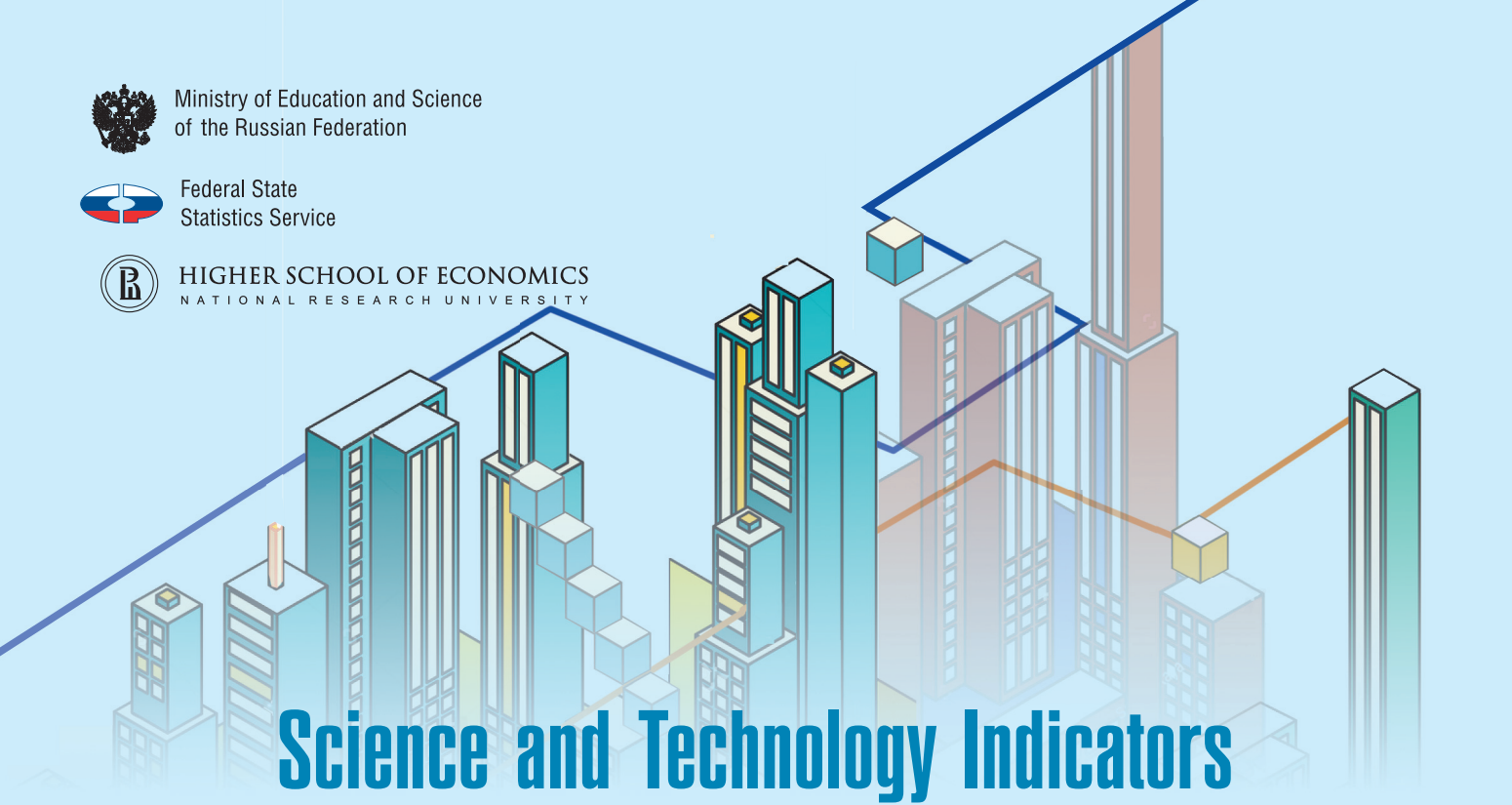
Ministry of Education and Science
of the Russian Federation

Federal State
Statistics Service

HIGHER SCHOOL OF ECONOMICS
NATIONAL RESEARCH UNIVERSITY



Science and Technology Indicators in the Russian Federation

Data Book

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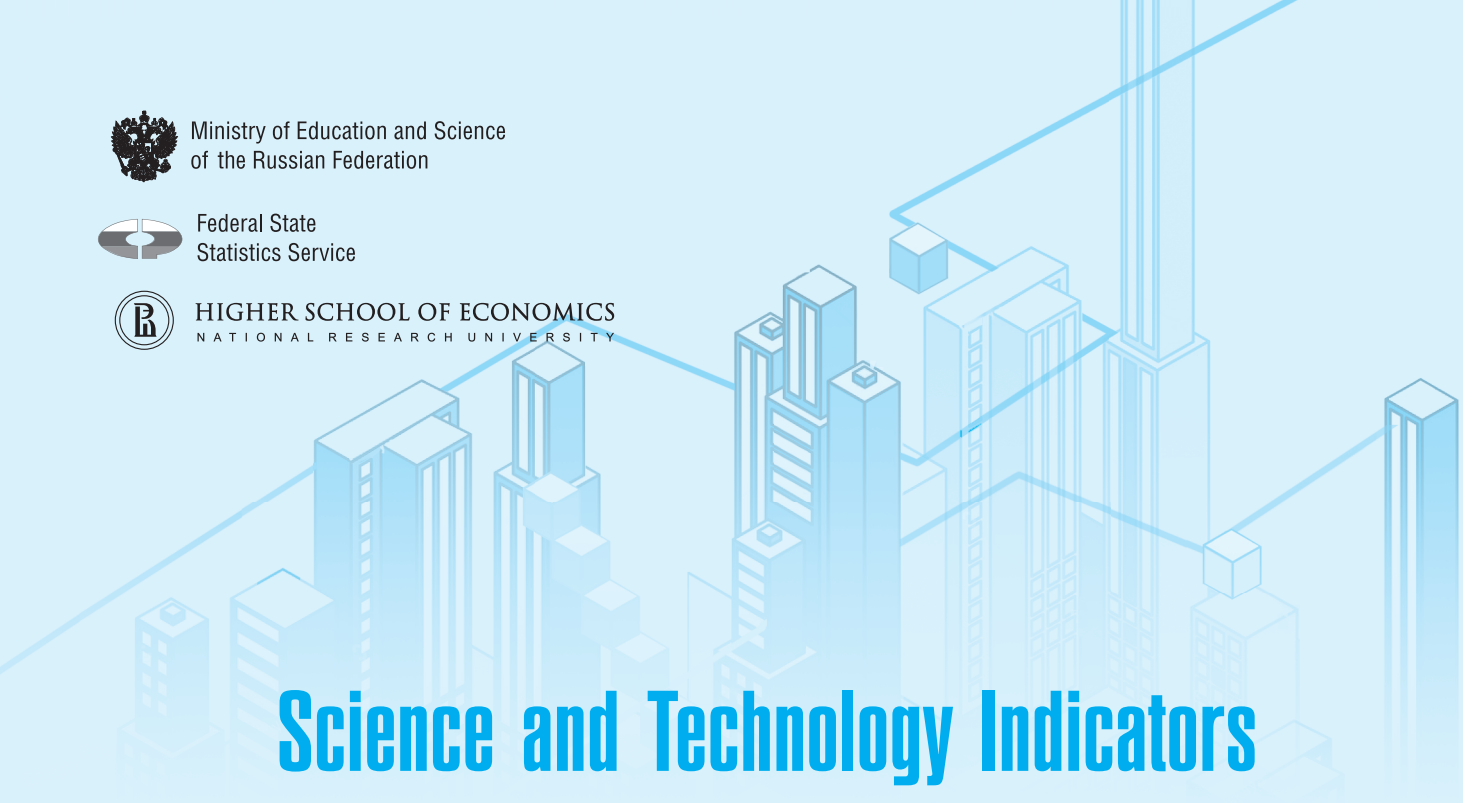

Science and Technology Indicators in the Russian Federation

Data Book

Moscow 2018

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With contributions by Irina Varzanovtseva

Science and Technology Indicators in the Russian Federation : Data book / K. Ditkovskiy, S. Fridlyanova, K. Fursov, L. Gokhberg, et al.; National Research University Higher School of Economics. – Moscow : HSE, 2018. – 320 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 Federal State Statistics Service, Russian Ministry of Science and Higher Education, Russian Federal Service for Intellectual Property, CIS Interstate Statistical Committee, Organisation for Economic Co-operation and Development (OECD), European Commission, Eurostat, UNESCO, World Intellectual Property Organisation, and results of own methodological and analytical studies of the HSE Institute for Statistical Studies and Economics of Knowledge.

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CONTENTS

SYMBOLS USED IN TABLES ARE:

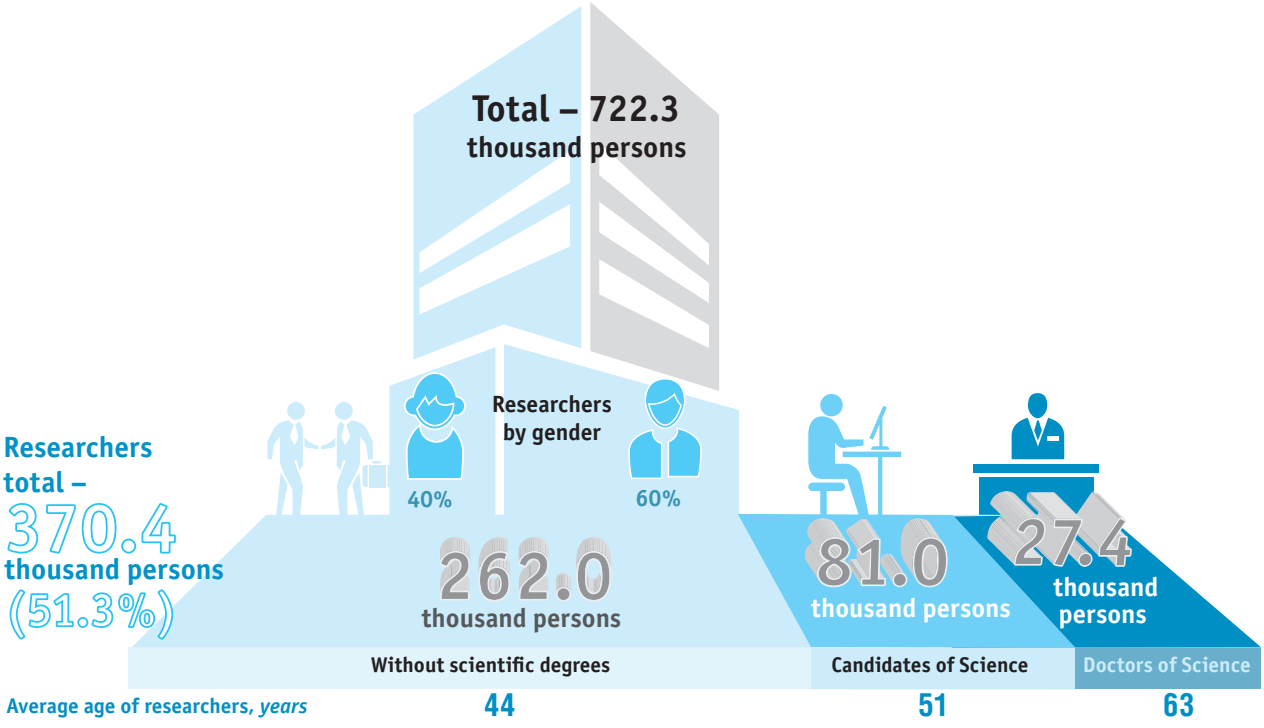
... data not available and not included in the totals,
– data not applicable,
0.0 insignificant value.

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

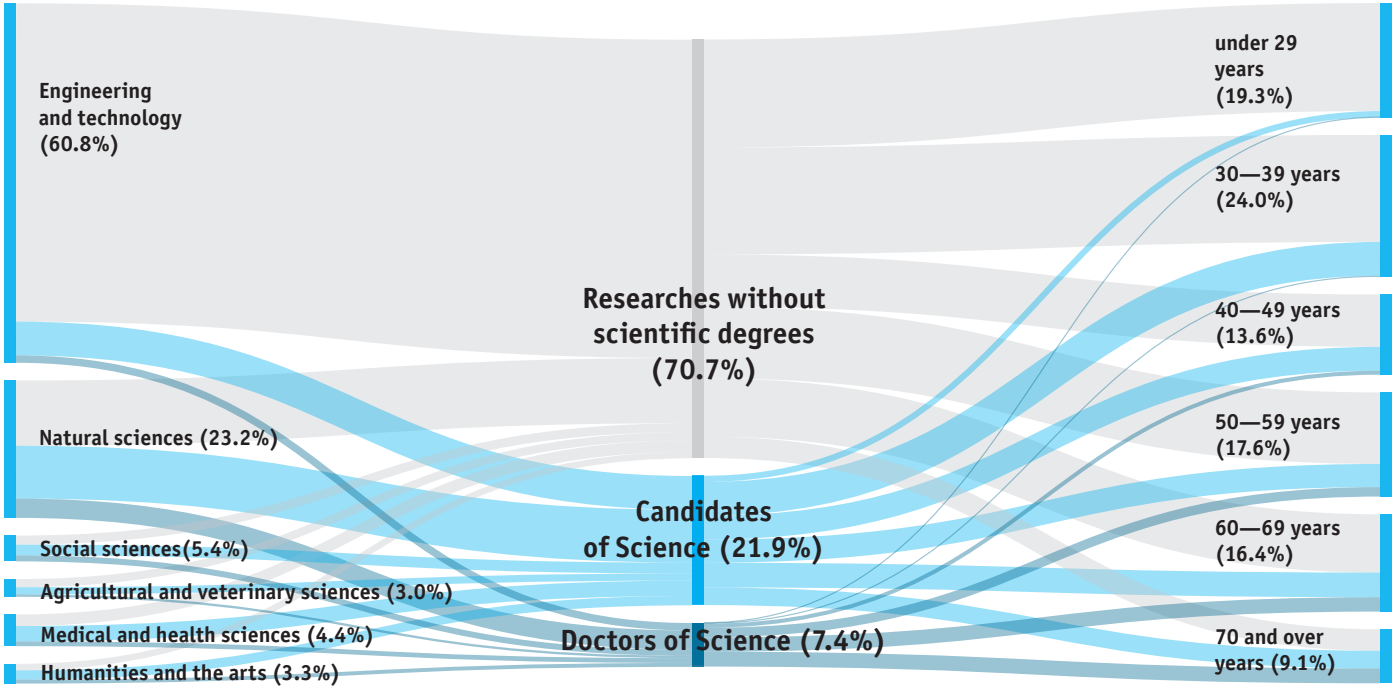
Infographics: 2016

R&D PERSONNEL, TRAINING OF SCIENTIFIC PERSONNEL

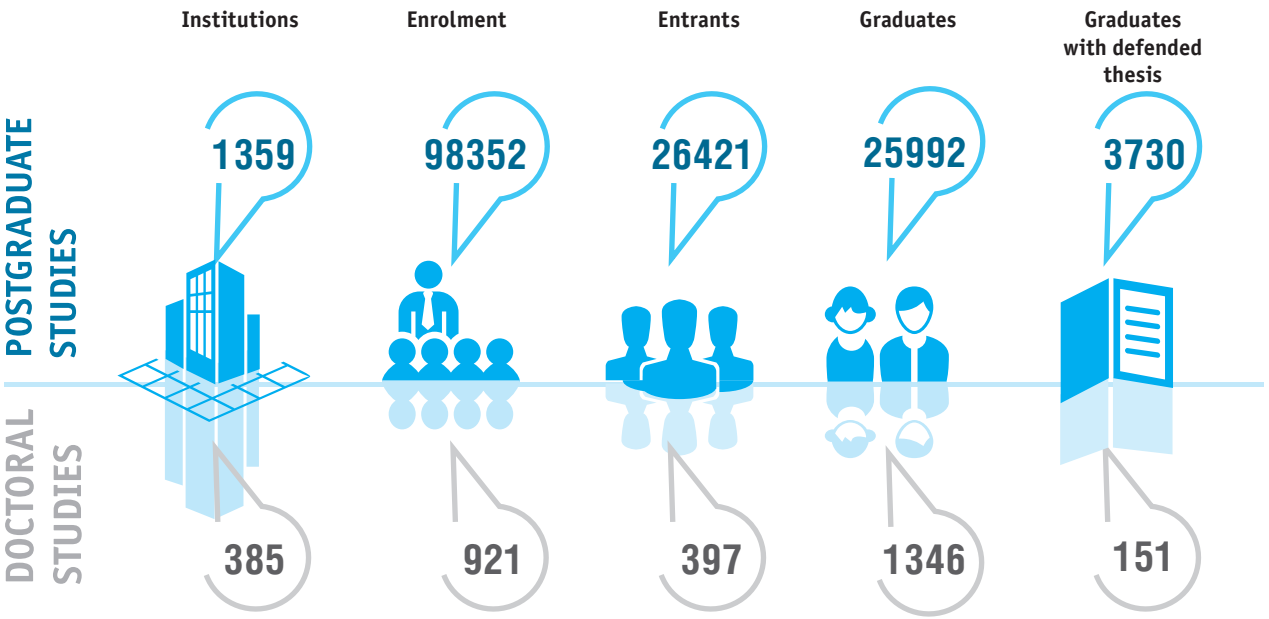
R&D PERSONNEL



PERCENTAGE DISTRIBUTION OF RESEARCHERS



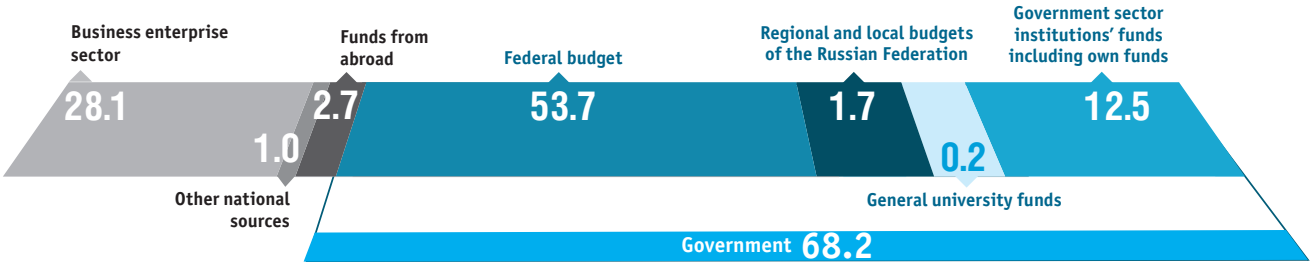
HIGHLY-QUALIFIED PERSONNEL TRAINING

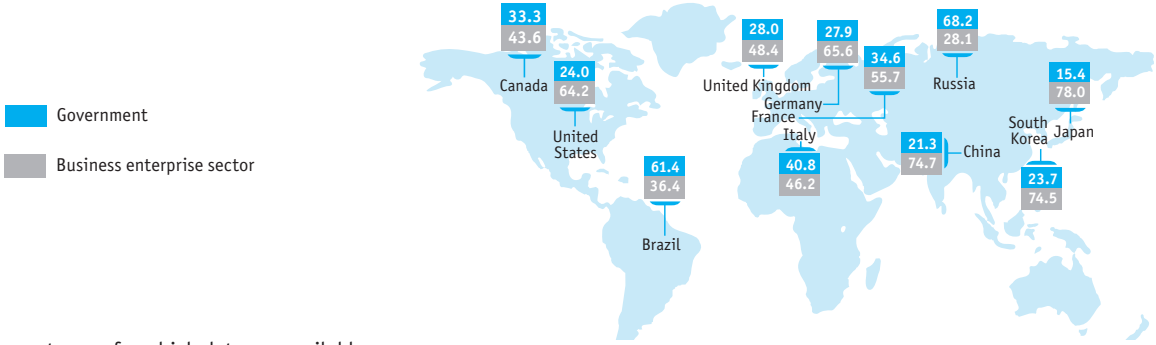


GROSS DOMESTIC EXPENDITURE ON R&D BY SOURCE OF FUNDS IN RUSSIA AND ABROAD*

(percentage)

Russia — 943.8 billion roubles (1.1% of GDP)





* Or nearest years for which data are available.

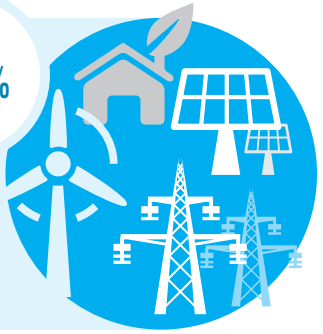
GROSS DOMESTIC EXPENDITURE ON R&D BY SOCIO-ECONOMIC OBJECTIVE

2.1%

Agriculture, forestry, and fishing

3.0%

Production, distribution and rational use of energy



28.3%

Manufacturing

4.3%

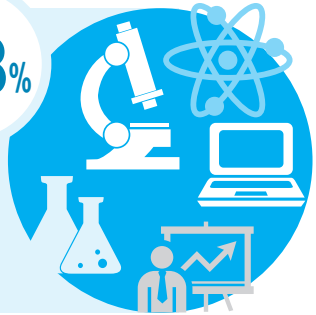
Infrastructure and general planning of urban and rural settlements including construction, transport, and communication

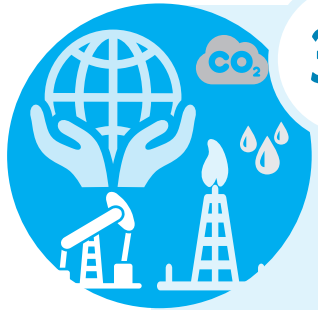
5.6%

Social objectives

14.8%

General advancement of science



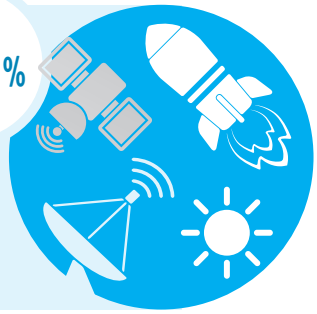


3.7%

Exploration and exploitation of the Earth and the atmosphere

4.9%

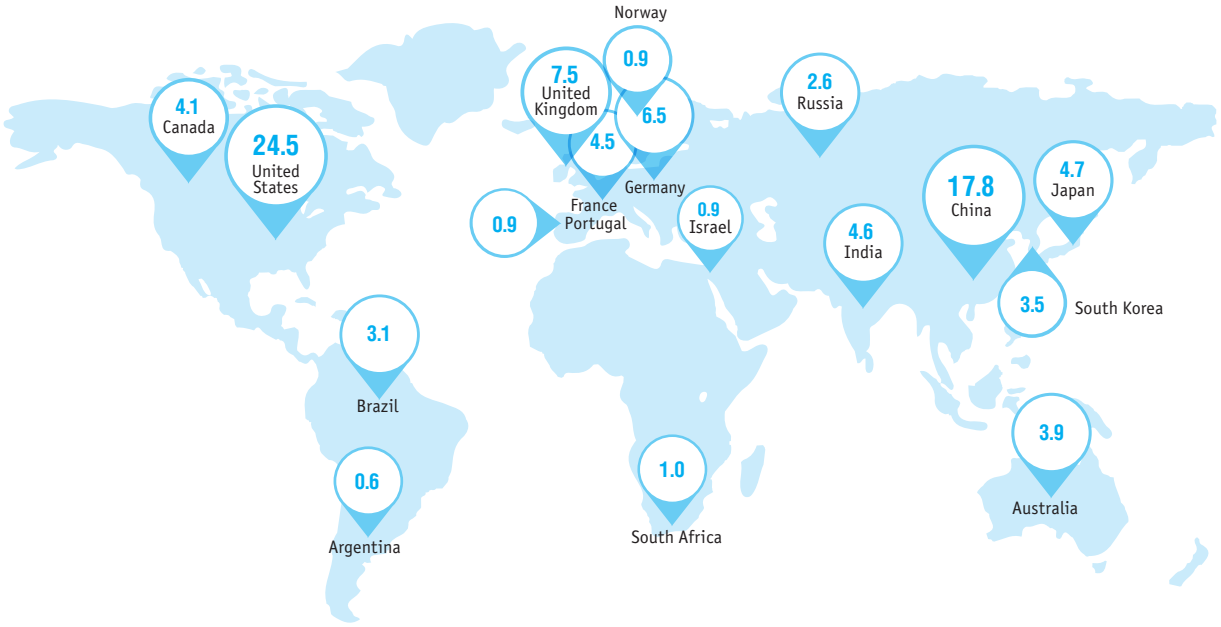
Peaceful uses of outer space



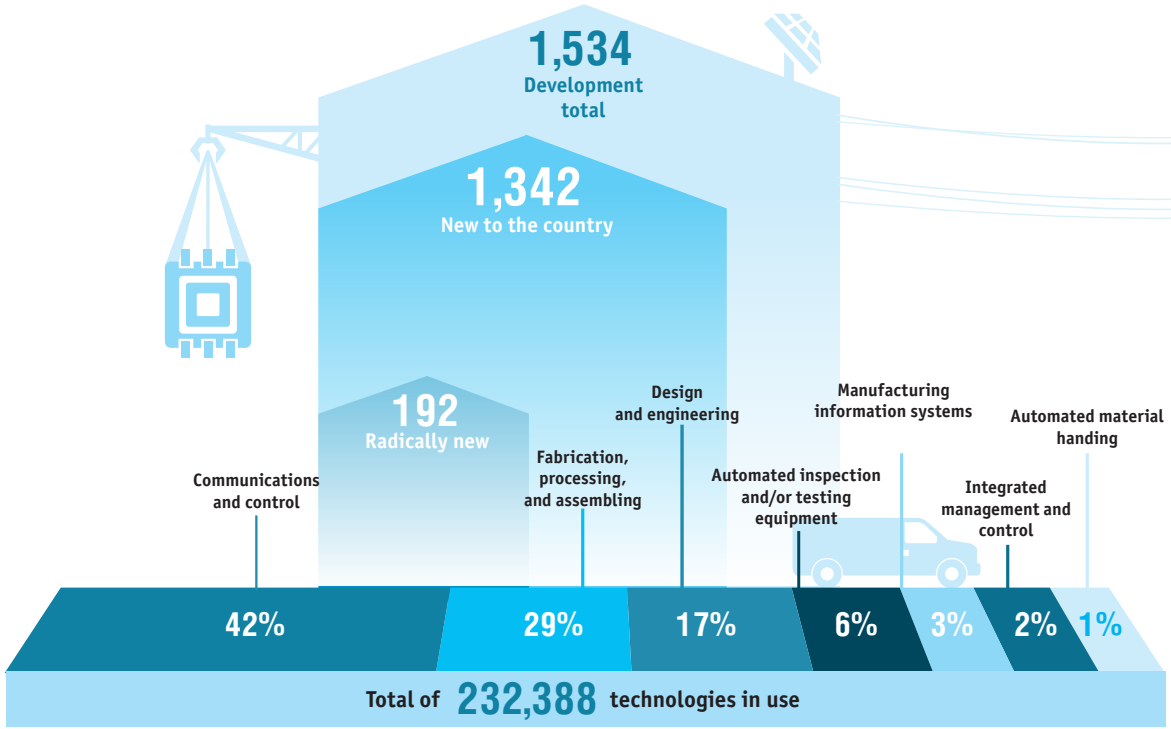
SELECTED COUNTRY SHARES IN THE WORLD TOTAL NUMBER OF ARTICLES IN SCIENTIFIC JOURNALS

(percentage)

WEB OF SCIENCE



DEVELOPMENT AND USE OF ADVANCED MANUFACTURING TECHNOLOGIES



MAIN SCIENCE AND TECHNOLOGY INDICATORS

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Gross domestic expenditure on R&D, *million roubles, 1995 – billion roubles:*										
at current prices	12149.5	76697.1	230785.2	523377.2	610426.7	699869.8	749797.6	847527.0	914669.1	943815.2
at constant 1989 prices	2.49	3.32	4.55	5.72	5.76	6.05	6.15	6.47	6.45	6.43
Gross domestic expenditure on R&D:										
as a percentage of GDP	0.85	1.05	1.07	1.13	1.01	1.03	1.03	1.07	1.10	1.10
as a percentage of the previous year at constant 1989 prices	84.9	116.0	98.7	94.2	100.7	105.1	101.6	105.1	99.7	99.6
Gross domestic expenditure on R&D per R&D institution, *thousand roubles, 1995 – million roubles:*										
at current prices	2993.2	18711.2	64718.2	149878.9	165786.7	196261.9	207988.2	235162.9	219082.4	234081.2

(continued)

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Gross domestic expenditure on R&D per R&D employee, *thousand roubles, 1995 –million roubles*	11.5	86.4	283.8	710.6	830.2	963.6	1031.3	1157.4	1238.0	1306.7
Gross domestic expenditure on R&D per researcher, *thousand roubles, 1995 – million roubles*	23.4	180.1	590.1	1418.7	1628.9	1878.2	2031.9	2266.7	2410.8	2548.2
Federal budget appropriations on civil S&T, *million roubles, 1995 – billion roubles:*										
at current prices	4413.6	17091.7	76909.0	237644.0	313899.3	355921.1	425301.7	437273.3	439392.8	402722.3
at constant 1995 prices	2.48	2.03	4.16	7.13	8.12	8.44	9.57	9.16	8.50	7.52
Federal budget appropriations on civil S&T as a percentage of GDP	0.31	0.23	0.36	0.51	0.52	0.52	0.58	0.55	0.53	0.47

(continued)

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
R&D personnel, *thousand persons*	1061.0	887.7	813.2	736.5	735.3	726.3	727.0	732.3	738.9	722.3
As a percentage of the previous year	95.9	101.8	96.9	99.2	99.8	98.8	100.1	100.7	100.9	97.8
R&D personnel per R&D institution, *headcount*	261	217	228	211	200	204	202	203	177	179
R&D personnel per 10,000 employment, *headcount*	160	138	122	109	109	107	107	108	108	100
Researchers, *thousand persons*	518.7	426.0	391.1	368.9	374.7	372.6	369.0	373.9	379.4	370.4
As a percentage of the previous year	98.7	101.4	97.4	99.9	101.6	99.4	99.0	101.3	101.5	97.6

(continued)

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Researchers per R&D institution, *headcount*	128	104	110	106	102	104	102	104	91	92
Researchers per 10,000 employment, *headcount*	78	66	59	55	55	55	54	55	55	51
Patent applications filed in the Russian Federation	22202	28688	32254	42500	41414	44211	44914	40308	45517	41587
Patent grants received in the Russian Federation	31556*	17592	23390	30322	29999	32880	31638	33950	34706	33536
Number of developed advanced manufacturing technologies	…	688	637	864	1138	1323	1429	1409	1398	1534
Number of advanced manufacturing technologies in use	…	70069	140983	203330	191650	191372	193830	204546	218018	232388
Total receipts from technology exports, *thousand USD*	…	203493.5	389396.4	627887.5	584656.9	688469.9	770584.8	1279213.1	1654732.1	1277023.5
Total payments for technology imports, *thousand USD*	…	182908.0	954199.2	1425983.3	1862566.6	2043187.9	2463626.3	2455830.7	2207406.8	2498677.8

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

MAIN INDICATORS OF INNOVATION

	2000	2005	2010	2011	2012	2013	2014	2015	2016
Enterprises engaged in technological innovation as a percentage of the total number of enterprises:									
mining and quarrying, manufacturing, electricity, gas and water supply	10.6	9.3	9.3	9.6	9.9	9.7	9.7	9.5	9.2
communication, computer and information technology-related activities*	12.1	15.3	10.8	9.9	10.3	10.3	9.5	9.4	7.7
Sales of innovative goods and services, *million roubles:*									
mining and quarrying, manufacturing, electricity, gas and water supply:									
at current prices	154135.0	545540.0	1165747.6	1847370.4	2509604.4	3072530.8	3037407.3	3258254.6	3723693.4
at constant 1995 prices	32626.7	52546.2	62312.8	85200.6	106088.8	123231.0	113323.0	112349.7	123937.2
communication, computer and information technology-related activities:									
at current prices	18033.2	43465.3	62636.4	74437.8	56092.2	71094.4	62928.5	86048.9	80955.8
at constant 1995 prices	3817.2	4186.6	3348.1	3433.1	2371.2	2851.4	2347.8	2967.1	2694.5

(continued)

	2000	2005	2010	2011	2012	2013	2014	2015	2016
Innovative goods and services as a percentage of total sales:									
mining and quarrying, manufacturing, electricity, gas and water supply	4.4	5.0	4.9	6.1	7.8	8.9	8.2	7.9	8.4
communication, computer and information technology-related activities	16.9	8.6	4.7	4.8	3.0	3.9	3.3	4.3	3.5
Expenditure on technological innovation, *million roubles:*									
mining and quarrying, manufacturing, electricity, gas and water supply:									
at current prices	49428.0	125678.2	349763.3	469442.2	583660.6	746778.2	762774.1	735757.7	777518.6
at constant 1995 prices	10462.7	12105.3	18695.9	21650.6	24673.1	29951.3	28458.4	25370.1	25878.5
communications, computer and information technology-related activities:									
at current prices	11794.1	17544.4	38684.0	137754.0	83230.6	66133.4	47066.3	66722.8	52733.5
at constant 1995 prices	2496.5	1689.9	2067.8	6353.2	3518.4	2652.4	1756.0	2300.7	1755.2

(continued)

	2000	2005	2010	2011	2012	2013	2014	2015	2016
Expenditure on technological innovation as a percentage of total sales:									
mining and quarrying, manufacturing, electricity, gas and water supply	1.4	1.2	1.5	1.5	1.8	2.2	2.1	1.8	1.8
communication, computer and information technology-related activities	11.1	3.5	2.9	8.8	4.4	3.6	2.4	3.3	2.3
Innovation activity of enterprises (enterprises engaged in technological, marketing, organisational innovation as a percentage of the total number of enterprises), *percentage:*									
mining and quarrying, manufacturing, electricity, gas and water supply	…	…	10.8	11.1	11.1	10.9	10.9	10.6	10.5
communication, computer and information technology-related activities	…	…	13.6	12.1	11.7	12.2	10.7	10.8	9.3
Enterprises engaged in marketing innovation as a percentage of the total number of enterprises:									
mining and quarrying, manufacturing, electricity, gas and water supply	…	…	2.5	2.5	2.2	2.1	2.0	2.0	1.9
communication, computer and information technology-related activities	…	…	4.7	3.9	3.2	3.1	2.3	3.4	2.1

(continued)

	2000	2005	2010	2011	2012	2013	2014	2015	2016
Enterprises engaged in organisational innovation as a percentage of the total number of enterprises:									
mining and quarrying, manufacturing, electricity, gas and water supply	…	…	3.4	3.5	3.2	3.1	3.0	2.9	2.8
communication, computer and information technology-related activities	…	…	5.1	3.9	3.6	3.5	3.4	3.8	3.2
Expenditure on technological, marketing and organisational innovation, *million roubles:*									
mining and quarrying, manufacturing, electricity, gas and water supply:									
at current prices	…	…	356163.5	474587.1	590341.6	756183.9	778263.5	741283.8	787232.5
at constant 1995 prices	…	…	19038.0	21887.9	24955.6	30328.5	29036.3	25560.6	26201.8
communication, computer and information technology-related activities:									
at current prices	…	…	40223.1	146419.4	86002.9	68115.1	48612.3	67749.9	54681.7
at constant 1995 prices	…	…	2150.0	6752.9	3635.6	2731.9	1813.7	2336.1	1820.0

(continued)

	2000	2005	2010	2011	2012	2013	2014	2015	2016
Expenditure on technological, marketing and organisational innovation as a percentage of total sales:									
mining and quarrying, manufacturing, electricity, gas and water supply	…	…	1.5	1.6	1.8	2.2	2.1	1.8	1.8
communication, computer and information technology-related activities	…	…	3.0	9.4	8.6	3.7	2.5	3.4	2.4
Small enterprises engaged in technological innovation as a percentage of the total number of small enterprises:									
mining and quarrying, manufacturing, electricity, gas and water supply	1.3	1.6	…	5.1	…	4.8	…	4.5	…

(continued)

	2000	2005	2010	2011	2012	2013	2014	2015	2016
Innovative goods and services as a percentage of total sales in small enterprises:									
mining and quarrying, manufacturing, electricity, gas and water supply	0.6	0.3	…	1.5	…	2.1	…	1.6	…
Expenditure on technological innovation in small enterprises, *million roubles:*									
mining and quarrying, manufacturing, electricity, gas and water supply:									
at current prices	867.6	1932.7	…	9479.3	…	13510.5	…	12151.8	…
at constant 1995 prices	183.7	186.2	…	437.2	…	541.9	…	419.0	…
Expenditure on technological innovation as a percentage of total sales in small enterprises:									
mining and quarrying, manufacturing, electricity, gas and water supply	0.6	0.2	…	0.9	…	1.0	…	0.6	…

* Unlike other services sector firms, the enterprises engaged in communication and computer and information technology-related activities were the target groups of statistical monitoring of innovative activity in the services sector during the entire reporting period.

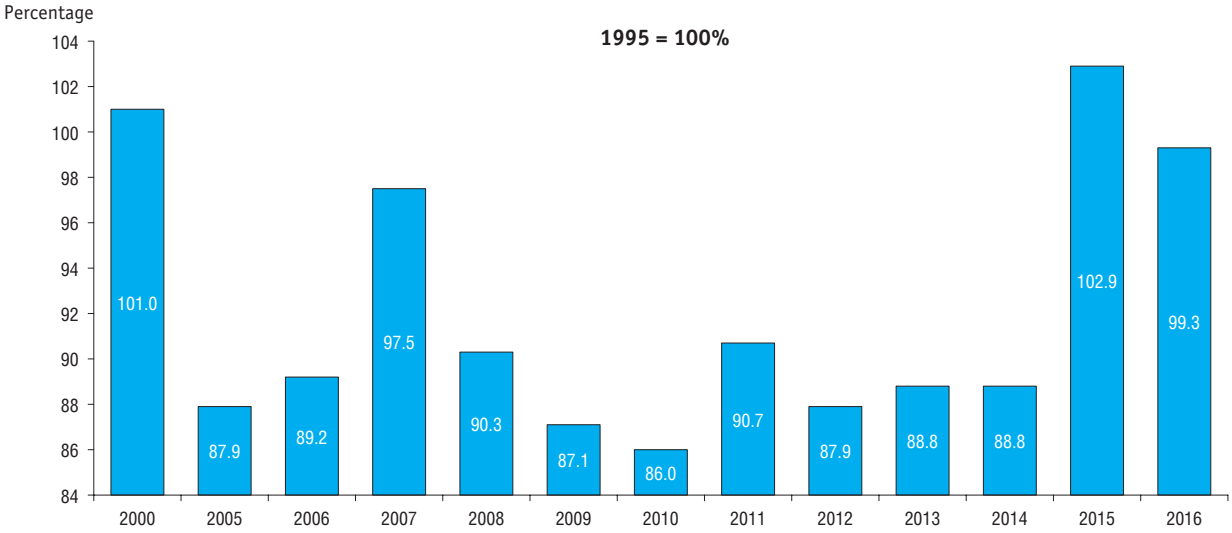
1. Institutions

1.1. R&D INSTITUTIONS BY TYPE

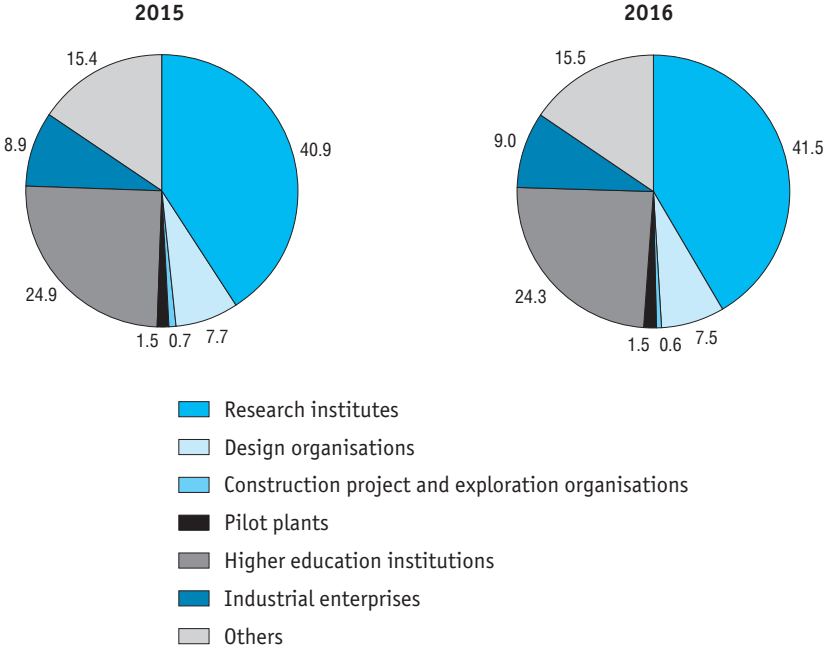
	1995	2000	2005*	2010	2011	2012	2013	2014	2015	2016
Total	**4059**	**4099**	**3566**	**3492**	**3682**	**3566**	**3605**	**3604**	**4175**	**4032**
Research institutes	2284	2686	2115	1840	1782	1744	1719	1689	1708	1673
Design organisations	548	318	489	362	364	338	331	317	322	304
Construction project and exploration organisations	207	85	61	36	38	33	33	32	29	26
Pilot plants	23	33	30	47	49	60	53	53	61	62
Higher education institutions	395	390	406	517	581	562	673	702	1040	979
Industrial enterprises	325	284	231	238	280	274	266	275	371	363
Others	277	303	234	452	588	555	530	536	644	625

* 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



1.4. R&D INSTITUTIONS BY OWNERSHIP

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Total	**4059**	**4099**	**3566**	**3492**	**3682**	**3566**	**3605**	**3604**	**4175**	**4032**
Russian ownership	4034	4035	3513	3436	3614	3506	3542	3538	4077	3940
Public ownership	2979	2938*	2632	2610	2670	2561	2526	2520	2684	2592
Federal	2783	2755	2483	2467	2493	2390	2363	2351	2494	2414
Regional	196	181	149	140	176	170	163	169	190	178
Municipal ownership	9	11	6	14	18	14	14	13	15	14
Ownership by voluntary associations	16	60	27	28	27	25	27	28	43	44
Private ownership	198	388	422	470	532	545	607	614	881	865
Ownership by Russian citizens permanently living abroad	…	…	…	…	1	1	1	1	1	1
Ownership by consumers' cooperatives**	…	3	4	4	4	2	2	2	5	6
Mixed ownership	832	635	422	304	337	298	300	296	358	326
Mixed ownership with a share of public ownership	…	…	…	268	296	247	236	231	275	248
Other mixed ownership	…	…	…	…	41	51	64	65	83	78
Ownership by state corporations	…	…	…	6	25	60	65	64	90	92
Foreign ownership	1	6	7	16	21	16	16	17	36	39
Joint ownership (with both Russian and foreign participation)	24	58	46	40	47	44	47	49	62	53

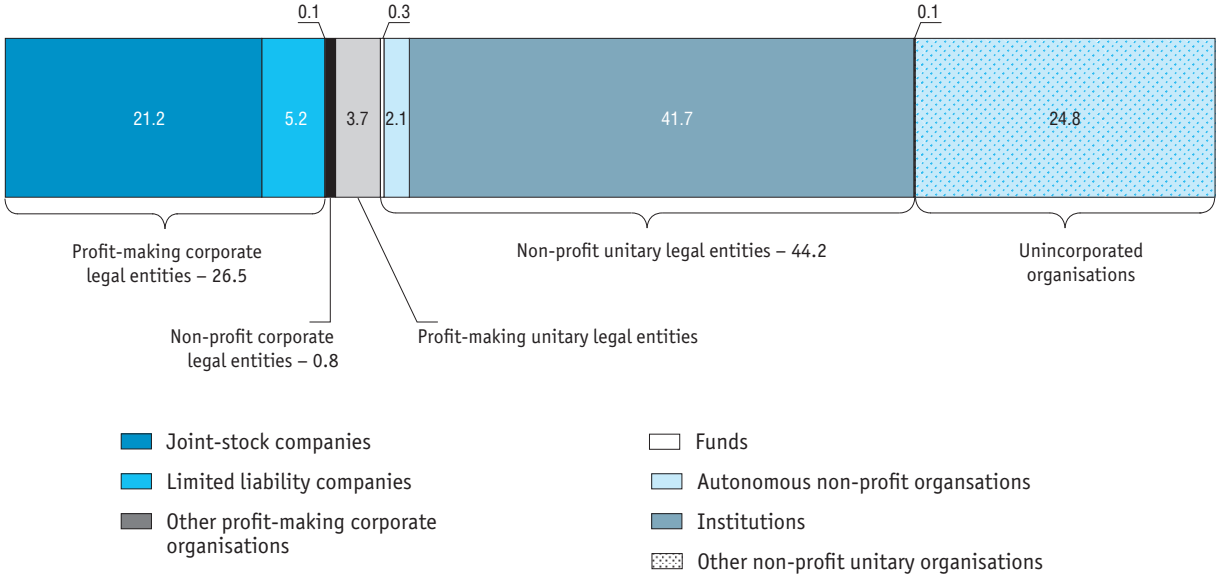
(continued)

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Total, *percentage*	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Russian ownership	99.4	98.4	98.5	98.4	98.2	98.3	98.3	98.2	97.7	97.7
Public ownership	73.4	71.7	73.8	74.7	72.5	71.8	70.1	69.9	64.3	64.3
Federal	68.6	67.2	69.6	70.6	67.7	67.0	65.5	65.2	59.7	59.9
Regional	4.8	4.4	4.2	4.0	4.8	4.8	4.5	4.7	4.6	4.4
Municipal ownership	0.2	0.3	0.2	0.4	0.5	0.4	0.4	0.4	0.4	0.3
Ownership by voluntary associations	0.4	1.5	0.8	0.8	0.7	0.7	0.7	0.8	1.0	1.1
Private ownership	4.9	9.5	11.8	13.5	14.4	15.3	16.8	17.0	21.1	21.5
Ownership by Russian citizens permanently living abroad	…	…	…	…	0.03	0.03	0.03	0.03	0.02	0.02
Ownership by consumers' cooperatives**	…	0.07	0.1	0.1	0.1	0.1	0.06	0.1	0.1	0.1
Mixed ownership	20.5	15.5	11.8	8.7	9.2	8.4	8.3	8.2	8.6	8.1
Mixed ownership with a share of public ownership	…	…	…	7.7	8.0	6.9	6.5	6.4	6.6	6.2
Other mixed ownership	…	…	…	…	1.1	1.4	1.8	1.8	2.0	1.9
Ownership by state corporations	…	…	…	0.2	0.7	1.7	1.8	1.8	2.2	2.3
Foreign ownership	0.02	0.1	0.2	0.5	0.6	0.4	0.4	0.5	0.9	1.0
Joint ownership (with both Russian and foreign participation)	0.6	1.4	1.3	1.1	1.3	1.2	1.3	1.4	1.5	1.3

* 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: 2016



1.6. R&D INSTITUTIONS BY TYPE OF ECONOMIC ACTIVITY

	2005	2010	2011	2012	2013	2014	2015	2016
Total	**3566**	**3492**	**3682**	**3566**	**3605**	**3604**	**4175**	**4032**
Agriculture, hunting, and forestry	24	35	34	31	31	30	35	33
Fishing	1	1	–	–	–	–	–	–
Mining and quarrying	8	1	2	4	3	2	4	4
Manufacturing	241	276	317	323	314	320	456	447
Electricity, gas and water supply	–	1	1	1	1	1	5	5
Construction	–	–	–	1	1	1	1	2
Wholesale and retail trade; repair of motor vehicles, motorcycles and of personal and household goods	–	–	2	–	–	–	2	5
Hotels and restaurants	–	–	–	1	1	–	1	1
Transportation, storage, and communication	1	3	4	7	4	4	4	4
Financial intermediation	–	–	–	–	–	–	2	2
Real estate, renting, and business activities	2757	2456	2526	2389	2344	2307	2321	2263
Of which:								
research and development	2628	2331	2398	2257	2213	2193	2175	2136
other services	117	95	93	88	87	76	91	77
Public administration and defence; compulsory social security	–	–	–	–	–	–	2	2
Education	428	549	620	632	732	768	1152	1083
Of which higher education	425	543	611	619	716	752	1129	1061
Health and social work	11	24	26	29	32	33	42	38
Other community, social and personal service activities	95	146	150	148	142	138	148	143
Of which recreational, cultural and sporting activities	90	140	143	139	135	132	139	136

2. R&D Personnel

2.1. R&D PERSONNEL

(headcount)

	1995	2000	2005*	2010	2011	2012	2013	2014	2015	2016
Total	**1061044**	**887729**	**813207**	**736540**	**735273**	**726318**	**727029**	**732274**	**738857**	**722291**
Research institutes	753253	718434	510523	435304	420031	430677	434243	435129	435502	427158
Design organisations	129689	56488	184785	157146	159620	138295	137098	139608	136263	133742
Construction project and exploration organisations	20870	6811	5443	6324	6466	6772	4907	4776	2849	1801
Pilot plants	13640	6145	1232	1558	1817	2330	2383	2653	3023	2996
Higher education institutions	40015	31110	33942	46776	53944	53699	54092	58573	60151	59124
Industrial enterprises	89030	54721	43524	51807	52004	52071	52232	49358	53868	50740
Others	14547	14020	33758	37625	41391	42474	42074	42177	47201	46730

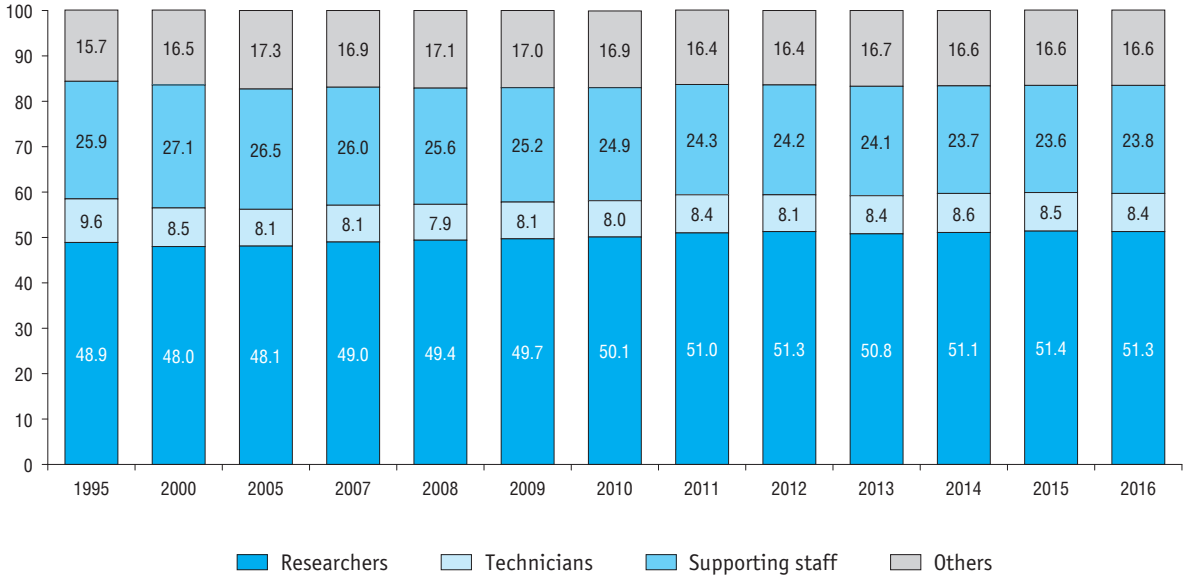
* In 2005, the R&D institutions classification by type was changed due to the abolition of the 'All-Russian Classifier of Economy Branches'.

2.2. R&D PERSONNEL BY OCCUPATION

(headcount)

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Total	**1061044**	**887729**	**813207**	**736540**	**735273**	**726318**	**727029**	**732274**	**738857**	**722291**
Researchers	518690	425954	391121	368915	374746	372620	369015	373905	379411	370379
Technicians	101371	75184	65982	59276	61562	58905	61401	63168	62805	60441
Supporting staff	274925	240506	215555	183713	178494	175790	175365	173554	174056	171915
Others	166058	146085	140549	124636	120471	119003	121248	121647	122585	119556

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	2011	2012	2013	2014	2015	2016
					Headcount					
Total	**1061044**	**887729**	**813207**	**736540**	**735273**	**726318**	**727029**	**732274**	**738857**	**722291**
Russian ownership	1060480	866386	797394	726234	723642	715691	710336	723101	729121	714043
Public ownership	816799	673658*	641310	575035	559339	536212	518460	522994	485424	458989
Federal	795299	657696	629207	564238	547922	525200	508083	508938	472548	447382
Regional	21500	15957	12103	10450	11355	10947	10377	14056	12876	11607
Municipal ownership	738	725	77	170	229	142	208	155	141	150
Ownership by voluntary associations	1036	1207	231	512	531	600	740	821	1010	959
Private ownership	26238	53408	58480	66906	74795	73260	77830	76920	85798	99312
Ownership by Russian citizens permanently living abroad	…	…	…	…	23	25	…***	…***	…***	…***
Ownership by consumer cooperatives**	…	16	27	268	308	2	…***	…***	20	23
Mixed ownership	215669	137372	97269	78464	78756	82862	87532	95863	124661	121142
Mixed ownership with a share of public ownership	…	…	…	66574	65362	59406	67452	75024	90907	91932
Other mixed ownership	…	…	…	…	13394	23456	20080	20839	33754	29210
Ownership by state corporations	…	…	…	4879	9661	22588	25560	26324	32063	33464
Foreign ownership	–	146	1145	1130	1358	1233	1955	2344	2898	2881
Joint ownership (with both Russian and foreign participation)	564	21197	14668	9176	10273	9394	14738	6829	6838	5367

(continued)

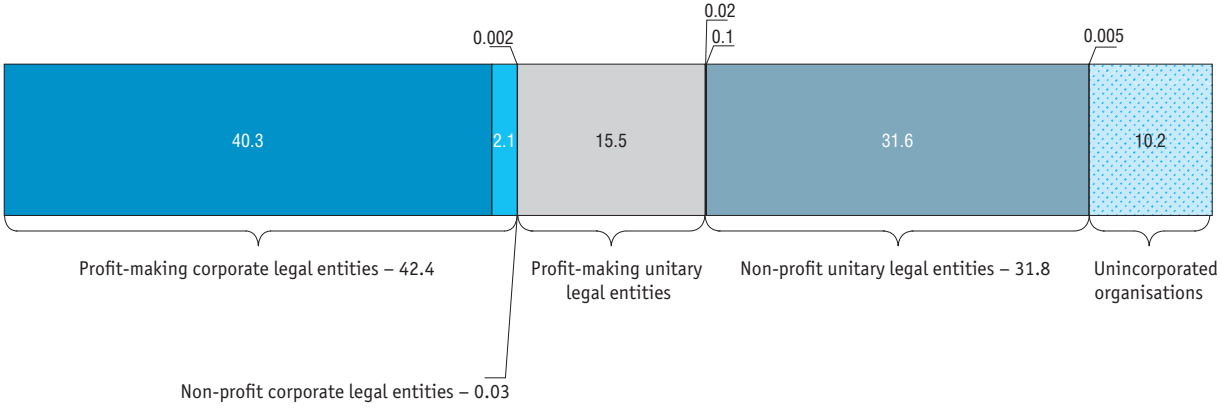
	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
					Percentage					
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Russian ownership	99.9	97.6	98.1	98.6	98.4	98.5	97.7	98.7	98.7	98.9
Public ownership	77.0	75.9	78.9	78.1	76.1	73.8	71.3	71.4	65.7	63.5
Federal	75.0	74.1	77.4	76.6	74.5	72.3	69.9	69.5	64.0	61.9
Regional	2.0	1.8	1.49	1.4	1.5	1.5	1.4	1.9	1.7	1.6
Municipal ownership	0.07	0.08	0.01	0.02	0.03	0.02	0.03	0.02	0.02	0.0
Ownership by voluntary associations	0.1	0.1	0.028	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Private ownership	2.5	6.0	7.19	9.1	10.2	10.1	10.7	10.5	11.6	13.7
Ownership by Russian citizens permanently living abroad	…	…	…	…	0.003	0.003	…***	…***	…***	…***
Ownership by consumer cooperatives**	….	0.002	0.003	0.04	0.04	0.0	…***	…***	0.003	0.003
Mixed ownership	20.3	15.5	11.96	10.7	10.7	11.4	12.0	13.1	16.9	16.8
Mixed ownership with a share of public ownership	…	…	…	9.0	8.9	8.2	9.3	10.2	12.3	12.7
Other mixed ownership	…	…	…	…	1.8	3.2	2.8	2.8	4.6	4.0
Ownership by state corporations	…	…	…	0.7	1.3	3.1	3.5	3.6	4.3	4.6
Foreign ownership	–	0.02	0.14	0.2	0.2	0.2	0.3	0.3	0.4	0.4
Joint ownership (with both Russian and foreign participation)	0.05	2.4	1.8	1.2	1.4	1.3	2.0	0.9	0.9	0.7

* 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).

