



Ministry of Science
and Higher Education of the Russian Federation



Federal State
Statistics Service



HIGHER SCHOOL OF ECONOMICS
NATIONAL RESEARCH UNIVERSITY



SCIENCE. TECHNOLOGY. INNOVATION

Pocket Data Book



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NATIONAL RESEARCH UNIVERSITY



SCIENCE. TECHNOLOGY. INNOVATION

Pocket Data Book

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The pocket data book contains main indicators characterizing S&T and innovation potential of the Russian Federation. There are the information about intellectual property, S&T output, data of international comparisons given.

The data book includes information of the Federal State Statistics Service, Federal Service for Intellectual Property, Organisation for Economic Co-operation and Development (OECD), Eurostat, UNESCO, World Intellectual Property Organisation, national statistical services of foreign countries, and results of own methodological and analytical studies of the HSE Institute for Statistical Studies and Economics of Knowledge.

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

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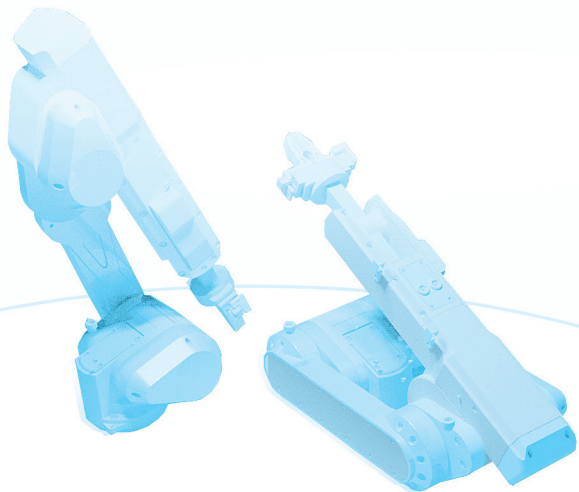
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Symbols used in tables are:

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

In some tables, details may not add to the totals
because of rounding.

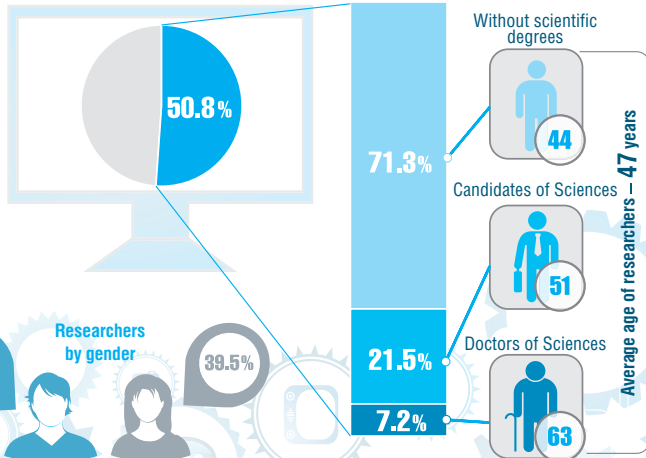


Infographics

R&D Personnel: 2017

R&D Personnel
Total – 707.9 thousand persons

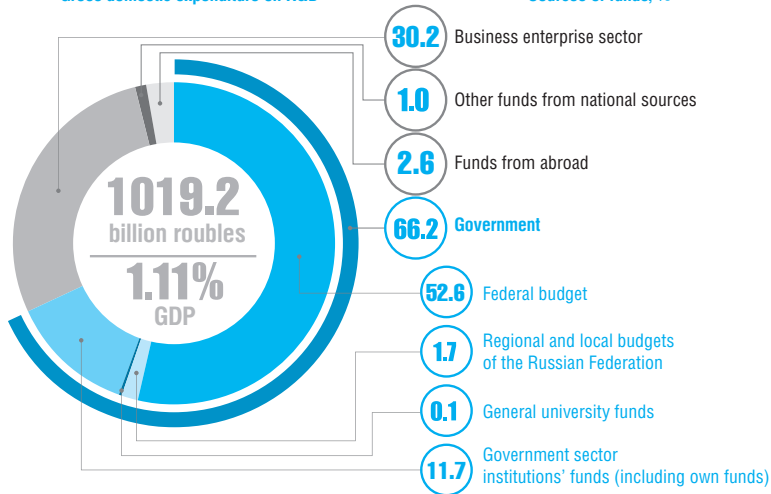
Researchers
Total – 359.8 thousand persons



R&D Funding: 2017

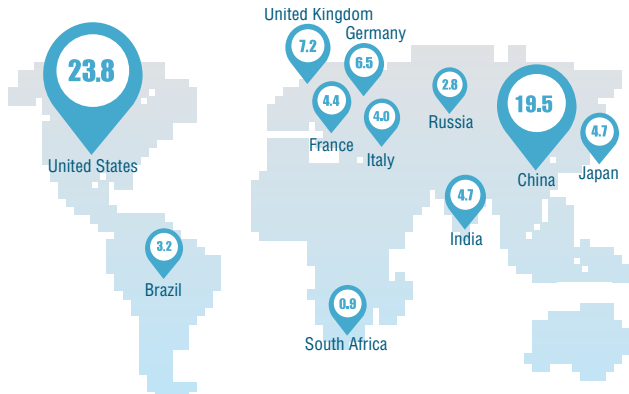
Gross domestic expenditure on R&D

Sources of funds, %

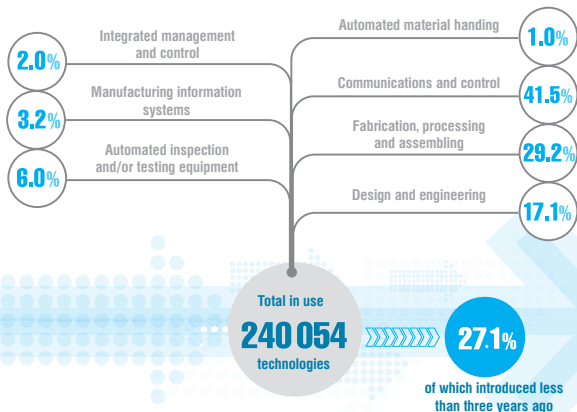


Country shares in the total number of articles in scientific journals indexed in Web of Science: 2017

(per cent)



Use of advanced manufacturing technologies by degree of novelty: 2017



Development of innovation: 2017



Industry



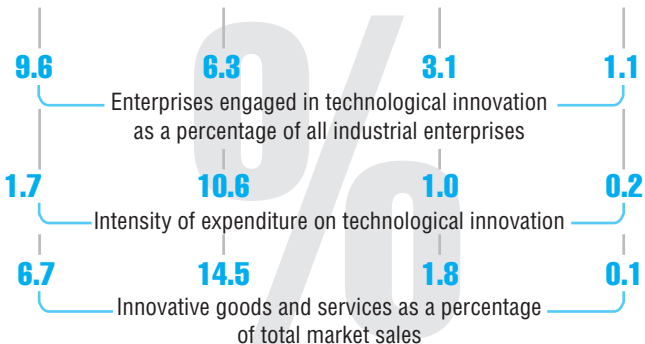
Service sector

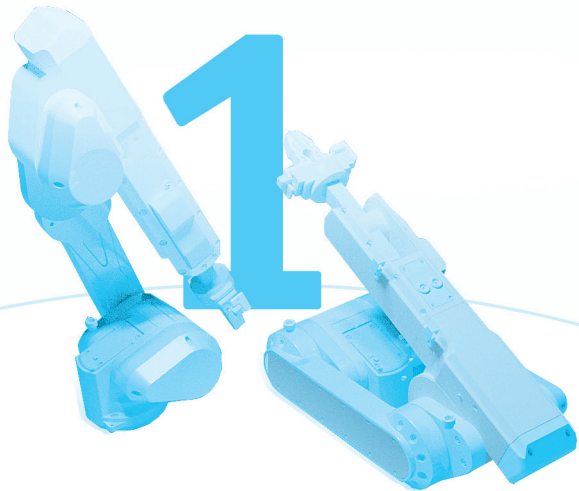


Agriculture



Construction





Institutions

1.1. R&D institutions by type

	1991	2000	2015*	2016	2017
Total	4564	4099	4175	4032	3944
Research institutes	1831	2686	1708	1673	1577
Design organisations	930	318	322	304	273
Construction project and exploration organisations	559	85	29	26	23
Experimental enterprises	15	33	61	62	63
Higher education institutions	450	390	1040	979	970
Industrial enterprises	400	284	371	363	380
Others	379	303	644	625	658

