



	Research and development (R&D)		Scientific and technical journal articles	Expenditures for R&D	High-technology exports		Charges for the use of intellectual property		Patent applications filed		Trademark applications filed
	Researchers	Technicians					Receipts	Payments	Residents	Nonresidents	
	full-time equivalent per million people	full-time equivalent per million people					\$ millions	\$ millions			
	2005-11	2005-11					2012	2012	2012	2012	
Afghanistan	..	..	8	..	..	..	0	16	..	..	..
Albania	148	38	27	0.15	5	0.4	2	23	3	8	2,700
Algeria	165	33	599	0.07	2	0.1	3	137	119	781	6,251
American Samoa	101	..	..	..	..	..	..	..	..	..	..
Andorra	..	..	1	..	..	..	..	..	..	..	803
Angola	..	..	6	..	..	..	..	3	..	..	..
Antigua and Barbuda	..	..	0	..	0	0.0	..	1	..	..	675
Argentina	1,178	236	3,863	0.62	1,946	7.7	161	2,087	735	4,078	83,163
Armenia	..	..	185	0.27	7	2.6	..	..	137	4	4,876
Aruba	..	..	..	..	3	10.2	0	10	..	..	..
Australia	4,280	1,120	20,603	2.38	4,761	12.7	965	4,186	2,627	23,731	63,367
Austria	4,397	1,996	5,103	2.75	16,176	12.8	776	1,543	2,258	294	9,519
Azerbaijan	..	..	149	0.22	42	7.3	0	28	144	12	5,743
Bahamas, The	..	..	3	..	0	0.0	..	17	..	..	..
Bahrain	..	..	40	..	2	0.2	..	..	3	161	7,026
Bangladesh	..	..	291	..	..	..	0	11	67	287	11,429
Barbados	..	..	16	..	20	12.0	3	19	..	36	1,397
Belarus	..	..	342	0.76	620	2.9	23	105	1,681	190	11,750
Belgium	3,679	1,472	7,484	2.04	36,504	11.4	2,651	2,642	755	127	25,961
Belize	..	..	3	..	0	4.8	3	2	..	..	..
Benin	..	..	51	..	0	0.5	0	2	..	..	..
Bermuda	..	..	..	0.24	0	7.3	0	10	..	..	..
Bhutan	..	..	8	..	0	0.0	0	0	..	..	625
Bolivia	162	25	47	0.16	53	9.2	9	43	..	..	..
Bosnia and Herzegovina	193	70	54	0.02	78	2.5	13	9	2	14	4,517
Botswana	..	..	50	0.52	61	1.2	0	12	..	..	800
Brazil	710	656	13,148	1.16	8,820	10.5	511	3,666	4,804	25,312	151,711
Brunei Darussalam	..	..	15	..	65	12.8	..	8	..	42	51
Bulgaria	1,623	445	650	0.57	982	7.7	23	184	245	14	6,329
Burkina Faso	48	37	53	0.20	3	5.9	0	0	2	..	34
Burundi	..	..	3	0.12	0	2.7	0	0	..	..	..
Cambodia	..	..	33	..	10	0.1	4	11	1	52	5,140
Cameroon	..	..	159	..	15	3.7	0	7	..	..	..
Canada	4,368	1,458	29,017	1.74	24,039	12.4	3,745	10,867	4,709	30,533	50,110
Cabo Verde	..	..	1	..	0	0.6	0	0	..	..	..
Cayman Islands	..	..	..	..	..	..	..	..	..	..	..
Central African Republic	..	..	4	..	0	0.0	..	..	..	..	..
Chad	..	..	2	..	..	..	..	..	..	..	..
Channel Islands	..	..	..	..	..	..	..	..	..	..	..
Chile	317	228	1,979	0.42	503	4.6	75	849	336	2,683	33,831
China	963	..	89,894	1.84	505,646	26.3	1,044	17,749	535,313	117,464	1,619,878
Hong Kong SAR, China	2,925	306	..	0.75	841	16.2	459	2,009	171	12,817	35,530
Macao SAR, China	476	727	..	0.04	0	0.0	..	171	5	53	9,581
Colombia	154	..	727	0.18	517	5.2	90	527	213	1,848	31,920
Comoros	..	..	0	..	0	7.3	..	..	..	..	1
Congo, Dem. Rep.	..	..	21	0.13	..	..	..	..	..	..	..
Congo, Rep.	..	..	16	..	79	3.7	..	..	..	..	..
Costa Rica	1,289	..	106	0.48	2,719	39.6	4	86	10	600	11,895
Cote d'Ivoire	73	..	44	..	155	15.1	0	17	26	1	..
Croatia	1,584	620	1,289	0.75	762	9.9	32	298	230	21	7,564
Cuba	..	..	224	0.61	..	..	..	..	38	140	2,739
Curacao	..	..	..	..	..	..	..	..	..	..	1,192
Cyprus	811	196	211	0.49	44	13.0	1	27	4	8	2,327
Czech Republic	2,891	1,612	4,127	1.84	22,008	16.1	199	819	867	150	11,198
Denmark	6,723	2,317	6,071	3.09	8,827	14.2	..	..	1,406	229	5,032
Djibouti	..	..	1	..	0	0.1	..	..	..	..	..
Dominica	..	..	2	..	2	8.8	0	0	..	..	..
Dominican Republic	..	..	9	..	121	2.7	..	78	18	264	6,453