2.5. PERCENTAGE DISTRIBUTION OF R&D PERSONNEL BY LEGAL STRUCTURE AND STATUS OF INSTITUTIONS: 2016



2.6. R&D PERSONNEL BY TYPE OF ECONOMIC ACTIVITY

(headcount)

	R&D personnel			Researchers		
	2014	2015	2016	2014	2015	2016
Total	**732274**	**738857**	**722291**	**373905**	**379411**	**370379**
Agriculture, hunting, and forestry	1101	1054	1024	350	296	279
Fishing	–	–	–	–	–	–
Mining and quarrying	…*	73	68	…*	71	67
Manufacturing	42758	80980	85351	25251	41085	43567
Electricity, gas and water supply	…*	166	172	…*	120	129
Construction	…*	…*	…*	…*	…*	…*
Wholesale and retail trade; repair of motor vehicles, motorcycles and of personal and household goods	–	…*	194	–	…*	169
Hotels and restaurants	–	…*	…*	–	…*	…*
Transportation, storage, and communication	1098	325	303	574	221	200
Financial intermediation	–	…*	…*	–	…*	…*
Real estate, renting, and business activities	618029	583084	563679	299881	286012	275729
Of which:						
research and development	607491	572632	554090	292849	278805	268806
other services	6608	6069	5609	4509	4135	3768
Public administration and defence; compulsory social security	–	…*	…*	–	…*	…*
Education	60908	65065	63286	44001	47397	45825
Of which higher education	60587	64834	62999	43742	47220	45591
Health and social work	3147	3723	3318	1680	1826	1877
Other community, social and personal service activities	5118	3968	3743	2098	2042	1923
Of which recreational, cultural and sporting activities	5109	3875	3658	2089	1963	1849

* 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).

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

2.8. RESEARCHERS BY GENDER AND AGE

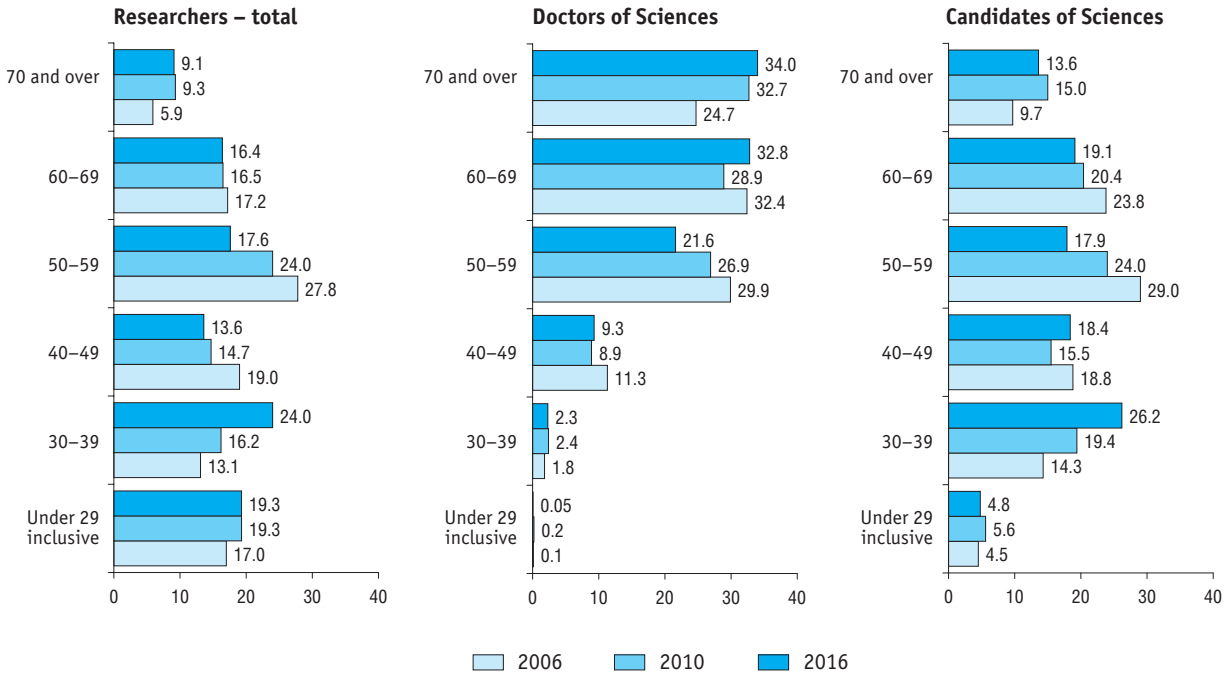
(headcount)

	2014			2015			2016		
	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	**373905**	**27969**	**81629**	**379411**	**28046**	**83487**	**370379**	**27430**	**80958**
Age, *years:*									
under 29 inclusive	75715	13	4660	76813	11	4408	71492	13	3864
30–39	78756	718	19839	85972	730	21207	88782	629	21204
40–49	49373	2558	13608	50171	2606	14703	50193	2547	14899
50–54	34606	2652	7662	32416	2457	7292	29592	2278	6670
55–59	38386	3885	8597	37136	3829	8435	35604	3649	7836
60–69	63866	9041	16238	63943	9280	16420	60915	8991	15443
70 and over	33203	9102	11025	32960	9133	11022	33801	9323	11042
Males	**222413**	**20842**	**47828**	**226482**	**20830**	**48564**	**222043**	**20288**	**47096**
Age, *years:*									
under 29 inclusive	47857	10	2828	48585	11	2658	45259	7	2321
30–39	46929	488	10630	51537	514	11424	53744	451	11642
40–49	26026	1638	6736	26724	1619	7151	27174	1560	7246
50–54	17965	1793	4286	16919	1634	3986	15498	1485	3590
55–59	21215	2691	5179	20562	2654	5045	19488	2504	4581
60–69	38838	6892	10721	38864	7024	10808	37171	6739	10168
70 and over	23583	7330	7448	23291	7374	7492	23709	7542	7548

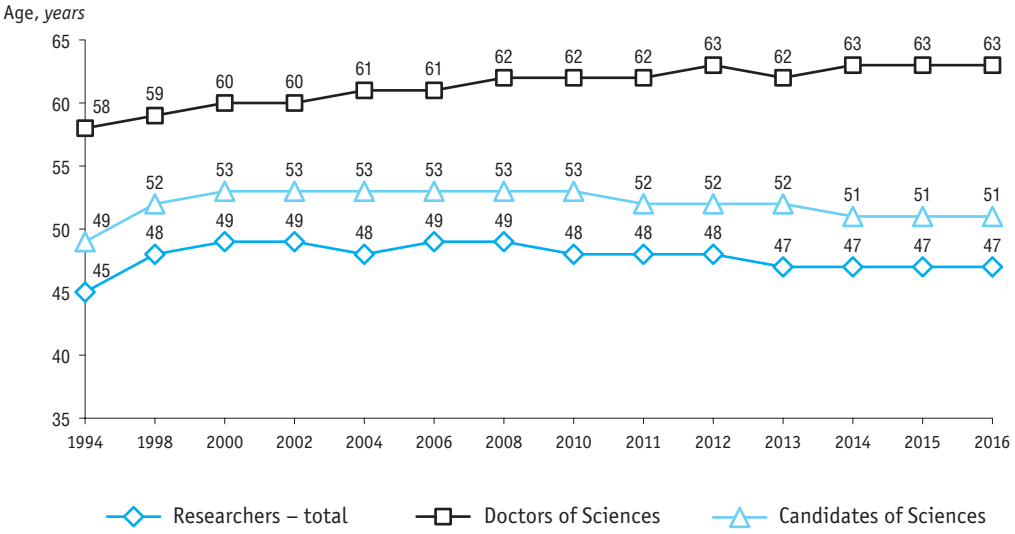
(continued)

	2014			2015			2016		
	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	**151492**	**7127**	**33801**	**152929**	**7216**	**34923**	**148336**	**7142**	**33862**
Age, *years:*									
under 29 inclusive	27858	3	1832	28228	–	1750	26233	6	1543
30–39	31827	230	9209	34435	216	9783	35038	178	9562
40–49	23347	920	6872	23447	987	7552	23019	987	7653
50–54	16641	859	3376	15497	823	3306	14094	793	3080
55–59	17171	1194	3418	16574	1175	3390	16116	1145	3255
60–69	25028	2149	5517	25079	2256	5612	23744	2252	5275
70 and over	9620	1772	3577	9669	1759	3530	10092	1781	3494

2.9. PERCENTAGE DISTRIBUTION OF RESEARCHERS BY AGE



2.10. AVERAGE AGE OF RESEARCHERS

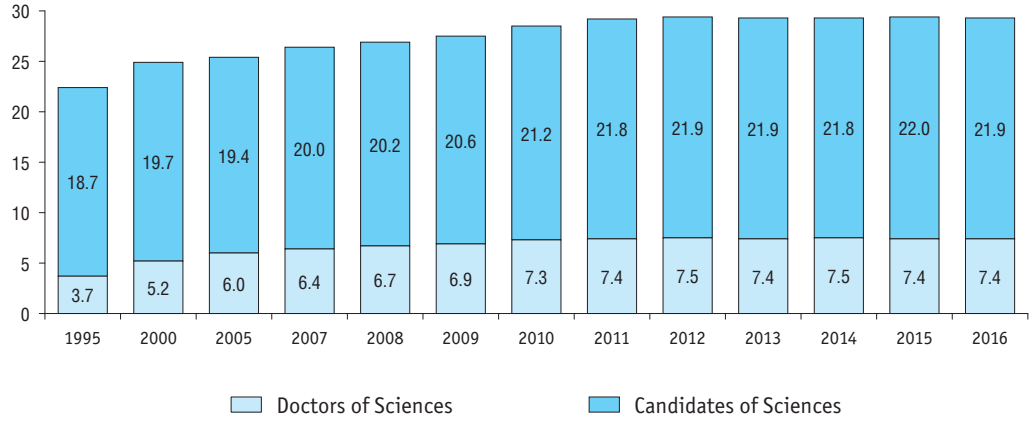


2.11. RESEARCHERS WITH SCIENTIFIC DEGREES

(headcount)

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Researchers with scientific degrees	**116465**	**105911**	**99428**	**105114**	**109493**	**109330**	**108248**	**109598**	**111533**	**108388**
Doctors of Sciences	19330	21949	23410	26789	27675	27784	27485	27969	28046	27430
Candidates of Sciences	97135	83962	76018	78325	81818	81546	80763	81629	83487	80958

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

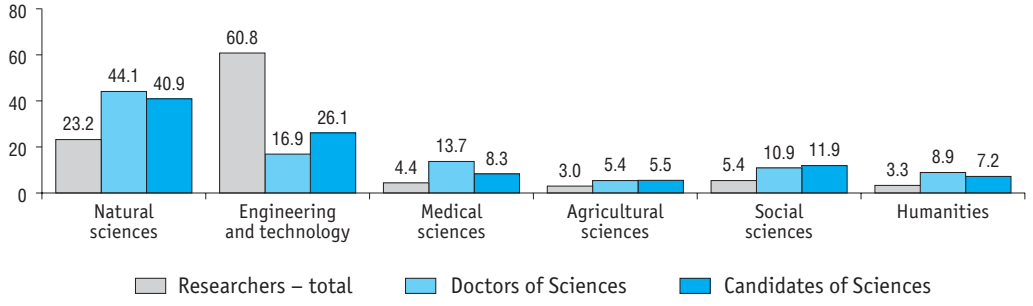


2.13. RESEARCHERS BY FIELD OF SCIENCE AND TECHNOLOGY

(headcount)

	2005			2010			2015			2016		
	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**	**379411**	**28046**	**83487**	**370379**	**27430**	**80958**
Natural sciences	91570	10738	32969	89375	12251	33664	86722	12233	33725	85979	12083	33087
Engineering and technology	249358	4495	23677	224641	4620	21260	231809	4928	21861	225038	4648	21153
Medical sciences	15672	3715	6791	16516	4045	7475	15819	3899	6808	16137	3768	6755
Agricultural sciences	13724	1356	4922	12734	1542	5004	11296	1551	4592	11066	1487	4483
Social sciences	12497	1336	4158	14347	2057	5861	20874	2951	10357	19831	2990	9611
Humanities	8300	1770	3501	11302	2274	5061	12891	2484	6144	12328	2454	5869

2.14. PERCENTAGE DISTRIBUTION OF RESEARCHERS BY FIELD OF SCIENCE AND TECHNOLOGY: 2016



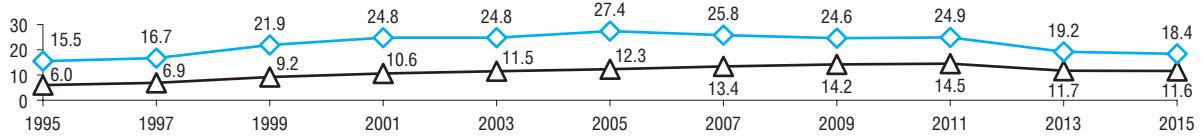
2.15. FLOWS OF R&D PERSONNEL

(headcount)

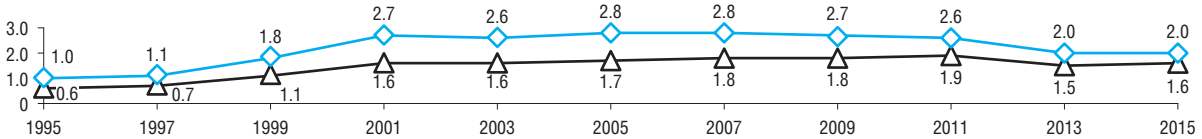
	Number at the beginning of the reporting year	Inflow				Outflow				Number at the end of the reporting year
		Total	Of whom			Total	Of whom			
			higher education graduates	other research institutes' graduates	others		resigned	were made redundant	left due to other reasons	
1995	1179294	108335	6498	23402	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

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

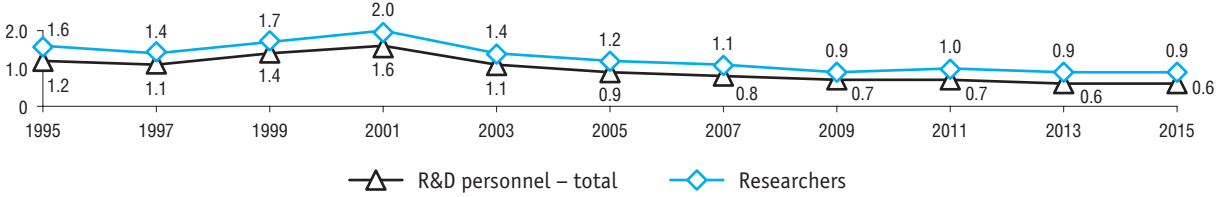
Higher education graduates as a percentage of those hired



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



Higher education graduates hired by R&D institutions as a percentage of the total number of higher education graduates**



* 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
R&D personnel balance by inflow*	0.099	0.152	0.138	0.135	0.131	0.135	0.138	0.144
R&D personnel balance by outflow**	0.207	0.158	0.154	0.152	0.136	0.144	0.136	0.142
Labour force replacement ratio***	0.478	0.962	0.896	0.889	0.963	0.941	1.015	1.017

* 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, *headcount (at the end of the year)*	Entrants, *headcount*	Graduates, *headcount*	Of whom with defended thesis, *headcount*
			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

(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 thesis, *headcount*
			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

(continued)

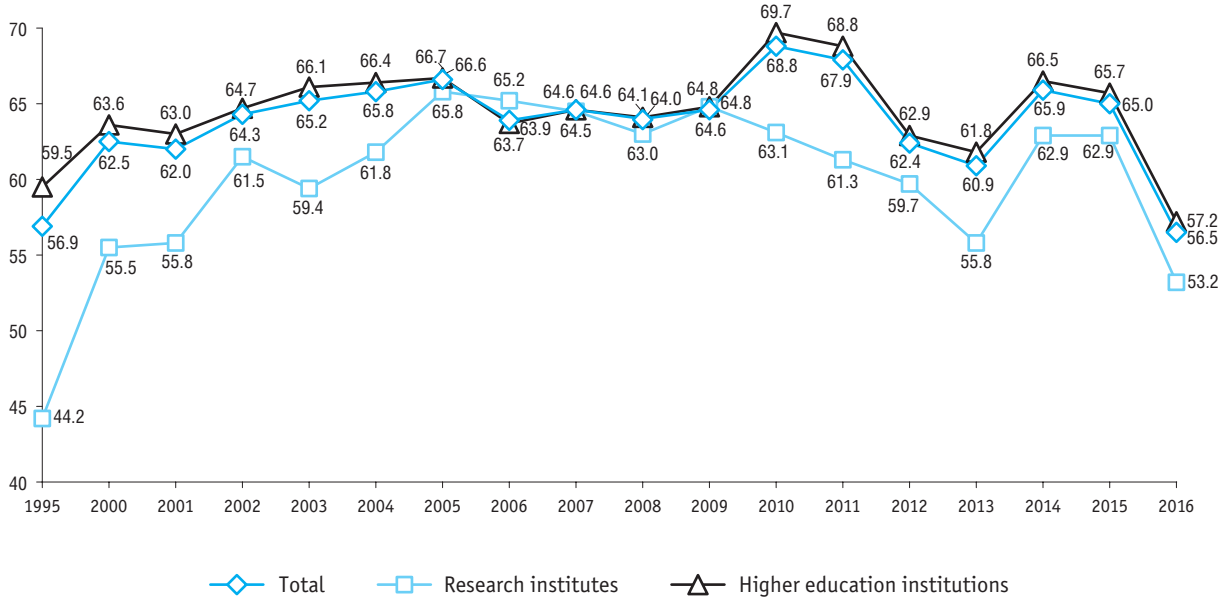
	Number of institutions *(at the end of the year)*	Enrolment, *headcount (at the end of the year)*	Entrants, *headcount*	Graduates, *headcount*	Of whom with defended thesis, *headcount*
			Higher education institutions		
1995	506	50829	20001	8555	2013
2000	565	100212	37025	21015	6630
2005	640	122913	40319	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
			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

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

(headcount)

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

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 STUDENTS BY GENDER AND AGE: 2016

(at the end of the year)

2.22. POSTGRADUATE ENROLMENT AND ENTRANTS BY FIELD OF STUDIES

(headcount)

	Enrolment		Entrants	
	2015*	2016*	2015	2016
Total	**60449**	**82750**	**31647**	**26421**
Engineering mathematics	1459	2050	752	652
Computer and information sciences	211	293	148	110
Physics and astronomy	2358	3456	1214	1234
Chemistry	1584	2153	799	681
Earth sciences	2097	2886	1065	922
Biological sciences	2563	3596	1352	1102
Architecture	323	477	158	166
Civil engineering and technology	1239	1641	663	501
Computer engineering	4802	6433	2556	1963
Information security	307	373	158	134
Electronics and communications engineering	1115	1512	558	505
Photonics, instrumentation engineering, optical and biomedical engineering	577	786	300	287
Power engineering and thermal power engineering	1065	1539	528	512
Nuclear power engineering and technology	160	226	88	91
Mechanical engineering	1366	1836	731	615
Engineering physics and technology	52	37	32	10
Weapons and armaments systems	4	10	3	3
Chemical engineering	743	1018	399	311
Industrial ecology and biotechnology	562	711	262	203
Technosphere safety and environmental engineering	270	363	130	116
Applied geology, mining and quarrying, oil and gas engineering, geodesy	601	841	310	294
Materials engineering	558	867	289	317
Surface transport engineering and technology	436	651	232	244
Aircraft and aerospace engineering	471	621	247	248
Flight navigation and aircraft and aerospace equipment operation	75	110	43	43

(continued)

	Enrolment		Entrants	
	2015*	2016*	2015	2016
Shipbuilding and water-borne transportation engineering and technology	268	397	148	144
Engineering systems management	541	790	280	266
Nanotechnologies and nanomaterials	22	29	11	11
Light industry technological processes	145	191	74	57
Basic medicine	530	839	288	291
Clinical medicine	4124	6174	2096	1941
Health sciences and preventive medicine	389	590	205	210
Pharmacology and pharmacy	224	314	125	99
Agriculture, forestry, and fisheries	1976	2681	1053	868
Veterinary science and animal science	979	1387	490	481
Psychology	1433	1989	804	673
Economics and management	7808	9957	4056	2903
Sociology and social work	931	1279	507	460
Law	4040	5229	2191	1545
Political sciences and area studies	1047	1405	559	480
Mass media, library and information science	284	385	151	140
Education and educational research	3512	4800	1917	1490
Linguistics and literary studies	2684	3678	1387	1145
History and archaeology	1903	2566	967	775
Philosophy, ethics, and religion	1156	1550	599	493
Theology	5	9	5	5
Physical training and sport	390	611	194	235
Art (arts, history of arts, etc.)	613	828	296	271
Cultural studies and sociocultural projects	447	586	227	174

* 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 enroll 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 AND ENTRANTS BY FIELD OF STUDIES CORRESPONDING TO PRIORITY AREAS OF MODERNISATION AND TECHNOLOGICAL DEVELOPMENT OF THE ECONOMY

(headcount)

	Enrolment		Entrants	
	2015*	2016*	2015	2016
Fields of studies, by priority areas of modernisation and technological development of the economy	29624	41514	15514	13495
Engineering mathematics	1459	2050	752	652
Computer and information sciences	211	293	148	110
Physics and astronomy	2358	3456	1214	1234
Biological sciences	2563	3596	1352	1102
Civil engineering and technology	1239	1641	663	501
Computer engineering	4802	6433	2556	1963
Information security	307	373	158	134
Electronics and communications engineering	1115	1512	558	505
Photonics, instrumentation engineering, optical and biomedical engineering	577	786	300	287
Power engineering and thermal power engineering	1065	1539	528	512
Nuclear power, thermal power engineering, and renewable related technologies	160	226	88	91
Mechanical engineering	1366	1836	731	615
Engineering physics and technology	52	37	32	10
Weapons and armaments systems	4	10	3	3
Chemical engineering	743	1018	399	311
Technosphere safety	270	363	130	116
Geology, exploration, and exploitation of minerals	560	774	286	280
Materials engineering	558	867	289	317
Aircraft and aerospace engineering	471	621	247	248

(continued)

	Enrolment		Entrants	
	2015*	2016*	2015	2016
Flight navigation and aircraft and aerospace equipment operation	75	110	43	43
Shipbuilding and water-borne transportation engineering and technology	268	397	148	144
Engineering systems management	541	790	280	266
Nanotechnologies and nanomaterials	22	29	11	11
Basic medicine	530	839	288	291
Clinical medicine	4124	6174	2096	1941
Medical and preventive care	389	590	205	210
Pharmacology and pharmacy	224	314	125	99
Technology, mechanisation tools and power equipment for agriculture, forestry, and fishing	887	1162	497	354
Linguistics and literary studies	2684	3678	1387	1145

* 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 enroll in are listed accoring 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*	2015	2016	2015	2016
Total	**49487**	**15602**	**25826**	**25992**	**4651**	**3730**
Physics and mathematics	3299	1319	1230	1677	272	318
Chemical sciences	1346	554	497	658	146	153
Biological sciences	2889	1094	1235	1437	232	173
Engineering and technology**	14011	4870	6723	7286	1093	1030
Agricultural sciences***	1684	448	1006	954	254	223
History and archaeology	1362	281	855	823	127	112
Economics	6082	1744	3839	3206	582	275
Philosophy	845	235	492	475	77	53
Philology and linguistics	2212	561	1248	1204	272	241
Law	2808	812	1461	1371	205	148
Educational research	2762	783	1580	1437	286	190
Medical sciences****	4781	1541	2611	2577	722	490
Art (arts, history of arts, etc.)	529	124	304	287	12	26
Psychology	1040	282	544	504	69	32
Sociology	725	188	423	387	68	47
Political science	674	166	392	385	48	27
Earth sciences*****	1883	454	1104	1050	154	152
Other sciences	555	146	282	274	32	40

* 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 enroll in are listed accoring 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 forth to fifth year of studies.

*** Including veterinary science.

**** Including pharmacology and pharmacy.

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

2.25. MAIN INDICATORS OF DOCTORAL STUDIES

	Number of institutions *(at the end of the year)*	Number of doctoral students *(at the end of the year)*	Entrants, *headcount*	Graduates, *headcount*	Of whom with defended doctoral thesis, *headcount*
			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

(continued)

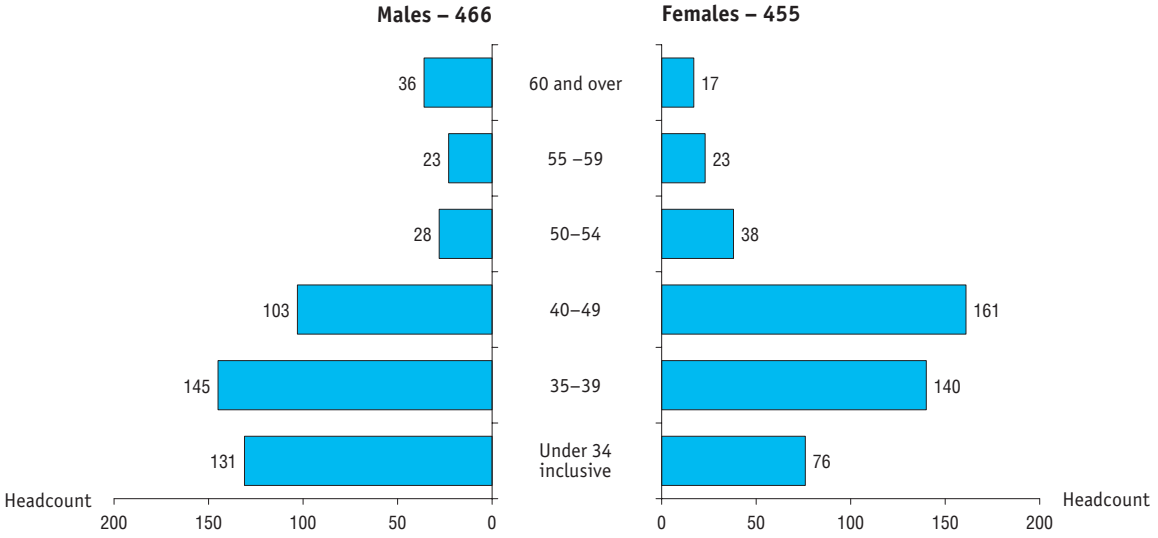
	Number of institutions *(at the end of the year)*	Number of doctoral students *(at the end of the year)*	Entrants, *headcount*	Graduates, *headcount*	Of whom with defended doctoral thesis, *headcount*
			Research institutes		
1995	167	483	197	128	41
2000	178	505	192	151	63
2005	173	445	147	148	48
2006	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

(continued)

	Number of institutions *(at the end of the year)*	Number of doctoral students *(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
			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	–	–	–	–	–

2.26. DOCTORAL STUDENTS BY GENDER AND AGE: 2016

(at the end of the year)



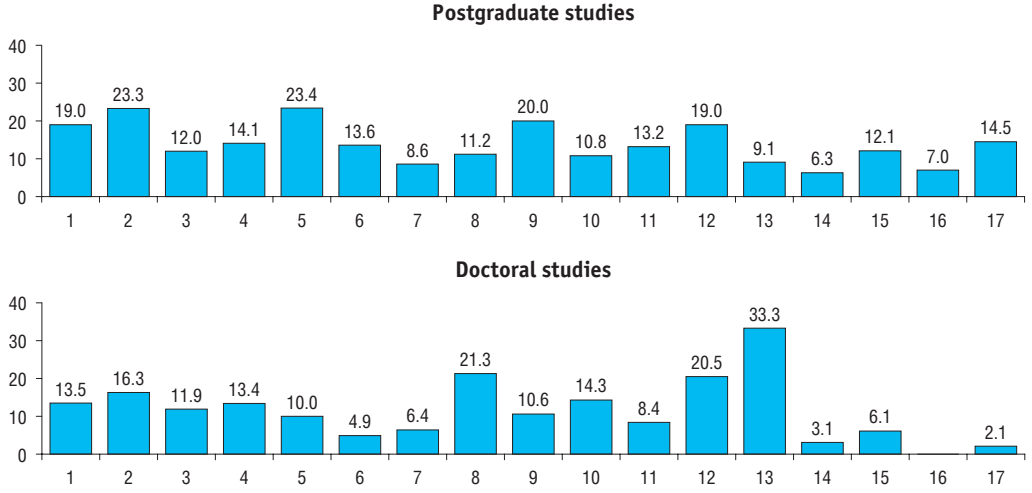
2.27. DOCTORAL ENROLMENT, ENTRANTS, AND GRADUATES BY FIELD OF SCIENCE AND TECHNOLOGY

(headcount)

	Number of doctoral students *(at the end of the year)*		Entrants		Graduates		Of whom with doctoral defended thesis	
	2015	2016	2015	2016	2015	2016	2015	2016
Total	**2007**	**921**	**419**	**397**	**1386**	**1346**	**181**	**151**
Physics and mathematics	147	57	28	23	105	111	11	15
Chemical sciences	61	23	6	11	40	49	4	8
Biological sciences	59	26	10	7	35	42	4	5
Engineering and technology*	517	244	99	116	409	366	56	49
Agricultural sciences**	54	23	5	5	30	40	4	4
History and archaeology	101	38	20	11	67	61	11	3
Economics	286	168	103	75	158	156	29	10
Philosophy	58	23	8	13	44	47	5	10
Philology and linguistics	119	41	12	19	95	85	6	9
Law	63	58	28	26	25	28	6	4
Educational research	185	82	38	36	127	119	16	10
Medical sciences***	99	29	11	8	82	73	14	15
Art (arts, history of arts, etc.)	25	7	1	–	12	15	1	5
Psychology	56	26	12	11	35	32	2	1
Sociology	42	15	4	6	26	33	3	2
Political science	33	22	6	11	27	24	2	–
Earth sciences****	61	23	12	11	47	47	4	1
Other sciences	41	16	16	8	22	18	3	–

* Including architecture.
** Including veterinary science.
*** Including pharmacology and pharmacy.
**** Including geology, mineralogy, and geography.

2.28. GRADUATES WHO DEFENDED THEIR POSTGRADUATE AND DOCTORAL THESIS DURING THEIR STUDIES AS A PERCENTAGE OF ALL GRADUATES WHO COMPLETED THEIR POSTGRADUATE AND DOCTORAL STUDIES BY FIELD OF SCIENCE AND TECHNOLOGY: 2016



1 – Physics and mathematics
2 – Chemical sciences
3 – Biological sciences
4 – Engineering and technology*
5 – Agricultural sciences**
6 – History and archaeology
7 – Economics
8 – Philosophy
9 – Philology and linguistics
10 – Law
11 – Educational researches
12 – Medical science***
13 – Art (arts, history of arts, etc.)
14 – Psychology
15 – Sociology
16 – Political science
17 – Earth sciences****

* Including architecture.
** Including veterinary science.
*** Including pharmacology and pharmacy.
**** Including geology, mineralogy, and geography.

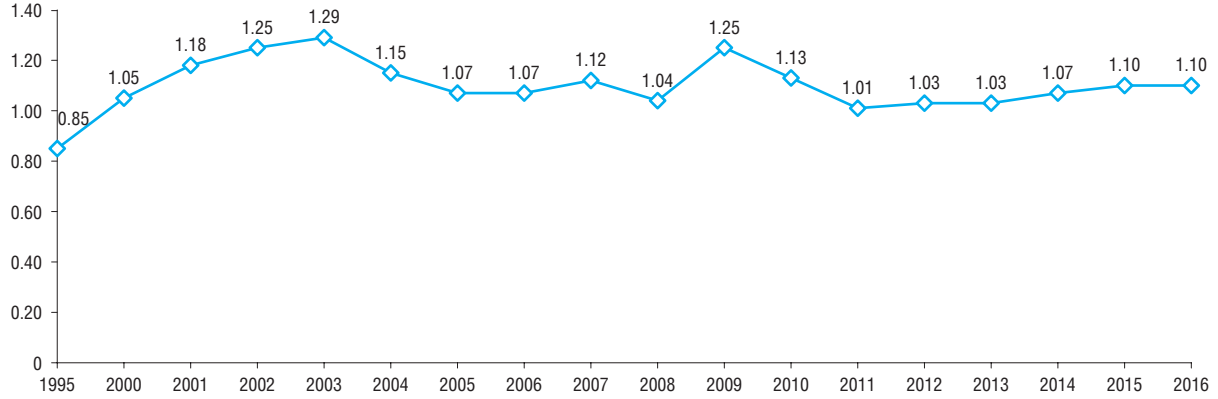
3. R&D Funding

3.1. GROSS DOMESTIC EXPENDITURE ON R&D

(thousand roubles, 1995 – million roubles)

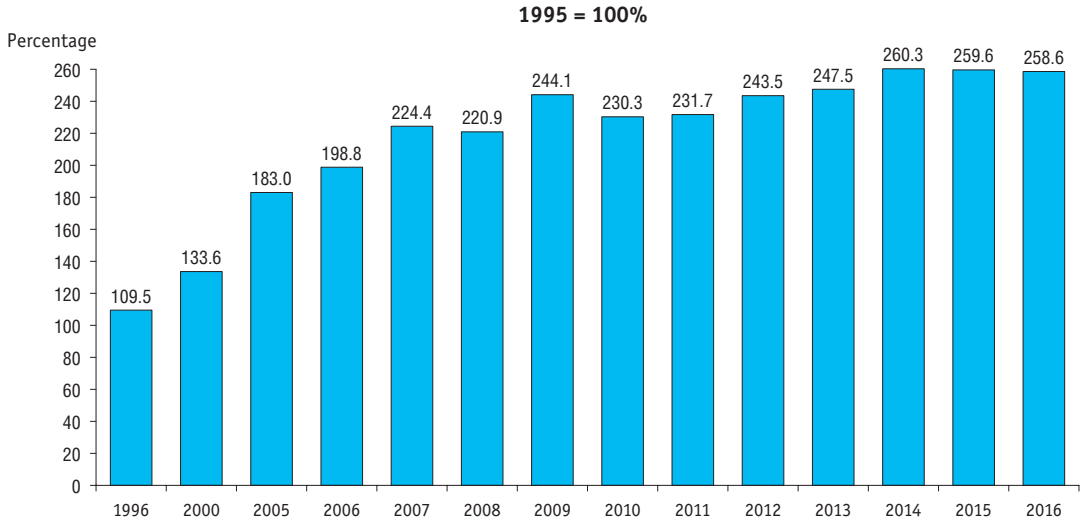
	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Gross domestic expenditure on R&D:										
at current prices	12149458.6	76697100.5	230785150.3	523377233.9	610426680.6	699869784.8	749797638.8	847526992.9	914669057.2	943815219.6
at constant 1989 prices	2485.4	3321.2	4547.5	5723.2	5759.3	6052.4	6152.0	6468.7	6452.1	6426.4

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

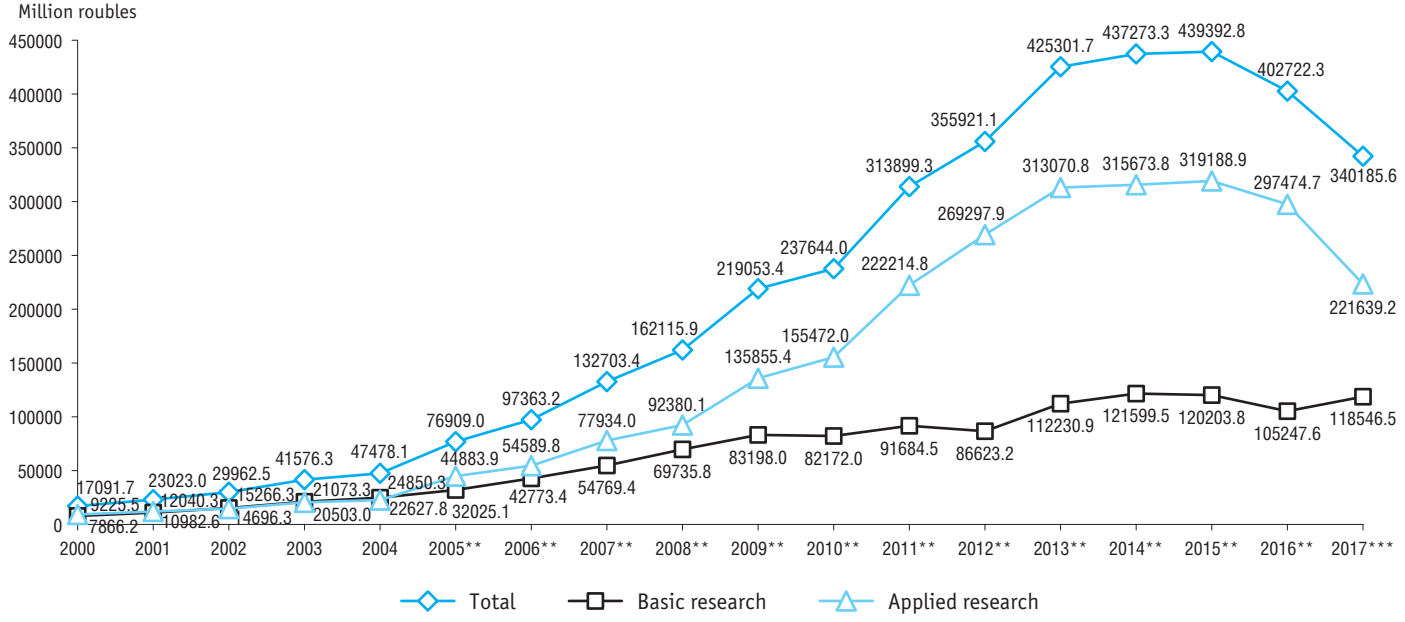


3.2. TRENDS IN GROSS DOMESTIC EXPENDITURE ON R&D

(at constant 1989 prices)



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

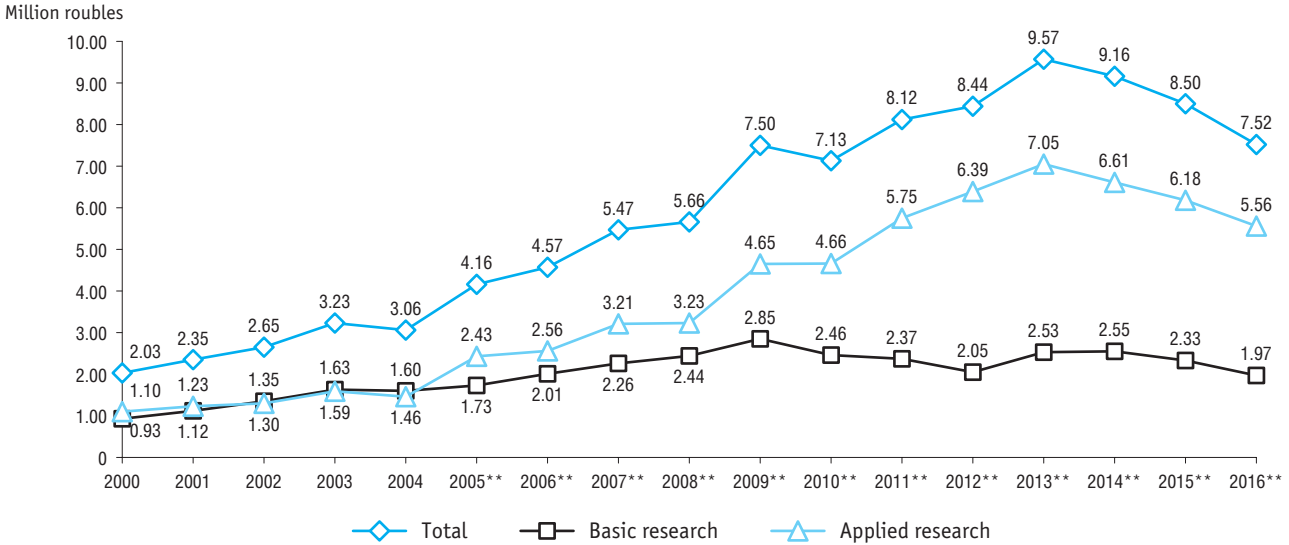


* In 2000–2004, federal budget appropriations under Section 06 'Basic Research and Scientific and Technological Progress Promotion' and the corresponding subsections.

** Data source for 2005–2016: reports on the implementation of the consolidated budget and budgets of state non-budgetary funds (the data are provided by the Federal Treasury).

*** In accordance with Federal Law no. 415-FL of December 19, 2016 'On the 2017 Federal Budget and the 2018-2019 Budget Plan' as amended by Federal Laws no. 157-FL of July 01, 2017, no. 326-FL of November 14, 2017 'On amendments to the Federal Law "On the 2017 Federal Budget and the 2018-2019 Budget Plan"'.

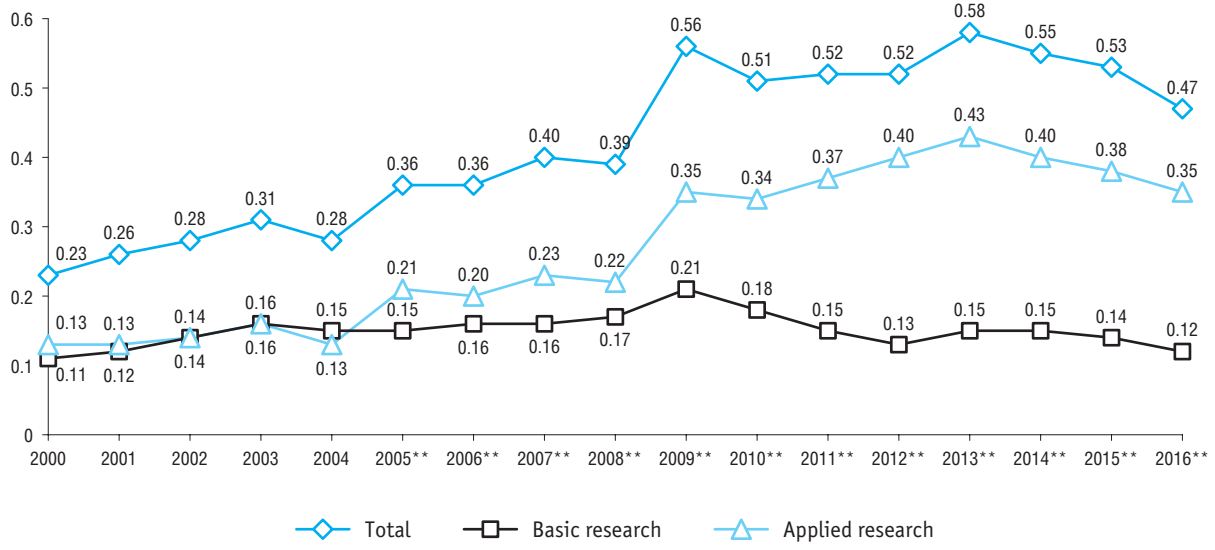
3.4. FEDERAL BUDGET APPROPRIATIONS ON CIVIL S&T AT CONSTANT 1991 PRICES*



* In 2000–2004, federal budget appropriations under Section 06 'Basic Research and Scientific and Technological Progress Promotion' and the corresponding subsections.

** Data source for 2005–2016: reports on the implementation of the consolidated budget and budgets of state non-budgetary funds (the data are provided by the Federal Treasury).

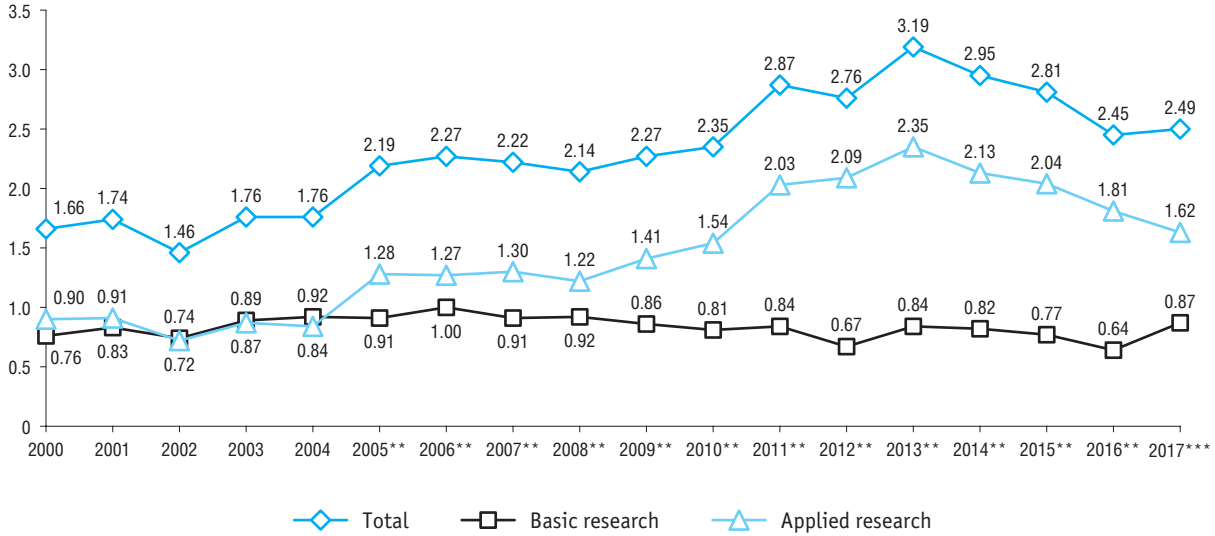
3.5. FEDERAL BUDGET APPROPRIATIONS ON CIVIL S&T AS A PERCENTAGE OF GDP*



* In 2000–2004, federal budget appropriations under Section 06 'Basic Research and Scientific and Technological Progress Promotion' and the corresponding subsections.

** Data source for 2005–2016: reports on the implementation of the consolidated budget and budgets of state non-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*

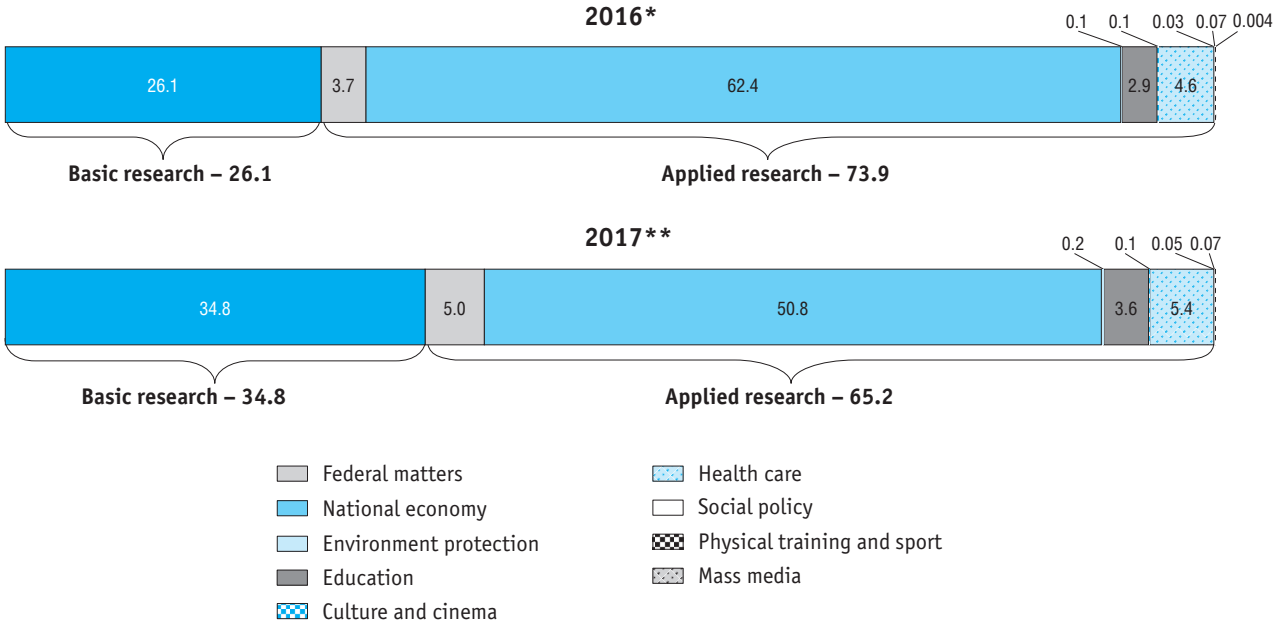


* In 2000–2004, federal budget appropriations under Section 06 'Basic Research and Scientific and Technological Progress Promotion' and the corresponding subsections.

** Data source for 2005–2016: reports on the implementation of the consolidated budget and budgets of state non-budgetary funds (the data are provided by the Federal Treasury).

*** In accordance with Federal Law no. 415-FL of December 19, 2016 'On the 2017 Federal Budget and the 2018-2019 Budget Plan' as amended by Federal Laws no. 157-FL of July 01, 2017, no. 326-FL of November 14, 2017 'On amendments to the Federal Law "On the 2017 Federal Budget and the 2018-2019 Budget Plan"'.

3.7. PERCENTAGE DISTRIBUTION OF FEDERAL BUDGET APPROPRIATIONS ON CIVIL S&T BY SECTION OF BUDGET EXPENDITURE CLASSIFICATION AND TYPE OF FEDERAL BUDGET



* Data source for 2016: reports on the implementation of the consolidated budget and budgets of state non-budgetary funds (the data are provided by the Federal Treasury).

