities (OKVED 2).

** The data are not published in order to ensure the confidentiality of primary statistics received from organisations, in accordance with Federal Law no. 282-FL of 29.11.2007 'On the Official Statistical Accounting and State Statistics System of the Russian Federation' (art. 4, para. 5; art. 9, para. 1).

2.7. R&D PERSONNEL BY EDUCATIONAL ATTAINMENT

(headcount)

	Total	Higher education	Secondary vocational education	Other education
1995	1061044	626979	168999	265066
2000	887729	530649	144503	212577
2005	813207	501718	134222	177267
2006	807066	502657	133454	170955
2007	801135	513099	129360	158676
2008	761252	495255	121508	144489
2009	742433	489076	115042	138315
2010	736540	493852	109158	133530
2011	735273	506330	103873	125070
2012	726318	508057	99503	118758
2013	727029	512017	97867	117145
2014	732274	522726	95564	113984
2015	738857	537118	95640	106099
2016	722291	529418	93123	99750
2017	707887	522779	90607	94501

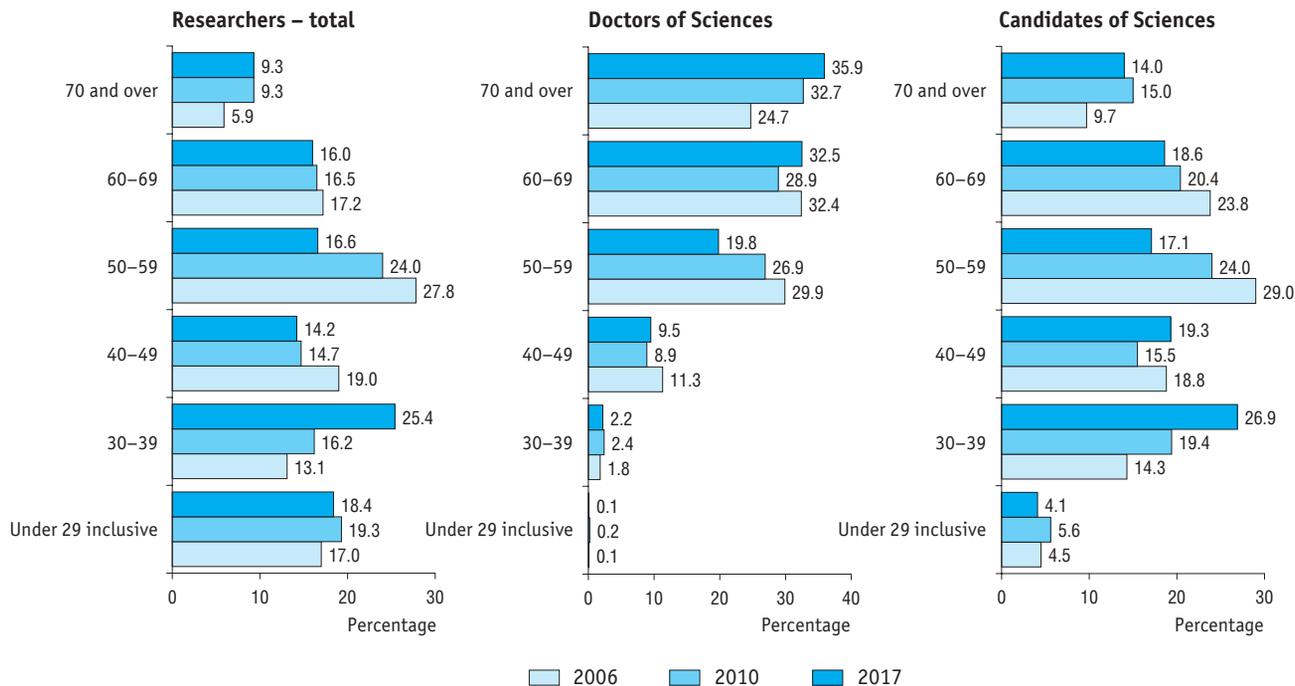
2.8. RESEARCHERS BY GENDER AND AGE (headcount)

	2015			2016			2017		
	Researchers	Of whom		Researchers	Of whom		Researchers	Of whom	
		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences
Total	379411	28046	83487	370379	27430	80958	359793	26076	77251
<i>Age, years:</i>									
under 29 inclusive	76813	11	4408	71492	13	3864	66376	32	3153
30–39	85972	730	21207	88782	629	21204	91429	566	20772
40–49	50171	2606	14703	50193	2547	14899	51149	2473	14906
50–54	32416	2457	7292	29592	2278	6670	26749	1987	5938
55–59	37136	3829	8435	35604	3649	7836	33144	3173	7300
60–69	63943	9280	16420	60915	8991	15443	57414	8484	14351
70 and over	32960	9133	11022	33801	9323	11042	33532	9361	10831
Males	226482	20830	48564	222043	20288	47096	217503	19260	44986
<i>Age, years:</i>									
under 29 inclusive	48585	11	2658	45259	7	2321	42388	32	1930
30–39	51537	514	11424	53744	451	11642	55983	408	11541
40–49	26724	1619	7151	27174	1560	7246	28400	1573	7384
50–54	16919	1634	3986	15498	1485	3590	14019	1256	3108
55–59	20562	2654	5045	19488	2504	4581	18275	2195	4298
60–69	38864	7024	10808	37171	6739	10168	34866	6237	9277
70 and over	23291	7374	7492	23709	7542	7548	23572	7559	7448

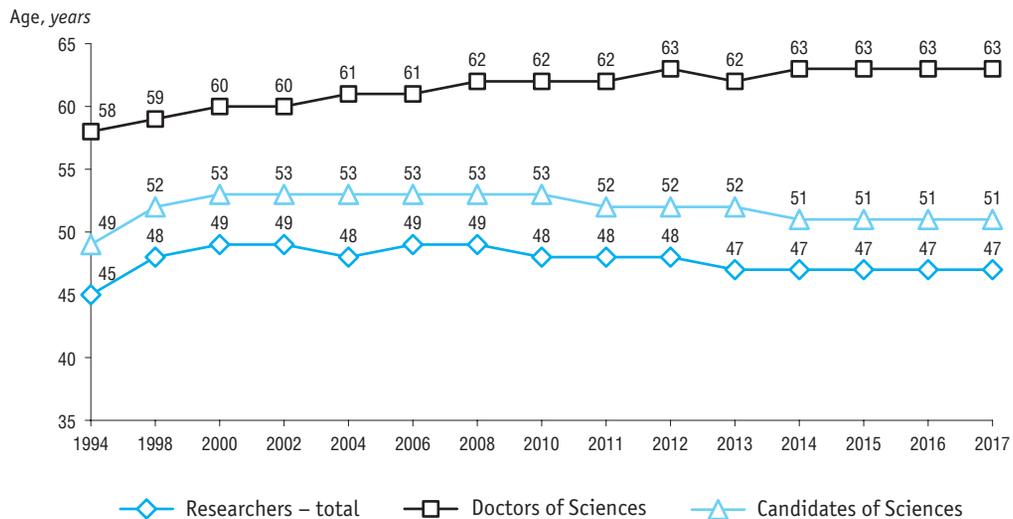
(continued)

	2015			2016			2017		
	Researchers	Of whom		Researchers	Of whom		Researchers	Of whom	
		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences
Females	152929	7216	34923	148336	7142	33862	142290	6816	32265
<i>Age, years:</i>									
under 29 inclusive	28228	–	1750	26233	6	1543	23988	–	1223
30–39	34435	216	9783	35038	178	9562	35446	158	9231
40–49	23447	987	7552	23019	987	7653	22749	900	7522
50–54	15497	823	3306	14094	793	3080	12730	731	2830
55–59	16574	1175	3390	16116	1145	3255	14869	978	3002
60–69	25079	2256	5612	23744	2252	5275	22548	2247	5074
70 and over	9669	1759	3530	10092	1781	3494	9960	1802	3383

2.9. PERCENTAGE DISTRIBUTION OF RESEARCHERS BY AGE



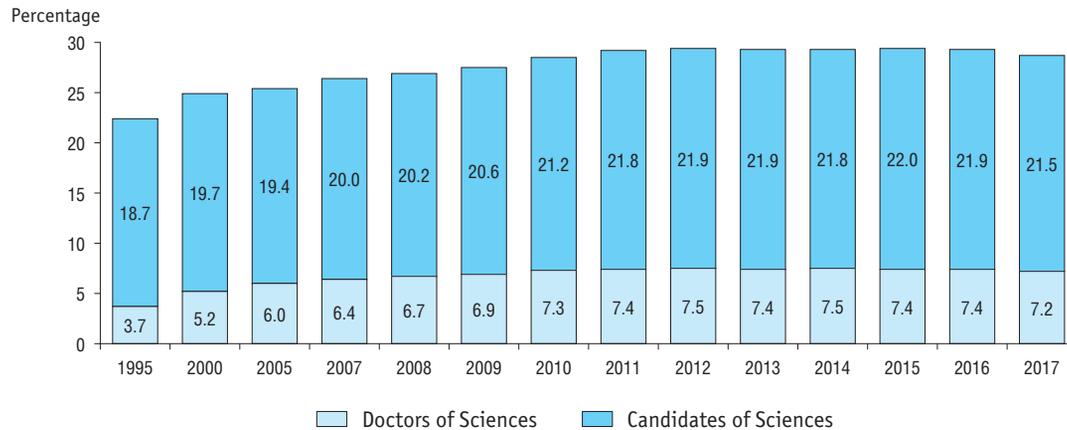
2.10. AVERAGE AGE OF RESEARCHERS



2.11. RESEARCHERS WITH SCIENTIFIC DEGREES (headcount)

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Researchers with scientific degrees	116465	105911	99428	105114	109330	108248	109598	111533	108388	103327
Doctors of Sciences	19330	21949	23410	26789	27784	27485	27969	28046	27430	26076
Candidates of Sciences	97135	83962	76018	78325	81546	80763	81629	83487	80958	77251

2.12. RESEARCHERS WITH SCIENTIFIC DEGREES AS A PERCENTAGE OF THE TOTAL NUMBER OF RESEARCHERS

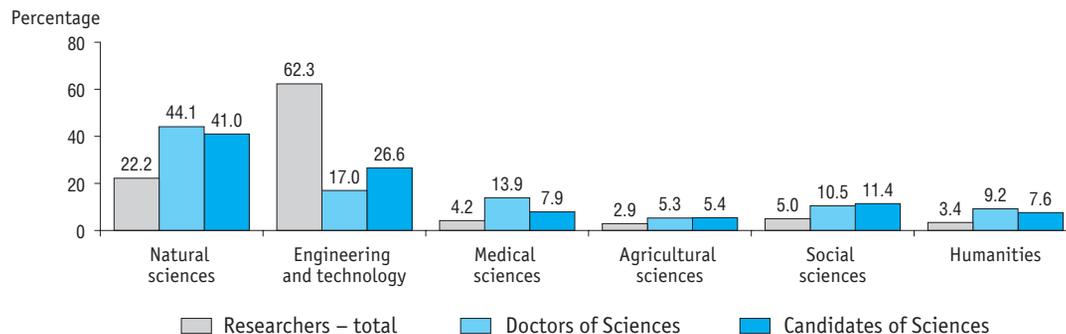


2.13. RESEARCHERS BY FIELD OF SCIENCE AND TECHNOLOGY

(headcount)

	2005			2010			2016			2017		
	Researchers	Of whom		Researchers	Of whom		Researchers	Of whom		Researchers	Of whom	
		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences
Total	391121	23410	76018	368915	26789	78325	370379	27430	80958	359793	26076	77251
Natural sciences	91570	10738	32969	89375	12251	33664	85979	12083	33087	79980	11503	31703
Engineering and technology	249358	4495	23677	224641	4620	21260	225038	4648	21153	224111	4435	20581
Medical sciences	15672	3715	6791	16516	4045	7475	16137	3768	6755	14942	3621	6133
Agricultural sciences	13724	1356	4922	12734	1542	5004	11066	1487	4483	10343	1384	4183
Social sciences	12497	1336	4158	14347	2057	5861	19831	2990	9611	18126	2726	8811
Humanities	8300	1770	3501	11302	2274	5061	12328	2454	5869	12291	2407	5840

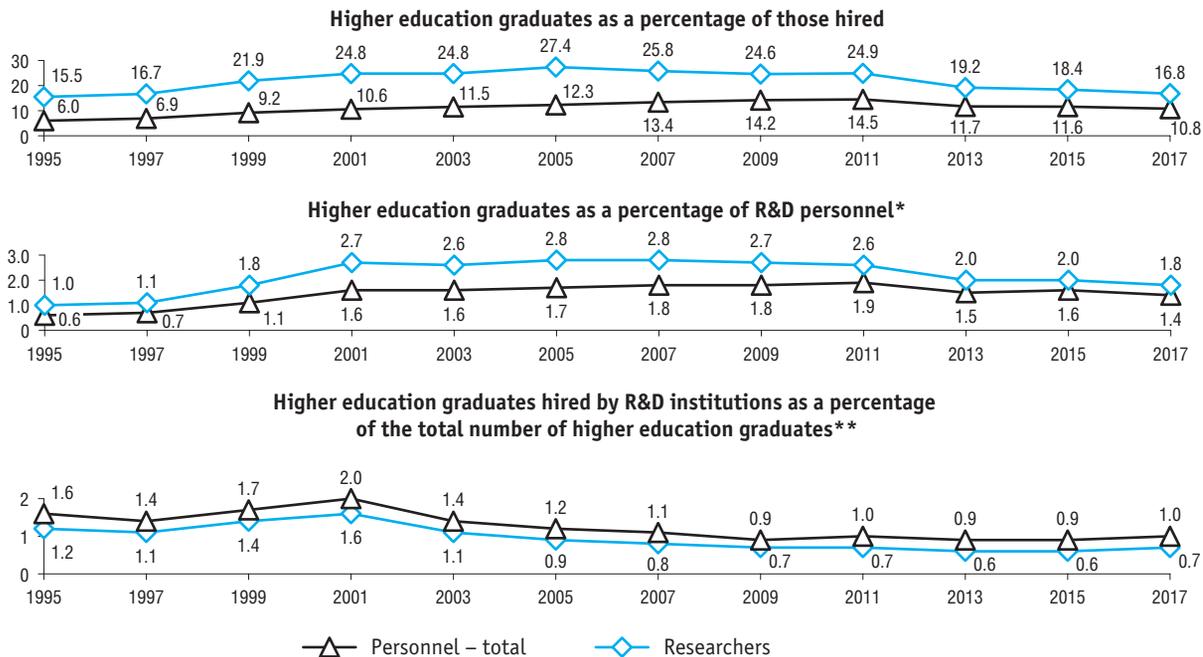
2.14. PERCENTAGE DISTRIBUTION OF RESEARCHERS BY FIELD OF SCIENCE AND TECHNOLOGY: 2017



2.15. FLOWS OF R&D PERSONNEL (headcount)

	Number at the beginning of the reporting year	Inflow				Outflow				Number at the end of the reporting year
		Total	Of whom			Total	Of whom			
			higher education graduates	other research institutes' graduates	others		resigned	were made redundant	left due to other reasons	
1995	1179294	108335	6498	23402	78435	226585	141776	29747	55062	1061044
2001	890718	132757	14122	21549	97086	137932	93587	3542	40803	885568
2003	867456	120298	13777	20702	85819	129284	89513	5917	33854	858470
2005	826007	109973	13495	15618	80860	122773	81623	6598	34552	813207
2007	814329	105758	14150	19778	71830	118952	80536	4617	33799	801135
2009	745978	93526	13235	13529	66762	97071	58295	5776	33000	742433
2011	741183	94939	13725	11881	69333	100849	62848	2973	35028	735273
2013	725591	94550	11075	13210	70265	93112	59214	2015	31883	727029
2015	737210	100290	11662	14026	74602	98643	58285	4238	36120	738857
2017	714384	92300	9985	12539	69776	98797	57974	4327	36496	707887

2.16. INFLOW OF HIGHER INSTITUTION GRADUATES IN R&D INSTITUTIONS



* The ratio of the higher education graduates hired during the year to the number of employees at the end of the year.

** Including private higher education institutions.

2.17. TRENDS IN INFLOW AND OUTFLOW OF R&D PERSONNEL

	1995	2001	2005	2007	2009	2011	2013	2015	2017
R&D personnel balance by inflow*	0.099	0.152	0.138	0.135	0.131	0.135	0.138	0.144	0.142
R&D personnel balance by outflow**	0.207	0.158	0.154	0.152	0.136	0.144	0.136	0.142	0.152
Labour force replacement ratio***	0.478	0.962	0.896	0.889	0.963	0.941	1.015	1.017	0.934

* The ratio of the R&D personnel inflow during the year to the average employment in the organisation.

** The ratio of the R&D personnel outflow during the year to the average employment in the organisation.

*** The ratio of R&D personnel inflow during the year to the outflow during the same period.

Training of R&D personnel

2.18. MAIN INDICATORS OF POSTGRADUATE STUDIES

	Number of institutions (at the end of the year)	Enrolment, <i>headcount</i> (at the end of the year)	Entrants, <i>headcount</i>	Graduates, <i>headcount</i>	Of whom with defended thesis*, <i>headcount</i>
Total					
1995	1334	62317	24025	11369	2609
2000	1362	117714	43100	24828	7503
2005	1473	142899	46896	33561	10650
2006	1493	146111	50462	35530	11893
2007	1490	147719	51633	35747	10970
2008	1529	147674	49638	33670	8831
2009	1547	154470	55540	34235	10770
2010	1568	157437	54558	33763	9611
2011	1570	156279	50582	33082	9635
2012	1575	146754	45556	35162	9195
2013	1557	132002	38971	34733	8979
2014	1519	119868	32981	28273	5189
2015	1446	109936	31647	25826	4651
2016	1359	98352	26421	25992	3730
2017	1284	93523	26081	18069	2320

* Here and below, the headcount of those who defended the thesis during their postgraduate studies (i.e., during the period of time specified in the order of admission).

(continued)

	Number of institutions (at the end of the year)	Enrolment, <i>headcount</i> (at the end of the year)	Entrants, <i>headcount</i>	Graduates, <i>headcount</i>	Of whom with defended thesis*, <i>headcount</i>
Research institutes					
1995	828	11488	4024	2814	596
2000	797	17502	6075	3813	873
2005	833	19986	6577	4806	1009
2006	820	19542	6330	4865	852
2007	799	18346	6072	4847	895
2008	811	17397	5381	4781	715
2009	800	16549	5549	4359	734
2010	809	16936	5655	4335	729
2011	805	15865	4784	4028	693
2012	820	14823	4555	4101	655
2013	818	13593	4166	3943	674
2014	805	12175	3126	3331	397
2015	771	11528	3189	2728	313
2016	733	10581	2949	2954	331
2017	670	10231	3133	2209	247

(continued)

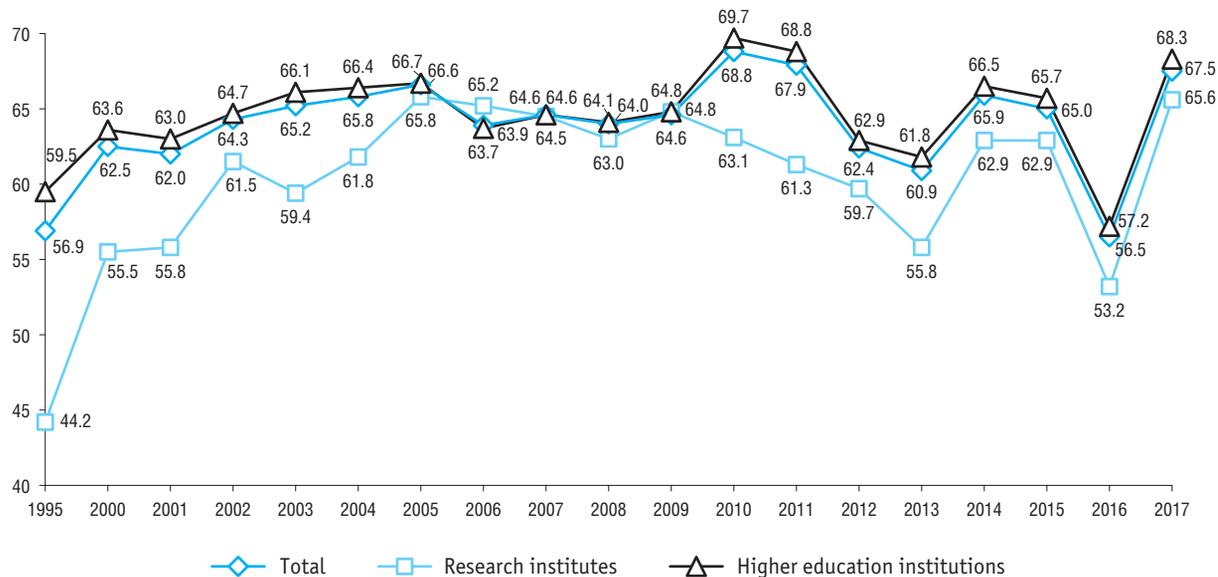
	Number of institutions (at the end of the year)	Enrolment, <i>headcount</i> (at the end of the year)	Entrants, <i>headcount</i>	Graduates, <i>headcount</i>	Of whom with defened thesis*, <i>headcount</i>
Higher education institutions					
1995	506	50829	20001	8555	2013
2000	565	100212	37025	21015	6630
2005	640	122913	40319	28755	9641
2006	673	126569	44132	30665	11041
2007	691	129373	45561	30900	10075
2008	718	130277	44257	28889	8116
2009	730	137068	49736	29678	9996
2010	748	139908	48748	29268	8854
2011	750	139542	45561	28847	8869
2012	740	131226	40802	30885	8480
2013	724	117790	34643	30639	8257
2014	698	107083	29700	24836	4770
2015	661	97847	28285	22971	4318
2016	611	87180	23281	22917	3379
2017	599	82633	22749	15753	2063
Additional professional (vocational) education institutions					
2009	17	853	255	198	40
2010	11	593	155	160	28
2011	15	872	237	207	73
2012	15	705	199	176	60
2013	15	619	162	151	48
2014	16	610	155	106	22
2015	14	561	173	127	20
2016	15	591	191	121	20
2017	15	659	199	107	10

2.19. HIGHER EDUCATION GRADUATES OF THE REPORTING YEAR ADMITTED TO POSTGRADUATE STUDIES BY MODE OF STUDY

(headcount)

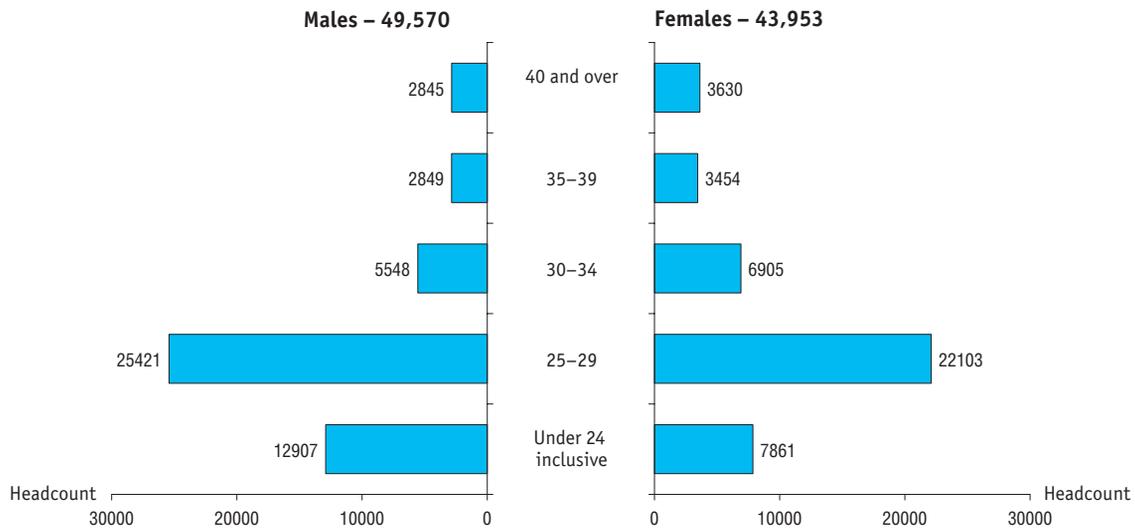
	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
Total	13673	26926	31211	37528	34326	28411	23736	21720	20585	14928	17605
Intramural full-time	11215	22076	25535	28507	24754	21528	19432	18180	17544	12567	14766
Intramural part-time	2458	4850	5676	9021	9572	6883	4304	3540	3041	2361	2839
Research institutes	1777	3370	4328	3569	2933	2718	2326	1965	2005	1570	2055
Intramural full-time	1340	2677	3439	2877	2379	2226	1852	1652	1772	1374	1801
Intramural part-time	437	693	889	692	554	492	474	313	233	196	254
Higher education institutions	11896	23556	26883	33955	31356	25671	21398	19746	18572	13324	15533
Intramural full-time	9875	19399	22096	25628	22347	19298	17578	16525	15770	11185	12965
Intramural part-time	2021	4157	4787	8327	9009	6373	3820	3221	2802	2139	2568
Additional professional (vocational) education institutions	–	–	–	4	37	22	12	9	8	34	17
Intramural full-time	–	–	–	2	28	4	2	3	2	8	–
Intramural part-time	–	–	–	2	9	18	10	6	6	26	17

2.20. HIGHER EDUCATION GRADUATES OF THE REPORTING YEAR AS A PERCENTAGE OF THE TOTAL POSTGRADUATE ENROLMENT*



* Additional professional (vocational) education institutions: 2010 – 2.6%, 2011 – 15.6%, 2012 – 11.1%, 2013 – 7.4%, 2014 – 5.8%, 2015 – 4.6%, 2016 – 17.8%.

2.21. POSTGRADUATE ENROLMENT BY GENDER AND AGE: 2017 (at the end of the year)



2.22. POSTGRADUATE ENROLMENT, ENTRANTS, AND GRADUATES BY FIELD OF EDUCATION

(headcount)

	Enrolment			Entrants			Graduates	Of whom with defended thesis
	2015*	2016*	2017*	2015	2016	2017	2017	2017
Total	60449	82750	91922	31647	26421	26081	7457	865
Fields of education:								
Engineering mathematics	1459	2050	2501	752	652	713	49	11
Computer and information sciences	211	293	300	148	110	107	26	6
Physics and astronomy	2358	3456	4318	1214	1234	1166	102	33
Chemistry	1584	2153	2700	799	681	726	57	18
Earth sciences	2097	2886	2935	1065	922	970	480	37
Biological sciences	2563	3596	4488	1352	1102	1179	128	15
Architecture	323	477	474	158	166	135	53	3
Civil engineering and technology	1239	1641	2039	663	501	592	26	6
Computer engineering	4802	6433	7594	2556	1963	2021	130	22
Information security	307	373	453	158	134	145	3	–
Electronics and communications engineering	1115	1512	1829	558	505	517	40	8
Photonics, instrumentation engineering, optical and biomedical engineering	577	786	967	300	287	285	9	4
Power engineering and thermal power engineering	1065	1539	1949	528	512	542	25	5
Nuclear power engineering and technology	160	226	302	88	91	83	5	–
Mechanical engineering	1366	1836	2238	731	615	635	29	6
Engineering physics and technology	52	37	35	32	10	8	1	–
Weapons and armaments systems	4	10	12	3	3	5	–	–
Chemical engineering	743	1018	1262	399	311	336	9	2
Industrial ecology and biotechnology	562	711	872	262	203	192	17	5
Technosphere safety and environmental engineering	270	363	406	130	116	117	–	–
Applied geology, mining and quarrying, oil and gas engineering, geodesy	601	841	1114	310	294	323	15	6
Materials engineering	558	867	1087	289	317	337	12	2
Surface transport engineering and technology	436	651	779	232	244	229	16	1
Aircraft and aerospace engineering	471	621	720	247	248	208	12	1
Flight navigation and aircraft and aerospace equipment operation	75	110	145	43	43	51	–	–

(continued)

	Enrolment			Entrants			Graduates	Of whom with defended thesis
	2015*	2016*	2017*	2015	2016	2017	2017	2017
Shipbuilding and water-borne transportation engineering and technology	268	397	444	148	144	102	8	–
Engineering systems management	541	790	953	280	266	284	18	9
Nanotechnologies and nanomaterials	22	29	37	11	11	10	–	–
Light industry technological processes	145	191	201	74	57	66	32	1
Basic medicine	530	839	978	288	291	311	122	26
Clinical medicine	4124	6174	6808	2096	1941	1975	915	139
Health sciences and preventive medicine	389	590	668	205	210	229	62	4
Pharmacology and pharmacy	224	314	362	125	99	116	60	10
Agriculture, forestry, and fisheries	1976	2681	3077	1053	868	838	241	43
Veterinary science and animal science	979	1387	1376	490	481	419	225	47
Psychology	1433	1989	2107	804	673	567	220	16
Economics and management	7808	9957	9527	4056	2903	2653	1333	79
Sociology and social work	931	1279	1256	507	460	341	162	15
Law	4040	5229	5400	2191	1545	1570	600	46
Political sciences and area studies	1047	1405	1511	559	480	511	178	7
Mass media, library and information science	284	385	384	151	140	112	59	8
Education and educational research	3512	4800	5145	1917	1490	1434	497	31
Linguistics and literary studies	2684	3678	3815	1387	1145	1055	552	88
History and archaeology	1903	2566	2568	967	775	733	414	58
Philosophy, ethics, and religion	1156	1550	1519	599	493	424	237	30
Theology	5	9	22	5	5	13	–	–
Physical training and sport	390	611	678	194	235	225	88	3
Art (arts, history of arts, etc.)	613	828	952	296	271	298	112	6
Cultural studies and sociocultural projects	447	586	615	227	174	173	78	8

* In accordance with Federal Law no. 273-FL of December 29, 2012 'On the Education in the Russian Federation', since January 01, 2014, the fields of studies that postgraduate students can enrol in are listed according to Order of the Ministry of Education and Science of the Russian Federation no. 1061 of September 12, 2013 'On the Approval of the Lists of Professions and Fields of Studies in Higher Education'. The 2015 data – the number of postgraduate students in their first and second year of studies; 2016 – the number of postgraduate students in their first, second, and third year of studies.

2.23. POSTGRADUATE ENROLMENT, ENTRANTS, AND GRADUATES BY FIELD OF EDUCATION CORRESPONDING TO PRIORITY AREAS OF ECONOMICAL MODERNISATION AND TECHNOLOGICAL DEVELOPMENT

(headcount)

	Enrolment			Entrants			Graduates	Of whom with defended thesis
	2015*	2016*	2017*	2015	2016	2017	2017	2017
Fields of education, by priority areas of economical modernisation and technological development	29624	41514	48874	15514	13495	13778	2550	435
Engineering mathematics	1459	2050	2501	752	652	713	49	11
Computer and information sciences	211	293	300	148	110	107	26	6
Physics and astronomy	2358	3456	4318	1214	1234	1166	102	33
Biological sciences	2563	3596	4488	1352	1102	1179	128	15
Civil engineering and technology	1239	1641	2039	663	501	592	26	6
Computer engineering	4802	6433	7594	2556	1963	2021	130	22
Information security	307	373	453	158	134	145	3	–
Electronics and communications engineering	1115	1512	1829	558	505	517	40	8
Photonics, instrumentation engineering, optical and biomedical engineering	577	786	967	300	287	285	9	4
Power engineering and thermal power engineering	1065	1539	1949	528	512	542	25	5
Nuclear power, thermal power engineering, and renewable related technologies	160	226	302	88	91	83	5	–
Mechanical engineering	1366	1836	2238	731	615	635	29	6
Engineering physics and technology	52	37	35	32	10	8	1	–
Weapons and armaments systems	4	10	12	3	3	5	–	–
Chemical engineering	743	1018	1262	399	311	336	9	2
Technosphere safety	270	363	406	130	116	117	–	–
Geology, exploration, and exploitation of minerals	560	774	1042	286	280	304	8	6

(continued)

	Enrolment			Entrants			Graduates	Of whom with defended thesis
	2015*	2016*	2017*	2015	2016	2017	2017	2017
Materials engineering	558	867	1087	289	317	337	12	2
Aircraft and aerospace engineering	471	621	720	247	248	208	12	1
Flight navigation and aircraft and aerospace equipment operation	75	110	145	43	43	51	–	–
Shipbuilding and water-borne transportation engineering and technology	268	397	444	148	144	102	8	–
Engineering systems management	541	790	953	280	266	284	18	9
Nanotechnologies and nanomaterials	22	29	37	11	11	10	–	–
Basic medicine	530	839	978	288	291	311	122	26
Clinical medicine	4124	6174	6808	2096	1941	1975	915	139
Medical and preventive care	389	590	668	205	210	229	62	4
Pharmacology and pharmacy	224	314	362	125	99	116	60	10
Technology, mechanisation tools and power equipment for agriculture, forestry, and fishing	887	1162	1122	497	354	345	199	32
Linguistics and literary studies	2684	3678	3815	1387	1145	1055	552	88

* In accordance with Federal Law no. 273-FL of December 12, 2012 'On the Education in the Russian Federation', since January 01, 2014, the fields of studies that postgraduate students can enrol in are listed according to Order of the Ministry of Education and Science of the Russian Federation no. 1061 of September 12, 2013 'On the Approval of the Lists of Professions and Fields of Studies in Higher Education'. The 2015 data – the number of postgraduate students in their first and second year of studies; 2016 – the number of postgraduate students in their first, second, and third year of studies.

2.24. POSTGRADUATE ENROLMENT AND GRADUATES BY FIELD OF SCIENCE AND TECHNOLOGY

(headcount)

	Enrolment (at the end of the year)			Graduates			Of whom with defended thesis		
	2015*	2016*	2017*	2015	2016	2017	2015	2016	2017
Total	49487	15602	1601	25826	25992	10612	4651	3730	1455
Physics and mathematics	3299	1319	110	1230	1677	907	272	318	143
Chemical sciences	1346	554	34	497	658	428	146	153	106
Biological sciences	2889	1094	104	1235	1437	763	232	173	104
Engineering and technology**	14011	4870	564	6723	7286	3079	1093	1030	466
Agricultural sciences***	1684	448	44	1006	954	381	254	223	96
History and archaeology	1362	281	30	855	823	219	127	112	28
Economics	6082	1744	234	3839	3206	1030	582	275	72
Philosophy	845	235	21	492	475	162	77	53	19
Philology and linguistics	2212	561	43	1248	1204	443	272	241	55
Law	2808	812	84	1461	1371	497	205	148	24
Educational research	2762	783	59	1580	1437	529	286	190	46
Medical sciences****	4781	1541	141	2611	2577	1213	722	490	219
Art (arts, history of arts, etc.)	529	124	10	304	287	97	12	26	12
Psychology	1040	282	23	544	504	169	69	32	7
Sociology	725	188	20	423	387	123	68	47	11
Political science	674	166	14	392	385	130	48	27	4
Earth sciences*****	1883	454	50	1104	1050	336	154	152	29
Other sciences	555	146	16	282	274	106	32	40	14

* In accordance with Federal Law no. 273-FL of December 12, 2012 'On the Education in the Russian Federation', since January 01, 2014, the fields of studies that postgraduate students can enrol in are listed according to Order of the Ministry of Education and Science of the Russian Federation no. 1061 of September 12, 2013 'On the Approval of the Lists of Professions and Fields of Studies in Higher Education'. The 2015 data – the number of postgraduate students in their second to fifth year of studies; 2016 – the number of postgraduate students in their fourth to fifth year of studies.

** Including architecture.

*** Including veterinary science.

**** Including pharmacology and pharmacy.

***** Including geology, mineralogy, and geography.

**2.25. POSTGRADUATE GRADUATES WITH DEFENDED THESIS WHO HAVE BEEN GRANTED A DIPLOMA BY THE STATE COMMISSION
FOR ACADEMIC DEGREES AND TITLES OF THE MINISTRY OF SCIENCE AND HIGHER EDUCATION
OF THE RUSSIAN FEDERATION BY FIELD OF EDUCATION**

(headcount)

	2010	2011	2012	2013	2014	2015	2016	2017
Total	21155	22827	21144	20014	9896	12524	10497	9572
Mathematics	216	226	207	227	162	185	178	117
Mechanics	163	201	172	219	115	130	134	97
Astronomy	22	30	21	26	21	26	31	23
Physics	640	655	651	697	452	483	542	474
Chemistry	665	672	604	794	355	486	463	395
Physico-chemical biology	321	348	377	390	185	207	209	188
General biology	576	709	691	694	311	363	292	285
Physiology	291	311	272	276	100	165	126	107
Geometric engineering and computer-generated graphics	3	3	3	6	1	0	3	2
Mechanical engineering and engineering science	283	286	292	301	117	156	131	153
Energy, metallurgical and chemical engineering	44	55	59	53	24	34	50	34
Transportation, mining and civil engineering	54	45	78	62	32	47	39	38
Aircraft and aerospace engineering	50	44	47	36	23	32	31	47
Shipbuilding	28	34	36	36	15	17	17	17
Electrical machinery	139	122	137	159	78	80	107	92
Instrumentation engineering, metrology and data measuring instruments and systems	156	185	184	197	117	127	142	116
Radio-frequency engineering and communication	114	126	142	136	85	108	90	91
Computer engineering and control	964	1058	925	1046	539	588	475	450
Energy sector	112	113	130	135	79	79	82	77
Metallurgy and materials engineering	156	175	163	211	116	137	147	127

(continued)

	2010	2011	2012	2013	2014	2015	2016	2017
Chemical engineering	172	217	217	250	94	114	152	108
Food technology	176	247	188	274	120	128	104	88
Technology of textile materials and light industry products	58	49	64	50	20	26	15	24
Processes and machines in agro-engineering systems	154	168	183	205	81	111	107	118
Technology, machinery and equipment for logging and forestry, wood processing and biomass chemical conversion	51	59	54	94	28	59	35	52
Transportation	132	129	142	120	68	87	70	69
Construction and architecture	252	262	248	312	157	190	189	132
Documentary information	48	52	60	37	32	25	16	13
Civil defence	59	82	74	80	24	50	39	43
Electronics	44	63	66	88	43	54	50	57
Agronomy	171	368	341	304	133	201	180	168
Veterinary science and animal science	314	413	397	487	124	230	207	231
Forestry	17	56	50	71	22	32	34	28
Fishing	0	3	6	4	0	7	6	9
Historical sciences and archeology	819	820	681	574	251	389	401	367
Economic sciences	3449	3644	3387	2745	1156	1445	813	622
Philosophic sciences	375	462	399	293	198	218	213	180
Literary studies	412	431	393	391	182	266	261	248
Linguistics	910	975	876	753	345	494	480	421
Legal sciences	1186	1440	1185	895	522	630	514	490
Pedagogical sciences	1799	1694	1648	1256	731	939	571	524

(continued)

	2010	2011	2012	2013	2014	2015	2016	2017
Clinical medicine	2581	2470	2238	2261	1265	1580	1355	1321
Preventive medicine	309	322	284	230	138	154	72	86
Life sciences	463	510	454	425	227	262	210	214
Pharmaceutical sciences	46	124	101	138	58	83	71	60
Art (arts, history of arts, etc.)	177	206	192	204	84	101	126	144
Psychological sciences	547	542	486	387	195	246	180	150
Social sciences	323	375	332	283	128	192	150	153
Political sciences	283	365	294	294	124	201	114	95
Culturology	178	239	202	152	90	99	91	85
Earth sciences	653	642	711	656	329	461	382	341
Theology	–	–	–	–	–	–	–	1

Source: Ministry of Science and Higher Education of the Russian Federation.

2.26. MAIN INDICATORS OF DOCTORAL STUDIES

	Number of institutions (at the end of the year)	Enrolment, <i>headcount</i> (at the end of the year)	Entrants, <i>headcount</i>	Graduates, <i>headcount</i>	Of whom with defended doctoral thesis*, <i>headcount</i>
Total					
1995	384	2190	904	464	137
2000	492	4213	1637	1251	486
2005	535	4282	1457	1417	516
2006	548	4189	1499	1383	450
2007	579	4109	1520	1320	429
2008	593	4242	1517	1216	297
2009	598	4294	1569	1302	435
2010	602	4418	1650	1259	336
2011	608	4562	1696	1321	382
2012	597	4554	1632	1371	394
2013	585	4572	1582	1356	323
2014	478	3204	166	1359	231
2015	437	2007	419	1386	181
2016	385	921	397	1346	151
2017	223	1059	439	253	65

* Here and below, the headcount of those who defended the thesis during their doctoral studies (i.e., during the period of time specified in the order of admission).

(continued)

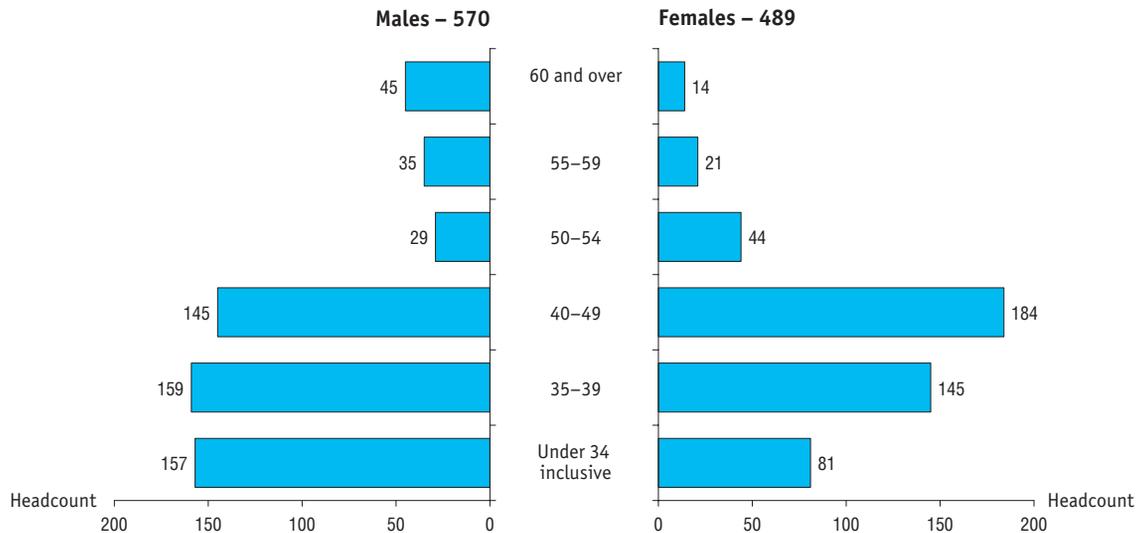
	Number of institutions (at the end of the year)	Enrolment, <i>headcount</i> (at the end of the year)	Entrants, <i>headcount</i>	Graduates, <i>headcount</i>	Of whom with defended doctoral thesis*, <i>headcount</i>
Higher education institutions					
1995	167	483	197	128	41
2000	178	505	192	151	63
2005	173	445	147	148	48
2006	178	426	142	139	35
2007	201	358	118	116	33
2008	205	336	111	123	23
2009	204	327	114	107	23
2010	192	299	100	95	20
2011	192	303	106	100	17
2012	183	254	87	99	16
2013	184	262	110	73	9
2014	105	194	23	78	14
2015	91	153	46	67	8
2016	82	96	29	76	8
2017	45	97	26	27	9

(continued)

	Number of institutions (at the end of the year)	Enrolment, headcount (at the end of the year)	Entrants, headcount	Graduates, headcount	Of whom with defended doctoral thesis*, headcount
Higher education institutions					
1995	217	1707	707	336	96
2000	314	3708	1445	1100	423
2005	362	3837	1310	1269	468
2006	370	3763	1357	1244	415
2007	378	3751	1402	1204	396
2008	388	3906	1406	1093	274
2009	391	3962	1454	1193	412
2010	407	4116	1548	1162	316
2011	412	4256	1589	1220	365
2012	410	4296	1543	1271	378
2013	398	4307	1471	1281	314
2014	372	3009	143	1281	217
2015	345	1853	373	1319	173
2016	303	825	368	1270	143
2017	178	962	413	226	56
Additional professional (vocational) education institutions					
2009	3	5	1	2	–
2010	3	3	2	2	–
2011	4	3	1	1	–
2012	4	4	2	1	–
2013	3	3	1	2	–
2014	1	1	–	–	–
2015	1	1	–	–	–
2016	–	–	–	–	–
2017	–	–	–	–	–

2.27. DOCTORAL ENROLMENT BY GENDER AND AGE: 2017

(at the end of the year)



2.28. DOCTORAL ENROLMENT, ENTRANTS, AND GRADUATES BY FIELD OF SCIENCE AND TECHNOLOGY (headcount)

	Enrolment, <i>headcount</i> (<i>at the end of the year</i>)		Entrants		Graduates		Of whom with doctoral defended thesis	
	2016	2017	2016	2017	2016	2017	2016	2017
Total	921	1059	397	439	1346	253	151	65
Physics and mathematics	57	62	23	25	111	14	15	5
Chemical sciences	23	20	11	6	49	4	8	1
Biological sciences	26	27	7	9	42	9	5	3
Engineering and technology*	244	309	116	141	366	50	49	11
Agricultural sciences**	23	23	5	10	40	13	4	4
History and archaeology	38	32	11	8	61	12	3	4
Economics	168	172	75	66	156	38	10	5
Philosophy	23	31	13	19	47	6	10	1
Philology and linguistics	41	54	19	27	85	15	9	4
Law	58	73	26	32	28	24	4	5
Educational research	82	88	36	36	119	17	10	3
Medical sciences***	29	50	8	22	73	16	15	8
Art (arts, history of arts, etc.)	7	3	–	2	15	7	5	2
Psychology	26	24	11	6	32	6	1	2
Sociology	15	20	6	7	33	6	2	2
Political science	22	27	11	8	24	8	–	–
Earth sciences****	23	24	11	6	47	5	1	3
Other sciences	16	20	8	9	18	3	–	2

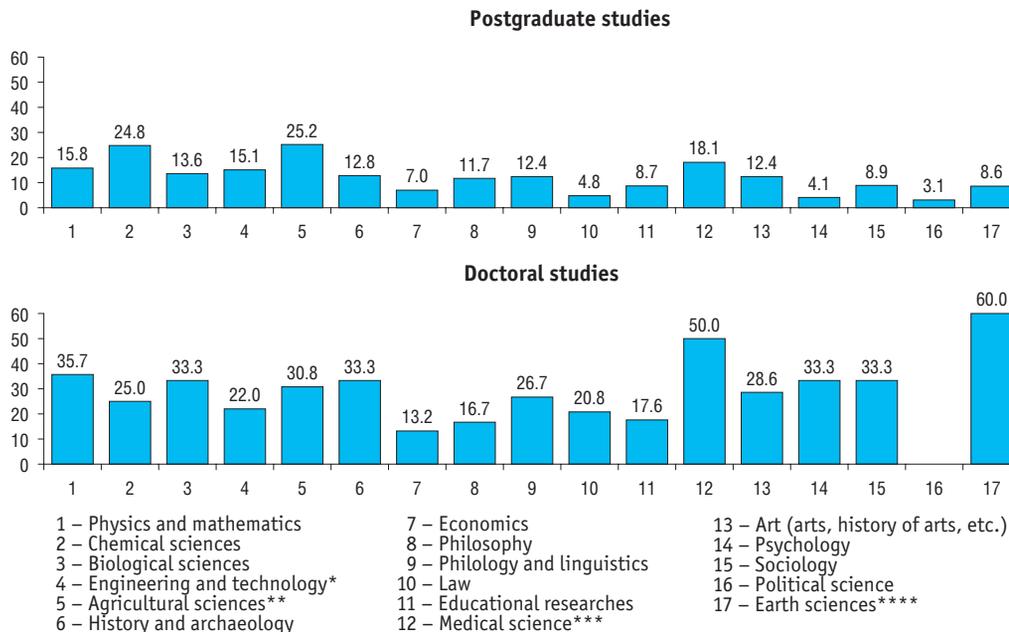
* Including architecture.

** Including veterinary science.

*** Including pharmacology and pharmacy.

**** Including geology, mineralogy, and geography.

2.29. GRADUATES WHO DEFENDED THEIR POSTGRADUATE AND DOCTORAL THESIS DURING THEIR STUDIES AS A PERCENTAGE OF GRADUATES WHO COMPLETED THEIR POSTGRADUATE AND DOCTORAL STUDIES BY FIELD OF SCIENCE AND TECHNOLOGY: 2017



* Including architecture.

** Including veterinary science.

*** Including pharmacology and pharmacy.

**** Including geology, mineralogy, and geography.

**2.30. DOCTORAL GRADUATES WITH DEFENDED THESIS WHO HAVE BEEN GRANTED A DIPLOMA BY THE STATE COMMISSION
FOR ACADEMIC DEGREES AND TITLES OF THE MINISTRY OF SCIENCE AND HIGHER EDUCATION
OF THE RUSSIAN FEDERATION BY FIELD OF EDUCATION**

(headcount)

	2010	2011	2012	2013	2014	2015	2016	2017
Total	2685	3079	2875	2380	1573	1615	1449	1353
Mathematics	48	44	38	37	31	16	28	20
Mechanics	29	29	24	28	22	14	23	18
Astronomy	8	10	9	7	7	4	7	3
Physics	144	156	125	115	88	69	92	69
Chemistry	78	95	87	83	65	42	52	48
Physico-chemical biology	42	66	54	35	33	29	22	31
General biology	94	113	99	87	53	58	65	64
Physiology	38	57	51	38	39	31	28	23
Geometric engineering and computer-generated graphics	0	1	1	1	1	0	0	0
Mechanical engineering and engineering science	34	44	35	38	22	9	16	18
Energy, metallurgical and chemical engineering	9	9	6	3	8	3	1	5
Transportation, mining and civil engineering	8	9	8	7	6	5	8	3
Aircraft and aerospace engineering	4	5	5	3	2	1	4	3
Shipbuilding	6	4	6	1	2	2	4	3
Electrical machinery	10	10	15	13	9	10	7	11
Instrumentation engineering, metrology and data measuring instruments and systems	18	15	19	17	14	15	13	17
Radio-frequency engineering and communication	14	14	12	10	13	8	7	3
Computer engineering and control	123	117	108	76	68	36	61	51
Energy sector	7	14	14	21	10	7	8	7
Metallurgy and materials engineering	27	20	29	22	8	12	15	9

(continued)

	2010	2011	2012	2013	2014	2015	2016	2017
Chemical engineering	30	23	23	24	9	23	13	12
Food technology	22	27	28	30	21	11	18	17
Technology of textile materials and light industry products	5	18	6	2	3	2	1	5
Processes and machines in agro-engineering systems	28	29	24	26	15	14	13	22
Technology, machinery and equipment for logging and forestry, biomass chemical conversion	5	8	5	8	3	10	10	7
Transportation	9	15	11	11	11	5	5	8
Construction and architecture	23	22	24	16	10	21	20	8
Documentary information	7	2	3	9	4	2	4	3
Civil defence	9	15	6	11	2	5	7	4
Electronics	14	4	7	4	5	7	4	7
Agronomy	27	51	47	38	26	23	24	21
Veterinary science and animal science	39	77	68	68	39	37	31	35
Forestry	3	6	10	7	5	5	6	5
Fishing	0	0	2	0	0	1	1	1
Historical sciences and archeology	130	144	130	99	49	74	69	55
Economic sciences	335	403	434	281	141	170	92	101
Philosophical sciences	71	102	78	47	29	43	46	37
Literary studies	72	62	58	47	32	41	24	39
Linguistics	91	97	74	76	52	58	54	56
Legal sciences	94	106	91	72	49	93	56	46
Pedagogical sciences	144	150	188	124	73	93	56	46

(continued)

	2010	2011	2012	2013	2014	2015	2016	2017
Clinical medicine	378	385	357	375	234	249	220	206
Preventive medicine	58	70	56	60	55	38	21	30
Life sciences	89	92	93	79	61	64	40	38
Pharmaceutical Sciences	5	15	20	12	6	6	6	15
Art (arts, history of arts, etc.)	23	24	31	27	15	18	18	11
Psychological sciences	38	42	60	29	25	24	18	21
Social sciences	33	42	32	35	19	17	21	23
Political sciences	35	44	26	34	12	21	20	3
Culturology	26	47	43	21	14	19	15	18
Earth sciences	101	125	95	66	53	50	55	47
Theology	–	–	–	–	–	–	–	1

Source: Ministry of Science and Higher Education of the Russian Federation.



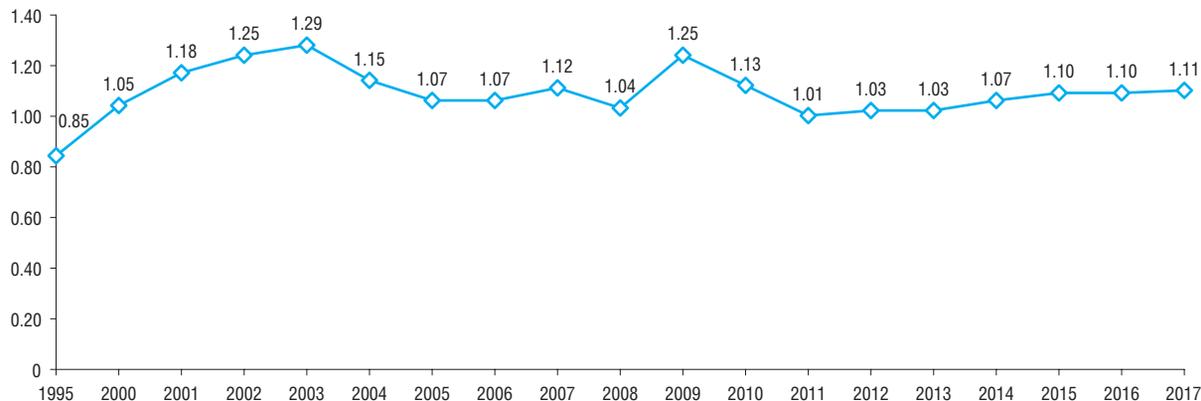
3. R&D Funding

3.1. GROSS DOMESTIC EXPENDITURE ON R&D

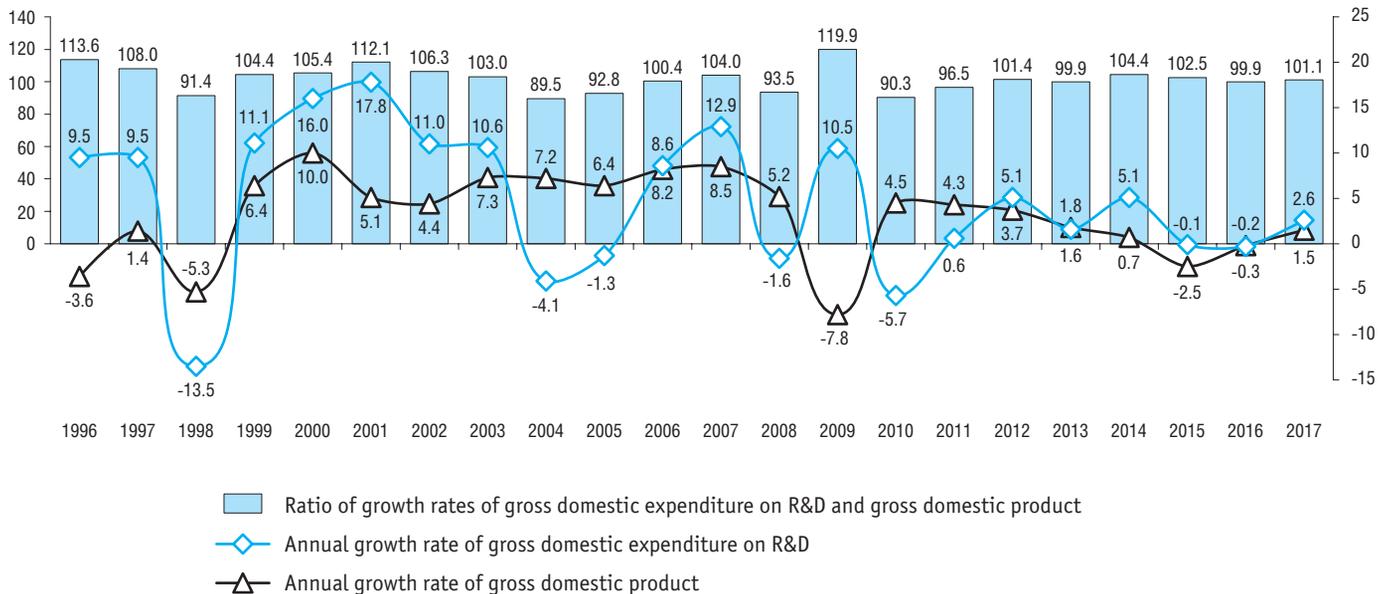
(thousand roubles, 1995 – million roubles)

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Gross domestic expenditure on R&D:										
at current prices	12149458.6	76697100.5	230785150.3	523377233.9	699869784.8	749797638.8	847526992.9	914669057.2	943815219.6	1019152437.1
at constant 1989 prices	2485.4	3321.2	4547.5	5723.2	6052.4	6152.0	6468.7	6464.1	6444.5	6614.9

Gross domestic expenditure on R&D as a percentage of GDP

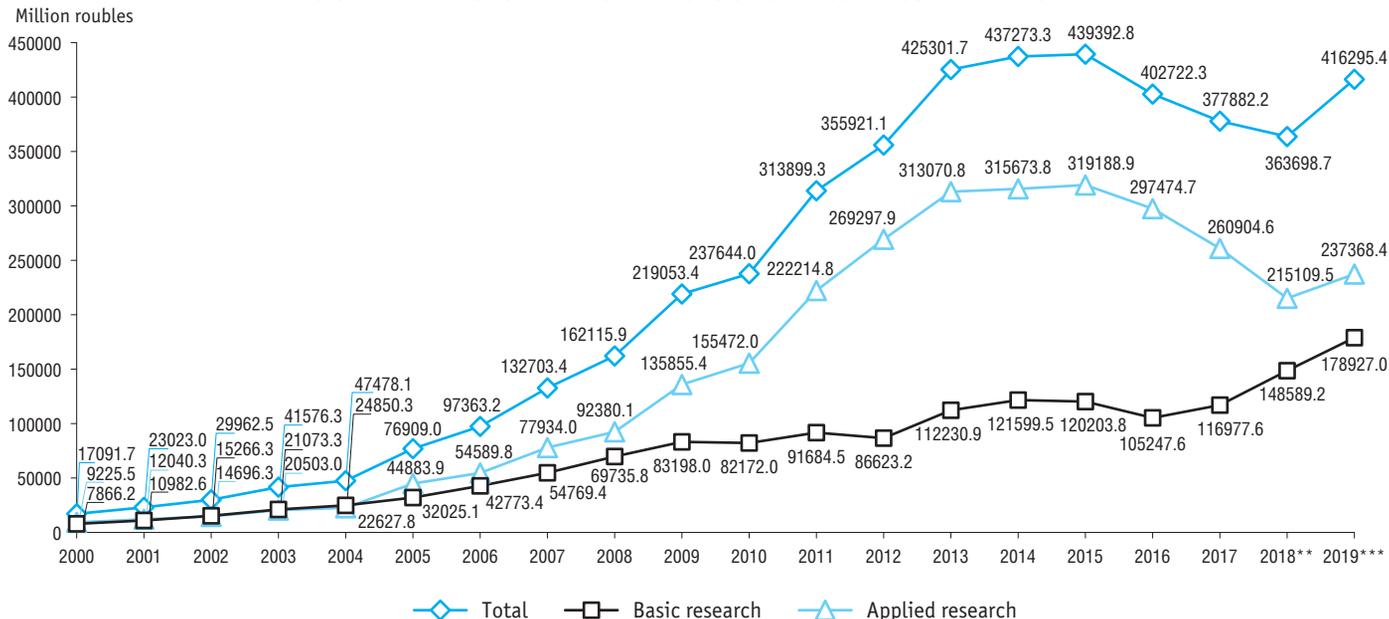


3.2. GROWTH RATES OF GROSS DOMESTIC EXPENDITURE ON R&D AND GROSS DOMESTIC PRODUCT* (percentage)



* Calculated in constant prices.