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	Research and development (R&D)		Scientific and technical journal articles	Expenditures for R&D % of GDP	High-technology exports		Charges for the use of intellectual property		Patent applications filed		Trademark applications filed Total
	Researchers	Technicians					Receipts	Payments	Residents	Nonresidents	
	full-time equivalent per million people	full-time equivalent per million people			\$ millions	% of manufactured exports	\$ millions	\$ millions			
	2005-11	2005-11	2011	2005-11	2012	2012	2012	2012	2012	2012	2012
Ecuador	103	30	60	0.26	52	2.5	..	90	4	690	16,195
Egypt, Arab Rep.	524	277	2,515	0.43	75	0.6	..	345	683	1,528	4,314
El Salvador	..	..	9	0.07	178	4.7	12	47	..	..	..
Equatorial Guinea	..	..	1	..	..	..	..	..	..	..	7
Eritrea	..	..	1	..	..	..	..	..	..	..	..
Estonia	3,428	700	514	2.38	1,235	10.7	19	61	20	5	2,727
Ethiopia	42	17	170	0.24	6	2.4	0	2	..	..	..
Faeroe Islands	..	..	..	..	0	0.6	1	9	..	..	..
Fiji	..	..	23	..	3	2.1	0	3	..	..	..
Finland	7,423	..	4,878	3.78	4,448	8.5	3,316	1,637	1,698	129	5,380
France	3,789	1,856	31,686	2.25	108,365	25.4	12,408	9,574	14,540	2,092	89,793
French Polynesia	..	..	..	..	2	2.5	0	4	..	..	..
Gabon	..	..	22	0.64	7	3.0	..	..	..	..	..
Gambia, The	34	425	13	0.13	0	3.3	..	..	..	..	..
Georgia	..	..	118	0.18	20	2.4	3	8	139	233	4,758
Germany	3,950	1,364	46,259	2.84	183,354	15.8	13,870	12,243	46,620	14,720	64,497
Ghana	17	15	121	0.23	73	7.3	..	..	..	..	1,177
Greece	1,899	765	4,534	0.60	1,041	9.2	82	371	628	28	5,750
Greenland	..	..	..	..	0	2.4	..	..	..	..	..
Grenada	..	..	13	..	..	..	0	6	..	..	..
Guam	303	..	..	..	..	..	..	..	..	..	..
Guatemala	25	19	22	0.04	193	4.7	16	84	7	337	9,175
Guinea	..	..	4	..	..	..	..	1	..	..	..
Guinea-Bissau	..	..	5	..	..	..	..	0	..	..	..
Guyana	..	..	3	..	0	0.1	52	42	..	..	..
Haiti	..	..	14	..	..	..	7	1	32	3	1,949
Honduras	..	..	10	..	12	1.3	..	39	8	233	6,938