** In accordance with Federal Law no. 415-FL of December 19, 2016 'On the 2017 Federal Budget and the 2018-2019 Budget Plan' as amended by Federal Laws no. 157-FL of July 01, 2017, no. 326-FL of November 14, 2017 'On amendments to the Federal Law "On the 2017 Federal Budget and the 2018-2019 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
	At current prices, *thousand roubles, 1995 – million roubles*					
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

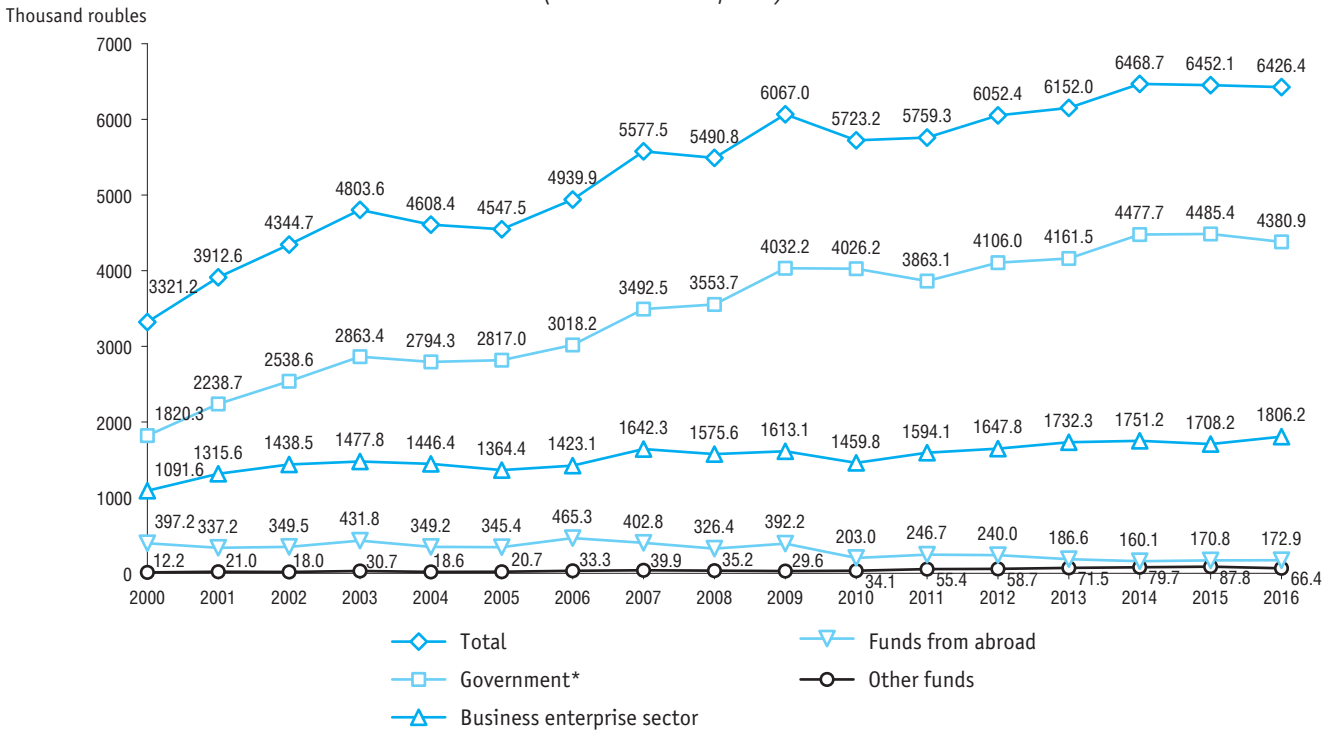
(continued)

	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

* Including budget funds, 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)



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

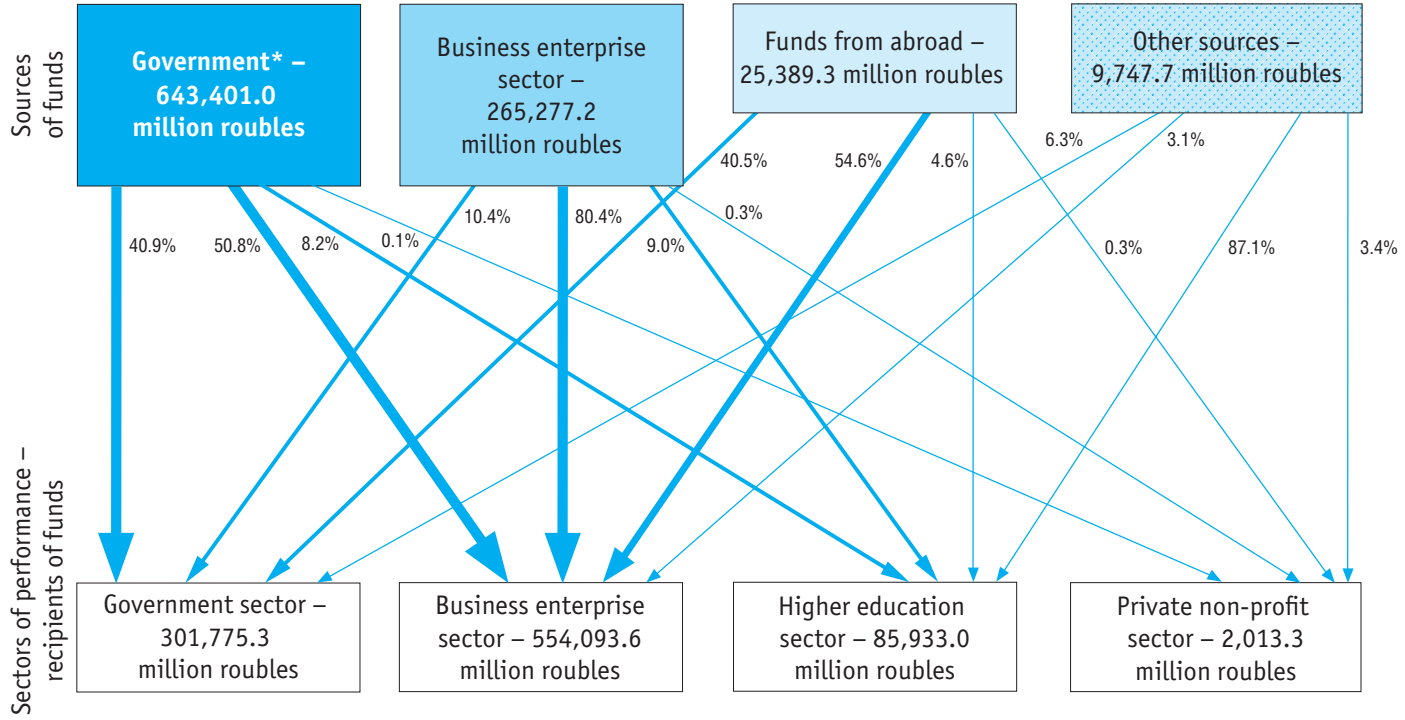
3.10. SUBSIDIES, GRANTS, AND OTHER COMPETITIVE R&D FUNDING: 2016

	Total	Budgets of all levels	Of which federal budget appropriations
Gross domestic expenditure on R&D	**943815219.6**	**523337322.9**	**506894782.4**
Of which:			
budget subsidies for institutitonal R&D funding	93975510.7	93975510.7	90842411.8
budget subsidies for performing R&D	36729558.4	36729558.4	35851107.1
grants from foundations for S&T and innovation	22642169.0	19543992.0	17566747.6
other types of competitive financing	58658143.2	48976176.4	47640861.2

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

	2014		2015		2016	
	Total, *thousand roubles*	Percentage	Total, *thousand roubles*	Percentage	Total, *thousand roubles*	Percentage
Gross domestic expenditure on R&D funded from abroad	**20982432.9**	**100.0**	**24211969.2**	**100.0**	**25389310.8**	**100.0**
Including						
International organisations	3104558.8	14.8	1287164.2	5.3	1477734.1	5.8
Government organisations of foreign countries	4769488.7	22.7	7221887.0	29.8	8104574.3	31.9
Business enterprise sector organisations of foreign countries	12082110.8	57.6	14209467.4	58.7	14204550.0	55.9
Other foreign organisations (educational institutions, funds, non-profit organisations)	1026274.6	4.9	1493450.6	6.2	1602452.4	6.3

3.12. R&D FUNDING BY SECTOR OF PERFORMANCE: 2016



* 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	2011	2012	2013	2014	2015	2016
	At current prices, *thousand roubles, 1995 – million roubles*									
Total	**12149458.6**	**76697100.5**	**230785150.3**	**523377233.9**	**610426680.6**	**699869784.8**	**749797638.8**	**847526992.9**	**914669057.2**	**943815219.6**
Russian ownership	12137095.6	74254897.9	226582085.6	514058161.4	598027432.9	685495275.4	725512775.4	831700355.3	897702466.4	930156714.4
Public ownership	9303329.4	56254567.1	171855852.1	394615118.0	448854863.1	495689326.0	510811584.2	588219503.3	570759794.5	569769183.6
Federal	9047499.6	55150426.2	168986692.6	389105256.8	441676795.3	487535217.5	502816626.9	577892310.2	559987658.5	555862200.4
Regional	255829.8	1099762.3	2869159.5	5396479.0	7152191.4	8124552.8	7994957.3	10327193.1	10772136.0	13906983.2
Municipal ownership	15214.6	50381.9	17253.5	50304.2	74152.5	65889.2	93873.2	78104.2	93960.3	90712.5
Ownership by voluntary associations	35640.0	209229.3	339129.1	525085.2	711349.2	915629.8	1246181.6	1181906.2	2010818.4	2083134.9
Private ownership	265827.3	4948266.7	20957744.5	60263592.5	69577239.4	80608901.3	94280978.5	100226515.2	116626956.5	149005447.9
Ownership by Russian citizens permanently living abroad	…	…	…	…	21631.3	6949.0	…**	…**	…**	…**
Ownership by consumers' cooperatives*	…	1095.2	4354.5	36590.0	39286.2	2468.5	…**	–	20664.7	22065.5
Mixed ownership	2517084.3	12791357.7	33407751.9	55954325.1	69203059.8	83947440.0	89367594.5	114333241.0	168031713.1	168078029.2
Mixed ownership with a share of public ownership	…	…	…	49557690.9	62421583.0	62059799.4	73525307.2	97555613.4	129154411.8	138670373.3
Other mixed ownership	…	…	…	…	6781476.8	21887640.6	15842287.3	16777627.6	38877301.3	29407655.9
Ownership by state corporations	…	…	…	2613146.4	9545851.4	24258671.6	29695934.9	27615092.9	40134256.9	41085157.5
Foreign ownership	336.7	117265.0	697993.4	1390905.3	1780045.0	2683049.2	7059984.4	7945428.4	5684831.2	7007423.6
Joint ownership (with both Russian and foreign participation)	12026.3	2324937.6	3505071.3	7928167.2	10619202.7	11691460.2	17224879.0	7881209.2	11281759.6	6651081.6

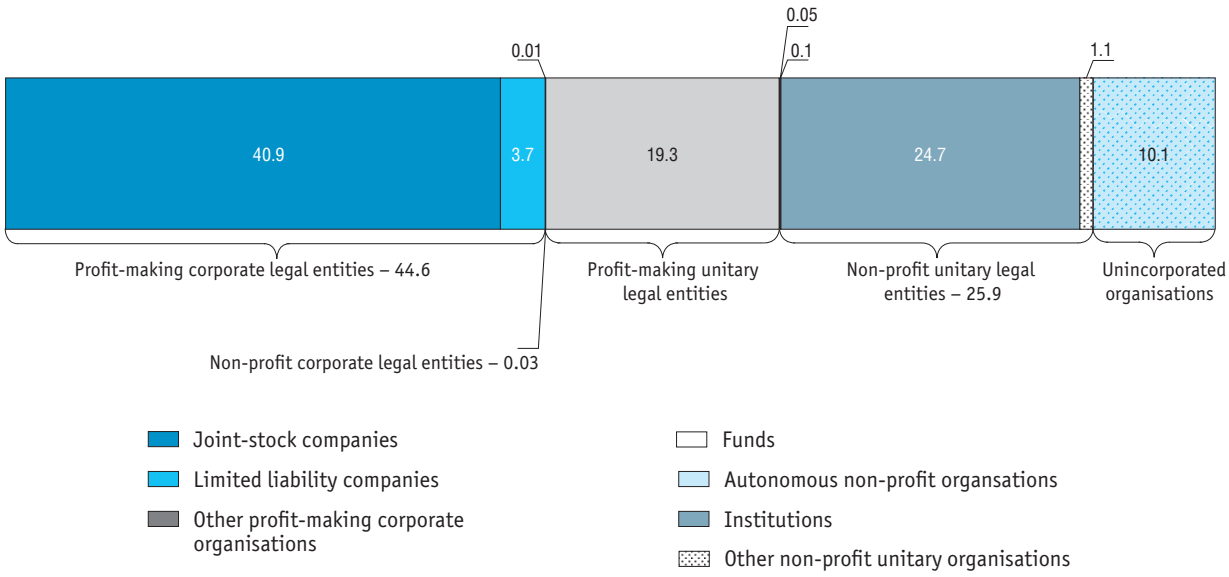
(continued)

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
					Percentage					
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Russian ownership	99.9	96.8	98.2	98.2	98.0	97.9	96.8	98.1	98.1	98.6
Public ownership	76.6	73.3	74.5	75.4	73.5	70.8	68.1	69.4	62.4	60.4
Federal	74.5	71.9	73.2	74.3	72.4	69.7	67.1	68.2	61.2	58.9
Regional	2.1	1.4	1.2	1.0	1.2	1.2	1.1	1.2	1.2	1.5
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	0.1	0.2	0.1	0.2	0.2
Private ownership	2.2	6.5	9.1	11.5	11.4	11.5	12.6	11.8	12.8	15.8
Ownership by Russian citizens permanently living abroad	…	…	…	…	0.004	0.001	…**	…**	…**	…**
Ownership by consumers' cooperatives*	…	0.0	0.0	0.0	0.006	0.0	…**	–	0.002	0.002
Mixed ownership	20.7	16.7	14.5	10.7	11.3	12.0	11.9	13.5	18.4	17.8
Mixed ownership with a share of public ownership	…	…	…	9.5	10.2	8.9	9.8	11.5	14.1	14.7
Other mixed ownership	…	…	…	…	1.1	3.1	2.1	2.0	4.3	3.1
Ownership by state corporations	…	…	…	0.5	1.6	3.5	4.0	3.3	4.4	4.4
Foreign ownership	0.002	0.2	0.3	0.3	0.3	0.4	0.9	0.9	0.6	0.7
Joint ownership (with both Russian and foreign participation)	0.1	3.0	1.5	1.5	1.7	1.7	2.3	0.9	1.2	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: 2016



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

(thousand roubles)

	2005	2010	2011	2012	2013	2014	2015	2016
Total	**230785150.3**	**523377233.9**	**610426680.6**	**699869784.8**	**749797638.8**	**847526992.9**	**914669057.2**	**943815219.6**
Agriculture, hunting, and forestry	146783.8	253871.9	289856.1	286476.4	392683.9	430205.2	583798.7	528982.8
Fishing	5559.6	485.2	–	–	–	–	–	–
Mining and quarrying	584953.6	55728.0	54729.0	42282.0	23211.4	…*	53955.0	48825.4
Manufacturing	10631526.1	21372426.7	23051252.7	33489559.2	41036284.6	41125116.8	96197060.7	101296557.8
Electricity, gas and water supply	–	8234.0	8654.0	–	…*	…*	33170.1	30618.8
Construction	–	–	–	35200.7	…*	…*	…*	…*
Wholesale and retail trade; repair of motor vehicles, motorcycles and of personal and household goods	–	–	5468.0	–	–	–	…*	662746.9
Hotels and restaurants	–	–	–	1074534.1	…*	–	…*	…*
Transportation, storage, and communication	29750.3	143777.6	190798.7	6704377.7	2045971.5	6169713.1	584258.6	560754.4
Financial intermediation	–	–	–	–	–	–	…*	…*
Real estate, renting, and business activities	207643389.9	455185374.4	530882724.2	591315932.3	634954769.4	713774604.4	724449636.6	749581705.9
Of which:								
research and development	204907680.4	447596655.1	520913787.4	576874368.1	621911256.0	702052200.0	711713170.0	735585293.4
other services	2469504.1	5464671.8	7513061.1	9712021.4	8582367.7	8147046.4	7558585.6	7592556.4

(continued)

	2005	2010	2011	2012	2013	2014	2015	2016
Public administration and defence; compulsory social security	–	–	–	–	–	–	…*	…*
Education	11076460.7	39254089.2	50880815.2	61985553.1	64847625.7	80366333.4	85381308.6	82740585.8
Of which higher education	11071971.7	39220988.4	50849957.2	61929787.4	64705330.3	80220750.8	85025299.0	82547828.6
Health and social work	71943.4	4758071.7	2082060.2	1961525.5	2372871.1	2401072.1	2927519.4	3642597.8
Other community, social and personal service activities	594782.9	2345175.2	2980322.5	2974343.8	2908651.8	3200835.2	3513767.1	3465786.7
Of which recreational, cultural and sporting activities	574352.3	2331388.6	2930451.3	2963837.0	2901432.2	3196933.0	3418087.3	3409148.0

* 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 OF EXPENDITURE

	2000	2005	2010	2011	2012	2013	2014	2015	2016
	At current prices, *thousand roubles*								
Gross domestic expenditure on R&D	**76697100.5**	**230785150.3**	**523377233.9**	**610426680.6**	**699869784.8**	**749797638.8**	**847526992.9**	**914669057.2**	**943815219.6**
Current expenditure	73873345.0	221119537.6	489450798.7	568386749.7	655061743.4	699948879.0	795407850.6	854288043.8	873778705.8
Salaries	27762734.2	94274 453.3	241472234.1	275925134.3	307881674.7	334769102.6	372215515.4	398143690.1	402793518.7
Of which for R&D personnel*	24452200.6	83218561.7	211660690.5	239162179.8	268058587.8	293118611.5	325421624.4	346425420.7	349060524.6
Social security payments	10419152.6	22597417.5	47904606.9	68647474.6	75417597.8	82806275.3	92645219.2	104167630.5	105441328.0
Equipment	3433380.7	9936177.7	18067655.4	20065178.2	25365780.5	23529482.7	26062433.8	28480160.0	24412188.2
Other material costs	17470855.0	51304357.4	89279048.7	101591855.4	123689963.6	134096570.4	158082737.1	157810431.8	174467767.8
Other current expenditure	14787222.5	43007131.7	92727253.6	102157107.2	122706726.8	124747448.0	146401945.1	165686131.4	166663903.1
Capital expenditure	2823755.5	9665612.7	33926435.2	42039930.9	44808041.4	49848759.8	52119142.3	60381013.4	70036513.8
Land and buildings	496202.4	1647639.4	8077521.7	8421252.7	11692714.0	8721163.4	9987854.6	10029243.3	12419641.1
Equipment	1448665.0	5818068.7	19887596.3	23968272.7	25459703.1	27306873.6	29421964.1	33807469.6	37427491.3
Other capital expenditure	878888.1	2199904.6	5961317.2	9650405.5	7655624.3	13820722.8	12709323.6	16544300.5	20189381.4

(continued)

	2000	2005	2010	2011	2012	2013	2014	2015	2016
					Percentage				
Gross domestic expenditure on R&D	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100.0**	**100.0**
Current expenditure	96.3	95.8	93.5	93.1	93.6	93.4	93.9	93.4	92.6
Salaries	36.2	40.8	46.1	45.2	44.0	44.6	43.9	43.5	42.7
Of which for R&D personnel*	31.9	36.1	40.4	39.2	38.3	39.1	38.4	37.9	37.0
Social security payments	13.6	9.8	9.2	11.2	10.8	11.0	10.9	11.4	11.2
Equipment	4.5	4.3	3.5	3.3	3.6	3.1	3.1	3.1	2.6
Other material costs	22.8	22.2	17.1	16.6	17.7	17.9	18.7	17.3	18.5
Other current expenditure	19.3	18.6	17.7	16.7	17.5	16.6	17.3	18.1	17.7
Capital expenditure	3.7	4.2	6.5	6.9	6.4	6.6	6.1	6.6	7.4
Land and buildings	0.6	0.7	1.5	1.4	1.7	1.2	1.2	1.1	1.3
Equipment	1.9	2.5	3.8	3.9	3.6	3.6	3.5	3.7	4.0
Other capital expenditure	1.1	0.95	1.1	1.6	1.1	1.8	1.5	1.8	2.1

* Excluding external multiple jobholders and independent contractors.

3.17. GROSS DOMESTIC EXPENDITURE ON R&D BY PRIORITY S&T AREA AND SOURCE OF FUNDS: 2016

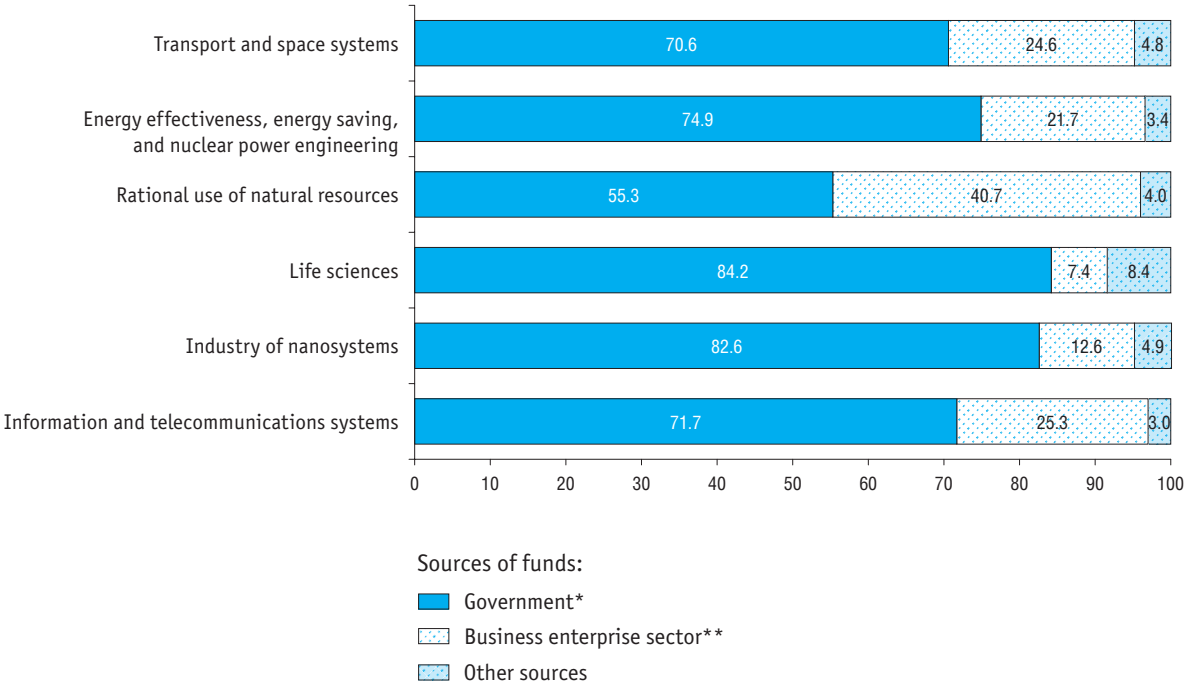
(thousand roubles)

	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	**670013754.5**	**77931990.5**	**25925183.4**	**48711891.7**	**51751060.8**	**98599570.5**	**215921199.2**
Government*	470269970.7	55865995.0	21404032.5	41013861.9	28605601.3	73862705.9	152470639.7
of which federal budget appropriations	381662794.7	47650434.7	14907003.9	35654129.7	22584681.1	60415302.8	128844209.1
Business enterprise sector**	170971134.8	19724287.9	3261654.3	3600016.9	21059820.3	21378123.0	53060080.2
Other sources	28772649.0	2341707.6	1259496.6	4098012.9	2085639.2	3358741.6	10390479.3

* 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: 2016



* 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

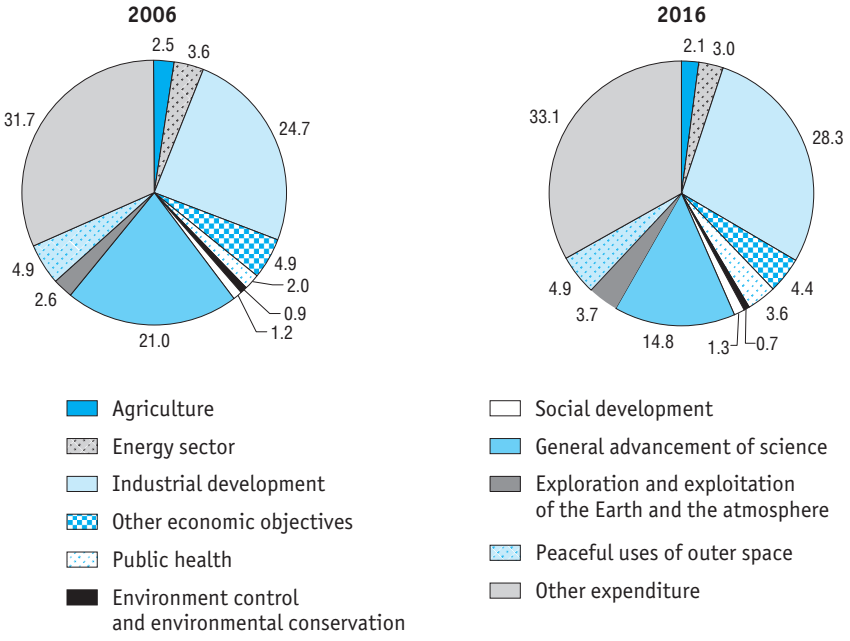
(thousand roubles)

	2006	2010	2012	2013	2014	2015	2016
Gross domestic expenditure on R&D	**288805211.5**	**523377233.9**	**699869784.8**	**749797638.8**	**847526992.9**	**914669057.2**	**943815219.6**
Economic development	103033497.6	183113782.3	295901906.0	303849005.2	319943400.5	335508245.3	356656937.7
Agriculture, forestry, and fishing	7248977.0	12090814.9	16151602.6	18162639.9	19356066.3	20507885.2	19839916.9
Production, distribution, and rational use of energy	10267046.6	19174764.6	30798200.6	32391136.1	30009786.7	28233810.5	27986109.3
Manufacturing	71319151.3	126029410.7	200459644.4	211581275.8	225973823.4	247190324.1	267198733.4
Increasing economic efficiency and technological level of production	8331516.8	14916168.9	22472542.8	23766954.4	26183678.7	27970190.2	32603056.9
Extraction and processing of non-energy minerals	628547.3	1279265.4	1863605.2	2857681.5	1893285.1	2979762.1	3515879.2
Manufacture of chemicals and chemical products	4194564.2	5839135.5	9155732.6	9253596.1	12102652.2	18046159.1	16726672.0
Manufacture of motor vehicles and other vehicles	14450931.1	21495410.4	32391176.2	43571684.0	37432847.4	38496344.6	47336591.0
Electronics industry, manufacture of radio, television and communication equipment, office equipment	9281563.7	13389386.0	26449997.0	30121503.4	30917362.1	34152557.2	28696420.2
Software development	3355339.6	6740442.6	8932282.7	10343013.7	8906139.6	10935776.1	13858343.1
Manufacture of electrical machinery and appliances	1292927.0	2879253.1	5235647.6	10666259.5	6852593.2	6855694.7	9068432.3
Manufacture of instruments	6600437.6	13466912.8	29563984.4	26441262.5	25964146.5	24545740.1	30199136.8
Manufacture of other machinery and equipment	6965389.1	13654259.2	15781575.2	14251449.9	21053098.6	19618563.5	23208998.1
Manufacture of wearing apparel, textiles, and leather goods	54077.2	97483.3	254582.3	116171.9	125925.2	152999.3	112320.3
Production of food and beverages	296729.6	565348.2	758191.9	1043282.0	777287.7	883049.0	815777.0
Other sectors of manufacturing industry	15867128.1	31706345.3	47600326.5	39148416.9	53764807.1	62553488.2	61057106.5

(continued)

	2006	2010	2012	2013	2014	2015	2016
Construction	2697184.2	5513681.4	8504203.4	5514071.6	7302858.5	4100727.2	4527423.8
Transport	9011178.7	12686004.3	23986235.6	26950369.3	25052775.9	28936996.8	28935628.1
Communication	1709581.2	6704734.7	14147246.2	7577748.3	10809004.6	5137035.8	6753395.9
Infrastructure and general planning of urban and rural settlements	430140.7	354546.0	912451.2	702102.6	754005.3	720423.3	750011.5
Services sector	350237.9	559825.7	942322.0	969661.6	685079.8	681042.4	665718.8
Social objectives	11954593.3	24966176.4	33070785.7	39876895.8	45328439.6	47512609.4	53126847.1
Environment control and environmental conservation	2595076.2	5950018.6	6972125.5	6139294.7	7690689.6	7698790.1	6978201.4
Medical and other public health care activities	5897030.0	14373675.7	19694713.1	22382779.3	27197492.2	27779185.8	33577707.1
Social development and community building	3462487.1	4642482.1	6403947.1	11354821.8	10440257.8	12034633.5	12570938.6
General advancement of science	60629124.4	104294714.1	117873370.5	130695141.4	136414580.0	145154435.8	139556056.0
Exploration and exploitation of the Earth and the atmosphere	7577493.4	19821817.2	25474648.5	32889936.2	39068691.1	43206894.0	35280752.7
Peaceful uses of outer space	14018574.9	27503697.9	37558965.0	51558366.4	48996185.8	57441295.9	46367115.9
Other expenditures	91591927.9	163677046.0	189990109.1	190928293.8	257775695.9	285845576.8	312827510.2

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

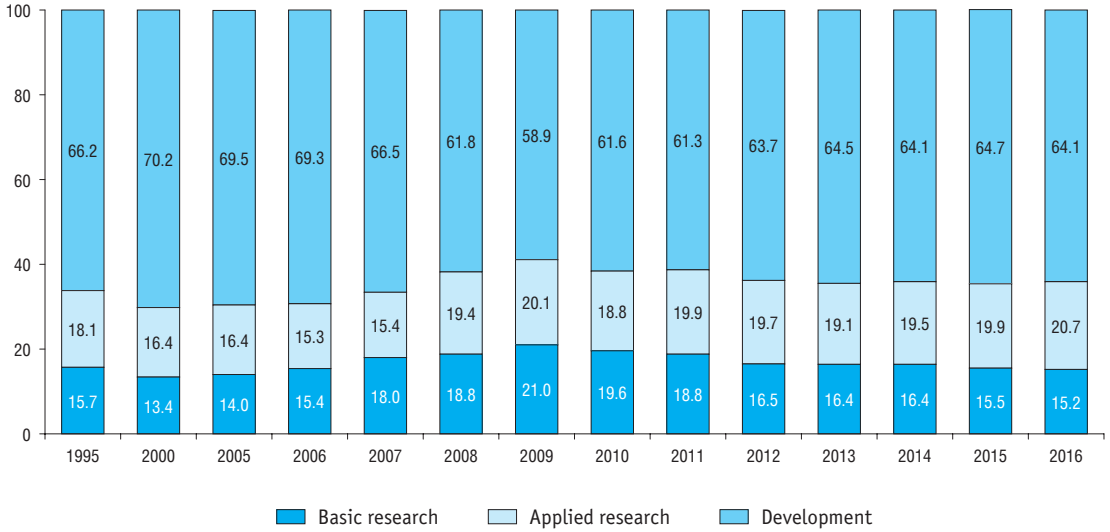
(thousand roubles)

	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

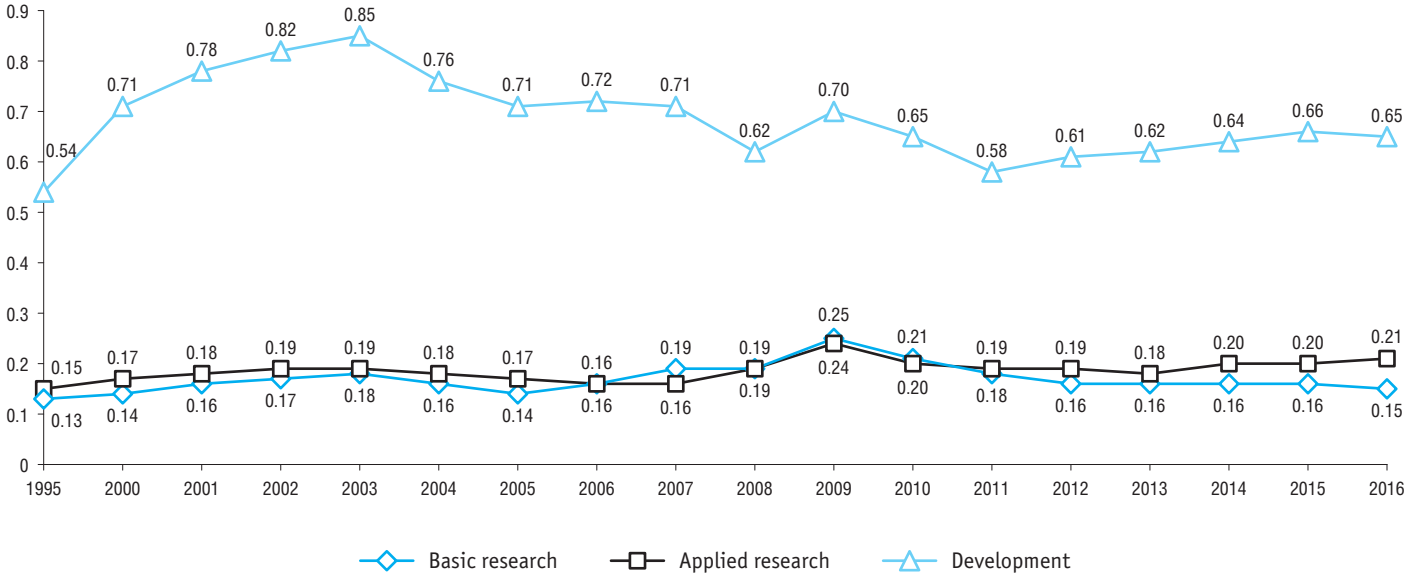
(continued)

	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

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. TAX INCENTIVES ON R&D BY TYPE

(million roubles)

	2012*	2013*	2014*	2015**	2016*
Tax expenditure on R&D – total	**94206.7**	**107402.9**	**116585.6**	**122800.2**	**139891.0**
VAT exemption	80824.8	95538.4	105469.1	111954.0	128150.0
R&D funded from budget and special foundations	61012.8	71446.5	81656.7	82718.0	96199.2
Sales of exclusive rights on R&D results	16400.7	18622.4	18572.8	21976.0	24882.9
R&D aimed at development / improvement of new technologies and products (for selected types of economic activity)	3411.3	5469.5	5239.6	7260.0	7067.9
Income tax reduction	11998.9	9682.7	8873.1	8790.2	9552.2
Accelerated depreciation of fixed assets for S&T activity	118.3	80.9	51.6	41.0	37.2
Accelerated R&D expenditure write-off	11859.5	9585.0	8821.5	8749.2	9514.2
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
State Research Centres	1383.0	2181.8	2243.4	2056.0	2188.9

* The source of 2012–2014, 2016 data are 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.

** Sources for 2015 data on value added tax expenditure – Appendix 1 'Tax and Non-Tax Expenditure for 2014–2020' to the project '2017 Tax Policy Guidelines and the 2018–2019 Budget Plans'.

3.25. AVERAGE MONTHLY SALARY OF R&D PERSONNEL

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Average monthly salary, *roubles, 1995 – thousand roubles*	305.3	2322.9	8672.0	25043.5	28387.5	32539.9	35618.8	39549.3	41511.8	43539.5
As a percentage of the salary:										
in the national economy (=100%)	64.6	104.5	101.4	119.5	121.5	122.2	119.6	121.7	122.0	118.5
in manufacturing (=100%)	67.3	98.2	103.0	131.3	130.3	132.8	131.7	134.0	130.1	125.3
in construction (=100%)	52.0	88.0	95.9	118.3	119.9	125.4	128.6	134.7	138.6	135.3

4. R&D Fixed Assets

4.1. R&D FIXED ASSETS

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
At current prices										
Fixed assets – total, *million roubles, 1995 – billion roubles*	**85087.6**	**237564.4**	**399515.9**	**741512.1**	**859318.0**	**914572.2**	**1086445.9**	**1235780.3**	**1498990.8**	**1696171.4**
Per employee, *thousand roubles, 1995 – million roubles*	80.2	267.6	491.3	1006.8	1168.7	1259.2	1494.4	1687.6	2028.8	2348.3
Per researcher, *thousand roubles, 1995 – million roubles*	164.0	557.7	1021.5	2010.0	2292.8	2454.4	2944.2	3305.1	3950.8	4579.6
Machinery and equipment, *million roubles, before 1995 – billion roubles*	**26505.8**	**66938.3**	**142154.7**	**300165.9**	**348511.4**	**398562.4**	**466609.0**	**541617.9**	**676194.6**	**753104.4**
Per employee, *thousand roubles, 1995 – million roubles*	25.0	75.4	174.8	407.5	474.0	548.7	641.8	739.6	915.2	1042.7
Per researcher, *thousand roubles, 1995 – million roubles*	51.1	157.1	363.5	813.6	929.9	1069.6	1264.5	1448.5	1782.2	2033.3
Machinery and equipment under 5 years, *million roubles*	…	…	…	…	…	**169757.0**	**205062.6**	**257269.1**	**320676.7**	**352080.8**
As a percentage of the total value of machinery and equipment	…	…	…	…	…	42.6	43.9	47.5	47.4	46.8

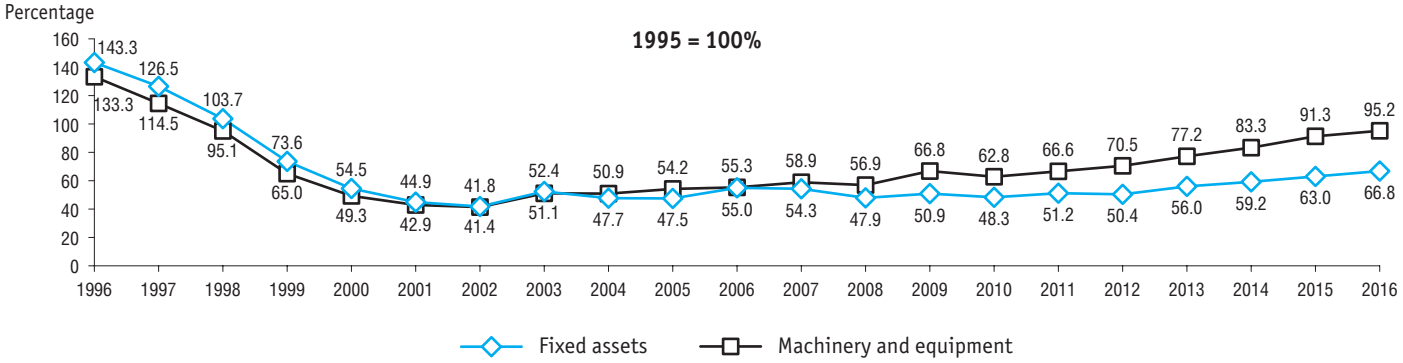
(continued)

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
					At constant 1995 prices*					
Fixed assets – total, *million roubles, 1995 – billion roubles*	**85087.6**	**46336.0**	**40383.7**	**41103.8**	**43540.6**	**42907.4**	**47636.5**	**50357.8**	**53629.2**	**56819.4**
Per employee, *thousand roubles, 1995 – million roubles*	80.2	52.2	49.7	55.8	59.2	59.1	65.5	68.8	72.6	78.7
Per researcher, *thousand roubles, 1995 – million roubles*	164.0	108.8	103.3	111.4	116.2	115.2	129.1	134.7	141.3	153.4
Machinery and equipment, *million roubles, 1995 – billion roubles*	**26505.8**	**13056.0**	**14369.2**	**16638.9**	**17658.7**	**18698.7**	**20459.0**	**22070.8**	**24192.1**	**25227.9**
Per employee, *thousand roubles, 1995 – million roubles*	25.0	14.7	17.7	22.6	24.0	25.7	28.1	30.1	32.7	34.9
Per researcher, *thousand roubles, 1995 – million roubles*	51.1	30.7	36.7	45.1	47.1	50.2	55.4	59.0	63.8	68.1
Machinery and equipment under 5 years, *million roubles*	…	…	…	…	…	**7964.2**	**8991.2**	**10483.7**	**11472.8**	**11794.2**

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

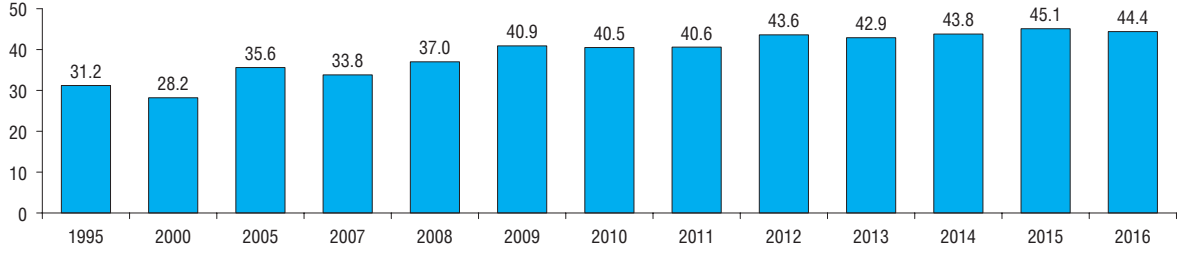
4.2. TRENDS IN R&D FIXED ASSETS VALUE*

(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	2011	2012	2013	2014	2015	2016
					Fixed assets					
Total	**85087.6**	**237564.4**	**399515.9**	**741512.1**	**859318.0**	**914572.2**	**1086445.9**	**1235780.3**	**1498990.8**	**1696171.4**
Russian ownership	85081.2	232793.0	393181.0	725165.1	847942.2	897838.2	1052994.8	1218842.6	1469213.6	1671745.0
Public ownership	71686.4	194659.0*	344693.4	635491.6	736631.7	757157.9	886578.4	1005741.7	1126242.5	1225443.7
Federal	70561.9	191972.3	336223.9	617118.2	712172.1	733671.7	861801.5	960098.3	1090290.3	1188742.5
Regional	1124.5	2686.3	8469.5	18110.1	24452.1	23477.9	24776.9	45643.4	35952.3	36701.2
Municipal ownership	190.0	541.7	28.2	35.9	74.7	17.3	53.0	38.0	104.4	113.7
Ownership by voluntary associations	77.5	221.8	38.9	82.1	98.7	164.4	372.6	495.7	832.5	898.4
Private ownership	1306.4	10499.1	17478.8	43615.5	49833.4	56938.0	64420.2	80213.8	107275.4	154400.3
Ownership by Russian citizens permanently living abroad	…	…	…	…	18.1	17.0	…***	…***	…***	…***
Ownership by consumers' cooperatives**	…	0.09	0.9	1.7	5.5	–	–	…***	28.9	29.9
Mixed ownership	11820.9	26871.3	30940.7	42862.9	52606.5	59170.5	68104.5	93511.6	157314.6	194653.9
Mixed ownership with a share of public ownership	…	…	…	38571.0	47524.3	47722.7	56261.7	72454.4	117386.6	155829.6
Other mixed ownership	…	…	…	…	5082.1	11447.8	11842.7	21057.3	39928.0	38824.3
Ownership by state corporations	…	…	…	3075.4	8673.7	24373.1	33451.8	38817.0	77404.6	96193.8
Foreign ownership	0.04	49.0	114.9	1131.5	1063.7	1177.8	3064.9	2571.1	6198.6	7957.3
Joint ownership (with both Russian and foreign participation)	6.4	4722.4	6220.1	15215.5	10312.1	15556.2	30386.2	14366.6	23578.6	16469.1

(continued)

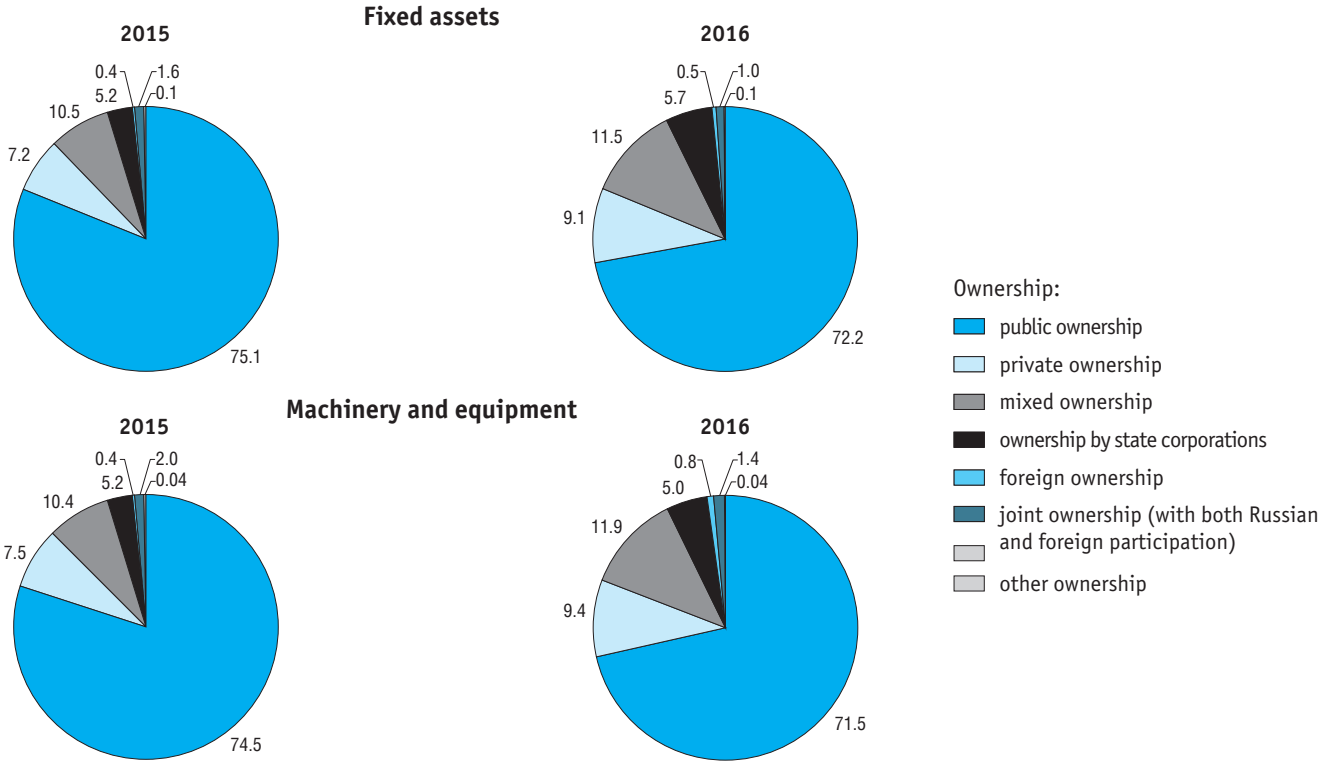
	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
					Machinery and equipment					
Total	**26505.8**	**66938.3**	**142154.7**	**300165.9**	**348511.4**	**398562.4**	**466609.0**	**541617.9**	**676194.6**	**753104.4**
Russian ownership	26503.0	65631.5	140294.5	290440.4	341846.2	390464.6	457596.7	533892.2	659628.5	737057.5
Public ownership	21632.0	53434.4*	121662.2	256172.4	293528.4	332053.6	382612.7	433814.9	503877.8	538303.6
Federal	21340.3	52750.5	117529.4	248766.8	284876.3	323644.7	371352.8	422330.3	487747.4	523789.9
Regional	291.7	683.5	4132.8	7284.9	8645.6	8401.9	11259.9	11484.6	16130.4	14513.7
Municipal ownership	113.0	176.0	4.7	6.2	17.0	4.4	6.7	7.2	26.0	25.3
Ownership by voluntary associations	32.3	41.6	20.4	49.5	69.9	62.6	98.2	134.7	209.1	225.2
Private ownership	353.5	4235.7	8094.0	17150.5	22907.4	26610.2	30837.6	41712.6	50474.8	70650.8
Ownership by Russian citizens permanently living abroad	…	…	…	…	17.0	16.0	…***	…***	…***	…***
Ownership by consumers' cooperatives**	…	0.09	0.2	1.0	4.2	–	–	…***	7.0	7.0
Mixed ownership	4372.2	7743.7	10513.1	15944.0	21883.9	22090.9	30297.8	41440.4	70093.0	89889.1
Mixed ownership with a share of public ownership	…	…	…	13870.9	19476.7	16689.3	25209.2	31476.5	52907.6	68716.0
Other mixed ownership	…	…	…	…	2407.1	5401.6	5088.6	9964.0	17185.5	21173.1
Ownership by state corporations	…	…	…	1116.7	3418.5	9627.0	13730.4	16767.1	34931.1	37946.0
Foreign ownership	0.03	48.2	61.0	630.0	611.0	438.0	668.9	975.0	2958.5	5835.9
Joint ownership (with both Russian and foreign participation)	2.8	1258.6	1792.2	9095.5	6054.2	7659.8	8343.4	6750.7	13607.6	10211.0

* 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



4.6. R&D FIXED ASSETS BY TYPE OF ECONOMIC ACTIVITY

(million roubles)

	Fixed assets			Machinery and equipment		
	2014	2015	2016	2014	2015	2016
Total	**1235780.3**	**1498990.8**	**1696171.4**	**541617.9**	**676194.6**	**753104.4**
Agriculture, hunting, and forestry	1389.8	1239.0	1837.8	323.2	346.6	568.7
Fishing	–	–	–	–	–	–
Mining and quarrying	–	347.4	380.3	–	220.2	251.9
Manufacturing	82216.7	168166.4	193529.8	41598.8	83071.8	99574.9
Electricity, gas and water supply	…*	735.5	820.6	…*	98.8	161.0
Construction	…*	…*	…*	…*	…*	…*
Wholesale and retail trade; repair of motor vehicles, motorcycles and of personal and household goods	–	…*	574.9	–	…*	378.1
Hotels and restaurants	–	–	–	–	–	–
Transportation, storage, and communication	688.4	243.2	368.4	345.6	164.5	279.7
Financial intermediation	–	…*	…*	–	…*	…*
Real estate, renting, and business activities	965527.1	1095270.3	1221591.7	425416.3	494779.2	540797.5
Of which:						
research and development	946522.9	1075073.9	1203970.8	418474.8	483186.2	531140.9
other services	11830.5	14757.6	10504.4	4258.4	8382.7	5123.8
Publuc administration and defence; compulsory social security	–	…*	…*	–	…*	…*
Education	158770.1	205562.2	225307.3	62501.3	86336.6	93463.9
Of which higher education	158691.5	205499.4	225238.0	62488.2	86319.6	93436.2
Health and social work	23652.8	23371.1	46289.3	10882.5	10340.0	16416.7
Other community, social and personal service activities	3483.6	3124.5	4028.8	511.2	433.4	536.2
Of which recreational, cultural and sporting activities	3481.2	3105.3	4015.1	508.8	415.4	524.3

* 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).

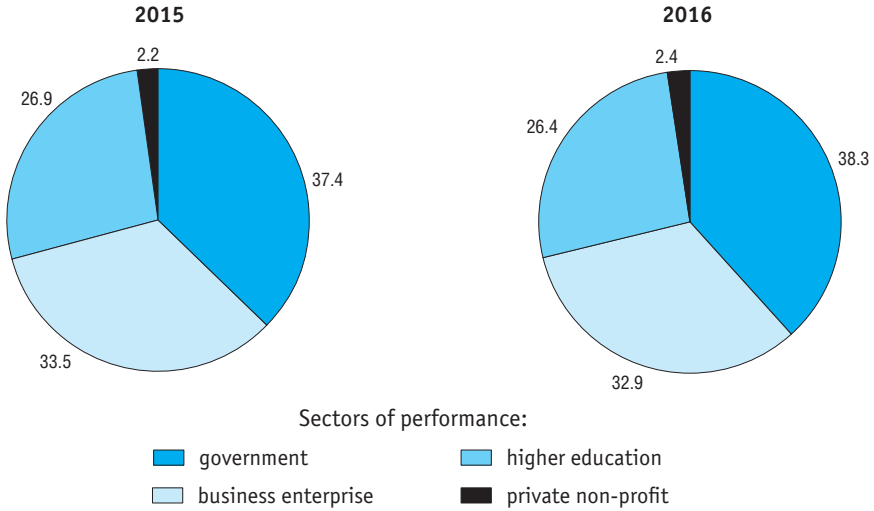
5. Sectors of R&D Performance

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

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	2011	2012	2013	2014	2015	2016
Total	**1061044**	**887729**	**813207**	**736540**	**735273**	**726318**	**727029**	**732274**	**738857**	**722291**
Researchers	518690	425954	391121	368915	374746	372620	369015	373905	379411	370379
Technicians	101371	75184	65982	59276	61562	58905	61401	63168	62805	60441
Supporting staff	274925	240506	215555	183713	178494	175790	175365	173554	174056	171915
Others	166058	146085	140549	124636	120471	119003	121248	121647	122585	119556
Government sector	282166	255850	272718	259007	254896	271466	261869	263712	265429	269056
Researchers	146342	129725	139378	131734	128672	136442	132117	132701	134794	134225
Technicians	27178	25085	25462	24009	26960	28094	27777	27761	27090	26075
Supporting staff	66226	59706	61448	56530	54176	60067	56795	56744	56552	61140
Others	42420	41334	46430	46734	45088	46863	45180	46506	46993	47616
Business enterprise sector	726568	590646	496706	423112	419752	394182	405268	405529	408802	388385
Researchers	336671	267640	221445	197785	202185	192285	193736	196320	198123	190378
Technicians	70180	46535	36837	30063	28235	26720	28920	29452	29850	27519
Supporting staff	201122	175261	147980	120485	116829	106306	109691	107215	108230	101219
Others	118595	101210	90444	74779	72503	68871	72921	72542	72599	69269
Higher education sector	52065	40787	43500	53290	59454	59469	59247	62400	63870	63046
Researchers	35508	28325	30111	38640	43121	43103	42692	44427	45967	44994
Technicians	4010	3509	3658	5095	6256	3998	4670	5939	5836	6789
Supporting staff	7520	5463	6098	6564	7345	9264	8828	9538	9217	8929
Others	5027	3490	3633	2991	2732	3104	3057	2496	2850	2334
Private non-profit sector	245	446	283	1131	1171	1201	645	633	756	1804
Researchers	169	264	187	756	768	790	470	457	527	782
Technicians	3	55	25	109	111	93	34	16	29	58
Supporting staff	57	76	29	134	144	153	51	57	57	627
Others	16	51	42	132	148	165	90	103	143	337

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

(headcount)

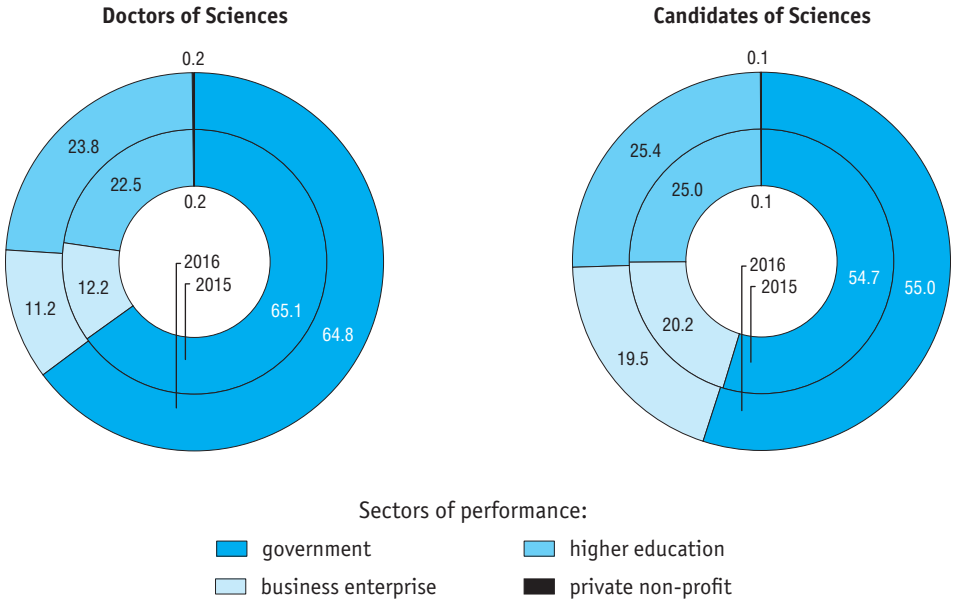
	Total	Government sector	Business enterprise sector	Higher education sector	Private non-profit sector
R&D personnel					
2005	813207	272718	496706	43500	283
2010	736540	259007	423112	53290	1131
2014	732274	263712	405529	62400	633
2015	738857	265429	408802	63870	756
2016	722291	269056	388385	63046	1804
Higher education					
2005	501718	177676	288649	35159	234
2010	493852	178026	268821	46112	893
2014	522726	189447	276675	56009	595
2015	537118	194608	283664	58144	702
2016	529418	196289	274477	57504	1148
Secondary vocational education					
2005	134222	40495	89265	4430	32
2010	109158	36091	69552	3394	121
2014	95564	33699	59564	2274	27
2015	95640	33163	60370	2071	36
2016	93123	34452	56221	2066	384
Other education					
2005	177267	54547	118792	3911	17
2010	133530	44890	84739	3784	117
2014	113984	40566	69290	4117	11
2015	106099	37658	64768	3655	18
2016	99750	38315	57687	3476	272

5.1.5. RESEARCHERS WITH SCIENTIFIC DEGREES BY SECTOR OF PERFORMANCE

(headcount)

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Researchers with scientific degrees	**116465**	**105911**	**99428**	**105114**	**109493**	**109330**	**108248**	**109598**	**111533**	**108388**
Doctors of Sciences	19330	21949	23410	26789	27675	27784	27485	27969	28046	27430
Candidates of Sciences	97135	83962	76018	78325	81818	81546	80763	81629	83487	80958
Government sector	61062	58901	60066	61194	61605	63092	62837	62944	63906	62285
Doctors of Sciences	13358	14987	16511	17646	17789	18181	18184	18198	18264	17781
Candidates of Sciences	47704	43914	43555	43548	43816	44911	44653	44746	45642	44504
Business enterprise sector	41207	34775	26661	23169	23045	21758	20955	20595	20270	18833
Doctors of Sciences	4348	4806	4222	3987	4018	3767	3622	3511	3413	3071
Candidates of Sciences	36859	29969	22439	19182	19027	17991	17333	17084	16857	15762
Higher education sector	14162	12113	12618	20423	24502	24144	24306	25899	27184	27109
Doctors of Sciences	1617	2120	2654	5068	5774	5753	5638	6218	6318	6532
Candidates of Sciences	12545	9993	9964	15355	18728	18391	18668	19681	20866	20577
Private non-profit sector	34	122	83	328	341	336	150	160	173	161
Doctors of Sciences	7	36	23	88	94	83	41	42	51	46
Candidates of Sciences	27	86	60	240	247	253	109	118	122	115

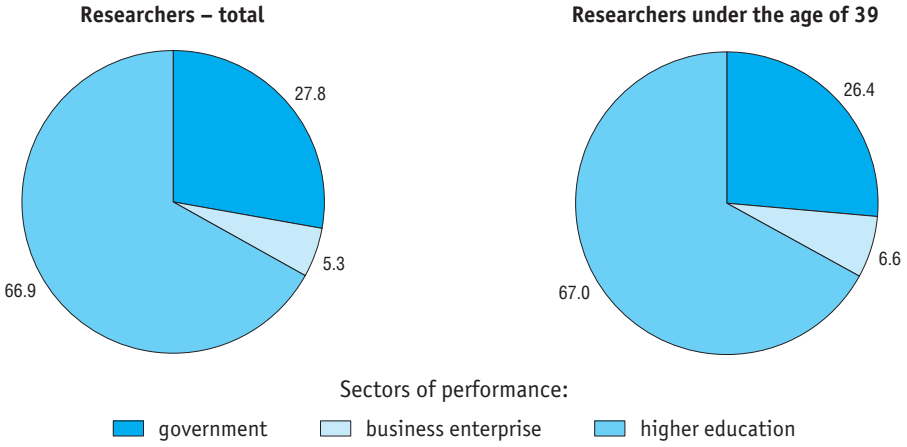
5.1.6. PERCENTAGE DISTRIBUTION OF RESEARCHERS WITH SCIENTIFIC DEGREES BY SECTOR OF PERFORMANCE



5.1.7. RESEARCHERS ASSIGNED TO WORK (INTERNSHIP) PLACEMENTS AT FOREIGN RESEARCH INSTITUTIONS BY SECTOR OF PERFORMANCE: 2016

	Total	Government sector	Business enterprise sector	Higher education sector
Number of institutions that assigned researchers to work (internship) placements at foreign research institutions	248	104	25	119
Number of researchers assigned to work (internship) placements at foreign reasearch institutions	3425	953	181	2291
Of whom under the age of 39	1597	422	105	1070

5.1.8. PERCENTAGE DISTRIBUTION OF RESEARCHERS ASSIGNED TO WORK (INTERNSHIP) PLACEMENTS AT FOREIGN RESEARCH INSTITUTIONS BY SECTOR OF PERFORMANCE: 2016

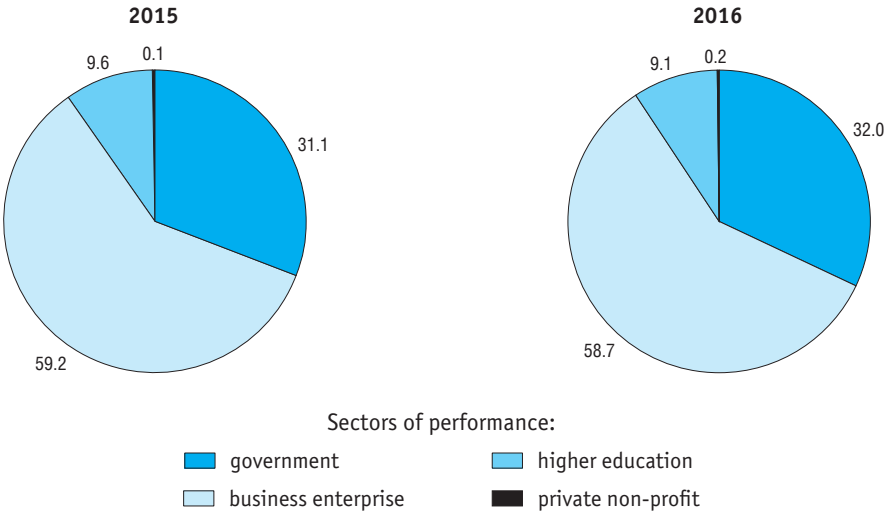


5.1.9. GROSS DOMESTIC EXPENDITURE ON R&D BY SECTOR OF PERFORMANCE

(thousand roubles, 1995 – million roubles)

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
At current prices										
Gross domestic expenditure on R&D	**12149458.6**	**76697100.5**	**230785150.3**	**523377233.9**	**610426680.6**	**699869784.8**	**749797638.8**	**847526992.9**	**914669057.2**	**943815219.6**
Sectors of performance:										
government	3165439.4	18748588.2	60158166.6	161988411.4	182135309.9	224982089.2	226590120.7	258023009.1	284154288.3	301775305.3
business enterprise	8323907.6	54288781.4	156880029.0	316701679.9	372088873.4	408284378.5	454409251.0	505210341.3	541533094.3	554093599.1
higher education	657374.0	3489342.2	13337987.1	43714007.3	55134893.9	65334232.1	67858855.1	83205260.1	87730781.4	85932983.0
private non-profit	2737.6	170388.7	408967.6	973135.3	1067603.4	1269085.0	939412.0	1088382.4	1250893.2	2013332.2
At constant 1989 prices										
Gross domestic expenditure on R&D	**2485.4**	**3321.2**	**4547.5**	**5723.2**	**5759.3**	**6052.4**	**6152.0**	**6468.7**	**6452.1**	**6426.4**
Sectors of performance:										
government	647.6	811.9	1185.4	1771.4	1718.4	1945.6	1859.1	1969.4	2004.4	2054.8
business enterprise	1702.8	2350.9	3091.2	3463.2	3510.6	3530.8	3728.4	3856.0	3820.0	3772.8
higher education	134.5	151.1	262.8	478.0	520.2	565.0	556.8	635.1	618.9	585.1
private non-profit	0.6	7.4	8.1	10.6	10.1	11.0	7.7	8.3	8.8	13.7

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

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

(continued)

	Total	Government funds*	Business enterprise sector funds	Higher education sector funds	Private non-profit sector funds	Funds from abroad
			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
			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

* 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: 2016

(thousand roubles)