3.3. FEDERAL BUDGET APPROPRIATIONS ON CIVIL S&T AT CURRENT PRICES*

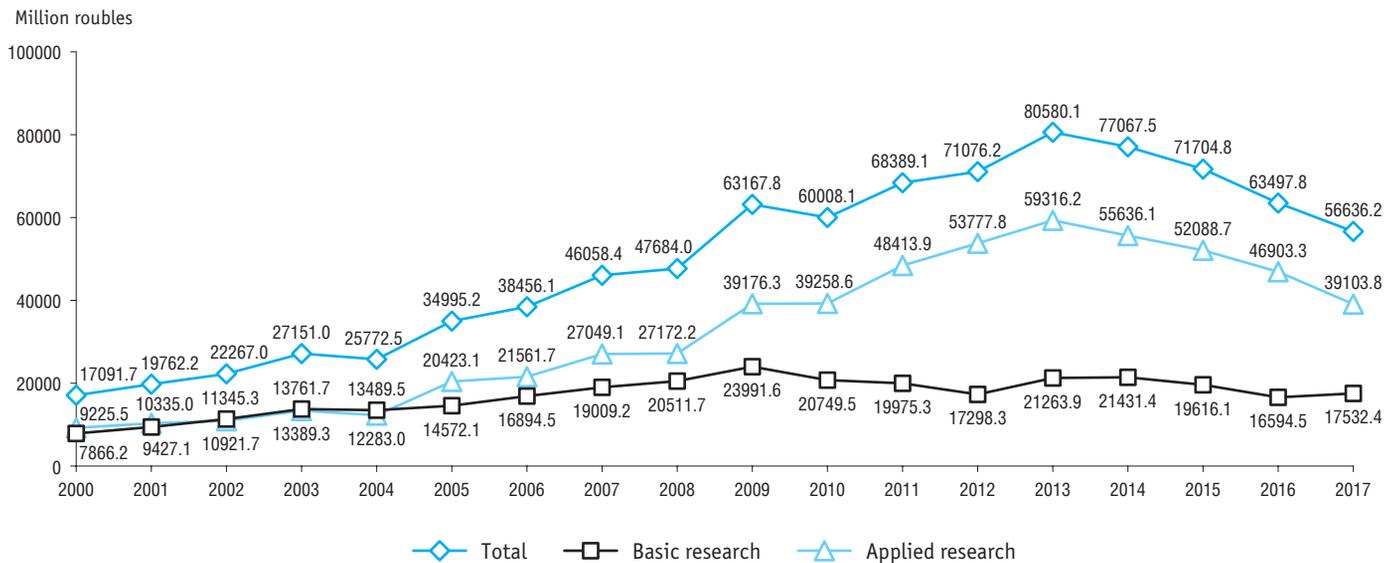


* In 2000–2004, federal budget appropriations under Section 06 ‘Basic Research and Scientific and Technological Progress Promotion’ and the corresponding subsections. Data source for 2005–2017: reports on the implementation of the consolidated budget and budgets of state extra-budgetary funds (the data are provided by the Federal Treasury).

** In accordance with Federal Law no. 362-FZ of December 5, 2017 ‘On the 2018 Federal Budget and the 2019-2020 Budget Plan’ as amended by Federal Laws no. 193-FZ of July 03, 2018, no. 193-FZ of November 29, 2018 ‘On amendments to the Federal Law “On the 2018 Federal Budget and the 2019-2020 Budget Plan”’

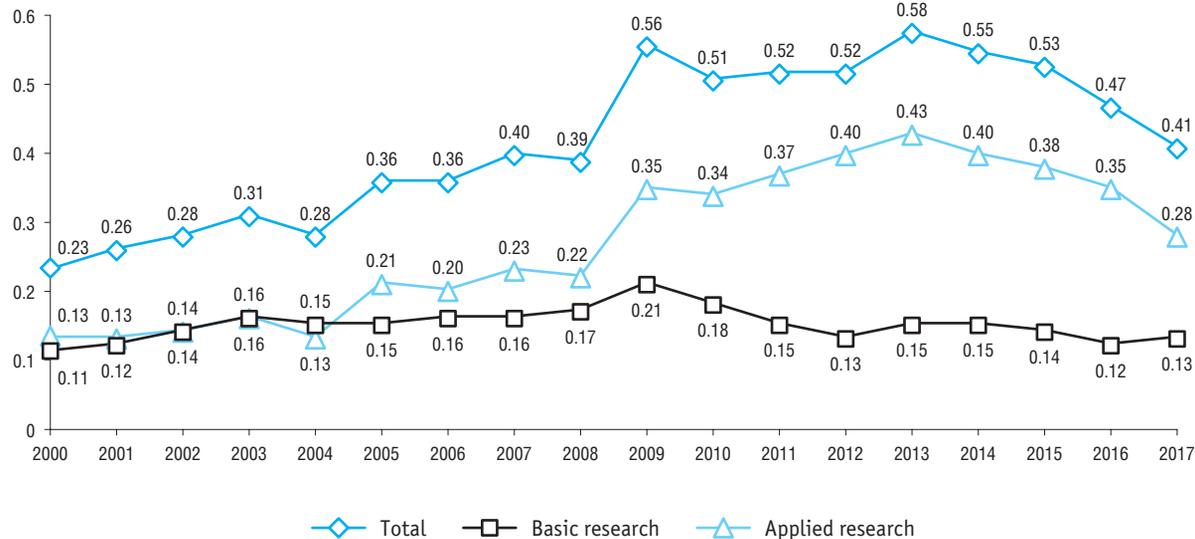
*** In accordance with Federal Law no. 459-FZ of November 29, 2018 ‘On the 2019 Federal Budget and the 2020-2021 Budget Plan’.

3.4. FEDERAL BUDGET APPROPRIATIONS ON CIVIL S&T AT CONSTANT 2000 PRICES*



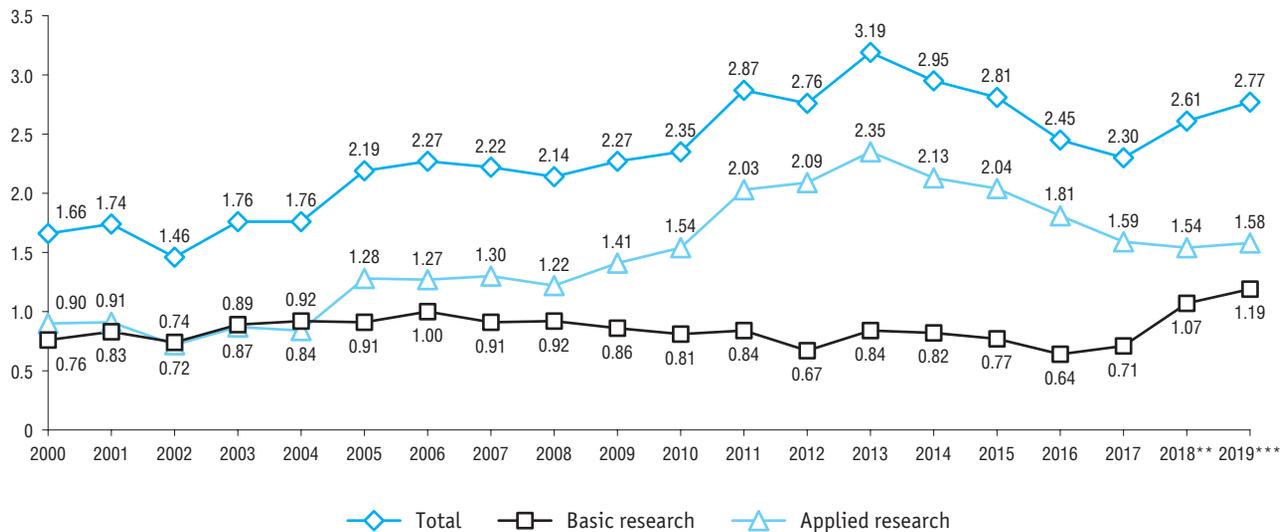
* In 2000–2004, federal budget appropriations under Section 06 ‘Basic Research and Scientific and Technological Progress Promotion’ and the corresponding subsections. Data source for 2005–2017: reports on the implementation of the consolidated budget and budgets of state extra-budgetary funds (the data are provided by the Federal Treasury).

3.5. FEDERAL BUDGET APPROPRIATIONS ON CIVIL S&T AS A PERCENTAGE OF GDP*



* In 2000–2004, federal budget appropriations under Section 06 ‘Basic Research and Scientific and Technological Progress Promotion’ and the corresponding subsections. Data source for 2005–2017: reports on the implementation of the consolidated budget and budgets of state extra-budgetary funds (the data are provided by the Federal Treasury).

3.6. FEDERAL BUDGET APPROPRIATIONS ON CIVIL S&T AS A PERCENTAGE OF FEDERAL BUDGET EXPENDITURE*

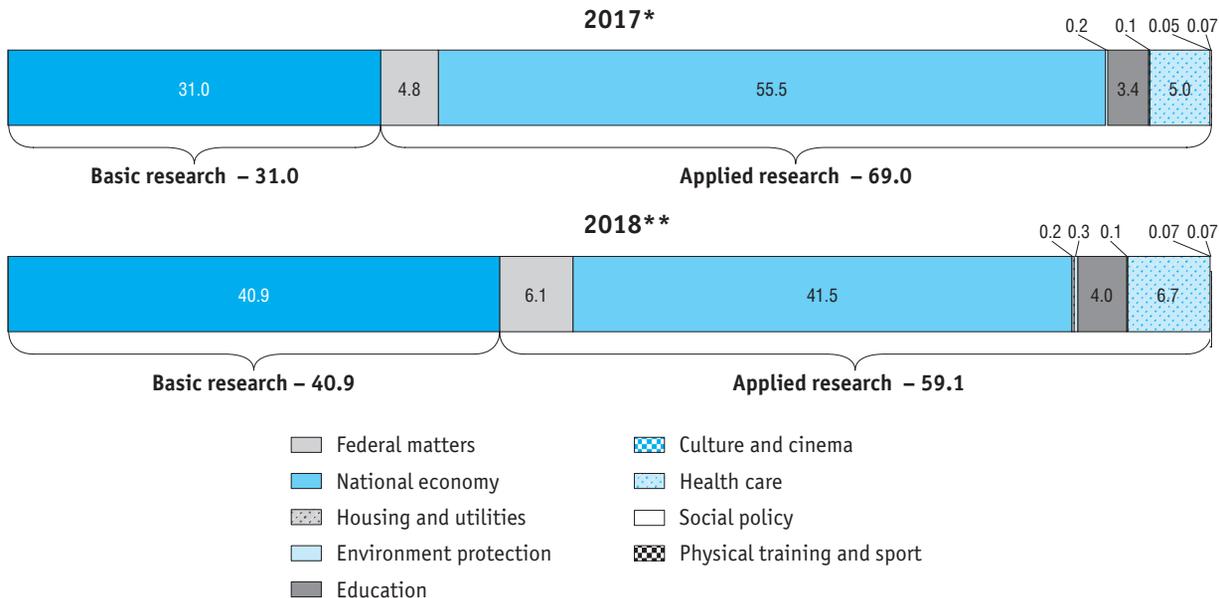


* In 2000–2004, federal budget appropriations under Section 06 ‘Basic Research and Scientific and Technological Progress Promotion’ and the corresponding subsections. Data source for 2005–2017: reports on the implementation of the consolidated budget and budgets of state extra-budgetary funds (the data are provided by the Federal Treasury).

** In accordance with Federal Law no. 362-FZ of December 5, 2017 ‘On the 2018 Federal Budget and the 2019-2020 Budget Plan’ as amended by Federal Laws no. 193-FZ of July 03, 2018, no. 193-FZ of November 29, 2018 ‘On amendments to the Federal Law “On the 2018 Federal Budget and the 2019-2020 Budget Plan”’

*** In accordance with Federal Law no. 459-FZ of November 29, 2018 ‘On the 2019 Federal Budget and the 2020-2021 Budget Plan’.

3.7. PERCENTAGE DISTRIBUTION OF FEDERAL BUDGET APPROPRIATIONS ON CIVIL S&T BY SUBSECTION OF BUDGET EXPENDITURE CLASSIFICATION AND TYPE OF R&D ACTIVITY



* Data source for 2017, reports on the implementation of the consolidated budget and budgets of state extra-budgetary funds (the data are provided by the Federal Treasury).

** In accordance with Federal Law no. 362-FL of December 05, 2017 'On the 2018 Federal Budget and the 2019-2020 Budget Plan' as amended by Federal Laws no. 193-FL of July 03, 2018, no. 458-FL of November 29, 2018 'On amendments to the Federal Law "On the 2018 Federal Budget and the 2019-2020 Budget Plan."'

3.8. GROSS DOMESTIC EXPENDITURE ON R&D BY SOURCE OF FUNDS

	Gross domestic expenditure on R&D	Government*	Business enterprise sector	Higher education sector	Private non-profit sector	Funds from abroad
<i>At current prices, thousand roubles, 1995 – million roubles</i>						
1995	12149458.6	7476767.6	4076707.0	30543.0	3672.1	561768.9
2000	76697100.5	42035655.1	25208436.5	212990.3	67641.5	9172377.1
2005	230785150.3	142960799.1	69244740.5	983242.0	68412.2	17527956.5
2006	288805211.5	176457427.8	83197909.8	1652533.1	296869.8	27200471.0
2007	371080327.1	232364775.8	109265410.0	2276881.0	377417.8	26795842.5
2008	431073185.2	278992303.3	123695707.2	1993888.9	768479.1	25622806.7
2009	485834338.2	322889237.6	129170972.3	1896167.0	471799.6	31406161.7
2010	523377233.9	368191779.8	133498976.0	2436564.1	682378.0	18567536.0
2011	610426680.6	409449448.8	168957596.6	4664465.3	1209661.5	26145508.4
2012	699869784.8	474789779.0	190545904.2	5905489.1	877937.6	27750674.9
2013	749797638.8	507197614.5	211135955.9	7820677.9	896366.0	22747024.5
2014	847526992.9	586658713.4	229444656.4	9069176.1	1372014.1	20982432.9
2015	914669057.2	635859865.4	242155382.4	10875090.0	1566750.2	24211969.2
2016	943815219.6	643401009.6	265277238.1	8210528.3	1537132.8	25389310.8
2017	1019152437.1	674344339.3	307459020.2	7901322.1	2645187.7	26802567.8

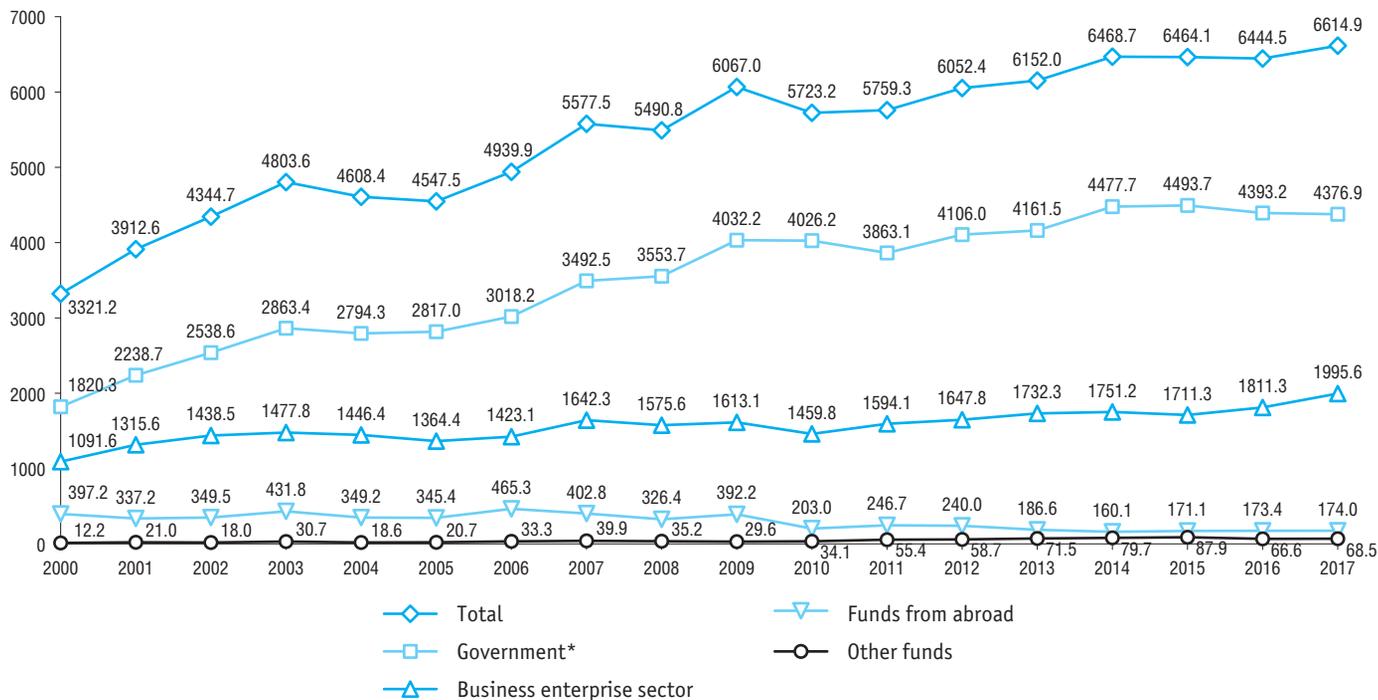
(continued)

	Gross domestic expenditure on R&D	Government*	Business enterprise sector	Higher education sector	Private non-profit sector	Funds from abroad
	Percentage					
1995	100	61.5	33.6	0.3	0.03	4.6
2000	100	54.8	32.9	0.3	0.09	12.0
2005	100	61.9	30.0	0.4	0.03	7.6
2006	100	61.1	28.8	0.6	0.1	9.4
2007	100	62.6	29.4	0.6	0.1	7.2
2008	100	64.7	28.7	0.5	0.2	5.9
2009	100	66.5	26.6	0.4	0.1	6.5
2010	100	70.3	25.5	0.5	0.1	3.5
2011	100	67.1	27.7	0.8	0.2	4.3
2012	100	67.8	27.2	0.8	0.1	4.0
2013	100	67.6	28.2	1.0	0.1	3.0
2014	100	69.2	27.1	1.1	0.2	2.5
2015	100	69.5	26.5	1.2	0.2	2.6
2016	100	68.2	28.1	0.9	0.2	2.7
2017	100	66.2	30.2	0.8	0.2	2.6

* Including budget funds, government budget appropriations for higher education institutions, and government sector institutions' funds (including own funds).

3.9. TRENDS IN GROSS DOMESTIC EXPENDITURE ON R&D BY SOURCE OF FUNDS (at constant 1989 prices)

Thousand roubles



* Including budget funds, budget appropriations for higher education institutions, and government sector institutions' funds (including own funds).

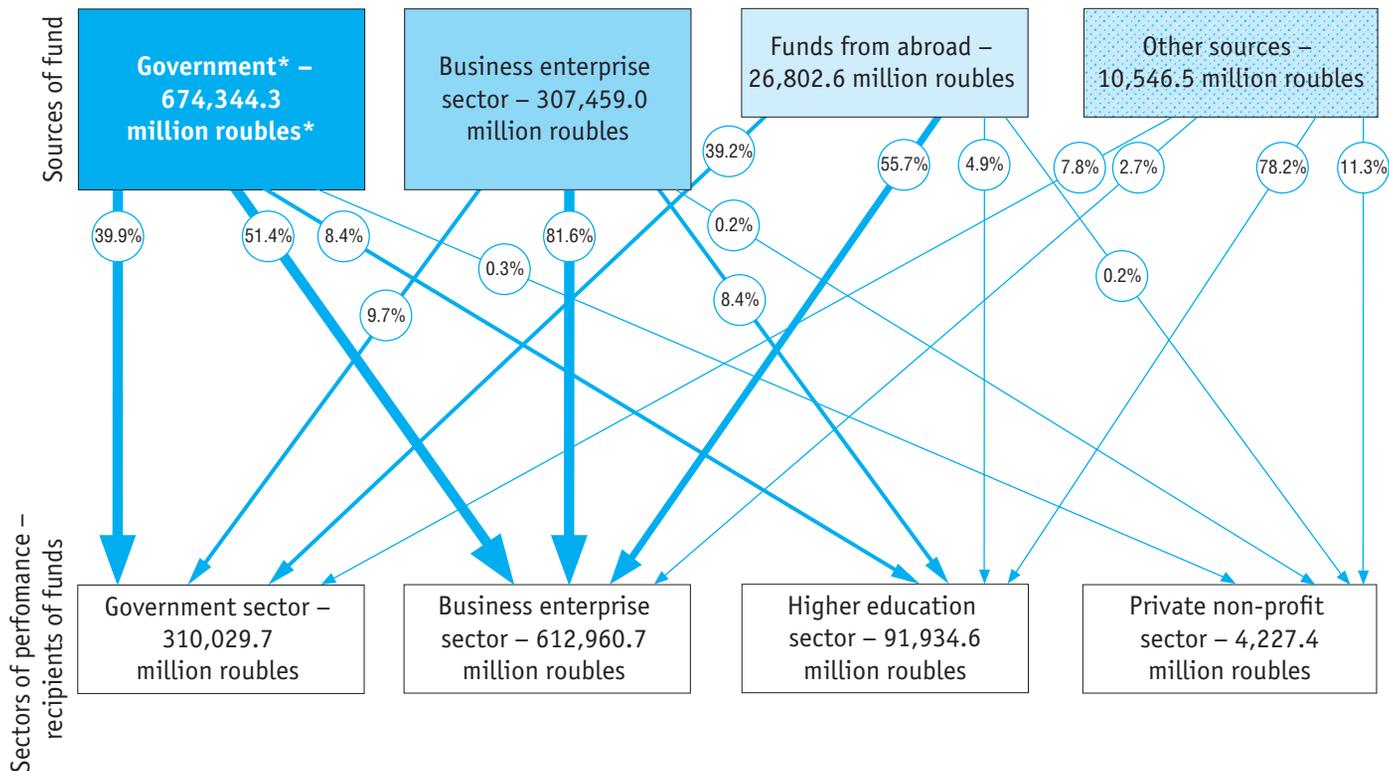
3.10. SUBSIDIES, GRANTS AND OTHER COMPETITIVE R&D FUNDING: 2017

	Total	Budgets of all levels	Of which federal budget appropriations
Gross domestic expenditure on R&D	1019152437.1	553352958.7	536387340.3
Of which:			
budget subsidies for institutional R&D funding	104268980.4	104268980.4	99453949.3
budget subsidies for performing R&D	39418651.2	39418651.2	38204859.3
grants from foundations for S&T and innovation	22597541.0	18980542.9	17960952.5
other types of competitive financing	71388650.4	59239783.2	57981996.5

3.11. GROSS DOMESTIC EXPENDITURE ON R&D FUNDED FROM ABROAD

	2015		2016		2017	
	Total, <i>thousand roubles</i>	Percentage	Total, <i>thousand roubles</i>	Percentage	Total, <i>thousand roubles</i>	Percentage
Gross domestic expenditure on R&D funded from abroad	24211969.2	100.0	25389310.8	100.0	26802567.8	100.0
Including:						
International organisations	1287164.2	5.3	1477734.1	5.8	1096341.7	4.1
Government organisations of foreign countries	7221887.0	29.8	8104574.3	31.9	9260504.9	34.6
Business enterprise sector institutions of foreign countries	14209467.4	58.7	14204550.0	55.9	14644054.6	54.6
Other foreign institutions (educational institutions, funds, non-profit organisations)	1493450.6	6.2	1602452.4	6.3	1801666.6	6.7

3.12. R&D FUNDING BY SECTOR OF PERFORMANCE: 2017



* Including budget funds, budget appropriations for higher education institutions, and government sector institutions' funds (including own funds).

3.13. GROSS DOMESTIC EXPENDITURE ON R&D BY OWNERSHIP OF R&D INSTITUTIONS

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
At current prices, thousand roubles, 1995 – million roubles										
Total	12149458.6	76697100.5	230785150.3	523377233.9	699869784.8	749797638.8	847526992.9	914669057.2	943815219.6	1019152437.1
Russian ownership	12137095.6	74254897.9	226582085.6	514058161.4	685495275.4	725512775.4	831700355.3	897702466.4	930156714.4	1002767874.7
Public ownership	9303329.4	56254567.1	171855852.1	394615118.0	495689326.0	510811584.2	588219503.3	570759794.5	569769183.6	553896563.1
Federal	9047499.6	55150426.2	168986692.6	389105256.8	487535217.5	502816626.9	577892310.2	559987658.5	555862200.4	543888734.1
Regional	255829.8	1099762.3	2869159.5	5396479.0	8124552.8	7994957.3	10327193.1	10772136.0	13906983.2	10007829.0
Municipal ownership	15214.6	50381.9	17253.5	50304.2	65889.2	93873.2	78104.2	93960.3	90712.5	113977.1
Ownership by voluntary associations	35640.0	209229.3	339129.1	525085.2	915629.8	1246181.6	1181906.2	2010818.4	2083134.9	2478750.5
Private ownership	265827.3	4948266.7	20957744.5	60263592.5	80608901.3	94280978.5	100226515.2	116626956.5	149005447.9	181015620.9
Ownership by Russian citizens permanently living abroad	...	...	...	...	6949.0	...**	...**	...**	...**	...**
Ownership by consumers' cooperatives*	...	1095.2	4354.5	36590.0	2468.5	...**	–	20664.7	22065.5	21885.2
Mixed ownership	2517084.3	12791357.7	33407751.9	55954325.1	83947440.0	89367594.5	114333241.0	168031713.1	168078029.2	204497889.4
Mixed ownership with a share of public ownership	...	...	...	49557690.9	62059799.4	73525307.2	97555613.4	129154411.8	138670373.3	170078332.1
Other mixed ownership	...	...	...	...	21887640.6	15842287.3	16777627.6	38877301.3	29407655.9	34419557.3
Ownership by state corporations	...	...	...	2613146.4	24258671.6	29695934.9	27615092.9	40134256.9	41085157.5	60722748.5
Foreign ownership	336.7	117265.0	697993.4	1390905.3	2683049.2	7059984.4	7945428.4	5684831.2	7007423.6	8754129.1
Joint ownership (with both Russian and foreign participation)	12026.3	2324937.6	3505071.3	7928167.2	11691460.2	17224879.0	7881209.2	11281759.6	6651081.6	7630433.3

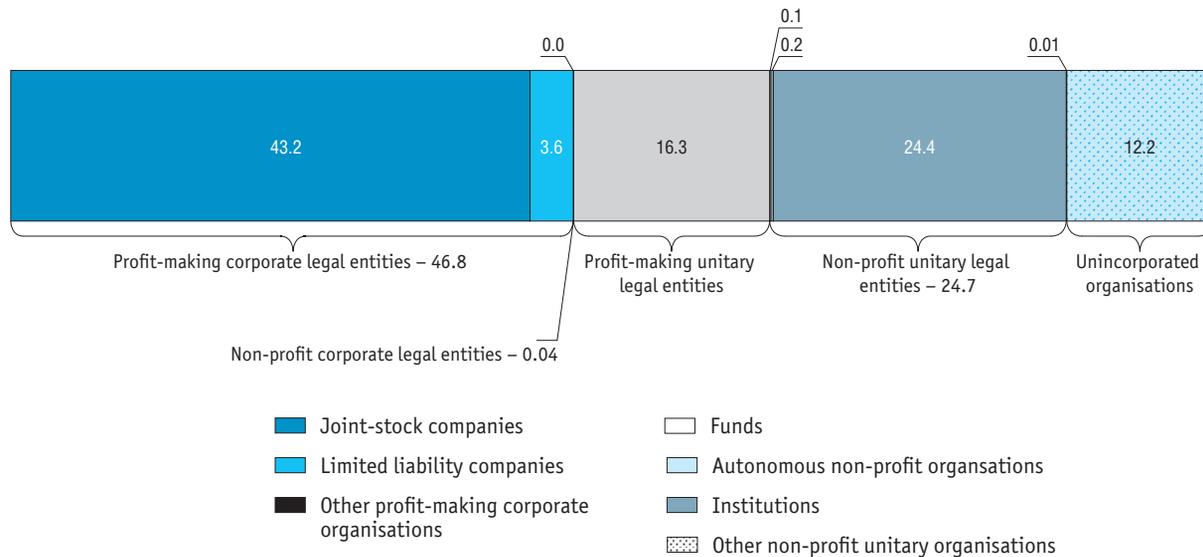
(continued)

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
	Percentage									
Total	100	100	100	100	100	100	100	100	100	100
Russian ownership	99.9	96.8	98.2	98.2	97.9	96.8	98.1	98.1	98.6	98.4
Public ownership	76.6	73.3	74.5	75.4	70.8	68.1	69.4	62.4	60.4	54.4
Federal	74.5	71.9	73.2	74.3	69.7	67.1	68.2	61.2	58.9	53.4
Regional	2.1	1.4	1.2	1.0	1.2	1.1	1.2	1.2	1.5	1.0
Municipal ownership	0.1	0.07	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Ownership by voluntary associations	0.3	0.3	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2
Private ownership	2.2	6.5	9.1	11.5	11.5	12.6	11.8	12.8	15.8	17.8
Ownership by Russian citizens permanently living abroad	...	...	...	...	0.001	... **	... **	... **	... **	... **
Ownership by consumers' cooperatives*	...	0.0	0.0	0.0	0.0	... **	–	0.002	0.002	0.002
Mixed ownership	20.7	16.7	14.5	10.7	12.0	11.9	13.5	18.4	17.8	20.1
Mixed ownership with a share of public ownership	...	...	...	9.5	8.9	9.8	11.5	14.1	14.7	16.7
Other mixed ownership	...	...	...	...	3.1	2.1	2.0	4.3	3.1	3.4
Ownership by state corporations	...	...	...	0.5	3.5	4.0	3.3	4.4	4.4	6.0
Foreign ownership	0.002	0.2	0.3	0.3	0.4	0.9	0.9	0.6	0.7	0.9
Joint ownership (with both Russian and foreign participation)	0.1	3.0	1.5	1.5	1.7	2.3	0.9	1.2	0.7	0.7

* Up to the year 2000, it was included into private and mixed Russian ownership.

** The data are not published in order to ensure the confidentiality of primary statistics received from organisations, in accordance with Federal Law no. 282-FL of November 29, 2007 'On the Official Statistical Accounting and State Statistics System of the Russian Federation' (art. 4, para. 5; art. 9, para. 1).

3.14. PERCENTAGE DISTRIBUTION OF GROSS DOMESTIC EXPENDITURE ON R&D BY LEGAL STRUCTURE AND STATUS OF INSTITUTIONS: 2017



3.15. GROSS DOMESTIC EXPENDITURE ON R&D BY TYPE OF ECONOMIC ACTIVITY: 2017*

(thousand roubles)

	2017
Total	1019152437.1
Agriculture, forestry and fishing	568513.0
Mining and quarrying	1071551.7
Manufacturing	98333308.1
Electricity, gas, steam and air-conditioning supply	23972.7
Water supply; sewerage, waste management, and remediation activities	...**
Construction	59649.5
Wholesale and retail trade; repair of motor vehicles and motorcycles	1071838.3
Transportation and storage	156279.0
Accommodation and food service activities	...**
Information and communication	5788816.2
Financial and insurance activities	47805.6
Real estate activities	990685.6
Professional, scientific and technical activities	815599917.9
Of which research and development	808225650.4

(continued)

	2017
Administrative and support service activities	54238.3
Public administration and defence; compulsory social security	... **
Education	87955797.0
Of which higher education	87079971.1
Human health and social work activities	3628315.9
Art, entertainment and recreation	2337314.1
Other service activities	233374.4

* In accordance with All-Russian Classifier of Economic Activities (OKVED 2).

** The data are not published in order to ensure the confidentiality of primary statistics received from organisations, in accordance with Federal Law no. 282-FL of November 29, 2007 'On the Official Statistical Accounting and State Statistics System of the Russian Federation' (art. 4, para. 5; art. 9, para. 1).

3.16. GROSS DOMESTIC EXPENDITURE ON R&D BY TYPE

	2000	2005	2010	2012	2013	2014	2015	2016	2017
	<i>At current prices, thousand roubles</i>								
Gross domestic expenditure on R&D	76697100.5	230785150.3	523377233.9	699869784.8	749797638.8	847526992.9	914669057.2	943815219.6	1019152437.1
Current expenditure	73873345.0	221119537.6	489450798.7	655061743.4	699948879.0	795407850.6	854288043.8	873778705.8	950256965.4
Salaries	27762734.2	94274 453.3	241472234.1	307881674.7	334769102.6	372215515.4	398143690.1	402793518.7	437788837.4
Of which for R&D personnel*	24452200.6	83218561.7	211660690.5	268058587.8	293118611.5	325421624.4	346425420.7	349060524.6	381564501.7
Social security payments**	10419152.6	22597417.5	47904606.9	75417597.8	82806275.3	92645219.2	104167630.5	105441328.0	114318768.6
Equipment	3433380.7	9936177.7	18067655.4	25365780.5	23529482.7	26062433.8	28480160.0	24412188.2	21750617.6
Other material costs	17470855.0	51304357.4	89279048.7	123689963.6	134096570.4	158082737.1	157810431.8	174467767.8	186670110.7
Other current expenditure	14787222.5	43007131.7	92727253.6	122706726.8	124747448.0	146401945.1	165686131.4	166663903.1	189728631.1
Capital expenditure	2823755.5	9665612.7	33926435.2	44808041.4	49848759.8	52119142.3	60381013.4	70036513.8	68895471.7
Land and buildings	496202.4	1647639.4	8077521.7	11692714.0	8721163.4	9987854.6	10029243.3	12419641.1	15624626.2
Including:									
land	...	...	...	...	...	...	...	...	3340264.1
buildings	...	...	...	...	...	...	...	...	12284362.1
Equipment	1448665.0	5818068.7	19887596.3	25459703.1	27306873.6	29421964.1	33807469.6	37427491.3	36339715.7
Intellectual property and results of intellectual activity	...	...	...	...	...	...	...	...	3499599.3
Other capital expenditure	878888.1	2199904.6	5961317.2	7655624.3	13820722.8	12709323.6	16544300.5	20189381.4	13431530.5

(continued)

	2000	2005	2010	2012	2013	2014	2015	2016	2017
	Percentage								
Gross domestic expenditure on R&D	100	100	100	100	100	100	100	100	100
Current expenditure	96.3	95.8	93.5	93.6	93.4	93.9	93.4	92.6	93.2
Salaries	36.2	40.8	46.1	44.0	44.6	43.9	43.5	42.7	43.0
Of which for R&D personnel*	31.9	36.1	40.4	38.3	39.1	38.4	37.9	37.0	37.4
Social security payments**	13.6	9.8	9.2	10.8	11.0	10.9	11.4	11.2	11.2
Equipment	4.5	4.3	3.5	3.6	3.1	3.1	3.1	2.6	2.1
Other material costs	22.8	22.2	17.1	17.7	17.9	18.7	17.3	18.5	18.3
Other current expenditure	19.3	18.6	17.7	17.5	16.6	17.3	18.1	17.7	18.6
Capital expenditure	3.7	4.2	6.5	6.4	6.6	6.1	6.6	7.4	6.8
Land and buildings	0.6	0.7	1.5	1.7	1.2	1.2	1.1	1.3	1.5
Including:									
land	...	...	...	...	...	...	...	...	0.3
buildings	...	...	...	...	...	...	...	...	1.2
Equipment	1.9	2.5	3.8	3.6	3.6	3.5	3.7	4.0	3.6
Intellectual property and results of intellectual activity	...	...	...	...	...	...	...	...	0.3
Other capital expenditure	1.1	0.95	1.1	1.1	1.8	1.5	1.8	2.1	1.3

* Excluding external multiple jobholders and independent contractors.

** National pension insurance, national health insurance, national social insurance.

3.17. GROSS DOMESTIC EXPENDITURE ON R&D BY PRIORITY S&T AREA AND SOURCE OF FUNDS: 2017

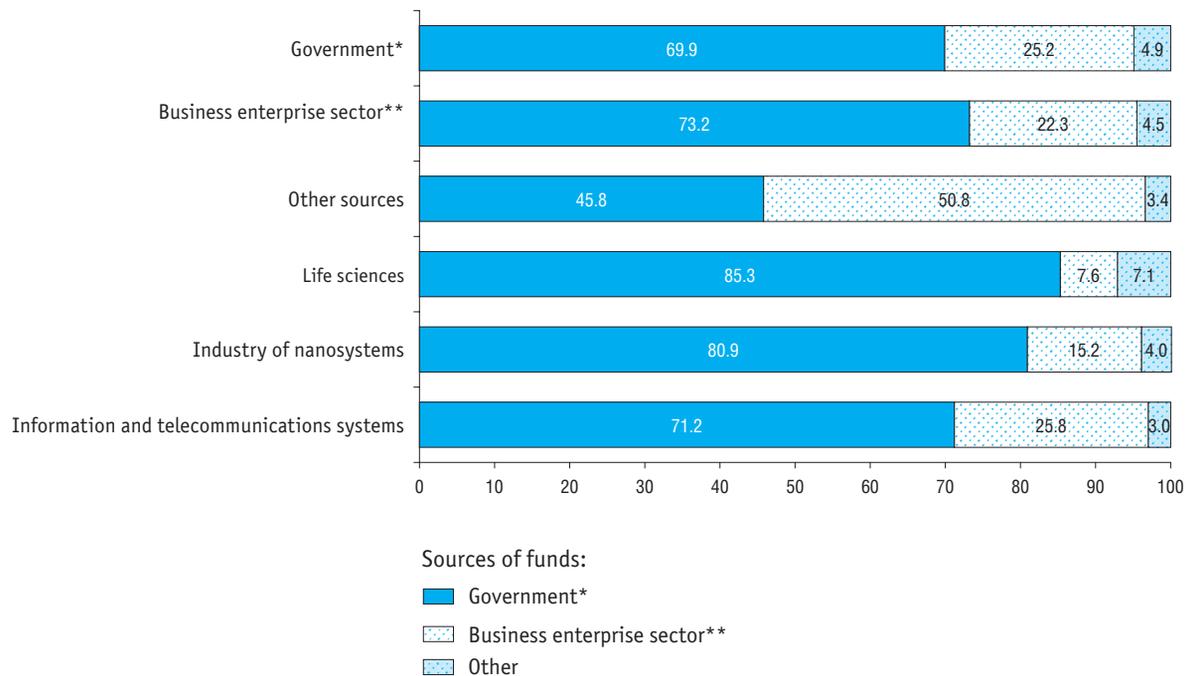
(thousand roubles)

	Total	Information and telecommunications systems	Industry of nanosystems	Life sciences	Rational use of natural resources	Energy effectiveness, energy saving, and nuclear power engineering	Transport and space systems
Gross domestic expenditure on R&D by priority S&T area	718706798.8	81390706.1	22373713.4	51721218.1	55715637.8	103717802.9	243140462.9
Sources of funds:							
Government*	494188204.4	57942555.7	18094000.4	44104746.4	25509001.1	75883960.4	170009784.7
of which federal budget appropriations	417313387.9	49284186.3	14605875.3	37895205.7	22898998.4	63287865.9	144949226.2
Business enterprise sector**	193815115.7	21035407.7	3390683.1	3930401.9	28296128.1	23169011.9	61304137.2
Other	30703478.7	2412742.7	889029.9	3686069.8	1910508.6	4664830.6	11826541.0

* Including budget appropriations and government sector institutions' funds (including own funds).

** Business enterprise sector institutions' funds (including own funds).

3.18. PERCENTAGE DISTRIBUTION OF GROSS DOMESTIC EXPENDITURE ON R&D BY PRIORITY S&T AREA AND SOURCE OF FUNDS: 2017



* Including budget appropriations and government sector institutions' funds (including own funds).

** Business enterprise sector institutions' funds (including own funds).

3.19. GROSS DOMESTIC EXPENDITURE ON R&D BY SOCIO-ECONOMIC OBJECTIVE

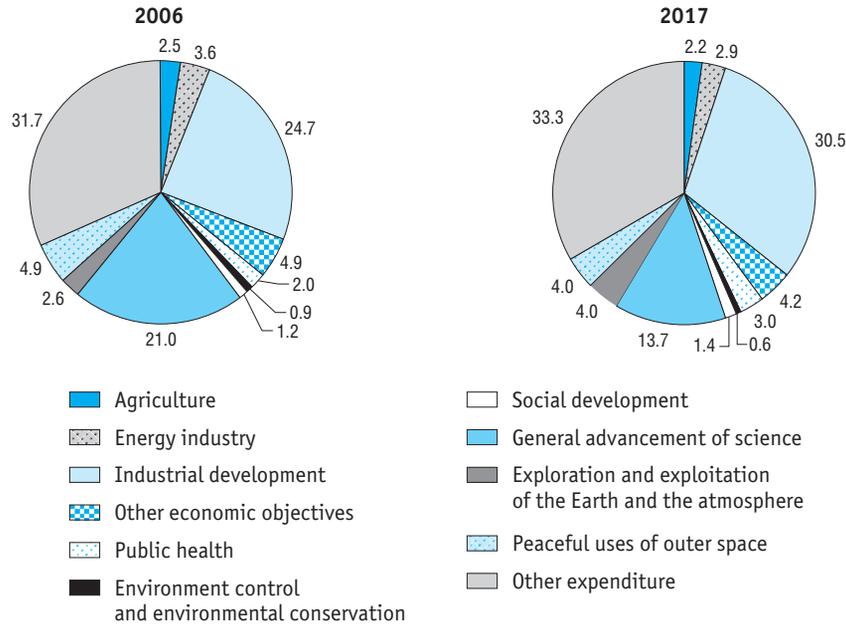
(thousand roubles)

	2006	2010	2013	2014	2015	2016	2017
Gross domestic expenditure on R&D	288805211.5	523377233.9	749797638.8	847526992.9	914669057.2	943815219.6	1019152437.1
Economic development	103033497.6	183113782.3	303849005.2	319943400.5	335508245.3	356656937.7	405957250.5
Agriculture, forestry, and fishing	7248977.0	12090814.9	18162639.9	19356066.3	20507885.2	19839916.9	22158788.8
Production, distribution, and rational use of energy	10267046.6	19174764.6	32391136.1	30009786.7	28233810.5	27986109.3	29764264.2
Manufacturing	71319151.3	126029410.7	211581275.8	225973823.4	247190324.1	267198733.4	310831962.7
Increasing economic efficiency and technological level of production	8331516.8	14916168.9	23766954.4	26183678.7	27970190.2	32603056.9	35330996.0
Extraction and processing of non-energy minerals	628547.3	1279265.4	2857681.5	1893285.1	2979762.1	3515879.2	3088792.3
Manufacture of chemicals and chemical products	4194564.2	5839135.5	9253596.1	12102652.2	18046159.1	16726672.0	22666897.6
Manufacture of motor vehicles and other vehicles	14450931.1	21495410.4	43571684.0	37432847.4	38496344.6	47336591.0	52963468.8
Electronics industry, manufacture of radio, television and communication equipment, office equipment	9281563.7	13389386.0	30121503.4	30917362.1	34152557.2	28696420.2	38512032.2
Software development	3355339.6	6740442.6	10343013.7	8906139.6	10935776.1	13858343.1	16942170.0
Manufacture of electrical machinery and appliances	1292927.0	2879253.1	10666259.5	6852593.2	6855694.7	9068432.3	11649795.4
Manufacture of instruments	6600437.6	13466912.8	26441262.5	25964146.5	24545740.1	30199136.8	29594205.1
Manufacture of other machinery and equipment	6965389.1	13654259.2	14251449.9	21053098.6	19618563.5	23208998.1	35130556.7
Manufacture of wearing apparel, textiles, and leather goods	54077.2	97483.3	116171.9	125925.2	152999.3	112320.3	331649.1
Production of food and beverages	296729.6	565348.2	1043282.0	777287.7	883049.0	815777.0	924618.2
Other sectors of manufacturing industry	15867128.1	31706345.3	39148416.9	53764807.1	62553488.2	61057106.5	63696781.3

(continued)

	2006	2010	2013	2014	2015	2016	2017
Construction	2697184.2	5513681.4	5514071.6	7302858.5	4100727.2	4527423.8	4492617.8
Transport	9011178.7	12686004.3	26950369.3	25052775.9	28936996.8	28935628.1	29024172.8
Communication	1709581.2	6704734.7	7577748.3	10809004.6	5137035.8	6753395.9	8343946.4
Infrastructure and general planning of urban and rural settlements	430140.7	354546.0	702102.6	754005.3	720423.3	750011.5	594804.6
Services sector	350237.9	559825.7	969661.6	685079.8	681042.4	665718.8	746693.2
Social objectives	11954593.3	24966176.4	39876895.8	45328439.6	47512609.4	53126847.1	51110186.9
Environment control and environmental conservation	2595076.2	5950018.6	6139294.7	7690689.6	7698790.1	6978201.4	6241376.7
Medical and other public health care activities	5897030.0	14373675.7	22382779.3	27197492.2	27779185.8	33577707.1	30526694.5
Social development and community building	3462487.1	4642482.1	11354821.8	10440257.8	12034633.5	12570938.6	14342115.7
General advancement of science	60629124.4	104294714.1	130695141.4	136414580.0	145154435.8	139556056.0	139964844.3
Exploration and exploitation of the Earth and the atmosphere	7577493.4	19821817.2	32889936.2	39068691.1	43206894.0	35280752.7	40987614.3
Peaceful uses of outer space	14018574.9	27503697.9	51558366.4	48996185.8	57441295.9	46367115.9	41270828.6
Other expenditures	91591927.9	163677046.0	190928293.8	257775695.9	285845576.8	312827510.2	339861712.5

3.20. PERCENTAGE DISTRIBUTION OF GROSS DOMESTIC EXPENDITURE ON R&D BY SOCIO-ECONOMIC OBJECTIVE



3.21. CURRENT EXPENDITURE ON R&D BY TYPE OF R&D ACTIVITY AND FIELD OF SCIENCE AND TECHNOLOGY

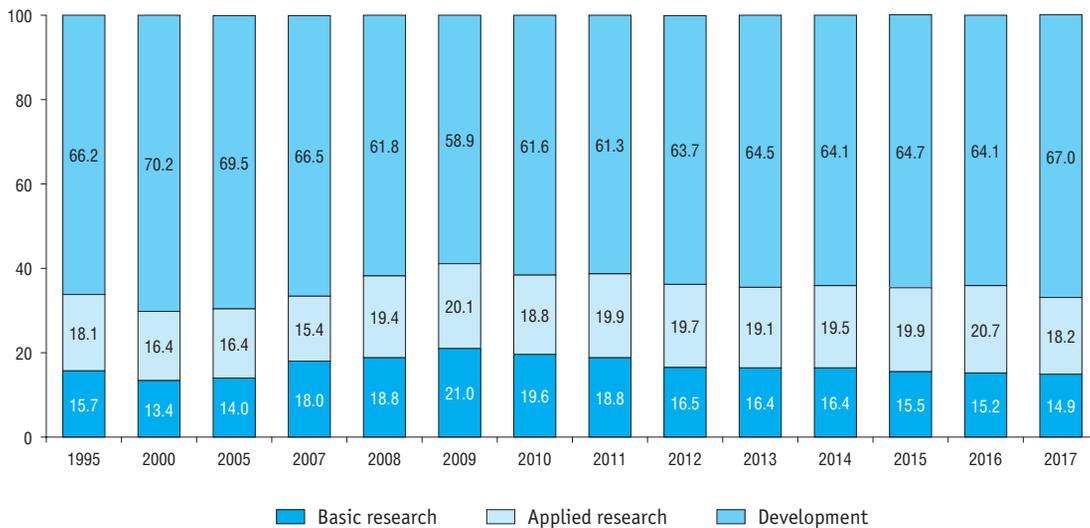
(thousand roubles)

	Total	Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities
2005							
Current expenditure on R&D	221119537.6	34579040.8	171109626.3	4571313.8	4159368.3	4628535.6	2071652.8
Basic research	31022855.8	19345182.8	4579039.5	1865239.8	1947227.1	1723405.3	1562761.3
Applied research	36360266.9	8860755.5	21725918.2	2051910.3	1409317.9	1957292.2	355072.8
Development	153736414.9	6373102.5	144804668.6	654163.7	802823.3	947838.1	153818.7
2010							
Current expenditure on R&D	489450798.7	96010015.2	348621966.4	15462300.4	8887624.5	13752461.7	6716430.5
Basic research	95881364.3	50550000.6	22866475.2	6378644.4	4766037.6	6074153.0	5246053.5
Applied research	92010677.2	27202686.8	46841680.2	7900476.3	2582521.1	6199410.7	1283902.1
Development	301558757.2	18257327.8	278913811.0	1183179.7	1539065.8	1478898.0	186474.9
2013							
Current expenditure on R&D	699948879.0	124384149.8	511559101.0	21833262.2	11504657.6	20769449.3	9898259.1
Basic research	114829117.8	62710077.9	22645513.3	9046385.0	4845910.5	8500037.6	7081193.5
Applied research	133787976.7	36709680.9	69787265.9	10611446.9	4651482.5	9865521.3	2162579.2
Development	451331784.5	24964391.0	419126321.8	2175430.3	2007264.6	2403890.4	654486.4

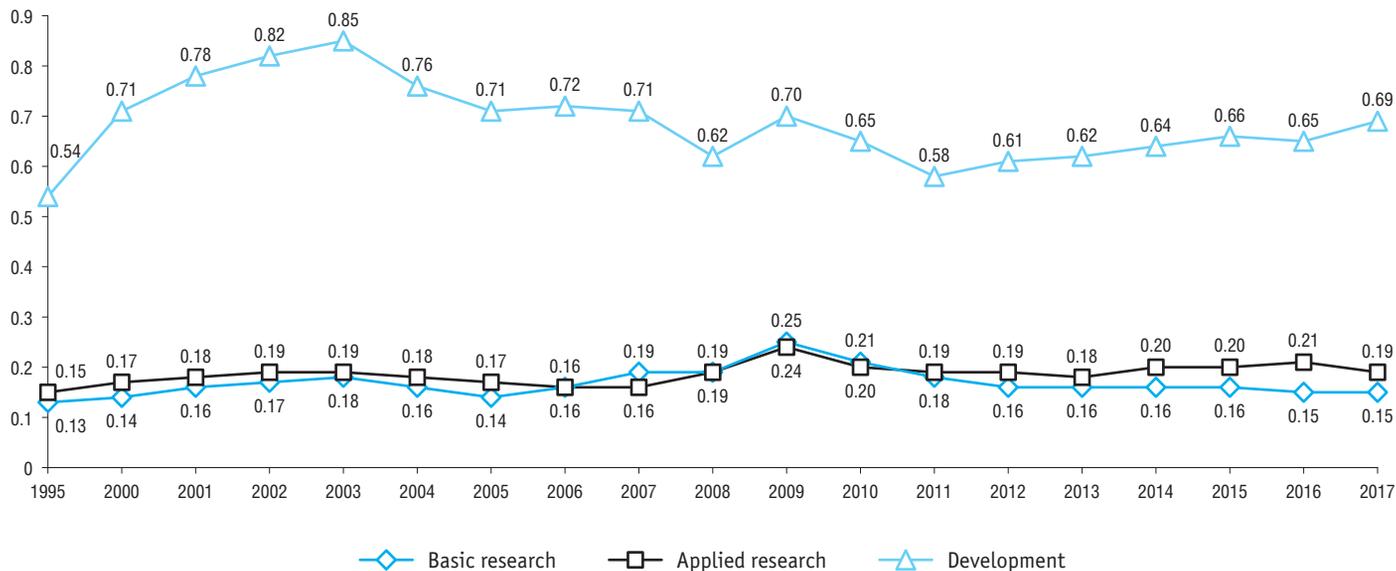
(continued)

	Total	Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities
2014							
Current expenditure on R&D	795407850.6	144536189.4	578160024.6	25016451.2	13156185.8	22959524.1	11579475.5
Basic research	130618045.6	72493481.3	22849372.1	10263113.4	7535996.1	9379368.0	8096714.7
Applied research	155231401.5	41403579.4	84622052.5	12393369.8	3703331.5	10613069.7	2495998.6
Development	509558403.5	30639128.7	470688600.0	2359968.0	1916858.2	2967086.4	986762.2
2015							
Current expenditure on R&D	854288043.8	148980051.6	624144576.7	29945902.1	13664068.9	23961543.0	13591901.5
Basic research	132064934.3	75057491.5	20557380.6	9996433.7	8047617.4	9160226.3	9245784.8
Applied research	169654641.2	43503918.7	90396242.3	16630952.5	3699011.9	12207246.2	3217269.6
Development	552568468.3	30418641.4	513190953.8	3318515.9	1917439.6	2594070.5	1128847.1
2016							
Current expenditure on R&D	873778705.8	150065638.1	639426488.3	34010751.8	13862990.4	23858523.9	12554313.3
Basic research	132565068.0	75583175.8	19980288.1	10033815.9	8052319.3	9528971.1	9386497.8
Applied research	181157915.6	42247364.2	99021927.6	20821845.4	4000996.8	12612505.1	2453276.5
Development	560055722.2	32235098.1	520424272.6	3155090.5	1809674.3	1717047.7	714539.0
2017							
Current expenditure on R&D	950256965.4	155186614.5	706493153.9	35829672.6	14167508.6	25687644.1	12892371.7
Basic research	141299165.2	77361415.5	23807892.1	11414915.1	8234831.6	10958118.6	9521992.3
Applied research	172547880.5	40122849.0	91653902.6	20594962.9	4407671.8	12992561.9	2775932.3
Development	636409919.7	37702350.0	591031359.2	3819794.6	1525005.2	1736963.6	594447.1

3.22. PERCENTAGE DISTRIBUTION OF CURRENT EXPENDITURE ON R&D BY TYPE OF R&D ACTIVITY



3.23. CURRENT EXPENDITURE ON R&D BY TYPE OF R&D ACTIVITY AS A PERCENTAGE OF GDP



3.24. AVERAGE MONTHLY SALARY OF R&D PERSONNEL

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Average monthly salary, roubles, 1995 – thousand roubles	305.3	2322.9	8672.0	25043.5	32539.9	35618.8	39549.3	41511.8	43539.5	48833.6
As a percentage of the salary:										
in the national economy (=100%)	64.6	104.5	101.4	119.5	122.2	119.6	121.7	122.0	118.6	124.7
in manufacturing (=100%)	67.3	98.2	103.0	131.3	132.8	131.7	134.0	130.1	125.9	126.8
in construction (=100%)	52.0	88.0	95.9	118.3	125.4	128.6	134.7	138.6	134.7	145.0

3.25. TAX INCENTIVES ON R&D BY TYPE

(million roubles)

	2012	2013	2014	2015	2016	2017
Tax expenditure on R&D – total	94206.7	107402.9	116585.6	122800.1	139891.0	143133.1
VAT exemption:	80824.8	95538.4	105469.1	111953.9	128150.0	128925.2
R&D funded from budget and special foundations	61012.8	71446.5	81656.7	82718.1	96199.2	95200.5
Sales of exclusive rights on R&D results	16400.7	18622.4	18572.8	21976.3	24882.9	27767.7
R&D aimed at development/improvement of new technologies and products (for selected types of economic activity)	3411.3	5469.5	5239.6	7259.6	7067.9	5956.9
Income tax reduction:	11998.9	9682.7	8873.1	8790.2	9552.2	12005.1
Accelerated depreciation of fixed assets for S&T activity	118.3	80.9	51.6	41.0	37.2	36.6
Accelerated R&D expenditure write-off	11859.5	9585.0	8821.5	8749.2	9514.2	11968.5
Contributions to the state foundations for R&D and innovation support	21.1	16.9	–	–	0.8	–
Property tax exemption:	1383.0	2181.8	2243.4	2056.0	2188.9	2202.9
State Research Centres	1383.0	2181.8	2243.4	2056.0	2188.9	2202.9

Sources: national statistical surveys on the structure of VAT calculation, on the tax base and the structure of income tax calculation for organisations, on the tax base and the structure of property tax calculation for organisations.



4. R&D Fixed Assets

4.1. R&D FIXED ASSETS

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
At current prices										
Fixed assets – total, million roubles, 1995 – billion roubles	85087.6	237564.4	399515.9	741512.1	914572.2	1086445.9	1235780.3	1498990.8	1696171.4	1966209.0
Per employee, <i>thousand roubles, 1995 – million roubles</i>	80.2	267.6	491.3	1006.8	1259.2	1494.4	1687.6	2028.8	2348.3	2777.6
Per researcher, <i>thousand roubles, 1995 – million roubles</i>	164.0	557.7	1021.5	2010.0	2454.4	2944.2	3305.1	3950.8	4579.6	5464.8
Machinery and equipment, million roubles, before 1995 – billion roubles	26505.8	66938.3	142154.7	300165.9	398562.4	466609.0	541617.9	676194.6	753104.4	827473.9
Per employee, <i>thousand roubles, 1995 – million roubles</i>	25.0	75.4	174.8	407.5	548.7	641.8	739.6	915.2	1042.7	1168.9
Per researcher, <i>thousand roubles, 1995 – million roubles</i>	51.1	157.1	363.5	813.6	1069.6	1264.5	1448.5	1782.2	2033.3	2299.9
Machinery and equipment under 5 years, million roubles	...	...	...	...	169683.3	205062.6	257269.1	320676.7	352080.8	347976.6
As a percentage of the total value of machinery and equipment	...	...	...	...	42.6	43.9	47.5	47.4	46.8	42.1

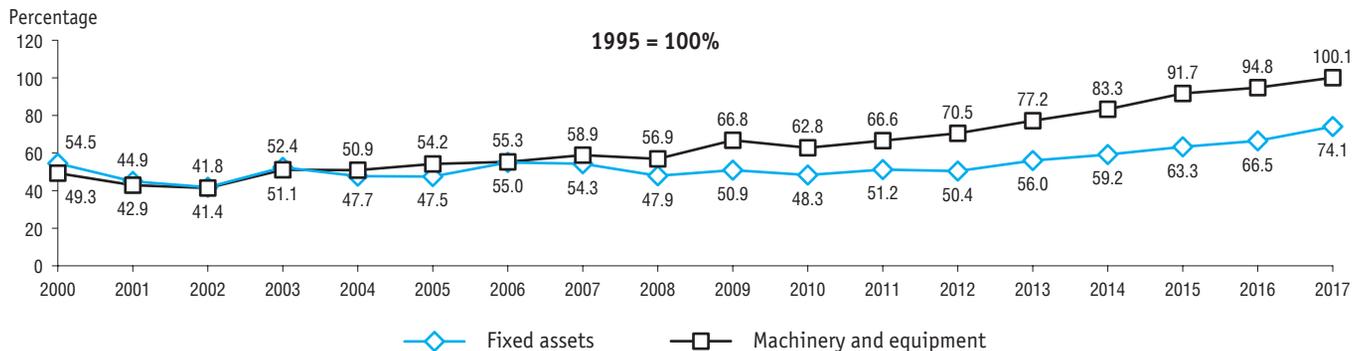
(continued)

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
At constant 1995 prices*										
Fixed assets – total, million roubles, 1995 – billion roubles	85087.6	46336.0	40383.7	41103.8	42907.4	47636.5	50357.8	53866.3	56593.8	63019.5
Per employee, <i>thousand roubles, 1995 – million roubles</i>	80.2	52.2	49.7	55.8	59.1	65.5	68.8	72.9	78.4	89.0
Per researcher, <i>thousand roubles, 1995 – million roubles</i>	164.0	108.8	103.3	111.4	115.2	129.1	134.7	142.0	152.8	175.2
Machinery and equipment, million roubles, before 1995 – billion roubles	26505.8	13056.0	14369.2	16638.9	18698.7	20459.0	22070.8	24299.1	25127.8	26521.6
Per employee, <i>thousand roubles, 1995 – million roubles</i>	25.0	14.7	17.7	22.6	25.7	28.1	30.1	32.9	34.8	37.5
Per researcher, <i>thousand roubles, 1995 – million roubles</i>	51.1	30.7	36.7	45.1	50.2	55.4	59.0	64.0	67.8	73.7
Machinery and equipment under 5 years, million roubles	...	...	...	...	7960.7	8991.2	10483.7	11523.5	11747.4	11153.1

* Calculated on the basis of the gross fixed capital formation deflator.