Hungary	2,303	651	2,289	1.20	14,878	18.1	1,095	1,351	692	66	4,939
Iceland	9,118	1,994	258	2.65	104	14.3	..	..	37	7	3,655
India	137	94	22,481	0.76	12,434	6.6	321	3,990	9,553	34,402	190,850
Indonesia	90	..	270	0.08	4,962	7.3	58	1,800	541	5,297	53,196
Iran, Islamic Rep.	747	..	8,176	0.79	653	4.1	..	..	..	..	3,155
Iraq	426	61	96	0.06	..	..	0	5	..	..	..
Ireland	3,418	796	3,186	1.75	22,702	22.6	4,997	42,103	492	63	3,506
Isle of Man	..	..	..	..	..	..	..	..	..	..	..
Israel	..	..	6,096	4.39	9,212	15.8	1,057	1,073	1,319	5,473	9,002
Italy	1,759	..	26,503	1.25	27,526	7.1	4,060	6,049	8,439	871	39,605
Jamaica	..	..	51	..	5	0.6	5	47	20	93	2,372
Japan	5,151	588	47,106	3.26	123,412	17.4	31,892	19,898	287,013	55,783	123,239
Jordan	..	..	342	0.43	116	2.5	..	..	48	346	6,751
Kazakhstan	652	58	87	0.16	3,539	30.0	..	152	1,415	317	6,059
Kenya	56	63	290	0.42	100	5.7	32	32	123	136	1,668
Kiribati	..	..	0	..	0	38.5	..	..	..	..	..
Korea, Dem. Rep.	..	..	4	..	..	..	..	..	8,354	27	1,179
Korea, Rep.	5,451	981	25,593	3.74	121,313	26.2	3,436	8,387	148,136	40,779	142,625
Kosovo	..	..	0	..	..	..	0	0	..	..	..
Kuwait	132	26	202	0.09	16	0.5	..	..	..	..	..
Kyrgyz Republic	..	..	17	0.16	16	4.6	3	8	110	1	3,542
Lao PDR	..	..	21	..	..	..	..	..	..	..	..
Latvia	1,904	395	204	0.70	675	9.8	11	44	193	12	3,501
Lebanon	..	..	251	..	39	2.0	2	21	..	..	7,127
Lesotho	6	1	6	0.01	2	0.3	0	5	..	..	666
Liberia	..	..	4	..	..	..	..	..	..	..	790
Libya	..	..	18	..	..	..	..	..	..	..	..
Liechtenstein	..	..	10	..	..	..	..	..	..	..	2,483
Lithuania	2,756	468	457	0.92	1,613	10.4	4	38	109	15	4,222
Luxembourg	5,105	3,290	204	1.43	863	8.1	721	568	109	52	..
Macedonia, FYR	461	81	77	0.23	112	3.9	8	34	37	3	3,275
Madagascar	51	17	33	0.11	2	0.4	..	..	4	40	2,030
Malawi	30	58	57	..	4	3.2	..	0	..	..	..
Malaysia	1,643	158	2,092	1.07	61,223	43.7	135	1,532	1,114	5,826	28,833
Maldives	..	..	0	..	..	..	3	2	..	..	..
Mali	42	13	29	0.25	2	1.2	0	2	..	..	63
Malta	1,771	971	46	0.74	1,265	45.7	18	125	11	6	787