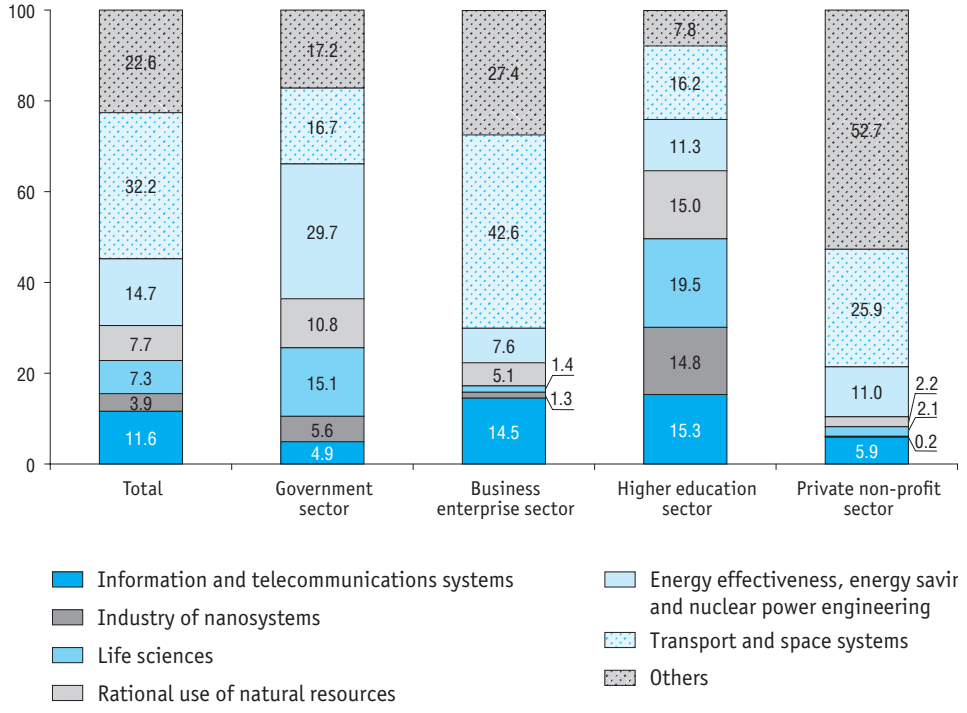
	Total	Government sector	Business enterprise sector	Higher education sector	Private non-profit sector
Budget subsidies for institutitonal R&D funding	93975510.7	68799879.5	8996391.8	16165417.7	13821.7
of which federal	90842411.8	66835816.3	8815277.0	15191318.5	–
Budget subsidies for performing R&D	36729558.4	7943052.0	19580898.7	9167407.4	38200.3
of which federal	35851107.1	7434232.9	19426983.3	8951690.6	38200.3
Grants from foundations for S&T and innovation	22642169.0	12429000.5	574086.1	9566322.6	72759.8
Funds from budgets of all levels	19543992.0	10914816.4	379896.0	8226151.9	23127.7
of which federal	17566747.6	10419703.0	378443.4	6745523.5	23077.7
Other types of competitive financing	58658143.2	9832185.8	41478913.4	7315369.0	31675.0
Funds from budgets of all levels	48976176.4	7134875.7	37843927.6	3985418.1	11955.0
of which federal	47640861.2	6898271.9	37356322.0	3382937.3	3330.0

5.1.14. GROSS DOMESTIC EXPENDITURE ON R&D BY PRIORITY S&T AREA AND SECTOR OF PERFORMANCE: 2016

(thousand roubles)

	Total	Government sector	Business enterpris sector	Higher education sector	Private non-profit sector
Gross domestic expenditure on R&D by priority S&T area	**670013754.5**	**205996255.7**	**402307531.5**	**60317820.9**	**1392146.4**
Information and telecommunications systems	77931990.5	10153791.1	58450474.7	9245596.5	82128.2
Industry of nanosystems	25925183.4	11577315.8	5402441.3	8941976.3	3450.0
Life sciences	48711891.7	31124361.9	5808163.4	11749956.4	29410.0
Rational use of natural resources	51751060.8	22150818.0	20506488.5	9063493.4	30260.9
Energy effectiveness, energy saving, and nuclear power engineering	98599570.5	61098481.1	30514443.3	6833743.1	152903.0
Transport and space systems	215921199.2	34493862.1	171269307.4	9797324.6	360705.1

5.1.15. PERCENTAGE DISTRIBUTION OF GROSS DOMESTIC EXPENDITURE ON R&D BY PRIORITY S&T AREA AND SECTOR OF PERFORMANCE: 2016



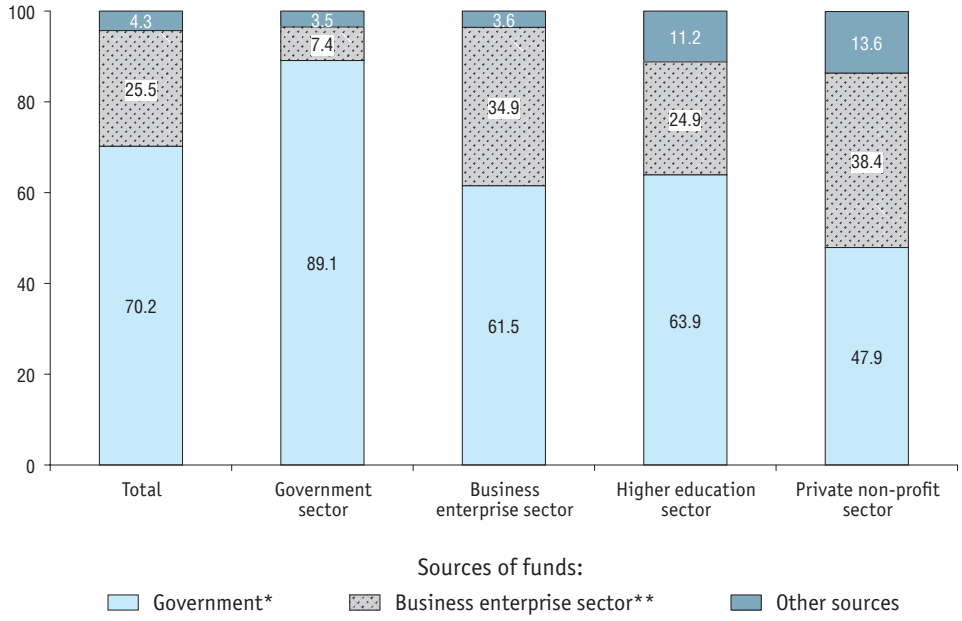
5.1.16. SOURCES OF FUNDS FOR GROSS DOMESTIC EXPENDITURE ON R&D BY PRIORITY S&T AREA AND SECTOR OF PERFORMANCE: 2016

(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	**670013754.5**	**205996255.7**	**402307531.5**	**60317820.9**	**1392146.4**
Including by source of funds:					
government*	470269970.7	183590083.7	247461743.0	38550932.2	667211.8
of which federal budget appropriations	381662794.7	143771032.4	204921915.8	32609750.1	360096.4
business enterprise sector**	170971134.8	15184397.3	140246721.2	15004933.3	535083.0
other sources	28772649.0	7221774.7	14599067.3	6761955.4	189851.6

* Including 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: 2016



* 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)

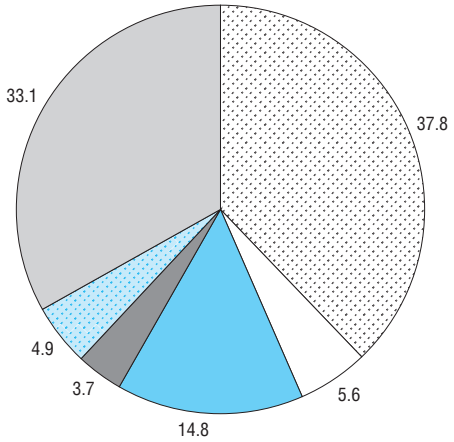
	Total	Government sector	Business enterprise sector	Higher education sector	Private non-profit sector
		2013			
Gross domestic expenditure on R&D	**749797638.8**	**226590120.7**	**454409251.0**	**67858855.1**	**939412.0**
Economic development	303849005.2	57707206.0	215317955.6	30734547.3	89296.3
Social 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

(continued)

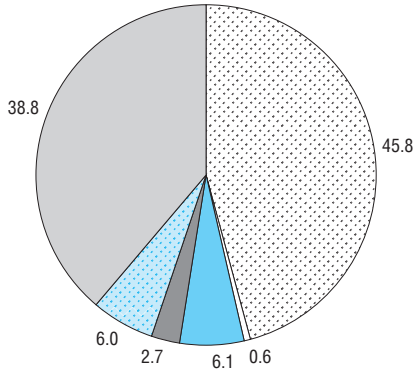
	Total	Government sector	Business enterprise sector	Higher education sector	Private non-profit sector
		2015			
Gross domestic expenditure on R&D	**914669057.2**	**284154288.3**	**541533094.3**	**87730781.4**	**1250893.2**
Economic development	335508245.3	66498291.0	229892147.1	38839549.5	278257.7
Social objectives	47512609.4	26204488.0	3635210.6	17511474.7	161436.1
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

5.1.19. PERCENTAGE DISTRIBUTION OF GROSS DOMESTIC EXPENDITURE ON R&D BY SECTOR OF PERFORMANCE AND SOCIO-ECONOMIC OBJECTIVE: 2016

Total –
943,815.2 million roubles



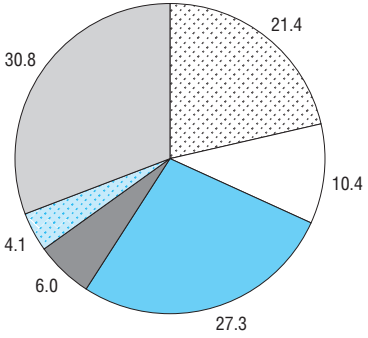
Business enterprise sector –
554,093.6 million roubles



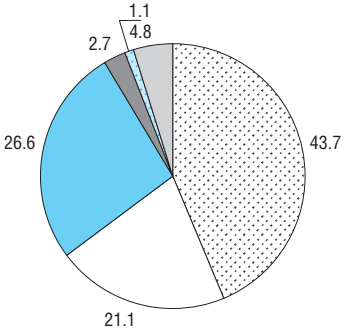
- Economic development
- Social objectives
- General advancement of science
- Exploration and exploitation of the Earth and the atmosphere
- Peaceful uses of outer space
- Other purposes

(continued)

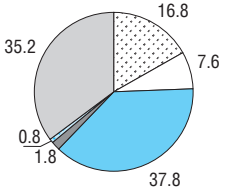
Government sector – 301,775.3 million roubles



Higher education sector – 85,933.0 million roubles



Private non-profit sector – 2,013.3 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
2014	795407850.6	244655172.5	470728154.3	78939146.3	1085377.5
2015	854288043.8	265478556.9	503088818.5	84495233.0	1225435.4
2016	873778705.8	279027077.7	509168604.8	83579171.0	2003852.3
Basic research					
2005	31022855.8	24586195.8	2591506.7	3841327.6	3825.7
2010	95881364.3	65041375.9	16935403.4	13647906.8	256678.2
2014	130618045.6	97017979.4	11654667.9	21840738.8	104659.5
2015	132064934.3	99987000.6	7122577.4	24839057.2	116299.1
2016	132565068.0	97607131.4	8206064.7	26537618.5	214253.4
Applied research					
2005	36360266.9	10603039.3	20026408.8	5405410.3	325408.5
2010	92010677.2	30948555.6	42872394.0	17804762.0	384965.6
2014	155231401.5	53934451.4	62451087.5	38214808.7	631053.9
2015	169654641.2	66248286.3	61520451.3	41098469.1	787434.5
2016	181157915.6	77012901.0	62485456.3	40348147.3	1311411.0
Development					
2005	153736414.9	21153092.6	128610778.1	3897554.6	74989.6
2010	301558757.2	55835195.1	234296030.3	11099576.6	327955.2
2014	509558403.5	93702741.7	396622398.9	18883598.8	349664.1
2015	552568468.3	99243270.0	434445789.8	18557706.7	321701.8
2016	560055722.2	104407045.3	438477083.8	16693405.2	478187.9

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

5.2. Government sector

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

	2005	2010	2011	2012	2013	2014	2015	2016
Total	**1282**	**1400**	**1457**	**1465**	**1495**	**1491**	**1560**	**1546**
Research institutes	1145	1124	1109	1114	1144	1139	1173	1167
Design organisations, design-and-engineering organisations	62	61	65	64	56	55	55	55
Construction project and exploration organisations	6	5	6	6	7	6	8	5
Pilot plants	14	30	33	37	43	42	48	47
Others	55	180	244	244	245	249	276	272

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

(headcount)

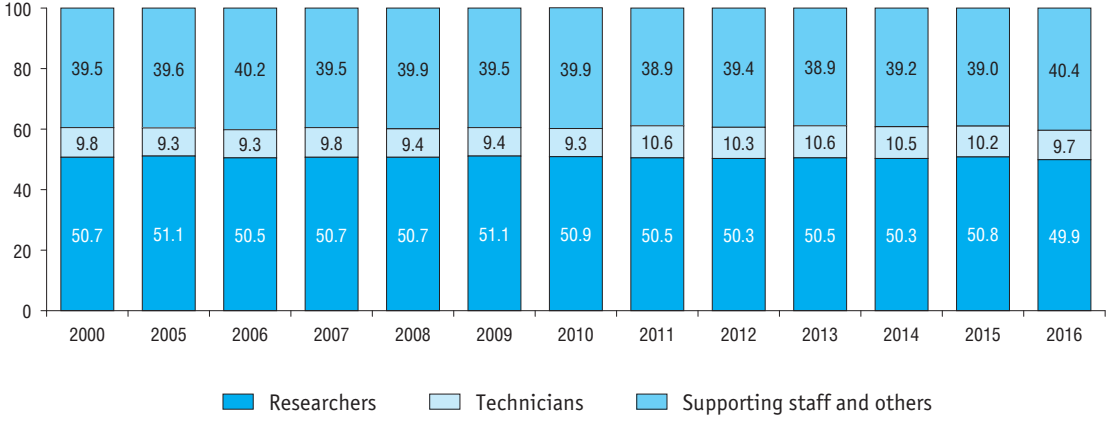
	2005	2010	2011	2012	2013	2014	2015	2016
Total	**272718**	**259007**	**254896**	**271466**	**261869**	**263712**	**265429**	**269056**
Research institutes	248214	222613	219220	232655	225798	228146	230893	232100
Design organisations, design-and-engineering organisations	21499	26473	23290	26084	22979	23448	19459	23544
Construction project and exploration organisations	159	1419	1390	1370	1156	1174	1220	52
Pilot plants	367	631	957	1375	1762	1278	1519	1365
Others	2479	7871	10039	9982	10174	9666	12338	11995

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

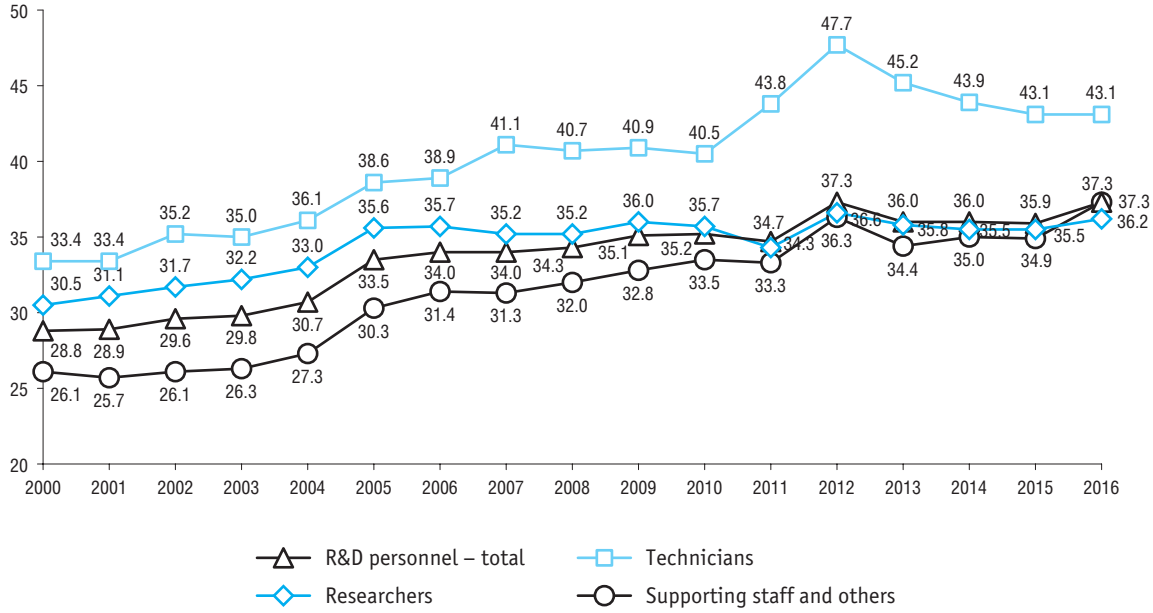
(headcount)

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Total	**282166**	**255850**	**272718**	**259007**	**254896**	**271466**	**261869**	**263712**	**265429**	**269056**
Researchers	146342	129725	139378	131734	128672	136442	132117	132701	134794	134225
Technicians	27178	25085	25462	24009	26960	28094	27777	27761	27090	26075
Supporting staff	66226	59706	61448	56530	54176	60067	56795	56744	56552	61140
Others	42420	41334	46430	46734	45088	46863	45180	46506	46993	47616

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 education
R&D personnel				
2005	272718	177676	40495	54547
2010	259007	178026	36091	44890
2013	261869	187058	33629	41182
2014	263712	189447	33699	40566
2015	265429	194608	33163	37658
2016	269056	196289	34452	38315
Researchers				
2005	139378	139378	–	–
2010	131734	131734	–	–
2013	132117	132117	–	–
2014	132701	132701	–	–
2015	134794	134794	–	–
2016	134225	134225	–	–
Technicians				
2005	25462	7802	12177	5483
2010	24009	9110	10155	4744
2013	27777	12669	9747	5361
2014	27761	13245	9310	5206
2015	27090	13761	8609	4720
2016	26075	12877	8616	4582

(continued)

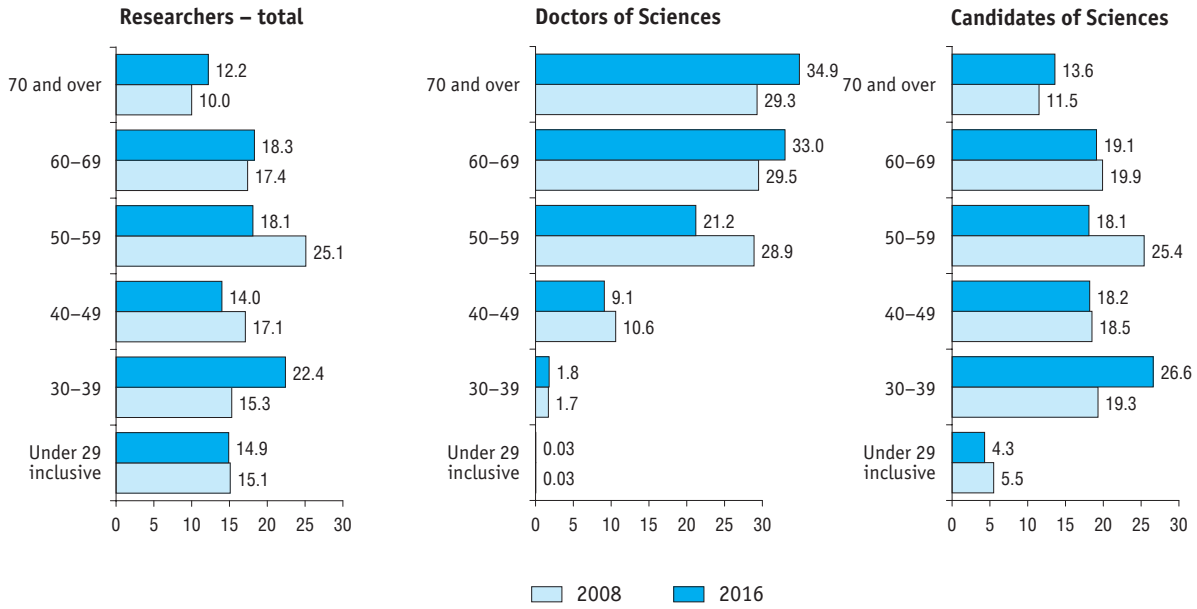
	Total	Higher education	Secondary vocational education	Other education
Supporting staff				
2005	61448	19119	15834	26495
2010	56530	21762	14287	20481
2013	56795	24082	13110	19603
2014	56744	24586	13038	19120
2015	56552	26144	13119	17289
2016	61140	29283	13611	18246
Others				
2005	46430	11377	12484	22569
2010	46734	15420	11649	19665
2013	45180	18190	10772	16218
2014	46506	18915	11351	16240
2015	46993	19909	11435	15649
2016	47616	19904	12225	15487

5.2.7. RESEARCHERS IN THE GOVERNMENT SECTOR BY GENDER AND AGE

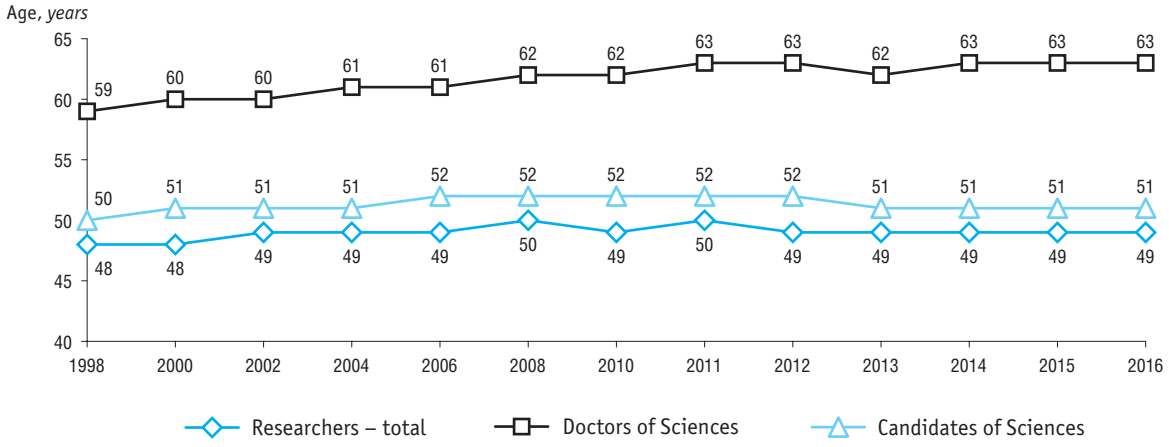
(headcount)

	2008			2016		
	Researchers	Of whom		Researchers	Of whom	
		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences
Total	**132261**	**17326**	**43043**	**134225**	**17781**	**44504**
Age, *years:*						
under 29 inclusive	19971	5	2348	20056	6	1930
30–39	20242	289	8296	30083	314	11854
40–49	22644	1838	7969	18834	1620	8107
50–54	16357	2194	5445	10849	1412	3731
55–59	16849	2821	5492	13405	2363	4315
60–69	23031	5106	8553	24624	5868	8507
70 and over	13167	5073	4940	16374	6198	6060
Males	72653	13078	23696	75932	12873	24157
Age, *years:*						
under 29 inclusive	11530	2	1354	11594	2	1062
30–39	9970	209	4091	16776	215	6206
40–49	10894	1307	3946	9447	990	3764
50–54	8373	1583	2966	5499	914	1897
55–59	9183	2073	3229	7156	1578	2312
60–69	13688	4001	4974	14541	4273	5163
70 and over	9015	3903	3136	10919	4901	3753
Females	59608	4248	19347	58293	4908	20347
Age, *years:*						
under 29 inclusive	8441	3	994	8462	4	868
30–39	10272	80	4205	13307	99	5648
40–49	11750	531	4023	9387	630	4343
50–54	7984	611	2479	5350	498	1834
55–59	7666	748	2263	6249	785	2003
60–69	9343	1105	3579	10083	1595	3344
70 and over	4152	1170	1804	5455	1297	2307

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



5.2.9. AVERAGE AGE OF RESEARCHERS IN THE GOVERNMENT SECTOR

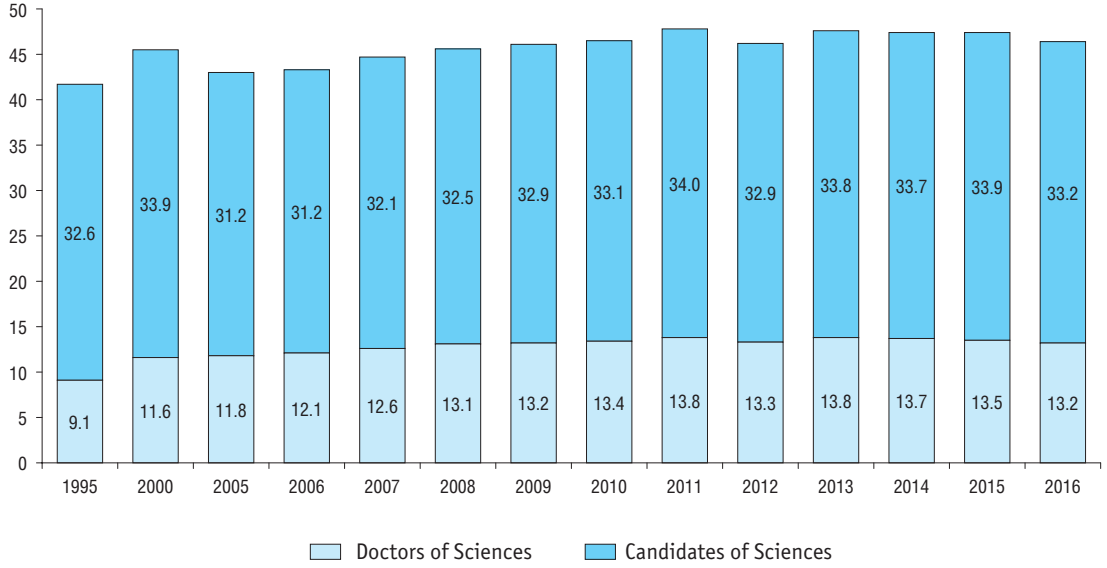


5.2.10. RESEARCHERS WITH SCIENTIFIC DEGREES IN THE GOVERNMENT SECTOR

(headcount)

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Researchers with scientific degrees	**61062**	**58901**	**60066**	**61194**	**61605**	**63092**	**62837**	**62944**	**63906**	**62285**
Doctors of Sciences	13358	14987	16511	17646	17789	18181	18184	18198	18264	17781
Candidates of Sciences	47704	43914	43555	43548	43816	44911	44653	44746	45642	44504

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)

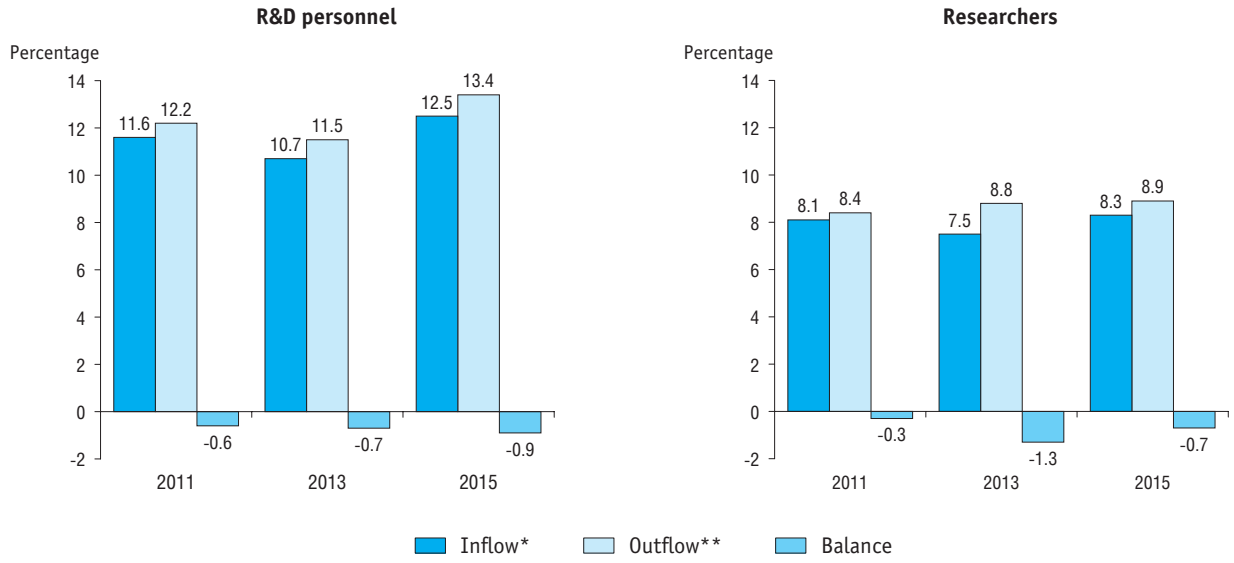
	2008			2014			2015			2016		
	Researchers	Of whom		Researchers	Of whom		Researchers	Of whom		Researchers	Of whom	
		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences
Total	**132261**	**17326**	**43043**	**132701**	**18198**	**44746**	**134794**	**18264**	**45642**	**134225**	**17781**	**44504**
Natural sciences	52719	8525	21841	54676	8950	23242	56349	9010	23705	55827	8850	23180
Engineering and technology	44097	1740	6204	42378	1765	5874	42326	1802	6044	43059	1682	5864
Medical sciences	12918	3320	5921	12710	3407	5801	12643	3369	5628	12838	3241	5577
Agricultural sciences	10285	1225	3930	10093	1315	3979	10008	1344	4040	9798	1303	3936
Social sciences	5456	935	2251	6174	1254	2859	6709	1213	3153	6235	1203	2940
Humanities	6786	1581	2896	6670	1507	2991	6759	1526	3072	6468	1502	3007

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
2011	256637	29523	3152	4193	22178	31264	20567	1115	9582	254896
2013	264121	28184	2650	3461	22073	30436	20179	642	9615	261869
2015	268080	33169	3182	4136	25851	35820	20622	1319	13879	265429
Researchers										
2005	139746	11715	3127	3121	5467	12087	8871	358	2858	139378
2011	129871	10428	2192	2337	5899	10944	7072	335	3537	128717
2013	133682	10035	1894	2211	5930	11819	8172	277	3370	132117
2015	136237	11127	2147	2347	6633	12169	7725	505	3939	134794
Technicians										
2005	25569	4128	336	630	3162	4227	2892	83	1252	25462
2011	24540	4424	363	220	3841	4484	2717	146	1621	26960
2013	28152	4034	349	292	3393	4371	2696	55	1620	27777
2015	28250	4634	463	439	3732	5846	2689	138	3019	27090
Supporting staff and others										
2005	109934	16791	527	1705	14555	18851	13161	410	5280	107878
2011	102226	14671	597	1636	12438	15836	10778	634	4424	99219
2013	102287	14115	407	958	12750	14246	9311	310	4625	101975
2015	103593	17408	572	1350	15486	17805	10208	676	6921	103545

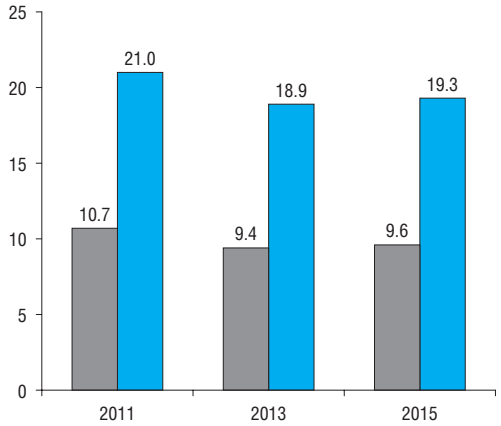
5.2.14. INFLOW AND OUTFLOW OF R&D PERSONNEL IN THE GOVERNMENT SECTOR



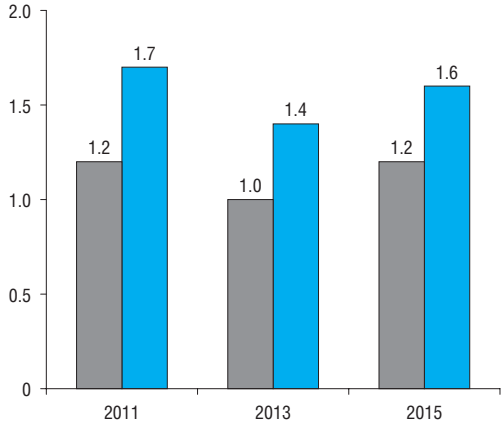
* The ratio of those hired during the year to the total employment at the end of the year.
** The ratio of those who left during the year to the total employment at the beginning of the year.

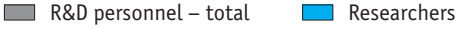
5.2.15. INFLOW OF HIGHER EDUCATION GRADUATES INTO GOVERNMENT SECTOR INSTITUTIONS

Higher education graduates as a percentage of those hired



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





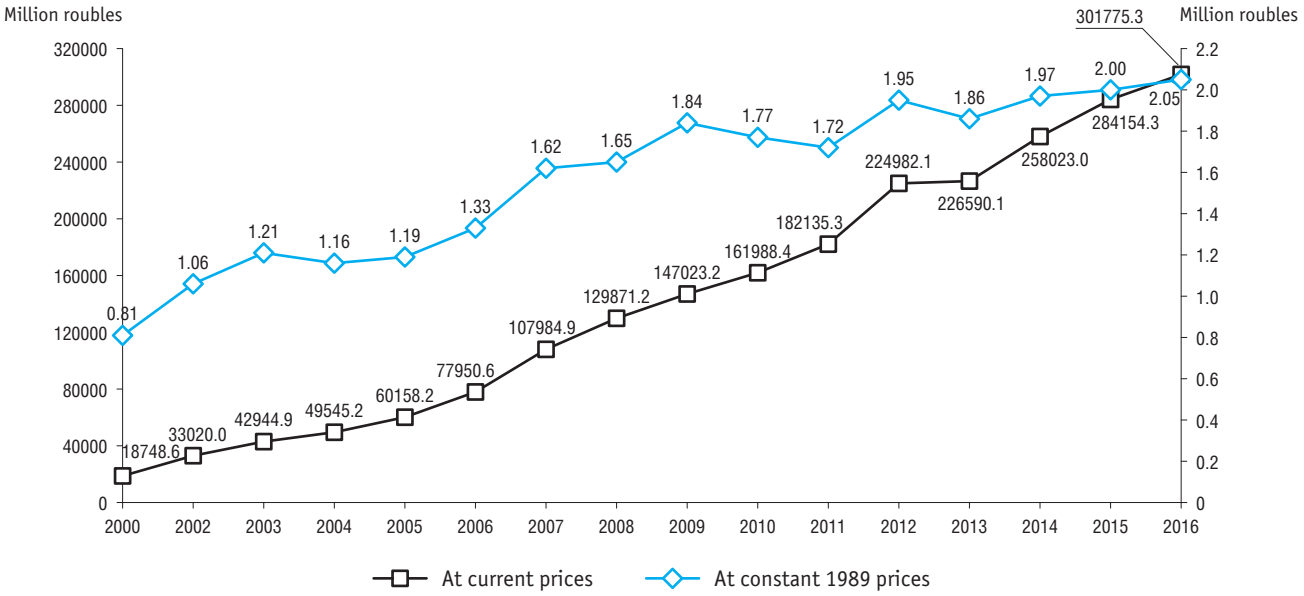
* The ratio of the higher education graduates hired during the year to the total employment at the end of the year.

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

(thousand roubles)

	2005	2010	2011	2012	2013	2014	2015	2016
Total	**60158166.6**	**161988411.4**	**182135309.9**	**224982089.2**	**226590120.7**	**258023009.1**	**284154288.3**	**301775305.3**
Research institutes	55762222.6	136870186.3	151261078.9	190774482.9	191023430.1	222183967.5	241159555.3	254408906.6
Design organisations, design-and-engineering organisations	4007361.7	20163653.6	23348735.0	24722611.1	25707283.0	27081699.7	31243788.5	35387725.2
Construction project and exploration organisations	21993.6	524208.6	551628.3	561026.1	433811.9	449560.6	384269.6	27093.9
Pilot plants	20300.0	139733.5	528561.1	970655.0	1076831.6	925741.2	998142.5	1093828.8
Others	346288.7	4290629.4	6445306.6	7953314.1	8348764.1	7382040.1	10368532.4	10857750.8

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

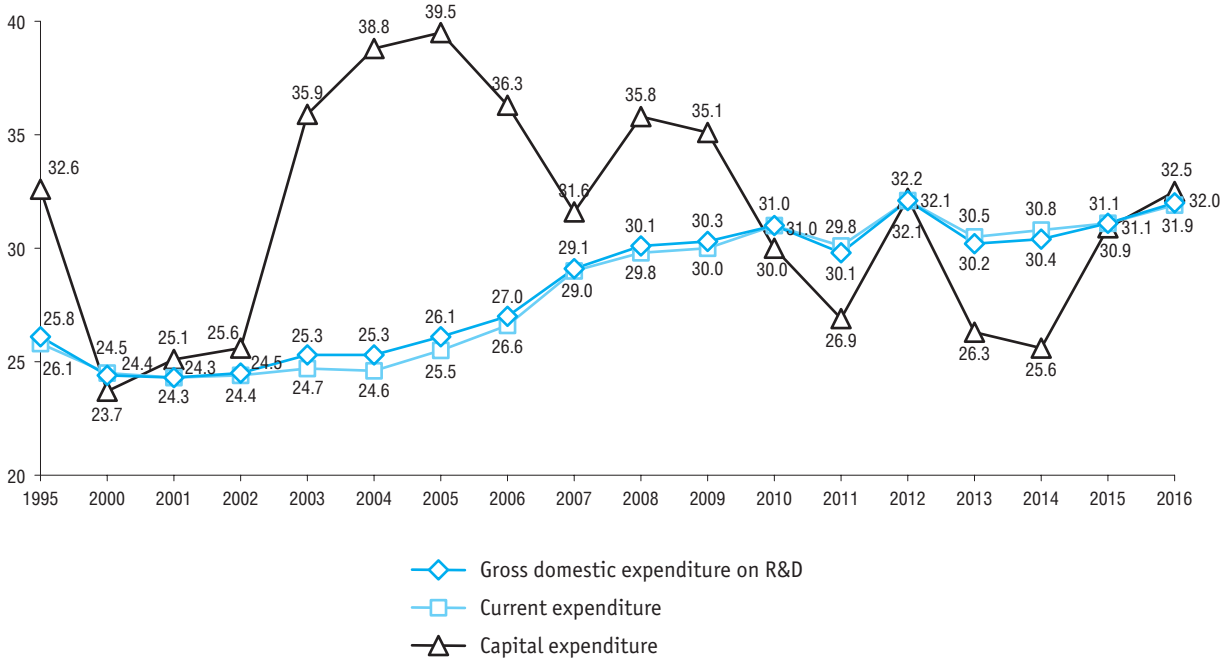
	Total	Government funds*	Business enterprise sector funds	Higher education sector funds	Private non-profit sector funds	Funds from abroad
At current prices, *thousand roubles, 1995 – million roubles*						
1995	3165439.4	2779222.3	255799.4	2313.0	821.0	127283.7
2000	18748588.2	15060439.1	2028296.2	11323.4	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

(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	0.1	0.07	4.1
2007	100	79.5	13.3	0.07	0.01	7.1
2008	100	83.3	12.4	0.1	0.09	4.0
2009	100	84.4	11.1	0.06	0.03	4.5
2010	100	82.9	12.9	0.1	0.05	4.1
2011	100	84.3	11.8	0.1	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	0.1	0.04	3.4
2015	100	84.6	11.6	0.1	0.06	3.7
2016	100	87.3	9.1	0.1	0.1	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 OF EXPENDITURE

(thousand roubles)

	2005	2010	2012	2013	2014	2015	2016
Gross domestic expenditure on R&D	**60158166.6**	**161988411.4**	**224982089.2**	**226590120.7**	**258023009.1**	**284154288.3**	**301775305.3**
Current expenditure	56342327.7	151825126.6	210559632.9	213468794.6	244655172.5	265478556.9	279027077.7
Salaries	25406848.5	80849201.5	108036774.5	112439789.3	126267663.6	134412102.1	139090202.7
Of which for R&D personnel*	23066423.6	73752076.2	98720480.9	102744281.9	114929478.2	121375793.9	125987971.1
Social security payments	6257309.9	16436614.4	27038528.7	2923058.9	32567448.4	36154760.9	37718124.5
Equipment	3086873.3	5458681.5	8154615.9	6600021.2	7776357.0	7442689.6	5766984.9
Other material costs	9781232.9	22464861.8	33170617.4	32362326.9	39503365.7	42451174.6	53280149.8
Other current expenditure	11810063.1	26615767.4	34159096.4	32836118.3	38540337.8	45017829.7	43171615.8
Capital expenditure	3815838.9	10163284.8	14422456.3	13121326.1	13367836.6	18675731.4	22748227.6
Land and buildings	399698.5	3113137.6	2579811.6	2467555.2	3248423.4	3903611.8	5480973.9
Equipment	2485274.0	4647644.5	8948846.1	7352490.4	7037782.8	10358881.1	14661765.0
Other capital expenditure	930866.4	2402502.7	2893798.6	3301280.5	3081630.4	4413238.5	2605488.7

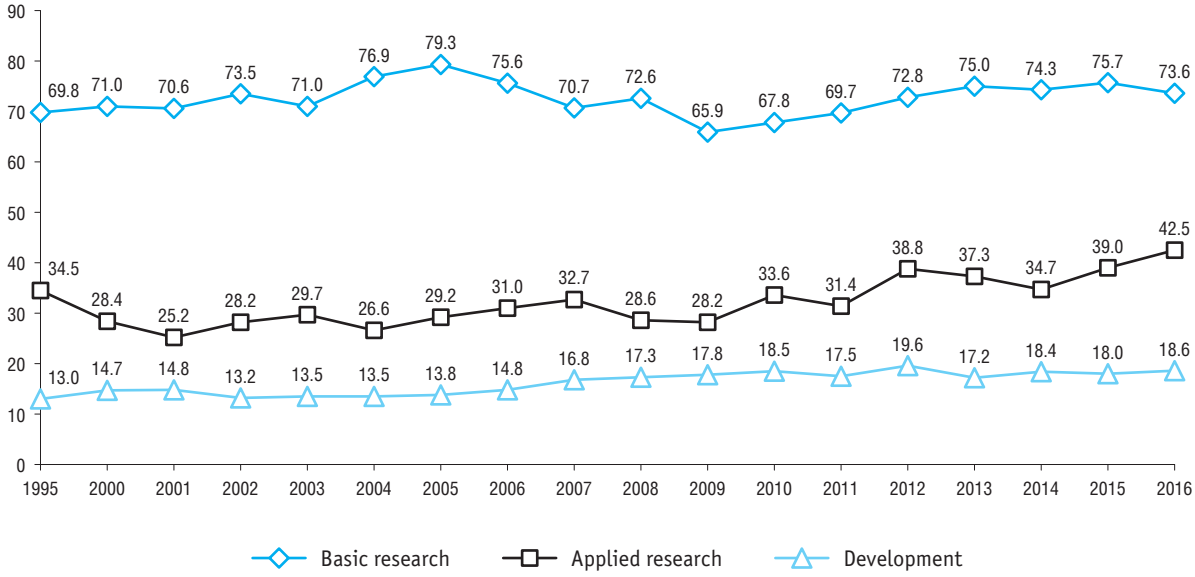
* Excluding external multiple jobholders and independent contractors.

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

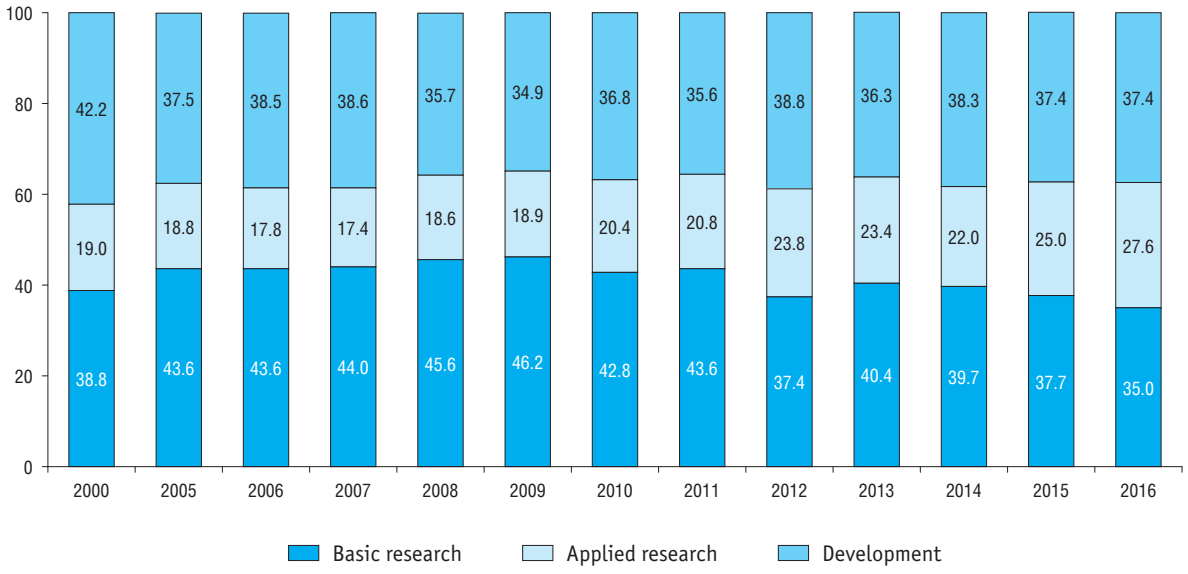
(thousand roubles)

	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
			2014				
Current expenditure on R&D	**244655172.5**	**92732641.7**	**107607344.3**	**18464196.6**	**10908795.6**	**7106804.7**	**7835389.6**
Basic research	97017979.4	57696082.8	12355070.9	8397591.8	7316853.9	4853294.3	6399085.7
Applied research	53934451.4	19852066.9	20568881.7	8767461.7	2429711.6	1501888.3	814441.2
Development	93702741.7	15184492.0	74683391.7	1299143.1	1162230.1	751622.1	621862.7
			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

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	2008	2009	2010	2011	2012	2013	2014	2015	2016
Average monthly salary, *roubles*	2015.6	7220.9	19561.0	22979.7	24792.1	27869.4	32031.0	34532.8	38715.6	40513.5	42125.9
As a percentage of the salary:											
in the national economy (=100%)	90.7	84.4	113.1	123.3	118.3	119.3	120.3	115.9	119.1	119.1	114.6
in manufacturing (=100%)	85.2	85.7	121.9	138.6	130.0	128.0	130.7	127.7	131.2	127.0	121.2
in construction (=100%)	76.4	79.9	105.3	126.8	117.1	117.7	123.4	124.7	131.9	135.2	130.9

5.3. Business enterprise sector

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

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Total	**2345**	**2278**	**1703**	**1405**	**1450**	**1362**	**1269**	**1265**	**1400**	**1326**
Research institutes	1089	1062	855	634	598	567	514	504	482	454
Design organisations, design-and-engineering organisations	615	564	410	290	287	262	265	254	260	244
Construction project and exploration organisations	204	94	55	31	32	27	26	26	21	21
Industrial enterprises	286	276	231	238	280	274	266	275	371	363
Pilot plants	31	32	16	16	14	19	9	10	11	14
Others	120	250	136	196	239	213	189	196	255	230

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

(headcount)

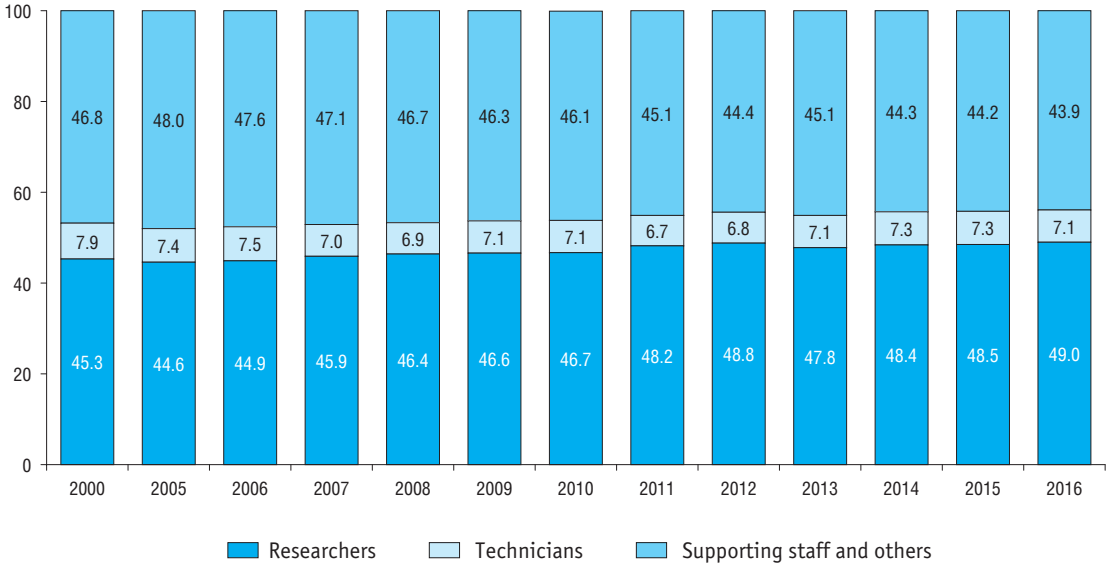
	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Total	**726568**	**590646**	**496706**	**423112**	**419752**	**394182**	**405268**	**405529**	**408802**	**388385**
Research institutes	438599	349242	255233	207166	196235	194274	205511	204860	202431	192150
Design organisations, design-and-engineering organisations	174523	151705	161295	129281	135133	110381	112617	114752	115683	109359
Construction project and exploration organisations	20844	8177	5284	4905	5076	5402	3751	3602	1629	1749
Industrial enterprises	73410	52598	43524	51807	52004	52071	52232	49358	53868	50740
Pilot plants	9998	3945	865	925	852	946	705	1374	1499	1630
Others	9194	24979	30505	29028	30452	31108	30536	31583	33692	32757

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

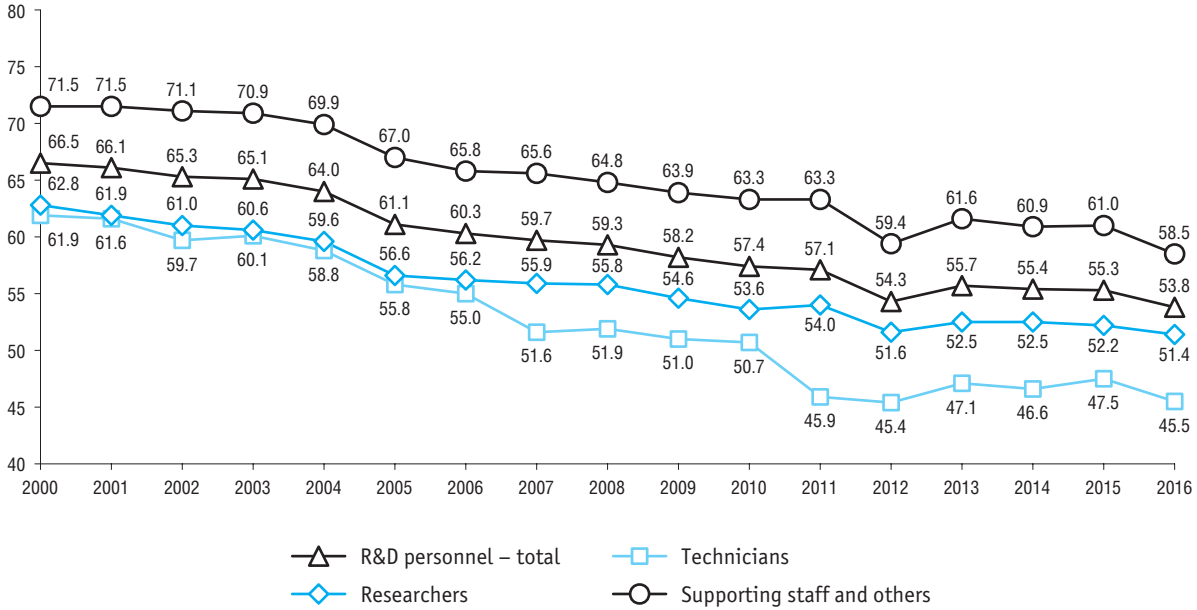
(headcount)

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Total	**726568**	**590646**	**496706**	**423112**	**419752**	**394182**	**405268**	**405529**	**408802**	**388385**
Researchers	336671	267640	221445	197785	202185	192285	193736	196320	198123	190378
Technicians	70180	46535	38837	30063	28235	26720	28920	29452	29850	27519
Supporting staff	201122	175261	147980	120485	116829	106306	109691	107215	108230	101219
Others	118595	101210	90444	74779	72503	68871	72921	72542	72599	69269

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
2013	405268	271434	61575	72259
2014	405529	276675	59564	69290
2015	408802	283664	60370	64768
2016	388385	274477	56221	57687
Researchers				
2005	221445	221445	–	–
2010	197785	197785	–	–
2013	193736	193736	–	–
2014	196320	196320	–	–
2015	198123	198123	–	–
2016	190378	190378	–	–
Technicians				
2005	36837	6274	21435	9130
2010	30063	7842	15051	7170
2013	28920	9428	12887	6605
2014	29452	10215	12503	6734
2015	29850	11656	11794	6400
2016	27519	11023	11025	5471

(continued)

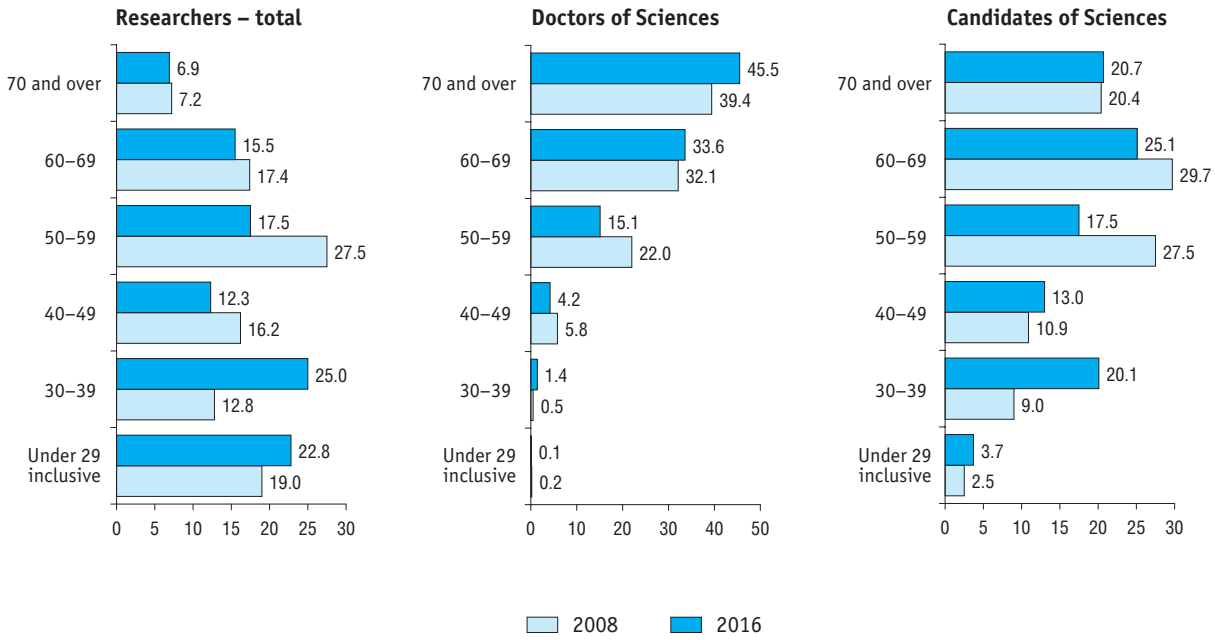
	Total	Higher education	Secondary vocational education	Other education
Supporting staff				
2005	147980	37101	42099	68780
2010	120485	38988	33362	48135
2013	109691	39124	29508	41059
2014	107215	40615	28175	38425
2015	108230	42934	30297	34999
2016	101219	41629	27909	31681
Others				
2005	90444	23829	25733	40882
2010	74779	24206	21139	29434
2013	72921	29146	19180	24595
2014	72542	29525	18886	24131
2015	72599	30951	18279	23369
2016	69269	31447	17287	20535