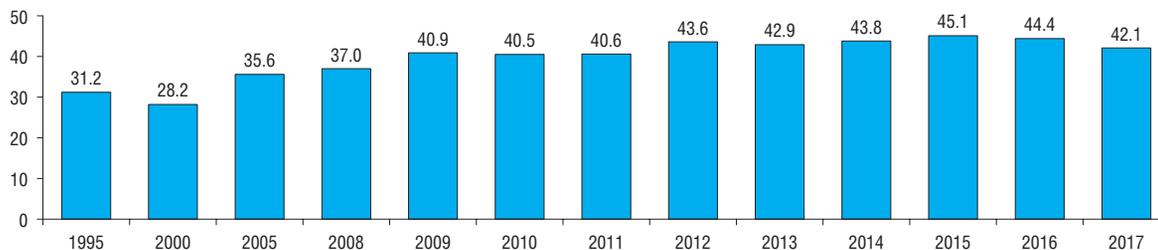
4.2. TRENDS IN R&D FIXED ASSETS VALUE*

(at constant 1995 prices)



* Calculated on the basis of the gross fixed capital formation deflator.

4.3. MACHINERY AND EQUIPMENT AS A PERCENTAGE OF THE TOTAL R&D FIXED ASSETS VALUE



4.4. R&D FIXED ASSETS BY OWNERSHIP OF R&D INSTITUTIONS

(million roubles, 1995 – billion roubles)

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Fixed assets										
Total	85087.6	237564.4	399515.9	741512.1	914572.2	1086445.9	1235780.3	1498990.8	1696171.4	1966209.0
Russian ownership	85081.2	232793.0	393181.0	725165.1	897838.2	1052994.8	1218842.6	1469213.6	1671745.0	1940826.9
Public ownership	71686.4	194659.0*	344693.4	635491.6	757158.0	886578.4	1005741.7	1126242.5	1225443.7	1326141.4
Federal	70561.9	191972.3	336223.9	617118.2	733671.7	861801.5	960098.3	1090290.3	1188742.5	1291470.8
Regional	1124.5	2686.3	8469.5	18110.1	23477.9	24776.9	45643.4	35952.3	36701.2	34670.7
Municipal ownership	190.0	541.7	28.2	35.9	17.3	53.0	38.0	104.4	113.7	115.0
Ownership by voluntary associations	77.5	221.8	38.9	82.1	164.4	372.6	495.7	832.5	898.4	1221.7
Private ownership	1306.4	10499.1	17478.8	43615.5	56938.0	64420.2	80213.8	107275.4	154400.3	173735.1
Ownership by Russian citizens permanently living abroad	...	...	...	...	17.0	...***	...***	...***	...***	...***
Ownership by consumers' cooperatives*	...	0.09	0.9	1.7	...***	...***	...***	28.9	29.9	28.6
Mixed ownership	11820.9	26871.3	30940.7	42862.9	59170.5	68104.5	93511.6	157314.6	194653.9	294699.8
Mixed ownership with a share of public ownership	...	...	...	38571.0	47722.7	56261.7	72454.4	117386.6	155829.6	238539.2
Other mixed ownership	...	...	...	...	11447.8	11842.7	21057.3	39928.0	38824.3	56160.6
Ownership by state corporations	...	...	...	3075.4	24373.1	33451.8	38817.0	77404.6	96193.8	144874.1
Foreign ownership	0.04	49.0	114.9	1131.5	1177.8	3064.9	2571.1	6198.6	7957.3	9896.2
Joint ownership (with both Russian and foreign participation)	6.4	4722.4	6220.1	15215.5	15556.2	30386.2	14366.6	23578.6	16469.1	15485.9

(continued)

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Machinery and equipment										
Total	26505.8	66938.3	142154.7	300165.9	398562.4	466609.0	541617.9	676194.6	753104.4	827473.9
Russian ownership	26503.0	65631.5	140294.5	290440.4	390464.6	457596.7	533892.2	659628.5	737057.5	810671.5
Public ownership	21632.0	53434.4*	121662.2	256172.4	332053.6	382612.7	433814.9	503877.8	538303.6	569891.9
Federal	21340.3	52750.5	117529.4	248766.8	323644.7	371352.8	422330.3	487747.4	523789.9	552906.2
Regional	291.7	683.5	4132.8	7284.9	8401.9	11259.9	11484.6	16130.4	14513.7	16985.7
Municipal ownership	113.0	176.0	4.7	6.2	4.4	6.7	7.2	26.0	25.3	26.7
Ownership by voluntary associations	32.3	41.6	20.4	49.5	62.6	98.2	134.7	209.1	225.2	370.1
Private ownership	353.5	4235.7	8094.0	17150.5	26610.2	30837.6	41712.6	50474.8	70650.8	76991.6
Ownership by Russian citizens permanently living abroad	...	...	...	...	16.0	...***	...***	...***	...***	...***
Ownership by consumers' cooperatives*	...	0.09	0.2	1.0	...***	...***	...***	7.0	7.0	7.0
Mixed ownership	4372.2	7743.7	10513.1	15944.0	22090.9	30297.8	41440.4	70093.0	89889.1	107805.3
Mixed ownership with a share of public ownership	...	...	...	13870.9	16689.3	25209.2	31476.5	52907.6	68716.0	75338.9
Other mixed ownership	...	...	...	...	5401.6	5088.6	9964.0	17185.5	21173.2	32466.4
Ownership by state corporations	...	...	...	1116.7	9627.0	13730.4	16767.1	34931.1	37946.0	55567.9
Foreign ownership	0.03	48.2	61.0	630.0	438.0	668.9	975.0	2958.5	5835.9	7104.1
Joint ownership (with both Russian and foreign participation)	2.8	1258.6	1799.2	9095.5	7659.8	8343.4	6750.7	13607.6	10211.0	9698.2

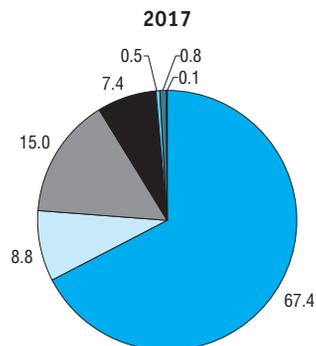
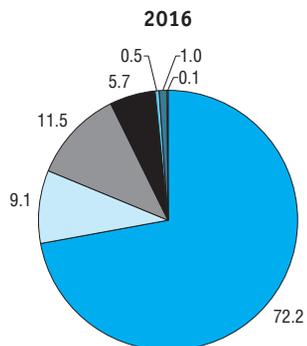
* The sum of the breakdown may not add to the total, because some institutions have shared ownership.

** Up to the year 2000, it was included into private and mixed Russian ownership.

*** The data are not published in order to ensure the confidentiality of primary statistics received from organisations, in accordance with Federal Law no. 282-FL of November 29, 2007 'On the Official Statistical Accounting and State Statistics System of the Russian Federation' (art. 4, para. 5; art. 9, para. 1).

4.5. PERCENTAGE DISTRIBUTION OF R&D FIXED ASSETS BY OWNERSHIP OF R&D INSTITUTIONS

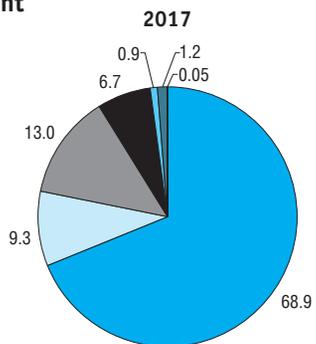
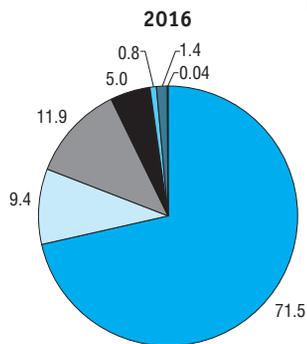
Fixed assets



Ownership:

- public ownership
- private ownership
- mixed ownership
- ownership of state corporations
- foreign ownership
- joint ownership (with both Russian and foreign participation)
- other ownership

Machinery and equipment



4.6. R&D FIXED ASSETS BY TYPE OF ECONOMIC ACTIVITY: 2017
(million roubles)

	Fixed assets	Machinery and equipment
Total	1966209.0	827473.9
Agriculture, forestry and fishing	1306.4	412.1
Mining and quarrying	636.0	600.1
Manufacturing	206597.3	106843.8
Electricity, gas, steam and air-conditioning supply	699.7	187.8
Water supply; sewerage, waste management, and remediation activities	...*	...*
Construction	80.7	61.1
Wholesale and retail trade; repair of motor vehicles and motorcycles	1171.5	570.4
Transportation and storage	142.5	77.5
Accommodation and food service activities	-	-
Information and communication	6831.2	4499.4
Financial and insurance activities	58.1	51.7
Real estate activities	1123.8	764.5
Professional, scientific and technical activities	1378514.5	606571.8
Of which research and development	1369473.4	600525.0
Administrative and support service activities	2.4	2.4
Public administration and defence; compulsory social security	...*	...*
Education	240116.6	90331.1
Of which higher education	237609.3	88866.1
Human health and social work activities	28481.3	13306.4
Art, entertainment and recreation	3527.4	526.5
Other service activities	117.6	43.7

* The data are not published in order to ensure the confidentiality of primary statistics received from organisations, in accordance with Federal Law no. 282-FL of November 29, 2007 'On the Official Statistical Accounting and State Statistics System of the Russian Federation' (art. 4, para. 5; art. 9, para. 1).



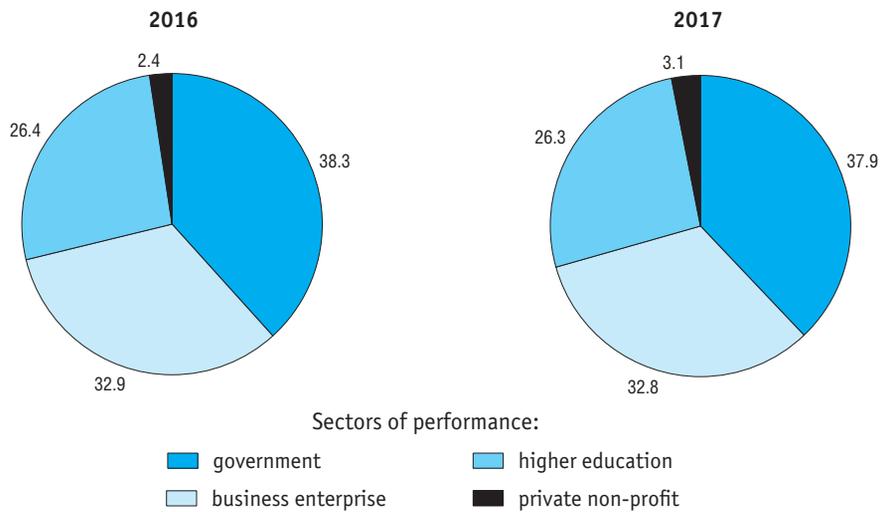
5. Sectors of R&D Performance

5.1. Composite indices

5.1.1. R&D INSTITUTIONS BY SECTOR OF PERFORMANCE

	Total	Government sector	Business enterprise sector	Higher education sector	Private non-profit sector
1995	4059	1193	2345	511	10
2000	4099	1247	2278	526	48
2005	3566	1282	1703	539	42
2006	3622	1341	1682	540	59
2007	3957	1483	1742	616	116
2008	3666	1429	1540	603	94
2009	3536	1406	1446	603	81
2010	3492	1400	1405	617	70
2011	3682	1457	1450	696	79
2012	3566	1465	1362	662	77
2013	3605	1495	1269	762	79
2014	3604	1491	1265	777	71
2015	4175	1560	1400	1124	91
2016	4032	1546	1326	1064	96
2017	3944	1493	1292	1038	121

5.1.2. PERCENTAGE DISTRIBUTION OF R&D INSTITUTIONS BY SECTOR OF PERFORMANCE



5.1.3. R&D PERSONNEL BY SECTOR OF PERFORMANCE AND OCCUPATION

(headcount)

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Total	1061044	887729	813207	736540	726318	727029	732274	738857	722291	707887
Researchers	518690	425954	391121	368915	372620	369015	373905	379411	370379	359793
Technicians	101371	75184	65982	59276	58905	61401	63168	62805	60441	59690
Supporting staff	274925	240506	215555	183713	175790	175365	173554	174056	171915	170347
Others	166058	146085	140549	124636	119003	121248	121647	122585	119556	118057
Government sector	282166	255850	272718	259007	271466	261869	263712	265429	269056	268080
Researchers	146342	129725	139378	131734	136442	132117	132701	134794	134225	130081
Technicians	27178	25085	25462	24009	28094	27777	27761	27090	26075	26040
Supporting staff	66226	59706	61448	56530	60067	56795	56744	56552	61140	62961
Others	42420	41334	46430	46734	46863	45180	46506	46993	47616	48998
Business enterprise sector	726568	590646	496706	423112	394182	405268	405529	408802	388385	377150
Researchers	336671	267640	221445	197785	192285	193736	196320	198123	190378	186347
Technicians	70180	46535	36837	30063	26720	28920	29452	29850	27519	26788
Supporting staff	201122	175261	147980	120485	106306	109691	107215	108230	101219	98139
Others	118595	101210	90444	74779	68871	72921	72542	72599	69269	65876
Higher education sector	52065	40787	43500	53290	59469	59247	62400	63870	63046	59729
Researchers	35508	28325	30111	38640	43103	42692	44427	45967	44994	42113
Technicians	4010	3509	3658	5095	3998	4670	5939	5836	6789	6584
Supporting staff	7520	5463	6098	6564	9264	8828	9538	9217	8929	8391
Others	5027	3490	3633	2991	3104	3057	2496	2850	2334	2641
Private non-profit sector	245	446	283	1131	1201	645	633	756	1804	2928
Researchers	169	264	187	756	790	470	457	527	782	1252
Technicians	3	55	25	109	93	34	16	29	58	278
Supporting staff	57	76	29	134	153	51	57	57	627	856
Others	16	51	42	132	165	90	103	143	337	542

5.1.4. R&D PERSONNEL BY SECTOR OF PERFORMANCE AND EDUCATIONAL ATTAINMENT (headcount)

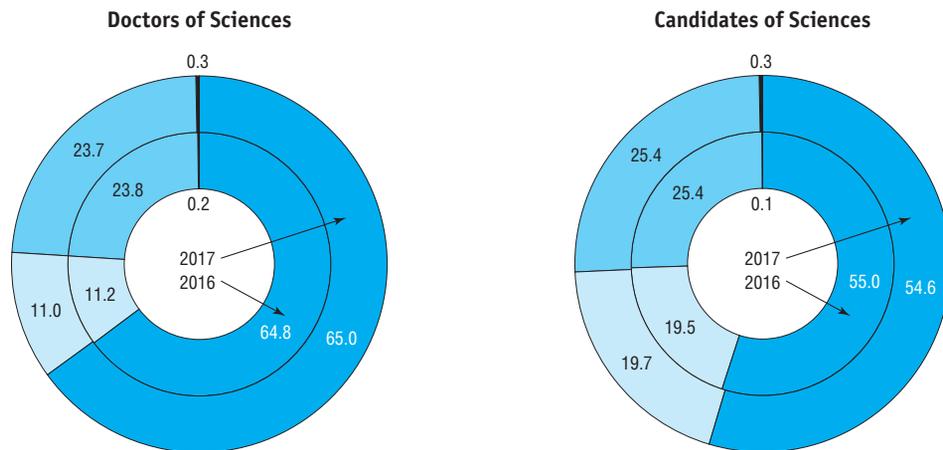
	Total	Government sector	Business enterprise sector	Higher education sector	Private non-profit sector
R&D personnel					
2005	813207	272718	496706	43500	283
2010	736540	259007	423112	53290	1131
2015	738857	265429	408802	63870	756
2016	722291	269056	388385	63046	1804
2017	707887	268080	377150	59729	2928
Higher education					
2005	501718	177676	288649	35159	234
2010	493852	178026	268821	46112	893
2015	537118	194608	283664	58144	702
2016	529418	196289	274477	57504	1148
2017	522779	195127	270951	54664	2037
Secondary vocational education					
2005	134222	40495	89265	4430	32
2010	109158	36091	69552	3394	121
2015	95640	33163	60370	2071	36
2016	93123	34452	56221	2066	384
2017	90607	33905	54342	1866	494
Other education					
2005	177267	54547	118792	3911	17
2010	133530	44890	84739	3784	117
2015	106099	37658	64768	3655	18
2016	99750	38315	57687	3476	272
2017	94501	39048	51857	3199	397

5.1.5. RESEARCHERS WITH SCIENTIFIC DEGREES BY SECTOR OF PERFORMANCE

(headcount)

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Researchers with scientific degrees	116465	105911	99428	105114	109330	108248	109598	111533	108388	103327
Doctors of Sciences	19330	21949	23410	26789	27784	27485	27969	28046	27430	26076
Candidates of Sciences	97135	83962	76018	78325	81546	80763	81629	83487	80958	77251
Government sector	61062	58901	60066	61194	63092	62837	62944	63906	62285	59138
Doctors of Sciences	13358	14987	16511	17646	18181	18184	18198	18264	17781	16948
Candidates of Sciences	47704	43914	43555	43548	44911	44653	44746	45642	44504	42190
Business enterprise sector	41207	34775	26661	23169	21758	20955	20595	20270	18833	18107
Doctors of Sciences	4348	4806	4222	3987	3767	3622	3511	3413	3071	2873
Candidates of Sciences	36859	29969	22439	19182	17991	17333	17084	16857	15762	15234
Higher education sector	14162	12113	12618	20423	24144	24306	25899	27184	27109	25812
Doctors of Sciences	1617	2120	2654	5068	5753	5638	6218	6318	6532	6185
Candidates of Sciences	12545	9993	9964	15355	18391	18668	19681	20866	20577	19627
Private non-profit sector	34	122	83	328	336	150	160	173	161	270
Doctors of Sciences	7	36	23	88	83	41	42	51	46	70
Candidates of Sciences	27	86	60	240	253	109	118	122	115	200

5.1.6. PERCENTAGE DISTRIBUTION OF RESEARCHERS WITH SCIENTIFIC DEGREES BY SECTOR OF PERFORMANCE



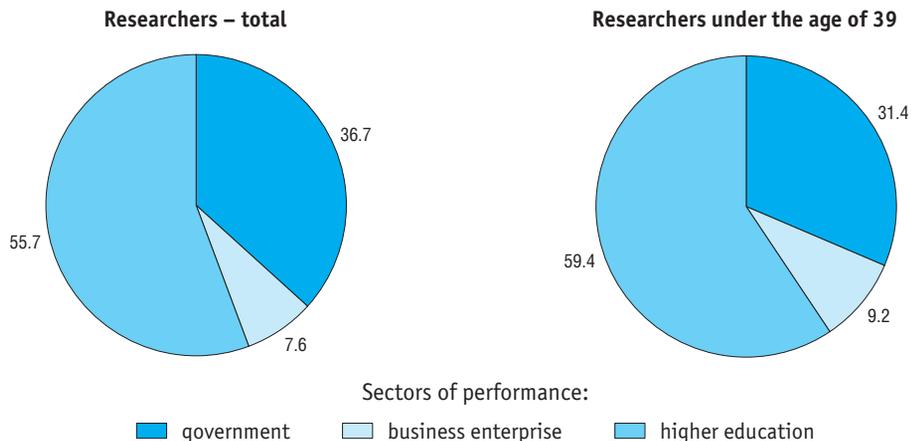
Sectors of performance:



5.1.7. RESEARCHERS ASSIGNED TO WORK (INTERNSHIP) PLACEMENTS AT FOREIGN RESEARCH INSTITUTIONS BY SECTOR OF PERFORMANCE: 2017

	Total	Government sector	Business enterprise sector	Higher education sector
Number of institutions that assigned researchers to work (internship) placements at foreign research institutions	211	81	17	113
Number of researchers assigned to work (internship) placements at foreign research institutions	3494	1282	267	1945
Of whom under the age of 39	1479	464	136	879

5.1.8. PERCENTAGE DISTRIBUTION OF RESEARCHERS ASSIGNED TO WORK (INTERNSHIP) PLACEMENTS AT FOREIGN RESEARCH INSTITUTIONS BY SECTOR OF PERFORMANCE: 2017

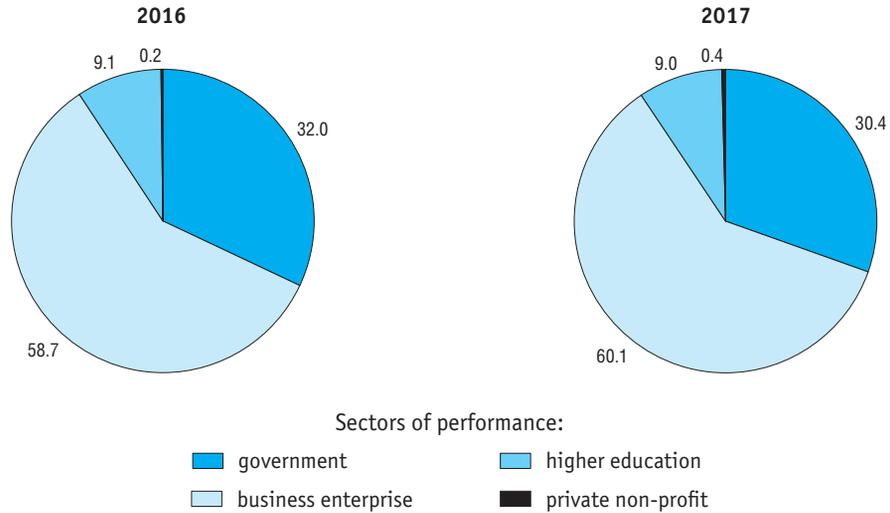


5.1.9. GROSS DOMESTIC EXPENDITURE ON R&D BY SECTOR OF PERFORMANCE

(thousand roubles, 1995 – million roubles)

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
At current prices										
Gross domestic expenditure on R&D	12149458.6	76697100.5	230785150.3	523377233.9	699869784.8	749797638.8	847526992.9	914669057.2	943815219.6	1019152437.1
Sectors of performance:										
government	3165439.4	18748588.2	60158166.6	161988411.4	224982089.2	226590120.7	258023009.1	284154288.3	301775305.3	310029734.6
business enterprise	8323907.6	54288781.4	156880029.0	316701679.9	408284378.5	454409251.0	505210341.3	541533094.3	554093599.1	612960678.4
higher education	657374.0	3489342.2	13337987.1	43714007.3	65334232.1	67858855.1	83205260.1	87730781.4	85932983.0	91934601.3
private non-profit	2737.6	170388.7	408967.6	973135.3	1269085.0	939412.0	1088382.4	1250893.2	2013332.2	4227422.8
At constant 1989 prices										
Gross domestic expenditure on R&D	2485.4	3321.2	4547.5	5723.2	6052.4	6152.0	6468.7	6464.1	6444.5	6614.9
Sectors of performance:										
government	647.6	811.9	1185.4	1771.4	1945.6	1859.1	1969.4	2008.1	2060.6	2012.3
business enterprise	1702.8	2350.9	3091.2	3463.2	3530.8	3728.4	3856.0	3827.1	3783.4	3978.5
higher education	134.5	151.1	262.8	478.0	565.0	556.8	635.1	620.0	586.8	596.7
private non-profit	0.6	7.4	8.1	10.6	11.0	7.7	8.3	8.8	13.7	27.4

5.1.10. PERCENTAGE DISTRIBUTION OF GROSS DOMESTIC EXPENDITURE ON R&D BY SECTOR OF PERFORMANCE



5.1.11. GROSS DOMESTIC EXPENDITURE ON R&D BY SECTOR OF PERFORMANCE AS A PERCENTAGE OF GDP

	Total	Government sector	Business enterprise sector	Higher education sector
1995	0.85	0.22	0.58	0.05
2000	1.05	0.26	0.74	0.05
2005	1.07	0.28	0.73	0.06
2006	1.07	0.29	0.72	0.07
2007	1.12	0.32	0.72	0.07
2008	1.04	0.31	0.66	0.07
2009	1.25	0.38	0.78	0.09
2010	1.13	0.35	0.68	0.09
2011	1.01	0.30	0.62	0.09
2012	1.03	0.33	0.60	0.10
2013	1.03	0.31	0.62	0.09
2014	1.07	0.33	0.64	0.11
2015	1.10	0.34	0.65	0.11
2016	1.10	0.35	0.64	0.10
2017	1.11	0.34	0.67	0.10

5.1.12. GROSS DOMESTIC EXPENDITURE ON R&D BY SECTOR OF PERFORMANCE AND SOURCE OF FUNDS

(thousand roubles)

	Total	Government funds*	Business enterprise sector funds	Higher education sector funds	Private non-profit sector funds	Funds from abroad
2013						
Gross domestic expenditure on R&D	749797638.8	507197614.5	211135955.9	7820677.9	896366.0	22747024.5
Sectors of performance:						
government	226590120.7	186930366.9	31300159.7	175890.2	105228.8	8078475.1
business enterprise	454409251.0	279358934.6	161100909.7	515567.0	88727.4	13345112.3
higher education	67858855.1	40378679.8	18663427.9	7080091.0	448892.7	1287763.7
private non-profit	939412.0	529633.2	71458.6	49129.7	253517.1	35673.4
2014						
Gross domestic expenditure on R&D	847526992.9	586658713.4	229444656.4	9069176.1	1372014.1	20982432.9
Sectors of performance:						
government	258023009.1	219020381.4	29660844.5	357181.2	100284.6	8884317.4
business enterprise	505210341.3	316622608.3	177116134.2	442911.7	359214.0	10669473.1
higher education	83205260.1	50496387.8	22607546.6	8215233.9	506189.0	1379902.8
private non-profit	1088382.4	519335.9	60131.1	53849.3	406326.5	48739.6
2015						
Gross domestic expenditure on R&D	914669057.2	635859865.4	242155382.4	10875090.0	1566750.2	24211969.2
Sectors of performance:						
government	284154288.3	240265758.8	32877099.7	321525.4	163335.5	10526568.9
business enterprise	541533094.3	343396867.3	185037359.3	561703.2	421868.8	12115295.7
higher education	87730781.4	51570251.1	24028351.9	9979551.2	671465.0	1481162.2
private non-profit	1250893.2	626988.2	212571.5	12310.2	310080.9	88942.4

(continued)

	Total	Government funds*	Business enterprise sector funds	Higher education sector funds	Private non-profit sector funds	Funds from abroad
2016						
Gross domestic expenditure on R&D	943815219.6	643401009.6	265277238.1	8210528.3	1537132.8	25389310.8
Sectors of performance:						
government	301775305.3	263326940.4	27544205.3	363329.0	253809.8	10287020.8
business enterprise	554093599.1	326710613.8	213215672.3	153457.6	149519.8	13864335.6
higher education	85932983.0	52444188.9	23832576.7	7658742.4	832874.6	1164600.4
private non-profit	2013332.2	919266.5	684783.8	34999.3	300928.6	73354.0
2017						
Gross domestic expenditure on R&D	1019152437.1	674344339.3	307459020.2	7901322.1	2645187.7	26802567.8
Sectors of performance:						
government	310029734.6	268775672.5	29924193.6	210118.7	608620.0	10511129.8
business enterprise	612960678.4	346858742.5	250875477.9	161779.1	125995.6	14938683.3
higher education	91934601.3	56486622.7	25896640.8	7528724.3	717720.7	1304892.8
private non-profit	4227422.8	2223301.6	762707.9	700.0	1192851.4	47861.9

* Including budget funds, budget appropriations for higher education institutions, and government sector institutions' funds (including own funds).

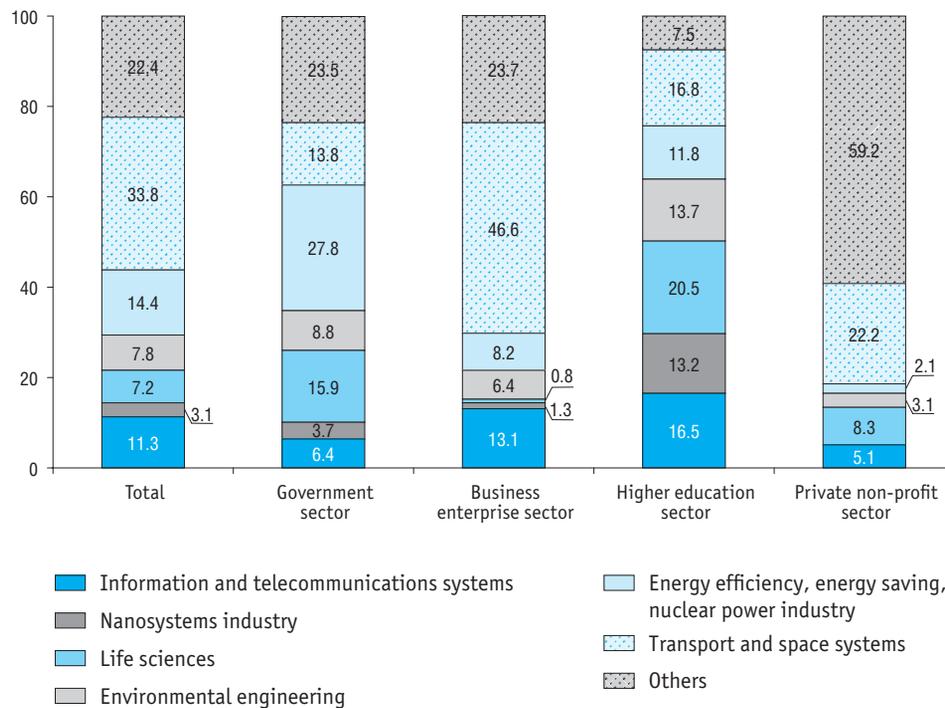
5.1.13. SUBSIDIES, GRANTS, AND OTHER COMPETITIVE R&D FUNDING BY SECTOR OF PERFORMANCE: 2017
(thousand roubles)

	Total	Government funds*	Business enterprise sector funds	Higher education sector funds	Private non-profit sector funds
Budget subsidies for institutional R&D funding	104268980.4	77445436.1	9695059.2	16956616.3	171868.8
of which federal	99453949.3	74069027.0	9116798.1	16096255.4	171868.8
Budget subsidies for performing R&D	39418651.2	9671139.4	19750880.1	9972610.7	24021.0
of which federal	38204859.3	8805159.1	19634306.7	9741372.5	24021.0
Grants from foundations for S&T and innovation	22597541.0	12468313.8	617722.4	9446546.8	64958.0
Funds from budgets of all levels	18980542.9	10674035.6	331373.8	7946823.6	28309.9
of which federal	17960952.5	10270794.7	330986.2	7336674.4	22497.2
Other types of competitive financing	71388650.4	13046469.4	49585103.2	8695241.1	61836.7
Funds from budgets of all levels	59239783.2	8965616.6	45288217.5	4959134.8	26814.3
of which federal	57981996.5	8226517.5	44974535.5	4764142.7	16800.8

5.1.14. GROSS DOMESTIC EXPENDITURE ON R&D BY PRIORITY S&T AREA AND SECTOR OF PERFORMANCE: 2017
(thousand roubles)

	Total	Government sector	Business enterprise sector	Higher education sector	Private non-profit sector
Gross domestic expenditure on R&D by priority S&T area	718706798.8	218196417.0	431778899.9	65372602.8	3358879.1
Of which:					
Information and telecommunications systems	81390706.1	14006637.8	56423265.2	10788396.1	172407.0
Industry of nanosystems	22373713.4	8112879.0	5610953.5	8649880.9	–
Life sciences	51721218.1	34767243.1	3274492.6	13402284.4	277198.0
Rational use of natural resources	55715637.8	19154078.2	27523437.6	8933348.2	104773.8
Energy effectiveness, energy saving, and nuclear power engineering	103717802.9	60733213.8	35209991.8	7703789.1	70808.2
Transport and space systems	243140462.9	30179029.5	201241705.9	10975386.3	744341.2

5.1.15. PERCENTAGE DISTRIBUTION OF GROSS DOMESTIC EXPENDITURE ON R&D BY PRIORITY S&T AREA AND SECTOR OF PERFORMANCE: 2017



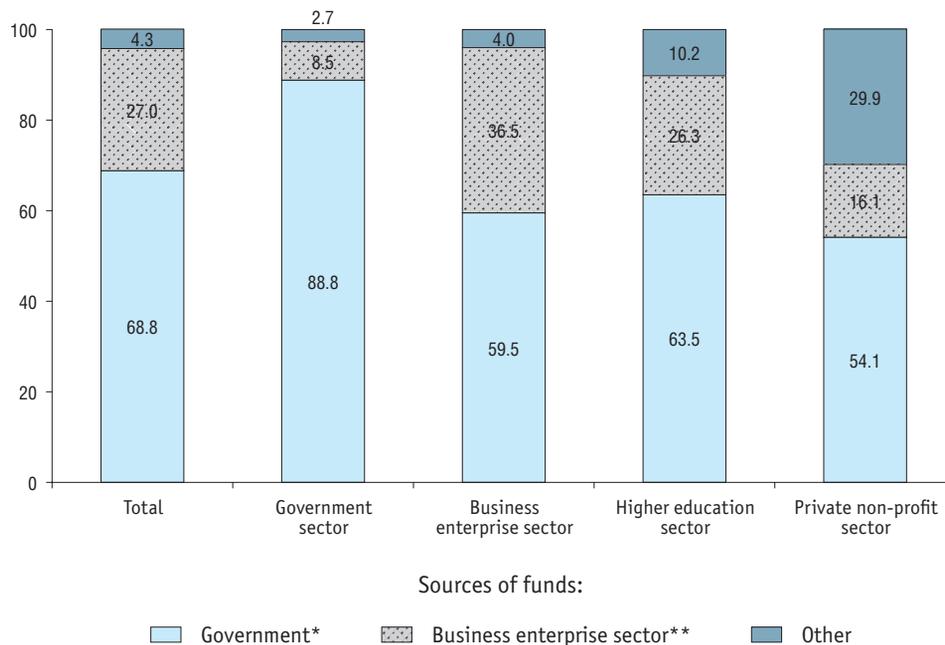
5.1.16. SOURCES OF FUNDS FOR GROSS DOMESTIC EXPENDITURE ON R&D BY PRIORITY S&T AREA AND SECTOR OF PERFORMANCE: 2017
(thousand roubles)

	Total	Government sector	Business enterprise sector	Higher education sector	Private non-profit sector
Gross domestic expenditure on R&D by priority S&T area	718706798.8	218196417.0	431778899.9	65372602.8	3358879.1
Including by sources of funds:					
government*	494188204.4	193844860.6	256999813.9	41527748.6	1815781.3
of which federal budget appropriations	417313387.9	161996491.5	218209335.9	35374021.9	1733538.6
business enterprise sector funds**	193815115.7	18517622.6	157580626.4	17177003.3	539863.4
other	30703478.7	5833933.8	17198459.6	6667850.9	1003234.4

* Including federal budget appropriations and government sector institutions' funds (including own funds).

** Business enterprise sector institutions' funds (including own funds).

5.1.17. PERCENTAGE DISTRIBUTION OF GROSS DOMESTIC EXPENDITURE ON R&D BY PRIORITY S&T AREA AND SOURCE OF FUNDS: 2017



* Including budget appropriations and government sector institutions' funds (including own funds).

** Business enterprise sector institutions' funds (including own funds).

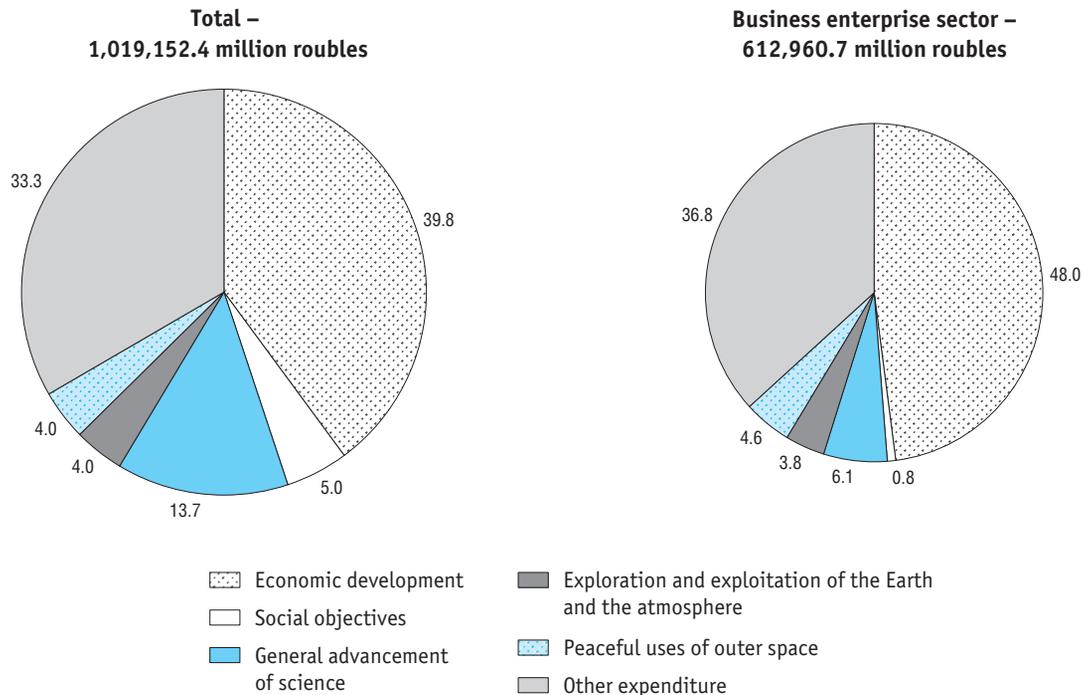
5.1.18. GROSS DOMESTIC EXPENDITURE ON R&D BY SECTOR OF PERFORMANCE AND SOCIO-ECONOMIC OBJECTIVE (thousand roubles)

	Total	Government sector	Business enterprise sector	Higher education sector	Private non-profit sector
2013					
Gross domestic expenditure on R&D	749797638.8	226590120.7	454409251.0	67858855.1	939412.0
Economic development	303849005.2	57707206.0	215317955.6	30734547.3	89296.3
Social objectives	39876895.8	22956650.4	4021637.0	12783813.4	114795.0
General advancement of science	130695141.4	69352465.7	42790745.8	18121418.8	430511.1
Exploration and exploitation of the Earth and the atmosphere	32889936.2	17181592.3	13663338.5	2011482.9	33522.5
Peaceful uses of outer space	51558366.4	11237808.4	39084006.0	1207010.5	29541.5
Other purposes	190928293.8	48154397.9	139531568.1	3000582.2	241745.6
2014					
Gross domestic expenditure on R&D	847526992.9	258023009.1	505210341.3	83205260.1	1088382.4
Economic development	319943400.5	58260041.0	224881936.8	36680335.6	121087.1
Social objectives	45328439.6	24604406.8	4745913.8	15848699.1	129419.9
General advancement of science	136414580.0	75836748.8	36193754.2	23948358.6	435718.4
Exploration and exploitation of the Earth and the atmosphere	39068691.1	19049241.1	17826089.6	2155683.5	37676.9
Peaceful uses of outer space	48996185.8	10308768.0	37455033.6	1189438.9	42945.3
Other purposes	257775695.9	69963803.4	184107613.3	3382744.4	321534.8
2015					
Gross domestic expenditure on R&D	914669057.2	284154288.3	541533094.3	87730781.4	1250893.2
Economic development	335508245.3	66498291.0	229892147.1	38839549.5	278257.7
Social objectives	47512609.4	26204488.0	3635210.6	17511474.7	161436.1

(continued)

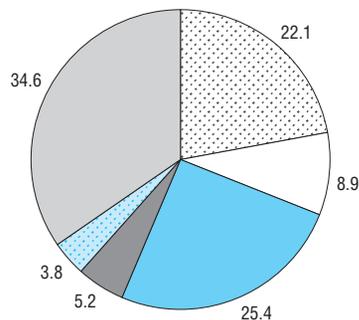
	Total	Government sector	Business enterprise sector	Higher education sector	Private non-profit sector
General advancement of science	145154435.8	84086241.6	37477260.5	23092224.3	498709.4
Exploration and exploitation of the Earth and the atmosphere	43206894.0	18496276.7	22445320.5	2221571.2	43725.6
Peaceful uses of outer space	57441295.9	10919478.4	45009580.3	1437968.4	74268.8
Other purposes	285845576.8	77949512.6	203073575.3	4627993.3	194495.6
		2016			
Gross domestic expenditure on R&D	943815219.6	301775305.3	554093599.1	85932983.0	2013332.2
Economic development	356656937.7	64707900.8	254029442.5	37581748.3	337846.1
Social objectives	53126847.1	31261859.3	3544044.4	18168104.3	152839.1
General advancement of science	139556056.0	82344016.1	33634645.2	22815366.6	762028.1
Exploration and exploitation of the Earth and the atmosphere	35280752.7	18048272.4	14855580.6	2340775.9	36123.8
Peaceful uses of outer space	46367115.9	12322365.9	33087370.1	941866.2	15513.7
Other purposes	312827510.2	93090890.8	214942516.3	4085121.7	708981.4
		2017			
Gross domestic expenditure on R&D	1019152437.1	310029734.6	612960678.4	91934601.3	4227422.8
Economic development	405957250.5	68613261.9	294054323.3	42389518.2	900147.1
Social objectives	51110186.9	27741889.2	4652612.0	18431794.6	283891.1
General advancement of science	139964844.3	78610103.3	37414969.0	23044595.5	895176.5
Exploration and exploitation of the Earth and the atmosphere	40987614.3	16017815.0	23009090.2	1916479.4	44229.7
Peaceful uses of outer space	41270828.6	11852982.8	28324873.5	1007750.0	85222.3
Other purposes	339861712.5	107193682.4	225504810.4	5144463.6	2018756.1

5.1.19. PERCENTAGE DISTRIBUTION OF GROSS DOMESTIC EXPENDITURE ON R&D BY SECTOR OF PERFORMANCE AND SOCIO-ECONOMIC OBJECTIVE: 2017

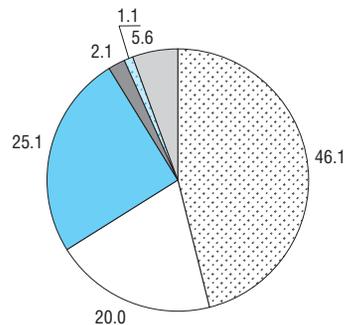


(continued)

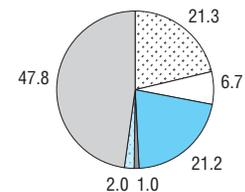
**Government sector –
310,029.7 million roubles**



**Higher education sector –
91,934.6 million roubles**



**Private non-profit sector –
4,227.4 million roubles**



 Economic development

 Social objectives

 General advancement
of science

 Exploration and exploitation of the Earth
and the atmosphere

 Peaceful uses of outer space

 Other purposes

5.1.20. CURRENT EXPENDITURE ON R&D BY SECTOR OF PERFORMANCE AND TYPE OF R&D ACTIVITY
(thousand roubles)

	Total	Government sector	Business enterprise sector	Higher education sector	Private non-profit sector
Current expenditure on R&D					
2005	221119537.6	56342327.7	151228693.6	13144292.5	404223.8
2010	489450798.7	151825126.6	294103827.7	42552245.4	969599.0
2015	854288043.8	265478556.9	503088818.5	84495233.0	1225435.4
2016	873778705.8	279027077.7	509168604.8	83579171.0	2003852.3
2017	950256965.4	283231733.5	573687801.6	89400111.3	3937319.0
Basic research					
2005	31022855.8	24586195.8	2591506.7	3841327.6	3825.7
2010	95881364.3	65041375.9	16935403.4	13647906.8	256678.2
2015	132064934.3	99987000.6	7122577.4	24839057.2	116299.1
2016	132565068.0	97607131.4	8206064.7	26537618.5	214253.4
2017	141299165.2	100604310.0	14087182.4	26153702.4	453970.4
Applied research					
2005	36360266.9	10603039.3	20026408.8	5405410.3	325408.5
2010	92010677.2	30948555.6	42872394.0	17804762.0	384965.6
2015	169654641.2	66248286.3	61520451.3	41098469.1	787434.5
2016	181157915.6	77012901.0	62485456.3	40348147.3	1311411.0
2017	172547880.5	67859495.4	57168047.3	46822282.4	698055.4
Development					
2005	153736414.9	21153092.6	128610778.1	3897554.6	74989.6
2010	301558757.2	55835195.1	234296030.3	11099576.6	327955.2
2015	552568468.3	99243270.0	434445789.8	18557706.7	321701.8
2016	560055722.2	104407045.3	438477083.8	16693405.2	478187.9
2017	636409919.7	114767928.1	502432571.9	16424126.5	2785293.2

5.1.21. AVERAGE MONTHLY SALARY OF R&D PERSONNEL BY SECTOR OF PERFORMANCE

(roubles)

	Total	Government sector	Business enterprise sector	Higher education sector	Private non-profit sector
2000	2322.9	2015.6	2519.9	1400.3	1836.1
2001	3348.9	2870.5	3630.1	2383.8	2619.8
2002	4552.1	3970.4	4893.6	3476.9	4770.2
2003	5712.8	4969.6	6124.3	4749.1	5654.7
2004	6918.4	5958.7	7525.0	5088.8	6575.0
2005	8672.0	7220.9	9599.6	7042.0	5767.4
2007	14683.4	14208.3	15203.6	12233.1	13237.3
2008	19263.3	19561.0	19345.3	16812.7	21161.2
2009	22104.3	22979.7	21674.1	21191.5	24253.8
2010	25043.5	24792.1	25359.7	23716.4	24438.5
2011	28387.5	27869.4	29174.9	24963.9	25956.5
2012	32539.9	31990.2	33165.2	30915.1	25983.7
2013	35618.8	34532.8	36540.8	34101.0	27979.8
2014	39549.3	38715.6	39855.8	41258.6	37197.0
2015	41511.8	40513.5	42102.7	41850.5	41898.6
2016	43539.5	42125.9	44611.1	43370.8	26588.1
2017	48833.6	44614.8	51648.5	49437.9	54279.4

5.2. Government sector

5.2.1. R&D INSTITUTIONS IN THE GOVERNMENT SECTOR BY TYPE

	2005	2010	2012	2013	2014	2015	2016	2017
Total	1282	1400	1465	1495	1491	1560	1546	1493
Research institutes	1145	1124	1114	1144	1139	1173	1167	1117
Design organisations, design-and-engineering organisations	62	61	64	56	55	55	55	43
Construction project and exploration organisations	6	5	6	7	6	8	5	5
Pilot plants	14	30	37	43	42	48	47	45
Others	55	180	244	245	249	276	272	283

5.2.2. R&D PERSONNEL IN THE GOVERNMENT SECTOR BY TYPE OF R&D INSTITUTIONS

(headcount)

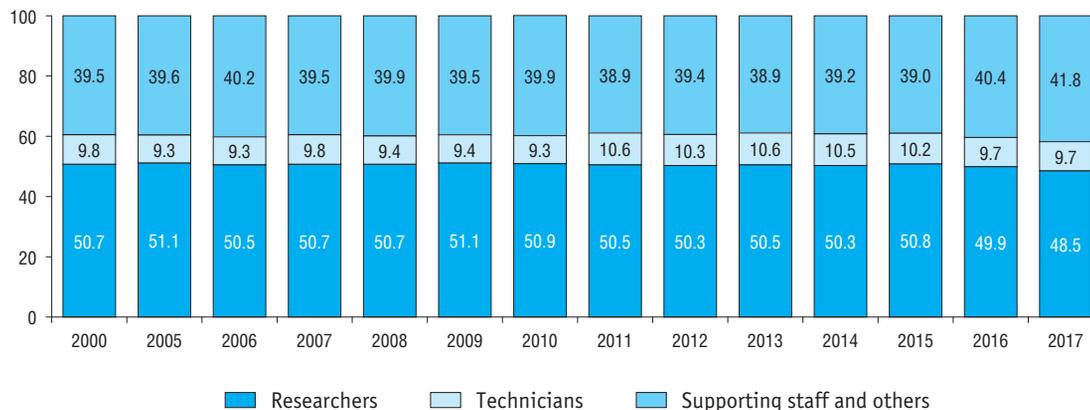
	2005	2010	2012	2013	2014	2015	2016	2017
Total	272718	259007	271466	261869	263712	265429	269056	268080
Research institutes	248214	222613	232655	225798	228146	230893	232100	228743
Design organisations, design-and-engineering organisations	21499	26473	26084	22979	23448	19459	23544	24404
Construction project and exploration organisations	159	1419	1370	1156	1174	1220	52	50
Pilot plants	367	631	1375	1762	1278	1519	1365	1372
Others	2479	7871	9982	10174	9666	12338	11995	13511

5.2.3. R&D PERSONNEL IN THE GOVERNMENT SECTOR BY OCCUPATION

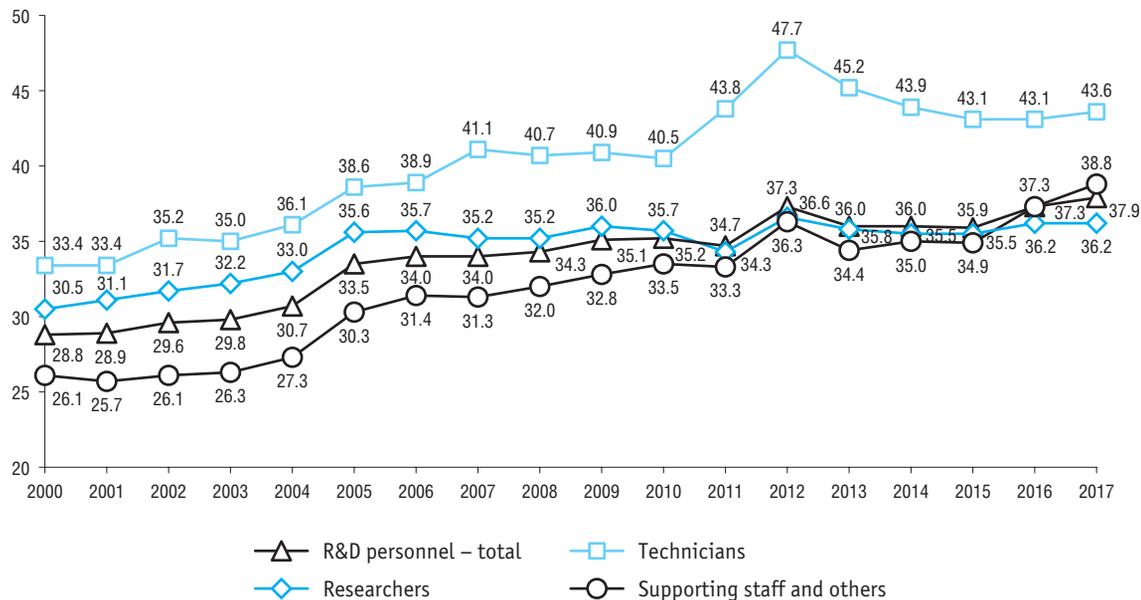
(headcount)

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Total	282166	255850	272718	259007	271466	261869	263712	265429	269056	268080
Researchers	146342	129725	139378	131734	136442	132117	132701	134794	134225	130081
Technicians	27178	25085	25462	24009	28094	27777	27761	27090	26075	26040
Supporting staff	66226	59706	61448	56530	60067	56795	56744	56552	61140	62961
Others	42420	41334	46430	46734	46863	45180	46506	46993	47616	48998

5.2.4. PERCENTAGE DISTRIBUTION OF R&D PERSONNEL IN THE GOVERNMENT SECTOR BY OCCUPATION



5.2.5. R&D PERSONNEL IN THE GOVERNMENT SECTOR AS A PERCENTAGE OF THE TOTAL NUMBER OF R&D PERSONNEL BY OCCUPATION



5.2.6. R&D PERSONNEL IN THE GOVERNMENT SECTOR BY EDUCATIONAL ATTAINMENT

(headcount)

	Total	Higher education	Secondary vocational education	Other educations
R&D personnel				
2005	272718	177676	40495	54547
2010	259007	178026	36091	44890
2014	263712	189447	33699	40566
2015	265429	194608	33163	37658
2016	269056	196289	34452	38315
2017	268080	195127	33905	39048
Researchers				
2005	139378	139378	–	–
2010	131734	131734	–	–
2014	132701	132701	–	–
2015	134794	134794	–	–
2016	134225	134225	–	–
2017	130081	130081	–	–
Technicians				
2005	25462	7802	12177	5483
2010	24009	9110	10155	4744
2014	27761	13245	9310	5206
2015	27090	13761	8609	4720
2016	26075	12877	8616	4582
2017	26040	13514	7951	4575

(continued)

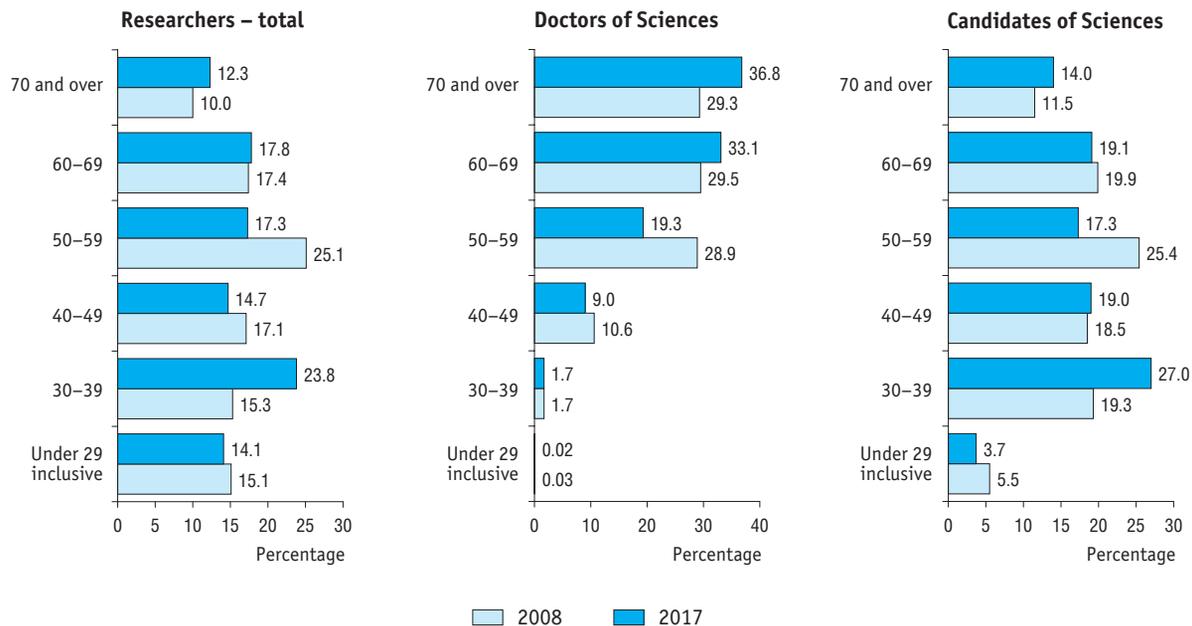
	Total	Higher education	Secondary vocational education	Other educations
Supporting staff				
2005	61448	19119	15834	26495
2010	56530	21762	14287	20481
2014	56744	24586	13038	19120
2015	56552	26144	13119	17289
2016	61140	29283	13611	18246
2017	62961	30829	13884	18248
Others				
2005	46430	11377	12484	22569
2010	46734	15420	11649	19665
2014	46506	18915	11351	16240
2015	46993	19909	11435	15649
2016	47616	19904	12225	15487
2017	48998	20703	12070	16225

5.2.7. RESEARCHERS IN THE GOVERNMENT SECTOR BY GENDER AND AGE

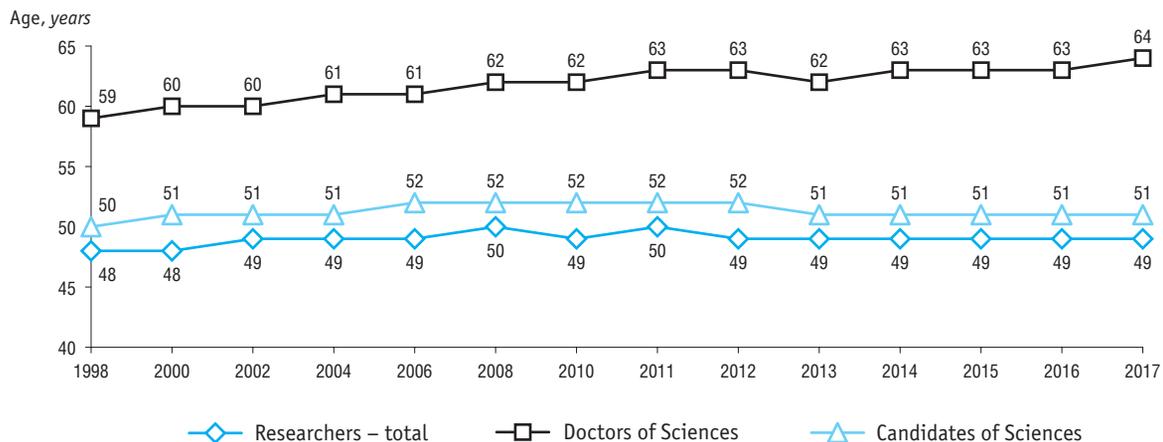
(headcount)

	2008			2017		
	Researchers	Of whom		Researchers	Of whom	
		Doctors of Science	Candidates of Science		Doctors of Science	Candidates of Science
Total	132261	17326	43043	130081	16948	42190
Age, years:						
under 29 inclusive	19971	5	2348	18393	3	1558
30–39	20242	289	8296	30940	296	11382
40–49	22644	1838	7969	19119	1526	8005
50–54	16357	2194	5445	9892	1232	3259
55–59	16849	2821	5492	12587	2047	4025
60–69	23031	5106	8553	23209	5609	8069
70 and over	13167	5073	4940	15941	6235	5892
Males	72653	13078	23696	73940	12311	22882
Age, years:						
under 29 inclusive	11530	2	1354	10668	3	897
30–39	9970	209	4091	17600	210	6017
40–49	10894	1307	3946	9848	967	3775
50–54	8373	1583	2966	4926	778	1608
55–59	9183	2073	3229	6599	1389	2175
60–69	13688	4001	4974	13566	4033	4741
70 and over	9015	3903	3136	10733	4931	3669
Females	59608	4248	19347	56141	4637	19308
Age, years:						
under 29 inclusive	8441	3	994	7725	–	661
30–39	10272	80	4205	13340	86	5365
40–49	11750	531	4023	9271	559	4230
50–54	7984	611	2479	4966	454	1651
55–59	7666	748	2263	5988	658	1850
60–69	9343	1105	3579	9643	1576	3328
70 and over	4152	1170	1804	5208	1304	2223

5.2.8. PERCENTAGE DISTRIBUTION OF RESEARCHERS IN THE GOVERNMENT SECTOR BY AGE



5.2.9. AVERAGE AGE OF RESEARCHERS IN THE GOVERNMENT SECTOR

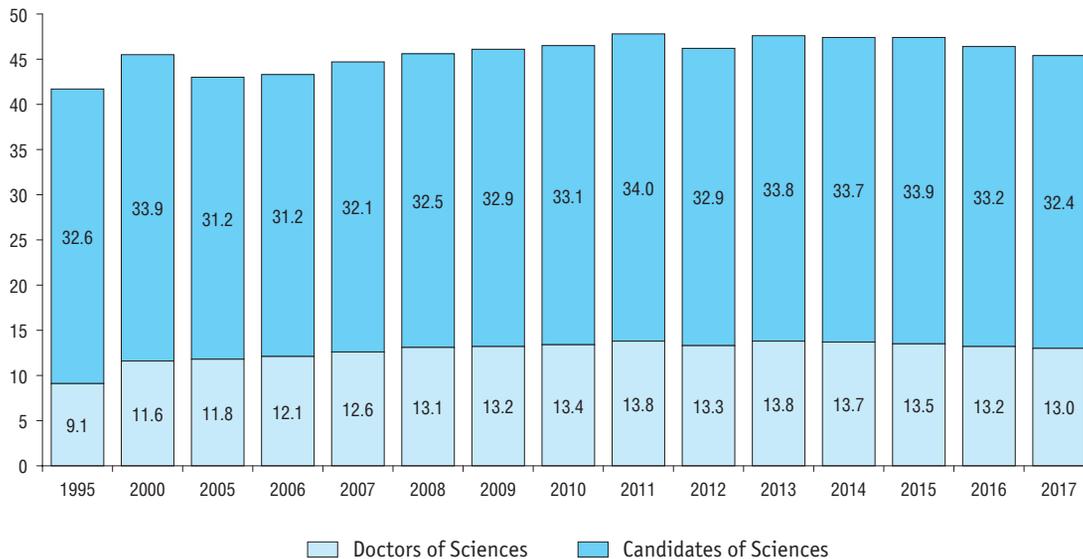


5.2.10. RESEARCHERS WITH SCIENTIFIC DEGREES IN THE GOVERNMENT SECTOR

(hedcount)

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Researchers with scientific degrees	61062	58901	60066	61194	63092	62837	62944	63906	62285	59138
Doctors of Sciences	13358	14987	16511	17646	18181	18184	18198	18264	17781	16948
Candidates of Sciences	47704	43914	43555	43548	44911	44653	44746	45642	44504	42190

5.2.11. RESEARCHERS WITH SCIENTIFIC DEGREES AS A PERCENTAGE OF THE TOTAL NUMBER OF RESEARCHERS IN THE GOVERNMENT SECTOR



5.2.12. RESEARCHERS IN THE GOVERNMENT SECTOR BY FIELD OF SCIENCE AND TECHNOLOGY

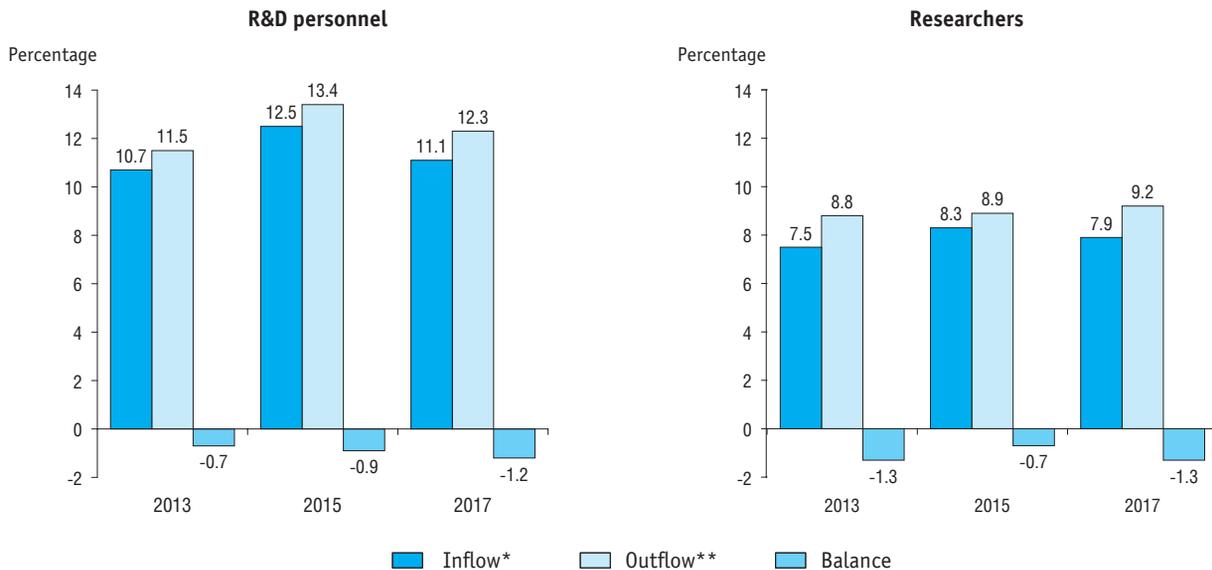
(headcount)

	2008			2015			2016			2017		
	Researchers	Of whom		Researchers	Of whom		Researchers	Of whom		Researchers	Of whom	
		Doctors of Science	Candidates of Science		Doctors of Science	Candidates of Science		Doctors of Science	Candidates of Science		Doctors of Science	Candidates of Science
Total	132261	17326	43043	134794	18264	45642	134225	17781	44504	130081	16948	42190
Natural sciences	52719	8525	21841	56349	9010	23705	55827	8850	23180	53705	8530	22568
Engineering and technology	44097	1740	6204	42326	1802	6044	43059	1682	5864	43728	1620	5550
Medical sciences	12918	3320	5921	12643	3369	5628	12838	3241	5577	11989	3154	5179
Agricultural sciences	10285	1225	3930	10008	1344	4040	9798	1303	3936	9275	1204	3669
Social sciences	5456	935	2251	6709	1213	3153	6235	1203	2940	4955	1044	2299
Humanities	6786	1581	2896	6759	1526	3072	6468	1502	3007	6429	1396	2925

5.2.13. R&D PERSONNEL TURNOVER IN THE GOVERNMENT SECTOR BY OCCUPATION (headcount)

	Number at the beginning of the reporting year	Inflow				Outflow				Number at the end of the reporting year
		Total	Of whom			Total	Of whom			
			higher education graduates	other research institutes' graduates	others		resigned	were made redundant	left due to other reasons	
Total										
2005	275249	32634	3990	5456	23188	35165	24924	851	9390	272718
2013	264121	28184	2650	3461	22073	30436	20179	642	9615	261869
2015	268080	33169	3182	4136	25851	35820	20622	1319	13879	265429
2017	271650	29850	2815	4564	22471	33420	21146	999	11275	268080
Researches										
2005	139746	11715	3127	3121	5467	12087	8871	358	2858	139378
2013	133682	10035	1894	2211	5930	11819	8172	277	3370	132117
2015	136237	11127	2147	2347	6633	12169	7725	505	3939	134794
2017	132188	10287	1811	2622	5854	12118	7685	330	4103	130081
Technicians										
2005	25569	4128	336	630	3162	4227	2892	83	1252	25462
2013	28152	4034	349	292	3393	4371	2696	55	1620	27777
2015	28250	4634	463	439	3732	5846	2689	138	3019	27090
2017	26083	3852	447	424	2981	4079	2560	78	1441	26040
Supporting staff and others										
2005	109934	16791	527	1705	14555	18851	13161	410	5280	107878
2013	102287	14115	407	958	12750	14246	9311	310	4625	101975
2015	103593	17408	572	1350	15486	17805	10208	676	6921	103545
2017	113379	15711	557	1518	13636	17223	10901	591	5731	111959

5.2.14. INFLOW AND OUTFLOW OF R&D PERSONNEL IN THE GOVERNMENT SECTOR

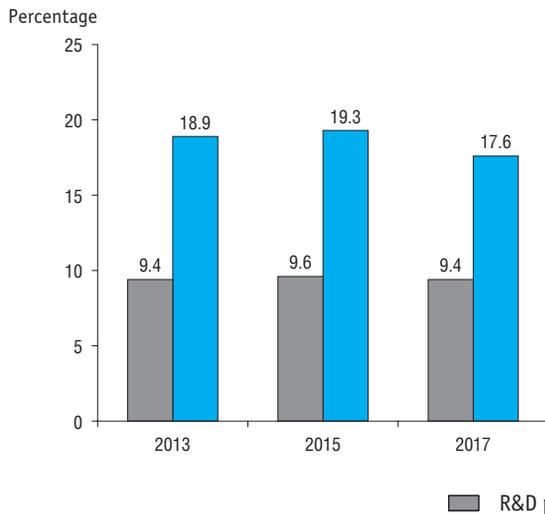


* The ratio of those hired during the year to the total employment at the end of the year.