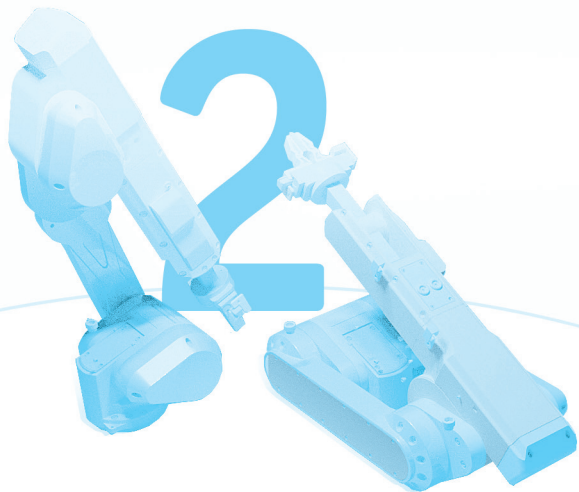
* Since 2015 the number of institutions includes branches of higher education institutions.

1.2. R&D institutions by sector of performance

	1991	2000	2015	2016	2017
Total	4564	4099	4175	4032	3944
Sectors of performance:					
government	992	1247	1560	1546	1493
business enterprise	3009	2278	1400	1326	1292
higher education	537	526	1124	1064	1038
private non-profit	26	48	91	96	121

1.3. R&D institutions by ownership

	1995	2000	2015	2016	2017
Total	4059	4099	4175	4032	3944
Ownership:					
public	2979	2938	2684	2592	2520
private	198	388	881	865	875
joint	832	635	358	326	296
of state corporations	...	...	90	92	106
foreign and joint (with both Russian and foreign participation)	25	64	98	92	85
others	25	74	64	65	62



R&D Personnel

2.1. R&D personnel

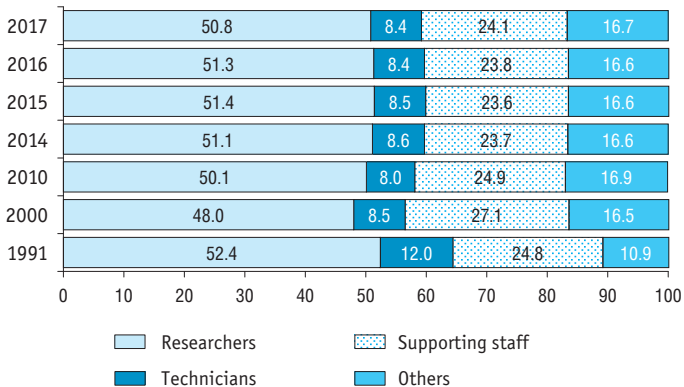
(headcount)

	1991	2000	2015	2016	2017
Total	1677784	887729	738857	722291	707887
Research institutes	970565	718434	435502	427158	407962
Design organisations	287504	56488	136263	133742	125272
Construction project and exploration organisations	149833	6811	2849	1801	1537
Experimental enterprises	19495	6145	3023	2996	6030
Higher education institutions	90550	31110	60151	59124	56571
Industrial enterprises	118414	54721	53868	50740	59421
Others	41423	14020	47201	46730	51094

2.2. R&D personnel by occupation (headcount)

	1991	2000	2015	2016	2017
Total	1677784	887729	738857	722291	707887
Researchers	878482	425954	379411	370379	359793
Technicians	200606	75184	62805	60441	59690
Supporting staff	416590	240506	174056	171915	170347
Others	182106	146085	122585	119556	118057

2.3. Percentage distribution of R&D personnel by occupation



2.4. R&D personnel by sector of performance (headcount)

	1991	2000	2015	2016	2017
Total	1677784	887729	738857	722291	707887
Sectors of performance:					
government	294500	255850	265429	269056	268080
business enterprise	1269200	590646	408802	388385	377150
higher education	112700	40787	63870	63046	59729
private non-profit	1400	446	756	1804	2928

2.5. Flows of R&D personnel (headcount)

	Inflow – total	Of which		Outflow – total	Of which	
		Graduates from higher education institutions	from other research institutes		at own initiative	due to staff reduction
1995	108335	6498	23402	226585	141776	29747
2005	109973	13495	15618	122773	81623	6598
2009	93526	13235	13529	97071	58295	5776
2011	94939	13725	11881	100849	62848	2973
2013	54550	11075	13210	93112	59214	2015
2015	100290	11662	14026	98643	58285	4238
2017	92300	9985	12539	98797	57974	4327

2.6. R&D personnel by country

(thousand person-years; in full-time equivalent)

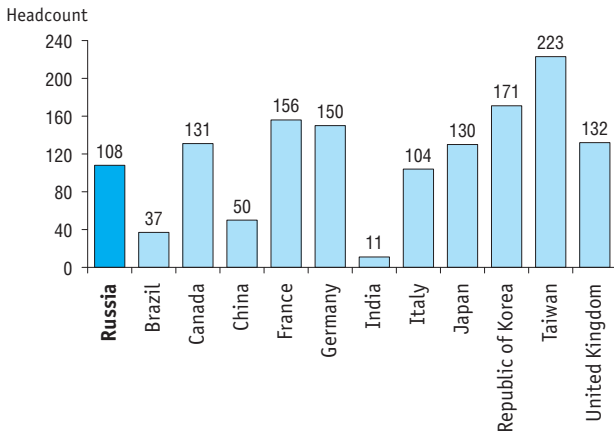
	1994	2000	2017*	Rank**
Russia	1264.1	1007.3	778.2	4
Brazil	...	133.0	347.7	10
Canada	143.6	167.9	237.3	13
China	783.2	922.1	3878.1	1
France	315.2	327.5	428.6	8
Germany	...	484.7	656.7	5
India	...	318.4	528.2	6
Italy	143.8	150.1	258.6	11
Japan	828.0	896.8	872.3	3
Republic of Korea	...	138.1	447.4	7
Taiwan	...	104.6	251.0	12
United Kingdom	267.8	288.6	419.9	9
United States***	773.2	983.3	1380.0	2

* Or nearest years for which data is available.

** Among countries of the world.

*** Calculated by employment in full-time equivalent.

2.7. R&D personnel per 10 000 employment by country: 2017*



* Or nearest years for which data is available. Calculated by employment in full-time equivalent.