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

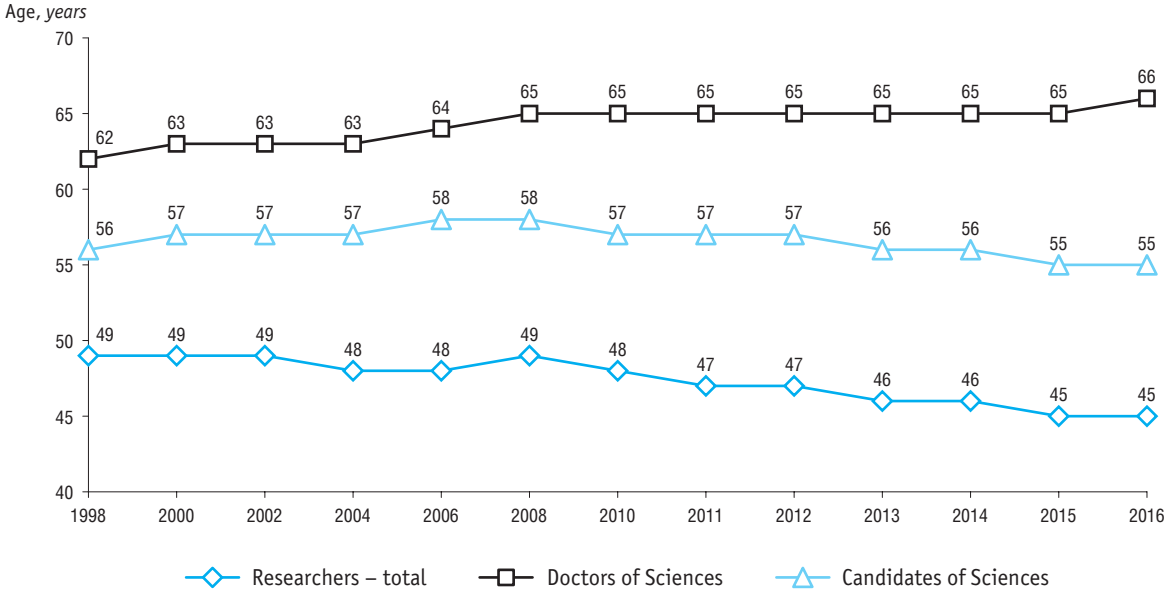
(headcount)

	2008			2016		
	Researchers	Of whom		Researchers	Of whom	
		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences
Total	**209579**	**4284**	**20560**	**190378**	**3071**	**15762**
Age, years:						
under 29 inclusive	39743	8	522	43325	3	577
30–39	26840	21	1845	47686	44	3162
40–49	33992	250	2234	23451	130	2045
50–54	28373	369	2334	15069	149	1111
55–59	29208	572	3324	18241	316	1650
60–69	36400	1375	6113	29415	1031	3955
70 and over	15023	1689	4188	13191	1398	3262
Males	125997	3905	16502	121653	2830	12767
Age, years:						
under 29 inclusive	25365	7	397	28981	2	437
30–39	16324	17	1303	31356	36	2387
40–49	17239	220	1676	14195	110	1522
50–54	15126	317	1817	8246	139	890
55–59	16262	509	2667	10322	285	1382
60–69	23519	1276	5109	18556	946	3351
70 and over	12162	1559	3533	9997	1312	2798
Females	83582	379	4058	68725	241	2995
Age, years:						
under 29 inclusive	14378	1	125	14344	1	140
30–39	10516	4	542	16330	8	775
40–49	16753	30	558	9256	20	523
50–54	13247	52	517	6823	10	221
55–59	12946	63	657	7919	31	268
60–69	12881	99	1004	10859	85	604
70 and over	2861	130	655	3194	86	464

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

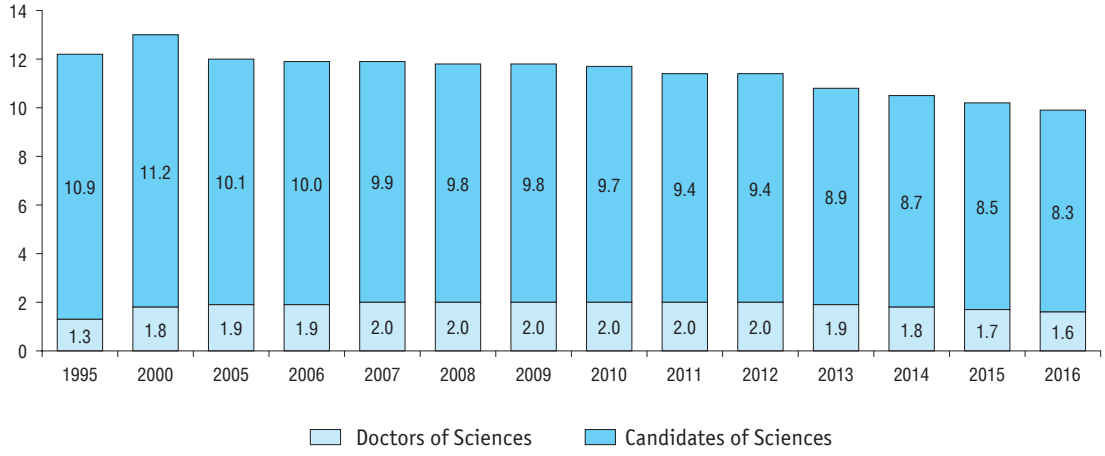


5.3.10. RESEARCHERS WITH SCIENTIFIC DEGREES IN THE BUSINESS SECTOR

(headcount)

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Researchers with scientific degrees	**41207**	**34775**	**26661**	**23169**	**23045**	**21758**	**20955**	**20595**	**20270**	**18833**
Doctors of Sciences	4348	4806	4222	3987	4018	3767	3622	3511	3413	3071
Candidates of Sciences	36859	29969	22439	19182	19027	17991	17333	17084	16857	15762

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)

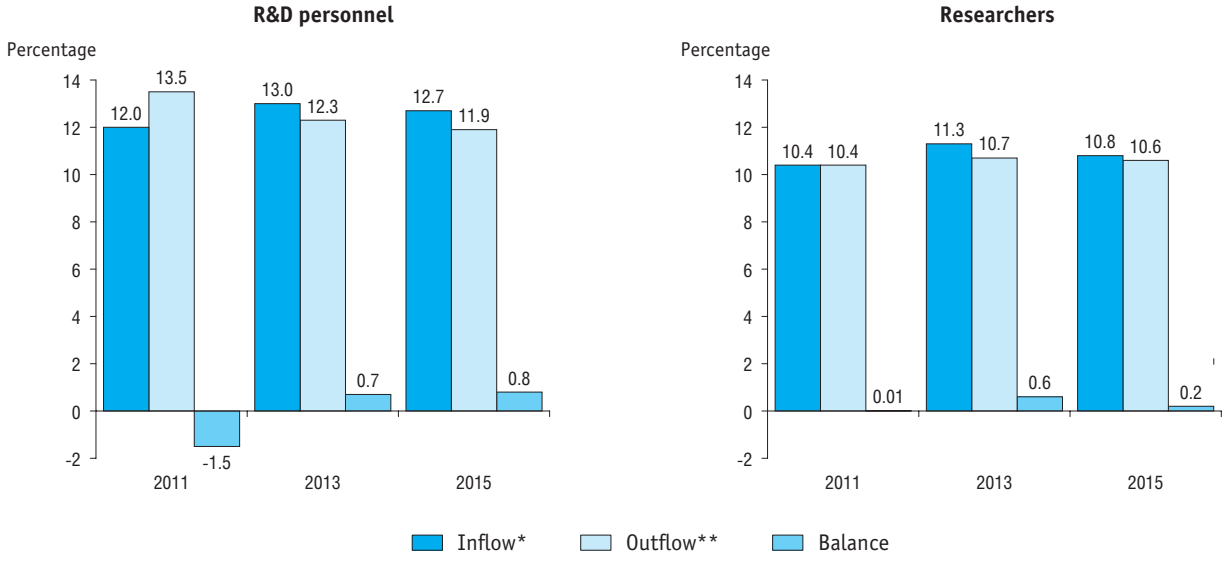
	2008			2014			2015			2016		
	Researchers	Of whom		Researchers	Of whom		Researchers	Of whom		Researchers	Of whom	
		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences
Total	**209579**	**4284**	**20560**	**196320**	**3511**	**17084**	**198123**	**3413**	**16857**	**190378**	**3071**	**15762**
Natural sciences	25014	1301	5106	20007	1034	3963	17101	928	3480	16913	853	3319
Engineering and technology	177503	2478	13712	171705	2177	12034	176440	2172	12325	169393	1991	11667
Medical sciences	1353	139	413	949	77	198	1116	64	179	1222	68	188
Agricultural sciences	2401	185	685	587	46	159	437	44	131	460	15	106
Social sciences	3109	161	587	2747	156	620	2577	166	602	2231	128	444
Humanities	199	20	57	325	21	110	452	39	140	159	16	38

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
2011	427274	50218	7976	6092	36150	57740	36033	1794	19913	419752
2013	401809	52700	6758	7632	38310	49241	32584	1159	15498	405268
2015	405181	52033	6175	7075	38783	48412	30324	2568	15520	408802
Researchers										
2005	227397	22807	6529	5028	11250	28822	19496	2053	7273	221445
2011	202213	21121	5890	3770	11461	21109	14428	696	5985	202185
2013	192306	21908	4703	4471	12734	20499	13769	380	6350	193736
2015	197658	21426	4225	3730	13471	20954	13382	831	6741	198123
Technicians										
2005	38078	5739	301	729	4709	6965	4347	388	2230	36837
2011	29057	4500	358	524	3618	5365	3378	124	1863	28235
2013	28318	5409	506	665	4238	4779	2829	75	1875	28920
2015	30047	4897	546	574	3777	4977	2973	304	1700	29850
Supporting staff and others										
2005	243365	39982	1197	2999	35786	44875	28691	3281	12903	238424
2011	196004	24597	1728	1798	21071	31266	18227	974	12065	189332
2013	181185	25383	1549	2496	21338	23963	15986	704	7273	182612
2015	177476	25710	1404	2771	21535	22481	13969	1433	7079	180829

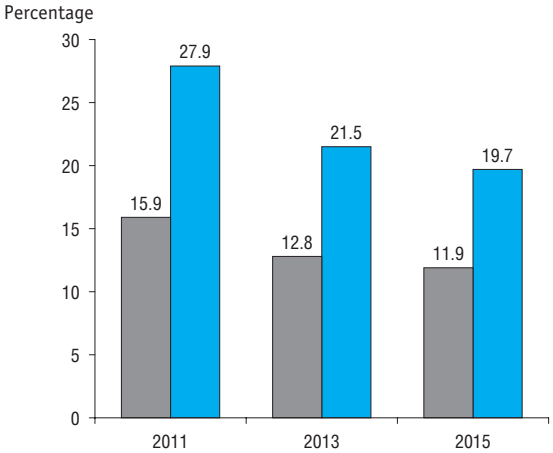
5.3.14. INFLOW AND OUTFLOW OF R&D PERSONNEL IN THE BUSINESS ENTERPRISE SECTOR



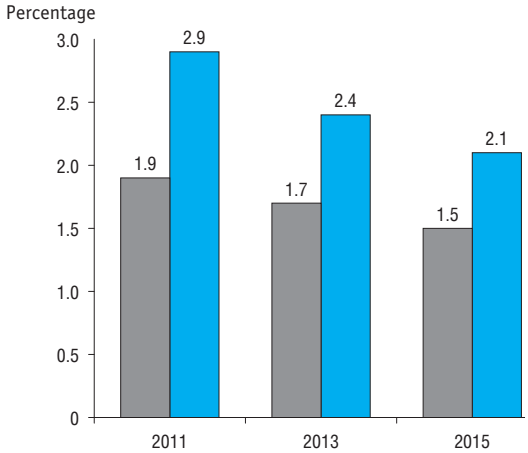
* The ratio of those hired during the year to the total employmentat the end of the year.
** The ratio of those who left during the year to the total employment at the beginning of the year.

5.3.15. 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 – total Researchers

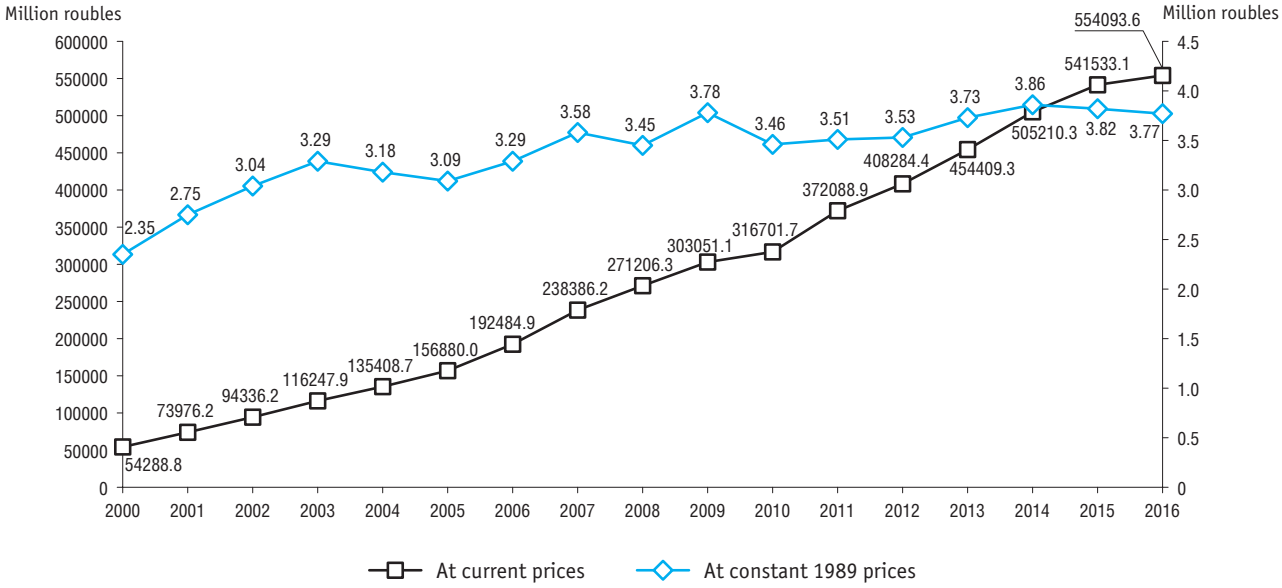
* The ratio of the higher education graduates hired during the year to the total employment at the end of the year.

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	2011	2012	2013	2014	2015	2016
Total	**54288781.4**	**156880029.0**	**316701679.9**	**372088873.4**	**408284378.5**	**454409251.0**	**505210341.3**	**541533094.3**	**554093599.1**
Research institutes	31145022.1	79303185.8	149370680.2	169714137.6	200622676.3	223137546.4	246251822.0	264045184.4	271903397.6
Design organisations, design-and-engineering organisations	13115444.7	51857668.0	99778643.7	117208342.7	104269890.1	118708123.0	140108876.6	142841408.8	139631208.0
Construction project and exploration organisations	539721.1	1604470.7	3690958.0	4688711.6	5827594.8	3579155.2	3567752.9	2380598.7	2530918.6
Industrial enterprises	4726082.4	12633435.9	32838780.9	41251710.9	49952762.8	59346858.0	60962171.4	74693899.2	75747420.1
Pilot plants	294581.2	150835.5	398159.1	372177.7	746678.7	808351.2	1749042.3	2223362.2	2105223.8
Others	4467929.9	11330433.1	30624458.0	38853792.9	46864775.8	48829217.2	52570676.1	55348641.0	62175431.0

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

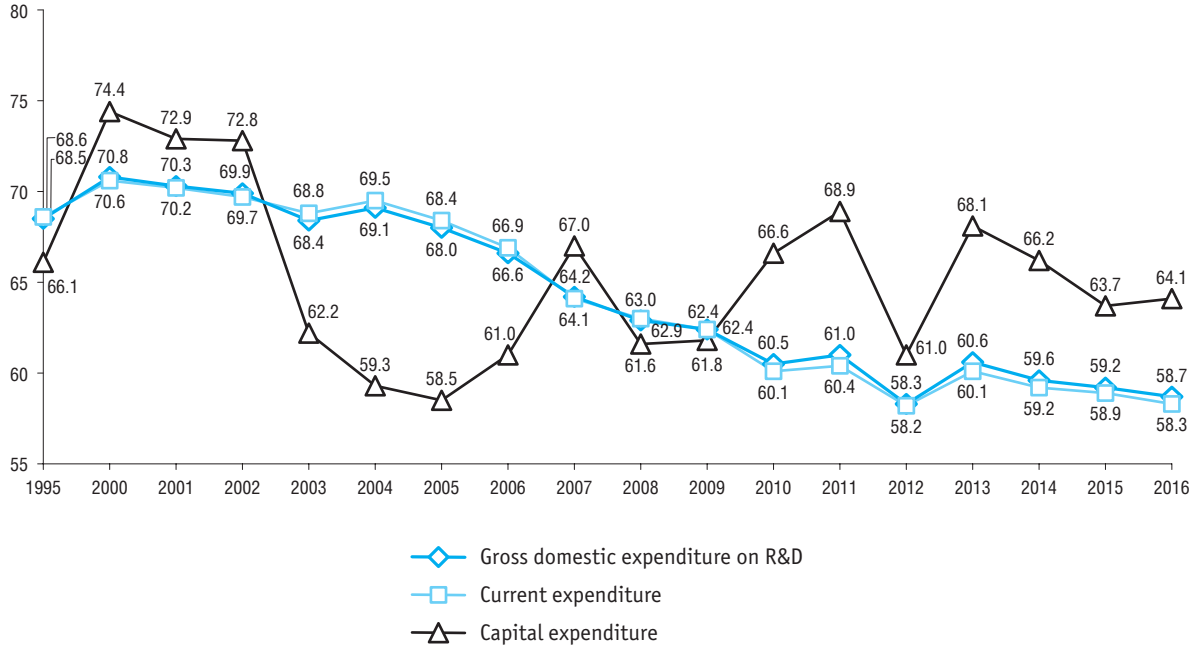
	Total	Government funds*	Business enterprise sector funds	Higher education sector funds	Private non-profit sector funds	Funds from abroad
At current prices, *thousand roubles, 1995 – million roubles*						
1995	8323907.6	4256825.1	3639140.1	822.4	486.8	426633.2
2000	54288781.4	24674880.5	22199361.6	23662.7	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

(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	0.3	0.07	7.8
2008	100	56.0	36.5	0.02	0.2	7.2
2009	100	57.4	34.6	0.02	0.08	7.9
2010	100	64.2	32.1	0.02	0.1	3.5
2011	100	58.7	36.0	0.1	0.2	5.0
2012	100	60.4	35.1	0.06	0.04	4.4
2013	100	61.5	35.5	0.1	0.02	2.9
2014	100	62.7	35.1	0.09	0.07	2.1
2015	100	63.4	34.2	0.1	0.08	2.2
2016	100	59.0	38.5	0.03	0.03	2.5

* 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 OF EXPENDITURE

(thousand roubles)

	2005	2010	2012	2013	2014	2015	2016
Gross domestic expenditure on R&D	**156880029.0**	**316701679.9**	**408284378.5**	**454409251.0**	**505210341.3**	**541533094.3**	**554093599.1**
Current expenditure	151228693.6	294103827.7	380968190.9	420438999.3	470728154.3	503088818.5	509168604.8
Salaries	61762384.5	134771346.7	163680881.0	184301583.4	199981537.7	214055655.0	214443342.3
Of which for R&D personnel*	56579998.4	123576290.3	149328527.6	168490249.3	184318111.2	196822214.9	195079681.0
Social security payments	14652167.0	26089246.1	39738423.4	44519677.6	49274407.7	55348833.5	55160883.4
Equipment	5919453.8	9955224.5	13822393.6	13592306.5	13499794.4	17319573.0	14429765.7
Other material costs	39963918.4	63367540.7	85310764.1	96060693.9	111940812.4	109075443.3	114649833.7
Other current expenditure	28930769.9	59920469.7	78415728.8	81964737.9	96031602.1	107289313.7	110484779.7
Capital expenditure	5651335.4	22597852.2	27316187.6	33970251.7	34482187.0	38444275.8	44924994.3
Land and buildings	1208092.5	4950198.0	9006103.9	6020259.0	6094066.5	5984058.2	6774304.9
Equipment	3228403.1	14167838.2	13818410.4	17818744.0	19820476.8	21054397.0	20877238.1
Other capital expenditure	1214839.8	3479816.0	4491673.3	10131248.7	8567643.7	11405820.6	17273451.3

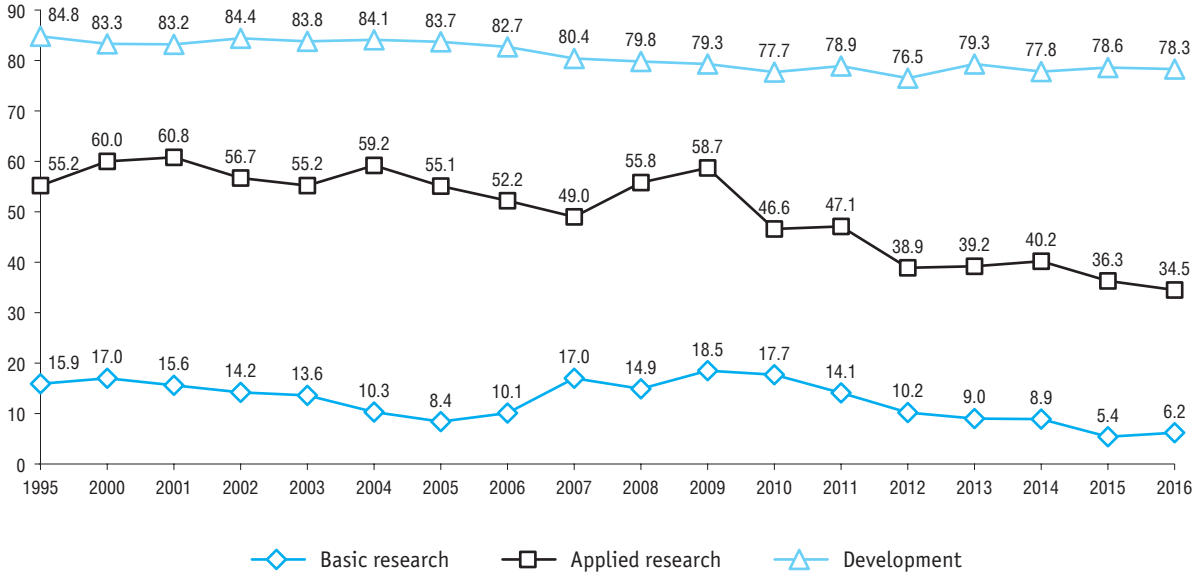
* Excluding external multiple jobholders and independent contractors.

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

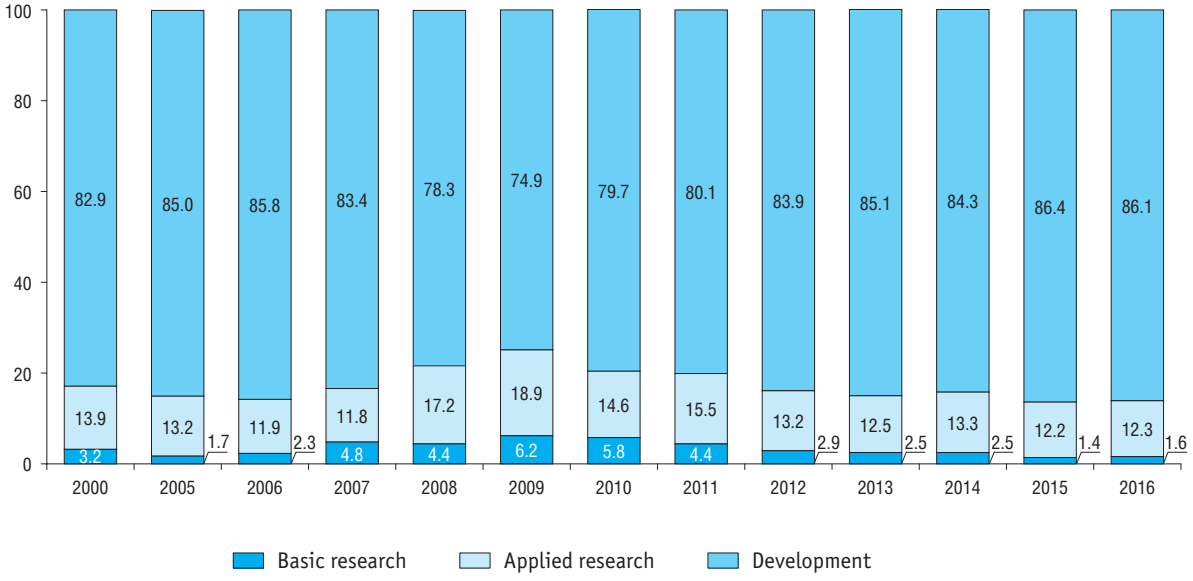
(thousand roubles)

	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
			2014				
Current expenditure on R&D	**470728154.3**	**28859233.5**	**435503592.5**	**2222531.9**	**727819.4**	**3252029.7**	**162947.3**
Basic research	11654667.9	2995756.1	7271091.0	705469.6	60395.0	600783.9	21172.3
Applied research	62451087.5	13258425.5	46200081.4	938617.9	139398.7	1880216.0	34348.0
Development	396622398.9	12605051.9	382032420.1	578444.4	528025.7	771029.8	107427.0
			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

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	2008	2009	2010	2011	2012	2013	2014	2015	2016
Average monthly salary, *roubles*	2519.9	9599.6	19345.3	21674.1	25359.7	29174.9	33165.2	36540.8	39855.8	42102.7	44611.1
As a percentage of the salary:											
in the national economy (=100%)	113.3	112.2	111.9	116.3	121.0	124.8	124.5	122.7	122.7	123.7	121.4
in manufacturing (=100%)	106.5	114.0	120.5	130.7	132.9	133.9	135.3	135.1	135.1	131.9	128.4
in construction (=100%)	95.5	106.2	104.2	119.6	119.8	123.2	127.8	131.9	135.8	140.5	138.6

5.4. Higher education sector

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

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Total	**511**	**526**	**539**	**617**	**696**	**662**	**762**	**777**	**1124**	**1064**
Higher education institutions	395	390	406	517	581	562	673	702	1040	979
Research institutes (centres)	88	107	109	71	67	54	51	37	43	40
Design organisations, design-and-engineering organisations	18	19	17	11	12	12	10	8	7	5
Pilot plants	1	2	–	1	2	4	1	1	2	1
Others	9	8	7	17	34	30	27	29	32	39

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

(headcount)

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Total	**52065**	**40787**	**43500**	**53290**	**59454**	**59469**	**59247**	**62400**	**63870**	**63046**
Higher education institutions	40015	31110	33942	46776	53944	53699	54092	58573	60151	59124
Research institutes (centres)	9458	7254	7021	4796	3904	3070	2864	2049	2092	1722
Design organisations, design-and-engineering organisations	2170	2198	1991	1392	1197	1830	1502	1408	1121	839
Pilot plants	23	4	–	2	8	9	…*	…*	…*	…*
Others	399	221	546	324	401	861	775	369	506	1360

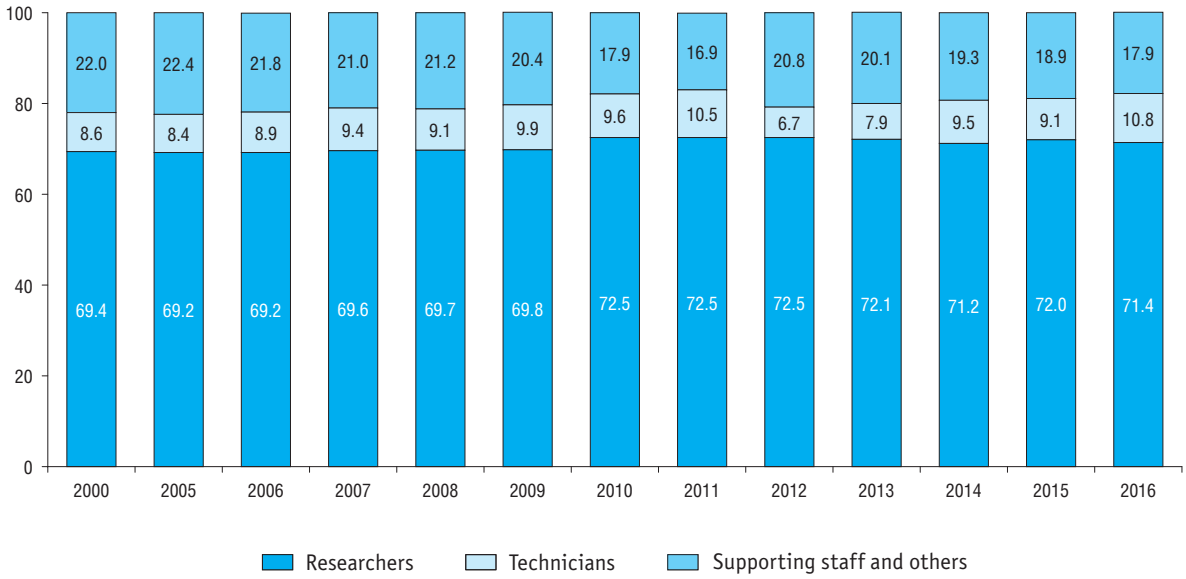
* The data are not published in order to ensure the confidentiality of primary statistics received from organisations, in accordance with Federal Law no. 282-FL of November 29, 2007 'On the Official Statistical Accounting and State Statistics System of the Russian Federation' (art. 4, para. 5; art. 9,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

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

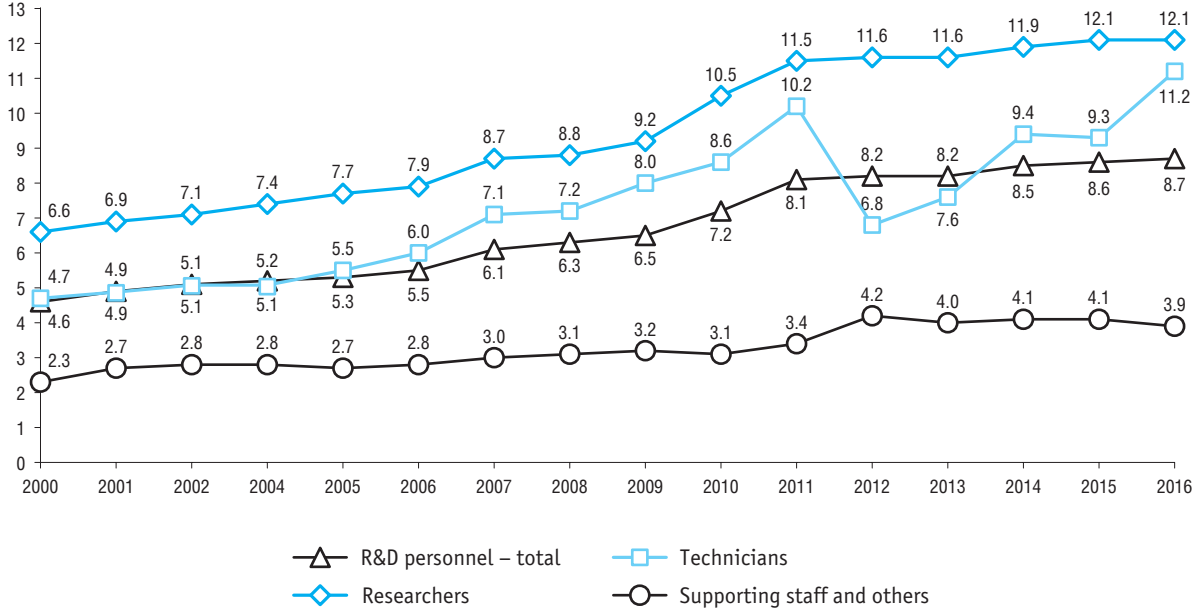
(headcount)

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Total	**52065**	**40787**	**43500**	**53290**	**59454**	**59469**	**59247**	**62400**	**63870**	**63046**
Researchers	35508	28325	30111	38640	43121	43103	42692	44427	45967	44994
Technicians	4010	3509	3658	5095	6256	3998	4670	5939	5836	6789
Supporting staff	7520	5463	6098	6564	7345	9264	8828	9538	9217	8929
Others	5027	3490	3633	2991	2732	3104	3057	2496	2850	2334

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
2013	59247	52927	2625	3695
2014	62400	56009	2274	4117
2015	63870	58144	2071	3655
2016	63046	57504	2066	3476
Researchers				
2005	30111	30111	–	–
2010	38640	38640	–	–
2013	42692	42692	–	–
2014	44427	44427	–	–
2015	45967	45967	–	–
2016	44994	44994	–	–
Technicians				
2005	3658	1079	2082	497
2010	5095	2460	1526	1109
2013	4670	2570	919	1181
2014	5939	3835	816	1288
2015	5836	4120	742	974
2016	6789	4761	779	1249

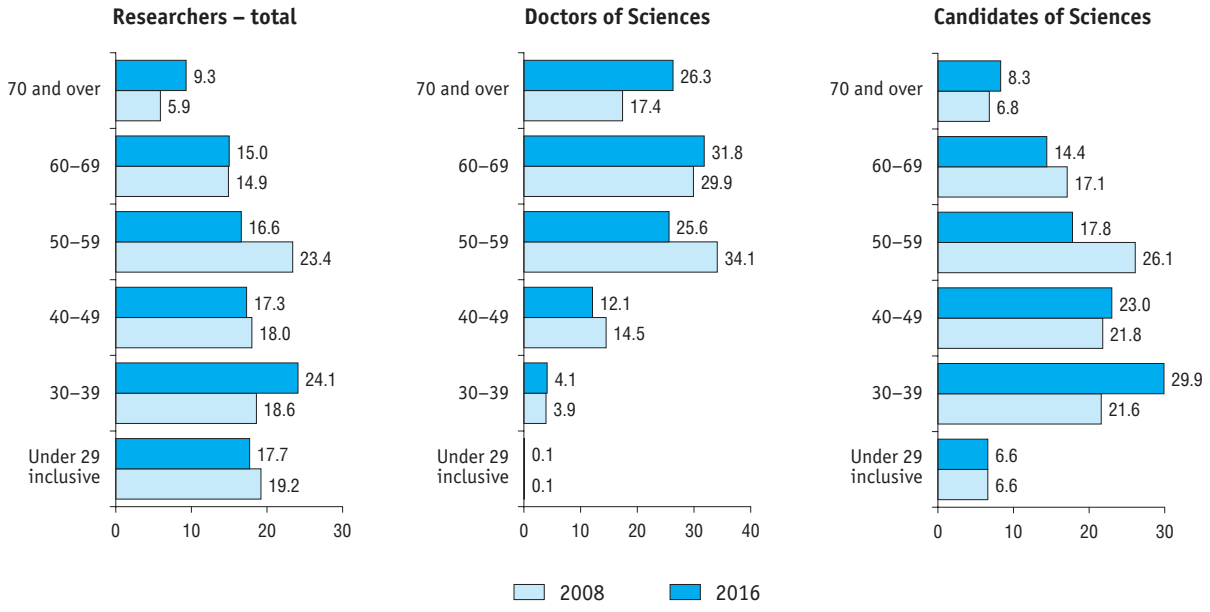
(continued)

	Total	Higher education	Secondary vocational education	Other education
Supporting staff				
2005	6098	2758	1465	1875
2010	6564	3695	1190	1679
2013	8828	5917	1129	1782
2014	9538	6404	976	2158
2015	9217	6068	898	2251
2016	8929	6299	844	1786
Others				
2005	3633	1211	883	1539
2010	2991	1317	678	996
2013	3057	1748	577	732
2014	2496	1343	482	671
2015	2850	1989	431	430
2016	2334	1450	443	441

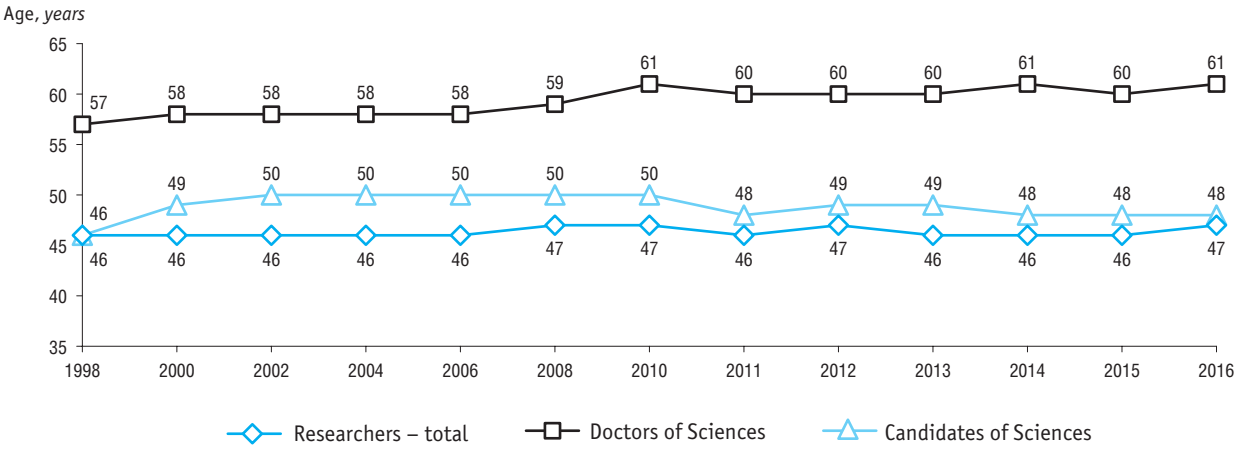
5.4.7. RESEARCHERS IN THE HIGHER EDUCATION SECTOR BY GENDER AND AGE

	2008			2016		
	Researchers	Of whom		Researchers	Of whom	
		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences
Total	**33160**	**3439**	**12040**	**44994**	**6532**	**20577**
Age, *years:*						
under 29 inclusive	6379	4	792	7967	4	1356
30–39	6164	133	2606	10846	270	6160
40–49	5964	499	2619	7799	792	4728
50–54	3999	547	1603	3602	710	1817
55–59	3760	627	1544	3852	961	1850
60–69	4937	1029	2055	6741	2080	2962
70 and over	1957	600	821	4187	1715	1704
Males	19506	2538	6770	23973	4551	10087
Age, *years:*						
under 29 inclusive	4055	3	448	4597	3	822
30–39	3284	94	1353	5517	199	3032
40–49	3298	349	1412	3473	457	1947
50–54	2951	384	909	1703	426	793
55–59	2224	450	928	1943	637	869
60–69	3063	791	1205	3989	1511	1640
70 and over	1231	467	515	2751	1318	984
Females	13654	901	5270	21021	1981	10490
Age, *years:*						
under 29 inclusive	2324	1	344	3370	1	534
30–39	2880	39	1253	5329	71	3128
40–49	2666	150	1207	4326	335	2781
50–54	1648	163	694	1899	284	1024
55–59	1536	177	616	1909	324	981
60–69	1874	238	850	2752	569	1322
70 and over	726	133	306	1436	397	720

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

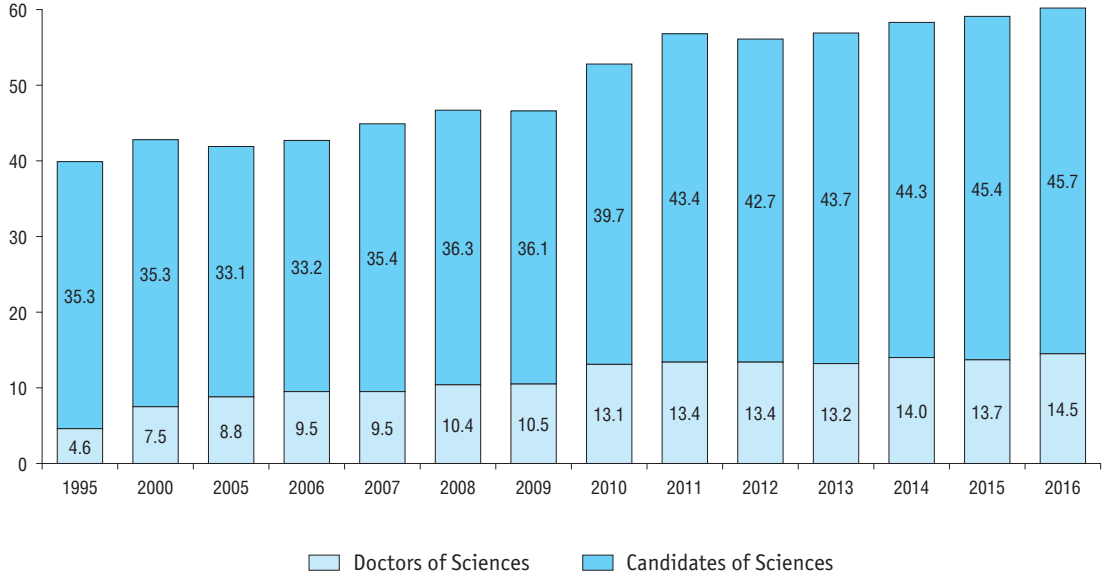


5.4.10. RESEARCHERS WITH SCIENTIFIC DEGREES IN THE HIGHER EDUCATION SECTOR

(headcount)

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Researchers with scientific degrees	**14162**	**12113**	**12618**	**20423**	**24502**	**24144**	**24306**	**25899**	**27184**	**27109**
Doctors of Sciences	1617	2120	2654	5068	5774	5753	5638	6218	6318	6532
Candidates of Sciences	12545	9993	9964	15355	18728	18391	18668	19681	20866	20577

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)

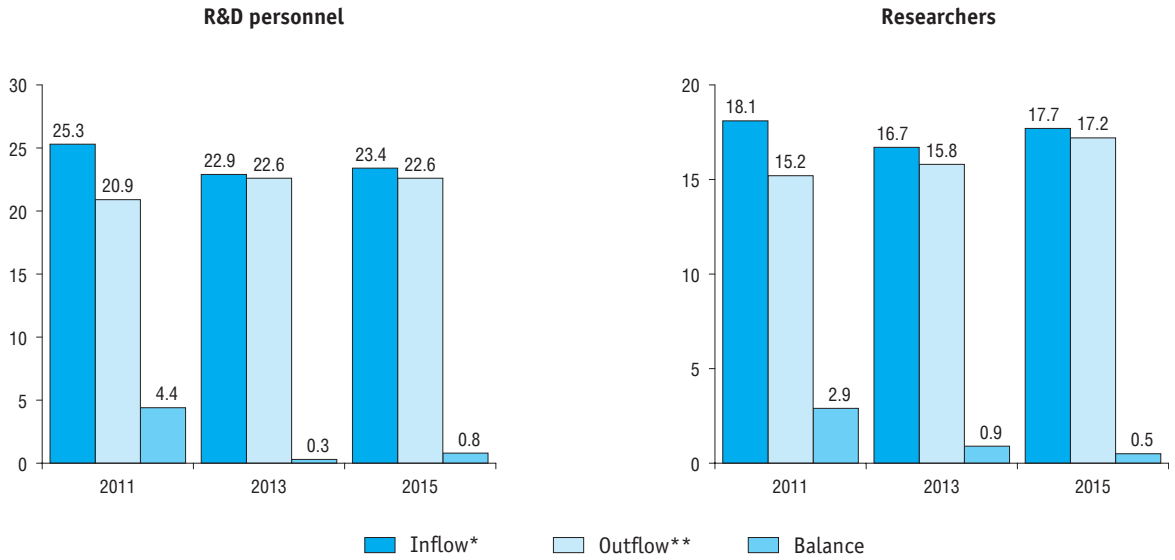
	2008			2014			2015			2016		
	Researchers	Of whom		Researchers	Of whom		Researchers	Of whom		Researchers	Of whom	
		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences		Doctors of Sciences	Candidates of Sciences
Total	**33160**	**3439**	**12040**	**44427**	**6218**	**19681**	**45967**	**6318**	**20866**	**44994**	**6532**	**20577**
Natural sciences	13111	1535	5244	13621	2318	6718	13175	2285	6515	13134	2370	6561
Engineering and technology	10524	484	2352	12403	919	3283	12856	939	3444	12148	964	3573
Medical sciences	2403	441	1142	2035	413	956	2018	451	990	2040	448	982
Agricultural sciences	933	116	416	1188	209	625	851	163	421	808	169	441
Social sciences	4309	512	1818	9659	1460	5281	11420	1562	6571	11199	1646	6199
Humanities	1880	351	1068	5521	899	2818	5647	918	2925	5665	935	2821

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
2011	56117	15068	2579	1578	10911	11731	6151	64	5516	59454
2013	59043	13561	1648	2104	9809	13357	6381	212	6764	59247
2015	63192	14971	2293	2788	9890	14293	7256	350	6687	63870
Researchers										
2005	28951	5219	1229	1058	2932	4062	2470	16	1576	30111
2011	41648	7823	1707	1156	4960	6347	3639	42	2666	43121
2013	42229	7140	903	1604	4633	6663	3584	134	2945	42692
2015	45677	8141	1102	1934	5105	7854	4158	226	3470	45967
Technicians										
2005	3451	1030	114	115	801	820	467	1	352	3658
2011	4713	3267	398	136	2733	1723	924	8	791	6256
2013	4490	2260	277	187	1796	2081	870	37	1174	4670
2015	5443	2701	606	186	1909	2276	1318	28	930	5836
Supporting staff and others										
2005	9199	2521	132	215	2174	1989	1159	8	822	9731
2011	9756	3978	474	286	3218	3661	1588	14	2059	10077
2013	12324	4161	468	313	3380	4613	1927	41	2645	11885
2015	12072	4129	585	668	2876	4163	1780	96	2287	12067

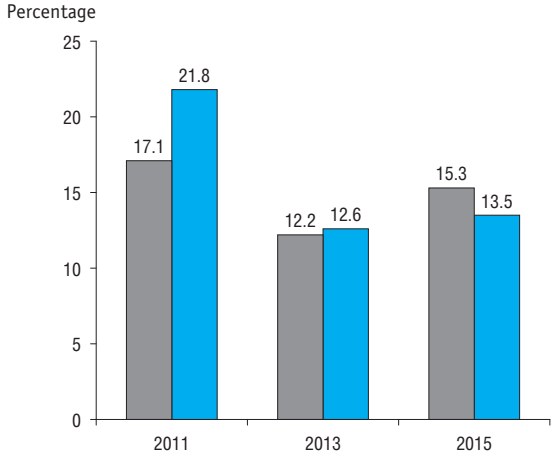
5.4.14. INFLOW AND OUTFLOW OF R&D PERSONNEL IN THE HIGHER EDUCATION SECTOR



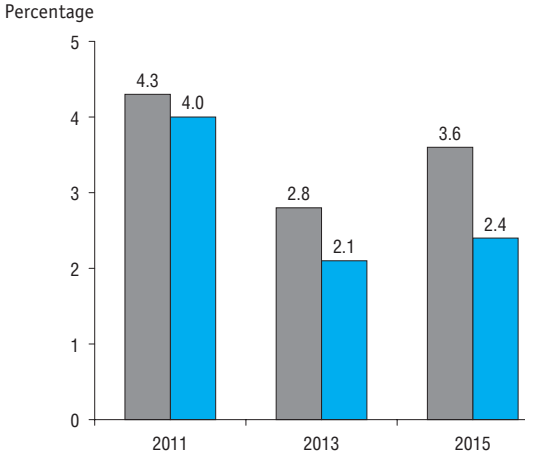
* The ratio of those hired during the year to the total employment at the end of the year.
** The ratio of those who left during the year to the total employment at the beginning of the year.

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

Higher education graduates as a percentage of those hired



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



R&D personnel – total Researchers

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

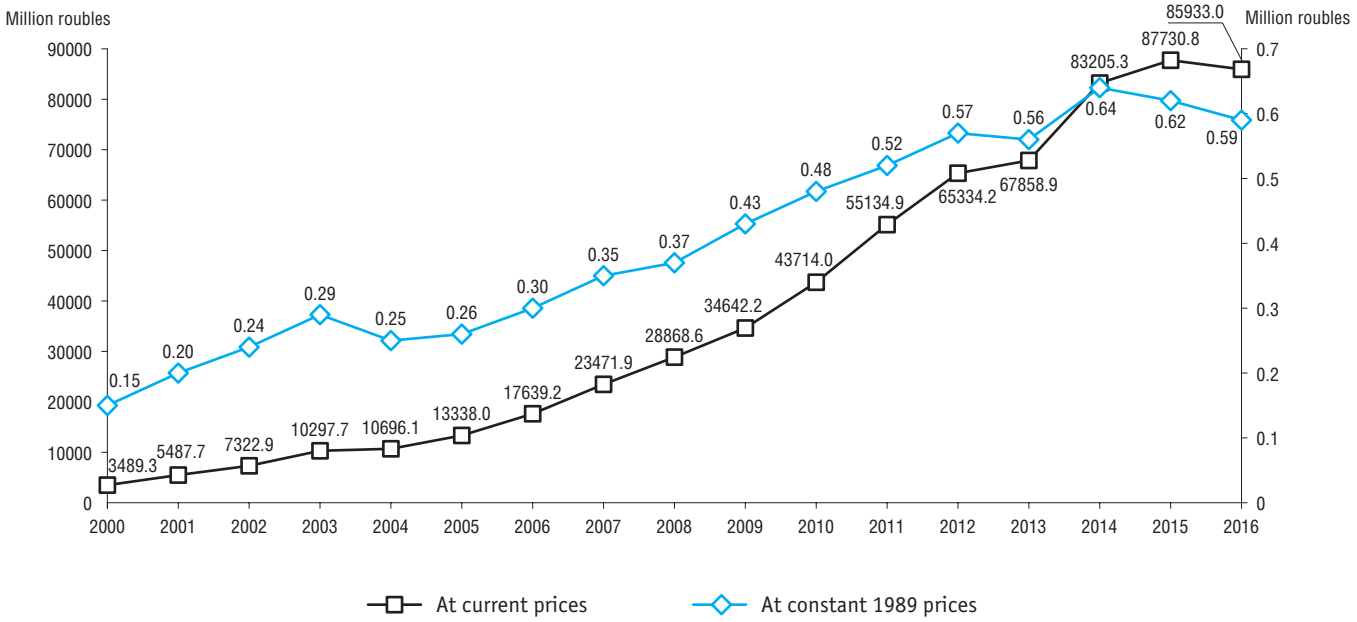
5.4.16. GROSS DOMESTIC EXPENDITURE ON R&D IN THE HIGHER EDUCATION SECTOR BY TYPE OF R&D INSTITUTIONS

(thousand roubles)

	2000	2005	2010	2011	2012	2013	2014	2015	2016
Total	**3489342.2**	**13337987.1**	**43714007.3**	**55134893.9**	**65334232.1**	**67858855.1**	**83205260.1**	**87730781.4**	**85932983.0**
Higher education institutions	2777397.1	10963094.5	38787366.4	51055347.1	59717923.7	63138131.0	77975805.2	82972415.2	80424185.9
Research institutes (centres)	528449.7	1596818.1	3429235.6	2935458.1	3571846.1	3022702.5	3616147.7	3382500.2	2306867.9
Design organisations, design-and-engineering organisations	157818.5	519987.1	984428.5	809586.0	1344028.6	1090711.3	1092686.4	1114835.9	1817239.9
Pilot plants	78.5	–	26584.0	12042.6	14652.7	…*	…*	…*	…*
Others	25598.4	258087.4	486392.8	322460.1	685781.0	596309.4	515769.8	253618.1	1379716.3

* 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

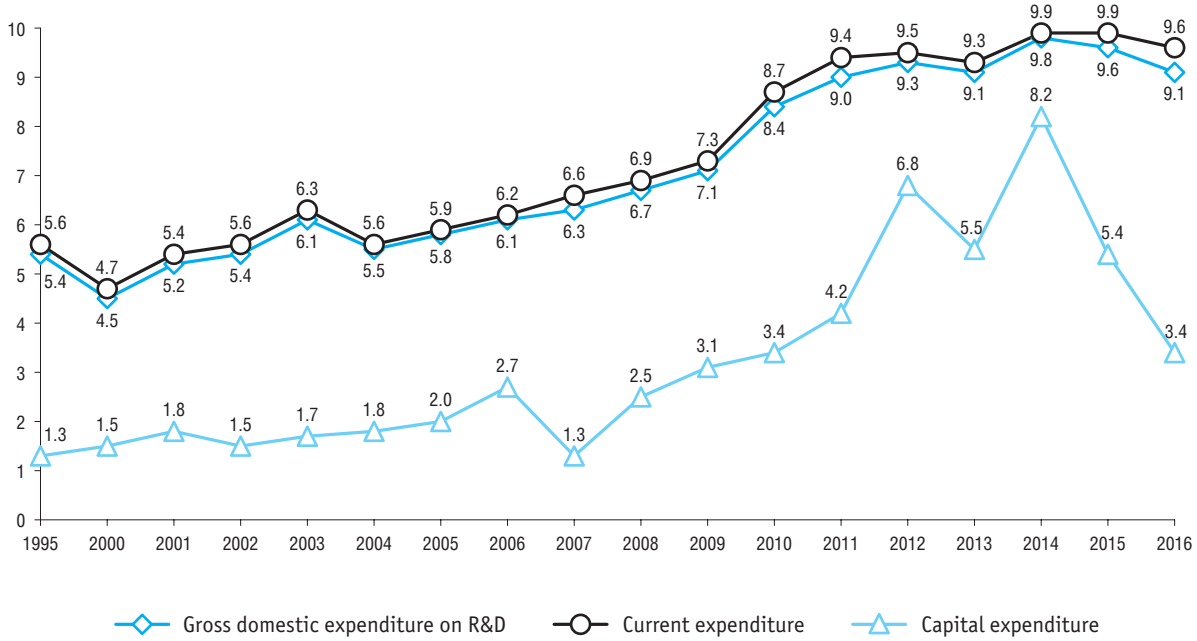
	Total	Government funds*	Business enterprise sector funds	Higher education sector funds	Private non-profit sector funds	Funds from abroad
	At current prices, *thousand roubles, 1995 – million roubles*					
1995	657374.0	440429.9	181015.3	27407.6	1279.1	7242.1
2000	3489342.2	2220574.3	951898.2	178004.2	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

(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

* 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 OF EXPENDITURE

(thousand roubles)

	2005	2010	2012	2013	2014	2015	2016
Gross domestic expenditure on R&D	**13337987.1**	**43714007.3**	**65334232.1**	**67858855.1**	**83205260.1**	**87730781.4**	**85932983.0**
Current expenditure	13144292.5	42552245.4	62268471.4	65103832.7	78939146.3	84495233.0	83579171.0
Salaries	6952057.5	25267352.4	35432527.8	37483889.6	45381722.2	48945642.1	48193431.8
Of which for R&D personnel*	3552276.8	14033490.5	19671272.1	21683297.6	25919161.2	27878480.3	27441222.3
Social security payments	1654258.7	5260709.4	8475705.7	8920077.8	10651630.2	12471272.2	12307550.0
Equipment	917350.6	2639343.7	3336796.8	3288338.4	4767932.9	3708006.7	4202312.8
Other material costs	1501392.4	3344896.4	5072129.7	5585226.3	6487280.5	6193042.0	6139669.1
Other current expenditure	2119233.3	6039943.5	9951311.4	9826300.6	11650580.5	13177270.0	12736207.3
Capital expenditure	193694.6	1161761.9	3065760.7	2755022.4	4266113.8	3235548.4	2353812.0
Land and buildings	39711.4	14186.1	106798.5	233349.2	645364.7	141573.3	164362.3
Equipment	104359.6	1068873.2	2688993.0	2133749.9	2561153.5	2375951.4	1884027.0
Other capital expenditure	49623.6	78702.6	269969.2	387923.3	1059595.6	718023.7	305422.7

* Excluding external multiple jobholders and independent contractors.