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	Researchers	Technicians					Receipts	Payments	Residents	Nonresidents	
	full-time equivalent per million people	full-time equivalent per million people			\$ millions	% of manufactured exports	\$ millions	\$ millions			
	2005-11	2005-11	2011	2005-11	2012	2012	2012	2012	2012	2012	2012
Marshall Islands	..	..	0	..	..	..	..	..	..	..	..
Mauritania	..	..	6	..	..	..	..	..	..	..	..
Mauritius	..	..	16	0.37	11	0.9	1	16	..	..	2,032
Mexico	386	172	4,128	0.46	44,013	16.3	96	1,120	1,294	14,020	105,825
Micronesia, Fed. Sts.	..	..	1	..	..	..	..	..	..	..	..
Moldova	781	67	76	0.41	25	4.8	5	19	93	22	5,558
Monaco	..	..	20	0.04	..	..	..	..	4	4	3,264
Mongolia	..	..	25	0.27	..	..	2	8	110	69	1,830
Montenegro	763	113	28	0.41	9	..	1	3	37	41	3,896
Morocco	864	53	386	0.73	889	6.4	2	57	197	843	11,231
Mozambique	38	46	38	0.47	105	24.7	3	8	..	..	1,082
Myanmar	..	..	9	..	0	0.0	..	..	..	..	8,490
Namibia	..	..	13	..	107	5.3	0	7	..	..	928
Nepal	..	..	64	0.30	2	0.3	..	..	..	..	2,700
Netherlands	3,218	1,726	15,508	2.04	63,963	20.1	5,561	3,627	2,375	338	..
New Caledonia	..	..	..	..	84	10.6	0	2	..	..	..
New Zealand	3,840	902	3,472	1.30	706	9.7	293	969	1,425	5,674	18,027
Nicaragua	..	..	17	..	6	4.8	..	1	4	172	..
Niger	8	10	18	..	2	6.0	..	2	..	..	..
Nigeria	39	13	439	0.22	77	1.9	..	252	..	..	..
Northern Mariana Islands	..	..	..	..	..	..	..	..	..	..	..
Norway	5,504	..	4,777	1.66	4,514	18.8	350	588	1,009	555	14,648
Oman	160	126	144	0.13	167	3.4	..	..	..	..	2,148
Pakistan	149	58	1,268	0.33	309	1.7	7	161	96	798	19,565
Palau	..	..	2	..	..	..	..	..	..	..	..
Panama	111	..	67	0.19	4,769	35.4	12	42	21	234	11,846
Papua New Guinea	..	..	21	..	16	3.5	..	..	..	..	..
Paraguay	48	12	9	0.06	44	6.9	..	3	18	347	22,102
Peru	..	..	162	..	185	3.5	12	229	54	1,136	25,295
Philippines	78	11	241	0.11	20,795	48.9	8	504	162	2,832	20,202
Poland	1,679	361	7,564	0.77	9,560	7.0	229	2,332	4,410	247	17,023
Portugal	4,463	378	4,621	1.50	1,744	4.1	47	453	621	26	16,783
Puerto Rico	674	..	..	0.49	..	..	..	..	..	..	..
Qatar	..	..	111	..	3	0.0	..	..	3	58	..
Romania	737	235	1,626	0.48	2,861	6.4	346	454	1,022	55	10,519
Russian Federation	3,120	491	14,151	1.12	7,095	8.4	664	7,629	28,701	15,510	62,694
Rwanda	12	..	22	..	1	2.5	30	1	40	30	517
Samoa	..	..	0	..	0	0.1	..	1	..	..	228
San Marino	..	..	1	..	..	..	..	..	..	..	1,247
Sao Tome and Principe	..	..	0	..	0	14.3	..	..	..	..	632
Saudi Arabia	..	..	1,491	0.08	206	0.6	..	..	347	643	..
Senegal	370	51	79	0.37	7	0.7	1	5	..	..	..
Serbia	1,221	226	1,269	0.73	..	..	36	175	192	32	6,815
Seychelles	149	609	6	0.30	..	..	2	2	..	..	91
Sierra Leone	..	..	4	..	..	..	1	0	..	..	746
Singapore	6,307	461	4,543	2.09	128,239	45.3	1,649	16,511	1,081	8,604	19,774
Sint Maarten (Dutch part)	..	..	..	..	..	..	..	..	..	..	893
Slovak Republic	2,817	353	1,099	0.68	6,250	9.3	4	129	168	35	4,744
Slovenia	4,255	2,447	1,239	2.51	1,389	6.2	43	357	442	11	1,824
Solomon Islands	..	..	5	..	0	87.4	0	1	..	..	..
Somalia	..	..	1	..	..	..	..	..	..	..	..
South Africa	389	114	3,125	0.87	1,952	5.5	67	2,017	608	6,836	34,604
South Sudan	..	..	..	..	3	..	..	..	..	..	..
Spain	2,800	1,314	22,910	1.33	13,378	7.0	1,275	2,371	3,266	209	47,134
Sri Lanka	103	89	130	0.16	58	0.9	..	..	225	235	6,244
St. Kitts and Nevis	..	..	0	..	0	0.1	0	2	..	..	..
St. Lucia	..	..	0	..	..	..	..	4	..	..	..
St. Martin (French part)	..	..	..	..	..	..	..	..	..	..	..
St. Vincent and the Grenadines	..	..	0	..	0	0.1	..	3	..	..	..