2.8. Researchers by sector of performance

(headcount)

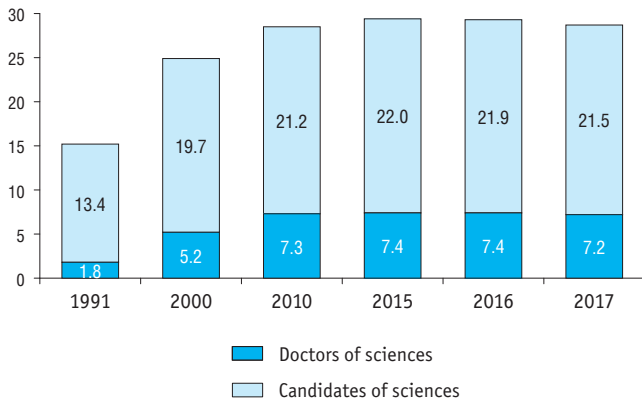
	1991	2000	2015	2016	2017
Total	878482	425954	379411	370379	359793
Sectors of performance:					
government	166100	129725	134794	134225	130081
business enterprise	637200	267640	198123	190378	186347
higher education	74300	28325	45967	44994	42113
private non-profit	900	264	527	782	1252

2.9. Researchers with scientific degrees

(headcount)

	1991	2000	2015	2016	2017
Researchers with scientific degrees	134176	105911	111533	108388	103327
Doctors of sciences	16165	21949	28046	27430	26076
Candidates of sciences	118011	83962	83487	80958	77251

2.10. Researchers with scientific degrees as a percentage of the total number of researchers

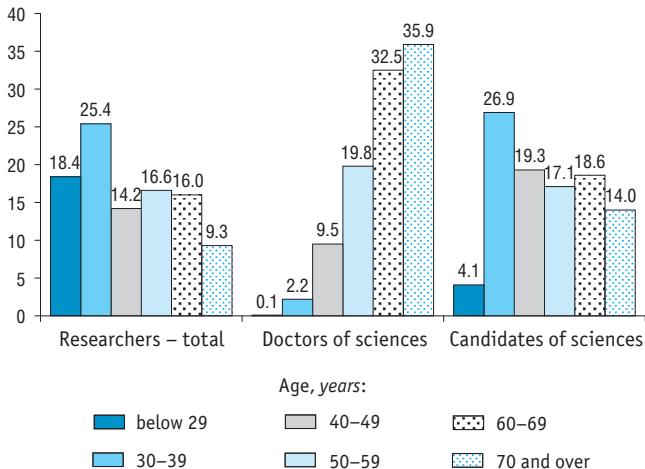


2.11. Researchers by field of science and technology: 2017

(headcount)

	Researchers	Of whom	
		doctors of sciences	candidates of sciences
Total	359793	26076	77251
Natural sciences	79980	11503	31703
Engineering	224111	4435	20581
Medical sciences	14942	3621	6133
Agricultural sciences	10343	1384	4183
Social sciences	18126	2726	8811
Humanities	12291	2407	5840

2.12. Percentage distribution of researchers by age: 2017



2.13. Researchers by country

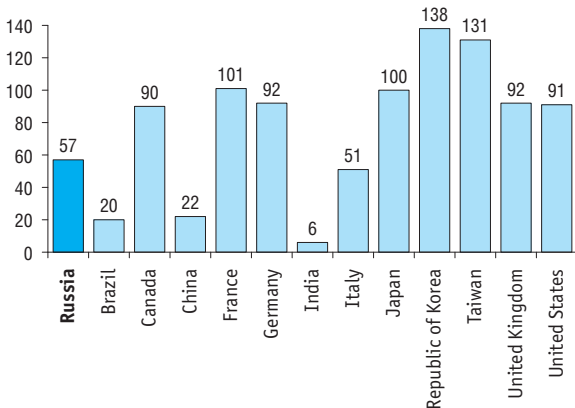
(thousand person-years; in full-time equivalent)

	1994	2000	2017*	Rank**
Russia	621.8	506.4	410.6	4
Brazil	...	73.9	183.9	10
Canada	85.9	107.9	162.1	11
China	552.0	695.1	1692.2	1
France	149.2	172.1	277.6	9
Germany	...	257.9	400.8	5
India	...	115.9	283.0	8
Italy	75.7	66.1	126.7	13
Japan	541.0	647.6	665.6	3
Republic of Korea	...	108.4	361.3	6
Taiwan	...	55.5	147.7	12
United Kingdom	134.0	170.6	291.4	7
United States	773.2	983.3	1380.0	2

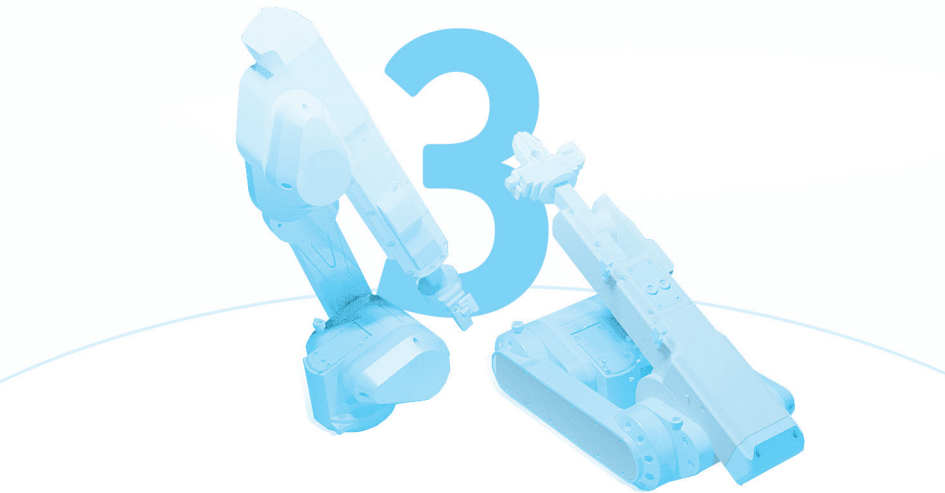
* Or nearest years for which data is available.

** Among countries of the world.

2.14. Researchers per 10 000 employment by country: 2017*



* Or nearest years for which data is available. Calculated by employment in full-time equivalent.



R&D Funding

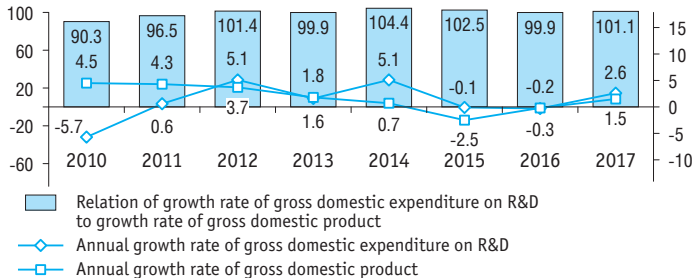
3.1. Gross domestic expenditure on R&D

(thousand roubles)

	2000	2015	2016	2017
Gross domestic expenditure on R&D:				
at current prices	76697100.5	914669057.2	943815219.6	1019152437.1
at constant 1989 prices	3321.2	6464.1	6444.5	6614.9

3.2. Relation of growth rates of gross domestic expenditure on R&D and gross domestic product*

(per cent)



*The calculations are in constant prices.

3.3. Gross domestic expenditure on R&D by country

(million current PPP \$)

	1991	2000	2017*	Rank**
Russia	19991.3	10726.9	42270.9	9
Brazil	...	15823.5	41104.1	10
Canada	8704.4	16745.4	26222.4	13
China	9164.9	33080.4	451201.4	2
France	24436.4	33269.5	62162.7	6
Germany	40164.1	53665.5	118158.5	4
India	...	15978.0	50118.7	7
Italy	12654.2	15471.4	29915.9	12
Japan	68893.2	98918.9	168644.9	3
Republic of Korea	7042.6	18533.1	79354.3	5
Taiwan	...	9182.7	35756.9	11
United Kingdom	18551.7	25145.2	47244.5	8
United States	161387.8	269513.0	511089.0	1

* Or nearest years for which data is available.

** Among countries of the world.

3.4. Gross domestic expenditure on R&D as a percentage of GDP by country

	1991	2000	2017*
Russia	1.43	1.05	1.11
Brazil	...	1.00	1.28
Canada	1.54	1.86	1.53
China	0.72	0.89	2.11
France	2.28	2.09	2.25
Germany	2.40	2.39	2.93
India	...	0.77	0.62
Italy	1.15	1.01	1.29
Japan	2.68	2.91	3.14
Republic of Korea	1.74	2.18	4.23
Taiwan	...	1.91	3.16
United Kingdom	1.87	1.63	1.69
United States	2.61	2.62	2.74

* Or nearest years for which data is available.