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

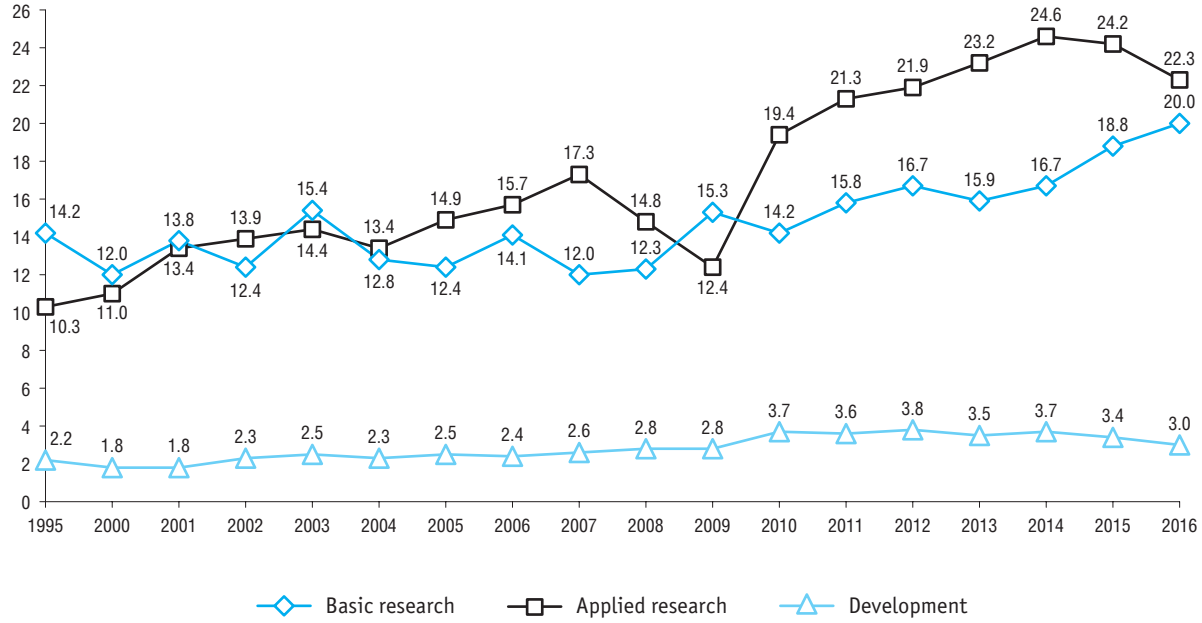
(thousand roubles)

	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
			2014				
Current expenditure on R&D	**78939146.3**	**22847258.1**	**34368948.3**	**4319356.6**	**1519234.5**	**12390936.4**	**3493412.4**
Basic research	21840738.8	11783175.6	3215755.1	1160052.0	158747.2	3908850.7	1614158.2
Applied research	38214808.7	8240598.6	17468661.1	2682946.2	1133884.9	7048722.5	1639995.4
Development	18883598.8	2823483.9	13684532.1	476358.4	226602.4	1433363.2	239258.8

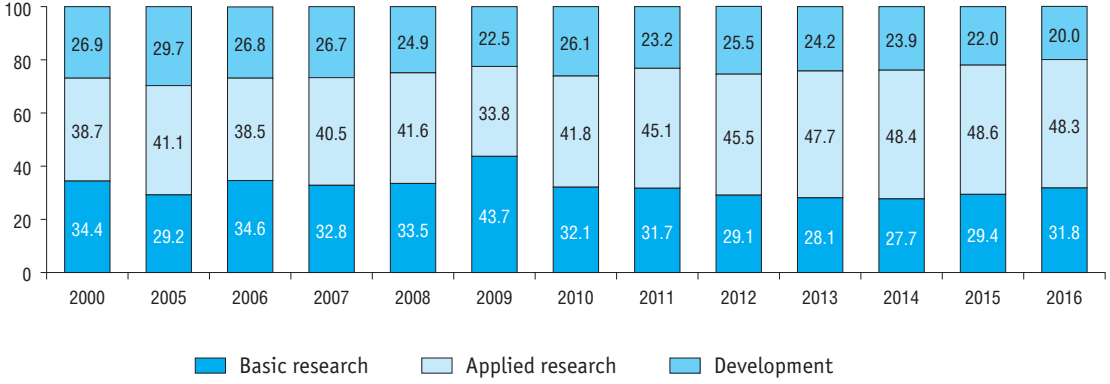
(continued)

	Total	Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities
				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
				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

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

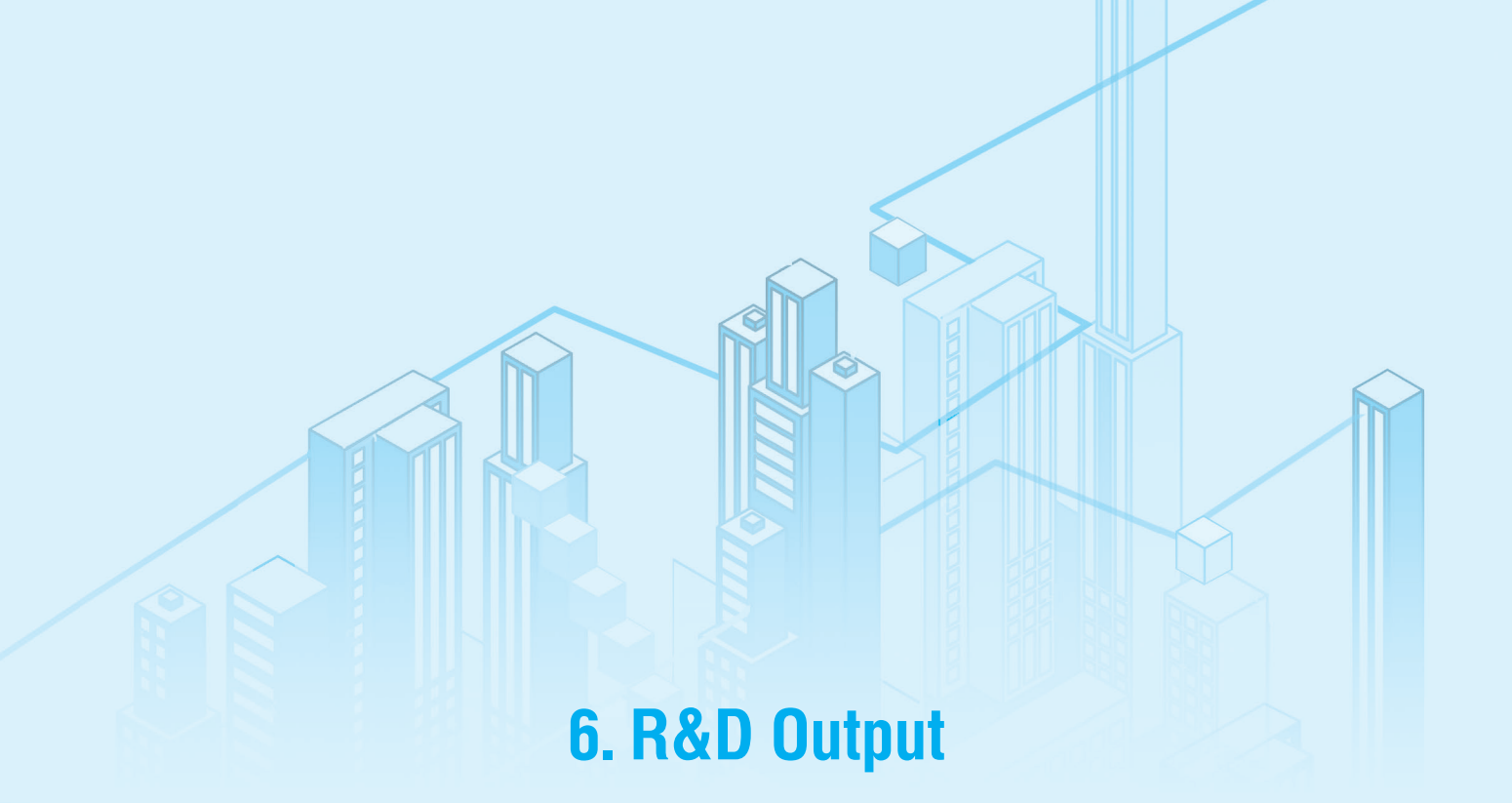


5.4.23. PERCENTAGE DISTRIBUTION OF CURRENT EXPENDITURE ON R&D IN THE HIGHER EDUCATION SECTOR BY TYPE OF R&D ACTIVITY



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

	2000	2005	2008	2009	2010	2011	2012	2013	2014	2015	2016
Average monthly salary, *roubles*	**1400.3**	**7042.0**	**16812.7**	**21191.5**	**23716.4**	**24963.9**	**30915.1**	**34101.0**	**41258.6**	**41850.5**	**43370.8**
As a percentage of the salary:											
in the national economy (=100%)	63.0	82.3	97.2	113.7	113.2	106.8	116.1	114.5	127.0	123.0	118.0
in manufacturing (=100%)	59.2	83.6	104.8	127.8	124.3	114.6	126.1	126.1	139.8	131.2	124.8
in construction (=100%)	53.0	77.9	90.5	116.9	112.0	105.4	119.1	123.1	140.6	139.7	134.7



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	2011	2012	2013	2014	2015	2016
Total number of publications										
Publications – total	**1047689**	**1294723**	**1893385**	**2454682**	**2609538**	**2733567**	**2832342**	**2896678**	**2844748**	**2859232**
Articles	825008	986942	1091914	1516752	1625091	1694034	1838298	1918809	1931671	1911430
Conference papers	103037	137160	377167	491047	519992	510743	482666	484154	407314	416868
Reviews	41545	77873	195725	132066	140306	157915	135494	142189	142689	158838
Other	78099	92748	228579	314817	324149	370875	375884	351526	363074	372096
Number of publications by Russian authors										
Publications – total	**18626**	**33068**	**39413**	**40507**	**43736**	**44733**	**48993**	**57311**	**66192**	**77188**
Articles	16910	29515	29091	31941	34381	33358	38546	43564	50491	54639
Conference papers	1338	2716	8329	6560	6706	7827	7301	10765	12134	17239
Reviews	164	665	1439	934	1257	1509	1321	1480	1884	2834
Other	214	172	554	1072	1392	2039	1825	1502	1683	2476
Russia's share in the world total number of publications										
Publications – total	**1.78**	**2.55**	**2.08**	**1.65**	**1.68**	**1.64**	**1.73**	**1.98**	**2.33**	**2.70**
Articles	2.05	2.99	2.66	2.11	2.12	1.97	2.10	2.27	2.61	2.86
Conference papers	1.30	1.98	2.21	1.34	1.29	1.53	1.51	2.22	2.98	4.14
Reviews	0.39	0.85	0.74	0.71	0.90	0.96	0.97	1.04	1.32	1.78
Other	0.27	0.19	0.24	0.34	0.43	0.55	0.49	0.43	0.46	0.67

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

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Total number of publications										
Publications – total	**1212137**	**1347993**	**1654501**	**2154588**	**2261306**	**2363938**	**2447690**	**2531043**	**2740435**	**2830325**
Articles	668014	797624	957874	1285276	1374547	1415764	1485808	1530444	1700203	1773345
Conference papers	203305	239469	306417	320651	311034	340094	337452	360360	383376	395410
Reviews	22442	33539	46160	63879	67162	75250	77823	80079	93082	106363
Other	391180	374909	467795	534761	545549	560900	572156	582092	595472	591099
Number of publications by Russian authors										
Publications – total	**30886**	**32685**	**30714**	**34571**	**35648**	**35720**	**37907**	**43473**	**54571**	**67020**
Articles	25330	27016	24537	27900	29151	28317	29540	30761	38778	45472
Conference papers	5485	7280	6441	4431	3999	4478	4495	8714	11816	17307
Reviews	544	641	682	773	729	803	856	874	1140	1363
Other	2422	1362	2137	2786	2883	2909	3738	3727	3980	4117
Russia's share in the world total number of publications										
Publications – total	**2.55**	**2.42**	**1.86**	**1.60**	**1.58**	**1.51**	**1.55**	**1.72**	**1.99**	**2.37**
Articles	3.79	3.39	2.56	2.17	2.12	2.00	1.99	2.01	2.28	2.56
Conference papers	2.70	3.04	2.10	1.38	1.29	1.32	1.33	2.42	3.08	4.38
Reviews	2.42	1.91	1.48	1.21	1.09	1.07	1.10	1.09	1.22	1.28
Other	0.62	0.36	0.46	0.52	0.53	0.52	0.65	0.64	0.67	0.70

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

	1996	2000	2005	2010	2011	2012	2013	2014	2015	2016
Russia										
Natural sciences and exact sciences	86.2	87.3	82.6	89.1	88.7	86.0	82.8	81.8	79.5	78.4
Engineering and technology	39.2	35.6	36.1	33.5	33.6	32.6	32.1	34.4	34.8	35.5
Medical sciences	9.5	13.0	8.4	10.1	10.4	12.4	12.6	13.3	13.3	14.1
Agricultural sciences	3.4	3.4	2.6	3.3	3.7	3.5	3.5	3.8	3.8	3.2
Social sciences	1.1	1.7	1.9	2.7	3.5	5.2	4.6	5.9	8.9	10.0
Humanities	0.3	0.3	0.4	0.6	0.8	1.1	1.1	2.7	4.4	2.8
World										
Natural sciences and exact sciences	55.9	56.5	54.0	59.5	58.8	58.5	58.0	58.7	60.0	61.2
Engineering and technology	25.6	27.0	31.0	29.2	29.9	29.6	29.7	30.8	30.0	29.9
Medical sciences	36.7	35.9	30.9	33.4	32.9	33.2	33.7	35.1	35.7	33.2
Agricultural sciences	6.5	6.0	5.5	6.0	6.3	6.6	6.8	6.7	6.8	6.7
Social sciences	8.7	9.3	9.2	11.5	11.4	11.0	11.0	11.1	11.7	12.1
Humanities	2.1	2.1	2.9	3.2	3.6	4.0	4.1	4.1	4.0	3.9

* 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 data from the analytical system Scopus SciVal.

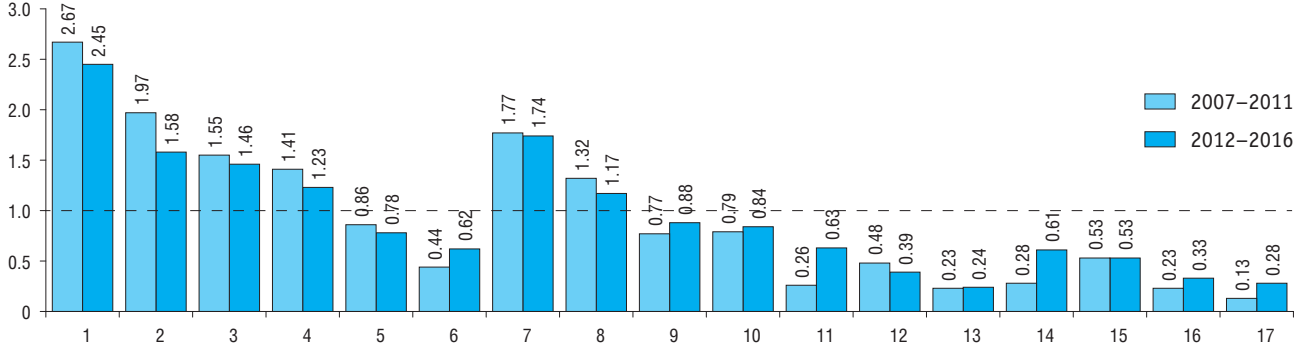
6.4. PERCENTAGE DISTRIBUTION OF PUBLICATIONS IN SCIENTIFIC JOURNALS INDEXED IN WEB OF SCIENCE BY FIELD OF SCIENCE AND TECHNOLOGY*

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Russia										
Natural sciences and exact sciences	79.2	80.1	80.6	78.4	78.0	76.0	76.0	73.0	71.4	67.9
Engineering and technology	26.0	27.6	27.4	24.1	24.4	26.0	26.4	32.3	33.0	35.2
Medical sciences	6.5	6.5	7.3	7.8	8.1	8.5	8.6	7.0	6.9	6.6
Agricultural sciences	0.9	1.1	1.0	1.0	0.9	1.0	0.9	1.0	0.9	1.1
Social sciences	2.7	2.5	2.6	2.8	2.9	3.8	3.6	4.3	5.9	6.8
Humanities	0.9	0.6	0.8	1.5	1.3	1.7	1.6	2.0	2.6	2.3
World										
Natural sciences and exact sciences	51.8	52.2	53.5	49.4	48.9	48.1	48.5	49.0	49.9	50.0
Engineering and technology	26.1	26.2	27.8	28.8	29.0	30.9	31.2	31.6	31.8	32.1
Medical sciences	28.3	29.0	27.0	27.1	26.6	26.1	26.0	25.4	25.4	25.4
Agricultural sciences	4.8	4.6	4.3	4.5	4.5	4.3	4.2	4.0	4.0	3.9
Social sciences	9.6	8.9	9.2	12.4	12.9	12.0	12.1	12.1	12.1	11.5
Humanities	5.1	4.8	4.6	5.0	5.2	5.3	5.3	5.2	5.0	4.2

* 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 and exact 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

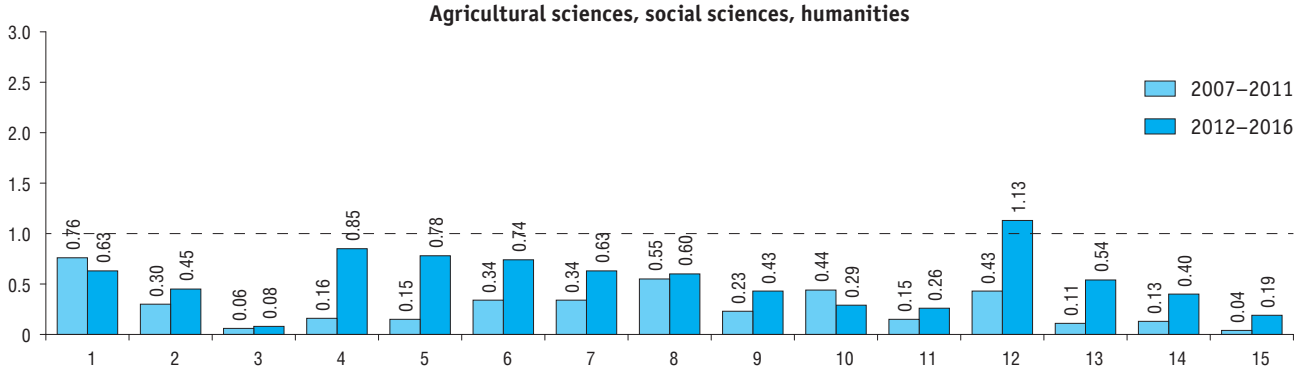
Engineering and technology

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 – Civil engineering

Medical sciences

14 – Medical biotechnology
15 – Basic medicine
16 – Clinical medicine
17 – Health sciences

(continued)



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

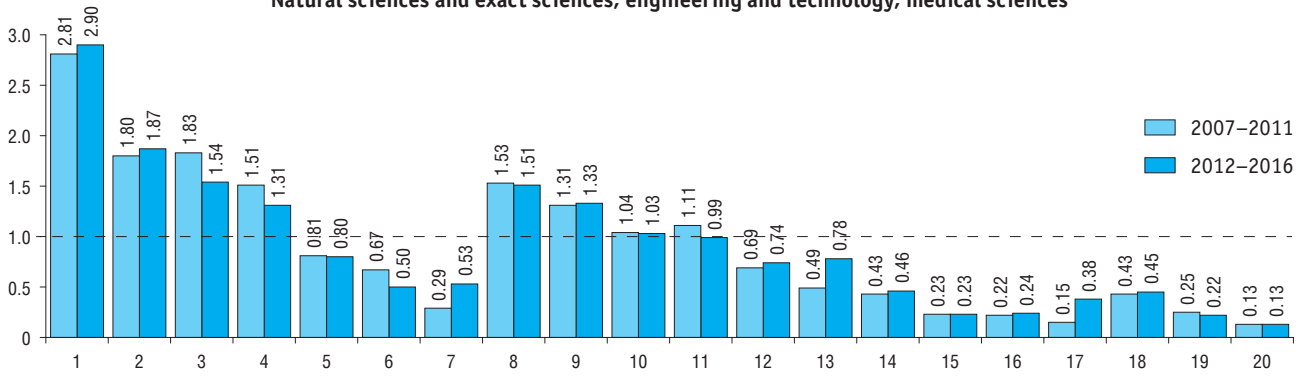
Social sciences
4 – Economics and business
5 – Educational sciences
6 – Political science
7 – Sociology
8 – Social and economic geography
9 – Law
10 – Media and communications
11 – Psychology

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 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

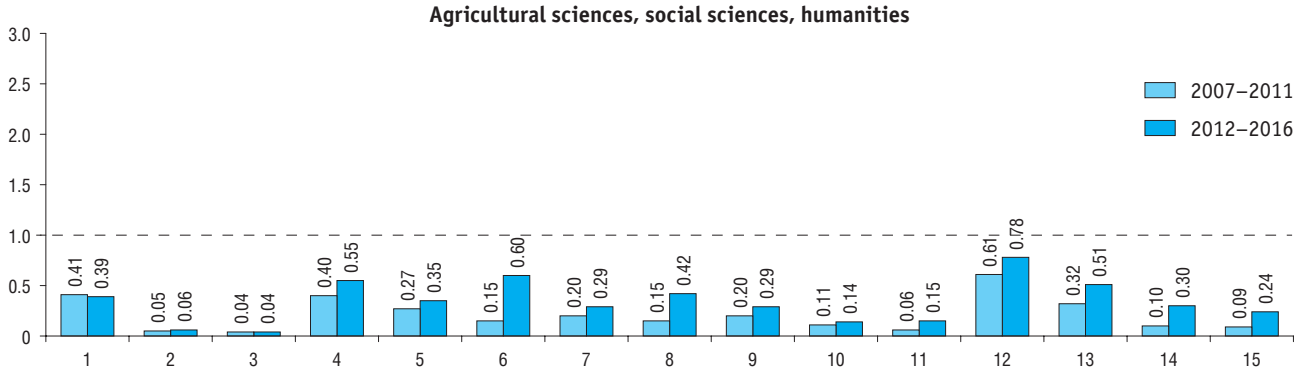


Natural sciences and exact sciences
1 – Physical sciences
2 – Mathematics
3 – Chemical sciences
4 – Earth and related environmental sciences
5 – Biological sciences
6 – Interdisciplinary research
7 – Computer and information sciences

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 technologies
14 – Environmental biotechnology
15 – Industrial biotechnology
16 – Medical technologies
17 – Construction and architecture

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

(continued)



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

Social sciences
4 – Sociology
5 – Social and economic geography
6 – Educational sciences
7 – Political science
8 – Economics and business
9 – Psychology
10 – Media and communications
11 – Law

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 Thomson Reuters.

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

	1996	2000	2005	2010	2011	2012	2013	2014	2015	2016
Average normalised citation of publications by Russian authors*	0.47	0.48	0.51	0.54	0.57	0.67	0.66	0.76	0.76	0.76
Number of citations of publications by Russian authors as a percentage in the world citation total	1.11	1.07	1.07	0.97	1.01	1.18	1.19	1.43	1.64	1.88
Number of publications by Russian authors as a percentage of the total number of highly cited publications**	0.72	0.64	0.67	0.69	0.83	0.87	1.06	1.25	1.21	1.73
Number of publications by Russian authors in the world total number of publications in Q1 journals***	1.76	1.65	1.36	1.02	0.99	1.03	1.05	1.11	1.13	1.21

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

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

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

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Average normalised citation of publications by Russian authors*	0.37	0.43	0.52	0.54	0.56	0.67	0.71	0.84	0.88	0.92
Number of citations of publications by Russian authors as a percentage in the world citation total	1.16	1.21	1.20	1.08	1.11	1.28	1.25	1.51	1.61	1.84
Number of publications by Russian authors as a percentage of the total number of highly cited publications**	–	–	–	0.87	0.90	1.07	1.18	1.40	1.31	1.76
Number of publications by Russian authors in the world total number of publications in Q1 journals***	–	1.47	1.38	0.99	1.02	1.06	1.04	1.13	1.25	1.26

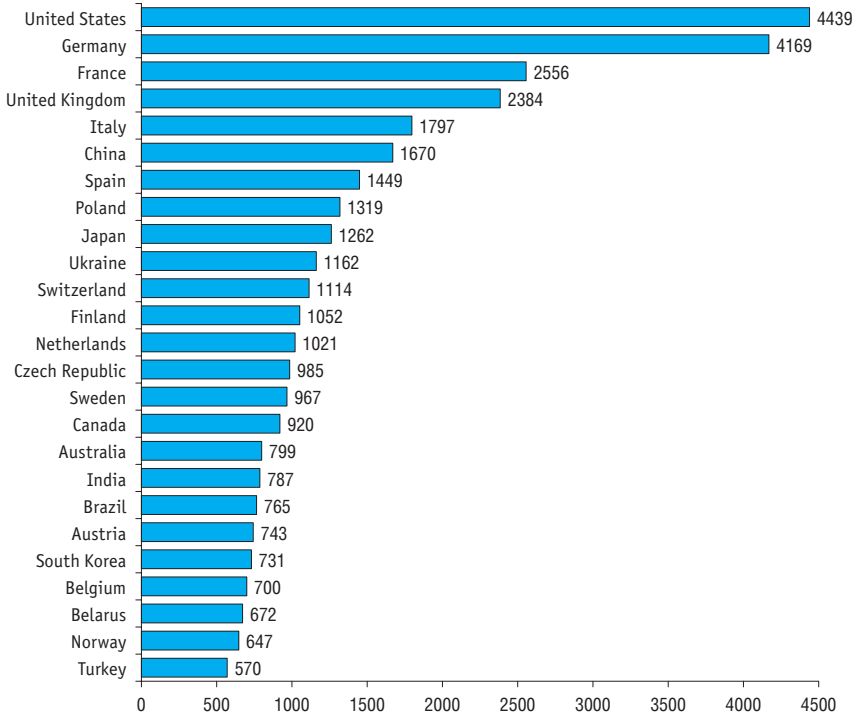
* Average citation of publications normalised by subject area relative to the world average.

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

*** Q1 (first quartile) journals have a highest impact factor in the top 25% of journals for one of its classified subdisciplines.

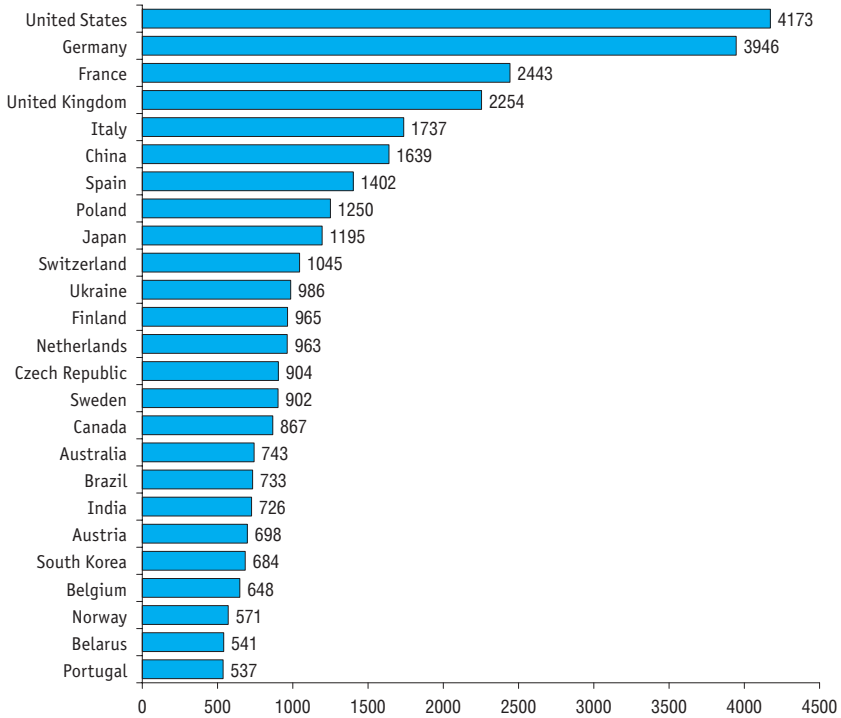
6.9. NUMBER OF PUBLICATIONS BY RUSSIAN AUTHORS WITH INTERNATIONAL COLLABORATION IN SCIENTIFIC JOURNALS INDEXED IN SCOPUS BY PARTNER COUNTRY: 2016

Total of publications by Russian authors with international collaboration: 17,917



6.10. NUMBER OF PUBLICATIONS BY RUSSIAN AUTHORS WITH INTERNATIONAL COLLABORATION IN SCIENTIFIC JOURNALS INDEXED IN WEB OF SCIENCE BY PARTNER COUNTRIES: 2016

Total number of publications by Russian authors with international collaboration: 16,128



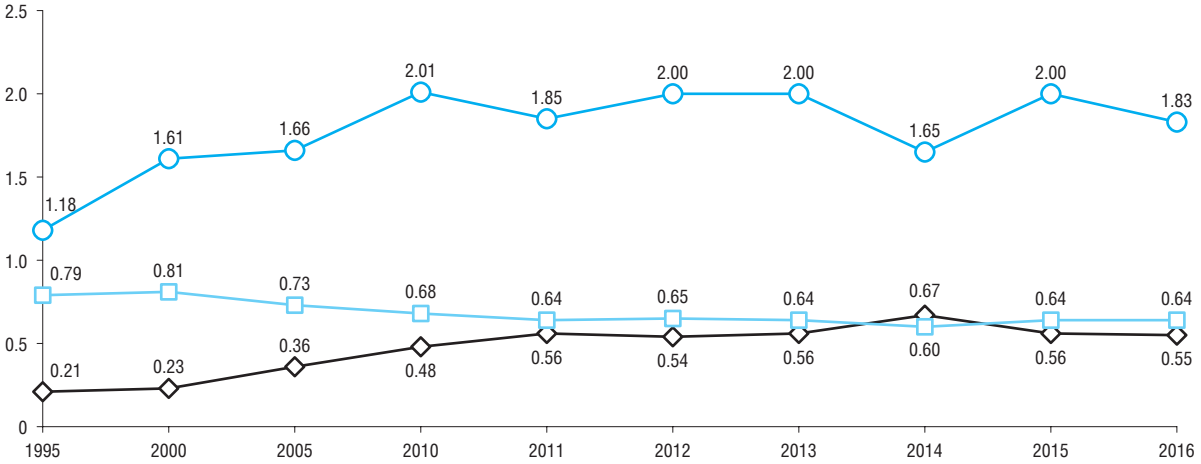
Patent activity

6.11. PATENT APPLICATIONS AND PATENT GRANTS

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Patent applications filed in the Russian Federation	22202	28688	32254	42500	41414	44211	44914	40308	45517	41587
By Russian residents	17551	23377	23644	28722	26495	28701	28765	24072	29269	26795
By non-residents	4651	5311	8610	13778	14919	15510	16149	16236	16248	14792
Patent grants received in the Russian Federation	31556*	17592	23390	30322	29999	32880	31638	33950	34706	33536
By Russian residents	20861	14444	19447	21627	20339	22481	21378	23065	22560	21020
By non-residents	4772	3148	3943	8695	9660	10399	10260	10885	12146	12516
Patents in force in the Russian Federation	76186	144325	123089	181904	168558	181515	194248	208320	218974	230870

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

6.12. 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

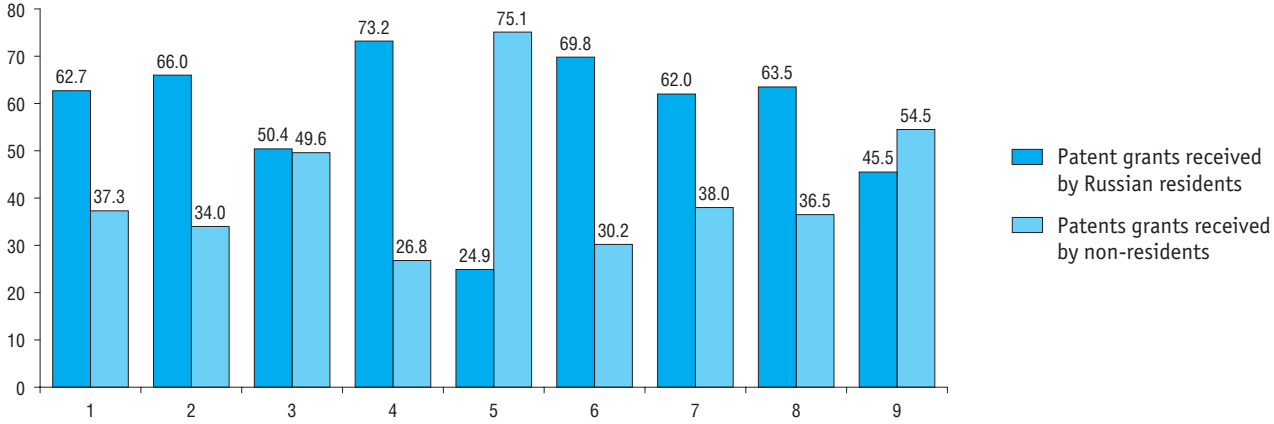
Country technological dependency ratio – number of patent applications filed in the Russian Federation by non-residents to the number of patent applications filed in the Russian Federation by Russian residents

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

	1995	2000	2010	2011	2012	2013	2014	2015	2016
Total	**25633**	**17592**	**30322**	**29999**	**32880**	**31638**	**33950**	**34706**	**33536**
A. Human necessities	4207	4347	8468	8907	9506	8042	9890	8283	7344
B. Performing operations; transporting	6129	2905	4711	4412	4969	4965	5331	5618	4689
C. Chemistry; metallurgy	4529	3332	5167	5512	5524	5779	5154	5910	7894
D. Textiles; paper	437	197	320	301	274	271	305	266	253
E. Fixed constructions; mining	2042	1156	1977	1603	1898	1807	2033	2068	1925
F. Mechanical engineering; lighting; heating; engines and pumps; weapons; blasting	3033	2144	3062	2761	3246	3453	3459	3824	3434
G. Physics	3083	2172	3734	3881	4381	4285	4484	5231	4785
H. Electricity	2173	1339	2883	2622	3082	3036	3294	3506	3212

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

6.14. PERCENTAGE DISTRIBUTION OF PATENT GRANTS RECEIVED IN THE RUSSIAN FEDERATION BY ASSIGNEE AND SECTION OF THE INTERNATIONAL PATENT CLASSIFICATION: 2016



1 – Total
2 – Human necessities
3 – Performing operations; transporting
4 – Chemistry; metallurgy
5 – Textiles; paper
6 – Fixed constructions; mining
7 – Mechanical engineering; lighting; heating; engines and pumps; weapons; blasting
8 – Physics
9 – Electricity

6.15. UTILITY MODEL APPLICATIONS AND GRANTS

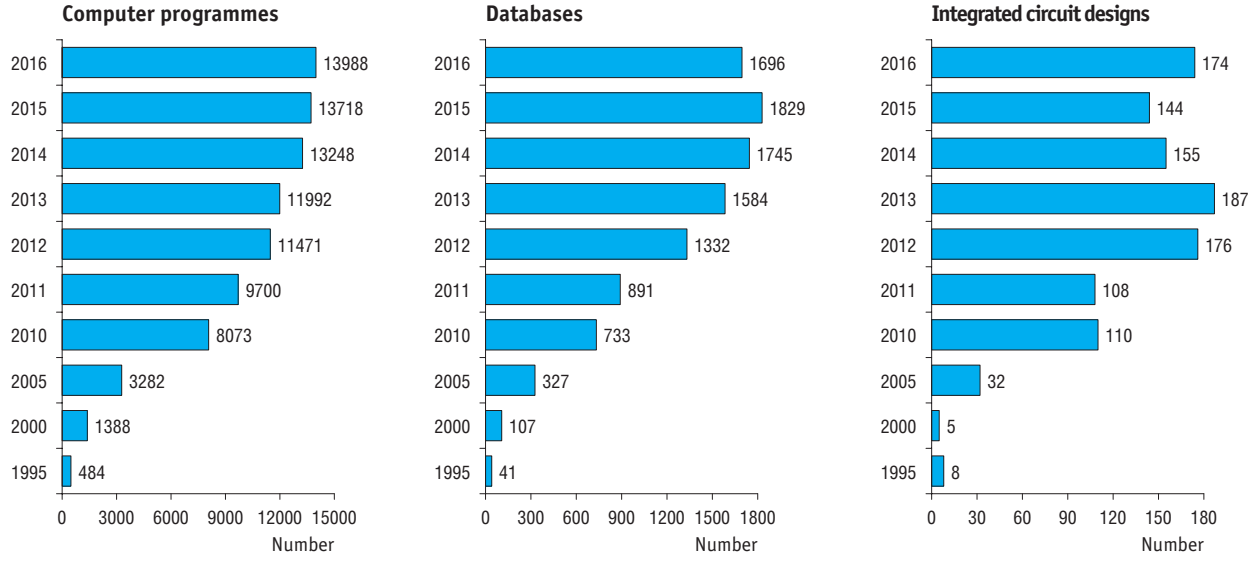
	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Utility model applications filed in the Russian Federation	2039	4631	9473	12262	13241	14069	14358	13952	11906	11112
By Russian residents	1997	4549	9082	11757	12584	13479	13589	13000	11403	10643
By non-residents	42	82	391	505	657	590	769	952	503	469
Utility model grants received in the Russian Federation	1207	4098	7242	10581	11079	11671	12653	13080	9008	8875
By Russian residents	1195	4041	6958	10187	10571	11152	12154	12267	8390	8474
By non-residents	12	57	284	394	508	519	499	813	618	401
Utility model in force in the Russian Federation	2971	15498	28364	54848	46876	50746	54420	58238	57448	53263

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

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Total	**1207**	**4098**	**7242**	**10581**	**11079**	**11671**	**12653**	**13080**	**9008**	**8875**
A. Human necessities	190	835	1344	1914	1833	1933	2091	2240	1579	1550
B. Performing operations; transporting	311	1004	1741	2411	2518	2678	2917	2935	2021	2034
C. Chemistry; metallurgy	30	145	289	398	340	370	398	383	269	194
D. Textiles; paper	37	73	73	57	68	55	52	45	42	36
E. Fixed constructions; mining	115	465	1022	1503	1459	1466	1611	1684	1192	1184
F. Mechanical engineering; lighting; heating; engines and pumps; weapons; blasting	235	679	1111	1701	1815	1957	2112	2459	1557	1487
G. Physics	150	490	949	1580	1842	1912	2017	2011	1376	1343
H. Electricity	139	407	713	1017	1204	1300	1455	1323	972	1047

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

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



6.18. DEVELOPMENT OF ADVANCED MANUFACTURING TECHNOLOGIES BY TYPE

	1997	2000	2005	2010	2011	2012	2013	2014	2015	2016
Advanced manufacturing technologies	**996**	**688**	**637**	**864**	**1138**	**1323**	**1429**	**1409**	**1398**	**1534**
Of which:										
design and engineering	223	165	138	216	316	305	426	445	359	402
manufacturing, processing, and assembling	390	281	291	383	405	548	517	506	548	509
automatic handling; materials and parts transportation	20	20	9	18	24	23	22	22	12	34
automatic inspecting or testing equipment	141	76	91	116	128	121	137	110	117	160
communications and management	131	90	57	70	154	204	206	202	232	285
manufacturing information systems	39	18	21	20	51	60	68	65	84	83
integrated management and control	52	38	30	41	60	62	53	59	46	61

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

	1997	2000	2005	2010	2011	2012	2013	2014	2015	2016
Technologies new to the country	**830**	**569**	**538**	**762**	**1028**	**1188**	**1276**	**1245**	**1223**	**1342**
Of which:										
design and engineering	195	136	125	191	272	269	367	390	323	352
manufacturing, processing, and assembling	315	231	239	336	371	491	469	450	471	449
automatic handling; materials and parts transportation	17	19	8	16	23	21	21	20	10	29
automatic inspecting or testing equipment	101	66	72	98	117	101	108	84	82	111
communications and management	118	74	52	67	147	194	195	187	218	264
manufacturing information systems	38	14	20	17	41	55	66	59	78	80
integrated management and control	46	29	22	37	57	57	50	55	41	57
Radically new technologies	**90**	**72**	**60**	**102**	**110**	**135**	**153**	**164**	**175**	**192**
Of which:										
design and engineering	18	12	12	25	44	36	59	55	36	50
manufacturing, processing, and assembling	41	32	30	47	34	57	48	56	77	60
automatic handling; materials and parts transportation	–	1	–	2	1	2	1	2	2	5
automatic inspecting or testing equipment	20	6	12	18	11	20	29	26	35	49
communications and management	7	9	4	3	7	10	11	15	14	21
manufacturing information systems	–	4	1	3	10	5	2	6	6	3
integrated management and control	4	8	1	4	3	5	3	4	5	4

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

	Total		Of which technologies			
	2015	2016	new to the country		radically new	
			2015	2016	2015	2016
Advanced manufacturing technologies	**1398**	**1534**	**1223**	**1342**	**175**	**192**
Mining and quarrying	18	25	17	25	1	–
Manufacturing	442	523	416	491	26	32
Electricity, gas and water supply	28	37	28	37	–	–
Transportation, storage, and communication	7	19	7	19	–	–
Wholesale and retail trade; repair of motor vehicles, motorcycles and of personal and household goods	–	1	–	1	–	–
Real estate, renting, and business activities	604	619	498	512	106	107
Of which:						
research and development	529	502	429	400	100	102
other services	31	38	29	36	2	2
Education	296	310	254	257	42	53
Of which higher education	296	310	254	257	42	53
Other community, social and personal service activities	3	–	3	–	–	–

6.21. USE OF ADVANCED MANUFACTURING TECHNOLOGIES BY TYPE

	1997	2000	2005	2010	2011	2012	2013	2014	2015	2016
Advanced manufacturing technologies	**55452**	**70069**	**140983**	**203330**	**191650**	**191372**	**193830**	**204546**	**218018**	**232388**
Of which:										
design and engineering	7109	14385	43273	56130	41422	39664	38735	38598	39831	40658
manufacturing, processing, and assembling	36538	35408	42976	55438	53563	55579	55424	58111	63379	67726
automatic handling; materials and parts transportation	707	685	970	1853	1649	1570	1823	1983	2129	2316
automatic inspecting or testing equipment	2644	2409	4525	9106	9395	9519	11314	12263	12876	13523
communication and management	6650	13713	44135	72798	77662	76479	78028	84730	89967	96846
manufacturing information systems	790	1823	3177	4848	4853	5171	5293	5555	6300	7275
integrated management and control	1014	1646	1927	3157	3106	3390	3213	3306	3536	4044

6.22. USE OF ADVANCED MANUFACTURING TECHNOLOGIES BY TYPE AND DURATION

	Total		Of which technology used during the period of							
			less than 1 year		1–3 years		4–5 years		6 years and more	
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
Advanced manufacturing technologies	**218018**	**232388**	**16844**	**15671**	**48293**	**49445**	**39250**	**39109**	**113631**	**128163**
Of which:										
design and engineering	39831	40658	3498	3418	9437	9033	8432	7161	18464	21046
manufacturing, processing, and assembling	63379	67726	5323	5060	13340	13927	8284	9250	36432	39489
automatic handling, materials and parts transportation	2129	2316	157	198	569	571	313	387	1090	1160
automatic inspecting or testing equipment	12876	13523	1109	1099	3880	3854	2488	2683	5399	5887
communication and management	89967	96846	6067	4898	18921	19699	18182	17903	46797	54346
manufacturing information systems	6300	7275	460	626	1474	1606	1026	1220	3340	3823
integrated management and control	3536	4044	230	372	672	755	525	505	2109	2412

6.23. 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		1–3 years		4–5 years		6 years and more	
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
Advanced manufacturing technologies	**218018**	**232388**	**16844**	**15671**	**48293**	**49445**	**39250**	**39109**	**113631**	**128163**
Mining and quarrying	9222	9989	382	462	2459	2278	2667	2808	3714	4441
Manufacturing	146700	152820	10815	10135	29324	30663	25412	23716	81149	88306
Electricity, gas and water supply	18443	21849	1762	1583	4807	5118	3552	3978	8322	11170
Wholesale and retail trade; repair of motor vehicles, motorcycles and of personal and household goods	357	677	7	4	104	89	64	445	182	139
Transportation, storage, and communication	5030	6083	257	439	2887	2964	1148	2049	2600	3463
Real estate, renting, and business activities	32632	35404	3101	2563	7374	6920	5497	5232	14798	17908
Of which research and development	22195	23431	2331	1744	5513	5531	3911	3834	10440	12322
Education	5492	5414	513	478	1311	1413	881	881	2787	2642
Of which higher education	5492	5414	513	478	1311	1413	881	881	2787	2642
Community, social and personal services	142	152	7	7	27	26	29	25	79	94

6.24. USE OF ADVANCED MANUFACTURING TECHNOLOGIES BY TYPE AND SOURCE OF ACQUISITION: 2016

	Total	Of which technology		
		developed in the reporting entity	acquired	
			in Russia	abroad
Advanced manufacturing technologies	**232388**	**36815**	**127089**	**68484**
Of which:				
design and engineering	40658	9450	23923	7285
manufacturing, processing, and assembling	67726	16627	25465	25634
automatic handling, materials and parts transportation	2316	260	982	1074
automatic inspecting or testing equipment	13523	1778	7735	4010
communication and management	96846	6494	62340	28012
manufacturing information systems	7275	1688	4155	1432
integrated management and control	4044	518	2489	1037

6.25. USE OF ADVANCED MANUFACTURING TECHNOLOGIES BY TYPE OF ECONOMIC ACTIVITY AND SOURCE OF ACQUISITION: 2016

	Total	Of which technology		
		developed in the reporting entity	acquired	
			in Russia	abroad
Advanced manufacturing technologies	**232388**	**36815**	**127089**	**68484**
Mining and quarrying	9989	522	7309	2158
Manufacturing	152820	24838	76066	51916
Electricity, gas and water supply	21849	1270	17401	3178
Wholesale and retail trade; repair of motor vehicles, motorcycles and of personal and household goods	677	16	615	46
Transportation, storage, and communication	6083	279	3366	2438
Real estate, renting, and business activities	35404	8362	19316	7726
Of which research and development	23431	7066	11108	5257
Education	5414	1521	2879	1014
Of which higher education	5414	1521	2879	1014
Community, social and personal services	152	7	137	8

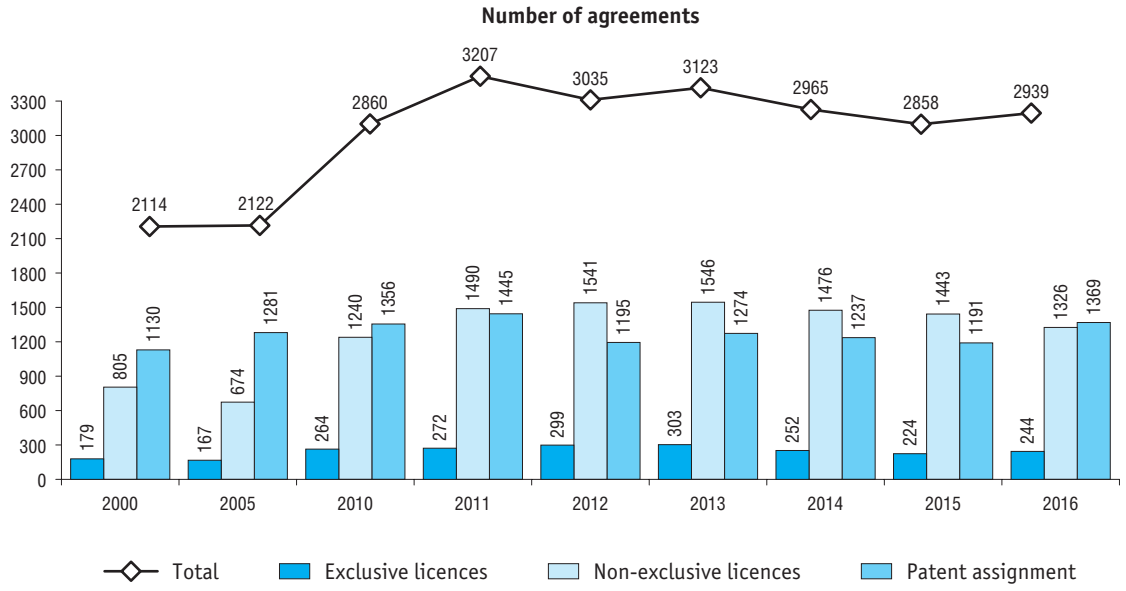
6.26. USE OF ADVANCED MANUFACTURING TECHNOLOGIES DEVELOPED ON THE BASIS OF INVENTION PATENTS BY TYPE*

	1997	2000	2005	2010	2011*	2012	2013	2014	2015	2016
Advanced manufacturing technologies	**3247**	**2804**	**3072**	**1012**	**6566**	**6032**	**9099**	**9519**	**9249**	**9617**
Of which:										
design and engineering	829	1115	1055	274	1574	1582	2193	2129	1819	1837
manufacturing, processing, and assembling	1756	1231	1411	337	2523	2236	2670	3203	3274	3194
automatic handling; materials and parts transportation	26	45	16	18	76	69	218	131	121	132
automatic inspecting or testing equipment	328	171	262	116	661	739	726	715	704	769
communication and management	197	182	258	209	1418	1138	2844	2870	2775	3023
manufacturing information systems	29	9	44	31	193	172	321	316	395	500
integrated management and control	82	51	26	27	121	96	127	155	161	162

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

Commercialisation of technology in domestic market

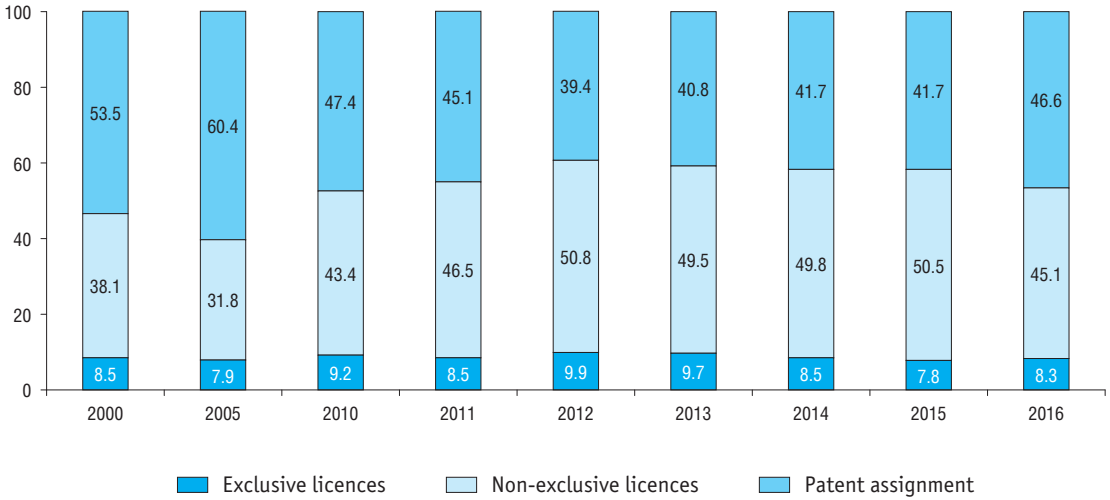
6.27. REGISTRATION OF INTERNAL LICENCE TRADE AGREEMENTS AND PATENT ASSIGNMENT CONTRACTS*



* Including patents for inventions, utility models, and industrial designs. Before 2008 – patent cession agreements.