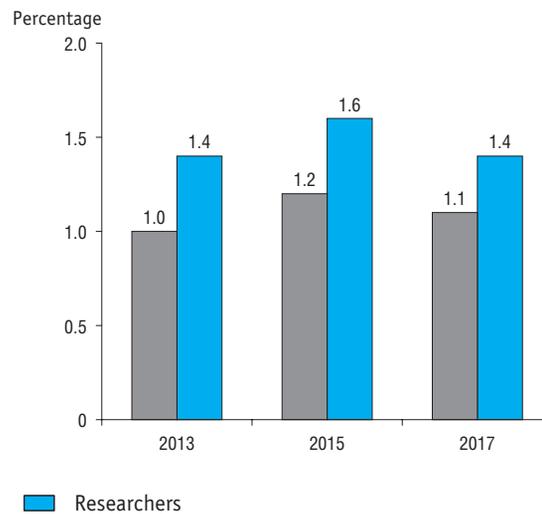
** The ratio of those who left during the year to the total employment at the beginning of the year.

5.2.15. INFLOW OF HIGHER EDUCATION GRADUATES INTO GOVERNMENT SECTOR INSTITUTIONS

Higher education graduates
as a percentage of those hired



Higher education graduates
as a percentage of R&D personnel*



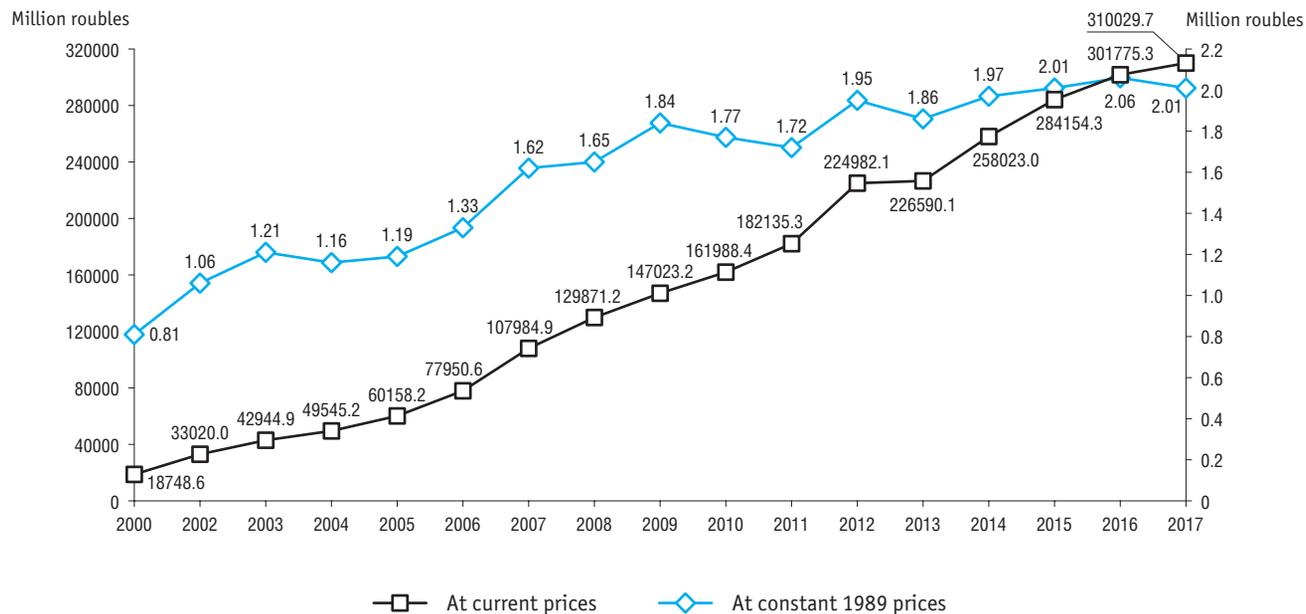
* The ratio of the higher education graduates hired during the year to the total employment at the end of the year.

5.2.16. GROSS DOMESTIC EXPENDITURE ON R&D IN THE GOVERNMENT SECTOR BY TYPE OF R&D INSTITUTIONS

(thousand roubles)

	2005	2010	2012	2013	2014	2015	2016	2017
Total	60158166.6	161988411.4	224982089.2	226590120.7	258023009.1	284154288.3	301775305.3	310029734.6
Research institutes	55762222.6	136870186.3	190774482.9	191023430.1	222183967.5	241159555.3	254408906.6	260728834.1
Design organisations, design-and-engineering organisations	4007361.7	20163653.6	24722611.1	25707283.0	27081699.7	31243788.5	35387725.2	34575060.4
Construction project and exploration organisations	21993.6	524208.6	561026.1	433811.9	449560.6	384269.6	27093.9	29684.9
Pilot plants	20300.0	139733.5	970655.0	1076831.6	925741.2	998142.5	1093828.8	2877813.2
Others	346288.7	4290629.4	7953314.1	8348764.1	7382040.1	10368532.4	10857750.8	11818342.0

5.2.17. GROSS DOMESTIC EXPENDITURE ON R&D IN THE GOVERNMENT SECTOR



5.2.18. GROSS DOMESTIC EXPENDITURE ON R&D IN THE GOVERNMENT SECTOR BY SOURCE OF FUNDS

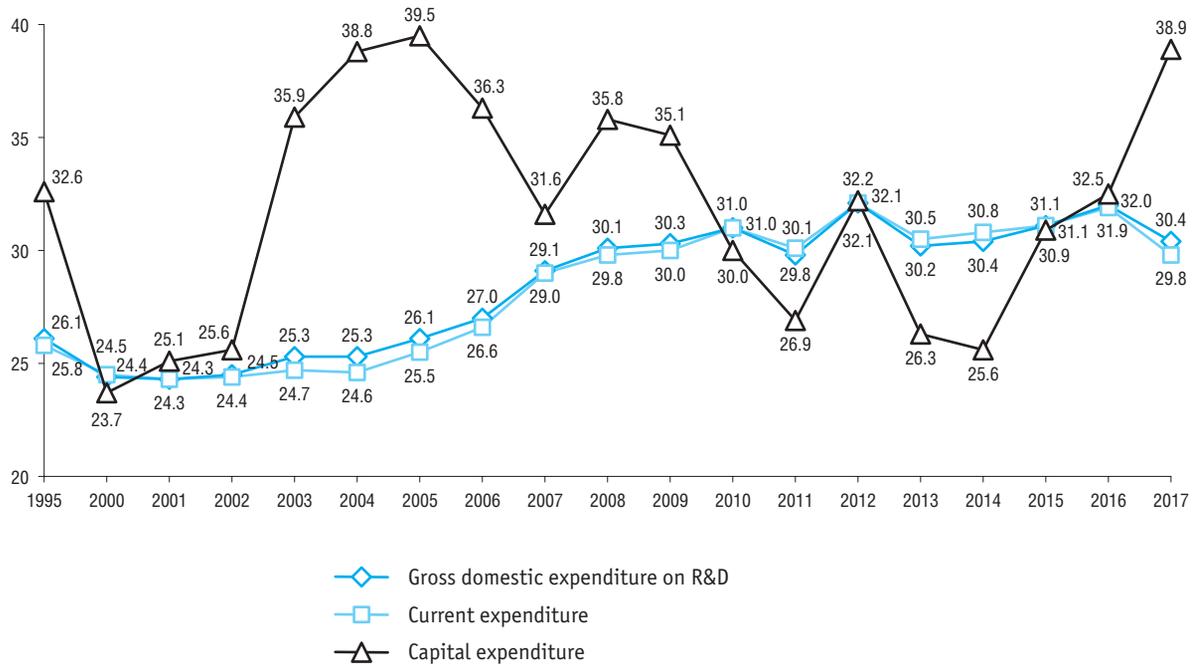
	Total	Government funds*	Business enterprise sector funds	Higher education sector funds	Private non-profit sector funds	Funds from abroad
<i>At current prices, thousand roubles, 1995 – million roubles</i>						
1995	3165439.4	2779222.3	255799.4	2313.0	821.0	127283.7
2000	18748588.2	15060439.1	2028296.2	11323.4	3898.5	1644631.0
2005	60158166.6	50589802.5	6845507.2	46912.8	21976.9	2653967.2
2006	77950634.9	65449102.1	9136754.4	111817.6	52071.9	3200888.9
2007	107984917.2	85896140.4	14355790.2	80481.6	12412.3	7640092.7
2008	129871228.3	108231726.8	16119227.3	183124.2	120667.0	5216483.0
2009	147023165.7	124027349.4	16292839.6	90578.1	38990.4	6573408.2
2010	161988411.4	134275595.6	20873979.0	205154.5	73117.4	6560564.9
2011	182135309.9	153529403.4	21528707.1	244802.6	61568.4	6770828.4
2012	224982089.2	186513895.7	29459319.3	197336.7	75635.7	8735901.8
2013	226590120.7	186895055.8	31300159.7	211201.3	105228.8	8078475.1
2014	258023009.1	219020381.4	29660844.5	357181.2	100284.6	8884317.4
2015	284154288.3	240265758.8	32877099.7	321525.4	163335.5	10526568.9
2016	301775305.3	263326940.4	27544205.3	363329.0	253809.8	10287020.8
2017	310029734.6	268775672.5	29924193.6	210118.7	608620.0	10511129.8

(continued)

	Total	Government funds*	Business enterprise sector funds	Higher education sector funds	Private non-profit sector funds	Funds from abroad
	Percentage					
1995	100	87.8	8.1	0.07	0.03	4.0
2000	100	80.3	10.8	0.06	0.02	8.8
2005	100	84.1	11.4	0.08	0.04	4.4
2006	100	84.0	11.7	0.10	0.07	4.1
2007	100	79.5	13.3	0.07	0.01	7.1
2008	100	83.3	12.4	0.10	0.09	4.0
2009	100	84.4	11.1	0.06	0.03	4.5
2010	100	82.9	12.9	0.10	0.05	4.1
2011	100	84.3	11.8	0.10	0.03	3.7
2012	100	82.9	13.1	0.09	0.03	3.9
2013	100	82.5	13.8	0.09	0.05	3.6
2014	100	84.9	11.5	0.10	0.04	3.4
2015	100	84.6	11.6	0.10	0.06	3.7
2016	100	87.3	9.1	0.10	0.10	3.4
2017	100	86.7	9.7	0.10	0.20	3.4

* Including budget funds, own funds, and government sector institutions' funds.

5.2.19. GOVERNMENT SECTOR AS A PERCENTAGE OF GROSS DOMESTIC EXPENDITURE ON R&D BY TYPE OF EXPENDITURE



5.2.20. GROSS DOMESTIC EXPENDITURE ON R&D IN THE GOVERNMENT SECTOR BY TYPE

(thousand roubles)

	2005	2010	2013	2014	2015	2016	2017
Gross domestic expenditure on R&D	60158166.6	161988411.4	226590120.7	258023009.1	284154288.3	301775305.3	310029734.6
Current expenditure	56342327.7	151825126.6	213468794.6	244655172.5	265478556.9	279027077.7	283231733.5
Salaries	25406848.5	80849201.5	112439789.3	126267663.6	134412102.1	139090202.7	144850814.7
Of which R&D personnel*	23066423.6	73752076.2	102744281.9	114929478.2	121375793.9	125987971.1	131753641.2
Social security payments**	6257309.9	16436614.4	2923058.9	32567448.4	36154760.9	37718124.5	39027533.6
Equipment	3086873.3	5458681.5	6600021.2	7776357.0	7442689.6	5766984.9	6071286.9
Other material costs	9781232.9	22464861.8	32362326.9	39503365.7	42451174.6	53280149.8	44970239.0
Other current expenditure	11810063.1	26615767.4	32836118.3	38540337.8	45017829.7	43171615.8	48311859.3
Capital expenditure	3815838.9	10163284.8	13121326.1	13367836.6	18675731.4	22748227.6	26798001.1
Land and buildings	399698.5	3113137.6	2467555.2	3248423.4	3903611.8	5480973.9	8823840.7
Including:							
land	...	...	...	...	...	...	2917843.6
buildings	...	...	...	...	...	...	5905997.1
Equipment	2485274.0	4647644.5	7352490.4	7037782.8	10358881.1	14661765.0	14481293.8
Intellectual property and results of intellectual activity	...	...	...	...	...	...	782015.5
Other capital expenditure	930866.4	2402502.7	3301280.5	3081630.4	4413238.5	2605488.7	2710851.1

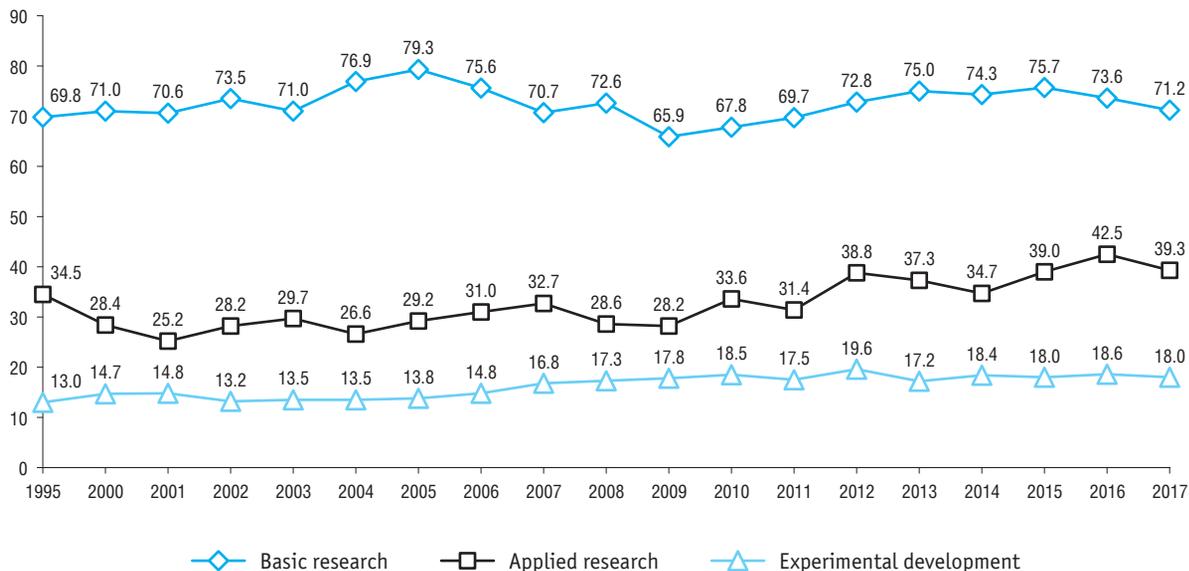
* Excluding external multiple jobholders and independent contractors.

** National pension insurance, national health insurance, national social insurance.

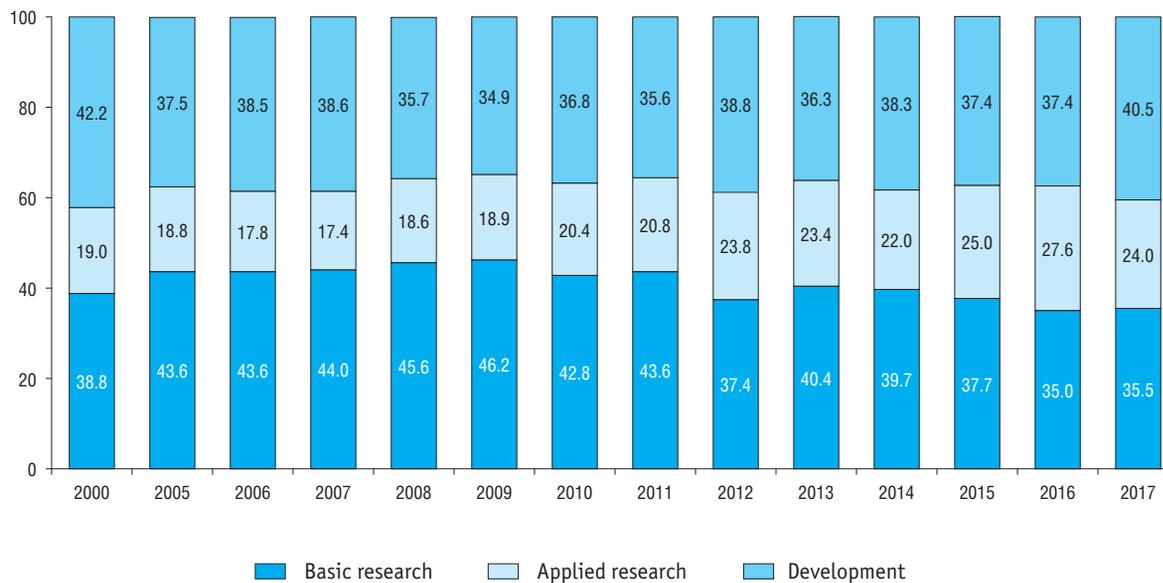
**5.2.21. CURRENT EXPENDITURE ON R&D IN THE GOVERNMENT SECTOR BY TYPE OF R&D ACTIVITY
AND FIELD OF SCIENCE AND TECHNOLOGY**
(thousand roubles)

	Total	Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities
2005							
Current expenditure on R&D	56342327.7	20577533.0	25509704.3	3738833.2	2939051.4	1951167.1	1626038.7
Basic research	24586195.8	15976354.8	2622298.0	1662238.3	1678543.7	1333808.2	1312952.8
Applied research	10603039.3	2644812.7	4734050.4	1703960.2	840824.2	475142.3	204249.5
Development	21153092.6	1956365.5	18153355.9	372634.7	419683.5	142216.6	108836.4
2010							
Current expenditure on R&D	151825126.6	56889173.8	65431955.8	12635358.1	6868458.0	4815854.6	5184326.3
Basic research	65041375.9	38927125.1	8471457.1	5340161.8	4177771.0	3645798.9	4479062.0
Applied research	30948555.6	13265692.5	7766540.0	6615628.6	1773878.6	936306.6	590509.3
Development	55835195.1	4696356.2	49193958.7	679567.7	916808.4	233749.1	114755.0
2015							
Current expenditure on R&D	265478556.9	98742002.1	117329719.0	22341866.9	11448932.5	7440718.3	8175318.1
Basic research	99987000.6	58183429.9	14273618.3	7951401.7	7804653.1	4972403.3	6801494.3
Applied research	66248286.3	24349761.4	23686724.2	13081555.6	2396404.2	1982310.8	751530.1
Development	99243270.0	16208810.8	79369376.5	1308909.6	1247875.2	486004.2	622293.7
2016							
Current expenditure on R&D	279027077.7	99526385.9	128071586.1	24495595.9	11531279.5	6971909.0	8430321.3
Basic research	97607131.4	56737246.3	13250617.6	7883362.0	7886667.3	4689278.9	7159959.3
Applied research	77012901.0	25009861.2	30659177.7	16019142.9	2534441.0	1851405.6	938872.6
Development	104407045.3	17779278.4	84161790.8	593091.0	1110171.2	431224.5	331489.4
2017							
Current expenditure on R&D	283231733.5	99562126.5	130984910.0	25686220.2	11974692.2	6900206.2	8123578.4
Basic research	100604310.0	59674407.1	11974890.7	9025639.6	8028433.8	4845029.9	7055908.9
Applied research	67859495.4	22044710.8	25189219.3	15215605.3	2865121.2	1711473.7	833365.1
Development	114767928.1	17843008.6	93820800.0	1444975.3	1081137.2	343702.6	234304.4

5.2.22. GOVERNMENT SECTOR AS A PERCENTAGE OF CURRENT EXPENDITURE ON R&D BY TYPE OF R&D ACTIVITY



5.2.23. PERCENTAGE DISTRIBUTION OF CURRENT EXPENDITURE ON R&D IN THE GOVERNMENT SECTOR BY TYPE OF R&D ACTIVITY



5.2.24. AVERAGE MONTHLY SALARY OF R&D PERSONNEL IN THE GOVERNMENT SECTOR

	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
Average monthly salary, roubles	2015.6	7220.9	24792.1	27869.4	31990.2	34532.8	38715.6	40513.5	42125.9	44614.8
As a percentage of the salary:										
in the national economy (=100%)	90.7	84.4	118.3	119.3	120.1	115.9	119.1	119.1	114.8	113.9
in manufacturing (=100%)	85.2	85.7	130.0	128.0	130.5	127.7	131.2	127.0	121.8	115.9
in construction (=100%)	76.4	79.9	117.1	117.7	123.3	124.7	131.9	135.2	130.3	132.5

5.3. Business enterprise sector

5.3.1. R&D INSTITUTIONS IN THE BUSINESS ENTERPRISE SECTOR BY TYPE

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Total	2345	2278	1703	1405	1362	1269	1265	1400	1326	1292
Research institutes	1089	1062	855	634	567	514	504	482	454	419
Design organisations, design-and-engineering organisations	615	564	410	290	262	265	254	260	244	229
Construction project and exploration organisations	204	94	55	31	27	26	26	21	21	18
Industrial enterprises	286	276	231	238	274	266	275	371	363	380
Pilot plants	31	32	16	16	19	9	10	11	14	18
Others	120	250	136	196	213	189	196	255	230	228

5.3.2. R&D PERSONNEL IN THE BUSINESS ENTERPRISE SECTOR BY TYPE OF R&D INSTITUTIONS

(headcount)

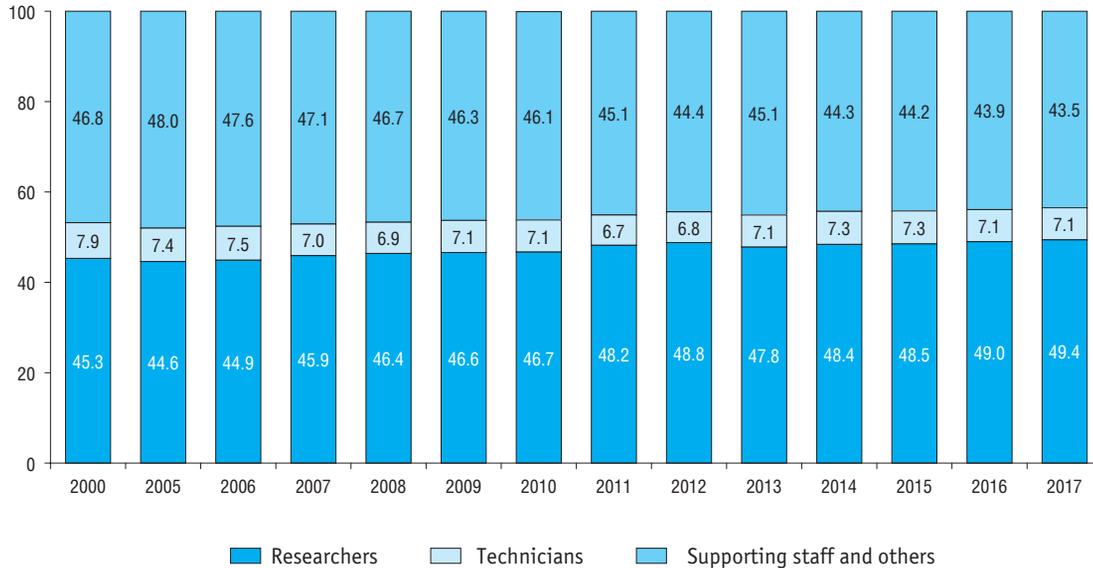
	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Total	726568	590646	496706	423112	394182	405268	405529	408802	388385	377150
Research institutes	438599	349242	255233	207166	194274	205511	204860	202431	192150	176736
Design organisations, design-and-engineering organisations	174523	151705	161295	129281	110381	112617	114752	115683	109359	100443
Construction project and exploration organisations	20844	8177	5284	4905	5402	3751	3602	1629	1749	1487
Industrial enterprises	73410	52598	43524	51807	52071	52232	49358	53868	50740	59421
Pilot plants	9998	3945	865	925	946	705	1374	1499	1630	4658
Others	9194	24979	30505	29028	31108	30536	31583	33692	32757	34405

5.3.3. R&D PERSONNEL IN THE BUSINESS ENTERPRISE SECTOR BY OCCUPATION

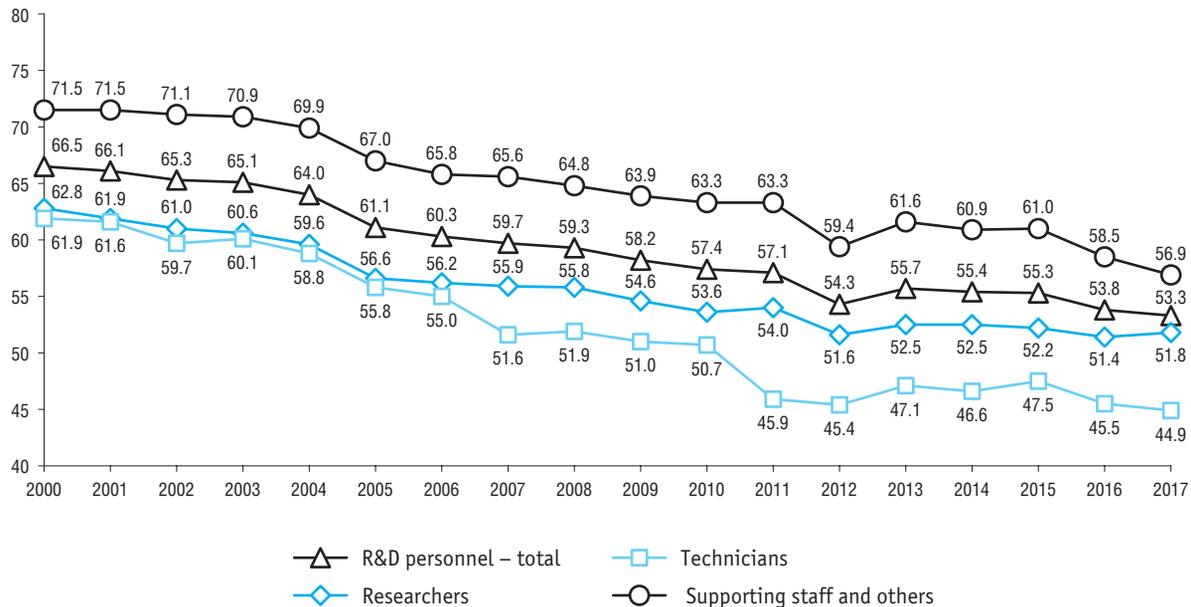
(headcount)

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Total	726568	590646	496706	423112	394182	405268	405529	408802	388385	377150
Researchers	336671	267640	221445	197785	192285	193736	196320	198123	190378	186347
Technicians	70180	46535	38837	30063	26720	28920	29452	29850	27519	26788
Supporting staff	201122	175261	147980	120485	106306	109691	107215	108230	101219	98139
Others	118595	101210	90444	74779	68871	72921	72542	72599	69269	65876

5.3.4. PERCENTAGE DISTRIBUTION OF R&D PERSONNEL IN THE BUSINESS ENTERPRISE SECTOR BY OCCUPATION



5.3.5. R&D PERSONNEL IN THE BUSINESS ENTERPRISE SECTOR AS A PERCENTAGE OF THE TOTAL NUMBER OF R&D PERSONNEL BY OCCUPATION



5.3.6. R&D PERSONNEL IN THE BUSINESS ENTERPRISE SECTOR BY EDUCATIONAL ATTAINMENT (headcount)

	Total	Higher education	Secondary vocational education	Other education
R&D personnel				
2005	496706	288649	89265	118792
2010	423112	268821	69552	84739
2014	405529	276675	59564	69290
2015	408802	283664	60370	64768
2016	388385	274477	56221	57687
2017	377150	270951	54342	51857
Researchers				
2005	221445	221445	–	–
2010	197785	197785	–	–
2014	196320	196320	–	–
2015	198123	198123	–	–
2016	190378	190378	–	–
2017	186347	186347	–	–
Technicians				
2005	36837	6274	21435	9130
2010	30063	7842	15051	7170
2014	29452	10215	12503	6734
2015	29850	11656	11794	6400
2016	27519	11023	11025	5471
2017	26788	10923	10333	5532

(continued)

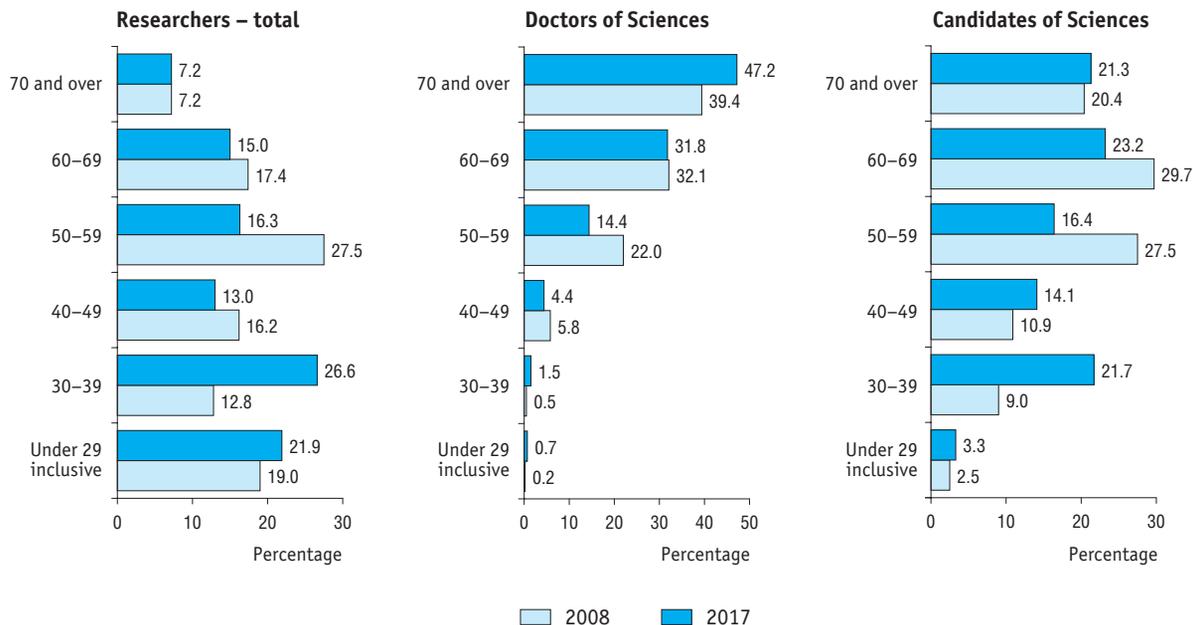
	Total	Higher education	Secondary vocational education	Other education
Supporting staff				
2005	147980	37101	42099	68780
2010	120485	38988	33362	48135
2014	107215	40615	28175	38425
2015	108230	42934	30297	34999
2016	101219	41629	27909	31681
2017	98139	42561	27490	28088
Others				
2005	90444	23829	25733	40882
2010	74779	24206	21139	29434
2014	72542	29525	18886	24131
2015	72599	30951	18279	23369
2016	69269	31447	17287	20535
2017	65876	31120	16519	18237

5.3.7. RESEARCHERS IN THE BUSINESS ENTERPRISE SECTOR BY GENDER AND AGE

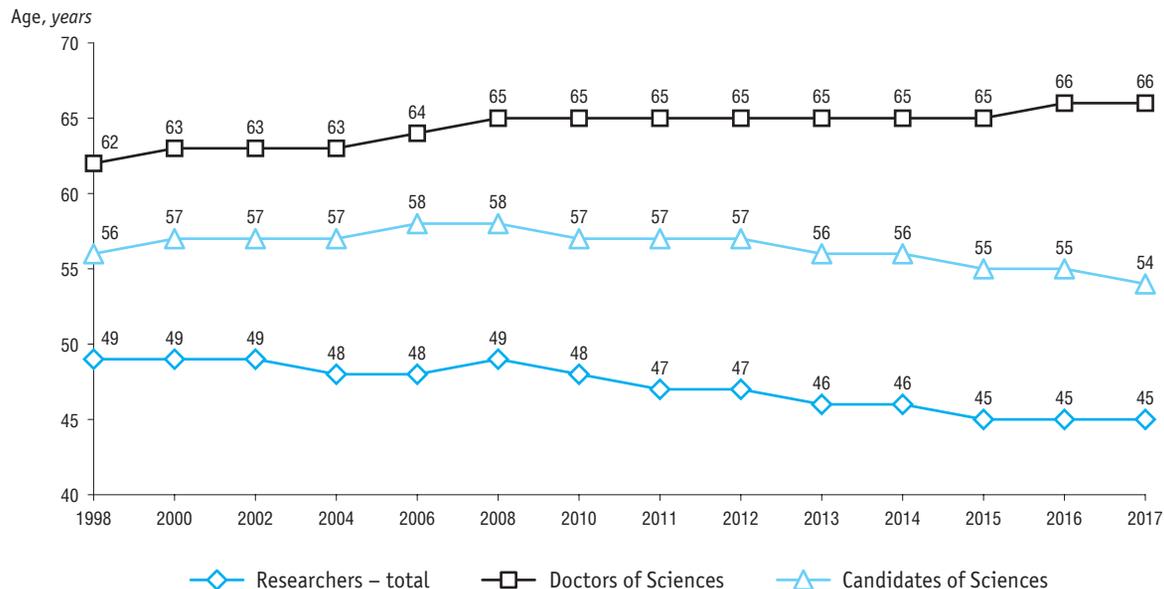
(headcount)

	2008			2017		
	Researchers	Of whom		Researchers	Of whom	
		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences
Total	209579	4284	20560	186347	2873	15234
<i>Age, years:</i>						
under 29 inclusive	39743	8	522	40804	21	508
30–39	26840	21	1845	49658	43	3304
40–49	33992	250	2234	24180	127	2144
50–54	28373	369	2334	13510	105	995
55–59	29208	572	3324	16924	308	1499
60–69	36400	1375	6113	27884	913	3535
70 and over	15023	1689	4188	13387	1356	3249
Males	125997	3905	16502	120262	2658	12404
<i>Age, years:</i>						
under 29 inclusive	25365	7	397	27544	21	390
30–39	16324	17	1303	32715	38	2502
40–49	17239	220	1676	15035	114	1621
50–54	15126	317	1817	7475	96	797
55–59	16262	509	2667	9767	278	1269
60–69	23519	1276	5109	17633	838	3032
70 and over	12162	1559	3533	10093	1273	2793
Females	83582	379	4058	66085	215	2830
<i>Age, years:</i>						
under 29 inclusive	14378	1	125	13260	–	118
30–39	10516	4	542	16943	5	802
40–49	16753	30	558	9145	13	523
50–54	13247	52	517	6035	9	198
55–59	12946	63	657	7157	30	230
60–69	12881	99	1004	10251	75	503
70 and over	2861	130	655	3294	83	456

5.3.8. PERCENTAGE DISTRIBUTION OF RESEARCHERS IN THE BUSINESS ENTERPRISE SECTOR BY AGE



5.3.9. AVERAGE AGE OF RESEARCHERS IN THE BUSINESS ENTERPRISE SECTOR

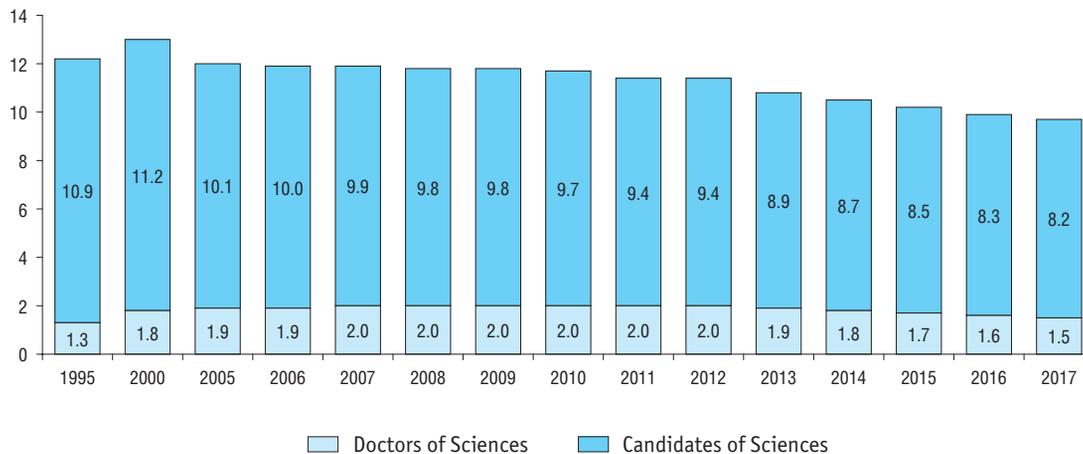


5.3.10. RESEARCHERS WITH SCIENTIFIC DEGREES IN THE BUSINESS ENTERPRISE SECTOR

(headcount)

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Researchers with scientific degrees	41207	34775	26661	23169	21758	20955	20595	20270	18833	18107
Doctors of Sciences	4348	4806	4222	3987	3767	3622	3511	3413	3071	2873
Candidates of Sciences	36859	29969	22439	19182	17991	17333	17084	16857	15762	15234

5.3.11. RESEARCHERS WITH SCIENTIFIC DEGREES AS A PERCENTAGE OF THE TOTAL NUMBER OF RESEARCHERS IN THE BUSINESS ENTERPRISE SECTOR



5.3.12. RESEARCHERS IN THE BUSINESS ENTERPRISE SECTOR BY FIELD OF SCIENCE AND TECHNOLOGY

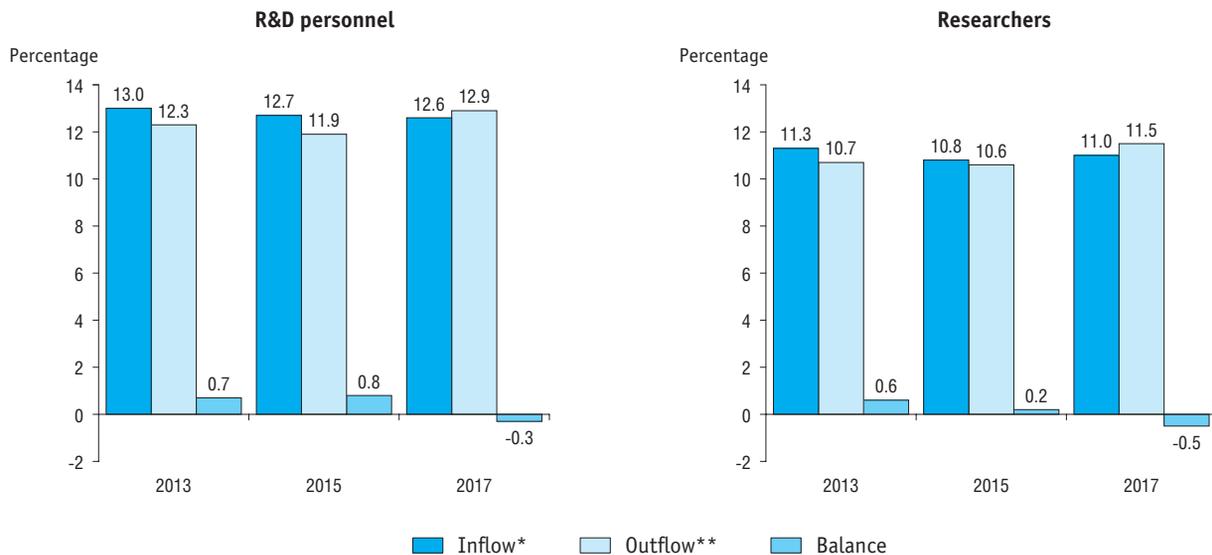
(headcount)

	2008			2015			2016			2017		
	Researchers	Of whom		Researchers	Of whom		Researchers	Of whom		Researchers	Of whom	
		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences
Total	209579	4284	20560	198123	3413	16857	190378	3071	15762	186347	2873	15234
Natural sciences												
Engineering and technology	25014	1301	5106	17101	928	3480	16913	853	3319	14006	716	2884
Medical sciences	177503	2478	13712	176440	2172	12325	169393	1991	11667	168561	1969	11627
	1353	139	413	1116	64	179	1222	68	188	1174	55	166
Agricultural sciences	2401	185	685	437	44	131	460	15	106	282	17	84
Social sciences	3109	161	587	2577	166	602	2231	128	444	2193	102	440
Humanities	199	20	57	452	39	140	159	16	38	131	14	33

5.3.13. R&D PERSONNEL TURNOVER IN THE BUSINESS ENTERPRISE SECTOR BY OCCUPATION (headcount)

	Number at the beginning of the reporting year	Inflow				Outflow				Number at the end of the reporting year
		Total	Of whom			Total	Of whom			
			higher education graduates	other research institutes' graduates	Others		resigned	were made redundant	left due to other reasons	
Total										
2005	508840	68528	8027	8756	51745	80662	52534	5722	22406	496706
2013	401809	52700	6758	7632	38310	49241	32584	1159	15498	405268
2015	405181	52033	6175	7075	38783	48412	30324	2568	15520	408802
2017	378521	47497	5116	5962	36419	48868	29951	2958	15959	377150
Researchers										
2005	227397	22807	6529	5028	11250	28822	19496	2053	7273	221445
2013	192306	21908	4703	4471	12734	20499	13769	380	6350	193736
2015	197658	21426	4225	3730	13471	20954	13382	831	6741	198123
2017	187881	20491	3610	3716	13165	21620	13324	1117	7179	186347
Technicians										
2005	38078	5739	301	729	4709	6965	4347	388	2230	36837
2013	28318	5409	506	665	4238	4779	2829	75	1875	28920
2015	30047	4897	546	574	3777	4977	2973	304	1700	29850
2017	26933	4654	505	417	3732	4911	2850	200	1861	26788
Supporting staff and others										
2005	243365	39982	1197	2999	35786	44875	28691	3281	12903	238424
2013	181185	25383	1549	2496	21338	23963	15986	704	7273	182612
2015	177476	25710	1404	2771	21535	22481	13969	1433	7079	180829
2017	163707	22352	1001	1829	19522	22337	13777	1641	6919	164015

5.3.14. INFLOW AND OUTFLOW OF RESEARCHERS IN THE BUSINESS ENTERPRISE SECTOR

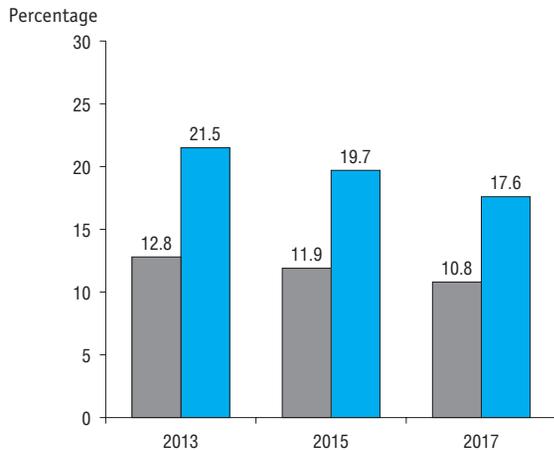


* The ratio of those hired during the year to the total number of employment at the end of the year.

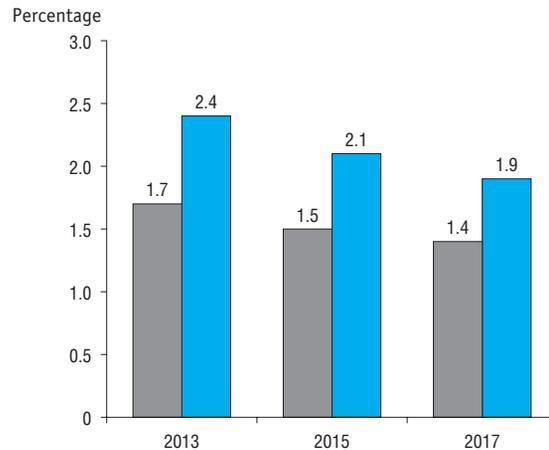
** The ratio of those who left during the year to the total number of employment at the beginning of the year.

5.3.15. INFLOW OF HIGHER EDUCATION GRADUATES INTO BUSINESS ENTERPRISE SECTOR INSTITUTIONS

Higher education graduates
as a percentage of those hired



Higher education graduates
as a percentage of R&D personnel*



■ R&D personnel ■ Researchers

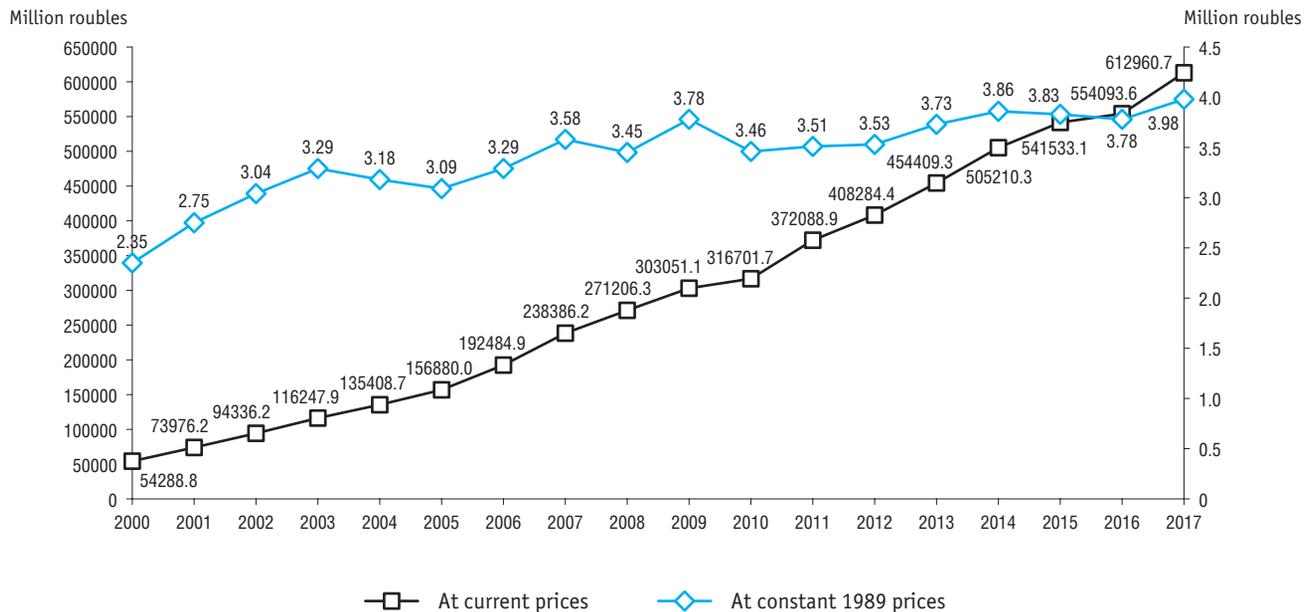
* The ratio of the higher education graduates hired during the year to the total employment at the end of the year.

5.3.16. GROSS DOMESTIC EXPENDITURE ON R&D IN THE BUSINESS ENTERPRISE SECTOR BY TYPE OF R&D INSTITUTIONS

(thousand roubles)

	2000	2005	2010	2012	2013	2014	2015	2016	2017
Total	54288781.4	156880029.0	316701679.9	408284378.5	454409251.0	505210341.3	541533094.3	554093599.1	612960678.4
Research institutes	31145022.1	79303185.8	149370680.2	200622676.3	223137546.4	246251822.0	264045184.4	271903397.6	294509447.1
Design organisations, design-and-engineering organisations	13115444.7	51857668.0	99778643.7	104269890.1	118708123.0	140108876.6	142841408.8	139631208.0	141773583.4
Construction project and exploration organisations	539721.1	1604470.7	3690958.0	5827594.8	3579155.2	3567752.9	2380598.7	2530918.6	2275602.3
Industrial enterprises	4726082.4	12633435.9	32838780.9	49952762.8	59346858.0	60962171.4	74693899.2	75747420.1	90217091.0
Pilot plants	294581.2	150835.5	398159.1	746678.7	808351.2	1749042.3	2223362.2	2105223.8	8459395.5
Others	4467929.9	11330433.1	30624458.0	46864775.8	48829217.2	52570676.1	55348641.0	62175431.0	75725559.1

5.3.17. GROSS DOMESTIC EXPENDITURE ON R&D IN THE BUSINESS ENTERPRISE SECTOR



5.3.18. GROSS DOMESTIC EXPENDITURE ON R&D IN THE BUSINESS ENTERPRISE SECTOR BY SOURCE OF FUNDS

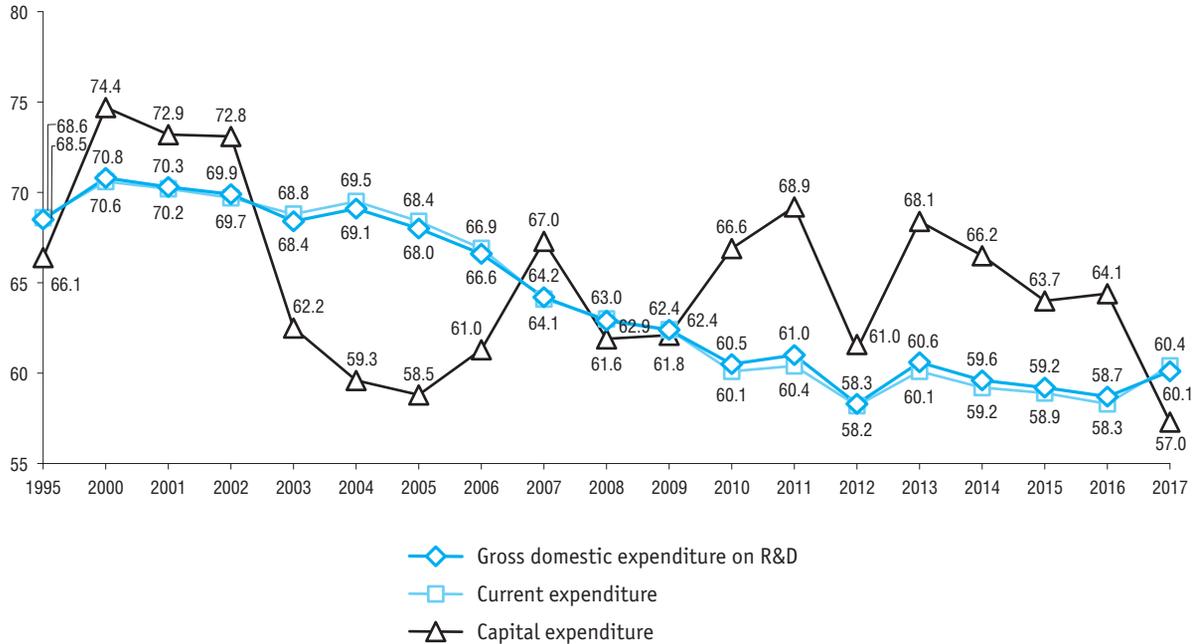
	Total	Government funds*	Business enterprise sector funds	Higher education sector funds	Private non-profit sector funds	Funds from abroad
At current prices, thousand roubles, 1995 – million roubles						
1995	8323907.6	4256825.1	3639140.1	822.4	486.8	426633.2
2000	54288781.4	24674880.5	22199361.6	23662.7	18968.0	7371908.6
2005	156880029.0	84032725.4	58460580.8	46809.5	14570.8	14325342.5
2006	192484851.0	100122872.7	68769254.4	34681.0	160678.6	23397364.3
2007	238386207.4	131768069.7	87352197.2	616853.5	163906.9	18485180.1
2008	271206280.5	151975682.0	99123835.8	43931.1	468252.7	19594578.9
2009	303051131.5	173872629.4	104955691.5	60958.8	238908.1	23922943.7
2010	316701679.9	203267110.6	101760706.5	75409.3	427247.1	11171206.4
2011	372088873.4	218291814.8	134043614.4	376915.9	806970.4	18569557.9
2012	408284378.5	246761318.2	143181603.7	240986.2	152505.3	17947965.1
2013	454409251.0	279358934.6	161100909.7	515567.0	88727.4	13345112.3
2014	505210341.3	316622608.3	177116134.2	442911.7	359214.0	10669473.1
2015	541533094.3	343396867.3	185037359.3	561703.2	421868.8	12115295.7
2016	554093599.1	326710613.8	213215672.3	153457.6	149519.8	13864335.6
2017	612960678.4	346858742.5	250875477.9	161779.1	125995.6	14938683.3

(continued)

	Total	Government funds*	Business enterprise sector funds	Higher education sector funds	Private non-profit sector funds	Funds from abroad
	Percentage					
1995	100	51.1	43.7	0.01	0.01	5.1
2000	100	45.5	40.9	0.04	0.03	13.6
2005	100	53.6	37.3	0.03	0.01	9.1
2006	100	52.0	35.7	0.02	0.08	12.2
2007	100	55.3	36.6	0.30	0.07	7.8
2008	100	56.0	36.5	0.02	0.20	7.2
2009	100	57.4	34.6	0.02	0.08	7.9
2010	100	64.2	32.1	0.02	0.10	3.5
2011	100	58.7	36.0	0.10	0.20	5.0
2012	100	60.4	35.1	0.06	0.04	4.4
2013	100	61.5	35.5	0.10	0.02	2.9
2014	100	62.7	35.1	0.09	0.07	2.1
2015	100	63.4	34.2	0.10	0.08	2.2
2016	100	59.0	38.5	0.03	0.03	2.5
2017	100	56.6	40.9	0.03	0.02	2.4

* Including budget funds, own funds, and government sector institutions' funds.