3.5. Federal budget appropriations on civil-purpose science and technology

	2000	2015*	2016*	2017*	2018**
Federal budget appropriations on civil-purpose science and technology,					
<i>million roubles</i>	17091.7	439392.8	402722.3	377882.2	373524.3
Basic research	7866.2	120203.8	105247.6	116977.6	148513.9
Applied research	9225.5	319188.9	297474.7	260904.6	225010.4
As a percentage:					
of GDP	0.23	0.53	0.47	0.41	...
of total federal budget appropriations	1.66	2.81	2.45	2.30	2.73

* The source of 2015–2017 data are reports on the execution of the consolidated budget of the Russian Federation and budgets of state extra-budgetary funds (according to the Russian Federal Treasury).

** According to the Federal Law of December 5, 2017 № 362-FL “On the federal budget for 2018 and the planning period of 2019 and 2020” in the wording of the Federal Law of July 3, 2018 № 193-FL “On amendments to the Federal Law ‘On the federal budget for 2018 and the planning period of 2019 and 2020’”.

3.6. Government budget appropriations on R&D by country

(million current PPP \$)

	1991	2000	2017*
Russia**	25840.0	4784.6	28231.8
Brazil***	...	8555.7	20620.9
Canada	3732.3	4589.6	7953.8
China***	...	11051.4	90397.4
France	13954.2	14877.7	17430.8
Germany	15978.9	17231.2	37221.1
Italy	7722.5	9507.0	12090.4
Japan	10782.0	21227.9	35010.5
Republic of Korea	...	5017.9	21894.1
Taiwan	...	2967.0	8266.4
United Kingdom	7687.7	9490.7	14604.0
United States	65897.0	83612.5	151380.0

* Or nearest years for which data is available.

** Federal budget appropriations on science and technology.

*** Gross domestic expenditure on R&D financed by the government.

3.7. Gross domestic expenditure on R&D by source of funds

(million roubles; 1994 – billion roubles)

	1994	2000	2015	2016	2017
Gross domestic expenditure on R&D	5146.1	76697.1	914669.1	943815.2	1019152.4
Government*	3205.6	42035.7	635859.9	643401.0	674344.3
Of which federal budget appropriations	... **	29639.3	516655.1	506894.8	536387.3
Business enterprise sector	1814.3	25208.4	242155.4	265277.2	307459.0
Higher education sector	19.8	213.0	10875.1	8210.5	7901.3
Private non-profit sector	5.6	67.6	1566.8	1537.1	2645.2
Funds from abroad	100.8	9172.4	24212.0	25389.3	26802.6

* Including federal budget appropriations, general university funds and funds of government sector institutions (e.g. own funds of R&D-performing institutions).

** In 1994, federal budget appropriations were not allocated separately in the structure of sources of funds.

3.8. Percentage distribution of gross domestic expenditure on R&D by source of funds and country: 2017*

	Gross domestic expenditure on R&D	Government	Business enterprise sector	Funds from abroad	Other funds from national sources
Russia	100	66.2**	30.2	2.6	1.0
Brazil	100	50.2	47.5	...	2.3
Canada	100	33.0	40.6	10.7	15.8
China	100	20.0	76.1	0.7	...
France	100	34.8	54.0	7.6	3.5
Germany	100	28.5	65.2	5.9	0.3
Italy	100	38.0	50.0	8.3	3.7
Japan	100	15.0	78.1	0.7	6.2
Republic of Korea	100	22.7	75.4	0.9	1.0
Taiwan	100	21.3	77.7	0.1	0.8
United Kingdom	100	27.7	49.0	17.1	6.3
United States	100	25.1	62.3	5.2	7.4

* Or nearest years for which data is available.

** Including federal budget appropriations, general university funds and funds of government sector institutions (e.g. own funds of R&D-performing institutions).

3.9. Percentage distribution of gross domestic expenditure on R&D by sector of performance and country: 2017*

	Gross domestic expenditure on R&D	Government sector	Business enterprise sector	Higher education sector	Private non-profit sector
Russia	100	30.4	60.1	9.0	0.4
Canada	100	7.2	51.0	41.3	0.5
China	100	15.7	77.5	6.8	...
France	100	12.9	63.6	22.0	1.6
Germany	100	13.8	68.2	18.0	...
India	100	52.5	43.6	3.9	...
Italy	100	13.2	58.3	25.5	3.0
Japan	100	7.5	78.8	12.3	1.4
Republic of Korea	100	11.5	77.7	9.1	1.6
Taiwan	100	13.1	77.6	9.0	0.3
United Kingdom	100	6.3	67.0	24.6	2.1
United States	100	11.5	71.2	13.2	4.1

* Or nearest years for which data is available.

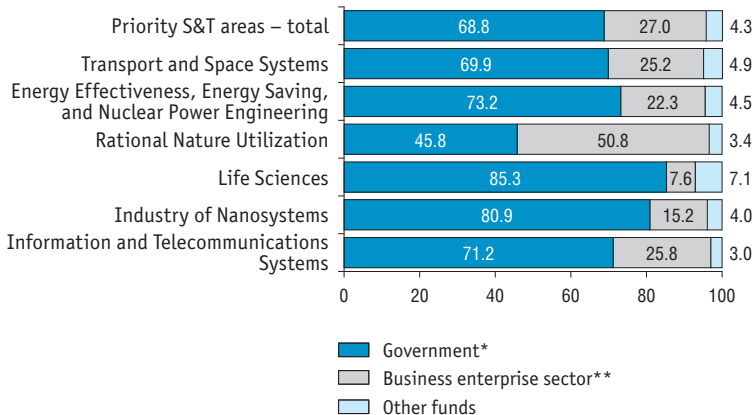
3.10. Gross domestic expenditure on R&D by priority S&T areas: 2017

(million roubles)

	Total	Government*	Of which federal budget appropriations
Gross domestic expenditure on R&D by priority S&T areas	718706.8	494188.2	417313.4
Information and Telecommunications Systems	81390.7	57942.6	49284.2
Industry of Nanosystems	22373.7	18094.0	14605.9
Life Sciences	51721.2	44104.7	37895.2
Rational Nature Utilization	55715.6	25509.0	22899.0
Energy Effectiveness, Energy Saving, and Nuclear Power Engineering	103717.8	75884.0	63287.9
Transport and Space Systems	243140.5	170009.8	144949.2

* Including federal budget appropriations and funds of government sector institutions (e.g. own funds of R&D performing institutions).

3.11. Percentage distribution of gross domestic expenditure on R&D by priority S&T areas and source of funds: 2017



* Including federal budget appropriations and funds of government sector institutions (e.g. own funds of R&D performing institutions).

** Funds of business enterprise sector institutions (including own funds).

3.12. Subsidies, grants and other types of competitive R&D funding: 2017

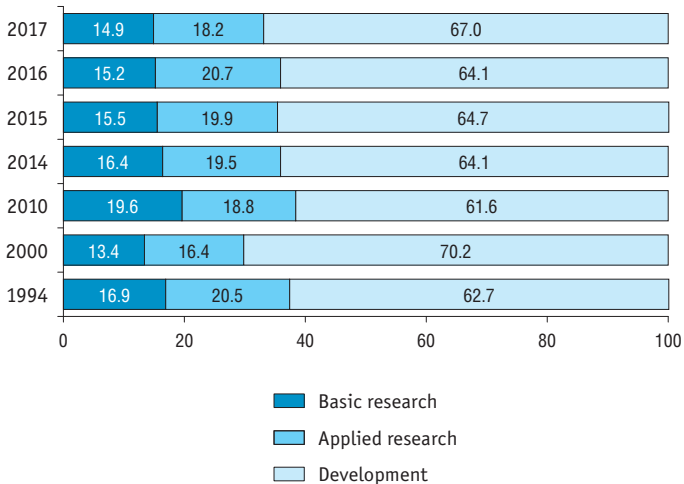
	Total, <i>million roubles</i>	As a percentage of the total
Gross domestic expenditure on R&D – total	1019152.4	100.0
Budget subsidies on state task for R&D	104269.0	10.2
Budget subsidies on R&D	39418.7	3.9
Grants from S&T and innovation supporting funds	22597.5	2.2
Other types of competitive funding	71388.7	7.0