(continued)

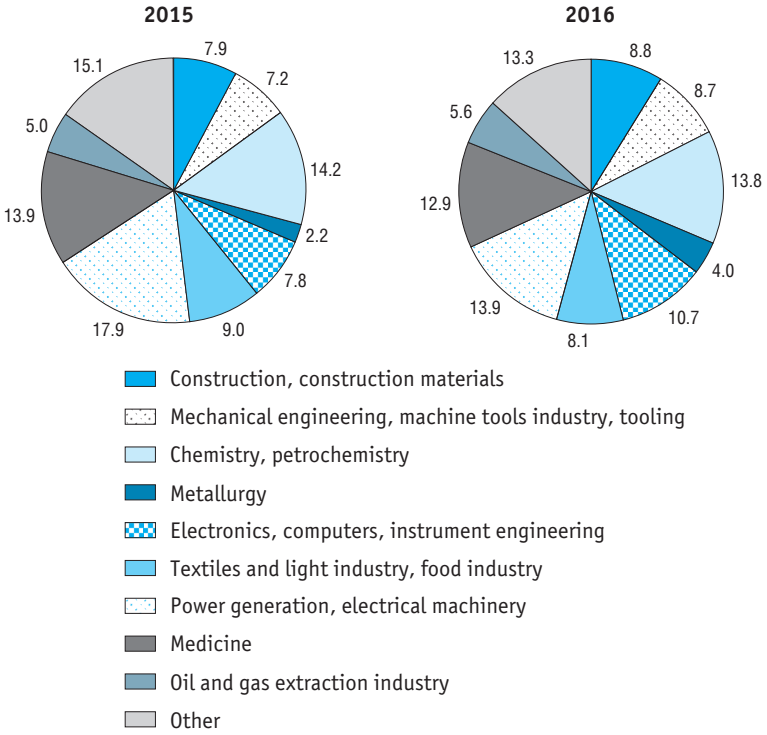
Percentage distribution of agreements by type



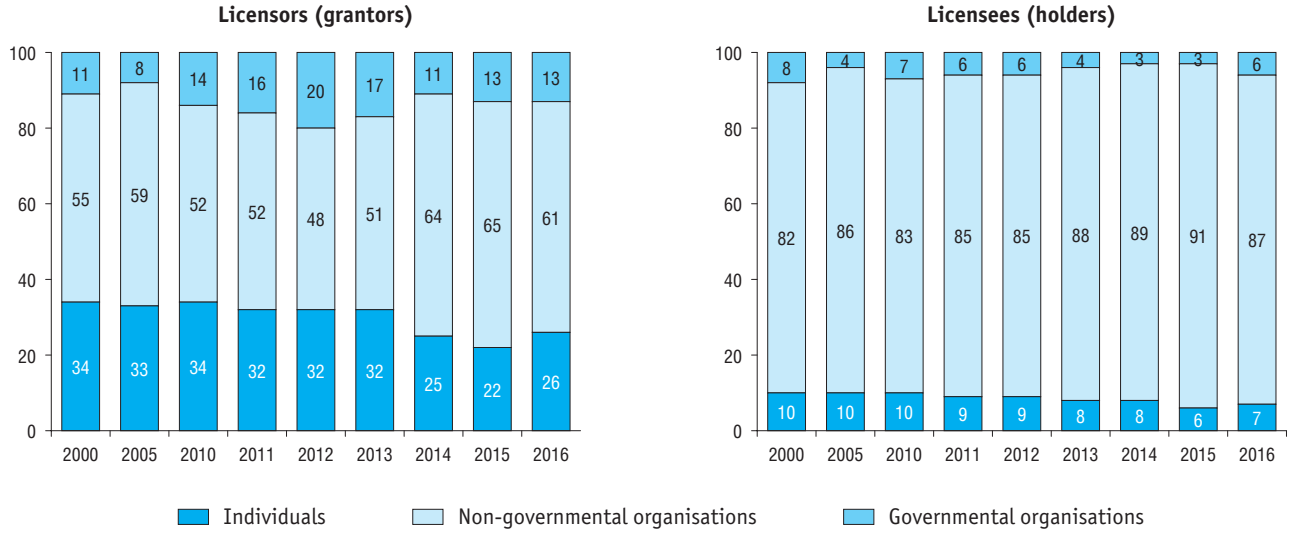
6.28. REGISTRATION OF INTERNAL LICENCE TRADE AGREEMENTS AND PATENT ASSIGNMENT AGREEMENTS BY TECHNOLOGY FIELD

	2000	2005	2010	2011	2012	2013	2014	2015	2016
Total	**2114**	**2122**	**2860**	**3207**	**3035**	**3123**	**2965**	**2858**	**2939**
I. Construction, construction materials	89	108	135	207	246	252	245	226	259
II. Mechanical engineering, machine tools industry, tooling	345	417	118	285	264	248	211	205	257
III. Chemistry, petrochemistry	203	268	286	454	438	382	407	406	406
IV. Metallurgy	85	69	86	113	103	108	100	62	118
V. Electronics, computers, instrument engineering	78	165	311	257	260	216	209	222	315
VI. Textiles and light industry, food industry	323	105	163	194	215	276	200	257	239
VII. Power generation, electrical machinery	150	223	421	567	499	490	470	511	409
VIII. Medicine	264	249	294	414	388	473	439	396	379
IX. Oil and gas extraction industry	224	136	162	158	152	168	135	142	166
X. Other	353	382	884	558	470	510	549	431	391

6.29. PERCENTAGE DISTRIBUTION OF INTERNAL LICENCE TRADE AGREEMENTS AND PATENT ASSIGNMENT AGREEMENTS BY TECHNOLOGY FIELD



6.30. PERCENTAGE DISTRIBUTION OF INTERNAL LICENCE TRADE AGREEMENTS AND PATENT ASSIGNMENT AGREEMENTS BY CATEGORY OF ECONOMIC ENTITY



6.31. TECHNOLOGY BALANCE OF PAYMENTS BY CATEGORY OF CONTRACTS

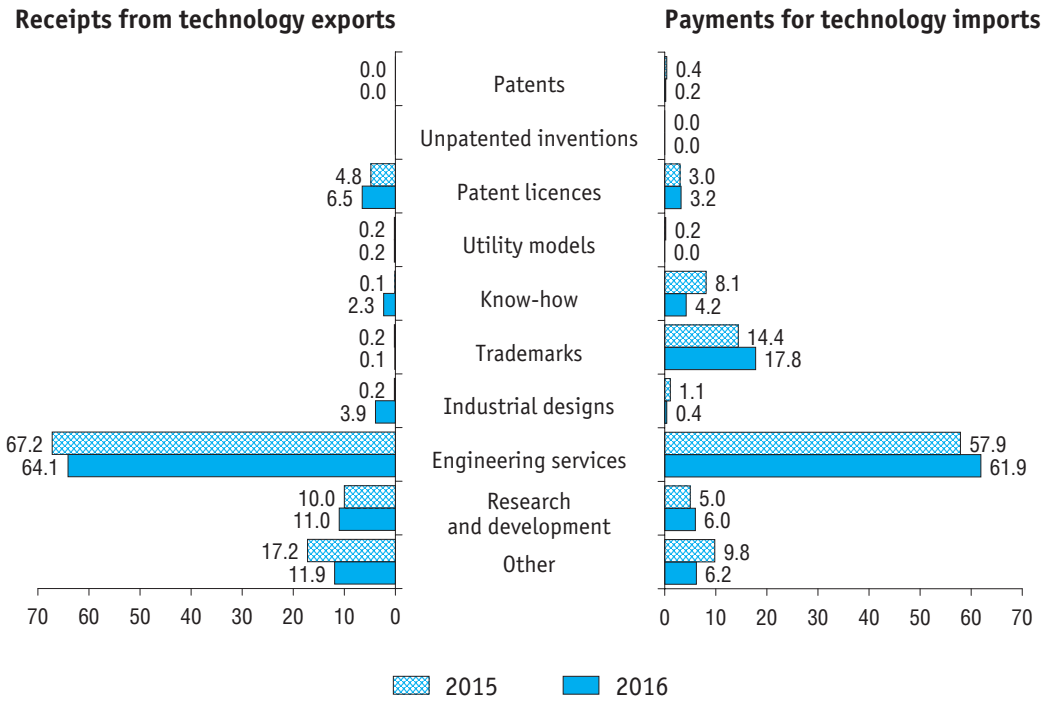
(thousand USD)

	Total	Patents	Unpatented inventions	Patent licences	Utility models	Know-how	Trademarks	Industrial designs	Engineering services	Research and development	Other
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
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

(continued)

	Total	Patents	Unpatented inventions	Patent licences	Utility models	Know-how	Trademarks	Industrial designs	Engineering services	Research and development	Other
2008	2087067.4	10716.8	16.5	63042.7	690.3	43270.8	408349.1	0.0	1156815.3	31030.0	373135.9
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
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

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



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

	Number of contracts			Net value of the contract's subject matter, *thousand USD*		
	2010	2015	2016	2010	2015	2016
Export						
Total	**1867**	**2236**	**2182**	**3474995.7**	**5234103.9**	**6320854.5**
Patents	7	3	6	295.6	7.7	4.8
Unpatented inventions	8	–	–	2753.0	–	–
Patent licences	42	98	96	17160.7	152100.0	128310.3
Utility models	10	6	9	1737.6	4295.6	2121.1
Know-how	33	27	30	35781.9	9667.4	33571.8
Trademarks	19	25	16	2209.2	9035.5	1685.7
Industrial designs	1	6	5	26667.0	55972.7	69530.3
Engineering services	682	781	771	2827690.4	3861387.8	5012835.2
Research and development	692	730	800	378940.6	716038.2	693878.6
Other	373	560	449	181759.7	425599.0	378916.7
Import						
Total	**1943**	**2989**	**3449**	**3028304.5**	**12103440.3**	**13011823.9**
Patents	5	19	27	15302.0	111477.3	108130.7
Unpatented inventions	–	1	2	–	3.4	83.0
Patent licences	70	126	171	179354.3	460896.4	491037.3
Utility models	13	12	8	12845.7	2791.7	4.4
Know-how	41	103	111	119611.1	309605.1	348240.5
Trademarks	108	167	211	490778.8	779708.4	943727.1
Industrial designs	1	20	38	16.4	25938.7	12577.6
Engineering services	1080	1532	1667	1744228.8	7472654.1	9635647.7
Research and development	89	296	337	45373.4	1337571.5	399053.1
Other	536	713	877	420794.0	1602793.7	1073322.5

6.34. TECHNOLOGY BALANCE OF PAYMENTS BY COUNTRY

(thousand USD)

	Receipts from technology exports			Payments for technology imports			Technology balance of payments		
	2014	2015	2016	2014	2015	2016	2014	2015	2016
Total	**1279213.1**	**1654732.1**	**1277023.5**	**2455830.7**	**2207406.8**	**2498677.8**	**-1176617.6**	**-552674.7**	**-1221654.3**
CIS countries	**198398.0**	**134126.3**	**154052.8**	**71229.1**	**36156.9**	**33756.3**	**127168.9**	**97969.4**	**120296.5**
Armenia	151.5	164.8	135.5	17.8	77.0	81.4	133.7	87.8	54.1
Azerbaijan	5263.8	1116.3	905.6	12.0	103.2	22.8	5251.8	1013.1	882.8
Belarus	87698.8	79447.4	71940.4	15805.9	8330.2	10482.4	71892.9	71117.2	61458.0
Kazakhstan	57558.1	27409.6	56320.8	7235.2	10882.4	15980.9	50322.9	16527.2	40339.9
Kyrgyzstan	1752.8	4824.5	5442.5	60.1	44.2	113.7	1692.7	4780.3	5328.8
Moldova	794.3	537.1	962.9	370.4	176.1	1.3	423.9	361.0	961.6
Tajikistan	6746.8	7360.3	5508.5	116.3	12.6	20.7	6630.5	7347.7	5487.8
Turkmenistan	3095.8	3043.9	3875.4	13.6	60.0	0.6	3082.2	2983.9	3874.8
Ukraine	30450.5	8067.7	6728.1	47473.4	15734.3	6968.6	-17022.9	-7666.6	-240.5
Uzbekistan	4885.6	2154.7	2233.1	124.4	736.9	83.9	4761.2	1417.8	2149.2
OECD countries	**909039.3**	**620932.5**	**511153.9**	**2299270.5**	**1863723.5**	**2317212.9**	**-1390231.2**	**-1242791.0**	**-1806059.0**
Australia	168.6	64.2	2485.9	661.8	3614.8	852.7	-493.2	-3550.6	1633.2
Austria	3748.6	21974.7	4475.2	53621.8	84060.9	132396.2	-49873.2	-62086.2	-127921.0
Belgium	5012.3	8346.1	1674.2	38765.1	35310.6	26447.6	-33752.8	-26964.5	-24773.4
Canada	3222.4	3884.8	1288.1	10294.6	21350.3	21137.8	-7072.2	-17465.5	-19849.7
Chile	–	31.7	39.1	–	–	–	–	31.7	39.1
Czech Republic	2111.0	4702.3	1208.5	84109.6	16266.8	16132.7	-81998.6	-11564.5	-14924.2
Denmark	4823.4	6638.2	4654.5	87177.2	24054.3	16883.5	-82353.8	-17416.1	-12229.0
Estonia	349.9	416.5	152.7	601.4	1925.3	2782.0	-251.5	-1508.8	-2629.3
Finland	5895.6	4837.6	7186.6	62808.4	196087.1	69424.8	-56912.8	-191249.5	-62238.2
France	20381.3	20646.8	41488.1	181465.9	174907.1	63516.7	-161084.6	-154260.3	-22028.6
Germany	42102.8	47236.1	89801.3	271533.0	392597.9	714638.7	-229430.2	-345361.9	-624837.4

(continued)

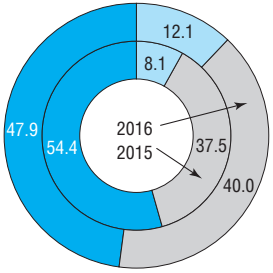
	Receipts from technology exports			Payments for technology imports			Technology balance of payments		
	2014	2015	2016	2014	2015	2016	2014	2015	2016
Greece	383.2	297.6	203.6	3068.6	1406.6	1532.0	-2685.4	-1109.0	-1328.4
Hungary	1150.8	272.7	493.2	4476.9	1518.6	1559.7	-3326.1	-1245.9	-1066.5
Iceland	–	–	–	0.8	–	–	-0.8	–	–
Ireland	1146.1	1916.4	3605.1	8362.4	5442.5	3397.1	-7216.3	-3526.1	208.0
Israel	1340.6	1574.8	1185.3	1238.1	505.8	513.0	102.5	1069.0	672.3
Italy	108753.1	7204.6	53900.0	94195.6	53949.9	67341.3	14557.5	-46745.3	-13441.3
Japan	14815.4	6553.5	2717.0	59592.1	39882.2	30219.6	-44776.7	-33328.7	-27502.6
Latvia	954.3	846.1	936.5	299.1	161.2	195.6	655.2	684.9	740.9
Luxembourg	23500.4	2953.0	10853.7	36351.9	29899.2	99212.2	-12851.5	-26946.2	-88358.5
Mexico	4286.6	21.6	6892.2	2.6	53.6	–	4284.0	-32.0	6892.2
Netherlands	50449.0	32305.2	31024.7	104249.4	81365.1	79179.1	-53800.4	-49059.9	-48154.4
New Zealand	44.6	–	–	603.0	–	64.1	-558.4	–	-64.1
Norway	10649.6	4663.2	4392.3	2611.7	3089.3	1134.4	8037.9	1573.9	3257.9
Poland	964.6	392.9	860.1	10675.6	7187.4	8974.9	-9711.0	-6794.5	-8114.8
Portugal	592.6	1.9	20.7	253.5	414.3	26.6	339.1	-412.4	-5.9
South Korea	9944.3	10024.7	3994.8	44174.4	44388.2	63857.0	-34230.1	-34363.5	-59862.2
Slovakia	50.4	53.6	65.8	1177.8	479.0	591.3	-1127.4	-425.4	-525.5
Slovenia	932.2	384.4	499.0	336.3	1075.9	1464.8	595.9	-691.5	-965.8
Spain	7984.6	1808.1	1733.5	36527.1	28977.9	28488.3	-28542.5	-27169.8	-26754.8
Sweden	9898.2	4996.2	2839.4	39116.4	42724.1	16566.3	-29218.2	-37727.9	-13726.9
Switzerland	15857.8	16940.2	28261.7	124912.1	166535.0	136724.6	-109054.3	-149594.8	-108462.9
Turkey	363367.3	70293.4	40125.7	163367.3	11871.4	193031.0	200000.0	58422.0	-152905.3
United Kingdom	31858.5	19546.9	39939.1	155378.6	138564.5	140054.3	-123520.1	-119017.6	-100115.2
United States	162299.2	319102.5	122156.3	617260.4	254056.7	378873.0	-454961.2	65045.8	-256716.7

(continued)

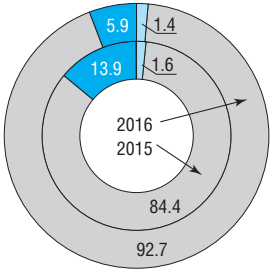
	Receipts from technology exports			Payments for technology imports			Technology balance of payments		
	2014	2015	2016	2014	2015	2016	2014	2015	2016
Other countries	**171775.8**	**899673.3**	**611816.8**	**85331.1**	**307526.4**	**147708.6**	**86444.7**	**592146.9**	**464108.2**
Brazil	428.4	926.5	96.7	397.6	111.8	44.8	30.8	814.7	51.9
Bulgaria	19605.9	14242.1	409.6	274.1	418.9	1554.1	19331.8	13823.2	-1144.5
China	60362.2	460338.5	413321.1	15644.3	5899.7	49464.4	44717.9	454438.8	363856.7
Cyprus	11649.3	9084.1	9947.7	41810.6	28103.0	31669.5	-30161.3	-19018.9	-21721.8
Georgia	201.7	210.3	2287.9	–	18.9	35.3	201.7	191.4	2252.6
Hong Kong	4902.4	7035.6	3948.2	394.2	1948.8	831.0	4508.2	5086.8	3117.2
India	26872.8	85910.6	123348.1	1058.6	1735.9	1955.6	25814.2	84174.7	121392.5
Iran	8762.1	17011.2	17509.2	–	–	29.0	8762.1	17011.2	17480.2
South Africa	823.7	991.7	969.6	51.5	63.2	82.0	772.2	928.5	887.6
Romania	286.7	4480.9	49.4	468.7	427.6	563.2	-182.0	4053.3	-513.8
Singapore	585.4	1118.0	1053.7	14587.4	5730.9	24690.4	-14002.0	-4612.9	-23636.7
Taiwan	1150.9	838.9	53.7	10.8	677.3	637.0	1140.1	161.6	-583.3
Other	36144.3	297484.9	38821.9	10633.3	262390.4	36152.3	25511.0	35094.5	2669.6

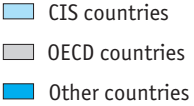
6.35. PERCENTAGE DISTRIBUTION OF TECHNOLOGY EXPORTS AND IMPORTS BY COUNTRY GROUP

Receipts from technology exports



Payments for technology imports





6.36. TECHNOLOGY BALANCE OF PAYMENTS BY SECTOR OF PERFORMANCE

(thousand USD)

	Receipts from technology exports			Payments for technology imports			Technology balance of payments		
	2014	2015	2016	2014	2015	2016	2014	2015	2016
Total	**1279213.1**	**1654732.1**	**1277023.5**	**2455830.7**	**2207406.8**	**2498677.8**	**-1176617.6**	**-552674.7**	**-1221654.3**
Sectors of performance:									
government	96353.5	56382.3	59424.3	92443.1	72446.0	136665.5	3910.4	-16063.7	-77241.2
business enterprise	1176888.9	1591990.1	1211037.1	2362556.1	2134075.5	2358091.6	-1185667.2	-542085.4	-1147054.5
higher education	5970.7	6359.7	4416.8	830.3	884.1	901.1	5140.4	5475.6	3515.7
private non-profit	–	–	2145.3	1.2	1.2	3019.6	-1.2	-1.2	-874.3

6.37. TECHNOLOGY BALANCE OF PAYMENTS BY TYPE OF ECONOMIC ACTIVITY

(thousand USD)

	Receipts from technology exports			Payments for technology imports			Technology balance of payments		
	2014	2015	2016	2014	2015	2016	2014	2015	2016
Total	**1279213.1**	**1654732.1**	**1277023.5**	**2455830.7**	**2207406.8**	**2498677.8**	**-1176617.6**	**-552674.7**	**-1221654.3**
Agriculture, hunting, and forestry	1478.0	2932.0	2825.7	1956.4	3683.7	2595.5	-478.4	-751.7	230.2
Mining and quarrying	2057.1	11210.7	6596.0	208401.9	264897.9	161536.8	-206344.8	-253687.2	-154940.8
Manufacturing	143521.3	152094.1	157185.6	1506157.5	1435667.2	1383169.4	-1362636.2	-1283573.1	-1225983.8
Electricity, gas and water supply	5519.7	1983.3	518931.0	1643.2	9842.2	2176.8	3876.5	-7858.9	516754.2
Construction	24.0	25.1	14.0	2221.5	953.2	717.8	-2197.5	-928.1	-703.8
Wholesale and retail trade; repair of motor vehicles, motorcycles and of personal and household goods	388882.5	857611.8	111546.7	71575.8	222180.1	92548.2	317306.7	635431.7	18998.5
Hotels and restaurants	–	–	–	17047.0	16583.9	83442.9	-17047.0	-16583.9	-83442.9
Transportation, storage, and communication	43002.3	27777.0	14063.7	196969.4	89845.7	82407.4	-153967.1	-62068.7	-68343.7
Real estate, renting, and business activities	691226.2	598591.9	461979.2	441677.9	160999.9	609278.6	249548.3	439569.5	-147299.4
Of which:									
computer and related activities	191511.8	184732.6	25412.6	7705.1	8451.2	703.4	183806.7	176281.4	24709.2
of which software development and related consultancy	154491.2	155364.8	195700.3	6565.1	7585.5	7339.6	147926.1	147779.3	188360.7
research and development	315586.9	157917.7	125414.7	301861.6	108754.4	541401.9	13725.3	49163.3	-415987.2
Public administration and defence; compulsory social security	441.5	–	–	157.5	–	–	284.0	–	–
Education	3060.5	2351.4	3876.4	1362.5	624.1	1172.2	1698.0	1727.3	2704.2

(continued)

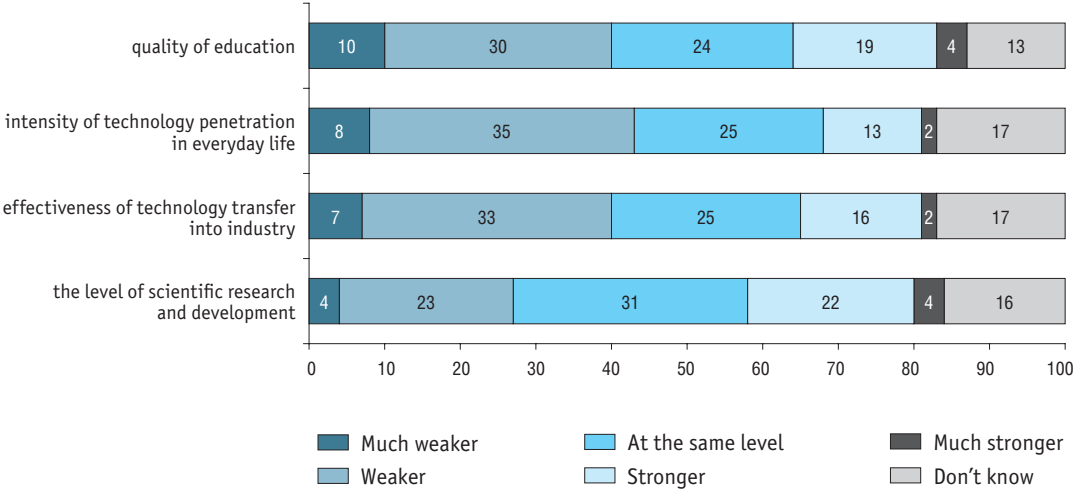
	Receipts from technology exports			Payments for technology imports			Technology balance of payments		
	2014	2015	2016	2014	2015	2016	2014	2015	2016
Health and social work	–	154.8	–	168.0	259.5	136.5	-168.0	-104.7	-136.5
Community, social and personal services	–	–	5.2	6492.1	1869.4	79495.7	-6492.1	-1869.4	-79490.5
Of which recreational, cultural and sporting activities	–	–	5.2	6492.1	1869.4	79495.7	-6492.1	-1869.4	-79490.5

7. Public Attitudes towards Science and Technology

7.1. PUBLIC OPINION ABOUT THE LEVEL OF S&T AND INNOVATION DEVELOPMENT IN RUSSIA: 2016*

(as a percentage of all respondents)

Is Russia stronger or weaker in comparison to other developed countries in...?

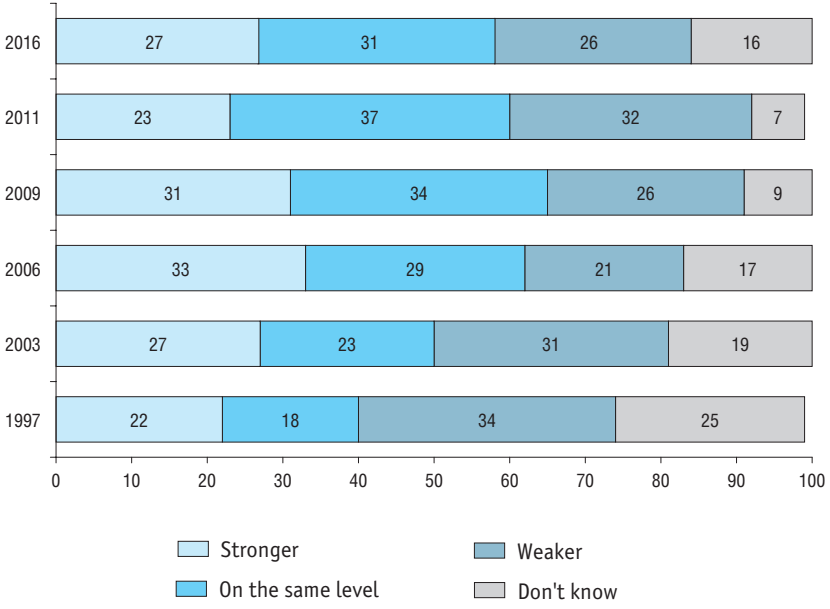


* Hereinafter, the section presents the results of a representative survey of the Russian population aged 16 years and over organised by the HSE Institute for Statistical Studies and Economics of Knowledge in cooperation with the Russian Longitudinal Monitoring Survey (RLMS) and financial support of the HSE Basic Research Programme. The survey was conducted in October 2016 – January 2017.

7.2. PUBLIC OPINION ABOUT THE LEVEL OF SCIENTIFIC RESEARCH IN RUSSIA

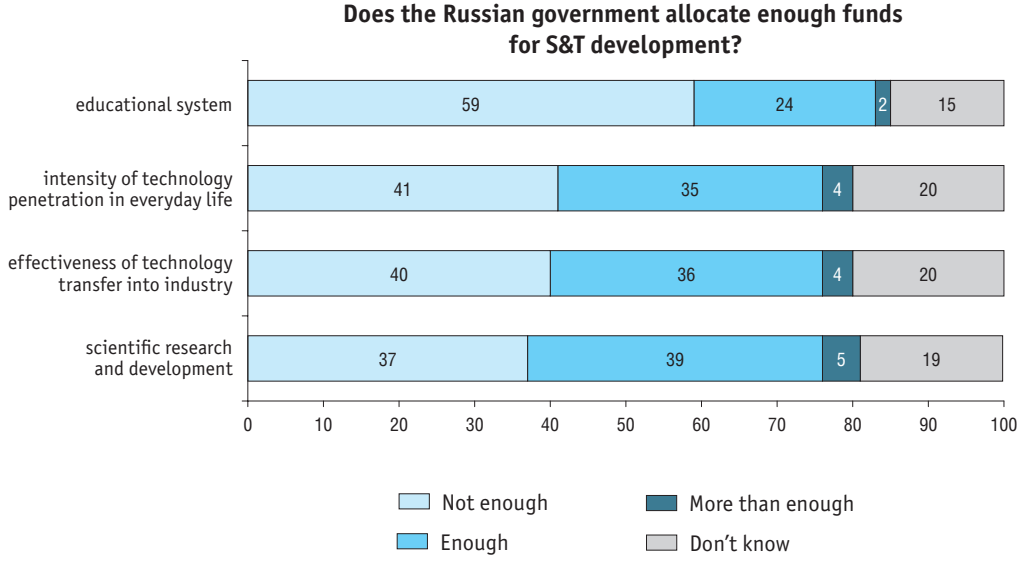
(as a percentage of all respondents)

Is Russia is stronger or weaker by the level of scientific research in comparison to other developed countries?



7.3. PUBLIC OPINION ABOUT FUNDING OF THE S&T DEVELOPMENT IN RUSSIA: 2016

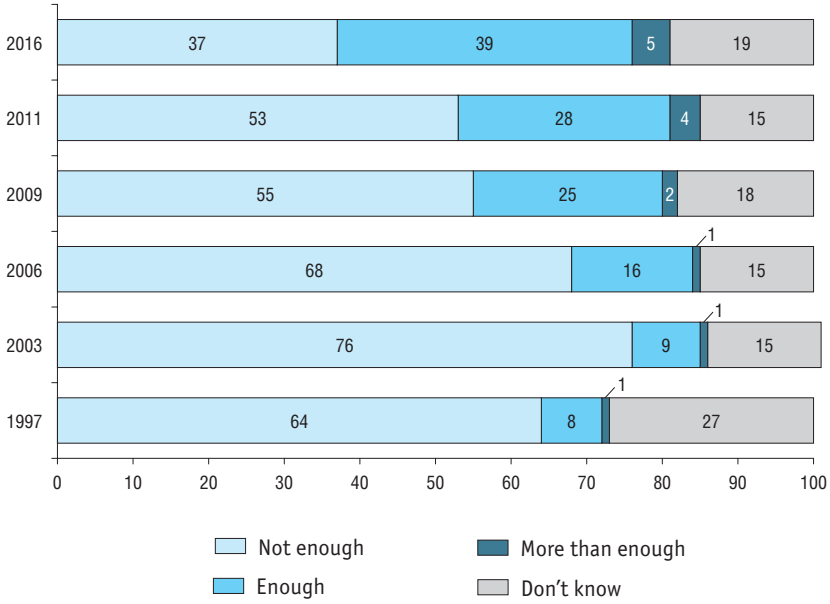
(as a percentage of all respondents)



7.4. PUBLIC OPINION ABOUT FEDERAL FUNDING OF SCIENTIFIC RESEARCH

(as a percentage of all respondents)

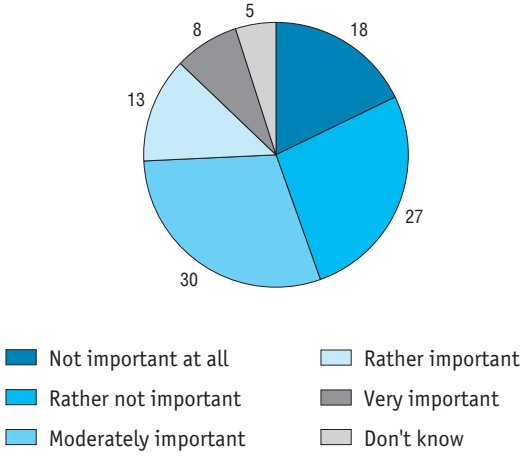
Does the Russian government allocate enough funds for scientific research?



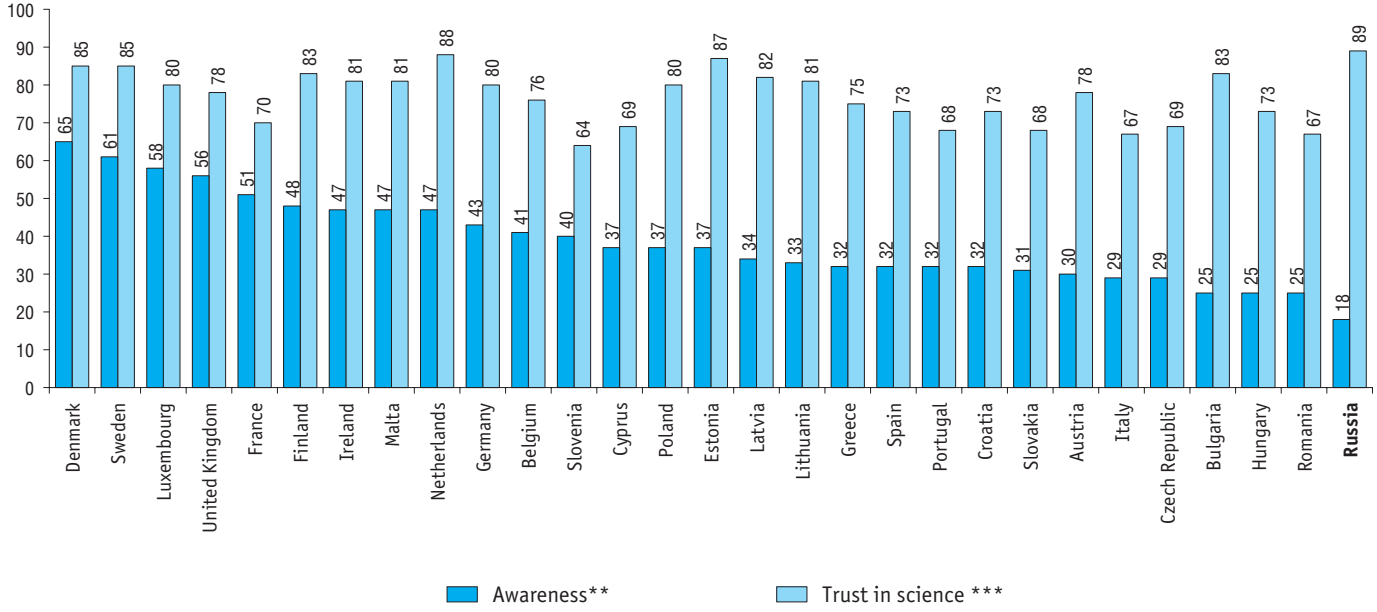
7.5. POPULATION OPINION ABOUT THE LEVEL OF AWARENESS ABOUT THE LATEST SCIENTIFIC DEVELOPMENTS: 2016

(as a percentage of all respondents)

How important it is for you to know about the latest achievements in science and technology?



7.6. THE CORRESPONDENCE OF THE LEVEL OF AWARENESS ABOUT THE LATEST SCIENTIFIC DEVELOPMENTS AND THE LEVEL OF TRUST IN SCIENCE BY COUNTRY: 2016*



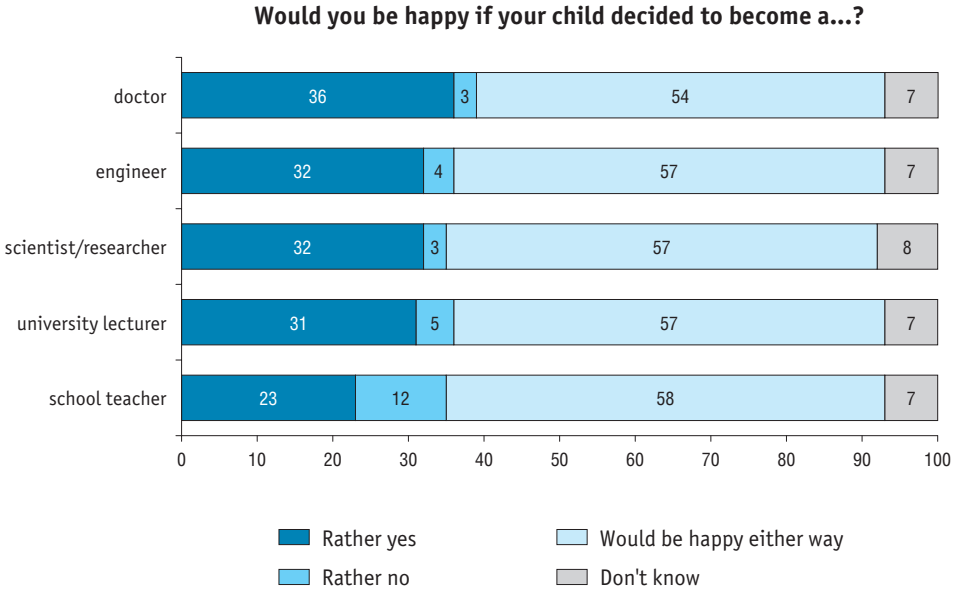
* Or nearest years for which data are available.

** The index of awareness is calculated as the sum of respondents who feel very well and fairly well informed about the latest scientific developments and technology as a percentage of all respondents.

*** The index of trust in science is calculated as the sum of respondents who strongly agree and somewhat agree with the statement: 'Thanks to science and technology, there will be more opportunities for future generations', as a percentage of all respondents.

7.7. PUBLIC PERCEPTIONS OF SCIENTIFIC AND ENGINEERING CAREERS: 2016

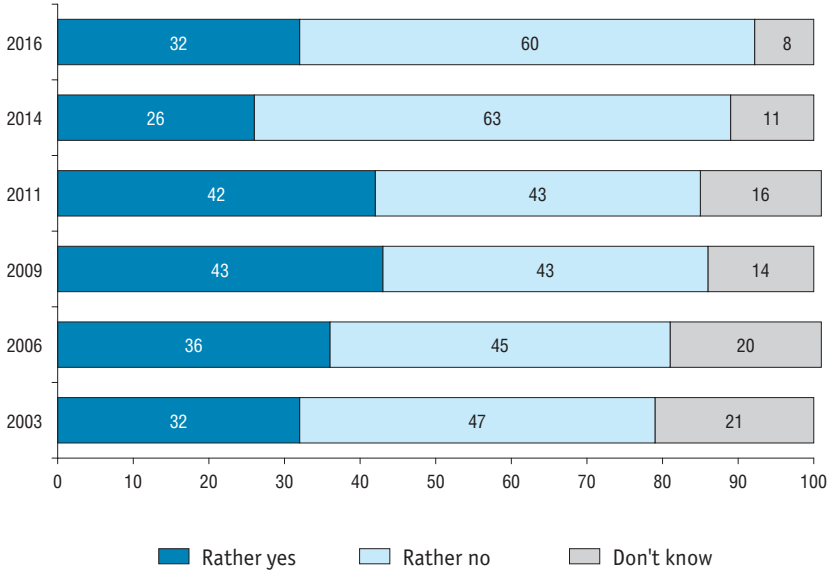
(as a percentage of all respondents)



7.8. PUBLIC PERCEPTIONS OF SCIENTIFIC CAREER

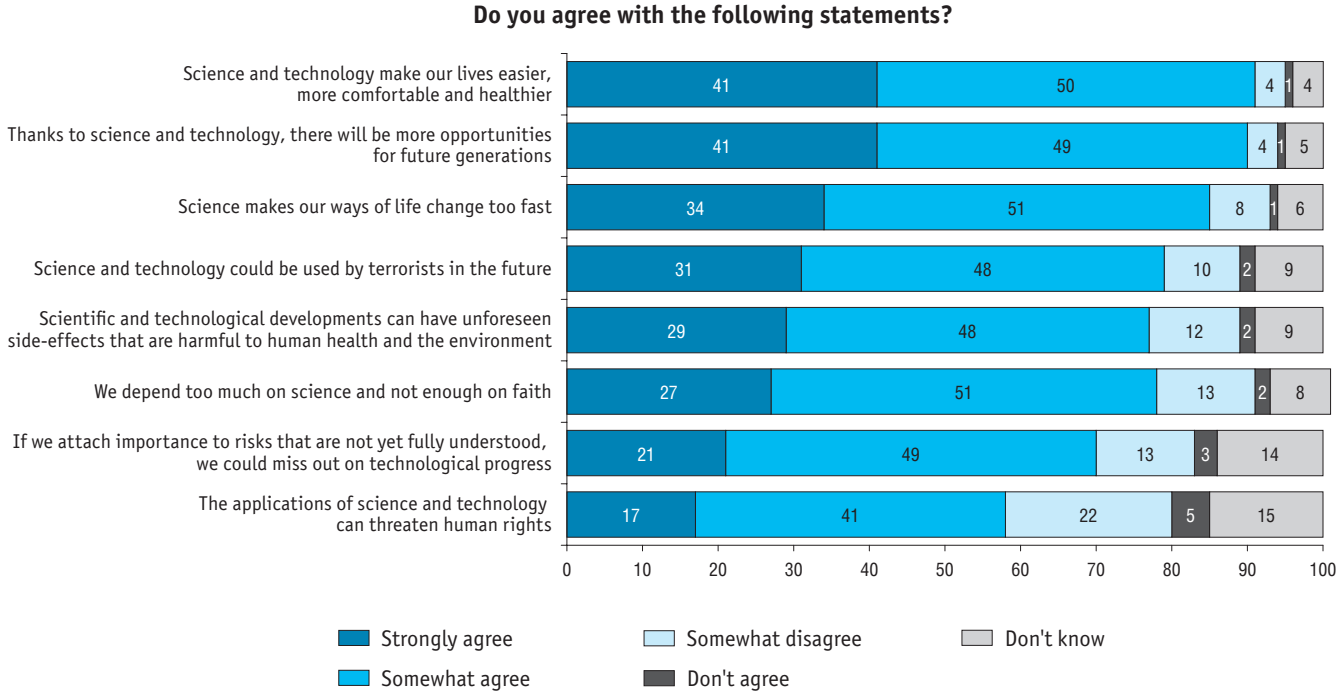
(as a percentage of all respondents)

Would you be happy if your child decided to become a scientist/researcher?



7.9. PUBLIC OPINION ABOUT SCIENCE AND TECHNOLOGY INFLUENCE ON DAILY LIFE: 2016

(as a percentage of all respondents)



8. International Comparisons

8.1. GROSS DOMESTIC EXPENDITURE ON R&D

(million current USD PPPs)

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Russia	**8122.3**	**10726.9**	**18115.0**	**33083.3**	**35183.1**	**37912.8**	**38609.6**	**39827.4**	**38143.0**	**37260.8**
CIS countries										
Armenia	…	13.6	36.6	45.6	54.5	52.6	51.4	58.9	63.7	…
Azerbaijan	…	95.6	132.3	309.1	304.7	326.8	341.9	352.4	381.6	…
Belarus	…	418.0	633.5	1012.6	1101.9	1087.0	1127.3	907.2	870.2	…
Kazakhstan	…	212.5	612.5	493.0	540.7	621.3	693.8	718.3	744.8	…
Kyrgyzstan	…	12.6	21.6	23.2	25.2	27.2	27.5	24.5	24.7	…
Moldova	…	…	42.2	60.0	60.3	62.8	59.2	66.1	66.2	…
Tajikistan	…	…	10.0	14.1	21.0	21.6	24.3	25.7	26.2	…
Ukraine	…	1799.1	3133.4	2930.9	2792.8	2904.6	2990.3	2428.4	2100.9	…
Uzbekistan	…	176.4	169.8	231.6	255.7	292.1	311.8	345.1	405.9	…
OECD countries										
Australia	…	7964.3	…	20572.9	20955.6	…	23133.6	…	…	…
Austria	2875.0	4435.9	6837.0	9595.7	9955.0	11415.1	12007.9	12847.1	13321.2	13675.3
Belgium	3739.9	5511.3	6225.2	8966.8	9822.0	11133.8	11840.8	12370.6	12624.6	…
Canada	11374.2	16745.4	23090.0	24903.1	25570.5	26176.9	26503.3	27873.0	27071.1	26715.6
Chile	…	…	…	1027.8	1232.1	1355.5	1532.6	1522.1	1603.7	…
Czech Republic	1251.0	1846.9	2619.5	3881.8	4702.3	5441.6	6089.3	6719.0	6927.4	…
Denmark	2120.3	…	4429.5	6972.1	7283.7	7468.8	7793.6	7877.4	8236.2	…
Estonia	…	78.9	206.7	455.4	751.5	730.6	624.1	544.5	569.3	…
Finland	2200.5	4491.1	5588.7	7756.1	7976.8	7520.0	7382.8	7185.4	6712.4	…
France	27664.2	33249.3	39530.1	50956.9	53617.3	55097.7	58353.3	59529.2	60818.7	…

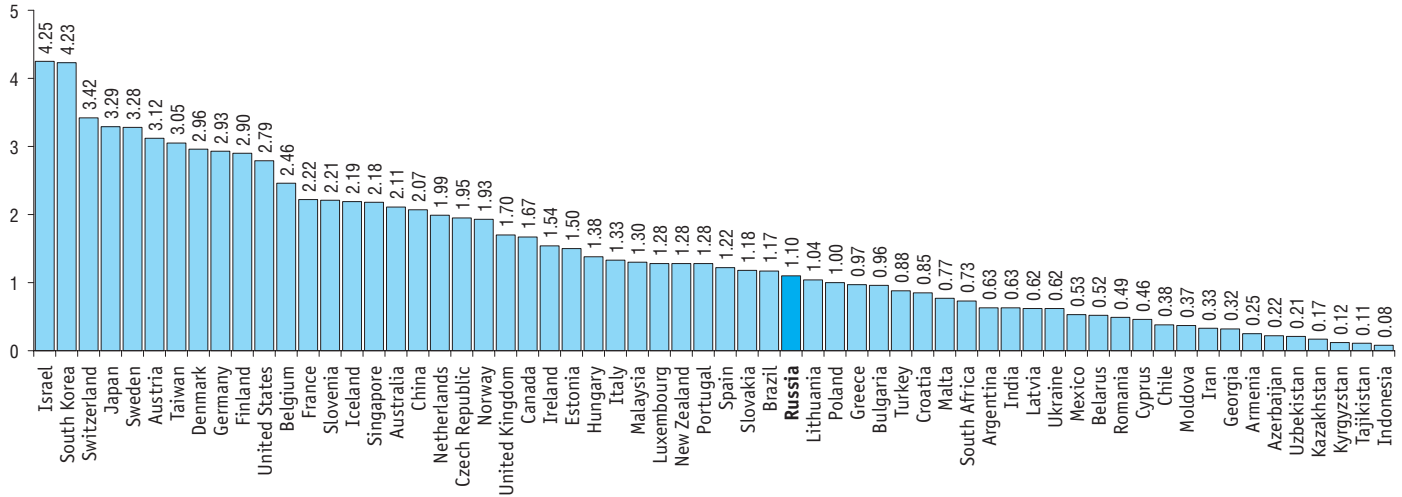
(continued)

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Germany	41012.5	53632.8	63868.1	87131.0	95810.0	100490.1	102905.5	109802.5	114778.1	…
Greece	679.1	…	1627.0	1876.8	1950.7	1953.7	2321.7	2408.7	2765.9	…
Hungary	668.8	956.7	1586.8	2458.5	2708.1	2895.0	3361.4	3424.4	3584.8	…
Iceland	96.5	215.2	296.8	…	313.9	…	243.3	292.0	345.6	…
Ireland	835.9	1244.9	2006.5	3148.3	3206.1	3351.0	3512.2	3638.7	…	…
Israel	2666.4	6167.2	6966.3	8666.3	9523.0	10450.6	11434.4	12253.8	13023.6	…
Italy	11858.2	15461.9	18241.2	25430.8	26111.7	27419.6	28459.4	30324.1	30102.1	…
Japan	76617.3	98758.0	128694.6	140603.1	148389.2	152325.6	164655.8	170512.3	170003.0	…
Latvia	59.0	82.7	164.2	225.4	283.7	287.2	279.4	328.1	307.7	…
Luxembourg	…	380.5	498.8	653.4	697.6	619.1	676.6	714.0	761.0	…
Mexico	1941.5	3362.8	5346.2	9291.1	9775.3	9799.0	10292.5	11581.8	11563.4	…
Netherlands	6591.9	9078.5	10892.4	12777.0	14634.4	15177.7	15969.2	16541.4	16909.7	…
New Zealand	607.9	…	1189.3	…	1766.6	…	1856.9	…	2227.9	…
Norway	1750.1	…	3275.8	4681.2	5002.9	5316.3	5620.4	5785.5	6218.4	…
Poland	1829.3	2614.6	2984.9	5782.0	6487.5	7990.8	8185.8	9187.2	10239.8	…
Portugal	744.7	1400.7	1808.2	4433.6	4119.0	3832.4	3869.8	3864.2	3921.5	…
Slovakia	419.9	390.9	441.0	830.8	925.0	1159.9	1243.8	1386.5	1911.6	…
Slovenia	402.6	486.5	676.5	1171.5	1433.1	1529.9	1583.7	1524.0	1458.9	…
South Korea	13195.6	18533.1	30618.3	52172.8	58379.7	64862.5	68234.1	73195.5	74051.5	…
Spain	4976.0	7724.8	13251.1	20105.9	19862.4	19269.2	19282.4	19341.5	19734.5	…
Sweden	6299.5	…	10388.2	12567.5	13433.8	13970.4	14496.4	14154.7	15371.7	…
Switzerland	…	5963.6	…	…	…	14744.9	…	…	17688.3	…
Turkey	1663.6	2833.3	4595.6	10088.7	11544.6	12807.9	13834.8	15324.2	16604.5	…
United Kingdom	19641.6	25129.9	30639.7	37609.3	38778.6	38490.2	41532.1	44163.8	46259.8	…
United States	184077.0	269513.0	328128.0	410093.0	429792.0	437081.0	457612.0	479358.0	502893.0	…

(continued)

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
EU countries which are not OECD members										
Bulgaria	…	259.6	348.9	624.0	612.7	716.2	767.9	999.5	1253.0	…
Croatia	…	496.6	564.7	631.8	666.8	677.4	752.5	736.7	808.1	…
Cyprus	…	33.5	75.3	123.3	127.2	117.9	122.1	124.4	121.9	…
Lithuania	…	173.0	360.7	488.5	625.5	659.1	750.5	851.0	871.4	…
Malta	…	…	47.6	71.0	80.5	103.0	102.4	103.9	112.9	…
Romania	931.9	480.4	844.7	1572.5	1797.9	1837.3	1534.5	1582.3	2136.6	…
Other countries										
Argentina	…	1771.6	2271.5	4258.5	4655.2	5266.6	5340.3	5029.8	5577.1	…
Brazil	…	15781.6	20520.0	32516.7	33904.4	34836.8	38733.3	38447.9	…	…
China	12781.9	33044.5	86827.6	213460.1	247808.3	292197.3	334135.5	370115.9	408829.0	…
Georgia	…	24.6	32.3	…	…	…	27.0	63.5	114.3	…
India	…	15662.8	26532.1	43674.8	48063.0	…	…	…	50269.4	…
Indonesia	…	659.0	…	…	…	…	2130.3	…	…	…
Iran	…	…	5853.6	3537.7	…	4172.3	…	…	…	…
Malaysia	…	1405.8	…	6023.5	6456.6	7333.4	…	9728.6	10637.6	…
South Africa	…	…	4051.2	4433.3	4652.2	4826.4	4975.0	…	…	…
Singapore	1266.5	3006.5	5085.7	7218.1	8359.7	8242.0	8777.1	10102.5	…	…
Taiwan	5608.5	9182.7	15298.9	25060.8	27422.7	29055.1	30718.3	32484.0	33564.1	…

8.2. GROSS DOMESTIC EXPENDITURE ON R&D AS A PERCENTAGE OF GDP: 2016*



* Or nearest years for which the data are available.

8.3. PERCENTAGE DISTRIBUTION OF GROSS DOMESTIC EXPENDITURE ON R&D BY SECTOR OF PERFORMANCE: 2016*

	Gross domestic expenditure on R&D	Government sector	Business enterprise sector	Higher education sector	Private non-profit sector
Russia	**100**	**32.0**	**58.7**	**9.1**	**0.2**
		CIS countries			
Armenia	100	84.2	…	15.8	…
Azerbaijan	100	86.1	5.0	8.6	0.2
Belarus	100	23.6	65.6	10.8	0.0
Kazakhstan	100	29.7	29.4	30.7	10.2
Kyrgyzstan	100	71.4	14.0	14.6	…
Moldova	100	67.1	20.8	12.1	…
Tajikistan	100	84.4	…	15.6	…
Ukraine	100	32.7	62.0	5.3	…
Uzbekistan	100	46.0	34.9	17.8	1.3
		OECD countries			
Australia	100	11.2	56.3	29.6	2.8
Austria	100	4.4	70.8	24.3	0.4
Belgium	100	7.8	71.9	19.9	0.3
Canada	100	8.5	52.3	38.8	0.4
Chile	100	7.8	34.3	38.5	19.4
Czech Republic	100	20.4	54.3	24.9	0.4
Denmark	100	2.3	64.0	33.4	0.4
Estonia	100	10.8	46.1	41.4	1.8
Finland	100	8.2	66.7	24.4	0.8
France	100	13.1	65.1	20.3	1.5

* Or 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
Germany	100	14.1	68.7	17.3	…
Greece	100	28.1	33.0	37.8	1.1
Hungary	100	13.3	73.4	12.1	…
Iceland	100	4.8	64.7	30.5	…
Ireland	100	4.4	71.0	24.7	…
Israel	100	1.7	85.4	11.7	1.2
Italy	100	13.3	55.3	28.6	2.9
Japan	100	7.9	78.5	12.3	1.3
Latvia	100	25.6	24.8	49.6	…
Luxembourg	100	31.1	51.0	17.8	…
Mexico	100	37.9	30.0	26.8	5.4
Netherlands	100	12.3	55.6	32.1	…
New Zealand	100	20.3	49.8	29.9	…
Norway	100	15.0	53.9	31.1	…
Poland	100	24.4	46.6	28.9	0.2
Portugal	100	5.9	47.1	45.5	1.5
Slovakia	100	27.9	28.0	43.8	0.4
Slovenia	100	13.5	76.3	10.2	0.0
South Korea	100	11.7	77.5	9.1	1.6
Spain	100	19.1	52.5	28.1	0.2
Sweden	100	3.4	69.7	26.7	0.2
Switzerland	100	0.9	71.0	26.7	1.5
Turkey	100	10.3	50.0	39.7	…
United Kingdom	100	6.8	65.7	25.6	1.9
United States	100	11.2	71.5	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	20.8	73.3	5.4	0.5
Croatia	100	24.5	51.2	24.2	…
Cyprus	100	13.6	16.5	53.7	16.2
Lithuania	100	17.2	26.9	55.9	…
Malta	100	17.5	48.5	34.0	…
Romania	100	38.3	44.0	17.4	0.3
Other countries					
Argentina	100	51.2	21.2	26.0	1.6
China	100	16.2	76.8	7.0	…
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	…
South Africa	100	23.4	45.9	28.4	2.3
Singapore	100	11.4	61.2	27.4	…
Taiwan	100	12.5	77.8	9.4	0.3

8.4. PERCENTAGE DISTRIBUTION OF GROSS DOMESTIC EXPENDITURE ON R&D BY SOURCE OF FUNDS: 2016*

	Gross domestic expenditure on R&D	Government funds	Business enterprise sector funds	Other national sources	Funds from abroad
Russia	**100**	**68.2****	**28.1**	**1.0**	**2.7**
		CIS countries			
Armenia	100	73.8	…	…	2.3
Azerbaijan	100	65.8	32.2	2.1	…
Belarus	100	46.0	41.3	…	12.7
Kazakhstan	100	63.7	28.9	…	0.8
Kyrgyzstan	100	89.2	8.7	0.2	1.0
Moldova	100	…	…	…	11.6
Tajikistan	100	100.0	…	…	0.2
Ukraine	100	39.4	40.3	0.2	18.2
Uzbekistan	100	57.0	38.9	…	1.2
		OECD countries			
Australia	100	34.6	61.9	1.9	1.6
Austria	100	30.7	53.4	0.5	15.5
Belgium	100	24.1	61.3	1.4	13.2
Canada	100	33.3	43.6	14.2	8.9
Chile	100	42.6	32.8	11.7	12.9
Czech Republic	100	32.2	34.5	0.8	32.5
Denmark	100	29.4	59.4	4.7	6.5
Estonia	100	46.4	41.0	0.4	12.2
Finland	100	28.9	54.8	1.8	14.5
France	100	34.6	55.7	2.0	7.8

* Or nearest years for which the 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
Germany	100	27.9	65.6	0.4	6.2
Greece	100	53.1	31.4	2.9	12.7
Hungary	100	34.6	49.7	0.7	15.0
Iceland	100	32.0	33.3	8.4	26.4
Ireland	100	27.5	52.1	1.7	18.7
Israel	100	12.5	37.0	1.3	49.2
Italy	100	40.8	46.2	3.6	9.3
Japan	100	15.4	78.0	6.1	0.5
Latvia	100	32.7	20.1	2.2	45.0
Luxembourg	100	48.4	16.5	2.8	32.3
Mexico	100	70.3	19.7	9.6	0.5
Netherlands	100	33.4	48.7	2.8	15.1
New Zealand	100	37.1	43.1	11.5	8.2
Norway	100	44.9	44.2	1.6	9.2
Poland	100	41.8	39.0	2.4	16.7
Portugal	100	47.1	41.8	5.4	5.6
Slovakia	100	31.9	25.1	3.6	39.4
Slovenia	100	19.9	69.2	0.3	10.6
South Korea	100	23.7	74.5	1.0	0.8
Spain	100	40.9	45.8	5.2	8.0
Sweden	100	28.3	61.0	4.1	6.7
Switzerland	100	24.4	63.5	1.9	10.2
Turkey	100	27.6	50.1	21.3	1.1
United Kingdom	100	28.0	48.4	6.0	17.6
United States	100	24.0	64.2	7.1	4.7

(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	26.4	22.3	0.5	50.9
Croatia	100	36.4	46.6	2.5	14.5
Cyprus	100	56.5	13.7	6.2	23.7
Lithuania	100	35.6	28.0	1.8	34.6
Malta	100	33.3	44.1	1.3	21.3
Romania	100	41.7	37.3	1.8	19.2
Other countries					
Argentina	100	76.4	17.2	3.1	3.3
Brazil	100	61.4	36.4	2.2	…
China	100	21.3	74.7	…	0.7
Georgia	100	46.7	…	39.2	14.7
Iran	100	61.6	30.9	7.4	…
Malaysia	100	35.7	11.4	7.0	1.7
South Africa	100	42.9	41.4	2.8	12.9
Singapore	100	37.1	54.1	2.0	6.8
Taiwan	100	21.1	77.9	0.9	0.1

8.5. PERCENTAGE DISTRIBUTION OF GROSS DOMESTIC EXPENDITURE ON R&D BY FIELD OF SCIENCE AND TECHNOLOGY: 2016*

	Total	Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities
Russia	**100**	**16.9**	**73.7**	**4.0**	**1.5**	**2.5**	**1.3**
CIS countries							
Armenia	100	56.2	21.5	2.8	1.2	6.1	12.2
Azerbaijan	100	22.9	47.5	8.3	5.8	5.8	9.8
Belarus	100	18.7	66.6	3.5	5.8	4.1	1.3
Kazakhstan	100	35.3	45.3	3.4	10.3	1.6	4.0
Kyrgyzstan	100	48.4	20.9	10.8	9.3	2.6	7.9
Moldova	100	35.1	24.3	10.8	14.1	9.2	6.5
Tajikistan	100	27.5	8.0	6.6	28.8	10.1	19.0
Ukraine	100	17.4	64.0	3.9	5.4	3.7	1.6
Uzbekistan	100	31.8	37.3	7.3	7.5	9.8	6.2
OECD countries							
Australia	100	30.8	41.8	15.2	4.8	6.0	1.5
Chile	100	34.1	30.9	9.7	14.4	9.1	1.8
Czech Republic	100	33.9	48.6	8.1	2.6	3.6	3.3
Greece	100	15.1	39.9	20.5	4.7	8.4	11.3
Hungary	100	25.2	56.5	6.0	4.5	3.8	2.7
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	21.7	41.2	16.8	8.2	9.0	3.2
Poland	100	21.3	52.8	10.5	6.4	4.9	4.1
Portugal	100	25.2	40.0	12.7	3.6	11.4	7.1
Slovakia	100	17.8	48.8	10.0	6.9	10.3	6.2

(continued)

	Total	Natural sciences	Engineering and technology	Medical sciences	Agricultural sciences	Social sciences	Humanities
Slovenia	100	35.7	52.2	3.0	2.2	4.2	2.7
South Korea	100	17.6	71.8	4.9	2.1	2.3	1.4
Spain	100	19.1	53.1	14.2	5.9	5.1	2.5
Turkey	100	10.6	54.6	15.0	4.4	10.1	5.2
United Kingdom	100	7.2	5.2	8.0	1.4	6.7	6.2
EU countries which are not OECD members							
Bulgaria	100	16.2	36.0	36.2	4.4	3.2	4.1
Croatia	100	21.2	37.4	19.1	7.5	9.8	5.0
Cyprus	100	40.3	23.0	4.5	8.5	15.8	7.9
Lithuania	100	24.2	15.2	10.0	4.7	11.6	8.9
Malta	100	24.2	35.7	20.5	2.5	10.4	5.4
Romania	100	20.5	51.9	10.4	8.5	6.2	2.4
Other countries							
Argentina	100	21.9	21.9	6.3	10.6	12.6	6.0
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
South Africa	100	27.5	26.0	18.2	8.6	17.5	2.3
Singapore	100	12.9	59.3	18.5	3.1	…	…
Taiwan	100	10.5	77.2	6.9	2.2	2.3	0.9

* Or nearest years for which the data are available.

** Including Humanities.

8.6. PERCENTAGE DISTRIBUTION OF CURRENT EXPENDITURE ON R&D BY TYPE OF R&D ACTIVITY: 2016*

	Current expenditure on R&D	Basic research	Applied research	Development
Russia	**100**	**15.2**	**20.7**	**64.1**
		CIS countries		
Armenia	100	38.0	6.9	55.2
Azerbaijan	100	51.5	19.8	5.3
Belarus	100	15.3	29.6	55.1
Kazakhstan**	100	20.7	53.8	25.5
Kyrgyzstan	100	55.0	9.5	35.5
Moldova	100	27.5	52.0	20.6
Tajikistan	100	52.7	28.2	19.1
Ukraine	100	20.7	14.4	50.6
Uzbekistan	100	20.3	35.1	32.1
		OECD countries		
Australia**	100	20.1	38.7	41.2
Austria**	100	18.9	35.6	43.9
Belgium**	100	19.9	38.7	41.4
Chile	100	36.7	39.3	24.0
Czech Republic**	100	31.0	35.0	34.0
Denmark	100	19.4	37.6	43.0
Estonia	100	30.8	26.5	42.7
France**	100	24.4	37.6	34.7
Greece **	100	34.6	38.9	26.5
Hungary	100	19.4	29.7	50.9
Iceland	100	22.4	50.2	27.4

(continued)

	Current expenditure on R&D	Basic research	Applied research	Development
Ireland**	100	18.9	33.3	47.8
Israel	100	9.8	9.4	80.8
Italy**	100	24.9	47.0	28.1
Japan**	100	11.9	19.9	63.7
Latvia**	100	29.4	43.6	27.0
Mexico**	100	28.2	30.1	41.7
Netherlands**	100	27.4	46.2	26.4
New Zealand**	100	25.2	39.1	35.8
Norway	100	18.8	39.5	41.6
Poland	100	32.3	20.7	47.0
Portugal	100	24.2	40.7	35.1
Slovakia	100	44.1	25.4	30.6
Slovenia	100	18.5	56.4	25.1
South Korea**	100	17.2	20.8	61.9
Spain	100	22.6	40.8	36.6
Switzerland**	100	30.4	40.7	28.9
United Kingdom	100	14.8	42.3	42.9
United States	100	17.2	19.4	63.4
EU countries which are not OECD members				
Bulgaria**	100	11.4	71.8	16.8
Croatia**	100	35.0	34.6	30.5
Cyprus**	100	20.6	61.3	18.0
Lithuania**	100	27.5	45.6	26.9
Malta**	100	56.6	23.9	10.0
Romania	100	36.1	44.5	19.3

(continued)

	Current expenditure on R&D	Basic research	Applied research	Development
Other countries				
Argentina**	100	34.2	38.8	7.0
China**	100	5.1	10.8	84.2
Georgia**	100	24.9	7.6	…
India**	100	16.0	22.3	23.5
Malaysia	100	20.4	70.6	9.0
South Africa**	100	23.8	47.3	28.9
Singapore**	100	19.7	32.1	48.3
Taiwan **	100	8.7	23.1	68.2

* Or nearest years for which the data are available.