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	Researchers	Technicians					Receipts	Payments	Residents	Nonresidents	
	full-time equivalent per million people	full-time equivalent per million people					\$ millions	\$ millions			
	2005-11	2005-11			2012	2012	2012	2012	2012	2012	2012
Sudan	..	..	69	..	0	0.7	2	0	..	..	2,676
Suriname	..	..	1	..	6	6.5	0	3	..	..	680
Swaziland	..	..	12	..	..	..	1	48	..	..	753
Sweden	5,191	1,984	9,473	3.37	16,547	13.4	6,729	2,349	2,288	148	11,290
Switzerland	3,285	2,844	10,019	2.87	50,102	25.8	..	..	1,480	1,508	29,110
Syrian Arab Republic	..	..	110	..	38	1.3	1	37	..	..	1,956
Tajikistan	..	..	18	0.12	..	..	0	0	3	3	2,992
Tanzania	..	..	121	0.43	95	10.2	..	2	..	..	..
Thailand	332	227	2,304	0.25	33,768	20.5	241	3,610	1,020	5,726	44,963
Timor-Leste	..	..	..	..	..	..	..	1	..	..	..
Togo	37	18	8	..	1	0.2	0	2	..	..	..
Tonga	..	..	1	..	0	6.5	..	..	..	..	..
Trinidad and Tobago	..	..	60	0.05	3	0.1	..	..	..	..	..
Tunisia	1,837	43	1,016	1.10	732	5.6	23	13	..	..	..
Turkey	892	144	8,328	0.84	1,979	1.8	..	741	4,434	232	111,699
Turkmenistan	..	..	1	..	..	..	..	..	..	..	2,549
Turks and Caicos Islands	..	..	..	..	0	1.9	..	..	..	..	..
Tuvalu	..	..	0	..	..	..	..	..	..	..	..
Uganda	..	..	158	0.41	166	20.7	20	11	..	..	..
Ukraine	1,253	261	1,727	0.73	2,623	6.3	124	727	2,491	2,464	32,070
United Arab Emirates	..	..	324	0.47	50	..	..	..	..	..	..
United Kingdom	4,202	971	46,035	1.77	67,787	21.7	12,486	8,413	15,370	7,865	42,848
United States	4,650	..	208,601	2.77	148,772	17.8	124,182	39,889	268,782	274,033	313,641
Uruguay	532	..	290	0.40	193	9.3	0	34	22	678	5,843
Uzbekistan	534	60	141	..	..	..	..	..	257	253	5,474
Vanuatu	..	..	5	..	3	54.0	0	0	..	..	..
Venezuela, RB	182	..	302	..	54	2.5	..	397	33	1,565	19,587
Vietnam	..	..	432	..	9,118	14.5	..	..	382	3,423	34,341
Virgin Islands (U.S.)	..	..	..	..	..	..	..	..	..	..	..
West Bank and Gaza	327	73	..	..	1	..	0	1	..	..	..
Yemen, Rep.	..	..	33	..	1	0.2	33	5	36	49	4,951
Zambia	43	67	60	0.34	221	24.8	..	1	7	31	2,611
Zimbabwe	..	..	63	..	20	5.9	..	..	..	..	..
World	1,265	..	582,012	2.09	1,933,747	17.6	242,491	254,324	1,430,327	739,805	4,075,279
Low income	..	..	1,629	..	..	..	64	103	..	..	..
Middle income	479	..	173,044	1.25	691,336	18.2	4,580	44,957	568,115	232,880	2,680,796
Lower middle income	..	..	31,328	0.61	44,999	8.4	620	8,192	14,278	47,625	358,282
Upper middle income	929	..	141,716	1.29	646,336	20.8	3,960	36,765	553,837	185,255	2,322,514
Low & middle income	465	..	174,673	1.24	621,438	18.1	4,644	45,061	576,817	233,456	2,723,165
East Asia & Pacific	977	..	95,382	1.81	..	26.5	1,492	25,219	546,346	135,350	1,736,251
Europe & Central Asia	..	..	17,209	0.71	27,795	8.2	1,681	4,023	11,679	3,624	240,060
Latin America & Caribbean	570	370	18,869	0.83	59,861	11.7	981	8,647	7,185	48,374	431,332
Middle East & North Africa	631	..	13,542	..	2,543	2.2	29	572	..	..	38,609
South Asia	130	87	24,249	0.75	..	6.2	331	4,180	9,716	35,487	225,169
Sub-Saharan Africa	..	..	5,422	0.58	2,010	4.3	129	2,419	..	..	..
High income	3,599	..	407,339	2.28	1,242,174	17.3	237,847	209,264	853,510	506,349	1,352,114
Euro area	3,323	1,398	176,189	2.12	490,921	15.2	49,859	83,925	82,197	19,015	297,877