3.13. Intramural current expenditure on R&D by type

(million roubles; 1994 – billion roubles)

	1994	2000	2015	2016	2017
Intramural current expenditure on R&D	4996.9	73873.3	854288.0	873778.7	950257.0
Basic research	842.0	9875.7	132064.9	132565.1	141299.2
Applied research	1021.9	12117.5	169654.6	181157.9	172547.9
Development	3133.0	51880.2	552568.5	560055.7	636409.9

3.14. Percentage distribution of intramural current expenditure on R&D by type



3.15. Average monthly salaries of R&D personnel

	1995	2000	2015	2016	2017
Average monthly salaries, roubles; <i>1995 – thousand roubles</i>	305.3	2322.9	41511.8	43539.5	48833.6
As a percentage of that:					
in the national economy (=100%)	64.6	104.5	122.0	118.6	124.7
in manufacturing (=100%)	67.3	98.2	130.1	125.9	126.8
in construction (=100%)	52.0	88.0	138.6	134.7	145.0

3.16. Tax incentives on R&D by type

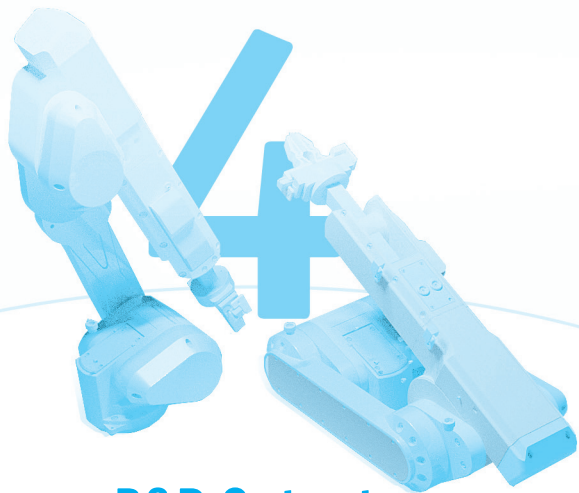
(million roubles)

	2013	2014	2015	2016	2017
Tax expenditure on R&D – total	107402.9	116585.6	122800.1	139891.0	143133.1
VAT exemption	95538.4	105469.1	111953.9	128150.0	128925.2
R&D funded from budget and special foundations	71446.5	81656.7	82718.1	96199.2	95200.5
Sales of exclusive rights on R&D results	18622.4	18572.8	21976.3	24882.9	27767.7
R&D aimed at development / improvement of new technologies and products (for selected types of economic activity)	5469.5	5239.6	7259.6	7067.9	5956.9

(continued)

	2013	2014	2015	2016	2017
Income tax reduction	9682.7	8873.1	8790.2	9552.2	12005.1
Accelerated depreciation of fixed assets for S&T activity	80.9	51.6	41.0	37.2	36.6
Accelerated expensing of R&D expenditure	9585.0	8821.5	8749.2	9514.2	11968.5
Contributions to the state foundations for R&D and innovation support	16.9	–	–	0.8	–
Property tax exemption	2181.8	2243.4	2056.0	2188.9	2202.9
State Research Centres	2181.8	2243.4	2056.0	2188.9	2202.9

Source: 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.



R&D Output

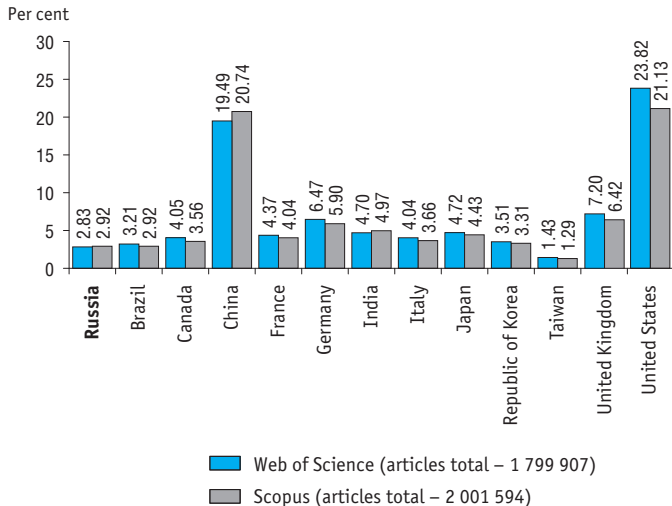
4.1. Articles in scientific journals indexed in international databases by country*

	Web of Science				Scopus			
	2007	Rank**	2017	Rank**	2007	Rank**	2017	Rank**
Russia	25091	13	51012	14	28561	13	58507	14
Brazil	23436	15	57721	13	28474	14	58540	13
Canada	46095	7	72840	8	49885	7	71312	9
China	93980	2	350759	2	167410	2	415091	2
France	54970	6	78682	7	59519	6	80901	7
Germany	76566	4	116396	4	84584	4	118026	4
India	32065	10	84645	6	40490	9	99545	5
Italy	43610	8	72672	9	47167	8	73351	8
Japan	74308	5	84871	5	83614	5	88601	6
Republic of Korea	29187	12	63157	12	30487	12	66203	12
Taiwan	19398	16	25807	21	21513	16	25961	21
United Kingdom	80411	3	129529	3	92858	3	128536	3
United States	297356	1	428731	1	318764	1	423007	1

* Here and below as of September 6, 2018.

** Among countries of the world.

4.2. Country shares in the total number of articles in scientific journals indexed in international databases: 2017



4.3. Publications by Russian authors in scientific journals indexed in internationally recognized databases by field of science: 2017

Field of science	Web of Science			Scopus		
	Articles by Russian authors	Russia's share in the total number of publications	Rank*	Articles by Russian authors	Russia's share in the total number of publications	Rank*
Natural sciences						
Physical sciences	12359	7.06	5	18122	6.37	5
Mathematics	3893	5.07	6	5891	4.61	7
Chemical sciences	8262	3.92	8	12272	4.23	7
Earth and related environmental sciences	3386	2.82	13	8751	3.38	12
Biological sciences	4583	2.04	17	8592	2.27	15
Interdisciplinary research	1969	2.56	16	4917	3.26	9
Computer and information sciences	665	1.08	26	2296	1.80	17

* Among countries of the world.

(continued)

Field of science	Web of Science			Scopus		
	Articles by Russian authors	Russia's share in the total number of publications	Rank*	Articles by Russian authors	Russia's share in the total number of publications	Rank*
Engineering and technology						
Mechanical engineering	2521	4.30	10	3015	2.45	12
Materials engineering	4414	3.39	9	10662	4.39	7
Nano-technology	906	2.37	16	...	...	...
Chemical engineering	1078	2.97	13	4198	3.26	9
Energy and Environmental engineering	1550	2.18	14	515	1.27	22
Electrical engineering, electronic engineering, information engineering	1326	1.60	18	2054	1.96	15
Environmental biotechnology	288	1.05	24	...	...	...
Industrial biotechnology	195	2.39	15	...	...	...
Medical engineering	118	0.63	32	643	2.37	14
Civil engineering	227	0.84	28	373	0.92	24

(continued)

Field of science	Web of Science			Scopus		
	Articles by Russian authors	Russia's share in the total number of publications	Rank*	Articles by Russian authors	Russia's share in the total number of publications	Rank*
Medical sciences						
Basic medicine	2 064	1.32	22	3 491	1.65	18
Clinical medicine	1 947	0.61	33	7 054	1.47	20
Health sciences	417	0.38	48	1 243	1.16	25
Agricultural sciences						
Agriculture, forestry, and fisheries	339	0.96	31	1 904	1.87	16
Veterinary science	30	0.21	57	60	0.33	55–56
Animal and dairy science	11	0.14	68	719	1.36	22
Humanities						
History and archaeology	1 373	7.38	4	1 059	5.71	2
Philosophy, ethics and religion	520	2.96	10	533	3.39	5–6
Languages and literature	829	3.58	7	598	2.77	10
Arts (arts, history of arts, etc.)	207	1.74	11	77	0.92	16