** 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	2011	2012	2013	2014	2015	2016
Russia	**5977.1**	**4784.6**	**13254.0**	**26076.7**	**28259.5**	**29851.1**	**34072.8**	**33900.9**	**32931.4**	**35639.6**
					OECD countries					
Australia	2324.5	2859.4	3729.1	4682.0	4748.2	4506.4	4981.3	4889.4	4758.5	4731.4
Austria	1224.2	1417.5	1836.6	2700.3	2920.6	3014.8	3246.3	3327.3	3445.4	3484.1
Belgium	1146.8	1580.2	2004.6	2844.3	2879.6	3028.1	3129.0	3417.7	3180.3	…
Canada	3835.5	4589.6	6777.1	8480.6	7736.9	7746.2	8190.4	7882.3	7700.1	…
Chile	…	…	…	…	616.0	726.4	812.3	862.2	867.4	…
Czech Republic	…	827.0	1129.0	1656.2	1935.9	1966.6	2088.7	2154.1	2174.4	2262.0
Denmark	768.4	1134.8	1329.3	2354.6	2483.5	2511.6	2673.5	2707.3	2803.4	2636.3
Estonia	…	43.6	89.9	201.0	246.1	279.9	294.7	269.4	264.1	…
Finland	942.4	1316.0	1648.0	2301.8	2306.8	2272.1	2228.8	2208.5	2213.1	2039.6
France	13367.3	14868.7	18220.2	19178.6	19983.8	17925.9	18457.1	18408.6	17721.1	17387.3
Germany	16397.7	17220.7	19732.0	28642.4	30103.1	30575.2	32745.9	33258.9	34301.9	35421.6
Greece	401.8	626.8	895.8	949.1	909.3	1069.1	1360.1	1264.5	1498.4	…
Hungary	…	…	696.1	762.6	665.8	777.0	1574.2	705.8	736.0	1034.8
Iceland	45.6	75.7	94.0	119.5	122.5	130.7	145.6	140.3	…	…
Ireland	215.1	319.8	710.7	972.7	946.2	914.1	889.5	890.6	915.0	…
Israel	884.4	1293.4	1044.9	1356.4	1479.7	1568.8	1676.4	1780.5	1805.0	…
Italy	6831.7	9501.2	11199.3	12372.7	12075.3	11798.8	11453.0	11495.7	11511.2	…
Japan	14324.8	21193.4	27617.8	32149.0	34105.2	35413.2	35633.5	35632.0	33907.4	33862.0
Latvia	31.3	34.3	57.4	59.4	59.7	64.4	64.9	77.0	94.2	…
Luxembourg	…	24.7	81.5	243.7	279.3	334.8	388.9	398.8	359.7	360.5
Mexico	1263.3	2119.2	2963.4	5141.1	5400.2	5850.8	6321.0	7223.8	7028.7	6718.5
Netherlands	2847.1	3798.6	4391.9	5697.9	5950.6	5672.9	6006.6	6076.3	6055.1	6242.4
New Zealand	308.0	…	…	681.3	729.2	735.4	756.4	880.8	893.1	989.6

(continued)

	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Norway	831.1	1061.4	1535.9	2384.8	2474.1	2564.1	2759.7	2893.3	2991.6	3084.6
Poland	1152.7	1545.3	1548.8	2912.8	2688.0	3192.1	3426.5	4203.1	4160.8	…
Portugal	589.2	1078.4	1628.9	2842.6	2814.5	2569.2	2705.6	2814.8	3007.5	2870.3
Slovakia	175.2	216.6	244.6	504.6	639.0	584.1	588.9	598.9	681.8	568.5
Slovenia	…	175.6	273.3	342.2	351.6	313.1	295.6	276.2	273.3	…
South Korea	…	5017.9	9886.5	16300.1	17423.9	18744.5	19730.2	20418.6	21207.5	…
Spain	2998.1	5131.1	6440.7	11450.4	10155.5	8899.8	8420.5	8714.7	9052.9	8922.9
Sweden	2089.5	1724.5	2508.0	3275.7	3276.2	3602.1	3662.5	3756.9	3713.5	…
Switzerland	…	1525.0	…	3170.6	…	4022.5	…	4443.8	4709.7	…
Turkey	…	…	…	4121.5	4580.9	4435.2	5445.5	4886.0	4971.9	5551.9
United Kingdom	7896.7	9484.9	12116.1	13341.6	12902.2	12974.6	14362.8	14781.1	14696.1	…
United States	68791.0	83612.5	131259.0	148962.0	144379.0	143737.0	132477.0	136159.0	138544.0	148999.0
Other countries										
Argentina	…	999.1	1217.6	2381.5	2477.1	2711.7	…	…	…	…
Romania	530.3	182.6	448.5	969.5	964.9	821.2	818.3	879.8	1128.3	1302.0
Taiwan	…	2967.0	4886.4	7044.2	7362.6	7350.6	7303.0	7368.9	7566.0	7994.1

8.8. R&D PERSONNEL: 2016*

(person-years; in full-time equivalent)

	R&D personnel	Researchers
Russia	**802317**	**428884**
	CIS countries	
Armenia	5044	3856
Azerbaijan	23093	16137
Belarus	26153	16953
Kazakhstan	17586	12552
Kyrgyzstan	4557	3441
Moldova	4169	2694
Tajikistan	3704	2467
Ukraine	81854	43016
Uzbekistan	20535	15385
	OECD countries	
Australia	147809	100414
Austria	69318	42339
Belgium	77864	55087
Canada	226620	159190
Chile	15261	8175
Czech Republic	66433	38081
Denmark	59532	42425
Estonia	5636	4186
Finland	50367	37516

* Or nearest years for which data are available. For several CIS countries (Armenia, Azerbaijan, Belarus, Kyrgyzstan, Tajikistan), Indonesia and Iran, the number given is the headcount (number of individuals). The data for Indonesia refer to different years.

(continued)

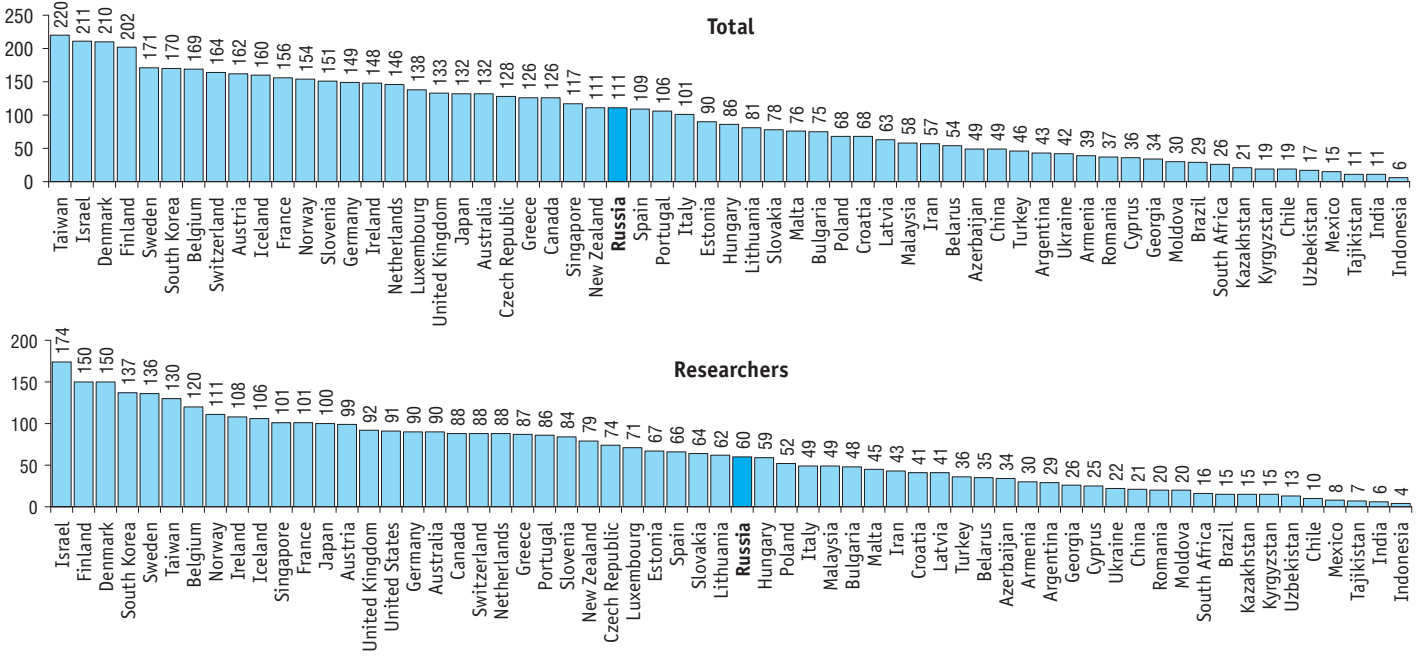
	R&D personnel	Researchers
France	428643	277631
Germany	640516	387982
Greece	50512	35069
Hungary	36847	25316
Iceland	2941	1944
Ireland	29444	21451
Israel	77143	63521
Italy	248140	120677
Japan	875005	662071
Latvia	5570	3613
Luxembourg	5593	2869
Mexico	59073	29921
Netherlands	128327	76977
New Zealand	26400	18700
Norway	42409	30632
Poland	109249	82594
Portugal	48478	39580
Slovakia	17591	14406
Slovenia	14225	7900
South Korea	442027	356447
Spain	200866	122437
Sweden	82156	65333
Switzerland	81451	43740
Turkey	122288	95161
United Kingdom	416538	289330
United States	…	1379977

(continued)

	R&D personnel	Researchers
EU countries which are not OECD members		
Bulgaria	22421	14224
Croatia	10645	6367
Cyprus	1245	860
Lithuania	10523	8124
Malta	1391	817
Romania	31331	17459
Other countries		
Argentina	78713	52970
Brazil	266709	138653
China	3758848	1619028
Georgia	6562	5152
India	528219	282994
Indonesia	55118	41143
Iran	128009	95200
Malaysia	82360	69864
South Africa	37956	23346
Singapore	42543	36666
Taiwan	245941	145381

8.9. R&D PERSONNEL PER 10,000 EMPLOYMENT: 2016*

(headcount)



* Or nearest years for which data are available. For several CIS countries (Armenia, Azerbaijan, Belarus, Kyrgyzstan, Tajikistan), Indonesia and Iran, 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: 2016*

	Government sector	Business enterprise sector	Higher education sector
Russia	**34.0**	**46.3**	**19.4**
CIS countries			
Armenia	78.4	…	21.6
Azerbaijan	66.7	4.3	28.8
Belarus	30.3	59.2	10.5
Kazakhstan	22.4	18.3	53.6
Kyrgyzstan	38.8	6.7	54.5
Moldova	72.4	7.6	20.0
Tajikistan	70.0	…	30.0
Ukraine	58.1	32.5	9.4
Uzbekistan	30.1	10.4	58.8
OECD countries			
Australia	…	27.9	60.6
Austria	3.9	63.7	31.8
Belgium	8.4	48.3	42.9
Canada	5.7	56.0	37.9
Chile	10.6	27.4	49.0
Czech Republic	19.4	50.3	29.8
Denmark	3.4	58.0	38.2
Estonia	12.3	27.5	58.1
Finland	9.5	56.8	32.6

* Or nearest years for which the data are available. For several CIS countries (Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Tajikistan), the calculation is headcount-based, for the rest of the countries it is FTE-based.

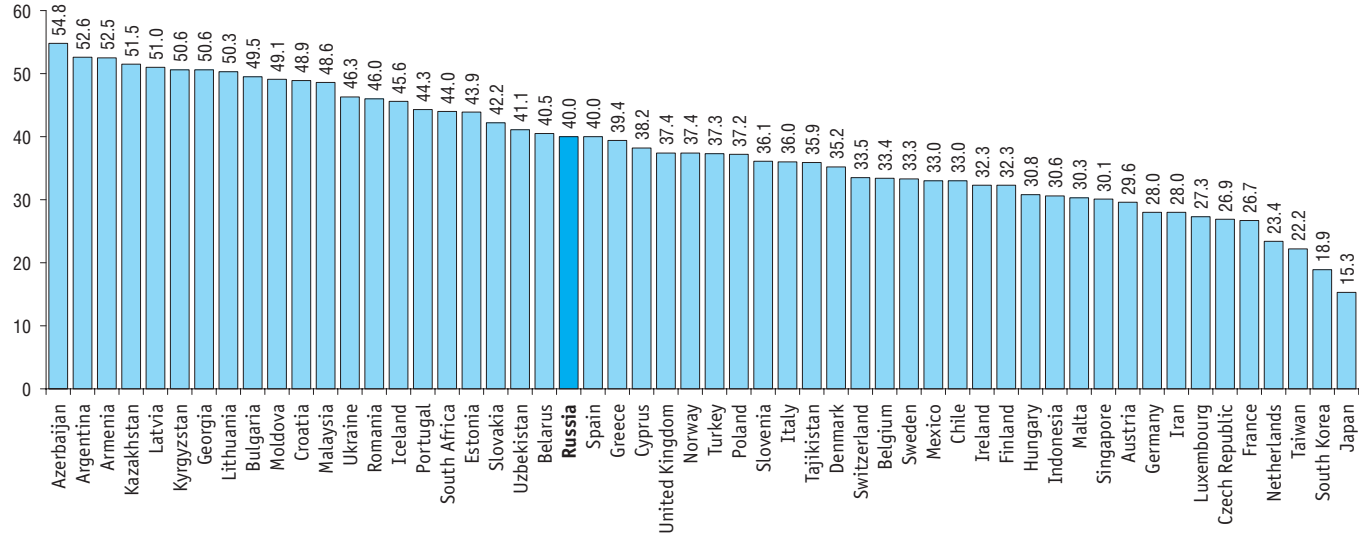
(continued)

	Government sector	Business enterprise sector	Higher education sector
France	10.2	59.7	28.7
Germany	13.9	59.5	26.6
Greece	19.8	14.3	65.2
Hungary	18.5	59.4	22.2
Iceland	12.3	41.8	45.9
Ireland	2.3	53.8	43.9
Israel	0.8	83.7	14.9
Italy	17.6	38.6	40.0
Japan	4.6	73.4	20.7
Latvia	19.1	16.7	64.2
Luxembourg	27.4	36.0	36.6
Mexico	24.3	24.5	48.2
Netherlands	11.9	59.1	29.0
New Zealand	10.2	36.9	52.9
Norway	15.5	48.7	35.8
Poland	16.5	34.8	48.6
Portugal	3.4	29.0	66.4
Slovakia	21.4	19.4	59.1
Slovenia	20.6	53.1	26.2
South Korea	7.4	79.7	11.5
Spain	16.3	36.9	46.6
Sweden	5.1	69.0	25.7
Switzerland	1.1	50.1	48.9
Turkey	6.9	47.6	45.5
United Kingdom	2.6	38.2	58.3
United States	…	71.1	…

(continued)

	Government sector	Business enterprise sector	Higher education sector
EU countries which are not OECD members			
Bulgaria	33.4	38.6	27.2
Croatia	27.6	16.7	55.7
Cyprus	9.9	21.5	61.0
Lithuania	17.8	22.7	59.5
Malta	2.3	58.0	39.8
Romania	38.1	24.3	37.1
Other countries			
Argentina	49.6	8.6	41.0
Brazil	5.5	25.9	67.8
China	18.9	62.7	18.5
Georgia	8.8	…	91.2
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
South Africa	11.6	19.4	67.6
Singapore	5.3	50.5	44.2
Taiwan	10.2	68.9	20.5

8.11. FEMALE RESEARCHERS AS A PERCENTAGE OF THE TOTAL NUMBER OF RESEARCHERS: 2016*



* Or 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: 2012–2016*

	Number of publications	Number of citations**	Number of citations per publication	Average normalised citation***
Russia	**281925**	**977176**	**3.47**	**0.73**
		CIS countries		
Armenia	5378	54314	10.10	1.32
Azerbaijan	3870	25968	6.71	0.94
Belarus	8484	57459	6.77	0.98
Kazakhstan	10290	20600	2.00	0.53
Kyrgyzstan	727	5854	8.05	1.27
Moldova	2137	10504	4.92	0.95
Tajikistan	540	1586	2.94	0.48
Turkmenistan	108	477	4.42	1.25
Ukraine	48618	168916	3.47	0.63
Uzbekistan	2476	6859	2.77	0.50
		OECD countries		
Australia	386085	3681503	9.54	1.56
Austria	105089	1024008	9.74	1.56
Belgium	142673	1541196	10.80	1.69
Canada	442695	4243191	9.58	1.50
Chile	49995	345903	6.92	1.13
Czech Republic	103012	603440	5.86	1.07
Denmark	111655	1321932	11.84	1.86
Estonia	13185	142776	10.83	1.78

(continued)

	Number of publications	Number of citations**	Number of citations per publication	Average normalised citation***
Finland	89135	862935	9.68	1.66
France	526129	4596617	8.74	1.36
Germany	749039	6873157	9.18	1.44
Greece	83239	697315	8.38	1.36
Hungary	48085	362363	7.54	1.20
Iceland	6542	97345	14.88	2.25
Ireland	57715	590226	10.23	1.61
Israel	88350	847828	9.60	1.48
Italy	465192	4141373	8.90	1.48
Japan	609650	3743874	6.14	0.95
Latvia	8331	39012	4.68	1.06
Luxembourg	7629	69305	9.08	1.80
Mexico	94117	511191	5.43	0.88
Netherlands	251861	3001506	11.92	1.80
New Zealand	62185	559053	8.99	1.48
Norway	86831	836921	9.64	1.65
Poland	191985	1020295	5.31	0.98
Portugal	102949	790462	7.68	1.28
Slovakia	34383	161957	4.71	1.02
Slovenia	27584	191768	6.95	1.17
South Korea	371397	2474282	6.66	1.04
Spain	392333	3318585	8.46	1.31
Sweden	170852	1832023	10.72	1.69

(continued)

	Number of publications	Number of citations**	Number of citations per publication	Average normalised citation***
Switzerland	191623	2393492	12.49	1.85
Turkey	187210	832242	4.45	0.79
United Kingdom	785738	7857363	10.00	1.59
United States	2748726	26293339	9.57	1.49
EU countries which are not OECD members				
Bulgaria	19344	111977	5.79	0.90
Croatia	29372	157780	5.37	0.86
Cyprus	8955	79202	8.84	1.57
Lithuania	15529	91160	5.87	1.03
Malta	2478	15669	6.32	1.26
Romania	69610	287482	4.13	0.82
Other countries				
Argentina	58793	395139	6.72	1.00
Brazil	312959	1528478	4.88	0.84
China	2258048	11666349	5.17	0.85
Egypt	75370	374837	4.97	0.88
Georgia	5433	63987	11.78	1.70
India	586472	2524731	4.30	0.76
Indonesia	33567	107708	3.21	0.85
Iran	215616	1070333	4.96	0.88
Malaysia	127487	534159	4.19	0.89
Pakistan	56532	293434	5.19	0.96

(continued)

	Number of publications	Number of citations**	Number of citations per publication	Average normalised citation***
South Africa	84897	575820	6.78	1.20
Saudi Arabia	80540	630869	7.83	1.36
Serbia	35379	196044	5.54	0.92
Singapore	89049	1037998	11.66	1.81
Taiwan	194772	1196282	6.14	0.99
Thailand	61768	326594	5.29	0.92

* According to the analytical system Scopus SciVal.
** The analysis includes citations from publications since the beginning of 2012 till September 8, 2017.
*** Average citation is normalised by field and in relation to worldwide average level.

8.13. NUMBER OF PUBLICATIONS AND CITATIONS IN SCIENTIFIC JOURNALS INDEXED IN WEB OF SCIENCE: 2012–2016*

	Number of publications	Number of citations**	Number of citations per publication	Average normalised citation***
Russia	**205641**	**781266**	**3.80**	**0.82**
		CIS countries		
Armenia	4577	49006	10.71	1.31
Azerbaijan	3004	22887	7.62	1.04
Belarus	6681	50160	7.51	1.02
Kazakhstan	5881	14910	2.54	0.75
Kyrgyzstan	580	4370	7.53	1.18
Moldova	1775	8156	4.59	0.8
Tajikistan	378	1200	3.17	0.54
Turkmenistan	110	555	5.05	1.82
Ukraine	31285	132970	4.25	0.76
Uzbekistan	1863	5660	3.04	0.56
		OECD countries		
Australia	340253	2882174	8.47	1.36
Austria	90622	811427	8.95	1.41
Belgium	127597	1229616	9.64	1.47
Canada	389785	3325445	8.53	1.31
Chile	42309	293199	6.93	1.08
Czech Republic	92432	483011	5.23	1.13
Denmark	99217	1064130	10.73	1.61
Estonia	11707	113685	9.71	1.62

(continued)

	Number of publications	Number of citations**	Number of citations per publication	Average normalised citation***
Finland	77093	677781	8.79	1.43
France	444073	3705532	8.34	1.26
Germany	638113	5598676	8.77	1.33
Greece	69450	528949	7.62	1.23
Hungary	41529	297868	7.17	1.11
Iceland	6209	77613	12.50	1.85
Ireland	49057	453074	9.24	1.39
Israel	81008	679476	8.39	1.25
Italy	396833	3210117	8.09	1.32
Japan	486917	3024943	6.21	0.91
Latvia	8175	26864	3.29	1
Luxembourg	6926	51723	7.47	1.5
Mexico	77035	397746	5.16	0.81
Netherlands	224584	2402284	10.70	1.56
New Zealand	53990	433546	8.03	1.31
Norway	75439	656103	8.70	1.46
Poland	160162	825771	5.16	1.05
Portugal	88775	612898	6.90	1.15
Slovakia	30433	122579	4.03	1.18
Slovenia	23472	153519	6.54	1.07
South Korea	311588	1965259	6.31	0.91
Spain	334892	2670680	7.97	1.2
Sweden	151756	1456822	9.60	1.46

(continued)

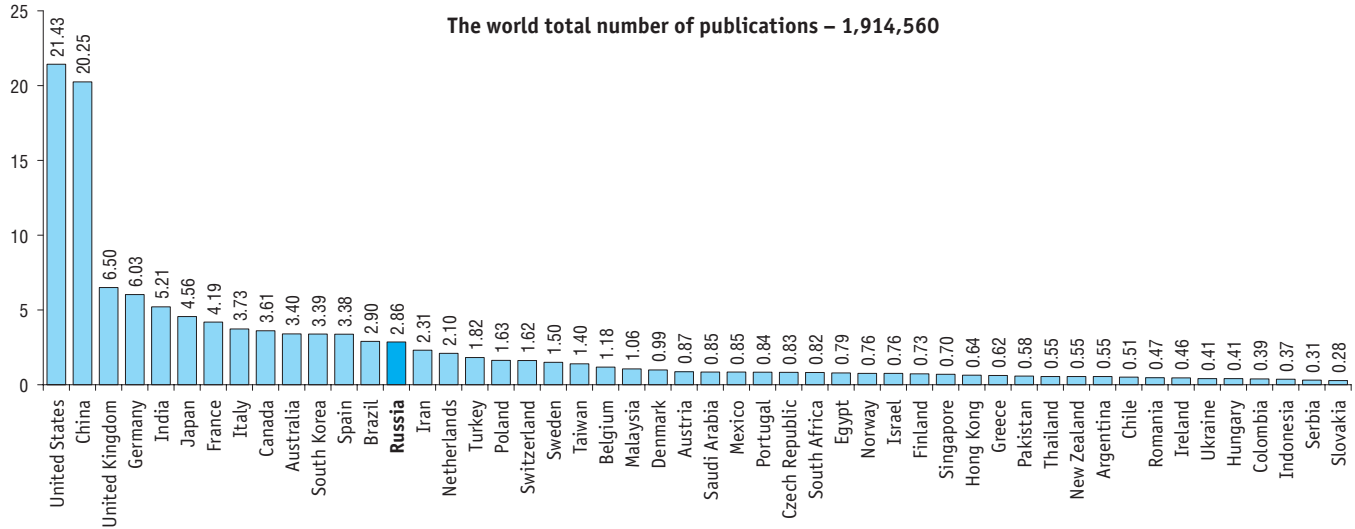
	Number of publications	Number of citations**	Number of citations per publication	Average normalised citation***
Switzerland	168983	1935600	11.45	1.66
Turkey	161212	633581	3.93	0.73
United Kingdom	689046	6151513	8.93	1.39
United States	2358165	20710228	8.78	1.32
EU countries which are not OECD members				
Bulgaria	15082	90661	6.01	0.93
Croatia	22792	124748	5.47	0.89
Cyprus	7763	62438	8.04	1.51
Lithuania	15104	73568	4.87	0.95
Malta	1940	10886	5.61	1.19
Romania	71303	239120	3.35	0.87
Other countries				
Argentina	49347	316756	6.42	0.93
Brazil	239726	1134227	4.73	0.8
China	1662153	9112437	5.48	0.89
Egypt	53949	261221	4.84	0.86
Georgia	3461	52541	15.18	1.92
India	392812	1780040	4.53	0.78
Indonesia	21976	67650	3.08	0.97
Iran	158666	763682	4.81	0.83
Malaysia	88328	345016	3.91	0.97
Pakistan	44019	216360	4.92	0.89

(continued)

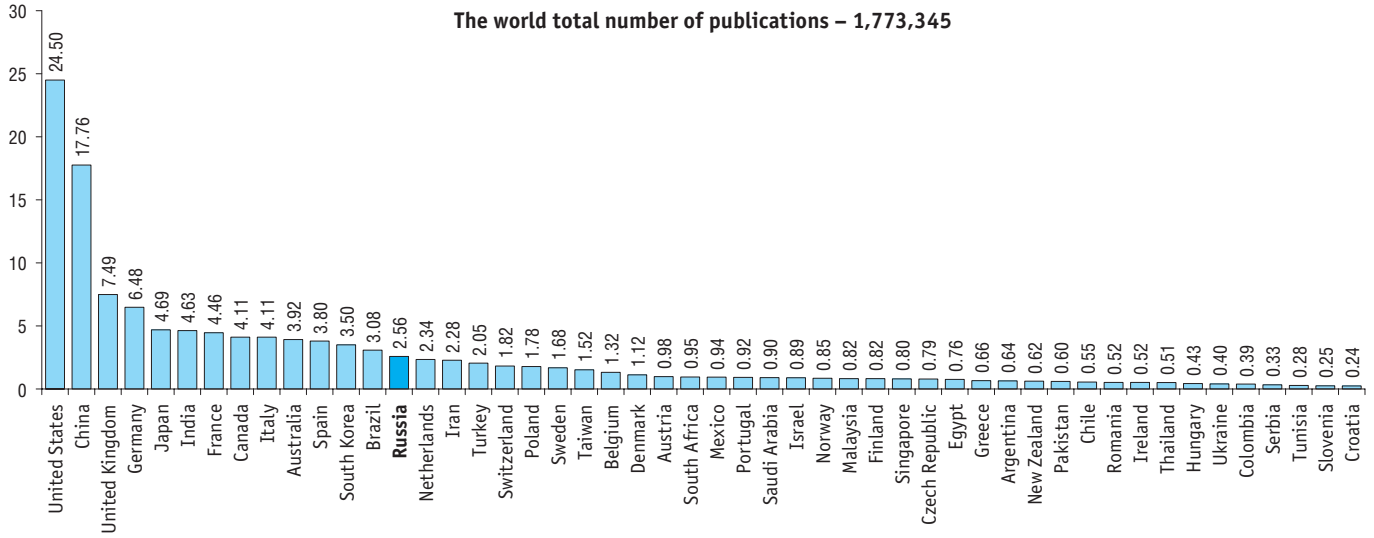
	Number of publications	Number of citations**	Number of citations per publication	Average normalised citation***
South Africa	70962	457849	6.45	1.1
Saudi Arabia	65373	493132	7.54	1.25
Serbia	31486	155765	4.95	0.81
Singapore	79907	822830	10.30	1.53
Taiwan	169754	961081	5.66	0.87
Thailand	46774	242776	5.19	0.93

* According to the analytical system InCites Thomson Reuters.
** The analysis includes citations from publications since the beginning of 2012 till September 9, 2017.
*** Average citation is normalised by field and in relation to worldwide average level.

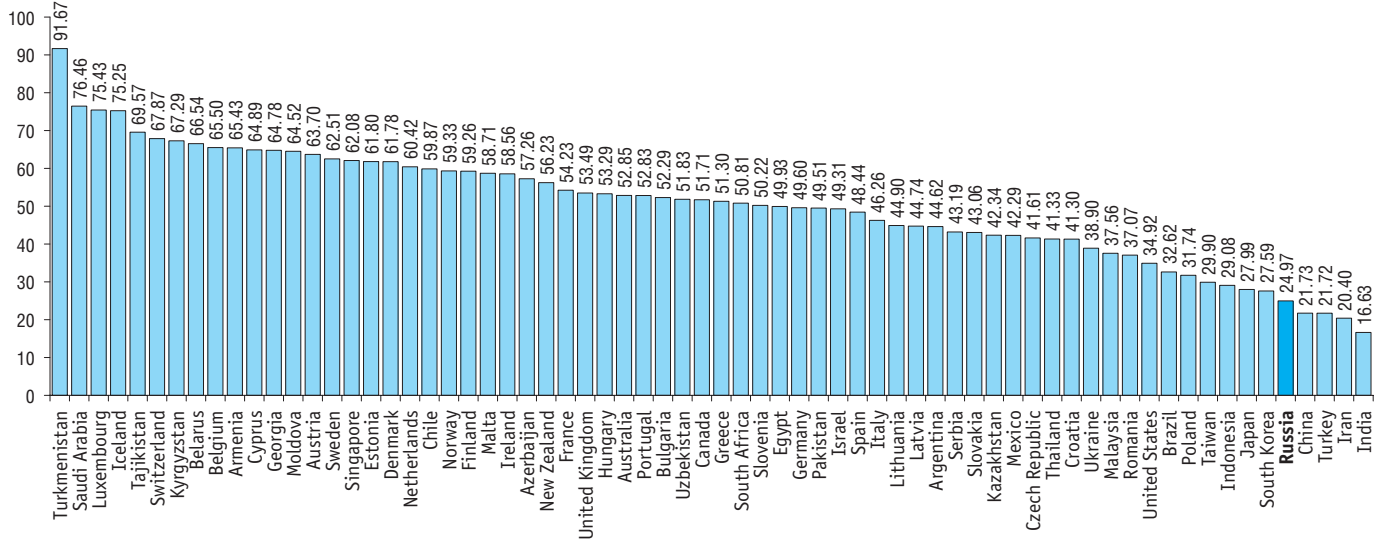
8.14. COUNTRY SHARES IN THE WORLD TOTAL NUMBER OF PUBLICATIONS IN SCIENTIFIC JOURNALS INDEXED IN SCOPUS: 2016



8.15. COUNTRY SHARES IN THE WORLD TOTAL NUMBER OF PUBLICATIONS IN SCIENTIFIC JOURNALS INDEXED IN WEB OF SCIENCE: 2016*

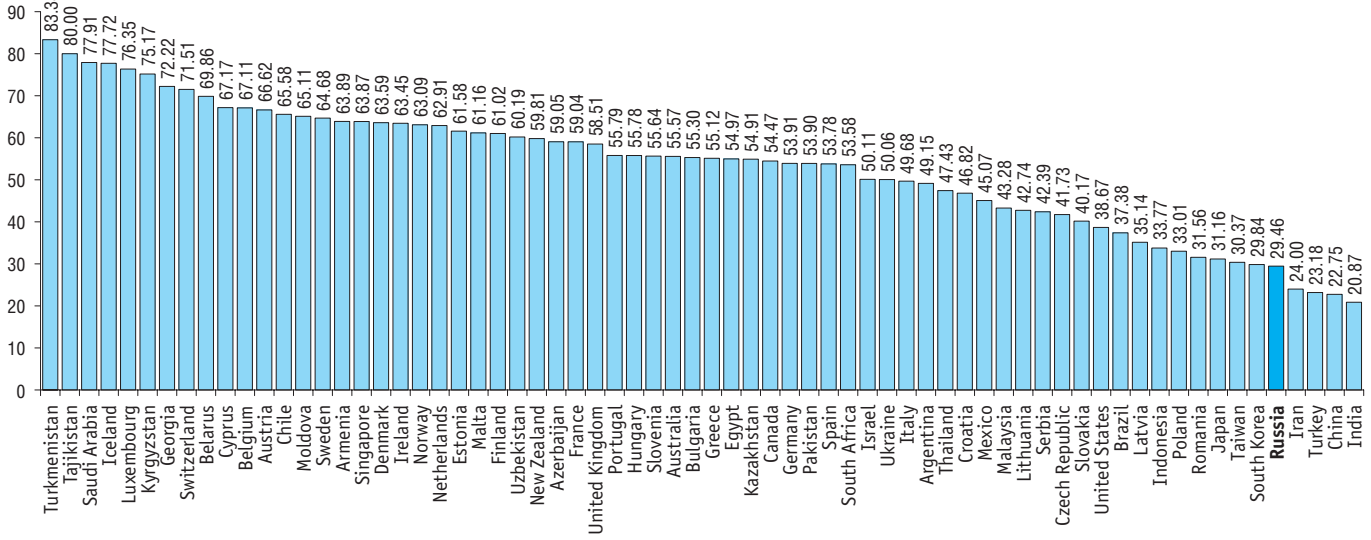


8.16. PUBLICATIONS CO-AUTHORED WITH FOREIGN RESEARCHERS AS A PERCENTAGE OF THE TOTAL NUMBER OF COUNTRY'S PUBLICATIONS IN SCIENTIFIC JOURNALS INDEXED IN SCOPUS: 2016*



* 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: 2016*



* According to InCites.

8.18. RESIDENT AND NON-RESIDENT PATENT APPLICATIONS BY PATENT OFFICE

	1995	2000	2005	2010	2011	2012	2013	2014	2015
Russia	**22202**	**28688**	**32254**	**42500**	**41414**	**44211**	**44914**	**40308**	**45517**
CIS countries									
Armenia	285	127	208	142	140	141	131	123	115
Azerbaijan	251	…	287	271	205	144	156	168	184
Belarus	1039	1198	1462	1933	1871	1871	1634	757	691
Kazakhstan	1373	1515	1626	1964	1732	…	2202	2013	1503
Kyrgyzstan	148	84	131	140	129	111	114	139	126
Moldova	309	250	388	150	108	115	96	139	124
Tajikistan	65	52	36	10	5	6	4	…	1
Turkmenistan	…	…	…	…	…	…	…	…	…
Ukraine	5960	7224	5592	5312	5253	4955	5412	4813	4497
Uzbekistan	1058	968	444	632	556	510	557	568	507
OECD countries									
Australia	14061	22001	23857	24887	25526	26358	29717	25956	28605
Austria	2186	2301	2505	2673	2430	2552	2406	2363	2441
Belgium	1087	820	622	760	763	882	876	1026	1097
Canada	26592	39622	39888	35449	35111	35242	34741	35481	36964
Chile	1706	3120	3007	1076	2792	3019	3072	3105	3274
Czech Republic	3519	4939	830	982	880	1071	1081	972	952
Denmark	1484	1870	1823	1768	1771	1635	1534	1583	1732
Estonia	79	804	38	97	77	25	42	50	36
Finland	3791	2903	2059	1833	1774	1827	1737	1545	1416

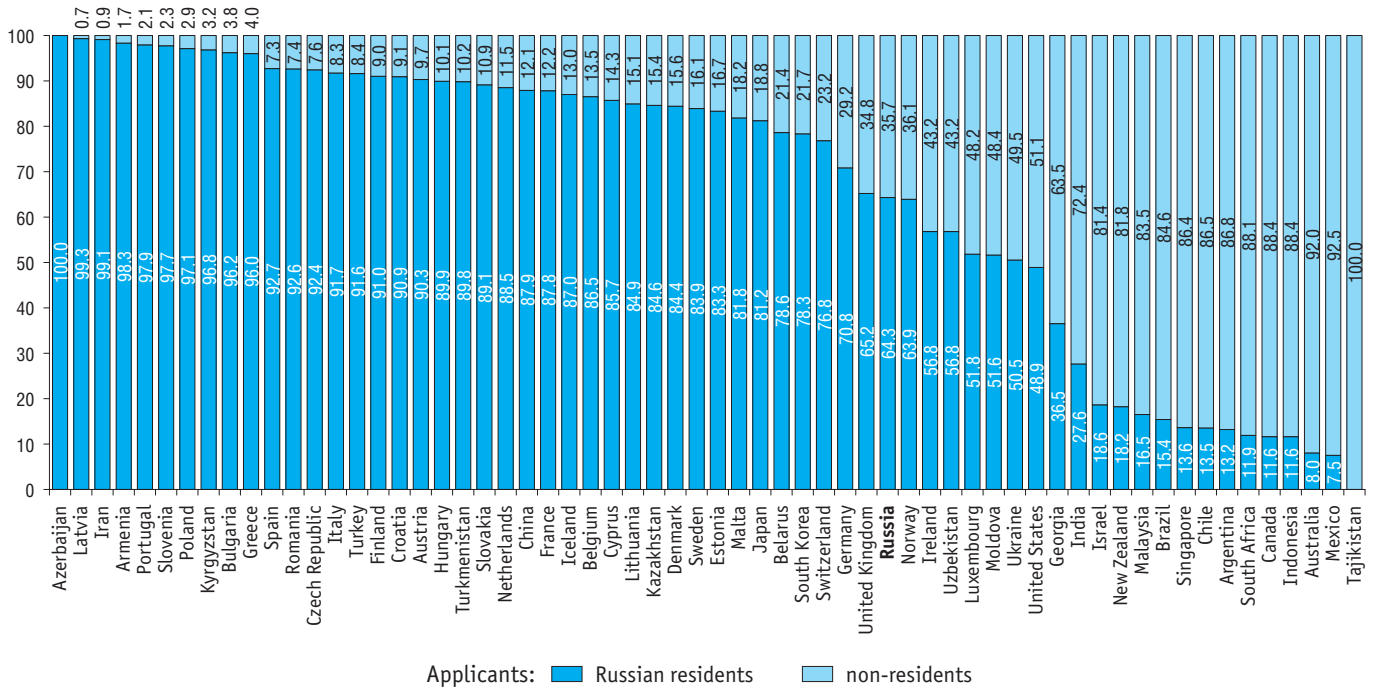
(continued)

	1995	2000	2005	2010	2011	2012	2013	2014	2015
France	15896	17353	17275	16580	16754	16632	16886	16533	16300
Germany	46158	62142	60222	59245	59444	61340	63167	65965	66893
Greece	312	340	482	744	…	656	717	670	573
Hungary	2889	4937	1202	696	698	758	708	619	633
Iceland	68	876	592	76	71	44	46	64	46
Ireland	990	1080	864	792	561	555	390	321	440
Israel	4425	6802	6826	7306	6886	6792	6185	6273	6908
Italy	8574	9273	9331	9723	9721	9310	9212	9382	9687
Japan	368831	419543	427078	344598	342610	342796	328436	325989	318721
Latvia	300	179	169	185	183	205	233	107	137
Luxembourg	104	176	88	100	128	161	169	218	247
Mexico	5234	13061	14435	14576	14055	15314	15444	16135	18071
Netherlands	2692	2994	2850	2767	2895	2713	2764	2582	2494
New Zealand	4719	7048	7005	6636	6209	7099	6781	7728	6501
Norway	5408	6700	5986	1813	1776	1564	1749	1563	1805
Poland	3860	7303	6583	3430	4123	4657	4411	4096	4815
Portugal	201	146	205	545	646	647	669	740	945
Slovakia	1669	2040	250	282	257	203	210	234	256
Slovenia	430	431	373	453	481	…	…	…	…
South Korea	78499	102010	160921	170101	178924	188915	204589	210292	213694
Spain	2600	3194	3353	3779	3626	3475	3244	3178	3020
Sweden	4865	5068	2960	2549	2341	2436	2495	2425	2428
Switzerland	3720	2551	2098	2155	2043	2988	2156	2048	1923
Turkey	1690	3433	1146	3357	4113	4666	4661	5097	5841
United Kingdom	27521	32747	27988	21929	22259	23235	22938	23040	22801
United States	228142	295895	390733	490226	503582	542815	571612	578802	589410

(continued)

	1995	2000	2005	2010	2011	2012	2013	2014	2015
EU countries which are not OECD members									
Bulgaria	731	940	313	260	283	259	297	234	291
Croatia	600	875	1012	278	251	249	253	200	186
Cyprus	…	70	64	8	8	12	3	4	7
Lithuania	133	127	115	114	108	124	137	165	119
Malta	24	116	…	19	15	17	17	13	11
Romania	2232	1290	984	1418	1463	1077	1046	1036	1053
Other countries									
Argentina	4264	6636	5269	4717	4821	4813	4772	4682	4125
Brazil	7448	17376	20005	22686	28306	30116	30884	30342	30219
China	18699	51906	173327	391177	526412	652777	825136	928177	1101864
Georgia	707	456	461	359	398	372	333	297	271
India	6566	8538	24382	39762	42291	43955	43031	42854	45658
Indonesia	2874	3890	4304	5630	5830	…	7450	8023	9153
Iran	407	616	4494	11636	12018	11054	11643	13802	14279
Malaysia	4052	6227	6286	6383	6452	6940	7205	7620	7727
South Africa	6365	3295	7004	6383	7245	7444	7295	7552	7497
Singapore	2557	8236	8605	9773	9794	9685	9722	10312	10814

8.19. PERCENTAGE DISTRIBUTION OF PATENT APPLICATIONS BY APPLICANT AND COUNTRY: 2015*



* Or nearest years for which data are available.

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			
	2012	2013	2014	2015	2012	2013	2014	2015	2012	2013	2014	2015
Russia	**34379**	**34067**	**28512**	**33792**	**239.9**	**237.1**	**194.9**	**230.7**	**447.1**	**445.3**	**373.7**	**444.0**
CIS countries												
Armenia	184	175	156	160	63.4	60.3	53.8	55.2	122.7	116.7	104.0	106.7
Azerbaijan	331	448	542	499	35.6	47.7	57.1	52.0	72.0	95.3	112.9	104.0
Belarus	2701	2323	1781	1967	284.3	244.5	187.5	207.1	551.2	474.1	371.0	409.8
Kazakhstan	504	2386	2453	1797	30.0	140.4	141.8	102.7	56.0	265.1	272.6	197.5
Kyrgyzstan	130	130	173	180	23.2	22.8	29.8	30.0	52.0	52.0	69.2	69.2
Moldova	144	144	79	98	40.0	40.0	21.9	27.2	120.0	120.0	65.8	75.4
Tajikistan	19	11	8	16	2.4	1.3	1.0	1.9	5.4	3.1	2.2	4.2
Turkmenistan	2	1	1	…	0.4	0.2	0.2	…	0.9	0.4	0.4	…
Ukraine	3069	3499	2990	2878	67.3	76.9	66.0	63.7	135.2	153.5	131.7	126.8
Uzbekistan	270	308	374	305	9.1	10.2	12.1	9.7	20.8	23.2	27.5	21.9
OECD countries												
Australia	11719	12515	11903	11193	514.0	541.8	506.5	470.3	976.6	1025.8	967.7	895.4
Austria	12398	13352	13689	14009	1476.0	1570.8	1610.5	1629.0	2817.7	3034.5	3111.1	3113.1
Belgium	12136	11726	12184	12342	1093.3	1047.0	1087.9	1092.2	2476.7	2345.2	2436.8	2468.4
Canada	26828	26304	24705	24713	770.9	749.4	695.9	690.3	1390.1	1348.9	1260.5	1254.5
Chile	784	805	998	850	45.3	46.0	56.7	47.8	94.5	94.7	114.7	96.6
Czech Republic	1886	2140	2180	2365	179.6	203.8	207.6	225.2	355.8	403.8	411.3	446.2
Denmark	10950	12207	12538	12195	1955.4	2179.8	2238.9	2139.5	3775.9	4209.3	4323.4	4205.2
Estonia	291	273	278	236	223.8	210.0	213.8	181.5	415.7	390.0	397.1	337.1

(continued)

	Number of applications				Number of applications per 1,000,000 population				Number of applications per 1,000,000 labour force			
	2012	2013	2014	2015	2012	2013	2014	2015	2012	2013	2014	2015
Finland	12940	12710	14070	13172	2396.3	2353.7	2558.2	2394.9	4792.6	4707.4	5211.1	4878.5
France	69985	71083	72310	72398	1065.2	1077.0	1095.6	1087.1	2340.6	2369.4	2410.3	2413.3
Germany	183048	184493	179506	175057	2276.7	2289.0	2216.1	2142.7	4379.1	4371.9	4223.7	4090.1
Greece	1107	1083	1251	1151	100.6	98.5	114.8	106.6	221.4	221.0	260.6	239.8
Hungary	1655	1560	1434	1493	167.2	157.6	144.8	152.3	376.1	354.5	318.7	331.8
Iceland	320	233	302	263	1066.7	776.7	1006.7	876.7	1600.0	1165.0	1510.0	1315.0
Ireland	4278	4389	4779	5322	930.0	954.1	1038.9	1132.3	1944.5	1995.0	2172.3	2419.1
Israel	12384	12767	13437	14470	1567.6	1576.2	1638.7	1722.6	3440.0	3450.5	3536.1	3710.3
Italy	28523	28896	29288	21608	479.4	480.0	481.7	356.0	1140.9	1155.8	1153.1	854.1
Japan	490271	473141	465971	455005	3842.2	3713.8	3660.4	3579.9	7508.0	7212.5	7070.9	6936.1
Latvia	359	480	193	287	179.5	240.0	96.5	143.5	359.0	480.0	193.0	287.0
Luxembourg	2449	2650	3137	2776	4898.0	5300.0	5228.3	3965.7	8163.3	8833.3	10456.7	9253.3
Mexico	2219	2139	2187	2508	18.4	17.7	17.9	20.2	41.3	39.3	39.3	44.2
Netherlands	31305	33589	37729	37983	1863.4	1999.3	2232.5	2247.5	3478.3	3732.1	4192.1	4220.3
New Zealand	2894	3450	3429	3282	657.7	784.1	762.0	713.5	1205.8	1437.5	1428.8	1312.8
Norway	5970	5765	5872	5703	1194.0	1130.4	1151.4	1096.7	2211.1	2135.2	2174.8	2036.8
Poland	6043	6031	6171	7009	158.6	158.7	162.4	184.4	330.2	329.6	335.4	380.9
Portugal	1128	1318	1332	1624	107.4	125.5	128.1	156.2	208.9	248.7	256.2	312.3
Slovakia	368	401	454	495	68.1	74.3	84.1	91.7	131.4	143.2	162.1	183.3
Slovenia	496	536	509	462	236.2	255.2	242.4	220.0	496.0	536.0	509.0	462.0
South Korea	203836	223527	230553	238045	4060.5	4435.1	4547.4	4667.5	7870.1	8531.6	8733.1	8915.5
Spain	11844	11012	10924	10843	253.1	236.3	234.9	233.7	501.9	470.6	470.9	469.4
Sweden	21725	22647	23854	24345	2286.8	2359.1	2459.2	2484.2	4259.8	4355.2	4587.3	4681.7

(continued)

	Number of applications				Number of applications per 1,000,000 population				Number of applications per 1,000,000 labour force			
	2012	2013	2014	2015	2012	2013	2014	2015	2012	2013	2014	2015
Switzerland	42015	44997	44406	45658	5251.9	5555.2	5415.4	5501.0	9133.7	9573.8	9251.3	9512.1
Turkey	5983	5793	6495	7287	80.2	76.4	84.4	93.1	220.0	207.6	226.3	248.7
United Kingdom	51562	51300	52605	53302	809.5	800.3	814.3	818.8	1576.8	1549.8	1575.0	1586.4
United States	473489	501162	509521	526632	1507.9	1586.0	1599.2	1641.1	2985.4	3150.0	3188.5	3271.0
EU countries which are not OECD members												
Bulgaria	371	500	467	512	50.8	68.5	64.9	71.1	103.1	147.1	137.4	155.2
Croatia	345	411	259	250	80.2	95.6	61.7	59.5	181.6	228.3	136.3	131.6
Cyprus	439	353	492	350	399.1	320.9	410.0	291.7	731.7	588.3	820.0	583.3
Lithuania	196	220	254	275	65.3	73.3	87.6	94.8	130.7	146.7	169.3	183.3
Malta	265	273	475	483	662.5	682.5	1187.5	1207.5	1325.0	1365.0	2375.0	2415.0
Romania	1244	1241	1252	1235	61.9	62.1	62.9	62.4	133.8	133.4	133.2	131.4
Other countries												
Argentina	1079	922	791	889	25.6	21.7	18.4	20.5	57.1	48.0	40.6	44.9
Brazil	6603	6848	6717	6552	32.9	33.8	32.9	31.8	64.2	65.8	63.5	61.2
China	561408	734096	837817	1010448	415.6	540.8	614.1	736.9	711.5	925.4	1051.3	1262.4
Georgia	153	119	131	124	40.3	31.3	34.5	33.5	72.9	56.7	65.5	62.0
India	18202	20908	22445	23946	14.4	16.4	17.3	18.3	38.2	43.1	45.6	47.7
Indonesia	…	755	771	1174	…	3.0	3.0	4.5	…	6.2	6.2	9.4
Iran	10700	11343	13768	…	139.9	146.6	175.6	…	421.3	432.9	517.6	…
Malaysia	1975	2299	2661	2299	67.6	77.4	88.1	74.9	149.6	165.4	187.4	157.5
South Africa	1688	2211	2317	2076	32.2	41.5	42.8	37.7	88.8	112.2	115.3	100.8
Singapore	4884	5471	5927	6155	921.5	1013.1	1077.6	1119.1	1628.0	1764.8	1911.9	1985.5

8.21. NUMBER OF TRIADIC PATENT FAMILIES*

	1995	2000	2005	2010	2011	2012	2013	2014	2015
Russia	**63**	**85**	**91**	**88**	**85**	**91**	**90**	**89**	**87**
OECD countries									
Australia	236	516	480	307	321	335	333	336	338
Austria	223	347	409	389	362	379	412	438	462
Belgium	375	455	543	461	460	430	442	447	448
Canada	390	612	717	552	578	526	561	553	537
Chile	2	2	6	14	16	10	12	13	13
Czech Republic	3	10	25	15	35	37	35	36	38
Denmark	189	290	389	301	259	283	294	297	297
Estonia	0	1	3	3	7	4	9	10	10
Finland	319	433	391	228	227	288	289	291	291
France	1976	2925	3048	2459	2597	2434	2461	2528	2578
Germany	4914	7636	7138	5058	4809	4586	4584	4520	4455
Greece	2	11	24	5	11	23	23	27	30
Hungary	25	42	58	37	43	31	30	32	33
Iceland	6	13	7	3	2	2	2	2	2
Ireland	31	51	98	65	69	73	87	95	104
Israel	161	385	502	348	366	402	426	443	463
Italy	621	832	964	683	721	724	741	761	781
Japan	9592	17915	17722	18463	18565	18637	17542	17484	17361
Latvia	2	5	10	1	3	2	4	3	3
Luxembourg	14	22	21	19	23	22	24	21	20
Mexico	12	9	19	16	18	16	16	18	19
Netherlands	769	1264	1761	825	968	1038	1094	1161	1167
New Zealand	21	72	73	43	51	103	112	126	130

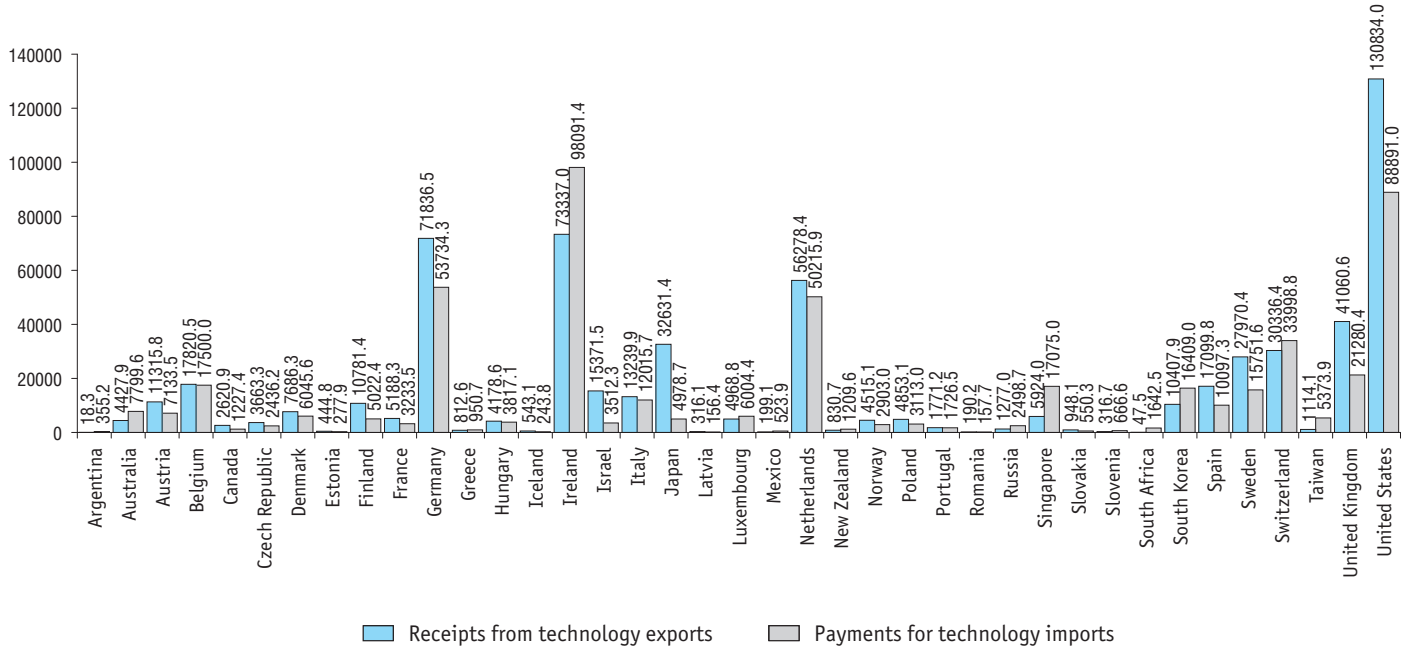
* Aggregate amount of patents issued for one invention by the European patent office (EPO), the United States patent and trademark office (USPTO), and the Japanese patent office (JPO). Data are as of November 20, 2017.

(continued)

	1995	2000	2005	2010	2011	2012	2013	2014	2015
Norway	87	138	141	115	94	101	100	95	91
Poland	5	9	18	62	64	69	79	91	100
Portugal	3	5	16	17	26	23	28	28	29
Slovakia	2	2	2	7	13	8	9	9	9
Slovenia	7	9	22	16	10	10	13	12	10
South Korea	331	908	2746	2461	2368	2493	2679	2684	2703
Spain	83	196	292	238	220	230	228	229	229
Sweden	760	792	969	644	614	662	632	648	658
Switzerland	771	1004	1084	1065	1054	1140	1180	1192	1207
Turkey	2	5	16	33	37	31	40	46	50
United Kingdom	1586	2362	2161	1656	1727	1699	1777	1793	1811
United States	12365	15622	17374	12744	13193	13712	14601	14688	14886
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	12	13	15
Other countries									
Argentina	6	8	16	8	10	8	6	6	7
Brazil	20	29	24	0	…	…	…	…	…
China	21	87	519	1425	1501	1946	2169	2477	2889
India	8	48	91	12	…	…	…	…	…
South Africa	25	51	49	31	44	33	32	29	25
Singapore	21	82	168	104	120	106	116	131	144

8.22. TECHNOLOGY BALANCE OF PAYMENTS: 2016*

(million USD)



* Or nearest years for which data are available.

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 with 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.

Enterprises engaged in technological innovation are enterprises (organisations, institutions) that develop and implement new or significantly improved goods, works, 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 Priority S&T Area 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 design and engineering solution for a manufactured or artisan product that determines its external appearance.

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; into technology new or significantly improved production processes or services delivery (provision) methods, that has 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.

Innovation goods and services are goods, works, 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 microorganism, 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.

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 programme 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 postgraduate 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 Russian Ministry of Science and Higher Education 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, enrolled in postgraduate programmes before January 1, 2014, are provided according to Academic Degrees Nomenclature, approved by the Order of the Russian Ministry of Science and Higher Education no. 59 of February 25, 2009 (as revised by Orders of the Russian Ministry of Science and Higher Education 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 vehicles;
- 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, researches 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 researches. 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.

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);

• budget appropriations for higher education institutions;

• 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.

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

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