Most Recent Value (MRV) if data for the specified year or full period are not available; or growth rate is calculated for less than the full period.

About the Data

**Researchers in R&D (per million people)***Long definition*

Researchers in R&D are professionals engaged in the conception or creation of new knowledge, products, processes, methods, or systems and in the management of the project concerned. Postgraduate PhD students (ISCED97 level 6) engaged in R&D are included.

Source

United Nations Educational, Scientific, and Cultural Organization (UNESCO) Institute for Statistics.

Scientific and technical journal articles*Long definition*

Scientific and technical journal articles refer to the number of scientific and engineering articles published in the following fields: physics, biology, chemistry, mathematics, clinical medicine, biomedical research, engineering and technology, and earth and space sciences.

Source

National Science Foundation, Science and Engineering Indicators.

Research and development expenditure (% of GDP)*Long definition*

Expenditures for research and development are current and capital expenditures (both public and private) on creative work undertaken systematically to increase knowledge, including knowledge of humanity, culture, and society, and the use of knowledge for new applications. R&D covers basic research, applied research, and experimental development.

Source

United Nations Educational, Scientific, and Cultural Organization (UNESCO) Institute for Statistics.

High-technology exports (current US\$)*Long definition*

High-technology exports are products with high R&D intensity, such as in aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery. Data are in current U.S. dollars.

Source

United Nations, Comtrade database.

Charges for the use of intellectual property, receipts (BoP, current US\$)*Long definition*

Charges for the use of intellectual property are payments and receipts between residents and nonresidents for the authorized use of proprietary rights (such as patents, trademarks, copyrights, industrial processes and designs including trade secrets, and franchises) and for the use, through licensing agreements, of produced originals or prototypes (such as copyrights on books and manuscripts, computer software, cinematographic works, and sound recordings) and related rights (such as for live performances on television, cable, or satellite broadcast). Data are in current U.S. dollars.

Source

International Monetary Fund, Balance of Payments Statistics Yearbook and data files.

Patent applications, residents*Long definition*

Patent applications are worldwide patent applications filed through the Patent Cooperation Treaty procedure or with a national patent office for exclusive rights for an invention—a product or process that provides a new way of doing something or offers a new technical solution to a problem. A patent provides protection for the invention to the owner of the patent for a limited period, generally 20 years.

Source

World Intellectual Property Organization (WIPO), World Intellectual Property Indicators and www.wipo.int/econ_stat. The International Bureau of WIPO assumes no responsibility with respect to the transformation of these data.

Trademark applications, total*Long definition*

Trademark applications filed are applications to register a trademark with a national or regional Intellectual Property (IP) office. A trademark is a distinctive sign which identifies certain goods or services as those produced or provided by a specific person or enterprise. A trademark provides protection to the owner of the mark by ensuring the exclusive right to use it to identify goods or services, or to authorize another to use it in return for payment. The period of protection varies, but a trademark can be renewed indefinitely beyond the time limit on payment of additional fees.

Source

World Intellectual Property Organization (WIPO), World Intellectual Property Indicators and www.wipo.int/econ_stat. The International Bureau of WIPO assumes no responsibility with respect to the transformation of these data.

Please see the online table at <http://wdi.worldbank.org/table/5.13> for observation-level metadata, which can be downloaded in Excel.



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