(continued)

Field of science	Web of Science			Scopus		
	Articles by Russian authors	Russia's share in the total number of publications	Rank*	Articles by Russian authors	Russia's share in the total number of publications	Rank*
Social sciences						
Sociology	514	2.06	13	2302	2.95	9
Social and economic geography	450	1.57	18	481	1.81	17
Educational sciences	681	2.23	10	948	2.46	12
Political sciences	348	2.43	10	548	3.82	6
Economics and business	920	1.55	20	2719	4.61	11
Psychology	859	1.77	15	640	1.01	24
Media and communications	297	2.49	11	66	0.85	30-31
Law	391	2.92	8	312	2.20	12

4.4. Patent applications and patents granted

	1995	2000	2005	2010	2016	2017
Patent applications filed in the Russian Federation	22202	28688	32254	42500	41587	36454
By residents	17551	23377	23644	28722	26795	22777
By non-residents	4651	5311	8610	13778	14792	13677
Patents granted with the indication of the Russian Federation	31556*	17592	23390	30322	33536	34254
To residents	20861	14444	19447	21627	21020	21037
To non-residents	4772	3148	3943	8695	12516	13217
Patents valid with the indication of the Russian Federation	76186	144325	123089	181904	230870	244321

* Including patents granted in exchange for author certificates.

4.5. Patent applications by country*

	1995	2000	2005	2010	2017**	Rank***
Russia	22202	28688	32254	42500	36454	7
Brazil	7448	17283	18498	24999	28010	10
Canada	26592	39622	39888	35449	34745	8
China	18699	51906	173327	391177	1338503	1
France	15896	17353	17275	16580	16218	13
Germany	46158	62142	60222	59245	67899	5
India	6566	8538	24382	39762	45057	6
Italy	8574	9273	9331	9723	9821	17
Japan	368831	419543	427078	344598	318381	3
Republic of Korea	78499	102010	160921	170101	208830	4
United Kingdom	27521	32747	27988	21929	22059	11
United States	228142	295895	390733	490226	605571	2

* All patent applications filed by residents and non-residents in national patent agencies.

** Or nearest years for which data is available.

*** Among countries of the world.

Source: WIPO Statistics Database, October 2018; Rospatent Annual Report 2017.

4.6. Patent applications filed by residents and non-residents by country: 2017*

	Patent applications filed in the country		
	Of which	Of which	
		by residents	by non-residents
Russia	36454	22777	13677
Brazil	28010	5200	22810
Canada	34745	4078	30667
China	1338503	1204981	133522
France	16218	14206	2012
Germany	67899	48480	19419
India	45057	13199	31858
Italy	9821	8848	973
Japan	318381	260244	58137
Republic of Korea	208830	163424	45406
United Kingdom	22059	13876	8183
United States	605571	295327	310244

* Or nearest years for which data is available.

Source: WIPO Statistics Database, October 2018; Rospatent Annual Report 2017.

4.7. Patents granted with the indication of the Russian Federation by section of the International Patent Classification*

	1995	2000	2010	2016	2017
Total	25633	17592	30322	33536	34254
A. Human necessities	4207	4347	8468	7344	7577
B. Performing operations; transporting	6129	2905	4711	4689	5501
C. Chemistry; metallurgy	4529	3332	5167	7894	5677
D. Textiles; paper	437	197	320	253	299
E. Fixed constructions; mining	2042	1156	1977	1925	2087
F. Mechanical engineering; lighting; heating; weapons; blasting	3033	2144	3062	3434	3972
G. Physics	3083	2172	3734	4785	5736
H. Electricity	2173	1339	2883	3212	3405

* Patents granted to resident and non-resident applicants.

4.8. Development of advanced manufacturing technologies by type and degree of novelty: 2017

	Total	Of which technologies	
		new to the country	radically new
Advanced manufacturing technologies	1402	1212	190
Design and engineering	417	358	59
Fabrication, processing and assembling	485	417	68
Automated material handling	34	27	7
Automated inspection and/or testing equipment	134	107	27
Communications and control	218	194	24
Manufacturing information systems	44	44	–
Integrated management and control	70	65	5

4.9. Use of advanced manufacturing technologies by type and duration: 2017

	Total	Of which technologies used during the period of			
		less than 1 year	1-3 years	4-5 years	6 years and over
Advanced manufacturing technologies	240054	17243	47927	40794	134090
Design and engineering	41130	4175	8122	6942	21891
Fabrication, processing and assembling	70160	5083	13765	10509	40803
Automated material handling	2484	175	531	402	1376
Automated inspection and/or testing equipment	14329	1148	3915	2845	6421
Communications and control	99525	5089	19210	18342	56884
Manufacturing information systems	7733	951	1548	1184	4050
Integrated management and control	4693	622	836	570	2665

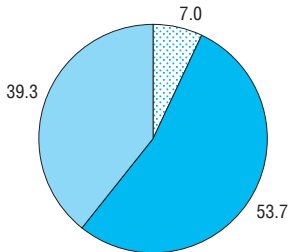
4.10. Technology balance of payments by category of contracts: 2017

(million US \$)

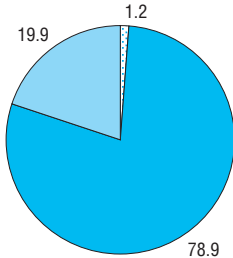
	Receipts from exports	Payments for imports	Balance of payments
Total	1181.2	3305.2	-2124.0
Invention patents	0.1	11.1	-11.0
Unpatented inventions	–	0.01	-0.01
Patent licenses	94.8	106.1	-11.3
Selection achievement	–	0.03	-0.03
Utility models	3.9	8.4	-4.5
Know-how	7.0	152.0	-145.0
Trademarks	2.6	504.4	-501.8
Industrial designs	20.0	1.4	18.6
Engineering services	720.2	2132.6	-1412.4
Research and development	177.8	83.5	94.3
Others	154.7	305.8	-151.1

4.11. Percentage distribution of technology exports and imports in Russia by country groups: 2017

Receipts from technology exports



Payments for technology imports



 CIS countries

 OECD countries

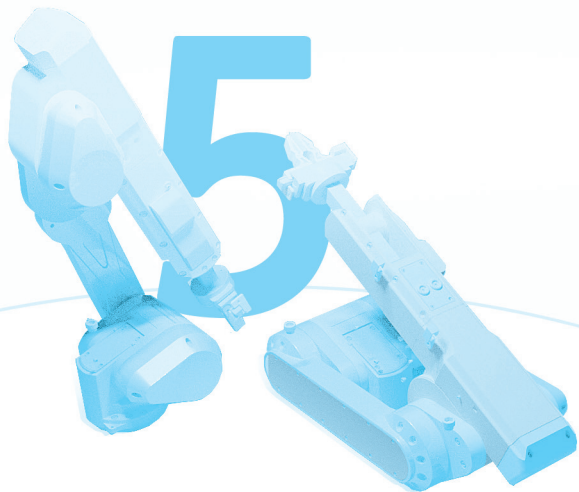
 Other countries

4.12. Technology balance of payments by country: 2017*

(million US \$)

	Receipts from exports	Payments for imports	Balance of payments
Russia	1181.2	3305.2	-2124.0
Canada	2620.9	1227.4	1393.5
France	5188.3	3233.5	1954.8
Germany	71836.5	53734.3	18102.2
Italy	13239.9	12015.7	1224.2
Japan	32631.4	4978.7	27652.6
Republic of Korea	10407.9	16409.0	-6001.1
Taiwan	1114.1	5373.9	-4259.8
United Kingdom	41060.6	21280.4	19780.1
United States	130834.0	88891.0	41943.0

* Or nearest years for which data is available.