5.3.19. BUSINESS ENTERPRISE SECTOR AS A PERCENTAGE OF GROSS DOMESTIC EXPENDITURE ON R&D BY TYPE OF EXPENDITURE



5.3.20. GROSS DOMESTIC EXPENDITURE ON R&D IN THE BUSINESS ENTERPRISE SECTOR BY TYPE (thousand roubles)

	2005	2010	2013	2014	2015	2016	2017
Gross domestic expenditure on R&D	156880029.0	316701679.9	454409251.0	505210341.3	541533094.3	554093599.1	612960678.4
Current expenditure	151228693.6	294103827.7	420438999.3	470728154.3	503088818.5	509168604.8	573687801.6
Salaries	61762384.5	134771346.7	184301583.4	199981537.7	214055655.0	214443342.3	238808979.2
Of which R&D personnel*	56579998.4	123576290.3	168490249.3	184318111.2	196822214.9	195079681.0	218756866.9
Social security payments**	14652167.0	26089246.1	44519677.6	49274407.7	55348833.5	55160883.4	61108594.2
Equipment	5919453.8	9955224.5	13592306.5	13499794.4	17319573.0	14429765.7	11511255.6
Other material costs	39963918.4	63367540.7	96060693.9	111940812.4	109075443.3	114649833.7	135209931.5
Other current expenditure	28930769.9	59920469.7	81964737.9	96031602.1	107289313.7	110484779.7	127049041.1
Capital expenditure	5651335.4	22597852.2	33970251.7	34482187.0	38444275.8	44924994.3	39272876.8
Land and buildings	1208092.5	4950198.0	6020259.0	6094066.5	5984058.2	6774304.9	6405412.6
Including:							
land	...	...	...	...	...	...	421752.0
buildings	...	...	...	...	...	...	5983660.6
Equipment	3228403.1	14167838.2	17818744.0	19820476.8	21054397.0	20877238.1	19887421.2
Intellectual property and results of intellectual activity	–	–	–	–	–	–	2525053.5
Other capital expenditure	1214839.8	3479816.0	10131248.7	8567643.7	11405820.6	17273451.3	10454989.5

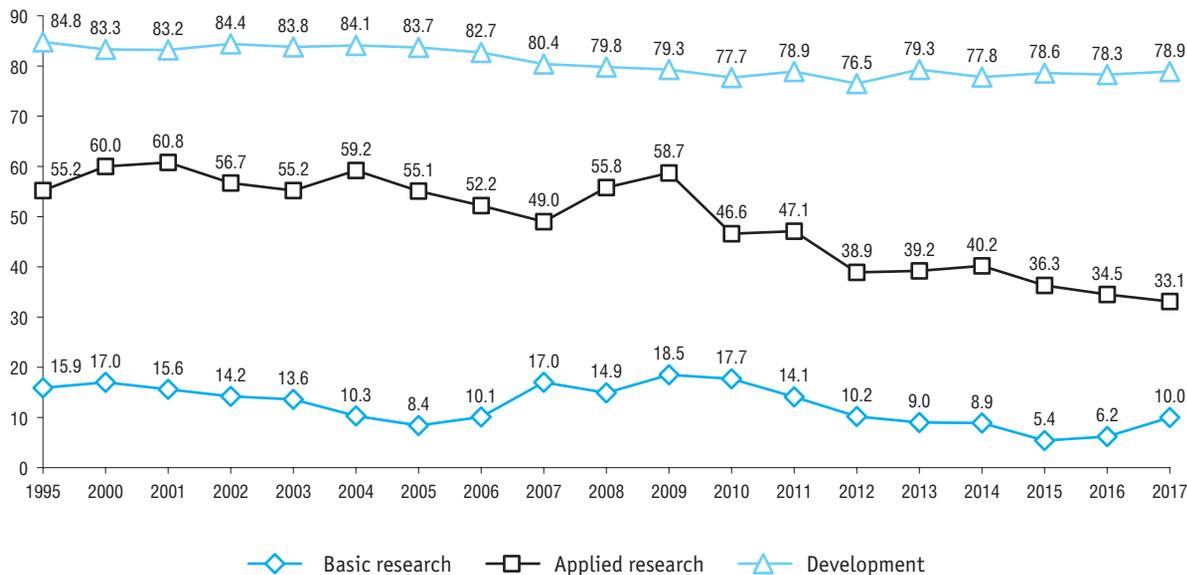
* Excluding external multiple jobholders and independent contractors.

** National pension insurance, national health insurance, national social insurance.

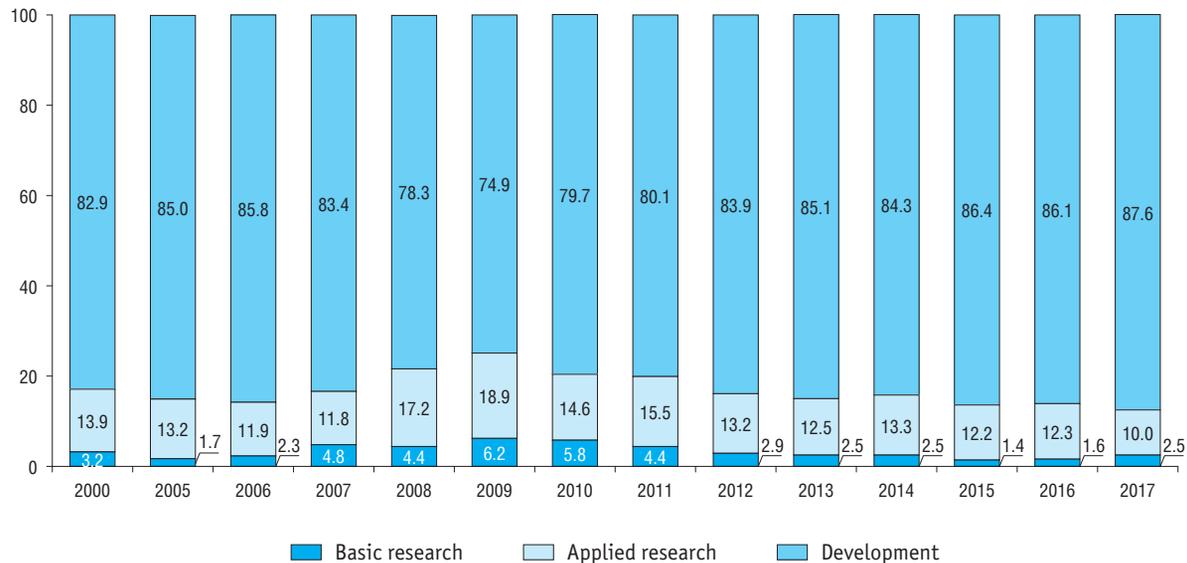
**5.3.21. CURRENT EXPENDITURE ON R&D IN THE BUSINESS ENTERPRISE SECTOR BY TYPE OF R&D ACTIVITY
AND FIELD OF SCIENCE AND TECHNOLOGY**
(thousand roubles)

	Total	Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities
2005							
Current expenditure on R&D	151228693.6	10041430.0	138455122.3	450558.6	1020195.6	1212995.6	48391.5
Basic research	2591506.7	1025517.8	1205156.9	53282.5	236864.8	47440.2	23244.5
Applied research	20026408.8	5053993.0	13842212.4	184566.8	446665.3	489579.6	9391.7
Development	128610778.1	3961919.2	123407753.0	212709.3	336665.5	675975.8	15755.3
2010							
Current expenditure on R&D	294103827.7	26739368.2	261926531.0	1507276.1	1288239.2	2550402.8	92010.4
Basic research	16935403.4	3875649.0	11521941.3	565100.5	441953.0	467877.0	62882.6
Applied research	42872394.0	10638493.8	29871209.5	595697.1	321868.8	1436993.9	8130.9
Development	234296030.3	12225225.4	220533380.2	346478.5	524417.4	645531.9	20996.9
2015							
Current expenditure on R&D	503088818.5	25579412.6	470180938.1	3064111.9	695241.7	3421527.3	147586.9
Basic research	7122577.4	3196716.9	2633478.4	696593.3	47856.6	494091.3	53840.9
Applied research	61520451.3	10793921.5	47539713.2	949480.0	127789.3	2074879.6	34667.7
Development	434445789.8	11588774.2	420007746.5	1418038.6	519595.8	852556.4	59078.3
2016							
Current expenditure on R&D	509168604.8	25624879.5	475773975.9	4000381.5	673777.2	3000612.8	94977.9
Basic research	8206064.7	4117537.7	2718652.3	950371.0	1307.5	364799.4	53396.8
Applied research	62485456.3	9778329.1	49191363.8	1184425.6	193808.5	2136283.2	1246.1
Development	438477083.8	11729012.7	423863959.8	1865584.9	478661.2	499530.2	40335.0
2017							
Current expenditure on R&D	573687801.6	32238281.7	533389305.1	3597393.8	414042.1	3972933.9	75845.0
Basic research	14087182.4	4171437.1	7605143.8	959432.6	18009.1	1275638.3	57521.5
Applied research	57168047.3	10653161.3	43450939.5	865220.4	165489.8	2024351.8	8884.5
Development	502432571.9	17413683.3	482333221.8	1772740.8	230543.2	672943.8	9439.0

5.3.22. BUSINESS ENTERPRISE SECTOR AS A PERCENTAGE OF CURRENT EXPENDITURE ON R&D BY TYPE OF R&D ACTIVITY



5.3.23. PERCENTAGE DISTRIBUTION OF CURRENT EXPENDITURE ON R&D IN THE BUSINESS ENTERPRISE SECTOR BY TYPE OF R&D ACTIVITY



5.3.24. AVERAGE MONTHLY SALARY OF R&D PERSONNEL IN THE BUSINESS ENTERPRISE SECTOR

	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
Average monthly salary, roubles	2519.9	9599.6	25359.7	29174.9	33165.2	36540.8	39855.8	42102.7	44611.1	51648.5
As a percentage of the salary:										
in the national economy (=100%)	113.3	112.2	121.0	124.8	124.5	122.7	122.7	123.7	121.5	131.9
in manufacturing (=100%)	106.5	114.0	132.9	133.9	135.3	135.1	135.1	131.9	129.0	134.1
In construction (=100%)	95.5	106.2	119.8	123.2	127.8	131.9	135.8	140.5	138.0	153.4

5.4. Higher education sector

5.4.1. R&D INSTITUTIONS IN THE HIGHER EDUCATION SECTOR BY TYPE

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Total	511	526	539	617	662	762	777	1124	1064	1038
Higher education institutions	395	390	406	517	562	673	702	1040	979	970
Research institutes (centres)	88	107	109	71	54	51	37	43	40	25
Design organisations, design-and-engineering organisations	18	19	17	11	12	10	8	7	5	1
Pilot plants	1	2	–	1	4	1	1	2	1	–
Others	9	8	7	17	30	27	29	32	39	42

5.4.2. R&D PERSONNEL IN THE HIGHER EDUCATION SECTOR BY TYPE OF R&D INSTITUTIONS (headcount)

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Total	52065	40787	43500	53290	59469	59247	62400	63870	63046	59729
Higher education institutions	40015	31110	33942	46776	53699	54092	58573	60151	59124	56571
Research institutes (centres)	9458	7254	7021	4796	3070	2864	2049	2092	1722	1128
Design organisations, design-and-engineering organisations	2170	2198	1991	1392	1830	1502	1408	1121	839	...*
Pilot plants	23	4	–	2	9	...*	...*	...*	...*	–
Others	399	221	546	324	861	775	369	506	1360	1605

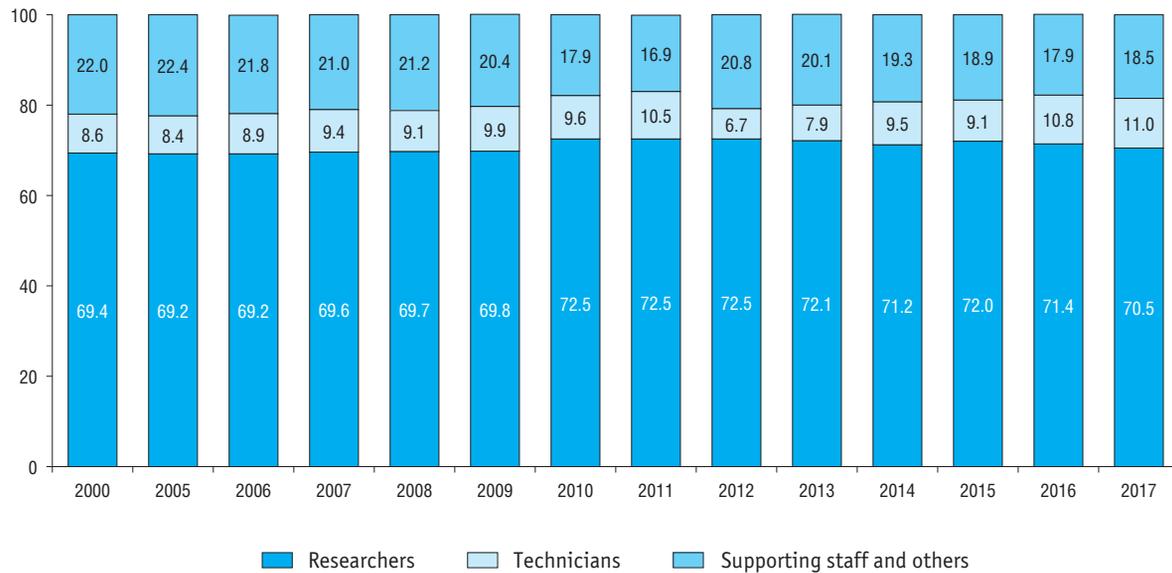
* The data are not published in order to ensure the confidentiality of primary statistics received from organisations, in accordance with Federal Law no. 282-FL of November 29, 2007 'On the Official Statistical Accounting and State Statistics System of the Russian Federation' (art. 4, para. 5; art. 9, para. 1).

5.4.3. R&D PERSONNEL IN THE HIGHER EDUCATION SECTOR BY OCCUPATION

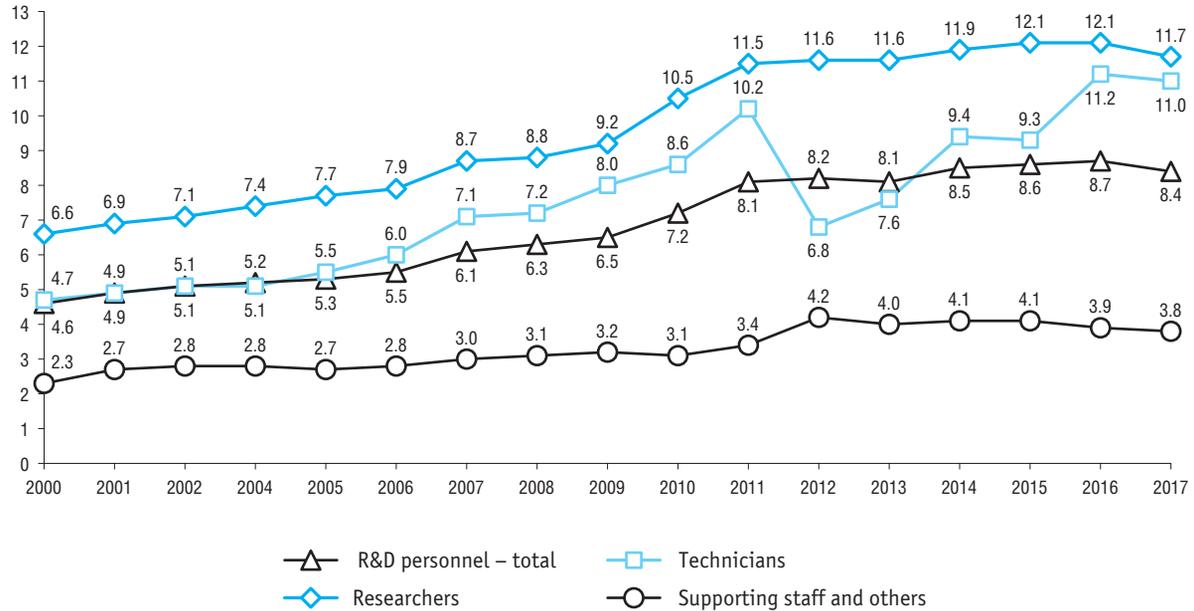
(headcount)

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Total	52065	40787	43500	53290	59469	59247	62400	63870	63046	59729
Researchers	35508	28325	30111	38640	43103	42692	44427	45967	44994	42113
Technicians	4010	3509	3658	5095	3998	4670	5939	5836	6789	6584
Supporting staff	7520	5463	6098	6564	9264	8828	9538	9217	8929	8391
Others	5027	3490	3633	2991	3104	3057	2496	2850	2334	2641

5.4.4. PERCENTAGE DISTRIBUTION OF R&D PERSONNEL IN THE HIGHER EDUCATION SECTOR BY OCCUPATION



5.4.5. R&D PERSONNEL IN THE HIGHER EDUCATION SECTOR AS A PERCENTAGE OF THE TOTAL NUMBER OF R&D PERSONNEL BY OCCUPATION



5.4.6. R&D PERSONNEL IN THE HIGHER EDUCATION SECTOR BY EDUCATIONAL ATTAINMENT (headcount)

	Total	Higher education	Secondary vocational education	Other education
R&D personnel				
2005	43500	35159	4430	3911
2010	53290	46112	3394	3784
2014	62400	56009	2274	4117
2015	63870	58144	2071	3655
2016	63046	57504	2066	3476
2017	59729	54664	1866	3199
Researchers				
2005	30111	30111	–	–
2010	38640	38640	–	–
2014	44427	44427	–	–
2015	45967	45967	–	–
2016	44994	44994	–	–
2017	42113	42113	–	–
Technicians				
2005	3658	1079	2082	497
2010	5095	2460	1526	1109
2014	5939	3835	816	1288
2015	5836	4120	742	974
2016	6789	4761	779	1249
2017	6584	4651	752	1181

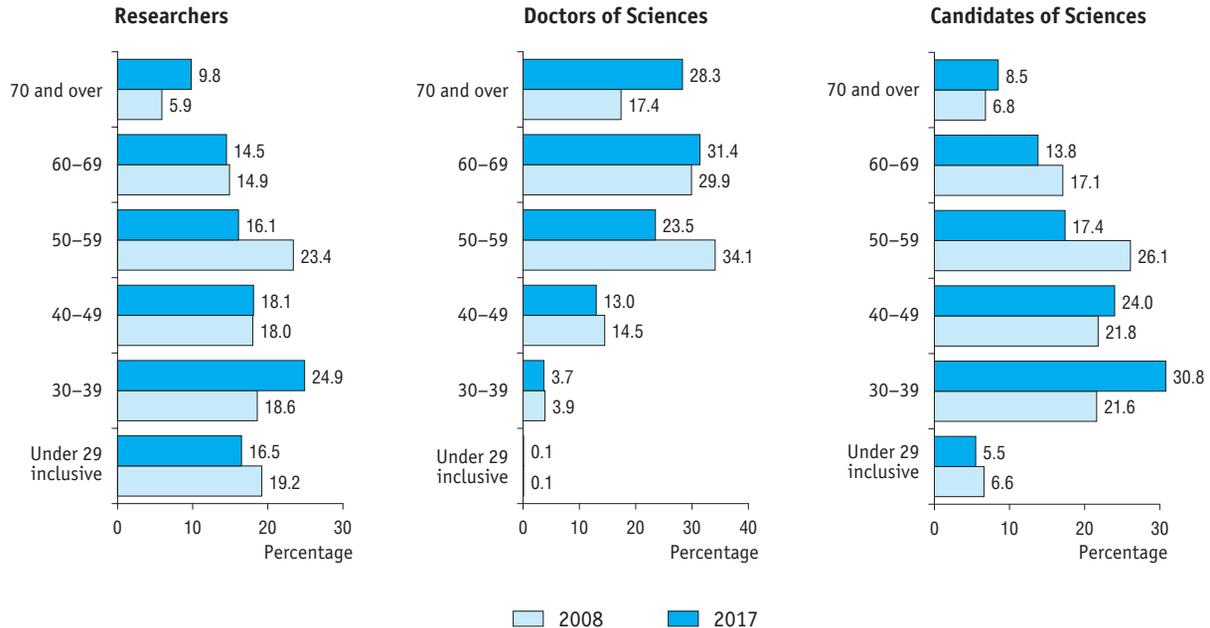
(continued)

	Total	Higher education	Secondary vocational education	Other education
Supporting staff				
2005	6098	2758	1465	1875
2010	6564	3695	1190	1679
2014	9538	6404	976	2158
2015	9217	6068	898	2251
2016	8929	6299	844	1786
2017	8391	5994	762	1635
Others				
2005	3633	1211	883	1539
2010	2991	1317	678	996
2014	2496	1343	482	671
2015	2850	1989	431	430
2016	2334	1450	443	441
2017	2641	1906	352	383

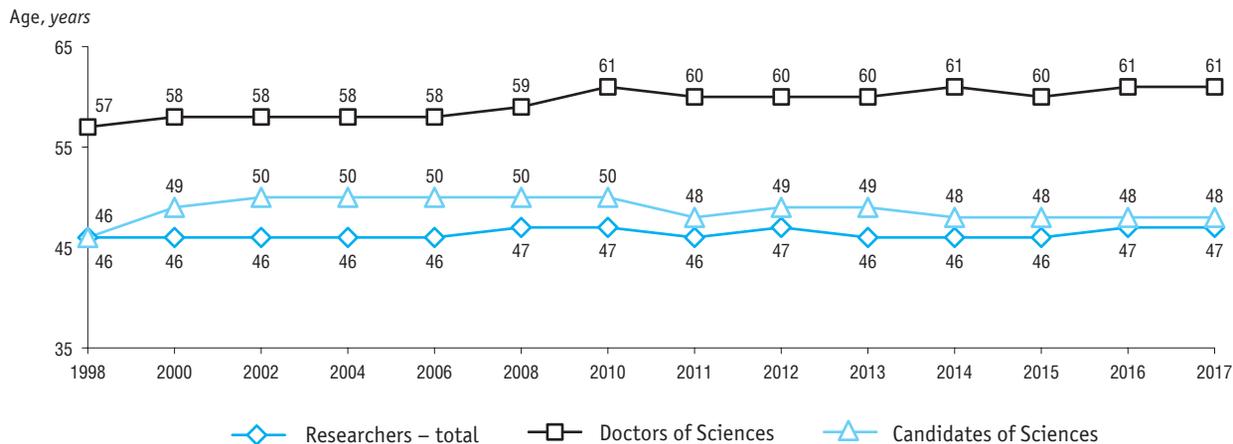
5.4.7. RESEARCHERS IN THE HIGHER EDUCATION SECTOR BY GENDER AND AGE

	2008			2017		
	Researchers	Of whom		Researchers	Of whom	
		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences
Total	33160	3439	12040	42113	6185	19627
<i>Age, years:</i>						
under 29 inclusive	6379	4	792	6964	8	1082
30–39	6164	133	2606	10503	226	6041
40–49	5964	499	2619	7624	807	4720
50–54	3999	547	1603	3249	643	1665
55–59	3760	627	1544	3511	809	1747
60–69	4937	1029	2055	6124	1941	2708
70 and over	1957	600	821	4138	1751	1664
Males	19506	2538	6770	22597	4236	9562
<i>Age, years:</i>						
under 29 inclusive	4055	3	448	4055	8	642
30–39	3284	94	1353	5482	159	2989
40–49	3298	349	1412	3431	483	1968
50–54	2951	384	909	1565	375	689
55–59	2224	450	928	1837	523	837
60–69	3063	791	1205	3536	1351	1473
70 and over	1231	467	515	2691	1337	964
Females	13654	901	5270	19516	1949	10065
<i>Age, years:</i>						
under 29 inclusive	2324	1	344	2909	–	440
30–39	2880	39	1253	5021	67	3052
40–49	2666	150	1207	4193	324	2752
50–54	1648	163	694	1684	268	976
55–59	1536	177	616	1674	286	910
60–69	1874	238	850	2588	590	1235
70 and over	726	133	306	1447	414	700

5.4.8. PERCENTAGE DISTRIBUTION OF RESEARCHERS IN THE HIGHER EDUCATION SECTOR BY AGE



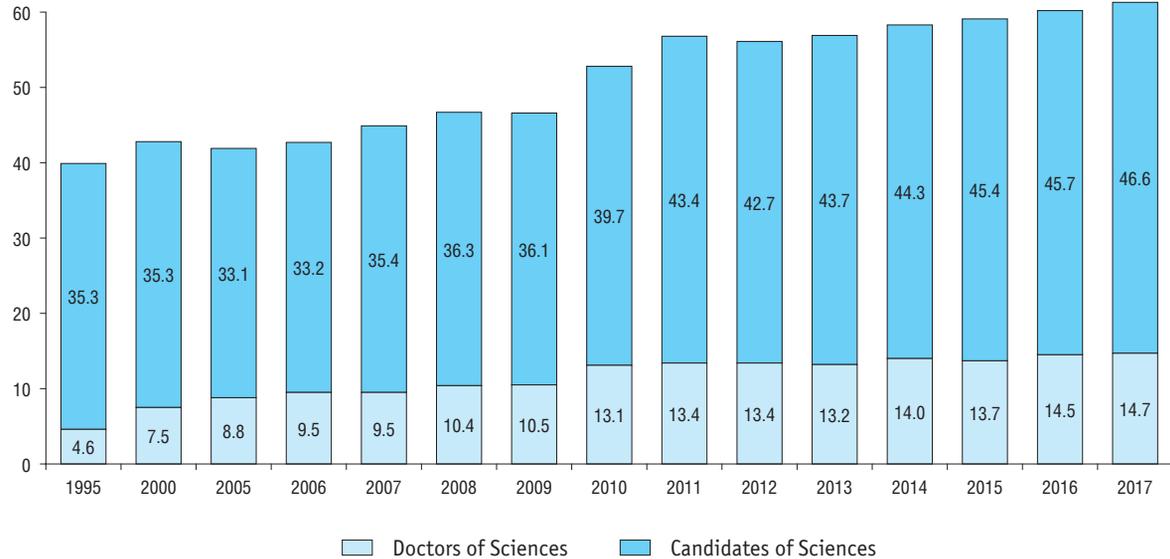
5.4.9. AVERAGE AGE OF RESEARCHERS IN THE HIGHER EDUCATION SECTOR



5.4.10. RESEARCHERS WITH SCIENTIFIC DEGREES IN THE HIGHER EDUCATION SECTOR (headcount)

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Researchers with scientific degrees	14162	12113	12618	20423	24144	24306	25899	27184	27109	25812
Doctors of Sciences	1617	2120	2654	5068	5753	5638	6218	6318	6532	6185
Candidates of Sciences	12545	9993	9964	15355	18391	18668	19681	20866	20577	19627

5.4.11. RESEARCHERS WITH SCIENTIFIC DEGREES AS A PERCENTAGE OF THE TOTAL NUMBER OF RESEARCHERS IN THE HIGHER EDUCATION SECTOR



5.4.12. RESEARCHERS IN THE HIGHER EDUCATION SECTOR BY FIELD OF SCIENCE AND TECHNOLOGY

(headcount)

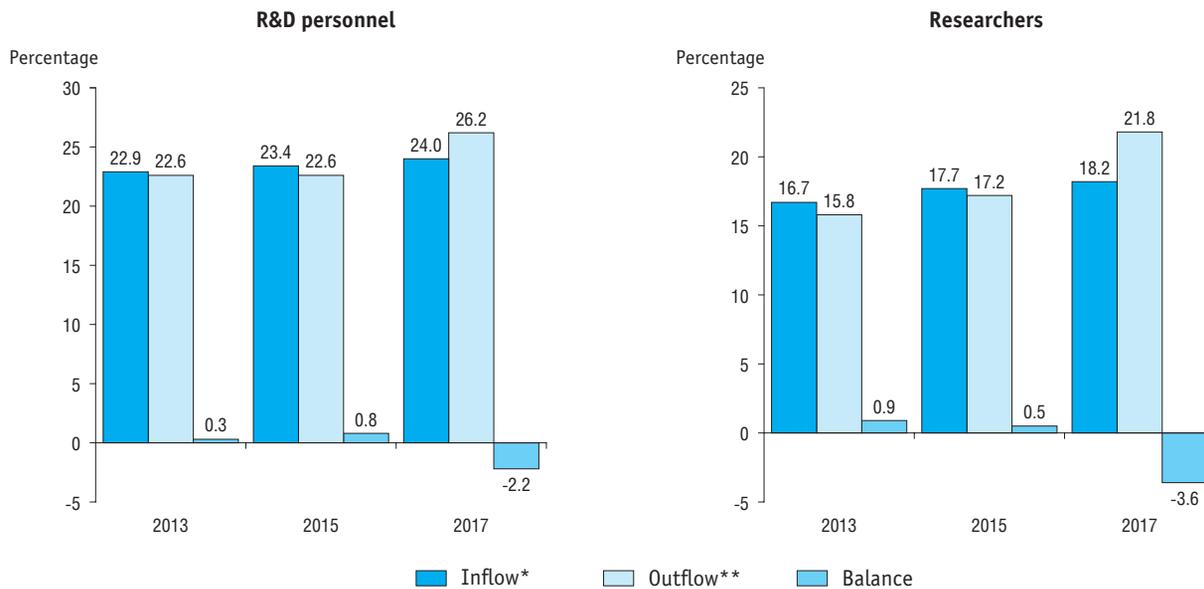
	2008			2015			2016			2017		
	Researchers	Of whom		Researchers	Of whom		Researchers	Of whom		Researchers	Of whom	
		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences
Total	33160	3439	12040	45967	6318	20866	44994	6532	20577	42113	6185	19627
Natural sciences	13111	1535	5244	13175	2285	6515	13134	2370	6561	12165	2248	6223
Engineering and technology	10524	484	2352	12856	939	3444	12148	964	3573	11025	815	3291
Medical sciences	2403	441	1142	2018	451	990	2040	448	982	1696	397	764
Agricultural sciences	933	116	416	851	163	421	808	169	441	778	161	428
Social sciences	4309	512	1818	11420	1562	6571	11199	1646	6199	10760	1570	6043
Humanities	1880	351	1068	5647	918	2925	5665	935	2821	5689	994	2878

5.4.13. R&D PERSONNEL TURNOVER IN THE HIGHER EDUCATION SECTOR BY OCCUPATION

(headcount)

	Number at the beginning of the reporting year	Inflow				Outflow				Number at the end of the reporting year
		Total	Of whom			Total	Of whom			
			higher education graduates	other research institutes' graduates	others		resigned	were made redundant	left due to other reasons	
Total										
2005	41601	8770	1475	1388	5907	6871	4096	25	2750	43500
2013	59043	13561	1648	2104	9809	13357	6381	212	6764	59247
2015	63192	14971	2293	2788	9890	14293	7256	350	6687	63870
2017	61561	14322	2019	1975	10328	16154	6692	357	9105	59729
Researchers										
2005	28951	5219	1229	1058	2932	4062	2470	16	1576	30111
2013	42229	7140	903	1604	4633	6663	3584	134	2945	42692
2015	45677	8141	1102	1934	5105	7854	4158	226	3470	45967
2017	44017	7685	1056	1306	5323	9587	3723	238	5626	42113
Technicians										
2005	3451	1030	114	115	801	820	467	1	352	3658
2013	4490	2260	277	187	1796	2081	870	37	1174	4670
2015	5443	2701	606	186	1909	2276	1318	28	930	5836
2017	6453	2770	470	417	1883	2671	1220	18	1433	6584
Supporting staff and others										
2005	9199	2521	132	215	2174	1989	1159	8	822	9731
2013	12324	4161	468	313	3380	4613	1927	41	2645	11885
2015	12072	4129	585	668	2876	4163	1780	96	2287	12067
2017	11091	3867	493	252	3122	3896	1749	101	2046	11032

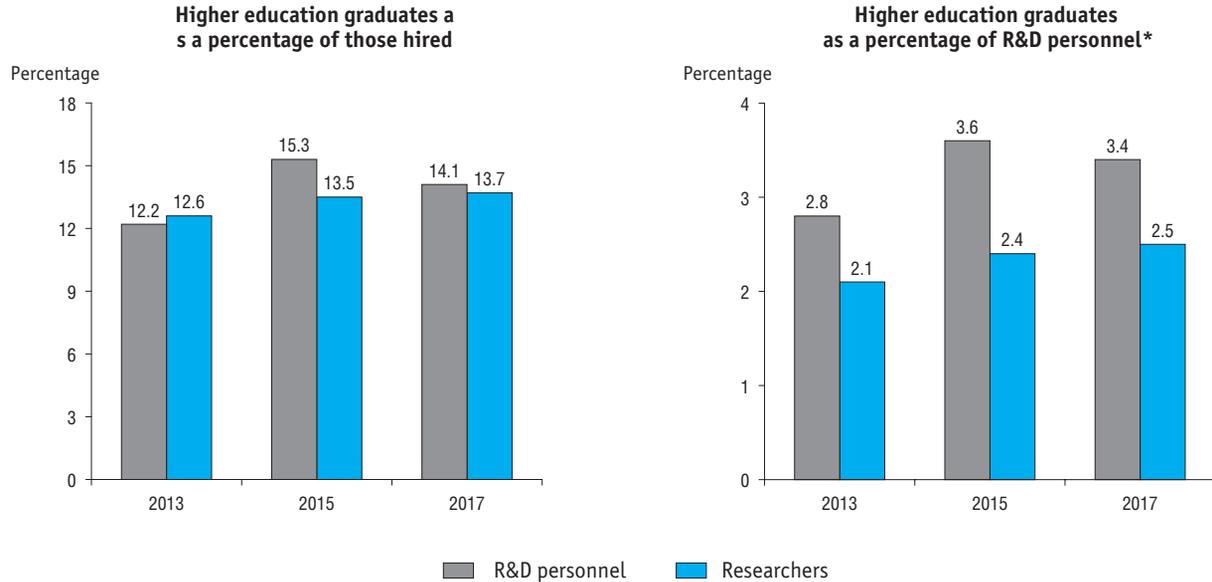
5.4.14. INFLOW AND OUTFLOW OF R&D PERSONNEL IN THE HIGHER EDUCATION SECTOR



* The ratio of those hired during the year to the total number of employment at the end of the year.

** The ratio of those who left during the year to the total number of employment at the beginning of the year.

5.4.15. INFLOW OF HIGHER EDUCATION GRADUATES INTO HIGHER EDUCATION SECTOR INSTITUTIONS



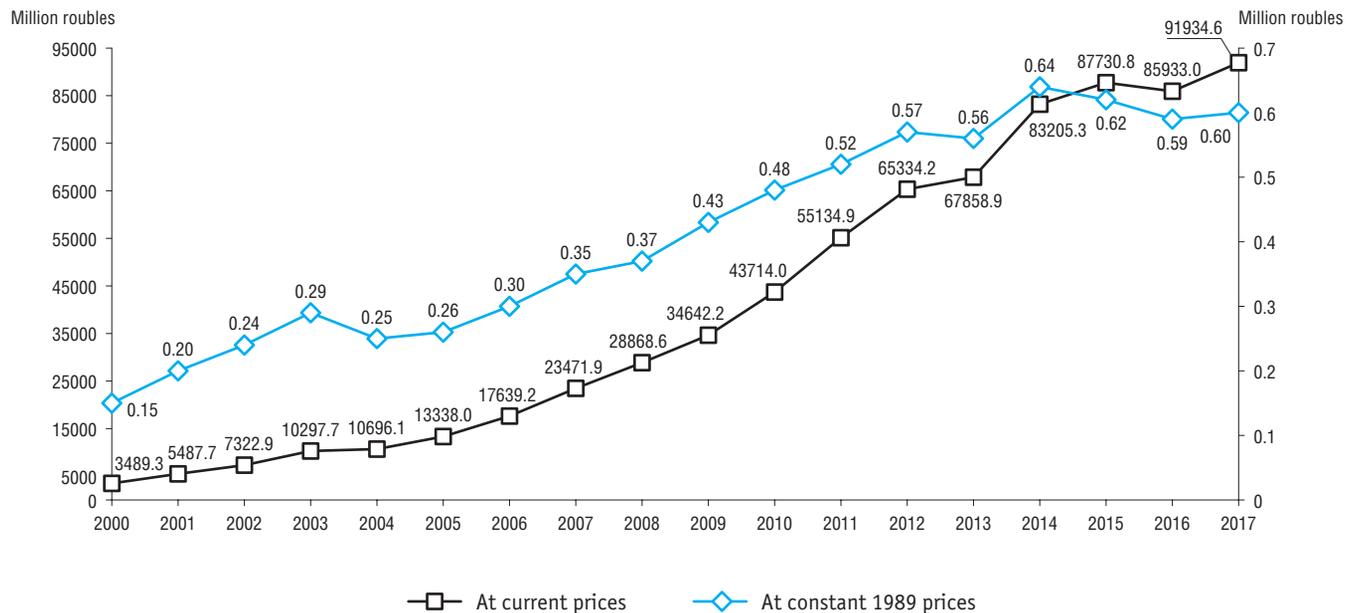
* The ratio of the higher education graduates hired during the year to the total employment at the end of the year.

5.4.16. GROSS DOMESTIC EXPENDITURE ON R&D IN THE HIGHER EDUCATION SECTOR BY TYPE OF R&D INSTITUTIONS (thousand roubles)

	2000	2005	2010	2012	2013	2014	2015	2016	2017
Total	3489342.2	13337987.1	43714007.3	65334232.1	67858855.1	83205260.1	87730781.4	85932983.0	91934601.3
Higher education institutions	2777397.1	10963094.5	38787366.4	59717923.7	63138131.0	77975805.2	82972415.2	80424185.9	86842669.4
Research institutes (centres)	528449.7	1596818.1	3429235.6	3571846.1	3022702.5	3616147.7	3382500.2	2306867.9	2010103.7
Design organisations, design-and-engineering organisations	157818.5	519987.1	984428.5	1344028.6	1090711.3	1092686.4	1114835.9	1817239.9	...*
Pilot plants	78.5	–	26584.0	14652.7	...*	...*	...*	...*	–
Others	25598.4	258087.4	486392.8	685781.0	596309.4	515769.8	253618.1	1379716.3	1518297.2

* The data are not published in order to ensure the confidentiality of primary statistics received from organisations, in accordance with Federal Law no. 282-FL of November 29, 2007 'On the Official Statistical Accounting and State Statistics System of the Russian Federation' (art. 4, para. 5; art. 9, para. 1).

5.4.17. GROSS DOMESTIC EXPENDITURE ON R&D IN THE HIGHER EDUCATION SECTOR



5.4.18. GROSS DOMESTIC EXPENDITURE ON R&D IN THE HIGHER EDUCATION SECTOR BY SOURCE OF FUNDS

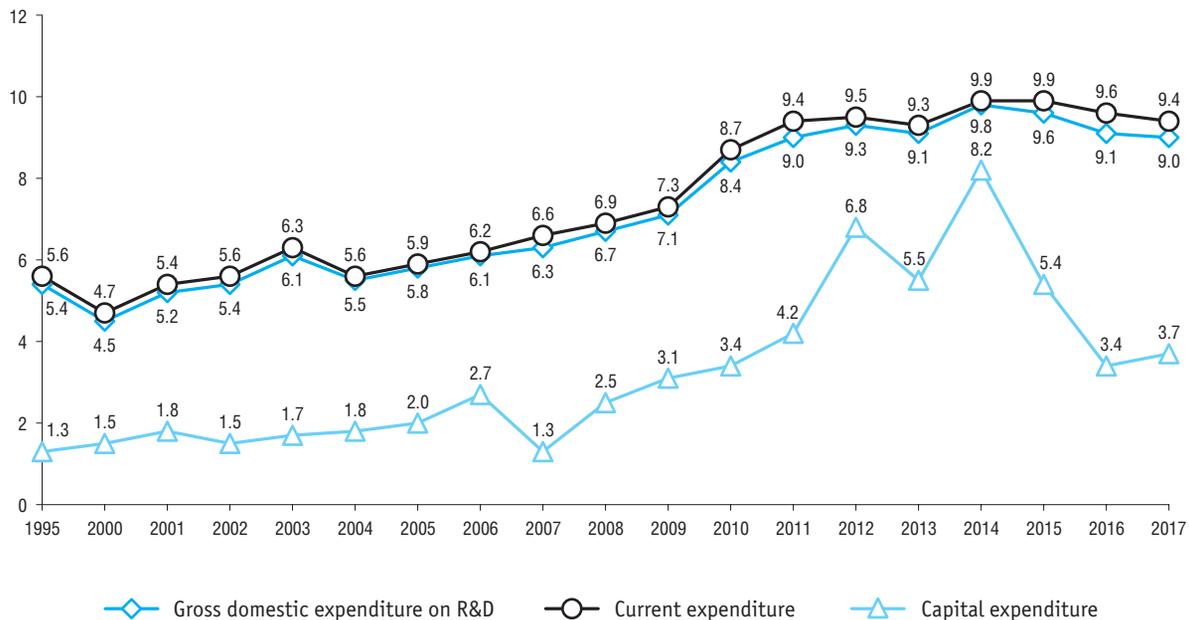
	Total	Government funds*	Business enterprise sector funds	Higher education sector funds	Private non-profit sector funds	Funds from abroad
<i>At current prices, thousand roubles, 1995 – million roubles</i>						
1995	657374.0	440429.9	181015.3	27407.6	1279.1	7242.1
2000	3489342.2	2220574.3	951898.2	178004.2	6651.5	132214.0
2005	13337987.1	7982229.6	3911201.8	889069.7	20503.0	534983.0
2006	17639173.8	10350996.7	5169607.6	1505274.5	26181.7	587113.3
2007	23471870.9	13931491.1	7267861.9	1573278.8	64898.0	634341.1
2008	28868566.7	18003735.9	8244450.2	1758509.8	84419.2	777451.6
2009	34642216.7	24181368.4	7769897.9	1741764.5	95595.8	853590.1
2010	43714007.3	30017817.7	10724045.9	2154774.3	55055.8	762313.6
2011	55134893.9	37047554.1	13224580.6	4030900.0	93584.3	738274.9
2012	65334232.1	40803297.5	17709405.2	5441235.5	371292.2	1009001.7
2013	67858855.1	40378679.8	18663427.9	7080091.0	448892.7	1287763.7
2014	83205260.1	50496387.8	22607546.6	8215233.9	506189.0	1379902.8
2015	87730781.4	51570251.1	24028351.9	9979551.2	671465.0	1481162.2
2016	85932983.0	52444188.9	23832576.7	7658742.4	832874.6	1164600.4
2017	91934601.3	56486622.7	25896640.8	7528724.3	717720.7	1304892.8

(continued)

	Total	Government funds*	Business enterprise sector funds	Higher education sector funds	Private non-profit sector funds	Funds from abroad
	Percentage					
1995	100	67.0	27.5	4.2	0.2	1.1
2000	100	63.6	27.3	5.1	0.2	3.8
2005	100	59.8	29.3	6.7	0.2	4.0
2006	100	58.7	29.3	8.5	0.1	3.3
2007	100	59.4	31.0	6.7	0.3	2.7
2008	100	62.4	28.6	6.1	0.3	2.7
2009	100	69.8	22.4	5.0	0.3	2.5
2010	100	68.7	24.5	4.9	0.1	1.7
2011	100	67.2	24.0	7.3	0.2	1.3
2012	100	62.5	27.1	8.3	0.6	1.5
2013	100	59.5	27.5	10.4	0.7	1.9
2014	100	60.7	27.2	9.9	0.6	1.7
2015	100	58.8	27.4	11.4	0.8	1.7
2016	100	61.0	27.7	8.9	1.0	1.4
2017	100	61.4	28.2	8.2	0.8	1.4

* Including budget appropriations, general university funds and government sector institutions' funds.

5.4.19. HIGHER EDUCATION SECTOR AS A PERCENTAGE OF GROSS DOMESTIC EXPENDITURE ON R&D BY TYPE OF EXPENDITURE



5.4.20. GROSS DOMESTIC EXPENDITURE ON R&D IN THE HIGHER EDUCATION SECTOR BY TYPE

(thousand roubles)

	2005	2010	2013	2014	2015	2016	2017
Gross domestic expenditure on R&D	13337987.1	43714007.3	67858855.1	83205260.1	87730781.4	85932983.0	91934601.3
Current expenditure	13144292.5	42552245.4	65103832.7	78939146.3	84495233.0	83579171.0	89400111.3
Salaries	6952057.5	25267352.4	37483889.6	45381722.2	48945642.1	48193431.8	51793629.5
Of which R&D personnel*	3552276.8	14033490.5	21683297.6	25919161.2	27878480.3	27441222.3	29270588.6
Social security payments**	1654258.7	5260709.4	8920077.8	10651630.2	12471272.2	12307550.0	13626193.1
Equipment	917350.6	2639343.7	3288338.4	4767932.9	3708006.7	4202312.8	4151400.5
Other material costs	1501392.4	3344896.4	5585226.3	6487280.5	6193042.0	6139669.1	6005843.5
Other current expenditure	2119233.3	6039943.5	9826300.6	11650580.5	13177270.0	12736207.3	13823044.7
Capital expenditure	193694.6	1161761.9	2755022.4	4266113.8	3235548.4	2353812.0	2534490.0
Land and buildings	39711.4	14186.1	233349.2	645364.7	141573.3	164362.3	326991.9
Including:							
land	...	...	...	...	...	...	668.5
buildings	...	...	...	...	...	...	326323.4
Equipment	104359.6	1068873.2	2133749.9	2561153.5	2375951.4	1884027.0	1830733.7
Intellectual property and results of intellectual activity	-	-	-	-	-	-	120854.4
Other capital expenditure	49623.6	78702.6	387923.3	1059595.6	718023.7	305422.7	255910.0

* Excluding external multiple jobholders and independent contractors.

** National pension insurance, national health insurance, national social insurance.

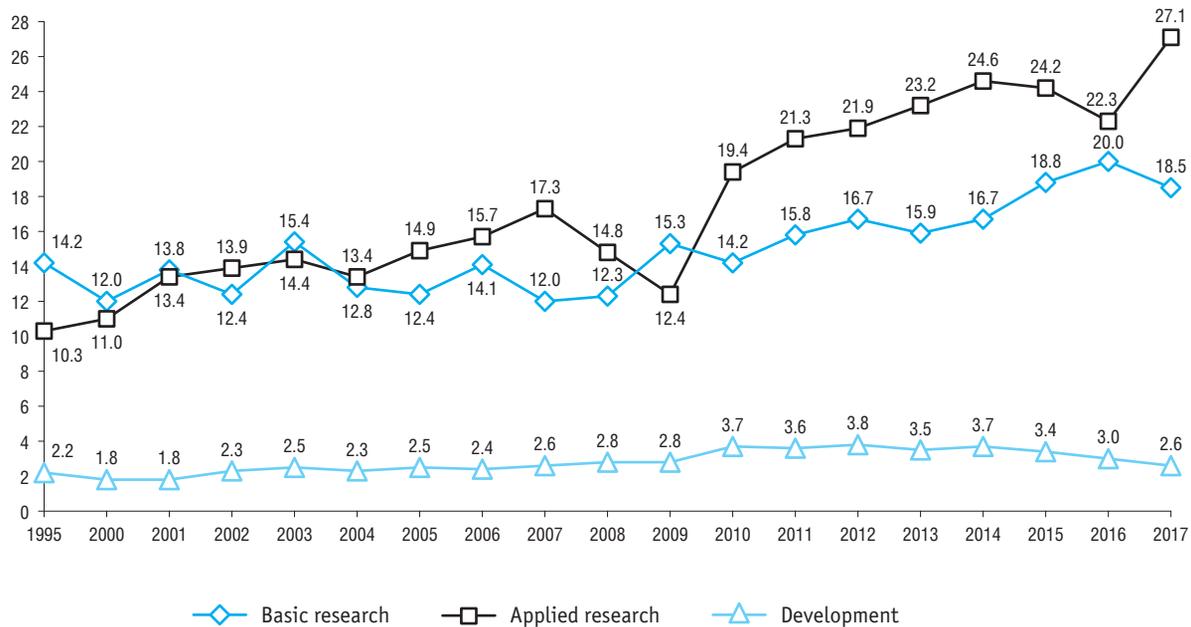
**5.4.21. CURRENT EXPENDITURE ON R&D IN THE HIGHER EDUCATION SECTOR BY TYPE OF R&D ACTIVITY
AND FIELD OF SCIENCE AND TECHNOLOGY**
(thousand roubles)

	Total	Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities
2005							
Current expenditure on R&D	13144292.5	3896908.4	6853399.7	378448.2	200121.3	1419552.8	395862.1
Basic research	3841327.6	2342791.4	751584.6	147772.6	31818.6	342156.9	225203.5
Applied research	5405410.3	1112036.2	2918946.4	161855.9	121828.4	949311.8	141431.6
Development	3897554.6	442080.8	3182868.7	68819.7	46474.3	128084.1	29227.0
2010							
Current expenditure on R&D	42552245.4	12076614.1	20864675.6	1309942.7	730315.2	6137791.2	1432906.6
Basic research	13647906.8	7585787.8	2819934.7	472436.1	145701.5	1919937.8	704108.9
Applied research	17804762.0	3177035.8	9056919.5	680400.6	486773.7	3723764.3	679868.1
Development	11099576.6	1313790.5	8987821.4	157106.0	97840.0	494089.1	48929.6
2015							
Current expenditure on R&D	84495233.0	24471293.5	36048768.8	4478205.2	1515246.7	12800336.7	5181382.1
Basic research	24839057.2	13659393.9	3644828.6	1348438.7	193512.2	3664822.7	2328061.1
Applied research	41098469.1	8214107.1	18786848.4	2576517.7	1171765.9	7925797.8	2423432.2
Development	18557706.7	2597792.5	13617091.8	553248.8	149968.6	1209716.2	429888.8

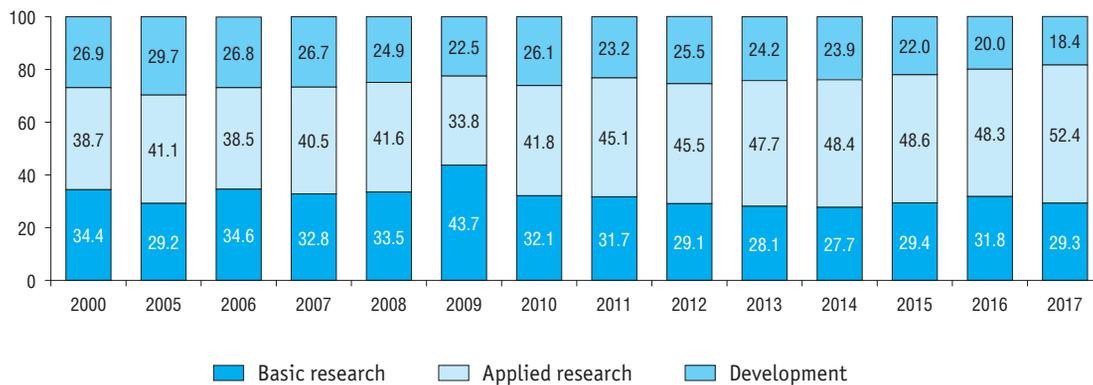
(continued)

	Total	Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities
2016							
Current expenditure on R&D	83579171.0	24514438.7	34467569.3	5441216.8	1650507.7	13574388.3	3931050.2
Basic research	26537618.5	14627211.7	4005517.0	1200082.9	164344.5	4423359.6	2117102.8
Applied research	40348147.3	7284019.6	18295645.5	3589996.0	1265321.3	8413626.8	1499538.1
Development	16693405.2	2603207.4	12166406.8	651137.9	220841.9	737401.9	314409.3
2017							
Current expenditure on R&D	89400111.3	22805581.9	39562309.1	6275906.1	1761530.0	14424022.0	4570762.2
Basic research	26153702.4	13303684.3	4142398.7	1429664.5	185433.3	4751446.3	2341075.3
Applied research	46822282.4	7235991.3	22947367.1	4320363.1	1366307.9	9032280.8	1919972.2
Development	16424126.5	2265906.3	12472543.3	525878.5	209788.8	640294.9	309714.7

5.4.22. HIGHER EDUCATION SECTOR AS A PERCENTAGE OF CURRENT EXPENDITURE ON R&D BY TYPE OF OF R&D ACTIVITY



5.4.23. PERCENTAGE DISTRIBUTION OF CURRENT EXPENDITURE ON R&D IN THE HIGHER EDUCATION SECTOR BY TYPE OF R&D ACTIVITY



5.4.24. AVERAGE MONTHLY SALARY OF R&D PERSONNEL IN THE HIGHER EDUCATION SECTOR

	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
Average monthly salary, roubles	1400.3	7042.0	23716.4	24963.9	30915.1	34101.0	41258.6	41850.5	43370.8	49437.9
As a percentage of the salary:										
in the national economy (=100%)	63.0	82.3	113.2	106.8	116.1	114.5	127.0	123.0	118.1	126.2
in manufacturing (=100%)	59.2	83.6	124.3	114.6	126.1	126.1	139.8	131.2	125.4	128.4
In construction (=100%)	53.0	77.9	112.0	105.4	119.1	123.1	140.6	139.7	134.1	146.8



6. R&D Output

Publication activity

6.1. NUMBER OF PUBLICATIONS BY RUSSIAN AUTHORS IN SCIENTIFIC JOURNALS INDEXED IN SCOPUS BY DOCUMENT TYPE

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Total number of publications										
Publications – total	1047226	1302927	1897782	2455131	2734133	2838035	2891866	2853812	2927487	3023832
Articles	824570	993419	1093981	1513932	1691088	1833800	1910113	1933335	1959758	2004718
Conference papers	103740	138842	377686	493123	514552	488756	489005	415686	434809	453124
Reviews	41218	77640	195622	131832	157261	134681	142681	144510	165552	174023
Other	77698	93026	230493	316244	371232	380798	350067	360281	367368	391967
Number of publications by Russian authors										
Publications – total	18709	33401	39452	40602	44904	49437	57803	66946	80265	87558
Articles	16927	29815	29111	31966	33609	38751	43832	51013	56899	58620
Conference papers	1399	2740	8333	6573	7909	7482	10949	12259	17751	22287
Reviews	165	662	1441	936	1521	1325	1507	1980	3078	3917
Other	218	184	567	1127	1865	1879	1515	1694	2537	2734
Russia's share in the world total number of publications										
Publications – total	1.79	2.56	2.08	1.65	1.64	1.74	2.00	2.35	2.74	2.90
Articles	2.05	3.00	2.66	2.11	1.99	2.11	2.29	2.64	2.90	2.92
Conference papers	1.35	1.97	2.21	1.33	1.54	1.53	2.24	2.95	4.08	4.92
Reviews	0.40	0.85	0.74	0.71	0.97	0.98	1.06	1.37	1.86	2.25
Other	0.28	0.20	0.25	0.36	0.50	0.49	0.43	0.47	0.69	0.70

6.2. NUMBER OF PUBLICATIONS BY RUSSIAN AUTHORS IN SCIENTIFIC JOURNALS INDEXED IN WEB OF SCIENCE BY DOCUMENT TYPE*

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Total number of publications										
Publications – total	1212184	1348060	1654832	2163336	2370372	2469073	2560234	2873107	2999539	2972329
Articles	667931	797671	957960	1286094	1419640	1493473	1539056	1775720	1843485	1887204
Conference papers	203057	239433	306417	322665	341343	339626	366350	389814	410745	362435
Reviews	22570	33589	46221	64021	75442	78013	80337	98066	108717	117748
Other	391182	374879	467945	540532	561585	583549	596373	641254	672339	638911
Number of publications by Russian authors										
Publications – total	30885	32701	30747	34719	35856	38046	43641	59777	71077	76369
Articles	25330	27032	24550	27916	28386	29564	30786	43411	48174	52141
Conference papers	5481	7280	6440	4508	4558	4539	8813	11893	17953	19524
Reviews	544	641	682	773	803	856	874	1216	1411	1573
Other	2422	1362	2156	2841	2898	3809	3770	4400	4786	4636
Russia's share in the world total number of publications										
Publications – total	2.55	2.43	1.86	1.60	1.51	1.54	1.70	2.08	2.37	2.57
Articles	3.79	3.39	2.56	2.17	2.00	1.98	2.00	2.44	2.61	2.76
Conference papers	2.70	3.04	2.10	1.40	1.34	1.34	2.41	3.05	4.37	5.39
Reviews	2.41	1.91	1.48	1.21	1.06	1.10	1.09	1.24	1.30	1.34
Other	0.62	0.36	0.46	0.53	0.52	0.65	0.63	0.69	0.71	0.73

* The sum of the publications breakdown by document type does not add to the total, because one publication may belong to several types.

6.3. PERCENTAGE DISTRIBUTION OF PUBLICATIONS IN SCIENTIFIC JOURNALS INDEXED IN SCOPUS BY FIELD OF SCIENCE AND TECHNOLOGY

	1996	2000	2005	2010	2012	2013	2014	2015	2016	2017
Russia										
Natural sciences and exact sciences	85.8	87.4	82.6	89.0	86.2	82.8	81.8	79.1	77.3	77.7
Engineering and technology	40.9	38.0	37.4	33.5	32.6	32.1	34.2	34.6	35.3	33.7
Medical sciences	10.3	13.0	8.8	9.6	11.7	12.1	12.3	12.2	14.2	14.7
Agricultural sciences	3.0	3.3	2.4	3.3	3.6	3.6	3.8	3.8	3.2	3.2
Social sciences	1.0	1.5	1.9	2.7	5.2	4.6	6.0	9.1	10.2	9.9
Humanities	0.3	0.4	0.5	0.7	1.1	1.1	2.7	4.6	3.1	3.9
World										
Natural sciences and exact sciences	56.2	57.0	54.4	59.6	58.6	58.2	58.9	60.1	60.8	62.3
Engineering and technology	26.1	27.4	31.5	29.1	29.6	29.8	31.0	30.2	30.3	31.1
Medical sciences	37.0	36.3	31.5	32.4	32.0	32.1	32.4	32.6	31.7	30.5
Agricultural sciences	6.3	5.8	5.4	6.1	6.7	6.9	6.8	6.8	6.7	6.8
Social sciences	8.8	9.5	9.4	11.6	11.1	11.0	11.3	11.8	12.2	12.4
Humanities	2.3	2.4	3.2	3.4	3.9	4.0	4.1	4.0	4.0	4.0

* The sciences are grouped in accordance with the OECD Fields of Science Classification based on the transitional table provided by the Greek National Documentation Centre. The sum in the column does not add up to the total, because one publication may belong to two and more fields of science. The calculations are based on the data from the analytical system Scopus SciVal.