Innovation

5.1. Main indicators of innovation in industry

	2000	2010	2015	2016	2017
Enterprises engaged in technological innovation as a percentage of all industrial enterprises	10.6	9.3	9.5	9.2	9.6
Sales of innovative goods and services, <i>million roubles</i>	154135.0	1165747.6	3258254.6	3723693.4	3403055.2
At constant 1995 prices	32626.7	62312.8	112558.2	124286.8	107970.4
As a percentage of total sales	4.4	4.9	7.9	8.4	6.7
Expenditure on technological innovation, <i>million roubles</i>	49428.0	349763.3	735757.7	777518.6	848045.9
At constant 1995 prices	10462.7	18695.9	25417.1	25951.5	26906.4
As a percentage of total sales	1.4	1.5	1.8	1.8	1.7

5.2. Innovative activity: 2017

	Enterprises engaged in innovation as a percentage of all enterprises			
	total	technological	marketing	organisational
Industry	10.6	9.6	1.8	2.8
Mining and quarrying	6.1	5.1	0.3	1.6
Manufacturing	15.1	13.7	3.0	3.8
High tech	33.0	31.8	5.9	8.6
Medium high tech	21.3	19.9	3.7	5.6
Medium low tech	11.4	10.1	2.0	3.6
Low tech	11.4	9.9	3.1	2.0
Electricity, gas, steam and air conditioning supply	5.7	5.1	0.3	1.6
Water supply; sewerage, waste management and remediation activities	3.1	2.7	0.3	1.1
Services	7.3	6.3	1.2	2.0
Telecommunications, computer programming, consultancy and related activities, information service activities*	9.9	8.0	2.2	2.0
Agriculture	3.7	3.1	0.5	0.9
Construction	1.8	1.1	0.7	1.1

* Here and below we provide consolidated data on enterprises by the types of economic activities according to codes of the Russian Classification of economic activities (OKVED2): 61, 62, 63.

5.3. Main indicators of innovation in agriculture: 2017

	Enterprises engaged in innovation as a percentage of all agricultural enterprises		Innovative goods and services		Expenditure on technological innovation	
	total	technological	Million roubles	as a percentage of total sales	Million roubles	as a percentage of total sales
Total	3.7	3.1	28446.0	1.8	15806.0	1.0
Growing of non-perennial crops	4.2	3.9	10625.8	1.9	8259.1	1.5
Growing of perennial crops	3.3	2.6	442.5	3.1	109.9	0.8
Plant propagation	2.1	2.1	457.3	21.4	12.1	0.6
Farming of animals	3.9	2.9	16602.3	1.7	6403.1	0.7
Mixed farming	1.3	–	–	–	–	–
Support activities to agriculture and post-harvest crop activities	2.4	2.1	318.1	1.8	1021.8	5.9

5.4. Enterprises engaged in technological innovation as a percentage of all industrial enterprises by country

(per cent)

	2010	2013	2017*
Russia	7.9	8.9	7.5
Brazil	41.2	38.2	38.9
Canada	58.1	53.4	32.2**
China	28.8***	...	26.9
France	34.3	36.7	40.9
Germany	64.2	55.0	52.6
India	...	35.4	...
Italy	40.4	41.5	37.0
Japan	...	27.5	28.3
Republic of Korea	37.2****	16.9	34.6
United Kingdom	32.7	34.0	40.9
United States	23.3	14.3	12.8

* Or nearest years for which data is available.

** Data covers product innovation only.

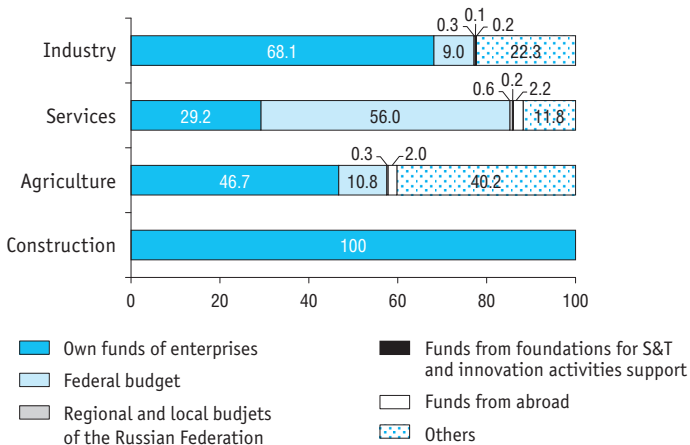
*** Data covers industry only.

**** Data covers manufacturing only.

5.5. Expenditure on technological innovation: 2017

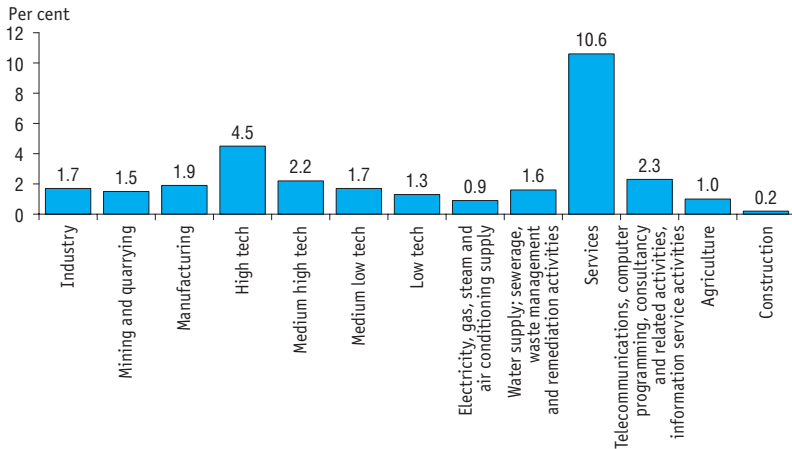
	Total, <i>million roubles</i>	<i>Of which, per cent</i>		
		R&D	acquisition of machinery and equipment	acquisition of technology
Industry	848045.9	21.6	50.7	1.4
Mining and quarrying	184811.2	18.7	67.6	0.9
Manufacturing	610218.1	23.6	46.3	1.5
High tech	57065.6	46.6	22.6	7.2
Medium high tech	167057.0	24.6	41.4	1.9
Medium low tech	306829.8	23.9	45.9	0.7
Low tech	79265.7	3.7	75.2	0.2
Electricity, gas, steam and air conditioning supply	43768.7	10.1	42.5	2.3
Water supply; sewerage, waste management and remediation activities	9247.9	1.7	42.7	1.1
Services	540937.4	75.3	7.8	0.4
Telecommunications, computer programming, consultancy and related activities, information service activities	54625.5	22.6	25.6	0.4
Agriculture	15806.0	27.9	48.7	1.5
Construction	196.0	–	1.4	–

5.6. Expenditure on technological innovation by source of funds: 2017 (per cent)



5.7. Intensity of expenditure on technological innovation: 2017

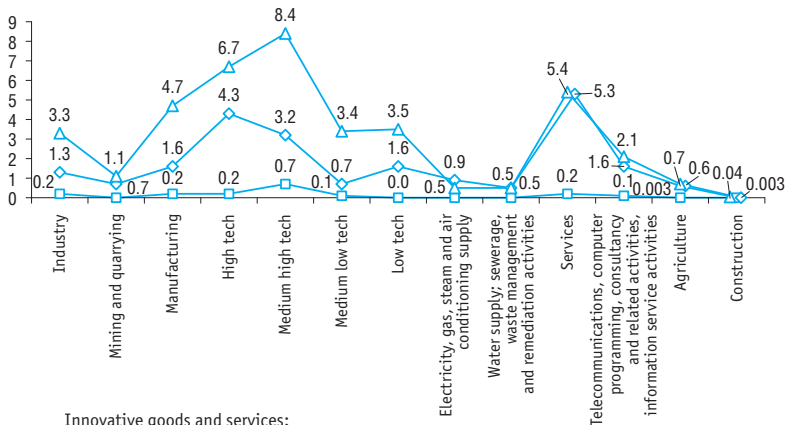
(ratio of expenditure to total sales of enterprises engaged in technological innovation)