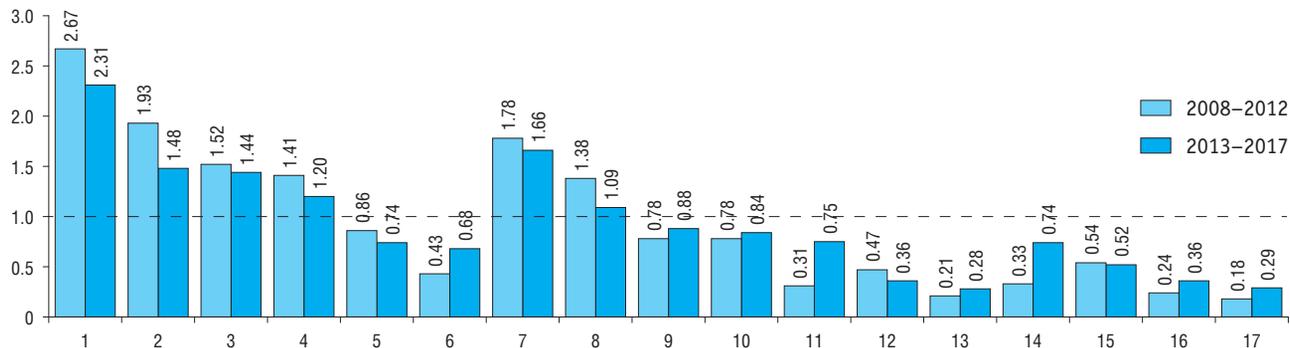
6.4. PERCENTAGE DISTRIBUTION OF PUBLICATIONS IN SCIENTIFIC JOURNALS INDEXED IN WEB OF SCIENCE BY FIELD OF SCIENCE AND TECHNOLOGY*

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Russia										
Natural sciences and exact sciences	79.3	80.2	80.6	78.4	75.9	76.1	73.0	65.3	62.2	61.2
Engineering and technology	26.0	27.8	27.5	24.1	25.9	26.2	32.3	31.2	32.5	32.5
Medical sciences	6.5	6.5	7.3	7.8	8.5	8.6	7.0	7.2	6.8	6.9
Agricultural sciences	0.9	1.1	1.0	1.0	1.0	0.9	1.0	0.8	1.0	0.8
Social sciences	2.2	2.2	2.4	2.5	3.5	3.3	4.1	8.5	9.8	11.3
Humanities	0.8	0.5	0.7	1.5	1.6	1.3	1.7	4.1	4.8	6.0
World										
Natural sciences and exact sciences	51.8	52.2	53.5	49.5	48.1	48.4	49.0	46.4	46.1	46.1
Engineering and technology	26.1	26.3	27.9	28.9	31.0	31.2	31.8	29.8	30.1	30.4
Medical sciences	28.4	29.1	27.0	27.1	26.0	25.9	25.3	26.0	25.7	26.1
Agricultural sciences	4.8	4.6	4.3	4.5	4.3	4.2	4.0	3.8	3.8	3.9
Social sciences	9.4	8.4	8.7	11.9	11.4	11.6	11.7	13.5	13.6	13.3
Humanities	4.2	4.1	3.7	4.3	4.5	4.5	4.4	4.9	4.9	4.8

* The sciences are grouped in accordance with the OECD Fields of Science Classification based on the transitional table provided by Thomson Reuters. The sum in the column does not add up to the total, because one publication may belong to two and more fields of science.

6.5. RUSSIA'S SCIENTIFIC SPECIALISATION INDICES BY PUBLICATIONS IN SCIENTIFIC JOURNALS INDEXED IN SCOPUS BY FIELD OF SCIENCE AND TECHNOLOGY*

Natural sciences, engineering and technology, medical sciences



Natural sciences and exact sciences

- 1 – Physical sciences
- 2 – Chemical sciences
- 3 – Mathematics
- 4 – Earth and related environmental sciences
- 5 – Biological sciences
- 6 – Computer and information sciences

Engineering and Technology

- 7 – Materials engineering
- 8 – Chemical engineering
- 9 – Mechanical engineering

- 10 – Electrical engineering, electronic engineering, information engineering

- 11 – Medical engineering

- 12 – Energy sector and rational use of natural resources

- 13 – Construction and architecture

Medical sciences

- 14 – Medical biotechnology

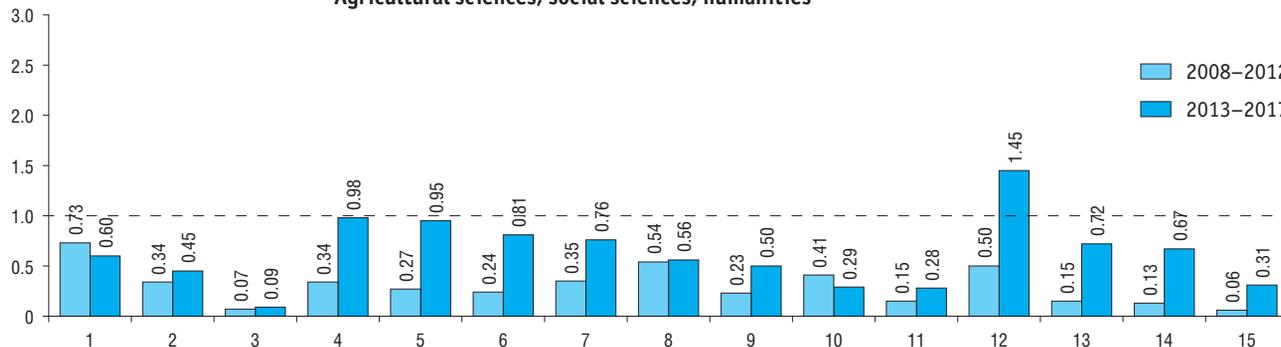
- 15 – Basic medicine

- 16 – Clinical medicine

- 17 – Health sciences

(continued)

Agricultural sciences, social sciences, humanities



Agricultural sciences

- 1 – Agriculture, forestry, and fisheries
- 2 – Animal and dairy science
- 3 – Veterinary science

Social sciences

- 4 – Political science
- 5 – Economics and business
- 6 – Educational sciences
- 7 – Sociology
- 8 – Social and economic geography

9 – Law

- 10 – Media and communications

11 – Psychology

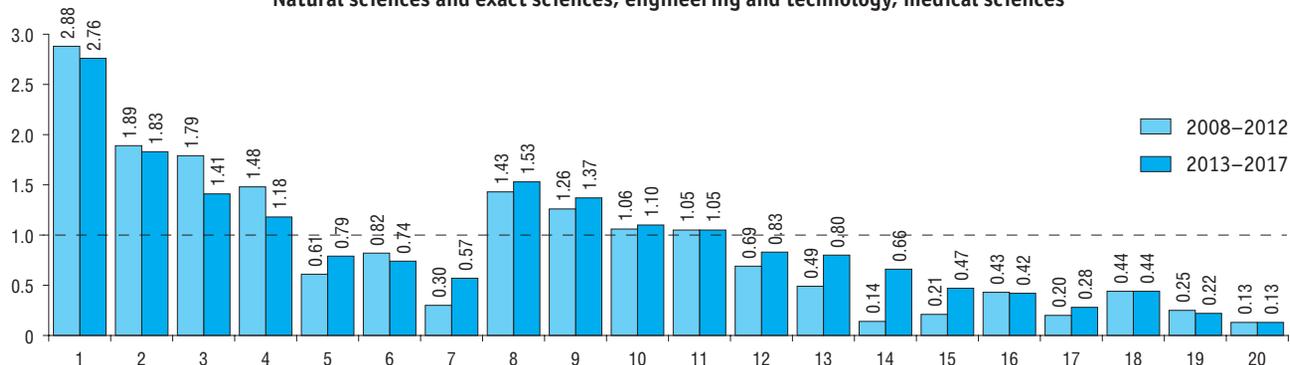
Humanities

- 12 – History and archaeology
- 13 – Philosophy, ethics, and religion
- 14 – Languages and literature
- 15 – Art (arts, history of arts, etc.)

* The sciences are grouped in accordance with the OECD Fields of Science Classification based on the transitional table provided by the Greek National Documentation Centre. The calculations are based on data from the analytical system Scopus SciVal.

6.6. RUSSIA'S SCIENTIFIC SPECIALISATION INDICES BY PUBLICATION IN SCIENTIFIC JOURNALS INDEXED IN WEB OF SCIENCE BY FIELD OF SCIENCE AND TECHNOLOGY*

Natural sciences and exact sciences, engineering and technology, medical sciences



Natural sciences and exact sciences

- 1 – Physical sciences
- 2 – Mathematics
- 3 – Chemical sciences
- 4 – Earth and related environmental sciences
- 5 – Interdisciplinary research
- 6 – Biological sciences
- 7 – Computer and information sciences

Engineering and technology

- 8 – Mechanical engineering
- 9 – Materials engineering
- 10 – Nanotechnology

11 – Chemical engineering

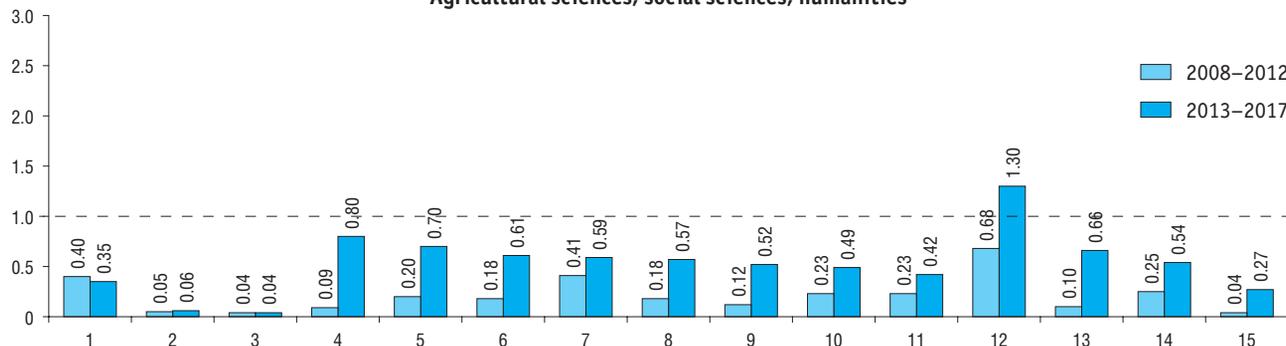
- 12 – Energy sector and rational use of natural resources
- 13 – Electrical engineering, electronic engineering, information engineering
- 14 – Construction and architecture
- 15 – Industrial biotechnology
- 16 – Environmental biotechnology
- 17 – Medical technologies

Medical sciences

- 18 – Basic medicine
- 19 – Clinical medicine
- 20 – Health sciences

(continued)

Agricultural sciences, social sciences, humanities



Agricultural sciences

- 1 – Agriculture, forestry, and fisheries
- 2 – Veterinary science
- 3 – Animal and dairy science

Social sciences

- 4 – Law
- 5 – Educational sciences
- 6 – Economics and business
- 7 – Sociology

- 8 – Social and economic geography

- 9 – Media and communications

- 10 – Psychology

- 11 – Political science

Humanities

- 12 – History and archaeology

- 13 – Languages and literature

- 14 – Philosophy, ethics, and religion

- 15 – Art (arts, history of arts, etc.)

* The sciences are grouped in accordance with the OECD Fields of Science Classification based on the transitional table provided by Thomson Reuters.

6.7. MAIN INDICATORS OF RUSSIAN AUTHORS' CONTRIBUTION TO THE WORLD TOTAL NUMBER OF PUBLICATIONS IN SCIENTIFIC JOURNALS INDEXED IN SCOPUS BY FIELD OF RESEARCH: 2017

	Number of publications by Russian authors	As a percentage of the world total number of publications	Russia's rank by number of publications
Natural and exact sciences			
Physical sciences	28205	6.94	4
Chemical sciences	14081	4.47	6
Earth and related environmental sciences	11880	3.80	10
Mathematics	9998	4.49	7
Biological sciences	9420	2.23	15
Computer and information sciences	9388	2.62	12
Interdisciplinary research	9245	4.12	8
Technical sciences			
Materials engineering	15942	4.98	6
Electrical engineering, electronic engineering, and information technology	5490	2.86	11
Chemical engineering	5057	3.26	10
Mechanical engineering	5048	2.83	10
Medical technologies	1281	3.32	11
Energy sector and rational use of natural resources	615	1.10	26
Construction and architecture	560	1.13	21
Medical sciences			
Clinical medicine	8356	1.47	20
Basic medicine	3961	1.62	18
Health sciences	1383	1.07	27

(continued)

	Number of publications by Russian authors	As a percentage of the world total number of publications	Russia's rank by number of publications
Agricultural sciences			
Agriculture, forestry, and fisheries	1976	1.82	16
Animal and dairy farming	817	1.43	19
Veterinary science	61	0.31	56
Social Sciences			
Economics and business	3381	3.63	9
Sociology	2252	3.32	7
Educational Sciences	1156	2.45	11
Psychology	714	1.01	23
Political science	701	4.07	6
Social and economic geography	588	1.84	16
Law	337	1.83	13
Media and communications	78	0.70	34
Humanities			
History and archaeology	1959	6.85	3
Languages and literature	914	2.77	10
Philosophy, ethics, religion	803	3.62	5
Art (arts, history of arts, etc.)	164	1.36	9

6.8. MAIN INDICATORS OF RUSSIAN AUTHORS' CONTRIBUTION TO THE WORLD TOTAL NUMBER OF PUBLICATIONS IN SCIENTIFIC JOURNALS INDEXED IN WEB OF SCIENCE BY FIELD OF RESEARCH: 2017

	Number of publications by Russian authors	As a percentage of the world total number of publications	Russia's rank by number of publications
Natural and exact sciences			
Physical sciences	19199	8.25	4
Chemical sciences	8663	3.85	8
Biological sciences	5262	2.03	16
Mathematics	4743	5.44	5
Earth and related environmental sciences	4098	3.02	12
Computer and information sciences	3241	2.04	14
Interdisciplinary research	2447	2.78	15
Technical sciences			
Electrical engineering, electronic engineering, information technologies	6450	2.74	11
Materials engineering	6399	4.14	7
Mechanical engineering	4010	4.64	7
Energy sector and rational use of natural resources	3217	2.94	14
Nanotechnology	1472	3.26	9
Construction and architecture	1462	3.38	9
Chemical engineering	1116	2.82	13
Environmental biotechnology	311	1.00	26
Medical technologies	294	1.13	24
Industrial biotechnology	231	2.39	15
Medical sciences			
Clinical medicine	2504	0.67	32
Basic medicine	2453	1.31	22
Health sciences	484	0.38	48

(continued)

	Number of publications by Russian authors	As a percentage of the world total number of publications	Russia's rank by number of publications
Agricultural sciences			
Agriculture, forestry, and fisheries	383	0.97	32
Veterinary science	30	0.20	59
Animal and dairy farming	11	0.13	68
Social Sciences			
Economics and business	2297	2.74	12
Educational sciences	1516	2.87	9
Social and economic geography	1226	2.89	10
Psychology	1077	1.90	12
Sociology	599	1.71	13
Law	479	2.61	11
Political science	425	1.83	14
Media and communications	398	2.41	11
Humanities			
History and archaeology	1460	5.00	4
Languages and literature	1042	3.36	9
Philosophy, ethics, religion	541	2.17	11
Art (arts, history of arts, etc.)	242	1.35	13

6.9. MAIN CITATION INDICATORS OF PUBLICATIONS BY RUSSIAN AUTHORS IN SCIENTIFIC JOURNALS INDEXED IN SCOPUS

	1996	2000	2005	2010	2012	2013	2014	2015	2016	2017
Average normalised citation of publications by Russian authors*	0.46	0.49	0.52	0.54	0.67	0.66	0.76	0.73	0.74	0.73
Number of citations of publications by Russian authors as a percentage in the world citation total	1.08	1.07	1.09	0.98	1.19	1.21	1.41	1.63	1.93	1.96
Number of publications by Russian authors as a percentage of the total number of highly cited publications**	0.69	0.65	0.70	0.69	0.87	1.05	1.28	1.24	1.66	1.70
Number of publications by Russian authors in the world total number of publications in Q1 journals***	1.69	1.72	1.36	1.00	1.02	1.04	1.07	1.14	1.25	1.27

* Average citation of publications normalised by subject area relative to the world average.

** Highly cited publications are the top 1% of the most highly cited publications.

*** Q1 (first quartile) journals have a highest SCIMago Journal Rank (SJR) in the top 25% of journals for one of its classified subdisciplines.

6.10. MAIN CITATION INDICATORS OF PUBLICATIONS BY RUSSIAN AUTHORS IN SCIENTIFIC JOURNALS INDEXED IN WEB OF SCIENCE

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Average normalised citation of publications by Russian authors*	0.37	0.43	0.52	0.54	0.67	0.70	0.82	0.85	0.93	0.80
Number of citations of publications by Russian authors as a percentage in the world citation total	1.15	1.19	1.18	1.05	1.25	1.23	1.46	1.59	1.86	1.88
Number of publications by Russian authors as a percentage of the total number of highly cited publications**	–	–	–	0.88	1.07	1.21	1.36	1.30	1.70	1.64
Number of publications by Russian authors in the world total number of publications in Q1 journals***	–	1.48	1.39	0.99	1.06	1.04	1.13	1.25	1.26	1.32

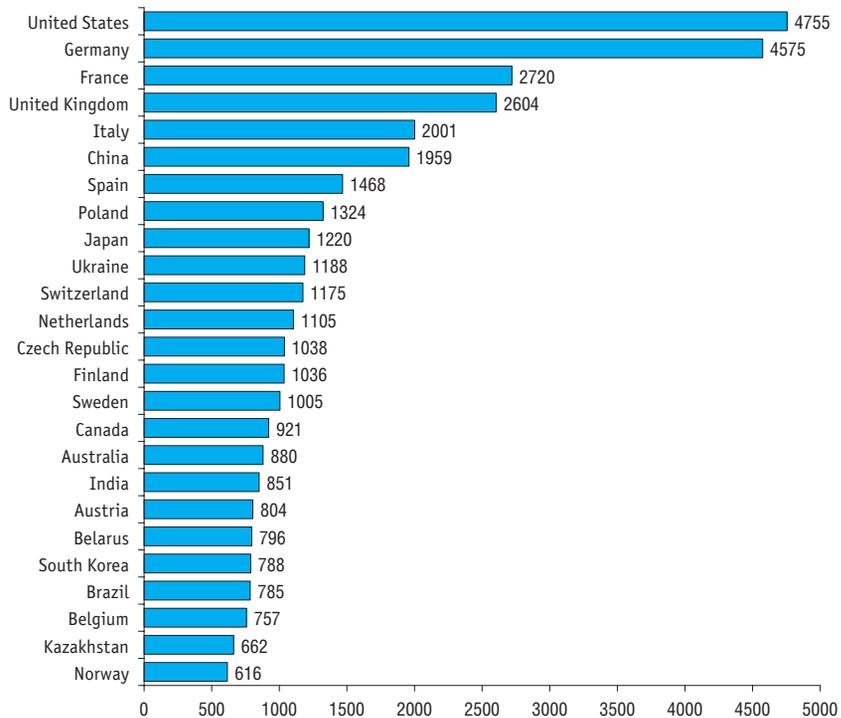
* Average citation of publications normalised by subject area relative to the world average.

** Highly cited publications are the top 1% of the most highly cited publications.

*** Q1 (first quartile) journals have a highest SCIMago Journal Rank (SJR) in the top 25% of journals for one of its classified subdisciplines.

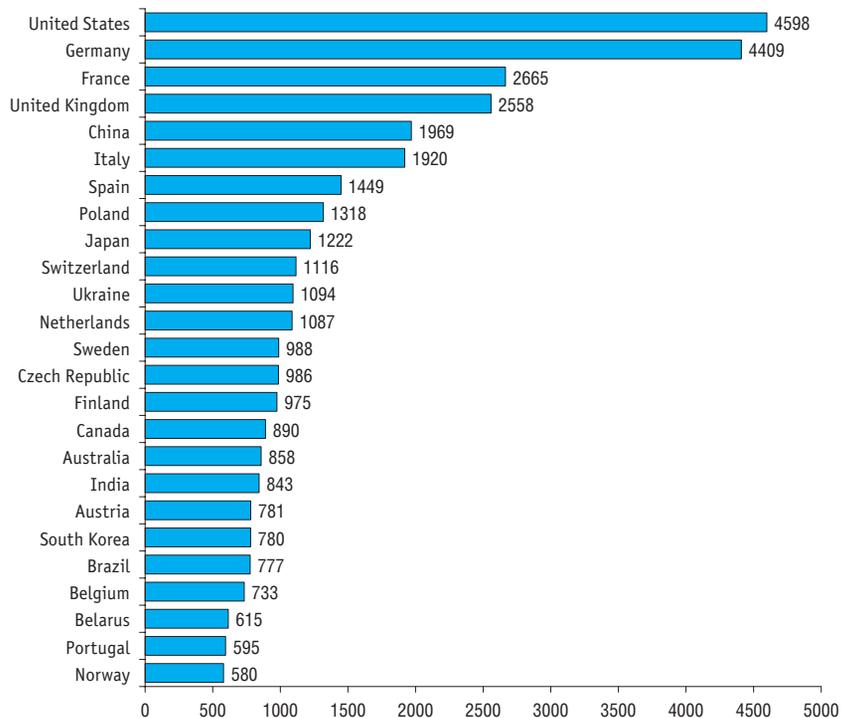
6.11. NUMBER OF PUBLICATIONS BY RUSSIAN AUTHORS WITH INTERNATIONAL COLLABORATION IN SCIENTIFIC JOURNALS INDEXED IN SCOPUS BY PARTNER COUNTRY: 2017

Total number of publications by Russian authors with international collaboration: 20,127



6.12. NUMBER OF PUBLICATIONS BY RUSSIAN AUTHORS WITH INTERNATIONAL COLLABORATION IN SCIENTIFIC JOURNALS INDEXED IN WEB OF SCIENCE BY PARTNER COUNTRIES: 2017

Total number of publications by Russian authors with international collaboration: 19,065



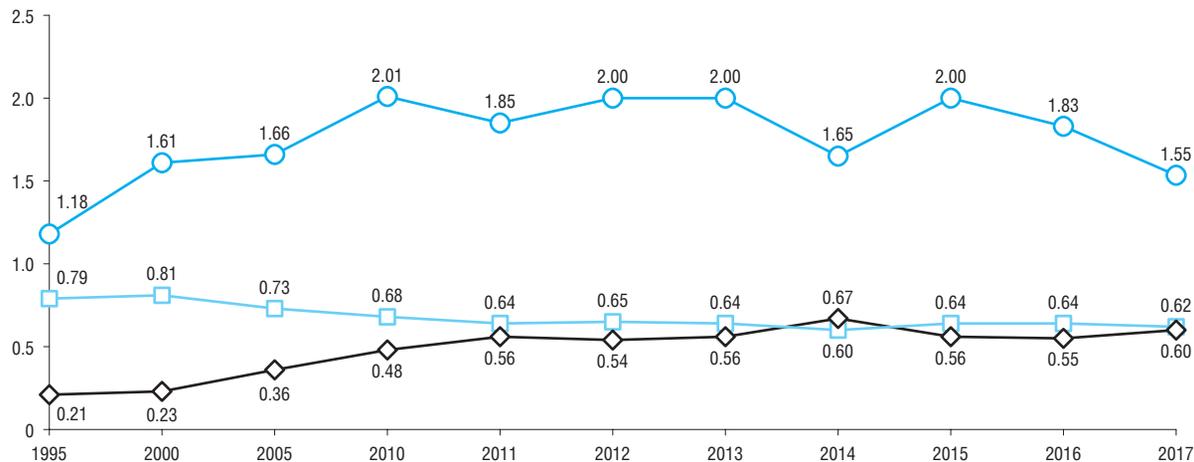
Patent activity

6.13. PATENT APPLICATIONS AND PATENT GRANTS

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Patent applications filed in the Russian Federation	22202	28688	32254	42500	44211	44914	40308	45517	41587	36454
By Russian residents	17551	23377	23644	28722	28701	28765	24072	29269	26795	22777
By non-residents	4651	5311	8610	13778	15510	16149	16236	16248	14792	13677
Patent grants received in the Russian Federation	31556*	17592	23390	30322	32880	31638	33950	34706	33536	34254
By Russian residents	20861	14444	19447	21627	22481	21378	23065	22560	21020	21037
By non-residents	4772	3148	3943	8695	10399	10260	10885	12146	12516	13217
Patents in force in the Russian Federation	76186	144325	123089	181904	181515	194248	208320	218974	230870	244321

* Taking into account patents granted in exchange for invention certificates.

6.14. PATENT ACTIVITY INDICATORS



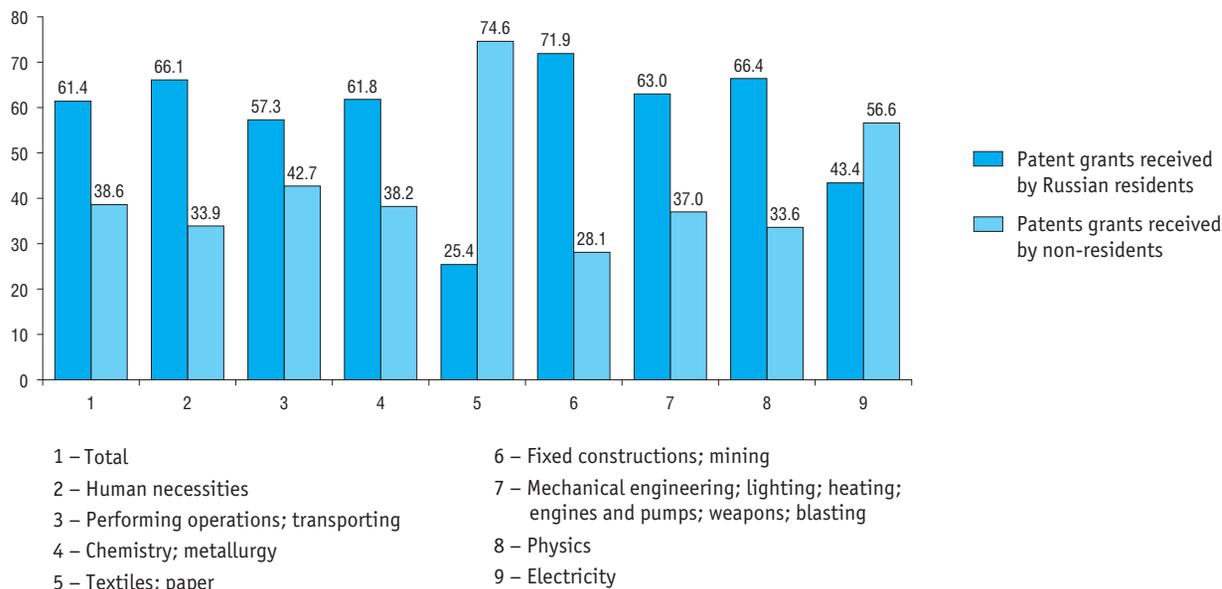
- Country inventiveness ratio – number of patent applications filed in the Russian Federation by Russian residents per 10,000 population
- Country self-sufficiency ratio – number of patent applications filed in the Russian Federation by Russian residents to the total number of patent applications filed in the Russian Federation
- ◇— Country technological dependency ratio – number of patent applications filed in the Russian Federation by non-residents to the number of patent applications filed in the Russian Federation by Russian residents

6.15. PATENT GRANTS RECEIVED IN THE RUSSIAN FEDERATION BY SECTION OF THE INTERNATIONAL PATENT CLASSIFICATION*

	1995	2000	2010	2012	2013	2014	2015	2016	2017
Total	25633	17592	30322	32880	31638	33950	34706	33536	34254
A. Human necessities	4207	4347	8468	9506	8042	9890	8283	7344	7577
B. Performing operations; transporting	6129	2905	4711	4969	4965	5331	5618	4689	5501
C. Chemistry; metallurgy	4529	3332	5167	5524	5779	5154	5910	7894	5677
D. Textiles; paper	437	197	320	274	271	305	266	253	299
E. Fixed constructions; mining	2042	1156	1977	1898	1807	2033	2068	1925	2087
F. Mechanical engineering; lighting; heating; engines and pumps; weapons; blasting	3033	2144	3062	3246	3453	3459	3824	3434	3972
G. Physics	3083	2172	3734	4381	4285	4484	5231	4785	5736
H. Electricity	2173	1339	2883	3082	3036	3294	3506	3212	3405

* Patent grants received by both Russian residents and non-residents.

6.16. PERCENTAGE DISTRIBUTION OF PATENT GRANTS RECEIVED IN THE RUSSIAN FEDERATION BY ASSIGNEE AND SECTION OF THE INTERNATIONAL PATENT CLASSIFICATION: 2017



6.17. UTILITY MODEL APPLICATIONS AND GRANTS

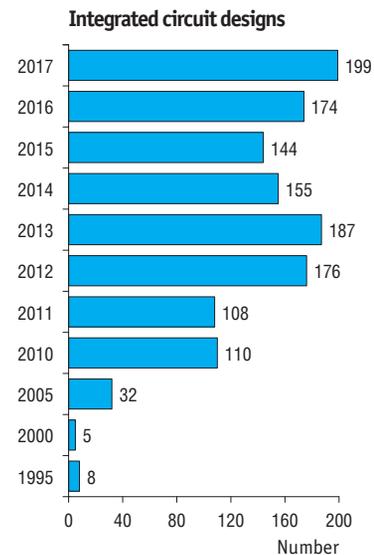
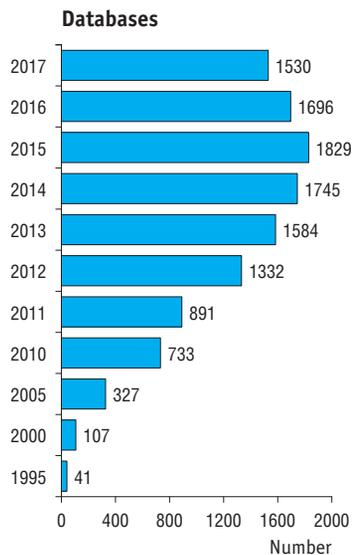
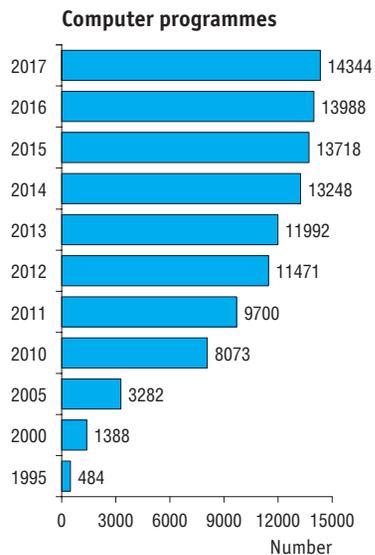
	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Utility model applications filed in the Russian Federation	2039	4631	9473	12262	14069	14358	13952	11906	11112	10643
By Russian residents	1997	4549	9082	11757	13479	13589	13000	11403	10643	10152
By non-residents	42	82	391	505	590	769	952	503	469	491
Utility model grants received in the Russian Federation	1207	4098	7242	10581	11671	12653	13080	9008	8875	8774
By Russian residents	1195	4041	6958	10187	11152	12154	12267	8390	8474	8376
By non-residents	12	57	284	394	519	499	813	618	401	398
Utility models in force in the Russian Federation	2971	15498	28364	54848	50746	54420	58238	57448	53263	50078

6.18. UTILITY MODEL GRANTS RECEIVED IN THE RUSSIAN FEDERATION BY SECTION OF THE INTERNATIONAL PATENT CLASSIFICATION*

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Total	1207	4098	7242	10581	11671	12653	13080	9008	8875	8774
A. Human necessities	190	835	1344	1914	1933	2091	2240	1579	1550	1717
B. Performing operations; transporting	311	1004	1741	2411	2678	2917	2935	2021	2034	2143
C. Chemistry; metallurgy	30	145	289	398	370	398	383	269	194	261
D. Textiles; paper	37	73	73	57	55	52	45	42	36	30
E. Fixed constructions; mining	115	465	1022	1503	1466	1611	1684	1192	1184	1058
F. Mechanical engineering; lighting; heating; engines and pumps; weapons; blasting	235	679	1111	1701	1957	2112	2459	1557	1487	1419
G. Physics	150	490	949	1580	1912	2017	2011	1376	1343	1193
H. Electricity	139	407	713	1017	1300	1455	1323	972	1047	953

* Grants received by both Russian residents and non-residents.

6.19. REGISTRATION OF INTELLECTUAL PROPERTY ITEMS IN THE FIELD OF INFORMATION TECHNOLOGY



Development and use of advanced manufacturing technologies

6.20. DEVELOPMENT OF ADVANCED MANUFACTURING TECHNOLOGIES BY TYPE

	1997	2000	2005	2010	2012	2013	2014	2015	2016	2017
Advanced manufacturing technologies	996	688	637	864	1323	1429	1409	1398	1534	1402
Of which:										
design and engineering	223	165	138	216	305	426	445	359	402	417
manufacturing, processing, and assembling	390	281	291	383	548	517	506	548	509	485
automatic handling; materials and parts transportation	20	20	9	18	23	22	22	12	34	34
automatic inspecting or testing equipment	141	76	91	116	121	137	110	117	160	134
communications and management	131	90	57	70	204	206	202	232	285	218
manufacturing information systems	39	18	21	20	60	68	65	84	83	44
integrated management and control	52	38	30	41	62	53	59	46	61	70

6.21. DEVELOPMENT OF ADVANCED MANUFACTURING TECHNOLOGIES BY DEGREE OF NOVELTY AND TYPE

	1997	2000	2005	2010	2012	2013	2014	2015	2016	2017
Technologies new to the country	830	569	538	762	1188	1276	1245	1223	1342	1212
Of which:										
design and engineering	195	136	125	191	269	367	390	323	352	358
manufacturing, processing, and assembling	315	231	239	336	491	469	450	471	449	417
automatic handling; materials and parts transportation	17	19	8	16	21	21	20	10	29	27
automatic inspecting or testing equipment	101	66	72	98	101	108	84	82	111	107
communications and management	118	74	52	67	194	195	187	218	264	194
manufacturing information systems	38	14	20	17	55	66	59	78	80	44
integrated management and control	46	29	22	37	57	50	55	41	57	65
Radically new technologies	90	72	60	102	135	153	164	175	192	190
Of which:										
design and engineering	18	12	12	25	36	59	55	36	50	59
manufacturing, processing, and assembling	41	32	30	47	57	48	56	77	60	68
automatic handling; materials and parts transportation	–	1	–	2	2	1	2	2	5	7
automatic inspecting or testing equipment	20	6	12	18	20	29	26	35	49	27
communications and management	7	9	4	3	10	11	15	14	21	24
manufacturing information systems	–	4	1	3	5	2	6	6	3	–
integrated management and control	4	8	1	4	5	3	4	5	4	5

6.22. DEVELOPMENT OF ADVANCED MANUFACTURING TECHNOLOGIES BY DEGREE OF NOVELTY AND TYPE OF ECONOMIC ACTIVITY

	Total		Of which technologies			
	2016	2017	new to the country		radically new	
			2016	2017	2016	2017
Advanced manufacturing technologies	1534	1402	1342	1212	192	190
Mining and quarrying	25	23	25	23	–	–
Manufacturing	523	442	491	409	32	33
Electricity, gas, steam and air-conditioning supply	17	31	17	29	–	2
Water supply; sewerage, waste management, and remediation activities	20	25	20	25	–	–
Wholesale and retail trade; repair of motor vehicles and motorcycles	1	1	1	1	–	–
Information and communication	76	86	73	75	3	11
Professional, scientific and technical activities	540	513	436	412	104	101
Of which research and development	502	490	400	391	102	99
Education	310	280	257	237	53	43
Of which higher education	310	280	257	237	53	43
Other service activities	22	1	22	1	–	–

6.23. USE OF ADVANCED MANUFACTURING TECHNOLOGIES BY TYPE

	1997	2000	2005	2010	2012	2013	2014	2015	2016	2017
Advanced manufacturing technologies	55452	70069	140983	203330	191372	193830	204546	218018	232388	240054
Of which:										
design and engineering	7109	14385	43273	56130	39664	38735	38598	39831	40658	41130
manufacturing, processing, and assembling	36538	35408	42976	55438	55579	55424	58111	63379	67726	70160
Automatic handling; materials and parts transportation	707	685	970	1853	1570	1823	1983	2129	2316	2484
automatic inspecting or testing equipment	2644	2409	4525	9106	9519	11314	12263	12876	13523	14329
communication and management	6650	13713	44135	72798	76479	78028	84730	89967	96846	99525
manufacturing information systems	790	1823	3177	4848	5171	5293	5555	6300	7275	7733
integrated management and control	1014	1646	1927	3157	3390	3213	3306	3536	4044	4693

6.24. USE OF ADVANCED MANUFACTURING TECHNOLOGIES BY TYPE AND DURATION

	Total		Of which technology used during the period of					
			less than 1 year		1–5 years		6 years and more	
	2016	2017	2016	2017	2016	2017	2016	2017
Advanced manufacturing technologies	232388	240054	15671	17243	88554	88721	128163	134090
Of which:								
design and engineering	40658	41130	3418	4175	16194	15064	21046	21891
manufacturing, processing, and assembling	67726	70160	5060	5083	23177	24274	39489	40803
automatic handling; materials and parts transportation	2316	2484	198	175	958	933	1160	1376
automatic inspecting or testing equipment	13523	14329	1099	1148	6537	6760	5887	6421
communication and management	96846	99525	4898	5089	37602	37552	54346	56884
manufacturing information systems	7275	7733	626	951	2826	2732	3823	4050
integrated management and control	4044	4693	372	622	1260	1406	2412	2665

6.25. USE OF ADVANCED MANUFACTURING TECHNOLOGIES BY TYPE OF ECONOMIC ACTIVITY AND DURATION

	Total		Of which technology used during the period of					
			less than 1 year		1–5 years		6 years and more	
	2016	2017	2016	2017	2016	2017	2016	2017
Advanced manufacturing technologies	232388	240054	15671	17243	88554	88721	128163	134090
Mining and quarrying	9989	10181	462	334	5086	5116	4441	4731
Manufacturing	152820	157881	10135	10804	54379	55089	88306	91988
Electricity, gas, steam and air-conditioning supply	18820	21766	1340	1330	7782	8793	9698	11643
Water supply; sewerage, waste management, and remediation activities	3029	4596	243	359	1314	1968	1472	2269
Wholesale and retail trade; repair of motor vehicles and motorcycles	662	709	3	9	526	523	133	177
Information and communication	11411	11865	771	2107	4940	4504	5700	5254
Professional, scientific and technical activities	30030	27897	2189	1889	12152	10637	15689	15371
Of which research and development	23431	23628	1744	1614	9365	8870	12322	13144
Education	5414	5120	478	411	2294	2077	2642	2632
Of which higher education	5414	5120	478	411	2294	2077	2642	2632
Other service activities	213	39	50	–	81	14	82	25

6.26. USE OF ADVANCED MANUFACTURING TECHNOLOGIES BY TYPE AND SOURCE OF ACQUISITION: 2017

	Total	Of which technology		
		developed in the reporting entity	acquired	
			in Russia	abroad
Advanced manufacturing technologies	240054	39473	131440	69141
Of which:				
design and engineering	41130	11251	23193	6686
manufacturing, processing, and assembling	70160	17448	26297	26415
automatic handling; materials and parts transportation	2484	313	1055	1116
automatic inspecting or testing equipment	14329	1831	8454	4044
communication and management	99525	6497	64624	28404
manufacturing information systems	7733	1603	4722	1408
integrated management and control	4693	530	3095	1068

6.27. USE OF ADVANCED MANUFACTURING TECHNOLOGIES BY TYPE OF ECONOMIC ACTIVITY AND SOURCE OF ACQUISITION: 2017

	Total	Of which technology		
		developed in the reporting entity	acquired	
			In Russia	abroad
Advanced manufacturing technologies	240054	39473	131440	69141
Mining and quarrying	10181	520	7823	1838
Manufacturing	157881	27031	77472	53378
Electricity, gas, steam and air-conditioning supply	21766	1152	17530	3084
Water supply; sewerage, waste management, and remediation activities	4596	491	3470	635
Wholesale and retail trade; repair of motor vehicles and motorcycles	709	6	647	56
Information and communication	11865	853	7767	3245
Professional, scientific and technical activities	27897	7781	14208	5908
Of which research and development	23628	7494	10843	5291
Education	5120	1634	2503	983
Of which higher education	5120	1634	2503	983
Other service activities	39	5	20	14

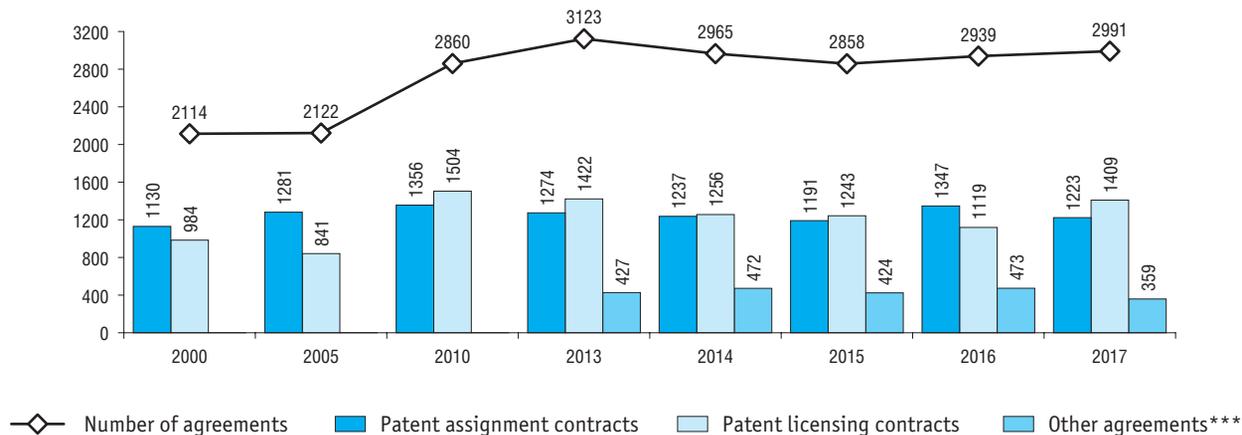
6.28. USE OF ADVANCED MANUFACTURING TECHNOLOGIES DEVELOPED ON THE BASIS OF INVENTION PATENTS BY TYPE*

	1997	2000	2005	2010	2012*	2013	2014	2015	2016	2017
Advanced manufacturing technologies	3247	2804	3072	1012	6032	9099	9519	9249	9617	9127
Of which:										
design and engineering	829	1115	1055	274	1582	2193	2129	1819	1837	1606
manufacturing, processing, and assembling	1756	1231	1411	337	2236	2670	3203	3274	3194	3190
automatic handling; materials and parts										
transportation	26	45	16	18	69	218	131	121	132	123
automatic inspecting or testing equipment	328	171	262	116	739	726	715	704	769	763
communication and management	197	182	258	209	1138	2844	2870	2775	3023	2844
manufacturing information systems	29	9	44	31	172	321	316	395	500	470
integrated management and control	82	51	26	27	96	127	155	161	162	131

* Due to the changes made in methodology in 2011, the data are not comparable with the results for previous years.

Commercialisation of technology in domestic market

6.29. STATE REGISTRATION* OF DISPOSITIONS OF THE EXCLUSIVE RIGHTS TO INVENTIONS, UTILITY MODELS, INDUSTRIAL DESIGNS BY PATENT ASSIGNMENT AND PATENT LICENSING CONTRACTS**

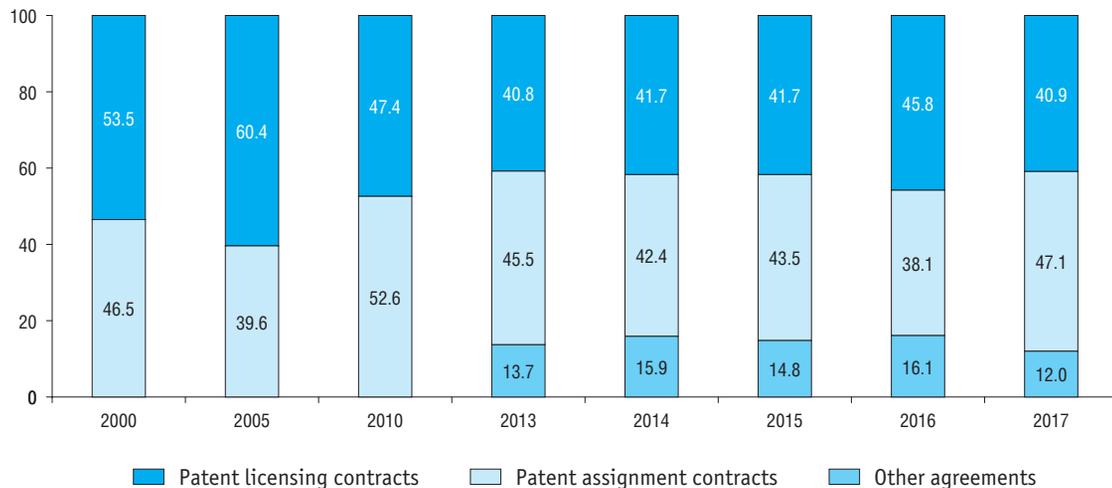


* Here and below: until October 1, 2014, registration of exclusive licences.

** Before 2008 – patent cession agreements.

*** Other agreements include pledge agreements, deeds of amendment to registered agreements, and early terminations of registered agreements.

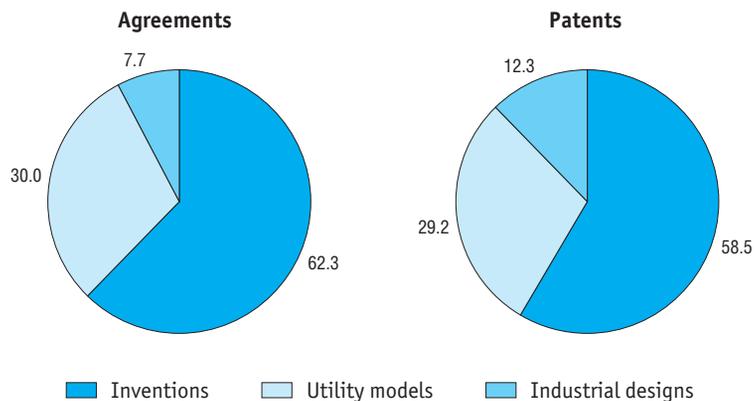
6.30. PERCENTAGE DISTRIBUTION OF DISPOSITIONS BY TYPE OF AGREEMENT



6.31. STATE REGISTRATION OF DISPOSITIONS UNDER AGREEMENTS AND PATENTS WITH REGISTERED DISPOSITIONS BY TYPE OF INTELLECTUAL PROPERTY

	Agreements					Patents				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Total	3123	2965	2858	2939	2991	5961	6375	6806	6633	7356
Inventions	2005	1789	1693	1847	1864	3599	3483	4271	4224	4303
Utility models	868	981	927	872	897	1771	2243	1795	1899	2148
Industrial designs	250	195	238	220	230	591	649	740	510	905

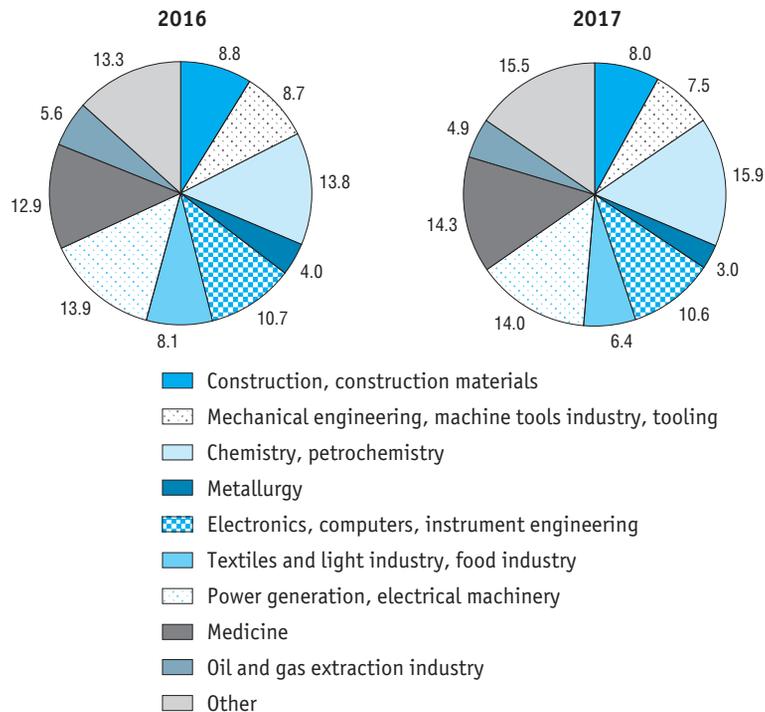
6.32. PERCENTAGE DISTRIBUTION OF AGREEMENTS AND PATENTS WITH REGISTERED DISPOSITIONS BY TYPE OF INTELLECTUAL PROPERTY: 2017



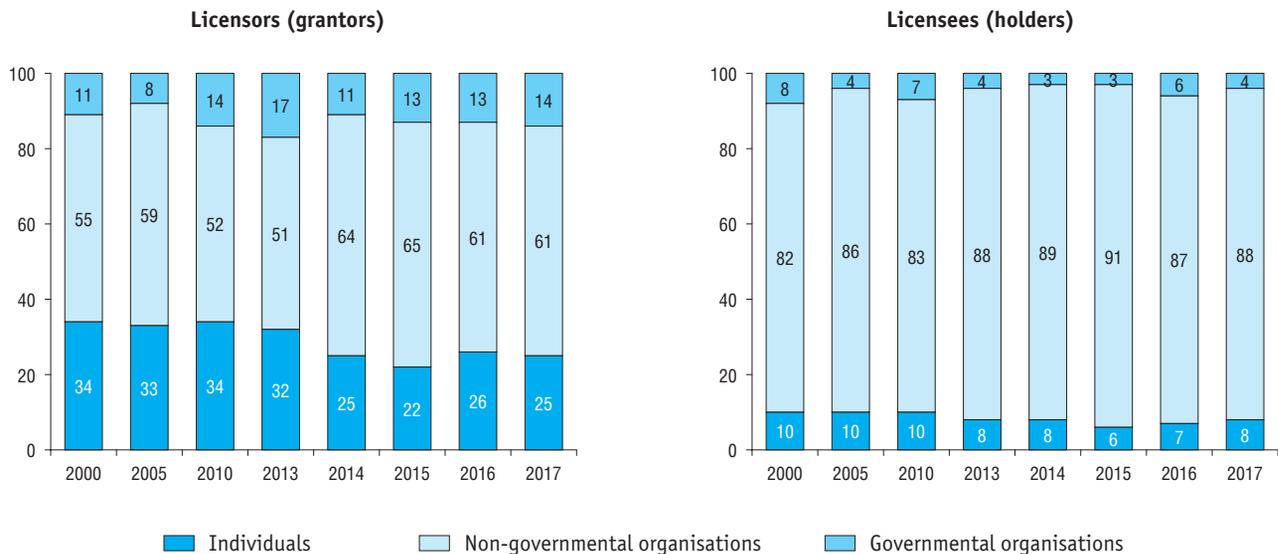
6.33. STATE REGISTRATION OF DISPOSITIONS OF EXCLUSIVE RIGHTS TO INVENTIONS, UTILITY MODELS, AND INDUSTRIAL DESIGNS BY TECHNOLOGY FIELD

	2000	2005	2010	2013	2014	2015	2016	2017
Total	2114	2122	2860	3123	2965	2858	2939	2991
I. Construction, construction materials	89	108	135	252	245	226	259	240
II. Mechanical engineering, machine tools industry, tooling	345	417	118	248	211	205	257	223
III. Chemistry, petrochemistry	203	268	286	382	407	406	406	475
IV. Metallurgy	85	69	86	108	100	62	118	89
V. Electronics, computers, instrument engineering	78	165	311	216	209	222	315	316
VI. Textiles and light industry, food industry	323	105	163	276	200	257	239	192
VII. Power generation, electrical machinery	150	223	421	490	470	511	409	418
VIII. Medicine	264	249	294	473	439	396	379	429
IX. Oil and gas extraction industry	224	136	162	168	135	142	166	146
X. Other	353	382	884	510	549	431	391	463

6.34. PERCENTAGE DISTRIBUTION OF DISPOSITIONS OF EXCLUSIVE RIGHTS TO INVENTIONS, UTILITY MODELS, AND INDUSTRIAL DESIGNS BY TECHNOLOGY FIELD



6.35. PERCENTAGE DISTRIBUTION OF DISPOSITIONS OF EXCLUSIVE RIGHTS TO INVENTIONS, UTILITY MODELS, AND INDUSTRIAL DESIGNS BY CATEGORY OF ECONOMIC ENTITY



International technological exchange

6.36. TECHNOLOGY BALANCE OF PAYMENTS BY CATEGORY OF CONTRACTS

(thousand USD)

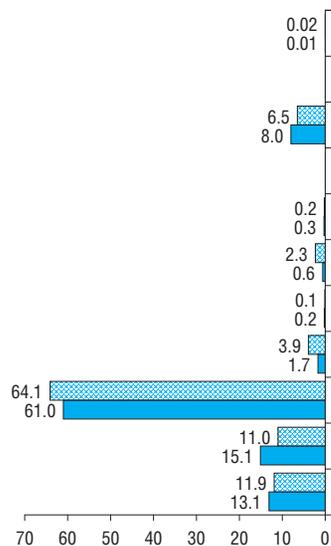
	Total	Invention patents	Unpatented inventions	Patent licences	Selection achievements	Utility models	Know-how	Trademarks	Industrial designs	Engineering services	Research and development	Others
Receipts from technology exports												
2002	211478.4	214.5	–	210.0	...	...	1909.3	1446.9	84.9	143764.1	20812.0	43036.7
2005	389396.4	926.3	467.0	1788.0	...	...	517.9	5583.5	1017.3	150858.8	83214.4	145023.2
2006	533385.9	100.8	4284.7	2576.1	...	...	398.0	6191.6	219.8	166911.1	89260.1	263443.7
2007	630391.6	347.2	–	5215.8	...	0.5	1985.1	7550.3	2457.0	267561.2	101170.3	244104.2
2008	833164.4	112.8	–	5183.8	...	3765.0	9709.5	17685.4	3752.3	491665.1	151463.4	149827.1
2009	618184.5	191.8	10.8	12825.7	...	936.2	10980.9	431.9	3554	410907.2	120877.9	57468.1
2010	627887.5	582.6	1987.0	11821.3	...	1718.9	13778.5	759.1	2531.0	368971.3	138356.8	87381.0
2011	584656.9	98.9	212.0	20334.7	...	688.0	4886.2	1251.7	2304.0	382161.5	111499.3	61220.6
2012	688469.9	21.0	–	21850.1	...	898.7	15653.4	999.4	2291.0	376428.2	170752.9	99575.2
2013	770584.8	81.0	110.0	25409.6	...	75.4	11798.9	388.2	2452.2	364000.7	235654.9	130613.9
2014	1279213.1	72.7	–	26610.9	...	35.9	11526.7	2765.3	2000.8	707674.2	356496.9	172029.7
2015	1654732.1	63.2	–	79062.3	...	4113.6	2474.5	3990.3	2492.1	1112557.2	164939.8	285039.1
2016	1277023.5	2.7	–	83102.3	...	2011.3	28737.5	861.6	50139.8	819004.6	140721.8	152441.9
2017	1181183.9	117.0	–	94811.6	...	3946.3	7026.2	2567.3	20044.9	720187.3	177833.0	154650.3
Payments for technology imports												
2002	572488.8	403.2	–	3873.6	...	...	16042.0	83127.7	508.0	180620.6	182662.7	105251.0
2005	954199.2	8730.3	2983.5	19315.4	...	...	9489.7	191045.0	1519.5	582813.8	16512.8	121789.2
2006	1128425.8	3201.3	–	21402.1	...	101.2	49705.7	160720.2	217.9	658016.9	38631.3	196429.2
2007	1426387.6	14408.5	–	68538.3	...	959.1	70461.1	222142.6	559.3	754249.4	32476.3	262593.0
2008	2087067.4	10716.8	16.5	63042.7	...	690.3	43270.8	408349.1	0.0	1156815.3	31030.0	373135.9

(continued)

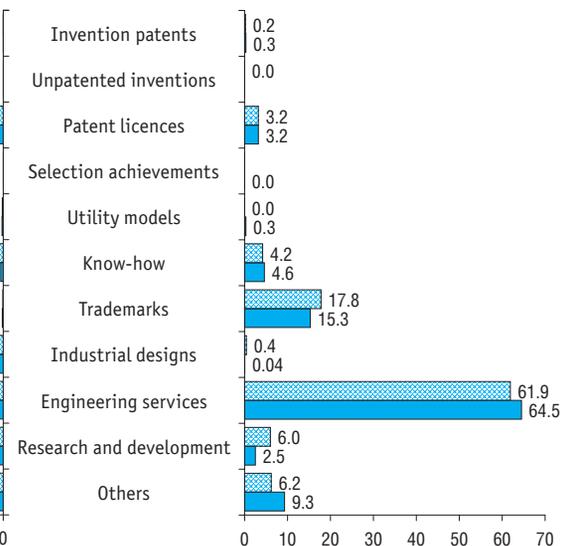
	Total	Invention patents	Unpatented inventions	Patent licences	Selection achievements	Utility models	Know-how	Trademarks	Industrial designs	Engineering services	Research and development	Others
2009	1619031.6	1109.4	–	74956.9	...	253.3	61944.4	392697.1	1.0	879212.9	19857.7	188998.9
2010	1425983.3	4024.2	–	82853.9	...	3665.6	62117.0	419009.3	2.2	526913.5	49631.8	277765.8
2011	1862566.6	3531.0	–	71764.2	...	2264.3	92153.1	406684.6	26.2	692495.2	72676.4	520971.6
2012	2043187.9	6970.5	14.0	64208.4	...	5138.4	158428.1	465370.3	997.0	806467.1	66295.4	469298.7
2013	2463626.3	22600.3	–	85973.2	...	1998.2	133742.2	587894.4	704.3	959742.4	171256.5	499714.8
2014	2455830.7	20879.5	–	100797.0	...	4066.3	121719.8	381160.4	182.6	1147892.0	151488.5	527644.6
2015	2207406.8	9636.1	3.4	66104.7	...	3461.5	179228.9	318504.5	24447.9	1277698.4	110310.7	218010.7
2016	2498677.8	5401.4	83.0	80561.5	...	1053.7	104879.1	444761.5	10494.0	1547859.8	149109.0	154474.8
2017	3305202.5	11054.5	11.1	106056.2	34.9	8409.2	152032.3	504369.2	1393.0	2132582.6	83500.7	305758.8
Technology balance of payments												
2002	-361010.4	-188.7	–	-3663.6	...	...	-14132.7	-81680.8	-423.1	-36856.5	-161850.7	-62214.3
2005	-564802.8	-7804.0	-2516.5	-17527.4	...	...	-8971.8	-185461.5	-502.2	-431955.0	66701.6	23234.0
2006	-595039.9	-3100.5	4284.7	-18826.0	...	-101.2	-49307.7	-154528.6	1.9	-491105.8	50628.8	67014.5
2007	-795996.0	-14061.3	–	-63322.5	...	-958.6	-68476.0	-214592.3	1897.7	-486688.2	68694.0	-18488.8
2008	-1253903.0	-10604.0	-16.5	-57858.9	...	3074.7	-33561.3	-390663.7	3752.3	-665150.2	120433.4	-223308.8
2009	-1000847.1	-917.6	10.8	-62131.2	...	682.9	-50963.5	-392265.2	3553.0	-468305.7	101020.2	-131530.8
2010	-798095.8	-3441.6	1987.0	-71032.6	...	-1946.7	-48338.5	-418250.2	2528.8	-157942.2	88725.0	-190384.8
2011	-1277909.7	-3432.1	212.0	-51429.5	...	-1576.3	-87266.9	-405432.9	2277.8	-310333.7	38822.9	-459751.0
2012	-1354718.0	-6949.5	-14.0	-42358.3	...	-4239.7	-142774.7	-464370.9	1294.0	-430038.9	104457.5	-369723.5
2013	-1693041.5	-22519.3	110.0	-60563.6	...	-1922.8	-121943.3	-587506.2	1747.9	-595741.7	64398.4	-369100.9
2014	-1176617.6	-20806.8	–	-74186.1	...	-4030.4	-110193.1	-378395.1	1818.2	-440217.8	205008.4	-355614.9
2015	-552674.7	-9572.9	-3.4	12957.6	...	652.1	-176754.4	-314514.2	-21955.8	-165141.2	54629.1	67028.4
2016	-1221654.3	-5398.7	-83.0	2540.8	...	957.6	-76141.6	-443899.9	39645.8	-728855.2	-8387.2	-2032.9
2017	-2124018.6	-10937.5	-11.1	-11244.6	-34.9	-4462.9	-145006.1	-501801.9	18651.9	-1412395.3	94332.3	-151108.5

6.37. PERCENTAGE DISTRIBUTION OF TECHNOLOGY EXPORTS AND IMPORTS BY CATEGORY OF CONTRACTS

Receipts from technology exports



Payments for technology imports



2016
 2017

6.38. NUMBER AND NET VALUE OF TECHNOLOGY EXPORTS AND IMPORTS BY CATEGORY OF CONTRACTS

	Number of contracts			Net value of the contract's subject matter, <i>thousand USD</i>		
	2010	2016	2017	2010	2016	2017
Exports						
Total	1867	2182	2757	3474995.7	6320854.5	5517080.5
Invention patents	7	6	5	295.6	4.8	119.2
Unpatented inventions	8	–	–	2753.0	–	–
Patent licences	42	96	117	17160.7	128310.3	133165.1
Selection achievements	–	–	–	–	–	–
Utility models	10	9	7	1737.6	2121.1	4947.1
Know-how	33	30	55	35781.9	33571.8	10194.2
Trademarks	19	16	28	2209.2	1685.7	4331.5
Industrial designs	1	5	4	26667.0	69530.3	20111.4
Engineering services	682	771	1036	2827690.4	5012835.2	4396379.0
Research and development	692	800	840	378940.6	693878.6	615821.3
Others	373	449	665	181759.7	378916.7	332011.7
Imports						
Total	1943	3449	4358	3028304.5	13011823.9	15894309.5
Invention patents	5	27	63	15302.0	108130.7	90209.8
Unpatented inventions	–	2	1	–	83.0	9.3
Patent licences	70	171	165	179354.3	491037.3	571301.2
Selection achievements	–	–	1	–	–	34.9
Utility models	13	8	9	12845.7	4.4	8031.1
Know-how	41	111	130	119611.1	348240.5	255575.6
Trademarks	108	211	314	490778.8	943727.1	926576.0
Industrial designs	1	38	40	16.4	12577.6	3159.9
Engineering services	1080	1667	2133	1744228.8	9635647.7	12838041.6
Research and development	89	337	339	45373.4	399053.1	204501.2
Others	536	877	1163	420794.0	1073322.5	996868.9

6.39. TECHNOLOGY BALANCE OF PAYMENTS BY COUNTRY

(thousand USD)

	Receipts from technology exports			Payments for technology imports			Technology balance of payments		
	2015	2016	2017	2015	2016	2017	2015	2016	2017
Total	1654732.1	1277023.5	1181183.9	2207406.8	2498677.8	3305202.5	-552674.7	-1221654.3	-2124018.6
CIS countries	134126.3	154052.8	83154.2	36156.9	33756.3	40118.4	97969.4	120296.5	43035.8
Armenia	164.8	135.5	347.5	77	81.4	139.1	87.8	54.1	208.4
Azerbaijan	1116.3	905.6	1004.9	103.2	22.8	14.2	1013.1	882.8	990.7
Belarus	79447.4	71940.4	38700.2	8330.2	10482.4	11022.3	71117.2	61458	27677.9
Kazakhstan	27409.6	56320.8	18037.7	10882.4	15980.9	11828.1	16527.2	40339.9	6209.6
Kyrgyzstan	4824.5	5442.5	4852.1	44.2	113.7	191.2	4780.3	5328.8	4660.9
Moldova	537.1	962.9	1542	176.1	1.3	556.5	361	961.6	985.5
Tajikistan	7360.3	5508.5	7971.1	12.6	20.7	11.2	7347.7	5487.8	7959.9
Turkmenistan	3043.9	3875.4	1795.4	60	0.6	25.2	2983.9	3874.8	1770.2
Ukraine	8067.7	6728.1	5222.8	15734.3	6968.6	16201.1	-7666.6	-240.5	-10978.3
Uzbekistan	2154.7	2233.1	3680.5	736.9	83.9	129.5	1417.8	2149.2	3551
OECD countries	620932.5	511153.9	634192.5	1863723.5	2317212.9	2608918.0	-1242791.0	-1806059.0	-1974725.5
Australia	64.2	2485.9	2150.6	3614.8	852.7	6816.3	-3550.6	1633.2	-4665.7
Austria	21974.7	4475.2	7700.9	84060.9	132396.2	47173	-62086.2	-127921	-39472.1
Belgium	8346.1	1674.2	9606.1	35310.6	26447.6	21098.2	-26964.5	-24773.4	-11492.1
Canada	3884.8	1288.1	2613.5	21350.3	21137.8	50518.6	-17465.5	-19849.7	-47905.1
Chile	31.7	39.1	1	-	-	-	31.7	39.1	1
Czech Republic	4702.3	1208.5	448	16266.8	16132.7	30160.8	-11564.5	-14924.2	-29712.8
Denmark	6638.2	4654.5	3928.6	24054.3	16883.5	56637.5	-17416.1	-12229	-52708.9
Estonia	416.5	152.7	750.3	1925.3	2782	700.9	-1508.8	-2629.3	49.4
Finland	4837.6	7186.6	30928.1	196087.1	69424.8	43619.6	-191249.5	-62238.2	-12691.5
France	20646.8	41488.1	20464.3	174907.1	63516.7	122477.7	-154260.3	-22028.6	-102013.4
Germany	47236.1	89801.3	54195.6	392597.9	714638.7	797123	-345361.9	-624837.4	-742927.4

(continued)

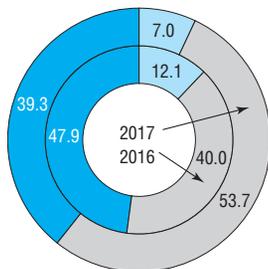
	Receipts from technology exports			Payments for technology imports			Technology balance of payments		
	2015	2016	2017	2015	2016	2017	2015	2016	2017
Greece	297.6	203.6	136.6	1406.6	1532	3009.4	-1109	-1328.4	-2872.8
Hungary	272.7	493.2	144659.5	1518.6	1559.7	476.5	-1245.9	-1066.5	144183
Iceland	-	-	14	-	-	-	-	-	14
Ireland	1916.4	3605.1	2180	5442.5	3397.1	4247.8	-3526.1	208	-2067.8
Israel	1574.8	1185.3	1222.3	505.8	513	1389.1	1069	672.3	-166.8
Italy	7204.6	53900	27806.6	53949.9	67341.3	325977.3	-46745.3	-13441.3	-298170.7
Japan	6553.5	2717	5015.3	39882.2	30219.6	49916	-33328.7	-27502.6	-44900.7
Latvia	846.1	936.5	2111.7	161.2	195.6	7368.4	684.9	740.9	-5256.7
Luxembourg	2953	10853.7	9941.1	29899.2	99212.2	98246.9	-26946.2	-88358.5	-88305.8
Mexico	21.6	6892.2	1575.9	53.6	-	3.3	-32	6892.2	1572.6
Netherlands	32305.2	31024.7	31388.3	81365.1	79179.1	122632	-49059.9	-48154.4	-91243.7
New Zealand	-	-	8.8	-	64.1	3909	-	-64.1	-3900.2
Norway	4663.2	4392.3	5039.8	3089.3	1134.4	4901.2	1573.9	3257.9	138.6
Poland	392.9	860.1	2183.2	7187.4	8974.9	10765.5	-6794.5	-8114.8	-8582.3
Portugal	1.9	20.7	182.8	414.3	26.6	49.2	-412.4	-5.9	133.6
Slovakia	53.6	65.8	302.5	479	591.3	453.4	-425.4	-525.5	-150.9
Slovenia	384.4	499	355.4	1075.9	1464.8	3548.7	-691.5	-965.8	-3193.3
South Korea	10024.7	3994.8	7631.8	44388.2	63857	73792.8	-34363.5	-59862.2	-66161
Spain	1808.1	1733.5	2578.6	28977.9	28488.3	36810.6	-27169.8	-26754.8	-34232
Sweden	4996.2	2839.4	4771.6	42724.1	16566.3	27216	-37727.9	-13726.9	-22444.4
Switzerland	16940.2	28261.7	23299.4	166535	136724.6	148667.3	-149594.8	-108462.9	-125367.9
Turkey	70293.4	40125.7	3160.2	11871.4	193031	110647.5	58422	-152905.3	-107487.3
United Kingdom	19546.9	39939.1	58187	138564.5	140054.3	136391	-119017.6	-100115.2	-78204
United States	319102.5	122156.3	167653.1	254056.7	378873	262173.5	65045.8	-256716.7	-94520.4

(continued)

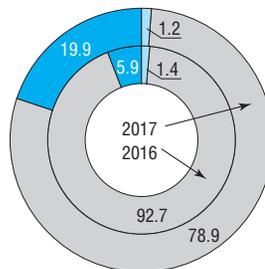
	Receipts from technology exports			Payments for technology imports			Technology balance of payments		
	2015	2016	2017	2015	2016	2017	2015	2016	2017
Other countries	899673.3	611816.8	463837.2	307526.4	147708.6	656166.1	592146.9	464108.2	-192328.9
Brazil	926.5	96.7	498.7	111.8	44.8	1017.9	814.7	51.9	-519.2
Bulgaria	14242.1	409.6	736	418.9	1554.1	2069.6	13823.2	-1144.5	-1333.6
China	460338.5	413321.1	135296.1	5899.7	49464.4	417345.5	454438.8	363856.7	-282049.4
Cyprus	9084.1	9947.7	6103.3	28103	31669.5	58324.2	-19018.9	-21721.8	-52220.9
Georgia	210.3	2287.9	4537.2	18.9	35.3	178.3	191.4	2252.6	4358.9
Hong Kong	7035.6	3948.2	772.6	1948.8	831	779	5086.8	3117.2	-6.4
India	85910.6	123348.1	230854.5	1735.9	1955.6	4724.6	84174.7	121392.5	226129.9
Iran	17011.2	17509.2	110	-	29	35.7	17011.2	17480.2	74.3
Romania	4480.9	49.4	335.4	427.6	563.2	1216.1	4053.3	-513.8	-880.7
Singapore	1118	1053.7	1223.8	5730.9	24690.4	7108.7	-4612.9	-23636.7	-5884.9
South Africa	838.9	53.7	316	677.3	637	2144.4	161.6	-583.3	-1828.4
Taiwan	991.7	969.6	846.6	63.2	82	118.5	928.5	887.6	728.1
Other	297484.9	38821.9	82207	262390.4	36152.3	161103.6	35094.5	2669.6	-78896.6

6.40. PERCENTAGE DISTRIBUTION OF TECHNOLOGY EXPORTS AND IMPORTS BY COUNTRY GROUP

Receipts from technology exports



Payments for technology imports



- CIS countries
- OECD countries
- Other countries

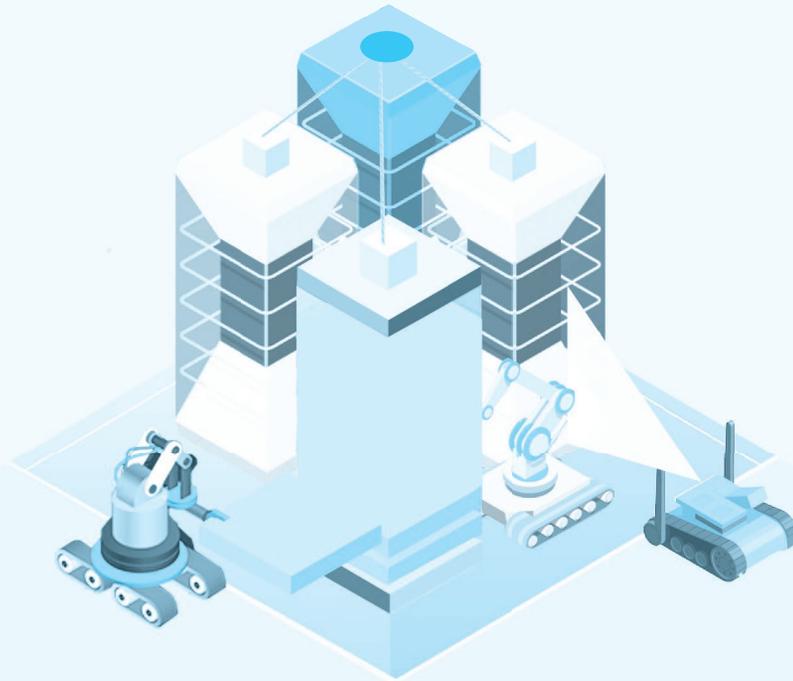
6.41. TECHNOLOGY BALANCE OF PAYMENTS BY SECTOR OF PERFORMANCE (thousand USD)

	Receipts from technology exports			Payments for technology imports			Technology balance of payments		
	2015	2016	2017	2015	2016	2017	2015	2016	2017
Total	1654732.1	1277023.5	1181183.9	2207406.8	2498677.8	3305202.5	-552674.7	-1221654.3	-2124018.6
Sectors of performance:									
government	56382.3	59424.3	20763.4	72446.0	136665.5	109745.4	-16063.7	-77241.2	-88982.0
business enterprise	1591990.1	1211037.1	1099892.0	2134075.5	2358091.6	3194835.2	-542085.4	-1147054.5	-2094943.2
higher education	6359.7	4416.8	57986.5	884.1	901.1	609.7	5475.6	3515.7	57376.8
private non-profit	-	2145.3	2542.0	1.2	3019.6	12.2	-1.2	-874.3	2529.8

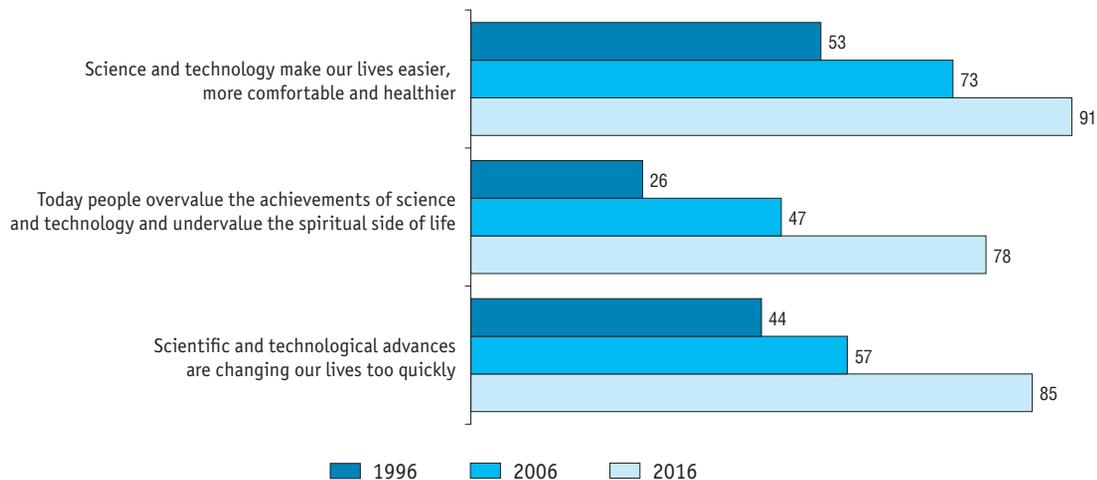
6.42. TECHNOLOGY BALANCE OF PAYMENTS BY TYPE OF ECONOMIC ACTIVITY: 2017

(thousand USD)

	Receipts from technology exports	Payments for technology imports	Technology balance of payments
Total	1181183.9	3305202.5	-2124018.6
Agriculture, forestry and fishing	1768.1	1119.8	648.3
Mining and quarrying	438.0	125552.2	-125114.2
Manufacturing	69628.0	1818148.2	-1748520.2
Electricity, gas, steam and air-conditioning supply	268934.1	9713.4	259220.7
Water supply; sewerage, waste management, and remediation activities	–	1.2	-1.2
Construction	6790.0	10763.9	-3973.9
Wholesale and retail trade; repair of motor vehicles and motorcycles	95576.1	164910.9	-69334.7
Transportation and storage	17331.9	62754.8	-45422.9
Accommodation and food service activities	–	80016.2	-80016.2
Information and communication	248071.1	36352.8	211718.3
Financial and insurance activities	–	1089.8	-1089.8
Real estate activities	375.3	6014.9	-5639.6
Professional, scientific and technical activities	464301.1	971659.9	-507358.8
Of which research and development	247797.4	909440.1	-661642.7
Administrative and support service activities	607.9	10213.8	-9605.9
Education	7210.4	657.9	6552.5
Of which higher education	7210.4	657.9	6552.5
Human health and social work activities	–	57.9	-57.9
Art, entertainment and recreation	3.1	6003.2	-6000.1
Other service activities	148.8	171.7	-22.9



7. Public Attitudes towards Science and Technology

7.1. PUBLIC OPINION ABOUT THE RISKS INVOLVING THE DEVELOPMENT OF SCIENCE, TECHNOLOGY AND ENGINEERING**(as a percentage of respondents aged 16 and over**)***Do you agree with the following statements?**

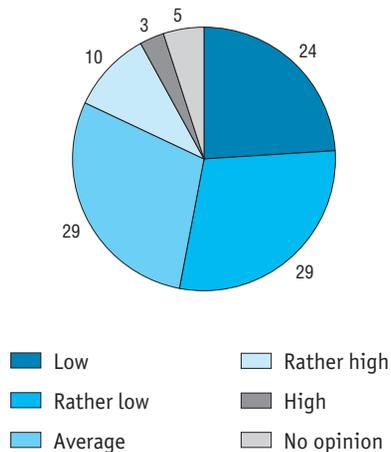
* Here and in diagram 7.2, the data are based on the results of representative surveys of the Russian population organised by the Institute for Statistical Studies and Economics of Knowledge of the National Research University Higher School of Economics within the framework of the HSE Basic Research Programme.

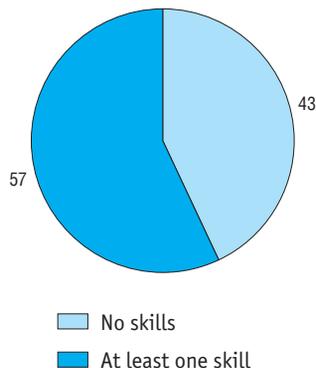
** The share of respondents who gave the answers 'strongly agree' and 'rather agree.'

7.2. PUBLIC OPINION ABOUT THE LEVEL OF AWARENESS ABOUT THE LATEST S&T ACHIEVEMENTS: 2016

(as a percentage of respondents aged 16 and over)

How would you rate your level of awareness of the latest advances in science and technology?



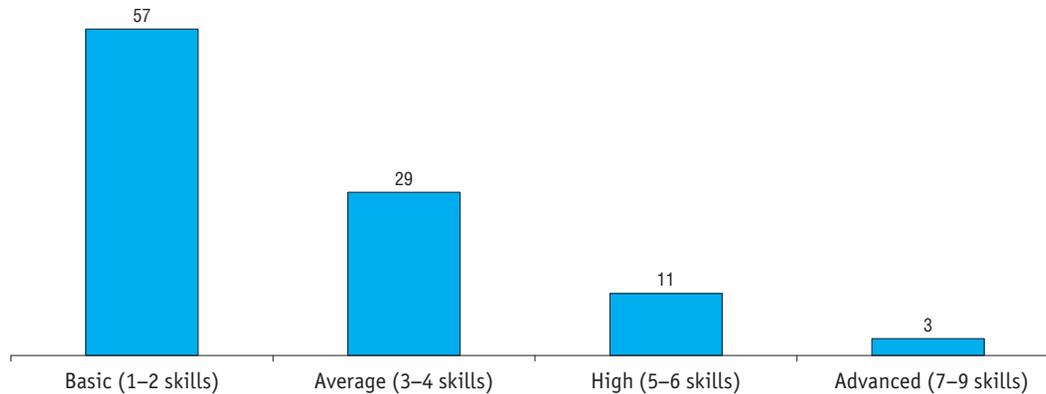
7.3. DIGITAL SKILLS: 2017**(as a percentage of the population aged 16–74)***What kind of actions have you performed when working with a computer within the last 12 months?**

- 1 – using word processing software
- 2 – using spreadsheet software
- 3 – using software to edit photos, video, and audio files
- 4 – creating e-presentations using special software (for example, Power Point)
- 5 – connecting and installing new devices
- 6 – writing software by oneself using a programming language
- 7 – transferring files between a computer and other devices (digital camera, player, mobile phone)
- 8 – changing software configuration settings
- 9 – installing or reinstalling an operating system

* Here and below, HSE estimates are based on the data from a representative survey of the Russian population on the use of information technologies and information and telecommunication networks, conducted by the Russian Federal State Statistics Service in 2017.

7.4. INDIVIDUALS' LEVEL OF DIGITAL SKILLS: 2017*

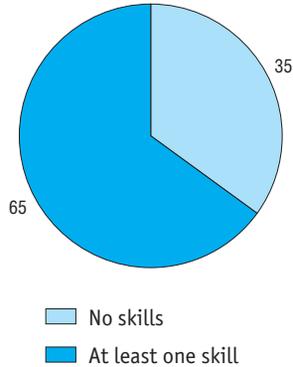
(as a percentage of respondents aged 16–74 who have at least one digital skill)



* Considered skills: working with digital devices and programs (see 7.3).

7.5. INTERNET SKILLS: 2017

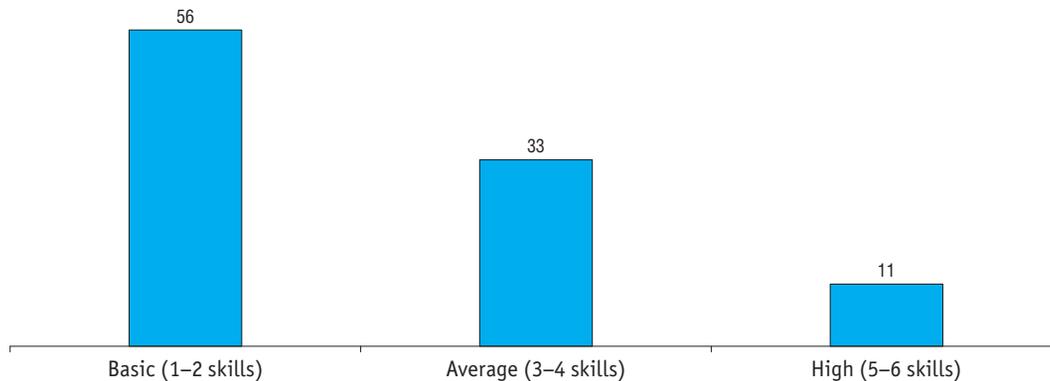
(as a percentage of respondents aged 16–74 who have used the Internet within the last three months)

What activities have you performed in the Internet within the last three months?

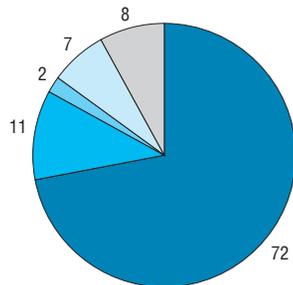
- 1 – searching for information about goods and services
- 2 – acquiring information and knowledge on general topics via Wikipedia, other online encyclopedias, etc.
- 3 – downloading movies, images, music; viewing videos; listening to music/radio
- 4 – downloading software (excluding computer games)
- 5 – reading/downloading online newspapers, magazines, or e-books
- 6 – uploading personal files (books, articles, photos, videos, software, etc.) to publicly accessible websites, social media, or cloud storage

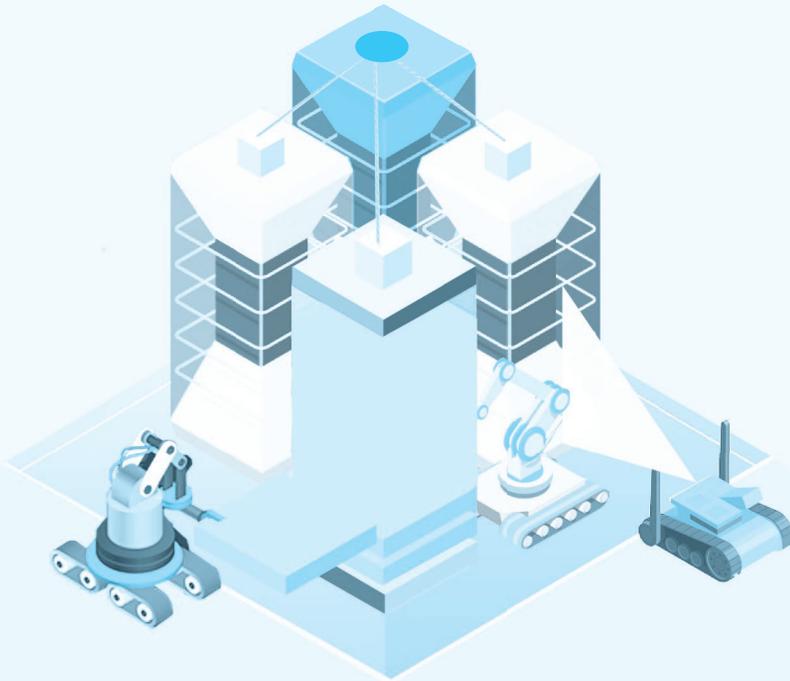
7.6. INDIVIDUALS' LEVEL OF INTERNET SKILLS: 2017*

(as a percentage of respondents aged 16–74 who have used the Internet within the last three months and have at least one Internet skill)



* Considered skills: working with information on the Internet (see 7.5).

7.7. PUBLIC OPINION ABOUT SCIENCE AND TECHNOLOGY INFLUENCE ON DAILY LIFE: 2017*(as a percentage of respondents aged 16 and over)***How do you assess the impact of information technologies and information and communication networks on your life?**



8. International Comparisons

8.1. GROSS DOMESTIC EXPENDITURE ON R&D

(million current USD PPPs)

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Russia	8122.3	10726.9	18115.0	33083.3	37912.8	38609.6	40339.2	39733.7	39873.9	42270.9
CIS countries										
Armenia	...	13.6	36.6	45.6	52.6	51.4	58.9	63.8	60.2	...
Azerbaijan	...	95.6	132.3	309.1	322.3	339.1	352.2	382.2	348.4	...
Belarus	...	432.0	654.7	1010.1	1088.5	1127.6	905.3	872.2	866.8	...
Kazakhstan	...	212.5	612.5	493.0	621.3	693.8	718.3	746.4	639.2	...
Kyrgyzstan	...	12.6	21.6	23.2	27.2	27.5	24.5	24.5	25.0	...
Moldova	...	...	42.2	60.0	62.8	59.2	66.1	66.2	62.8	...
Tajikistan	...	...	10.0	14.1	21.6	24.3	25.7	26.2	27.9	...
Ukraine	...	1799.1	3133.4	2930.9	2904.6	2990.3	2428.4	2097.8	1710.7	...
Uzbekistan	...	176.4	169.8	231.6	292.1	311.8	341.8	404.6	459.0	...
OECD countries										
Australia	...	7945.3	...	20591.9	...	23129.7	...	21198.5	...	...
Austria	2876.6	4438.6	6837.0	9586.5	11415.1	12007.9	12797.2	13139.4	13625.5	...
Belgium	3742.1	5514.7	6225.2	8958.2	10715.0	11358.6	11935.9	12626.9	13087.9	...
Canada	11374.2	16745.4	23090.0	24903.1	26019.5	26506.5	27793.5	26385.9	26072.0	26222.4
Chile	...	...	...	1022.7	1355.5	1532.6	1517.6	1540.4	1523.9	...
Czech Republic	1251.7	1848.0	2619.5	3878.1	5441.6	6089.3	6699.4	6809.5	6162.2	...
Denmark	2121.5	...	4429.5	6965.4	7468.8	7793.6	7877.6	8181.5	8063.6	...
Estonia	...	79.0	206.7	454.9	730.6	624.1	544.2	561.6	501.5	...
Finland	2201.8	4493.9	5588.7	7748.7	7520.0	7382.8	7178.2	6677.0	6546.9	...
France	27680.4	33269.5	39530.1	50908.2	55097.7	58353.3	60585.6	61239.8	62162.7	...
Germany	41036.6	53665.5	63868.1	87047.6	100490.1	102905.5	109562.7	113921.8	118158.5	...

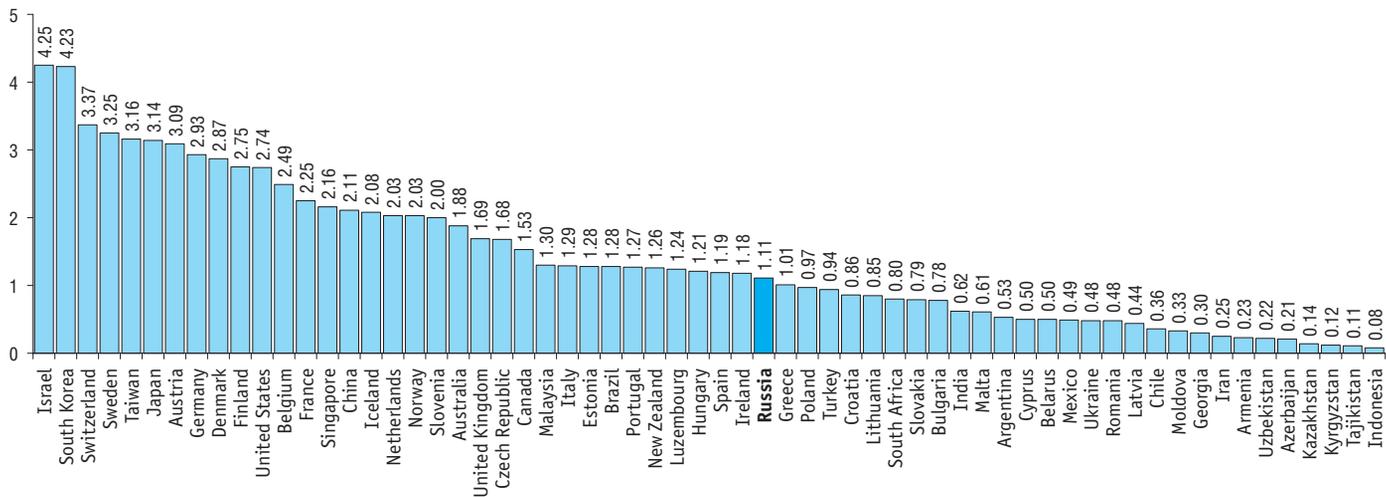
(continued)

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Greece	679.5	...	1627.0	1875.0	1953.7	2321.7	2436.0	2791.7	2904.4	...
Hungary	669.2	957.3	1586.8	2456.2	2895.0	3361.4	3408.4	3512.1	3160.4	...
Iceland	96.6	215.4	296.8	...	...	243.3	291.6	341.0	353.3	...
Ireland	836.4	1245.7	2006.5	3145.2	3351.0	3512.2	3625.3	3855.3	3995.0	...
Israel	2665.6	6168.3	6966.3	8663.3	10437.4	11420.3	11760.9	12839.0	13536.2	...
Italy	11865.2	15471.4	18241.2	25406.5	27419.6	28459.4	29448.3	29833.3	29915.9	...
Japan	76573.7	98918.9	128694.6	140619.1	152325.6	164655.8	169554.1	169673.1	168644.9	...
Latvia	59.1	82.8	164.2	225.2	287.2	279.4	327.2	303.3	222.1	...
Luxembourg	...	380.7	498.8	652.8	619.1	676.6	712.3	742.3	741.1	...
Mexico	1941.5	3362.8	5346.2	9291.1	9799.0	10292.5	11519.2	11376.3	11025.9	...
Netherlands	6595.8	9084.1	10892.4	12764.8	15177.7	15969.2	16404.4	16812.6	17493.3	...
New Zealand	607.8	...	1189.3	...	...	1856.9	...	2197.2	...	...
Norway	1751.1	...	3275.8	4676.7	5316.3	5620.4	5805.6	6185.9	6255.8	...
Poland	1830.4	2616.2	2984.9	5776.5	7990.8	8185.8	9149.3	10139.9	10037.5	...
Portugal	745.2	1401.5	1808.2	4429.3	3832.4	3869.8	3856.2	3801.2	4006.6	...
Slovakia	420.2	391.2	441.0	830.0	1159.9	1243.8	1379.5	1881.9	1306.3	...
Slovenia	402.8	486.8	676.5	1170.4	1529.9	1583.7	1505.7	1426.4	1352.9	...
South Korea	13195.6	18533.1	30618.3	52172.8	64862.5	68234.1	73099.8	75734.1	79354.3	...
Spain	4979.0	7729.6	13251.1	20086.7	19269.2	19282.4	19356.2	19722.9	20006.5	...
Sweden	6303.2	...	10388.2	12555.5	13970.4	14496.4	14191.1	15324.8	15795.5	...
Switzerland	...	5967.3	...	...	14744.9	...	...	17788.0	...	...
Turkey	1664.6	2835.0	4595.6	10079.1	12807.9	13834.8	15933.0	17142.1	18963.4	...
United Kingdom	19653.1	25145.2	30639.7	37573.3	38490.2	41532.1	43811.1	45345.0	47244.5	...
United States	184077.0	269513.0	328128.0	410093.0	434348.0	454821.0	476460.0	496585.0	511089.0	...

(continued)

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
EU countries which are not OECD members										
Bulgaria	...	259.6	348.9	624.0	716.2	767.9	999.5	1257.8	1084.7	...
Croatia	...	496.6	564.7	631.8	677.4	752.5	736.7	808.1	847.4	...
Cyprus	...	33.5	75.3	123.3	120.7	127.4	132.4	129.3	141.2	...
Lithuania	...	173.0	360.7	488.5	659.1	750.5	851.0	877.4	729.8	...
Malta	...	...	47.6	70.1	102.2	102.4	103.9	119.4	101.8	...
Romania	932.4	480.7	844.7	1571.0	1837.3	1534.5	1569.5	2084.9	2189.3	...
Other countries										
Argentina	...	1769.1	2275.8	4263.0	5265.7	5337.6	5042.6	5555.6	4733.3	...
Brazil	...	15823.5	20520.2	32516.9	34796.4	38645.5	42124.5	41104.1	...	...
China	12804.1	33080.4	86836.1	213485.7	292196.4	334116.6	370589.8	407415.1	451201.4	...
Georgia	...	24.6	32.3	...	...	27.0	63.5	114.5	112.2	...
India	...	15978.0	27066.0	43674.8	...	...	...	50118.7	...	...
Indonesia	...	618.9	...	...	...	2130.3	...	...	...	...
Iran	...	...	6098.7	3466.3	4097.8	3317.2	...	...	...	...
Malaysia	...	1405.8	...	6023.5	7333.3	...	9728.3	10659.7	...	...
Singapore	1266.5	3006.5	5085.7	7218.1	8232.7	8756.7	10066.7	...	...	...
South Africa	...	...	4045.9	4428.3	4836.9	4977.5	5478.1	5811.3	...	...
Taiwan	5608.5	9182.7	15298.9	25060.8	29055.1	30718.3	32484.0	33575.2	35756.9	...

8.2. GROSS DOMESTIC EXPENDITURE ON R&D AS A PERCENTAGE OF GDP: 2017*



* Or the nearest years for which data are available.

8.3. PERCENTAGE DISTRIBUTION OF GROSS DOMESTIC EXPENDITURE ON R&D BY SECTOR OF PERFORMANCE: 2017*

	Gross domestic expenditure on R&D	Government sector	Business enterprise sector	Higher education sector	Private non-profit sector
Russia	100	30.4	60.1	9.0	0.4
CIS countries					
Armenia	100	84.1	...	15.9	...
Azerbaijan	100	85.3	4.9	9.3	0.5
Belarus	100	23.5	66.8	9.6	0.03
Kazakhstan	100	28.0	43.4	17.3	11.3
Kyrgyzstan	100	73.4	12.6	14.1	...
Moldova	100	68.9	19.1	12.0	...
Tajikistan	100	85.2	...	14.8	...
Ukraine	100	31.8	61.9	6.3	...
Uzbekistan	100	40.6	39.4	18.7	1.2
OECD countries					
Australia	100	12.7	53.4	30.6	3.2
Austria	100	4.6	71.4	23.5	0.5
Belgium	100	9.5	69.7	20.2	0.6
Canada	100	7.2	51.0	41.3	0.5
Chile	100	13.2	38.5	41.8	6.5
Czech Republic	100	18.2	61.1	20.4	0.2
Denmark	100	2.2	65.8	31.6	0.3
Estonia	100	11.4	51.5	35.5	1.5
Finland	100	8.2	65.8	25.1	0.9
France	100	12.9	63.6	22.0	1.6
Germany	100	13.8	68.2	18.0	...

* Or the nearest years for which the data are available.

(continued)

	Gross domestic expenditure on R&D	Government sector	Business enterprise sector	Higher education sector	Private non-profit sector
Greece	100	25.0	42.2	31.9	0.9
Hungary	100	13.4	74.1	11.1	...
Iceland	100	4.9	63.0	32.1	...
Ireland	100	4.1	70.7	25.2	...
Israel	100	1.7	85.6	11.7	1.0
Italy	100	13.2	58.3	25.5	3.0
Japan	100	7.5	78.8	12.3	1.4
Latvia	100	31.8	24.5	43.8	...
Luxembourg	100	29.9	51.5	18.6	...
Mexico	100	36.5	30.6	26.8	6.2
Netherlands	100	11.5	56.9	31.5	...
New Zealand	100	20.3	49.8	29.9	...
Norway	100	14.2	53.3	32.6	...
Poland	100	2.5	65.7	31.4	0.4
Portugal	100	5.4	47.8	45.1	1.6
Slovakia	100	21.4	50.4	27.7	0.5
Slovenia	100	13.5	75.6	10.9	0.0
South Korea	100	11.5	77.7	9.1	1.6
Spain	100	18.5	53.7	27.5	0.2
Sweden	100	3.4	69.6	26.8	0.2
Switzerland	100	0.9	71.0	26.7	1.5
Turkey	100	9.5	54.2	36.3	...
United Kingdom	100	6.3	67.0	24.6	2.1
United States	100	11.5	71.2	13.2	4.1

(continued)

	Gross domestic expenditure on R&D	Government sector	Business enterprise sector	Higher education sector	Private non-profit sector
EU countries which are not OECD members					
Bulgaria	100	21.2	73.3	5.2	0.3
Croatia	100	21.8	44.9	33.3	...
Cyprus	100	11.5	32.9	42.1	13.5
Lithuania	100	26.1	35.0	38.9	...
Malta	100	1.1	63.5	35.4	...
Romania	100	33.3	55.2	11.3	0.2
Other countries					
Argentina	100	49.5	23.9	25.8	0.8
China	100	15.7	77.5	6.8	...
Georgia	100	15.0	...	85.0	...
India	100	52.5	43.6	3.9	...
Indonesia	100	39.4	25.7	34.9	...
Iran	100	56.1	10.6	33.3	...
Malaysia	100	19.6	52.0	28.5	...
Singapore	100	11.4	61.2	27.4	...
South Africa	100	24.0	42.7	30.5	2.8
Taiwan	100	13.1	77.6	9.0	0.3

8.4. PERCENTAGE DISTRIBUTION OF GROSS DOMESTIC EXPENDITURE ON R&D BY SOURCE OF FUNDS: 2017*

	Gross domestic expenditure on R&D	Government funds	Business enterprise sector funds	Other national sources	Funds from abroad
Russia	100	66.2**	30.2	1.0	2.6
CIS countries					
Armenia	100	72.9	...	...	1.8
Azerbaijan	100	68.5	29.9	1.6	...
Belarus	100	44.7	38.7	...	16.6
Kazakhstan	100	53.2	39.6	...	1.5
Kyrgyzstan	100	88.9	4.7	0.3	1.9
Moldova	100	...	...	...	4.2
Tajikistan	100	100.0	...	...	...
Ukraine	100	39.3	36.9	0.2	22.1
Uzbekistan	100	56.3	40.2	...	0.8
OECD countries					
Australia	100	34.6	61.9	1.9	1.6
Austria	100	30.7	53.4	0.5	15.5
Belgium	100	22.5	58.6	2.4	16.5
Canada	100	33.0	40.6	15.8	10.7
Chile	100	46.4	35.8	15.9	1.9
Czech Republic	100	35.6	39.5	0.9	24.0
Denmark	100	29.4	59.4	4.7	6.6
Estonia	100	37.6	48.2	0.6	13.6
Finland	100	28.9	54.8	1.8	14.5
France	100	34.8	54.0	3.5	7.6
Germany	100	28.5	65.2	0.3	5.9

* Or the nearest years for which data are available.

** Including budget funds, budget appropriations for higher education institutions, and government sector institutions' funds (including own funds).

(continued)

	Gross domestic expenditure on R&D	Government funds	Business enterprise sector funds	Other national sources	Funds from abroad
Greece	100	42.6	40.2	2.7	14.6
Hungary	100	34.6	49.7	0.7	15.0
Iceland	100	34.2	35.0	8.4	22.4
Ireland	100	25.9	48.4	1.9	23.8
Israel	100	12.8	34.3	1.3	51.6
Italy	100	38.0	50.0	3.7	8.3
Japan	100	15.0	78.1	6.2	0.7
Latvia	100	32.7	20.0	2.2	45.0
Luxembourg	100	47.7	47.1	1.9	3.4
Mexico	100	67.4	20.7	11.4	0.6
Netherlands	100	33.1	48.6	2.7	15.5
New Zealand	100	37.1	43.1	11.5	8.2
Norway	100	45.7	43.2	1.7	9.5
Poland	100	41.8	39.0	2.4	16.7
Portugal	100	44.3	42.7	5.7	7.4
Slovakia	100	31.9	25.1	3.6	39.4
Slovenia	100	19.9	69.2	0.3	10.6
South Korea	100	22.7	75.4	1.0	0.9
Spain	100	40.9	45.8	5.2	8.0
Sweden	100	...	57.3	4.3	...
Switzerland	100	24.4	63.5	1.9	10.2
Turkey	100	27.6	50.1	21.3	1.1
United Kingdom	100	27.7	49.0	6.3	17.1
United States	100	25.1	62.3	7.4	5.2

(continued)

	Gross domestic expenditure on R&D	Government funds	Business enterprise sector funds	Other national sources	Funds from abroad
EU countries which are not OECD members					
Bulgaria	100	20.3	35.6	0.2	43.8
Croatia	100	36.4	46.6	2.5	14.5
Cyprus	100	50.6	20.0	6.4	23.0
Lithuania	100	35.3	28.5	1.8	34.3
Malta	100	32.8	45.6	1.2	20.4
Romania	100	41.7	37.3	1.8	19.2
Other countries					
Argentina	100	73.1	18.2	2.4	6.3
Brazil	100	50.2	47.5	2.3	...
China	100	20.0	76.1	...	0.7
Georgia	100	46.7	...	39.2	14.7
Iran	100	61.6	30.9	7.4	...
Malaysia	100	35.8	49.6	7.0	1.7
Singapore	100	37.1	54.1	2.0	6.8
South Africa	100	44.6	38.9	3.5	13.0
Taiwan	100	21.3	77.7	0.8	0.1

8.5. PERCENTAGE DISTRIBUTION OF GROSS DOMESTIC EXPENDITURE ON R&D BY FIELD OF SCIENCE AND TECHNOLOGY: 2017*

	Total	Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities
Russia	100	16.1	74.9	3.7	1.4	2.6	1.3
CIS countries							
Armenia	100	57.8	18.9	2.9	0.9	5.1	14.3
Azerbaijan	100	26.1	42.7	7.2	6.6	7.5	10.0
Belarus	100	17.0	68.8	3.6	5.7	3.3	1.7
Kazakhstan	100	35.3	45.3	3.4	10.3	1.6	4.0
Kyrgyzstan	100	48.7	21.1	10.5	8.7	1.8	9.2
Moldova	100	36.0	22.9	10.7	15.8	8.0	6.6
Tajikistan	100	24.6	12.9	7.7	27.5	8.4	18.9
Ukraine	100	21.1	65.2	2.8	5.6	3.3	2.0
Uzbekistan	100	32.6	35.1	6.5	8.3	10.7	6.7
OECD countries							
Australia	100	30.8	41.8	15.2	4.8	6.0	1.5
Chile	100	26.5	34.2	10.4	16.1	10.5	2.3
Czech Republic	100	33.9	50.3	6.5	2.6	3.6	3.1
Greece	100	15.1	39.9	20.5	4.7	8.4	11.3
Hungary	100	28.9	51.5	6.5	4.8	4.6	2.5
Iceland	100	15.9	47.5	4.8	8.7	19.3	3.8
Latvia	100	31.9	34.0	11.1	9.1	10.7	3.3
Mexico	100	20.8	44.2	10.5	6.4	12.2	5.9
Netherlands	100	23.2	39.6	16.9	8.0	9.2	3.1
Poland	100	21.6	53.5	11.5	4.5	5.1	3.7
Portugal	100	24.2	40.7	12.9	3.3	12.4	6.5
Slovakia	100	15.9	48.0	7.5	8.0	17.1	3.4

* Or the nearest years for which data are available. For individual countries, the total does not equal 100%.

** Including humanities.

(continued)

	Total	Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities
Slovenia	100	29.1	48.3	14.0	2.0	3.7	2.8
South Korea	100	18.0	71.2	4.9	1.9	2.3	1.6
Spain	100	19.1	53.1	14.2	5.9	5.1	2.5
Turkey	100	11.2	54.3	15.0	4.1	9.9	5.6
United Kingdom	100	7.2	5.2	8.0	1.4	6.7	6.2
EU countries which are not OECD members							
Bulgaria	100	13.8	44.7	31.6	4.1	2.5	3.2
Croatia	100	19.5	37.3	22.7	7.4	8.3	4.8
Cyprus	100	42.6	22.4	3.6	7.9	15.3	8.2
Lithuania	100	27.0	15.1	9.6	5.0	9.3	6.5
Malta	100	20.4	34.5	24.4	5.2	9.5	6.0
Romania	100	17.3	59.5	11.3	5.9	3.6	2.4
Other countries							
Argentina	100	21.7	23.1	5.3	10.5	11.7	5.9
China	100	16.6	70.8	3.4	7.1	2.1**	...
Georgia	100	14.2	21.8	14.7	...	15.6	17.4
India	100	22.6	47.6	6.8	14.5	2.9	...
Malaysia	100	53.0	23.8	8.0	7.4	7.0	0.9
Singapore	100	12.9	59.3	18.5	3.1	...	...
South Africa	100	27.5	26.0	18.2	8.6	17.5	2.3
Taiwan	100	10.1	77.9	6.9	2.1	2.2	0.9

8.6. PERCENTAGE DISTRIBUTION OF CURRENT EXPENDITURE ON R&D BY TYPE OF R&D ACTIVITY: 2017*

	Current expenditure on R&D	Basic research	Applied research	Development
Russia	100	14.9	18.2	67.0
CIS countries				
Armenia	100	36.9	5.4	50.9
Azerbaijan	100	55.5	17.6	7.7
Belarus	100	14.8	31.7	53.6
Kazakhstan**	100	20.7	53.8	25.5
Kyrgyzstan	100	59.4	13.3	27.3
Moldova	100	25.7	55.3	19.0
Tajikistan	100	60.1	20.3	17.9
Ukraine	100	20.1	22.4	57.5
Uzbekistan	100	20.9	34.2	29.4
OECD countries				
Australia**	100	20.1	38.7	41.2
Austria**	100	17.6	34.5	46.2
Belgium**	100	15.6	45.4	39.0
Chile	100	33.0	40.9	26.1
Czech Republic**	100	31.6	36.9	31.4
Denmark	100	19.6	37.3	43.1
Estonia**	100	26.7	25.3	48.0
France	100	24.5	39.1	36.4
Greece**	100	35.9	39.1	25.0
Hungary	100	18.7	26.4	55.0
Iceland**	100	22.1	48.8	29.2
Ireland**	100	16.9	36.1	45.9

(continued)

	Current expenditure on R&D	Basic research	Applied research	Development
Israel**	100	11.6	11.0	77.4
Italy**	100	24.4	45.4	30.2
Japan	100	13.2	19.7	67.1
Latvia**	100	34.5	44.2	21.4
Luxembourg**	100	38.1	46.7	15.2
Mexico**	100	28.2	30.1	41.7
Netherlands**	100	27.0	44.6	28.4
New Zealand**	100	24.0	42.0	34.0
Norway	100	18.5	38.1	43.4
Poland**	100	31.9	20.3	47.8
Portugal**	100	23.1	39.5	37.4
Slovakia**	100	42.8	30.3	27.0
Slovenia**	100	17.7	58.3	24.0
South Korea**	100	16.0	22.5	61.5
Spain**	100	22.0	40.9	37.1
Switzerland**	100	38.2	28.5	33.3
United Kingdom**	100	16.7	44.3	39.0
United States	100	16.9	19.7	63.4
EU countries which are not OECD members				
Bulgaria**	100	9.0	67.1	23.9
Croatia**	100	32.0	36.8	31.2
Cyprus**	100	20.5	60.8	18.7
Lithuania**	100	30.4	45.9	23.7
Malta**	100	67.2	23.5	9.3
Romania	100	29.9	50.0	20.0

(continued)

	Current expenditure on R&D	Basic research	Applied research	Development
Other countries				
Argentina**	100	28.9	42.3	28.7
China**	100	5.2	10.3	84.5
Georgia**	100	24.9	7.6	...
India**	100	16.0	22.3	23.5
Malaysia	100	20.4	70.6	9.0
Singapore**	100	19.7	32.1	48.3
South Africa **	100	25.4	47.5	27.1
Taiwan**	100	8.2	22.9	68.9

* Or the nearest years for which data are available. For several countries, the total does not equal 100%.

** As a percentage of gross domestic expenditure on R&D.

8.7. GOVERNMENT BUDGET APPROPRIATIONS ON R&D

(million current USD PPPs)

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
Russia	5977.1	4784.6	13254.0	26076.7	29851.1	34072.8	34336.5	34304.7	38139.1	28231.8
OECD countries										
Australia	2319.1	2852.5	3729.1	4664.9	4487.1	4961.7	4890.1	4735.6	4711.1	4858.2
Austria	1224.9	1418.3	1836.6	2697.7	3014.8	3246.3	3314.3	3435.1	3592.7	3563.9
Belgium	1147.5	1581.1	2004.6	2841.6	3028.1	3129.0	3409.3	3166.4	3342.9	3571.6
Canada	3835.5	4589.6	6777.1	8480.6	7746.2	8192.0	7937.5	7953.8	...	...
Chile	...	...	...	...	726.4	812.3	859.7	833.1	...	...
Czech Republic	...	827.5	1129.0	1654.6	1966.6	2088.7	2147.8	2137.4	2152.6	2492.0
Denmark	768.8	1135.5	1329.3	2352.3	2511.6	2673.5	2707.4	2786.0	2593.1	2682.3
Estonia	...	43.6	89.9	200.8	279.9	294.7	269.2	260.5	269.2	...
Finland	943.0	1316.8	1648.0	2299.6	2272.1	2228.8	2206.3	2201.4	2028.8	2086.3
France	13375.1	14877.7	18220.2	19160.3	17925.9	18457.1	18349.2	17415.7	17430.8	...
Germany	16407.3	17231.2	19732.0	28615.0	30575.2	32745.9	33186.3	34046.0	35214.7	37221.1
Greece	402.0	627.2	895.8	948.2	1069.1	1360.1	1278.9	1512.4	1566.7	...
Hungary	...	...	696.1	761.9	777.0	1574.2	702.5	721.0	1035.7	...
Iceland	45.6	75.8	94.0	119.4	130.7	145.6	78.8	85.4	96.6	113.4
Ireland	215.2	320.0	710.7	971.8	914.1	889.5	887.4	906.0	886.1	...
Israel	884.1	1293.6	1044.9	1355.9	1568.8	1686.1	1749.9	1863.5	2057.5	...
Italy	6835.7	9507.0	11199.3	12360.9	11798.8	11453.0	11425.0	11271.9	12090.4	...
Japan	14316.6	21227.9	27617.8	32152.6	35413.2	35633.5	35431.8	33841.6	34455.5	35010.5
Latvia	31.3	34.3	57.4	59.4	64.4	64.9	76.8	92.9	105.8	...
Luxembourg	...	24.7	81.5	235.8	294.9	333.9	359.1	364.7	364.5	388.0
Mexico	1263.3	2119.2	2963.4	5141.1	5850.8	6321.0	7184.7	6915.0	6283.1	5784.9
Netherlands	2848.8	3801.0	4391.9	5692.4	5672.9	6006.6	6026.0	5991.5	6034.1	6266.3

(continued)

	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017
New Zealand	308.0	...	...	681.4	735.4	756.4	882.1	880.8	915.8	1025.9
Norway	831.6	1062.1	1535.9	2382.5	2564.1	2759.7	2903.4	2976.0	3055.6	3260.5
Poland	1153.3	1546.2	1548.8	2910.0	3192.1	3426.5	4185.8	4120.2	1656.6	...
Portugal	589.5	1079.0	1045.6	1564.7	974.0	1155.9	1087.4	1168.4	1209.4	1203.3
Slovakia	175.3	216.7	244.6	504.1	584.1	588.9	595.9	671.2	616.1	601.4
Slovenia	...	175.7	273.3	341.8	313.1	295.6	272.9	267.2	272.1	...
South Korea	...	5017.9	9886.5	16300.1	18744.5	19730.2	20391.9	21689.4	21894.1	...
Spain	2999.9	5134.2	6440.7	11439.4	8899.8	8420.5	8721.4	9047.4	9136.1	...
Sweden	2090.8	1725.6	2508.0	3272.5	3602.1	3662.5	3766.5	3702.2	3788.7	4030.8
Switzerland	...	1526.0	...	3167.5	4022.5	...	4451.7	4736.2	...	...
Turkey	...	...	...	4117.5	4435.2	5445.5	5080.2	5132.9	5777.7	5634.5
United Kingdom	7901.3	9490.7	12116.1	13328.8	12974.6	14362.8	14663.0	14506.1	14604.0	...
United States	68791.0	83612.5	131259.0	148962.0	143737.0	132477.0	136159.0	138544.0	150392.0	151380.0
Other countries										
Argentina	...	997.7	1219.9	2384.0	2711.2	...	...	...	...	...
Romania	530.6	182.7	448.5	968.6	821.2	818.3	872.6	1101.0	1273.2	949.4
Taiwan	...	2967.0	4886.4	7044.2	7350.6	7303.0	7368.9	7568.5	7968.3	8266.4

8.8. R&D PERSONNEL: 2017*
(*person-years; in full-time equivalent*)

	R&D personnel	Researchers
Russia	778155	410617
CIS countries		
Armenia	4881	3682
Azerbaijan	22527	15548
Belarus	25942	16879
Kazakhstan	16664	12369
Kyrgyzstan	4496	3454
Moldova	3939	2577
Tajikistan	3894	2601
Ukraine	71071	44177
Uzbekistan	20929	15911
OECD countries		
Australia	147809	100414
Austria	73643	44933
Belgium	79766	53771
Canada	237280	162090
Chile	16633	8993
Czech Republic	65783	37338
Denmark	60290	42923
Estonia	5772	4338
Finland	47429	35908
France	428643	277631

* Or nearest years for which data are available. For several CIS countries (except Russia, Moldova, Uzbekistan, and Ukraine), Iran, and Indonesia, the calculation is headcount-based, for the rest of the countries it is FTE-based.

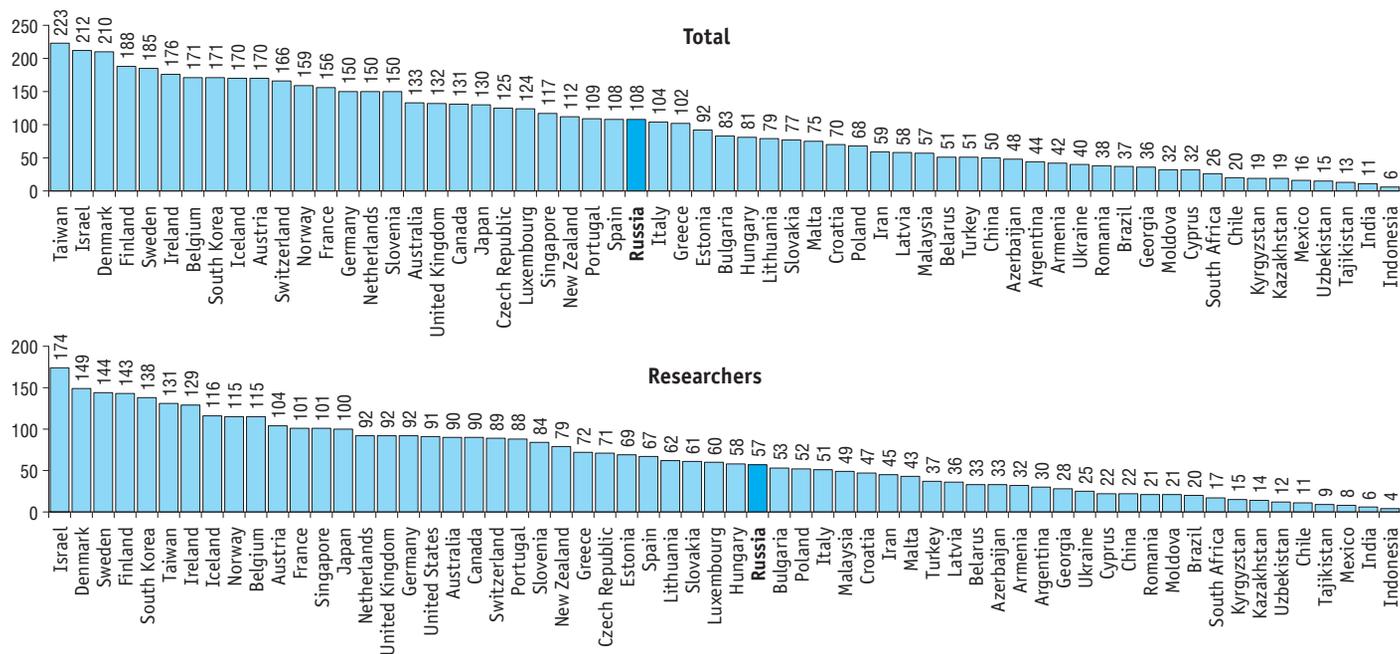
(continued)

	R&D personnel	Researchers
Germany	656727	400821
Great Britain	419898	291416
Greece	41790	29403
Hungary	35757	25804
Iceland	3247	2206
Ireland	36087	26293
Israel	77143	63521
Italy	258585	126674
Japan	872340	665566
Latvia	5120	3152
Luxembourg	5196	2505
Mexico	59073	29921
Netherlands	133214	82264
New Zealand	26400	18700
Norway	43918	31913
Poland	109249	82594
Portugal	50912	40746
Slovakia	17768	14149
Slovenia	14357	8102
South Korea	447408	361292
Spain	205873	126633
Sweden	90690	70372
Switzerland	81451	43740
Turkey	136953	100158
United States	...	1379977

(continued)

	R&D personnel	Researchers
EU countries which are not OECD members		
Bulgaria	25060	16001
Croatia	11197	7555
Cyprus	1260	855
Lithuania	10924	8526
Malta	1430	829
Romania	32232	18046
Other countries		
Argentina	79333	54046
Brazil	347737	183853
China	3878057	1692176
Georgia	6745	5247
India	528219	282994
Indonesia	55118	41143
Iran	131430	100014
Malaysia	82360	69864
Singapore	42543	36666
South Africa	41055	26159
Taiwan	251042	147710

8.9. R&D PERSONNEL PER 10,000 EMPLOYMENT: 2017*
(headcount)



* Or nearest years for which the data are available. For several CIS countries (except Russia, Moldova, Uzbekistan and Ukraine), Iran, and Indonesia the calculation is headcount based, for the rest of the countries it is FTE-based.