5.8. Sales of innovative goods and services: 2017

	Million roubles	As a per cent of total sales
Industry	3403055.2	6.7
Mining and quarrying	489447.1	3.9
Manufacturing	2832804.4	8.6
High tech	186306.8	14.7
Medium high tech	1154718.7	15.3
Medium low tech	1109104.6	6.2
Low tech	382674.3	6.1
Electricity, gas, steam and air conditioning supply	73287.2	1.5
Water supply; sewerage, waste management and remediation activities	7516.5	1.3
Services	735344.5	14.5
Telecommunications, computer programming, consultancy and related activities, information service activities	111254.6	4.8
Agriculture	28446.0	1.8
Construction	152.9	0.1

5.9. Technologically new or significantly improved goods and services as a percentage of total sales: 2017



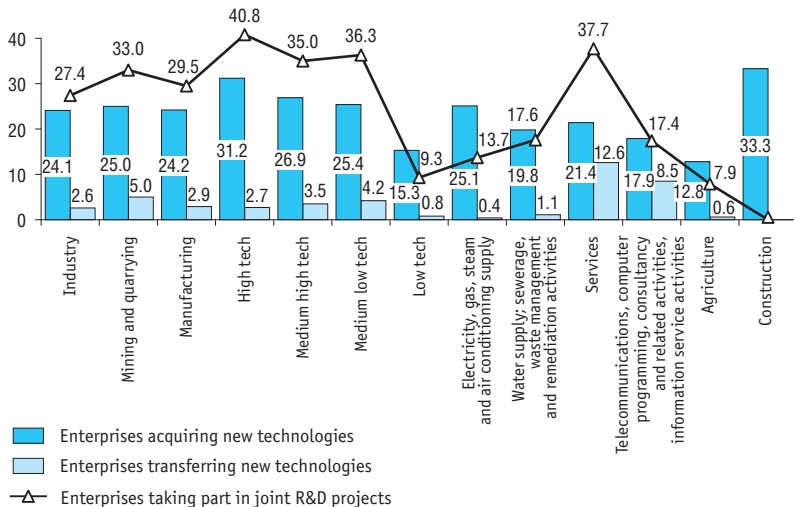
Innovative goods and services:

- ▲— new to an enterprise
- ◆— new to the enterprise's market
- new to the world

5.10. Innovative goods and services exports: 2017

	Million roubles	As a percentage of total goods and services exports
Industry	848137.3	7.1
Mining and quarrying	192698.6	5.1
Manufacturing	655438.7	8.0
High tech	10361.4	13.3
Medium high tech	210505.9	15.7
Medium low tech	335217.7	5.5
Low tech	99353.8	15.5
Electricity, gas, steam and air conditioning supply	–	–
Water supply; sewerage, waste management and remediation activities	–	–
Services	81013.3	22.0
Telecommunications, computer programming, consultancy and related activities, information service activities	5458.9	2.9
Agriculture	254.1	1.9
Construction	38.1	3.7

5.11. Co-operation links of enterprises engaged in technological innovation: 2017



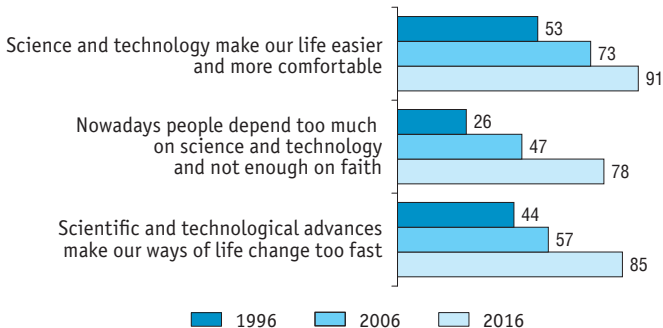


Public Attitudes towards Science, Technology, and Innovation

6.1. Public assessment of science and technology influence on daily life*

(as a percentage of all surveyed**)

Do you agree with the following statements?



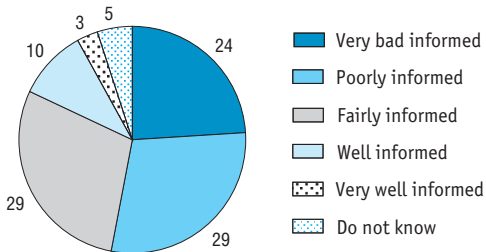
* Hereinafter in this section the data concerning Russia are based on the representative survey of population of 16 years and older, conducted by the HSE Institute for Statistical Studies and Economics of Knowledge (ISSEK) within the framework of the Basic Research Programme of the National Research University Higher School of Economics. The survey was conducted in October 2016 – January 2017.

** The sum of response rate 'Strongly agree' and 'Mindly agree'.

6.2. Public awareness of scientific and technical achievements: 2016

(as a percentage of those surveyed)

How informed do you feel about developments in science and technology?



Technical Notes

Bibliometric indicators are calculated on the basis of Web of Science Core Collection (SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI) and Scopus. An article belongs to a country if it is listed in the affiliated address of author or one of co-authors. Estimates reflect the databases situation as of September 6, 2018.

Competitive research funding (programme funding) – funds received by the organisation, which took the first place according to the decision of the competition commission made on the basis of summarizing the results of the competition of scientific, technical programmes, innovation and other projects related to the implementation of scientific research and development, on the basis of the best conditions for the implementation of the competitive project presented by the organisation in comparison with other participants.

Construction includes consolidated data on enterprises by the types of economic activities according to codes of the Russian Classification of economic activities (OKVED2): 43.91, 43.99.

Federal budget appropriations on civil-purpose S&T – federal budget funds allocated for civil-purpose basic and applied scientific research.

Grants are cash and other assets that are provided free of charge and irrevocably by persons and legal entities, including foreign citizens and foreign legal entities and international organisations which have the right to provide grants to the Russian Federation in accordance with the procedures laid down by the Government of the Russian Federation, to realize specific S&T programmes and projects, innovation projects, to conduct specific research under the conditions attached by grant-makers.

Gross domestic expenditure on R&D – actual expenditure on research and development performed by organisations during the reference year irrespective of financing sources, expressed in a monetary form.

Innovative goods and services are products (goods and services) that are new or have undergone technological modification in the last three years.

Marketing innovation is the implementation of a new or significantly improved marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing.

Number of personnel in full-time equivalent is the indicator which reflects the sum of time-shares actually spent by R&D personnel on R&D activities and is measured in person-years.

Organisational innovation is the implementation of a new organisational method in the firm's business practices, workplace organisation or external relations.

R&D personnel are professionals whose creative activities are aimed at the advancement of scientific knowledge or search for new areas of its application, as well as direct services related to performance of R&D.

Researchers are professionals engaged in R&D and immediately performing the creation of new knowledge, products, processes, methods, and systems, as well as in the management of these activities. Researchers usually have higher education (university or equivalent) degrees.

Service sector includes consolidated data on enterprises by the types of economic activities according to codes of the Russian Classification of economic activities (OKVED2): 43.91, 43.99.

Tax incentives (according to the main tax policy trends for 2015 and the planning period of 2016 and 2017 approved by the Government of the Russian Federation July 1, 2014)

are recognized as the income shortfalls of the Russian Federation budgetary system which are down to the application of tax benefits and other instruments (preferences) established by laws on taxation and duties.

Technological innovations are the final result of innovative activities, embodied in a technologically new or improved good or service introduced on a market, a technologically new or improved process or technique of service production (transfer) used in practice.

The technology balance of payments registers the volume of commercial transactions related to international technology and other intangible assets transfers (exports and imports).

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