8.10. PERCENTAGE DISTRIBUTION OF RESEARCHERS BY SECTOR OF PERFORMANCE: 2017*

(percentage)

	Government sector	Business enterprise sector	Higher education sector
Russia	34.0	47.1	18.5
CIS countries			
Armenia	81.3	...	18.7
Azerbaijan	51.0	4.7	44.2
Belarus	29.9	59.0	11.1
Kazakhstan	29.6	16.6	47.9
Kyrgyzstan	39.3	6.7	54.0
Moldova	73.0	6.6	20.4
Tajikistan	70.9	...	29.1
Ukraine	49.3	29.1	21.6
Uzbekistan	25.8	13.5	60.0
OECD countries			
Australia	8.9	29.9	57.8
Austria	3.9	64.0	31.4
Belgium	7.8	52.3	39.2
Canada	5.7	57.8	37.1
Chile	14.4	29.5	48.5
Czech Republic	20.1	51.4	28.2
Denmark	3.3	58.9	37.4
Estonia	11.6	30.4	55.9
Finland	8.9	56.4	33.4
France	10.2	59.7	28.7

* Or nearest years for which data are available. For several CIS countries (except Russia, Moldova, Uzbekistan, and Ukraine), Iran, and Indonesia, the calculation is head-count-based, for the rest of the countries it is FTE-based.

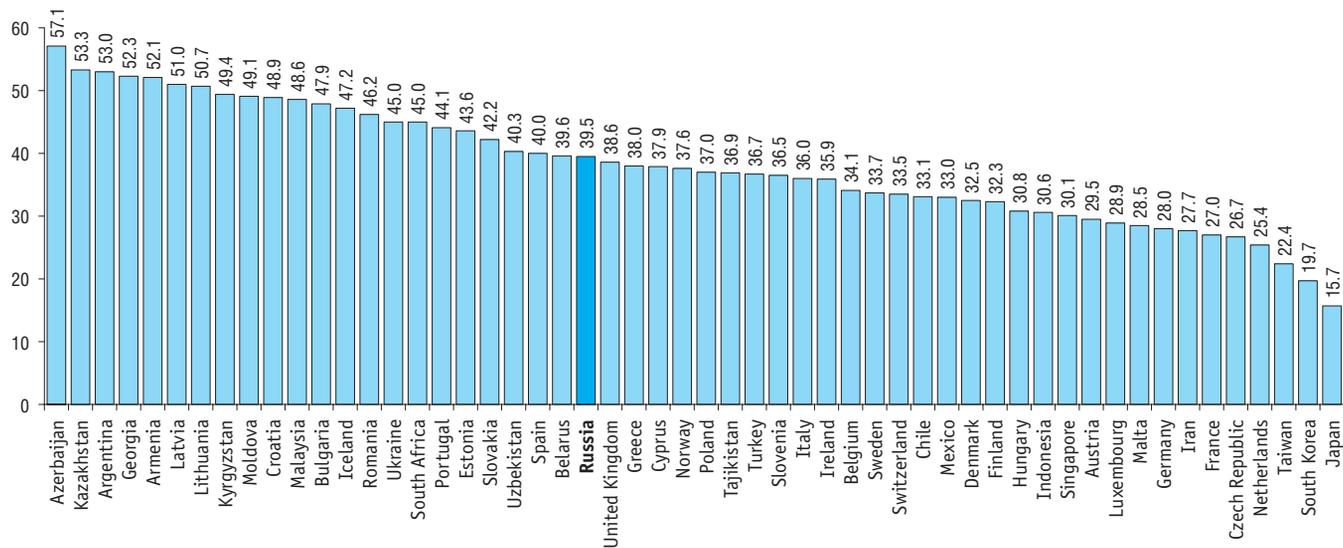
(continued)

	Government sector	Business enterprise sector	Higher education sector
Germany	13.5	58.8	27.4
Greece	21.3	19.1	58.6
Hungary	19.2	59.1	21.7
Iceland	6.5	36.9	52.2
Ireland	1.9	42.5	55.5
Israel	0.8	83.7	14.9
Italy	17.0	39.8	39.4
Japan	4.5	73.4	20.7
Latvia	19.9	18.5	61.7
Luxembourg	24.6	37.8	37.6
Mexico	24.3	24.5	48.2
Netherlands	11.1	61.4	27.5
New Zealand	10.2	36.9	52.9
Norway	15.0	48.0	37.0
Poland	16.5	34.8	48.6
Portugal	3.2	30.7	64.9
Slovakia	21.8	20.1	57.6
Slovenia	20.6	55.2	24.1
South Korea	7.5	79.7	11.3
Spain	16.3	37.3	46.1
Sweden	4.8	67.0	28.0
Switzerland	1.1	50.1	48.9
Turkey	6.7	52.4	40.9
United Kingdom	2.3	37.8	58.4
United States	...	71.1	...

(continued)

	Government sector	Business enterprise sector	Higher education sector
EU countries which are not OECD members			
Bulgaria	29.3	38.2	32.2
Croatia	22.6	20.9	56.5
Cyprus	9.4	25.7	57.3
Lithuania	18.5	22.9	58.6
Malta	1.8	58.4	39.8
Romania	37.4	26.9	35.0
Other countries			
Argentina	50.3	8.1	41.2
Brazil	3.3	26.1	69.9
China	19.9	61.9	18.2
Georgia	8.9	...	91.1
India	30.3	26.4	40.0
Indonesia	27.0	18.4	54.5
Iran	21.4	9.0	69.6
Malaysia	9.6	12.3	78.1
Singapore	5.3	50.5	44.2
South Africa	10.6	17.7	70.2
Taiwan	10.4	69.5	19.7

8.11. FEMALE RESEARCHERS AS A PERCENTAGE OF THE TOTAL NUMBER OF RESEARCHERS: 2017*



* Or the nearest years for which data are available. The calculation is headcount-based.

8.12. NUMBER OF PUBLICATIONS AND CITATIONS IN SCIENTIFIC JOURNALS INDEXED IN SCOPUS: 2013–2017*

	Number of publications	Number of citations**	Number of citations per publication	Average normalised citation***
Russia	330812	1179468	3.57	0.73
CIS countries				
Armenia	5480	55153	10.06	1.34
Azerbaijan	4166	28794	6.91	1.01
Belarus	8939	60717	6.79	1.04
Kazakhstan	13061	30286	2.32	0.58
Kyrgyzstan	885	10531	11.90	2.32
Moldova	2256	14038	6.22	1.10
Tajikistan	578	1714	2.97	0.49
Turkmenistan	83	396	4.77	1.31
Ukraine	52079	201070	3.86	0.71
Uzbekistan	2596	8271	3.19	0.53
OECD countries				
Australia	399535	3433127	8.59	1.40
Austria	101601	916244	9.02	1.44
Belgium	139186	1393076	10.01	1.53
Canada	435517	3738066	8.58	1.33
Chile	50259	347613	6.92	1.08
Czech Republic	101997	545302	5.35	1.10
Denmark	111853	1215587	10.87	1.64
Estonia	13222	136437	10.32	1.72
Finland	85991	775539	9.02	1.48
France	482565	4058857	8.41	1.25

(continued)

	Number of publications	Number of citations**	Number of citations per publication	Average normalised citation***
Germany	693606	6106438	8.80	1.34
Greece	77740	588890	7.58	1.24
Hungary	45423	328590	7.23	1.16
Iceland	7006	90596	12.93	2.01
Ireland	55907	519285	9.29	1.46
Israel	89063	754826	8.48	1.32
Italy	453444	3681842	8.12	1.32
Japan	520653	3237828	6.22	0.91
Latvia	9625	36005	3.74	1.18
Lithuania	16485	81570	4.95	1.02
Luxembourg	8266	70661	8.55	1.71
Mexico	94551	451342	4.77	0.77
Netherlands	243575	2652926	10.89	1.63
New Zealand	63367	491242	7.75	1.32
Norway	86513	756001	8.74	1.50
Poland	190256	973578	5.12	1.01
Portugal	101741	702330	6.90	1.17
Slovakia	35327	141064	3.99	1.12
Slovenia	25581	168315	6.58	1.10
South Korea	344068	2219771	6.45	0.93
Spain	393316	2961829	7.53	1.16
Sweden	169348	1656209	9.78	1.50
Switzerland	186422	2141442	11.49	1.68

(continued)

	Number of publications	Number of citations**	Number of citations per publication	Average normalised citation***
Turkey	197118	758857	3.85	0.73
United Kingdom	784219	6978939	8.90	1.43
United States	2591316	22548858	8.70	1.33
EU countries which are not OECD members				
Bulgaria	18608	101685	5.46	0.93
Croatia	26853	138396	5.15	0.89
Cyprus	9538	77214	8.10	1.51
Malta	2702	17790	6.58	1.41
Romania	80772	282631	3.50	0.87
Other countries				
Argentina	60916	415012	6.81	1.00
Brazil	330269	1752613	5.31	0.86
China	2372221	14126982	5.96	0.90
Egypt	80736	457411	5.67	0.96
Georgia	6250	76978	12.32	1.93
India	628609	2965767	4.72	0.79
Indonesia	50586	149278	2.95	0.93
Iran	230444	1300201	5.64	0.94
Malaysia	137321	657607	4.79	0.91
Pakistan	63837	375700	5.89	1.04
Saudi Arabia	90103	822338	9.13	1.43

(continued)

	Number of publications	Number of citations**	Number of citations per publication	Average normalised citation***
Serbia	35137	220749	6.28	1.01
Singapore	92794	1145019	12.34	1.79
South Africa	92932	663804	7.14	1.22
Taiwan	188180	1227770	6.52	0.99
Thailand	65850	358082	5.44	0.90

* According to the analytical system Scopus SciVal.

** The analysis includes citations from publications since the beginning of 2013 until September 20, 2018

*** Average citations is normalised by field of research and in relation to the world average value.

8.13. NUMBER OF PUBLICATIONS AND CITATIONS IN SCIENTIFIC JOURNALS INDEXED IN WEB OF SCIENCE: 2013–2017*

	Number of publications	Number of citations**	Number of citations per publication	Average normalised citation***
Russia	276037	932509	3.38	0.77
CIS countries				
Armenia	5059	42556	8.41	1.16
Azerbaijan	3980	23310	5.86	0.91
Belarus	8272	46840	5.66	0.89
Kazakhstan	9071	21669	2.39	0.73
Kyrgyzstan	835	7351	8.80	1.86
Moldova	2545	10360	4.07	0.71
Tajikistan	494	1371	2.78	0.46
Turkmenistan	97	460	4.74	1.61
Ukraine	46830	157116	3.36	0.67
Uzbekistan	2326	6843	2.94	0.54
OECD countries				
Australia	399535	3433127	8.59	1.40
Austria	101601	916244	9.02	1.44
Belgium	139186	1393076	10.01	1.53
Canada	435517	3738066	8.58	1.33
Chile	50259	347613	6.92	1.08
Czech Republic	101997	545302	5.35	1.10
Denmark	111853	1215587	10.87	1.64
Estonia	13222	136437	10.32	1.72
Finland	85991	775539	9.02	1.48
France	482565	4058857	8.41	1.25

(continued)

	Number of publications	Number of citations**	Number of citations per publication	Average normalised citation***
Germany	693606	6106438	8.80	1.34
Greece	77740	588890	7.58	1.24
Hungary	45423	328590	7.23	1.16
Iceland	7006	90596	12.93	2.01
Ireland	55907	519285	9.29	1.46
Israel	89063	754826	8.48	1.32
Italy	453444	3681842	8.12	1.32
Japan	520653	3237828	6.22	0.91
Latvia	9625	36005	3.74	1.18
Lithuania	16485	81570	4.95	1.02
Luxembourg	8266	70661	8.55	1.71
Mexico	94551	451342	4.77	0.77
Netherlands	243575	2652926	10.89	1.63
New Zealand	63367	491242	7.75	1.32
Norway	86513	756001	8.74	1.50
Poland	190256	973578	5.12	1.01
Portugal	101741	702330	6.90	1.17
Slovakia	35327	141064	3.99	1.12
Slovenia	25581	168315	6.58	1.10
South Korea	344068	2219771	6.45	0.93
Spain	393316	2961829	7.53	1.16
Sweden	169348	1656209	9.78	1.50

(continued)

	Number of publications	Number of citations**	Number of citations per publication	Average normalised citation***
Switzerland	186422	2141442	11.49	1.68
Turkey	197118	758857	3.85	0.73
United Kingdom	784219	6978939	8.90	1.43
United States	2591316	22548858	8.70	1.33
EU countries which are not OECD members				
Bulgaria	18608	101685	5.46	0.93
Croatia	26853	138396	5.15	0.89
Cyprus	9538	77214	8.10	1.51
Malta	2702	17790	6.58	1.41
Romania	80772	282631	3.50	0.87
Other countries				
Argentina	61708	344493	5.58	0.85
Brazil	300061	1365938	4.55	0.76
China	1861013	11143118	5.99	0.92
Egypt	71588	346948	4.85	0.86
Georgia	4073	54860	13.47	1.90
India	521931	2240550	4.29	0.74
Indonesia	45022	98322	2.18	0.82
Iran	203188	1009914	4.97	0.85
Malaysia	112702	468322	4.16	0.95
Pakistan	58996	296786	5.03	0.95
Saudi Arabia	82197	673241	8.19	1.28

(continued)

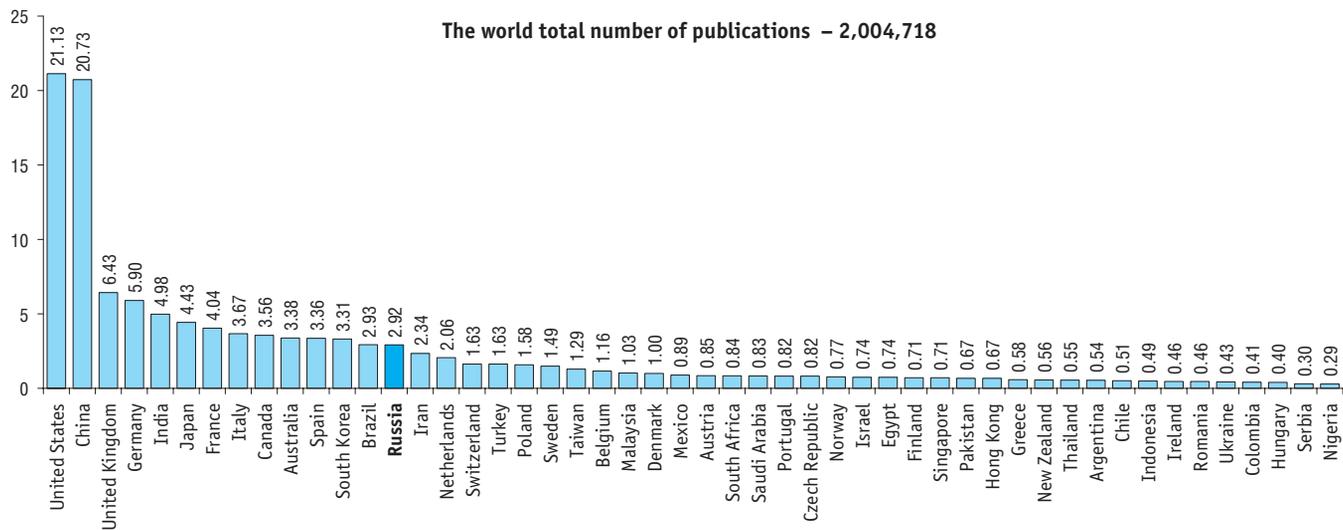
	Number of publications	Number of citations**	Number of citations per publication	Average normalised citation***
Serbia	34441	177539	5.15	0.87
Singapore	89278	929267	10.41	1.53
South Africa	91049	556533	6.11	1.10
Taiwan	172834	1013340	5.86	0.90
Thailand	55357	281845	5.09	0.90

* According to the analytical system InCites Thomson Reuters.

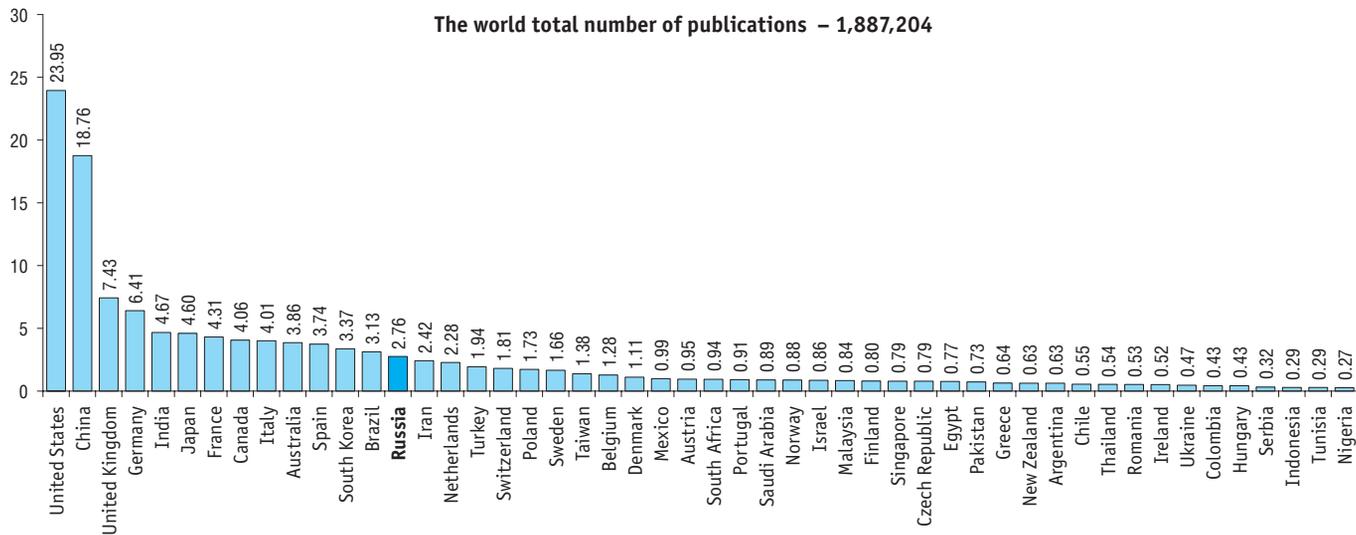
** The analysis includes citations from publications since the beginning of 2013 till September 20, 2018.

*** Average citation is normalised by field of research and in relation to world average value.

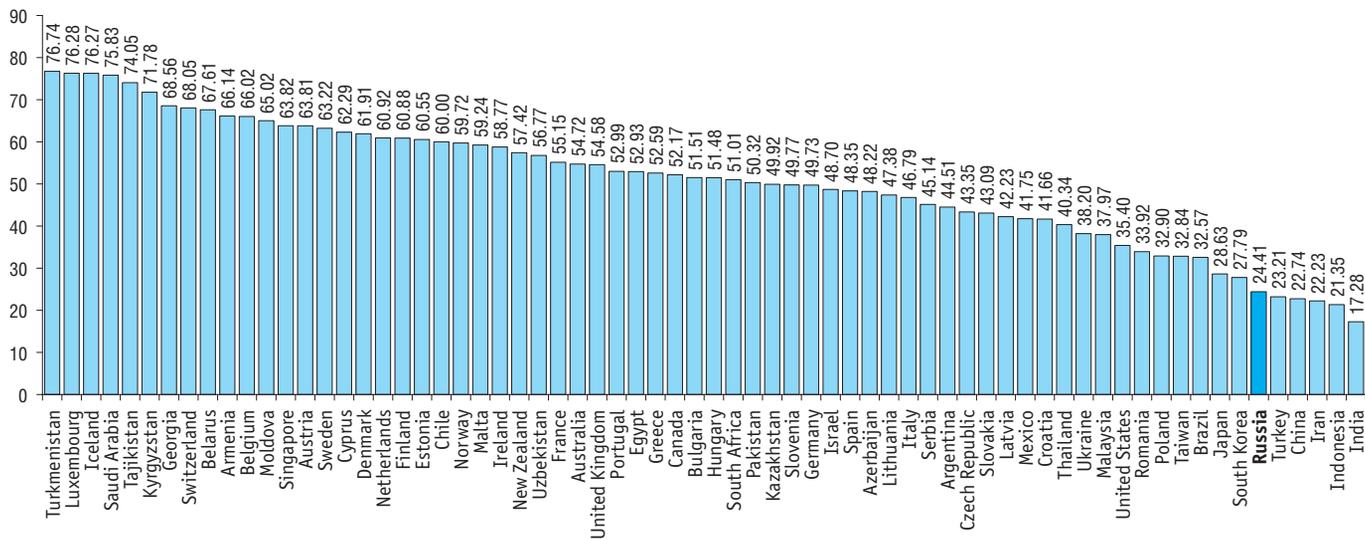
8.14. COUNTRIES' SHARES IN THE WORLD TOTAL NUMBER OF PUBLICATIONS IN SCIENTIFIC JOURNALS INDEXED IN SCOPUS: 2017



8.15. COUNTRIES' SHARES IN THE WORLD TOTAL NUMBER OF PUBLICATIONS IN SCIENTIFIC JOURNALS INDEXED IN WEB OF SCIENCE: 2017*

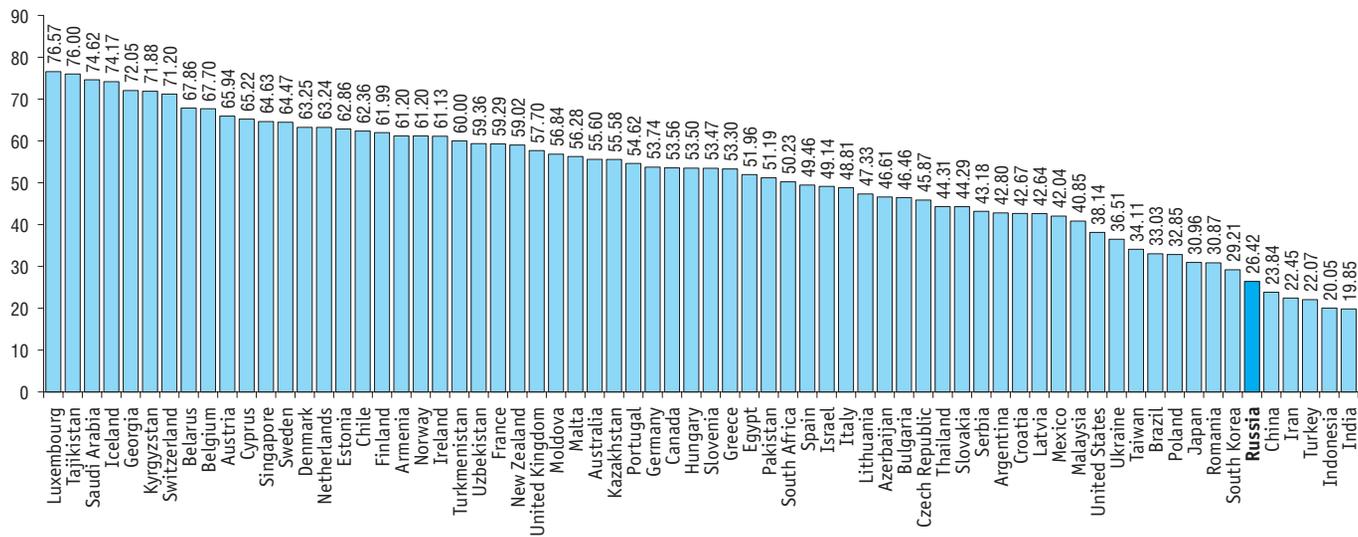


8.16. PUBLICATIONS CO-AUTHORED WITH FOREIGN RESEARCHERS AS A PERCENTAGE OF THE TOTAL NUMBER OF COUNTRY'S PUBLICATIONS IN SCIENTIFIC JOURNALS INDEXED IN SCOPUS: 2017*



* According to SCImago Journal & Country Rank.

8.17. PUBLICATIONS CO-AUTHORED WITH FOREIGN RESEARCHERS AS A PERCENTAGE OF THE TOTAL NUMBER OF COUNTRY'S PUBLICATIONS IN SCIENTIFIC JOURNALS INDEXED IN WEB OF SCIENCE: 2017*



* According to InCites.

8.18. RESIDENT AND ABROAD PATENT APPLICATIONS BY PATENT OFFICE

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
Russia	22202	28688	32254	42500	41414	44211	44914	40308	45517	41587	36464
CIS countries											
Armenia	285	127	208	142	140	141	131	123	115	126	110
Azerbaijan	251	...	287	271	205	144	156	168	184	163	...
Belarus	1039	1198	1462	1933	1871	1871	1634	757	691	521	524
Kazakhstan	1373	1515	1626	1964	1732	...	2202	2013	1503	1224	1228
Kyrgyzstan	148	84	131	140	129	111	114	139	126	89	146
Moldova	309	250	388	150	108	115	96	139	124	155	110
Tajikistan	65	52	36	10	5	6	4	...	1	...	...
Ukraine	5960	7224	5592	5312	5253	4955	5412	4813	4497	4095	4047
Uzbekistan	1058	968	444	632	556	510	557	568	507	555	553
OECD countries											
Australia	14061	22001	23857	24887	25526	26358	29717	25956	28605	28394	28906
Austria	2186	2301	2505	2673	2430	2552	2406	2363	2441	2315	2305
Belgium	1087	820	622	760	763	882	876	1026	1097	1173	1217
Canada	26592	39622	39888	35449	35111	35242	34741	35481	36964	34745	35022
Chile	1706	3120	3007	1076	2792	3019	3072	3105	3274	2907	2894
Czech Republic	3519	4939	830	982	880	1071	1081	972	952	839	860
Denmark	1484	1870	1823	1768	1771	1635	1534	1583	1732	1850	1772
Estonia	79	804	38	97	77	25	42	50	36	30	41
Finland	3791	2903	2059	1833	1774	1827	1737	1545	1416	1368	1529
France	15896	17353	17275	16580	16754	16632	16886	16533	16300	16218	16247
Germany	46158	62142	60222	59245	59444	61340	63167	65965	66893	67899	67712

(continued)

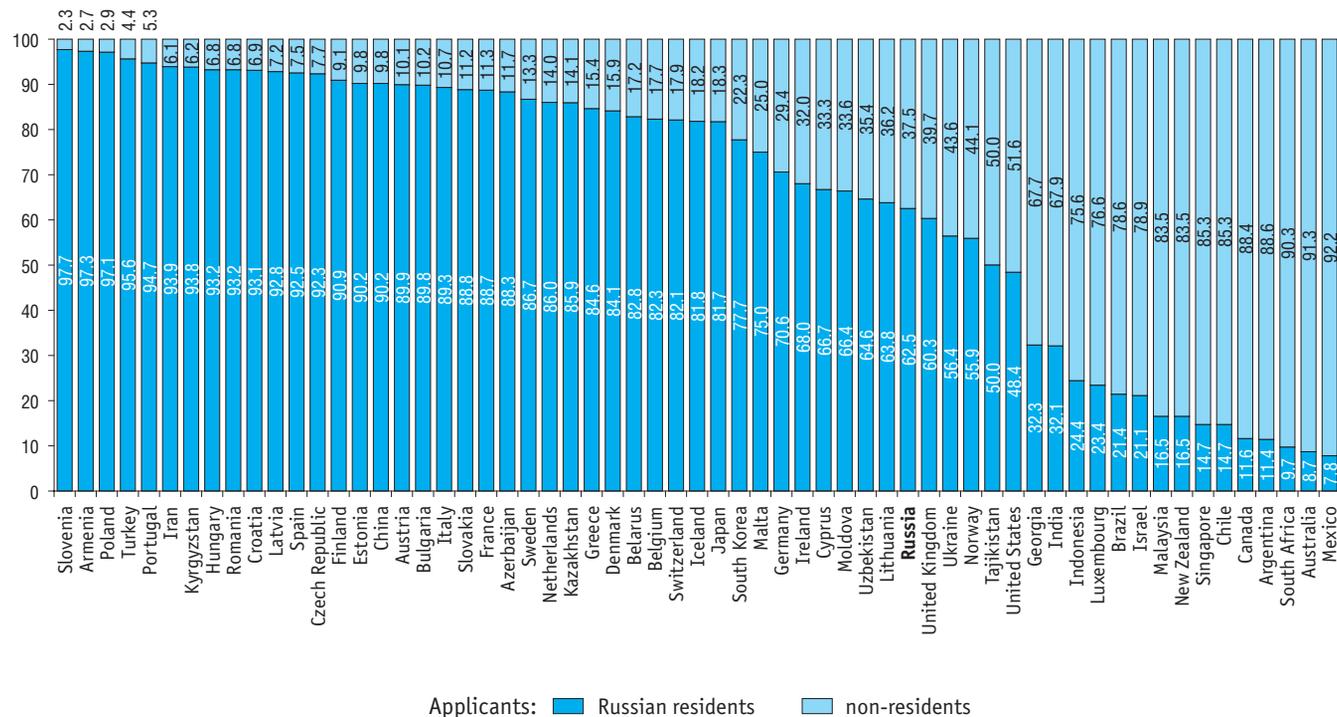
	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
Greece	312	340	482	744	741	656	717	670	573	646	589
Hungary	2889	4937	1202	696	698	758	708	619	633	665	532
Iceland	68	876	592	76	71	44	46	64	46	38	44
Ireland	990	1080	864	792	561	555	390	321	440	287	269
Israel	4425	6802	6826	7306	6886	6792	6185	6273	6908	6419	6813
Italy	8574	9273	9331	9723	9721	9310	9212	9382	9687	9821	9674
Japan	368831	419543	427078	344598	342610	342796	328436	325989	318721	318381	318479
Latvia	300	179	169	185	183	205	233	107	137	113	97
Lithuania	133	127	115	114	108	124	137	165	119	153	127
Luxembourg	104	176	88	100	128	161	169	218	247	444	668
Mexico	5234	13061	14435	14576	14055	15314	15444	16135	18071	17413	17184
Netherlands	2692	2994	2850	2767	2895	2713	2764	2582	2494	2604	2606
New Zealand	4719	7048	7005	6636	6209	7099	6781	7728	6501	6386	6160
Norway	5408	6700	5986	1813	1776	1564	1749	1563	1805	2060	2060
Poland	3860	7303	6583	3430	4123	4657	4411	4096	4815	4396	4041
Portugal	201	146	205	545	646	647	669	740	945	751	680
Slovakia	1669	2040	250	282	257	203	210	234	256	235	206
Slovenia	430	431	373	453	481	...	...	...	...	...	...
South Korea	78499	102010	160921	170101	178924	188915	204589	210292	213694	208830	204775
Spain	2600	3194	3353	3779	3626	3475	3244	3178	3020	2922	2343
Sweden	4865	5068	2960	2549	2341	2436	2495	2425	2428	2384	2297
Switzerland	3720	2551	2098	2155	2043	2988	2156	2048	1923	1771	1628
Turkey	1690	3433	1146	3357	4113	4666	4661	5097	5841	6848	8555
United Kingdom	27521	32747	27988	21929	22259	23235	22938	23040	22801	22059	22072
United States	228142	295895	390733	490226	503582	542815	571612	578802	589410	605571	606956

(continued)

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
EU countries which are not OECD members											
Bulgaria	731	940	313	260	283	259	297	234	291	241	225
Croatia	600	875	1012	278	251	249	253	200	186	188	159
Cyprus	...	70	64	8	8	12	3	4	7	4	12
Malta	24	116	...	19	15	17	17	13	11	4	...
Romania	2232	1290	984	1418	1463	1077	1046	1036	1053	1063	1178
Other countries											
Argentina	4264	6636	5269	4717	4821	4813	4772	4682	4125	3809	3443
Brazil	7448	17376	20005	22686	28306	30116	30884	30342	30219	28010	25658
China	18699	51906	173327	391177	526412	652777	825136	928177	1101864	1338503	1381594
Georgia	707	456	461	359	398	372	333	297	271	274	232
India	6566	8538	24382	39762	42291	43955	43031	42854	45658	45057	46582
Indonesia	2874	3890	4304	5630	5830	...	7450	8023	9153	9639	9303
Iran	407	616	4494	11636	12018	11054	11643	13802	14279	15632	16259
Malaysia	4052	6227	6286	6383	6452	6940	7205	7620	7727	7236	7072
Singapore	2557	8236	8605	9773	9794	9685	9722	10312	10814	10980	10930
South Africa	6365	3295	7004	6383	7245	7444	7295	7552	7497	7210	7544

Source: WIPO database, December 2018.

8.19. PERCENTAGE DISTRIBUTION OF PATENT APPLICATIONS BY APPLICANT AND COUNTRY: 2017*



* Or the nearest years for which data are available.

Source: WIPO database, December 2018.

8.20. RESIDENT AND ABROAD PATENT APPLICATIONS BY COUNTRY OF ORIGIN

	Number of applications				Number of applications per 1,000,000 population				Number of applications per 1,000,000 labour force			
	2014	2015	2016	2017	2014	2015	2016	2017	2014	2015	2016	2017
Russia	28512	33792	31817	27782	194.9	230.7	216.7	192.3	373.7	442.9	417.5	367.3
CIS countries												
Armenia	156	160	192	187	53.8	55.2	66.2	63.8	111.4	114.3	137.1	132.6
Azerbaijan	542	499	498	...	57.1	52.0	50.8	...	112.9	101.8	99.6	...
Belarus	1781	1967	1473	1525	187.5	207.1	155.1	160.4	349.2	385.7	288.8	301.0
Kazakhstan	2453	1797	1527	1771	141.8	102.7	85.8	98.2	269.6	197.5	166.0	191.9
Kyrgyzstan	173	180	138	170	29.8	30.0	22.6	27.4	69.2	69.2	53.1	65.2
Moldova	79	98	101	103	21.9	27.2	28.1	29.0	65.8	75.4	77.7	81.1
Tajikistan	8	16	...	...	1.0	1.9	...	...	2.5	4.8	...	...
Ukraine	2990	2878	2743	2791	66.0	63.7	61.0	62.3	143.1	137.7	131.9	135.9
Uzbekistan	374	305	358	366	12.1	9.7	11.3	11.3	26.0	20.7	23.9	23.9
OECD countries												
Australia	11903	11193	11739	11656	506.5	470.3	485.1	473.8	959.9	888.3	924.3	902.8
Austria	13689	14009	13852	13785	1610.5	1629.0	1592.2	1564.8	3111.1	3113.1	3078.2	3019.1
Belgium	12184	12342	12946	13737	1087.9	1092.2	1145.7	1208.0	2436.8	2468.4	2589.2	2741.2
Canada	24705	24713	24631	23914	695.9	690.3	678.5	651.5	1260.5	1254.5	1237.7	1189.9
Chile	998	850	943	876	56.7	47.8	52.7	48.5	116.0	96.6	107.2	97.7
Czech Republic	2180	2365	2152	2185	207.6	225.2	203.0	206.3	411.3	446.2	398.5	406.8
Denmark	12538	12195	11732	12861	2238.9	2139.5	2058.2	2229.1	4323.4	4205.2	3910.7	4227.6
Estonia	278	236	275	285	213.8	181.5	211.5	216.7	397.1	337.1	392.9	412.8

(continued)

	Number of applications				Number of applications per 1,000,000 population				Number of applications per 1,000,000 labour force			
	2014	2015	2016	2017	2014	2015	2016	2017	2014	2015	2016	2017
Finland	14070	13172	12559	12624	2558.2	2394.9	2283.5	2290.6	5211.1	4878.5	4651.5	4702.5
France	72310	72398	71424	70939	1095.6	1087.1	1067.6	1056.9	2394.4	2389.4	2357.2	2336.8
Germany	179506	175057	177072	176235	2216.1	2142.7	2148.9	2131.1	4223.7	4090.1	4089.4	4053.9
Greece	1251	1151	1223	1225	114.8	106.6	113.2	113.8	255.3	234.9	249.6	251.0
Hungary	1434	1493	1536	1257	144.8	152.3	156.7	128.5	318.7	324.6	326.8	269.9
Iceland	302	263	258	332	1006.7	876.7	860.0	972.8	1510.0	1315.0	1290.0	1574.8
Ireland	4779	5322	5351	5328	1038.9	1132.3	1114.8	1106.9	2172.3	2419.1	2432.3	2354.5
Israel	13437	14470	15103	15513	1638.7	1722.6	1776.8	1780.6	3536.1	3710.3	3775.8	3847.9
Italy	29288	21608	31142	31346	481.7	356.0	513.9	517.7	1153.1	854.1	1216.5	1231.2
Japan	465971	455005	456459	460660	3660.4	3579.9	3594.2	3633.4	7038.8	6852.5	6833.2	6926.8
Latvia	193	288	254	168	96.5	144.0	127.0	86.6	193.0	288.0	254.0	168.8
Lithuania	254	275	219	214	87.6	94.8	75.5	75.7	169.3	183.3	146.0	146.7
Luxembourg	3137	2776	3450	3454	5228.3	3965.7	5750.0	5762.0	10456.7	9253.3	11500.0	11913.2
Mexico	2187	2508	2403	2522	17.6	19.9	18.8	19.5	39.9	44.8	42.2	43.4
Netherlands	37729	37983	39044	37606	2232.5	2247.5	2296.7	2195.0	4192.1	4220.3	4290.5	4134.3
New Zealand	3429	3282	3065	3182	762.0	713.5	652.1	663.8	1371.6	1312.8	1178.8	1195.3
Norway	5872	5703	5902	5946	1151.4	1096.7	1135.0	1125.7	2174.8	2036.8	2107.9	2131.2
Poland	6171	7009	6143	6120	162.4	184.4	161.7	161.2	335.4	383.0	333.9	334.4
Portugal	1332	1624	1681	1508	128.1	156.2	163.2	146.5	256.2	312.3	323.3	291.5
Slovakia	454	495	458	440	84.1	91.7	84.8	80.9	168.1	183.3	163.6	159.8
Slovenia	509	462	...	...	242.4	220.0	...	...	509.0	462.0	...	...
South Korea	230553	238045	233795	226568	4547.4	4667.5	4557.4	4402.3	8507.5	8687.8	8440.3	8123.5
Spain	10924	10843	10803	10788	234.9	233.7	232.3	231.6	472.9	469.4	469.7	469.7
Sweden	23854	24345	23455	23395	2459.2	2484.2	2369.2	2323.8	4677.3	4681.7	4510.6	4400.2

(continued)

	Number of applications				Number of applications per 1,000,000 population				Number of applications per 1,000,000 labour force			
	2014	2015	2016	2017	2014	2015	2016	2017	2014	2015	2016	2017
Switzerland	44406	45658	46991	44424	5415.4	5501.0	5594.2	5247.3	9448.1	9512.1	9590.0	9009.4
Turkey	6495	7287	8376	11144	84.4	93.1	105.4	138.0	227.1	245.4	278.3	356.3
United Kingdom	52605	53302	52882	53746	814.3	818.8	806.1	814.1	1589.3	1595.9	1569.2	1586.8
United States	509521	526632	521642	524835	1599.2	1640.6	1613.0	1611.3	3188.5	3275.1	3204.2	3210.7
EU countries which are not OECD members												
Bulgaria	467	512	427	425	64.9	71.1	60.1	60.1	137.4	155.2	129.4	131.0
Croatia	259	250	255	280	61.7	59.5	60.7	67.9	136.3	131.6	141.7	155.1
Cyprus	492	350	337	399	410.0	291.7	280.8	338.3	820.0	583.3	561.7	647.8
Malta	475	483	496	...	1187.5	1207.5	992.0	...	2375.0	2415.0	2480.0	...
Romania	1252	1235	1255	1451	62.9	62.4	63.7	74.1	136.1	135.7	141.0	164.3
Other countries												
Argentina	791	889	1143	766	18.4	20.5	26.1	17.3	41.2	45.6	58.0	38.5
Brazil	6717	6552	7215	7505	32.9	31.8	34.7	35.9	66.8	64.0	69.9	72.0
China	837817	1010448	1257409	1306019	614.1	736.9	912.0	942.0	1065.1	1283.8	1597.5	1660.0
Georgia	131	124	117	93	34.5	33.5	31.6	25.0	65.5	62.0	58.5	45.8
India	22445	23946	25837	27985	17.3	18.3	19.5	20.9	45.3	47.5	50.4	53.8
Indonesia	771	1174	1154	2320	3.0	4.5	4.4	8.8	6.2	9.6	9.2	18.3
Iran	13768	...	15081	15475	175.6	...	187.8	190.7	550.7	...	554.4	565.9
Malaysia	2661	2299	1964	2148	88.1	74.9	62.9	67.9	184.8	155.3	130.1	139.1
Singapore	5927	6155	6724	6950	1077.6	1119.1	1200.7	1238.4	1911.9	1923.4	2101.3	2127.5
South Africa	2317	2076	2011	2178	42.8	37.7	35.9	38.4	113.0	97.5	92.7	98.8

Source: WIPO and World Bank database, December 2018.

8.21. NUMBER OF TRIADIC PATENT FAMILIES*

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Russia	63	85	91	88	86	93	76	88	86	92
OECD countries										
Australia	236	516	479	308	320	336	309	311	313	310
Austria	223	347	409	389	361	379	379	411	434	444
Belgium	375	456	543	465	460	429	431	407	412	407
Canada	390	613	718	553	580	526	618	582	56	538
Chile	2	2	6	14	16	10	11	12	12	11
Czech Republic	3	10	25	15	35	36	32	41	43	47
Denmark	189	290	389	301	259	283	263	283	285	285
Estonia	0	1	3	3	7	4	9	9	9	8
Finland	319	433	391	228	227	290	271	284	283	286
France	1976	2925	3048	2460	2597	2434	2413	2423	2473	2470
Germany	4914	7639	7141	5058	4822	4588	4904	4706	4626	4583
Greece	2	11	24	5	11	22	20	20	23	25
Hungary	25	42	58	38	43	31	20	30	32	33
Iceland	6	13	7	3	2	2	2	1	3	2
Ireland	31	51	98	64	70	73	94	99	109	110
Israel	161	386	502	351	367	400	436	422	446	462
Italy	621	832	965	682	721	725	769	791	817	836
Japan	9592	18263	18932	19295	18997	18610	17617	17116	17022	17066
Latvia	2	5	10	1	3	2	2	1	1	1
Luxembourg	14	22	21	19	24	21	15	20	19	21
Mexico	12	9	19	16	18	16	19	22	25	30
Netherlands	769	1264	1762	825	969	1039	1136	1193	1271	1306
New Zealand	21	72	73	44	51	104	69	89	99	99
Norway	87	138	141	115	94	101	103	101	96	96
Poland	5	9	18	62	64	69	59	69	79	75

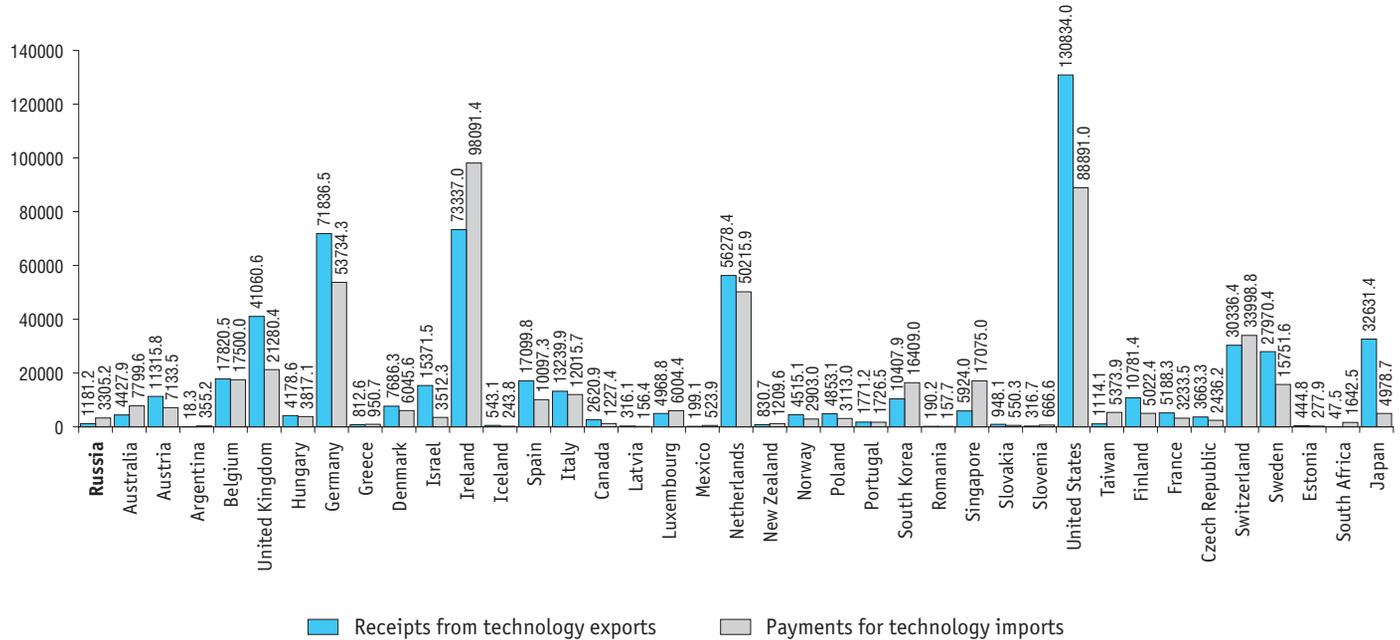
(continued)

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Portugal	3	5	16	17	26	23	21	27	30	34
Slovakia	2	2	2	7	12	8	9	7	8	9
Slovenia	7	9	22	16	10	10	14	13	11	11
South Korea	331	909	2746	2460	2367	2495	2547	2678	2670	2671
Spain	83	196	293	238	222	231	230	237	239	239
Sweden	760	792	969	642	615	662	587	614	628	617
Switzerland	771	1004	1064	1058	1054	1139	1112	1146	1175	1205
Turkey	2	5	16	33	37	31	41	38	42	45
United Kingdom	1586	2361	2164	1658	1726	1700	1818	1725	1734	1740
United States	12365	15626	17374	12743	13209	13723	14781	15243	15343	15219
EU countries which are not OECD members										
Bulgaria	3	1	3	...	...	...	...	...	...	...
Croatia	6	6	4	...	...	...	...	...	...	...
Cyprus	...	0	2	...	...	...	...	...	...	...
Lithuania	...	1	1	...	...	...	...	...	...	...
Malta	...	3	2	...	...	...	...	...	...	...
Romania	2	0	7	6	9	14	13	12	14	14
Other countries										
Argentina	6	8	16	8	10	8	6	9	10	11
Brazil	20	29	24	0	...	...	...	...	...	...
China	21	87	523	1425	1506	1951	2187	2624	3144	3766
India	8	48	91	12	...	...	...	...	...	...
Singapore	21	82	170	109	122	107	129	139	141	143
South Africa	25	52	49	30	43	33	29	26	24	22

* Aggregate amount of patent applications filed simultaneously to the European patent office (EPO), the United States patent and trademark office (USPTO), and the Japanese patent office (JPO).

Source: OECD database, December 2018.

8.22. TECHNOLOGY BALANCE OF PAYMENTS: 2017* (million USD)



* Or nearest years for which data are available.

TECHNICAL NOTES

Advanced manufacturing technologies are processes (including machinery, devices, equipment, and instrumentation) which are based on microchips or computer-controlled and are used to design, manufacture or process various products.

Applied research encompasses original activities aimed at acquisition of new knowledge for the purpose of solving specific practical problems. Applied research determines possible ways of using the results of basic research and new methods of solving previously defined problems.

Basic research means experimental or theoretical research aimed at acquiring new knowledge without any particular practical application. Hypotheses, theories, methods, etc. are obtained as a result of the basic research. It may conclude with recommendations on conducting applied research in order to identify the ways of implementing obtained scientific results, by scientific publications, etc.

Bibliometric indicators in part of publication activity are calculated on the basis of Web of Science and Scopus databases, and in part of citation level, they are calculated with the help of the InCites data of the Clarivate Analytics Company and SciVal data of the Elsevier Company (Scopus based). Unless indicated otherwise, the term 'publication' means three types of documents, namely 'articles', 'reviews' and 'conference papers' ('proceedings'). A publication belongs to a country if it is listed in the affiliated address of the author or one of the co-authors and has been recognised by Web of Science and Scopus. If the sole author

states several addresses in more than one country, such publication is considered to be written in international cooperation. Likewise, if one or more co-authors give additional affiliation in a different country, such publication is also considered to be written in international cooperation. All assessments of the data given in the present data book reflect the situation as of September 10, 2017.

Competitive R&D funding (programme funding) means funds received by the organisation, which came first according to the decision of a competition commission after summarising the results of a competition for scientific, technical programmes, innovation and other R&D-related projects, based on the best R&D project implementation conditions presented by this organisation in comparison to other participants.

Country's Scientific Specialisation Index (in a specific field of science) is calculated as a ratio of a number of publications in a specific field of science to the total number of publications of the country's authors in scientific journals indexed in Web of Science or Scopus, as well as to this country's share in the world total number of indexed publications. If the index value of a country is above 1.0, the field of science is considered to be this country's scientific specialisation.

Development are regular activities, based on knowledge received from realisation of research and practical experience, and aimed at the production of new products/processes or the improvement of existing products/processes.

Doctoral studies are a form of a highly-qualified personnel training programme undergone by persons with a Candidate of Sciences degree. The preparation of the doctoral thesis is performed by doctoral students in higher education institutions, additional vocational (professional) education institutions and in scientific institutes. Doctoral students prepare their doctoral thesis for a doctor's degree in the chosen scientific field of study in accordance with the Academic Degrees Nomenclature, approved by the Order of the Russian Ministry of Science and Higher Education.

Engineering means performance of contractual engineering and consulting services for the preparation and maintenance of the production or sales processes, maintenance of construction and operation of industrial, infrastructure or other facilities.

Enterprises engaged in technological innovation are enterprises (organisations, institutions) that develop and implement new or significantly improved goods and services, production processes or services delivery (provision) methods, as well as those that perform other types of innovative activities.

Expenditure on innovation is the actual expenditure in monetary form, connected with the implementation of different types of innovative activity performed within an organisation (industry, region, or country). Expenditure on innovation includes current expenditure and capital expenditure. The statistics studies expenditure on technological, marketing, and organisational innovation.

Federal budget appropriations on civil S&T are the federal budget funds allocated for basic and applied research to be applied in civil

S&T. In accordance with a new budget appropriations classification introduced on January 01, 2005, Subsection 0601 'Basic Research' and Subsection 0602 'Advanced Technologies and S&T Priority Areas Development' listed in Section 06 'Basic Research and Scientific and Technological Progress Promotion' of the Federal Budget refer to basic and applied research, respectively.

Grants are cash and other assets provided irrevocably and free of charge by individuals and legal entities, including foreign citizens and foreign legal entities, as well as international organisations entitle to offer grants in the Russian Federation in accordance with the procedures established by the Government of the Russian Federation, to implement specific S&T programmes and projects, to conduct specific scientific research under the conditions laid down by grantors (Federal Law no. 127-FL of August 26, 1996 'On Science and State Scientific and Technical Policy' (as amended)).

Gross domestic expenditure on R&D is the actual expenditure on research and development in the country (including R&D funded from abroad but excluding payments made abroad) in monetary form. The estimation is based on the statistical accounting regarding research and development performed by organisations using their own domestic resources during the reporting year, irrespective of the source of funds.

Gross domestic expenditure on R&D includes:

- current expenditure – expenditure on salaries, consolidated social security payments, acquisition or manufacture of special-purpose equipment (including at the expense of the production cost of the tasks performed), other material

expenditures (the cost of raw materials, material supplies, components, semi-finished products, fuel, energy, industrial works and services, etc. acquired from third parties) and other current expenditure;

- capital expenditure – expenditure on land acquisition, buildings acquisition or construction, machinery and tools acquisition included into fixed assets, etc.

Gross domestic expenditure on R&D is expressed both at current and constant prices calculated using the gross domestic product deflator.

Industrial design is a new duly registered engineering solution for a manufactured or artisan product that determines its external appearance and combines technical, functional and aesthetic properties.

Innovative activity is a type of activity related to transformation of ideas (usually, R&D results or other S&T achievements) into technologically new or significantly improved goods or services introduced into the market; or technology new or significantly improved production processes or services delivery (provision) methods, that have been used in real life. Innovation activities involve a combination of scientific, technological, organisational, financial, and commercial actions that result in new innovations.

Innovation activity of enterprises describes the involvement degree of enterprises (organisations) in general or specific innovative activity during a given period of time. The degree of an enterprise's involvement in innovation is usually evaluated as a ratio of the number of enterprises engaged in technological, marketing and organisational

innovation to the total number of surveyed enterprises in a country, industry, sector, region, etc. during a given period of time.

Innovative goods and services are goods and services, either new or those that underwent various technological changes within the last three years. According to the degree of novelty, there are two types of innovative goods, works, and services – those newly introduced (or those that have undergone substantial technological changes) and those significantly improved.

Invention is a technical and/or engineering solution in any sphere pertaining to a product (namely, a device, material, strain of micro-organism, plant and animal cell culture) or to a method (a process of manipulating material objects with the help of material means). An invention must be new, innovative, and applicable for industrial use.

Know-how are sensitive non-proprietary technological knowledge and processes, or practical experience, including methods, techniques, and skills necessary for the design, calculation, construction, and production of any goods, R&D or other works; compositions and recipes of materials, substances, alloys and others; treatment methods and therapies; mining and quarrying methods; specifications, formulas and recipes; documentation, organisational charts, experience in design, marketing, management, economics, and finance, or other information not available to the general public.

Licence is a permit by which the owner (licenser), subject to certain conditions and a fixed remuneration, gives an interested party (licensee) the exclusive right for an industrial property item or a know-how or the rights to use the item of the contract as agreed in a special contract

(agreement). Patent licence entitles the owner to use the patent, lists the scope of assigned rights, the territory and the period of its use, as well as the payment form.

Marketing innovation means implemented marketing methods, either new or significantly improved, that involve substantial changes in the design and packaging of goods, works, and services; usage of new goods, works, and services sales strategies and new methods of launching and promoting them on the target market; development of new price strategies. Marketing innovations are aimed at complete satisfaction of the target customers' needs and expansion of target audience, as well as at the development of new markets to increase sales.

Organisational innovation means implemented new business practices, management of workplace and external relations. Organisational innovations are aimed at enterprises' increase in performance efficiency as a result of cutting administrative and transaction costs, optimisation of workplace (working hours) and, hence, achieving a better labour productivity, access to the assets that are not on the market, and a delivery costs reduction.

Patent is a title of protection granted for an invention that certifies inventor's priority, inventorship, and the right of exclusive use of this invention during patent's term of validity.

Postgraduate studies is the main form of academic personnel training in scientific research institutions, higher education institutions and additional vocational (professional) education institutions. Only individuals having a higher education attainment (specialist's degree or master's degree) are eligible to apply to post-graduate programmes

of academic personnel training. In accordance with Federal Law no. 273-FL of December 29, 2012 'On the Education in the Russian Federation', since January 1, 2014, the fields of studies that postgraduates can enrol in are listed in the Order of the Ministry of Science and Higher Education of the Russian Federation no. 1061 of September 12, 2013 'On the Approval of the Lists of Professions and Fields of Studies in Higher Education'. The data concerning the people who enrolled in post-graduate programmes before January 1, 2014 are provided according to Academic Degrees Nomenclature, approved by the Order of the Ministry of Science and Higher Education of the Russian Federation no. 59 of February 25, 2009 (as revised by Orders of the Ministry of Science and Higher Education of the Russian Federation no. 294 of August 11, 2009; no. 603 of November 16, 2009; no. 5 of January 10, 2012; no. 14 of February 20, 2015).

Research and development (R&D) is creative activity performed on a regular basis in order to increase the total amount of scientific knowledge, inter alia the knowledge concerning humanity, nature, and society, as well as to find new application areas for this knowledge.

R&D fixed assets (capital) include:

- buildings and structures;
- machinery and equipment, including pilot and experimental devices, scientific instruments, automation equipment and computer tools, etc.;
- transport hicles;
- tools, furniture, and other fixed assets on the balance sheet of scientific organisations and their pilot and experimental facilities used in the course of their main activity.

R&D personnel are all individuals whose creative activity performed on a regular basis is aimed at increasing the total amount of scientific knowledge and finding new application areas for this knowledge, and they are involved in the provision of direct services associated with research and development.

R&D personnel can be divided into the following categories:

- researchers – employees professionally involved in research and development and directly engaged in the creation of new knowledge, products, processes, methods, and systems, as well as in the management of said activities. Generally, researchers have diplomas of higher education;
- technicians – employees, taking part in research and development and performing technical operating functions (operation, exploitation and maintenance of scientific instruments, lab equipment, computers, as well as preparation of materials, designs and blueprints, conduction of experiments, tests and assays, etc.), supervised, as a rule, by fellow researchers. Generally, technicians have secondary vocational education and/or the necessary vocational (professional) knowledge and experience;
- supporting staff – employees performing supporting work associated with research and development: employees of economic planning department, financial subdivisions, patent services, S&T information subdivisions, S&T libraries; workers who assemble, debug, tune, maintain and repair scientific instruments and devices; workers in pilot and experimental

facilities; lab assistants without higher education or secondary vocational education;

- other personnel include staff engaged in maintenance, as well as those performing general functions connected with the overall activity of the organisation (accountants, HR personnel, clerical workers, logistic support staff, typists, etc.).

Sectors of R&D performance:

- government sector involves departments' and agencies' organisations involved in government of the state and satisfaction of the needs of the society, in general; non-profit organisations, fully or partially, financed and controlled by the government;
- business enterprise sector involves organisations and enterprises, which main activity is associated with commercial production of goods and services, including organisations of public ownership; private non-profit organisations providing services to said organisations;
- higher education sector involves higher education institutions, irrespective of their source of funds and legal status, as well as scientific research institutes, experimental facilities, teaching hospitals under their control or affiliated therewith;
- private non-profit sector involves private non-commercial organisations that do not seek profit (professional communities, voluntary associations, etc.) and private organisations.

Selection achievements are the results of intellectual activity in the creation of biologically new objects with certain properties,

having a duly registered exclusive right of an individual or a legal entity. Selection achievements, i.e. plant varieties or animal breeds, constitute a special type of patent and legal protection objects. In Russia, only plant varieties and animal breeds registered in the State Register of Protected Selection Achievements could be regarded as protected objects of intellectual property rights, on the condition that these results of intellectual activity meet the requirements established by the Civil Code of the Russian Federation for such selection achievements.

Sources of funds for R&D are the primary sources of funds for R&D, which amount is determined following the direct money transfer from the client organisation to the executing organisation.

Generally, the R&D funds of the reporting organisation are subdivided into own funds of organisations and the funds that have been received from other organisations and institutions, irrespective of their affiliation with various sectors of activity.

The following sources are included in the sources of funds:

- budget funds (including federal budget funds, regional budget funds and municipal budget funds of the Russian Federation);
- general university funds;
- non-budgetary funds;
- funds from abroad;
- government sector organisations' funds;
- business enterprise sector funds;
- higher education sector funds;
- private non-profit sector funds;
- own funds of organisations.

Tax expenditure, as defined by '2015 Tax Policy Guidelines and the 2016-2017 Budget Plan' approved on July 1, 2014 by the Government of the Russian Federation, are revenues' shortfalls in budgets of the Russian budgetary system caused by applicable tax incentives and other instruments (preferences) set by the fiscal law of the Russian Federation.

Technological innovation is the final result of innovative activity presented in the form of new or significantly improved goods and services introduced into the market or new or significantly improved production processes or services delivery (provision) methods, that has been used in real life. Innovation is considered implemented if it is launched into the market or used in production process.

Technology balance of payments is the total sum of the money transfers on intangible transactions connected with technology imports and exports.

Trade in technology with foreign countries encompasses all commercial transactions regarding import and export of technology and technological services, including deals between joint ventures and foreign organisations registered in Russia, their branches (representative offices), and their foreign parent companies.

Trademark is an original graphic image, a combination of figures, letters, or words, etc., intended to distinguish the goods and services of some manufacturers from similar goods and services of other manufacturers.

Utility model is a technical solution pertaining to equipment. Utility models must be new and applicable for industrial use.

SCIENCE AND TECHNOLOGY INDICATORS IN THE RUSSIAN FEDERATION

Data Book

Edited by *M. Rukhalenko*

Design *P. Shelegeda*

Desk-top publishing *V. Parshina*

National Research University Higher School of Economics
Institute for Statistical Studies and Economics of Knowledge

20 Myasnitskaya st., Moscow, 101000, Russia

Tel.: +7 (495) 621-28-73

<http://issek.hse.ru>, E-mail: issek@hse.ru