Patent Cooperation Treaty Yearly Review 2019

The International Patent System

WIPO
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First published 2019

World Intellectual Property Organization
34, chemin des Colombettes, P.O. Box 18
CH-1211 Geneva 20, Switzerland

ISBN: 978-92-805-3031-5

Photo credits: Getty Images / chinaface
Printed in Switzerland

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Acknowledgements

The *PCT Yearly Review* was developed under the direction of Francis Gurry (Director General) and supervised by Carsten Fink (Chief Economist). The report was prepared by a team led by Bruno Le Feuvre and comprising Kyle Bergquist, Mosahid Khan, Ryan Lamb, Anastasiya Letnikava and Hao Zhou, all from the Economics and Statistics Division.

Thanks go to colleagues from the Patents and Technology Sector for providing valuable comments on drafts at various stages.

Samiah Do Carmo Figueiredo, Caterina Valles Galmès and Cécile Roure provided valuable administrative support. Gratitude is also due to the Communications Division for the editing and design of the review, and to the Printing Plant for their services.

Finally, WIPO is grateful to national and regional patent offices for sharing their annual statistics.

Further information

Online resources

The electronic version of the *Review*, as well as the underlying data used to compile all figures and tables, can be downloaded at *www.wipo.int/ipstats*. This webpage also provides links to the IP Statistics Data Center – offering access to WIPO's statistical data – and the IP Statistical Country Profiles.

The following other patent resources are available on WIPO's website:

- **PCT homepage** – WIPO's gateway to PCT resources for applicants, offices and the public.
- ***PCT Newsletter*** – PCT monthly publication containing information about the filing of PCT applications and news about changes relating to the PCT.
- **PATENTSCOPE** – enables the search and download of published PCT applications and national/regional patent collections. Also provides access to related patent and technology information programs and services.

Contact information

Economics and Statistics Division
Website: *www.wipo.int/ipstats*
Email: *ipstats.mail@wipo.int*

Key numbers for 2018

630,000 (+2.3%)
PCT national phase entries

253,000 (+3.9%)
PCT applications filed

54,341 (+3.8%)
Applicants

127 (+1)
Countries in which PCT applications were filed

57.3% (+1 percentage point)
Share of PCT national phase entries in worldwide non-resident filings

17.1% (+0.8 percentage points)
Share of women among PCT inventors

Note: The latest available year for PCT national phase entry data is 2017. “Applicants” refers to first named applicants in published PCT applications.

Special theme: 40 years of the Patent Cooperation Treaty

Over a period of 40 years, the Patent Cooperation Treaty (PCT) has steadily grown and is now the largest international intellectual property (IP) filing system for the World Intellectual Property Organization (WIPO) and the preferred filing route for applicants seeking patent protection in foreign jurisdictions.

In 1978, the PCT entered into force in 13 member States. During that year, the PCT gradually came into operation. Patent offices – acting as receiving offices – began to receive and process PCT applications starting on June 1, 1978. That same day, the European Patent Office (EPO), the United States Patent and Trademark Office (USPTO) and the patent offices of Germany, Sweden, Switzerland and the United Kingdom (U.K.) received their first PCT applications, from a total of 12 PCT applications filed. By comparison, in 2018, applicants filed a total of almost 700 PCT applications per day, on average.

This year's special theme analyzes the long-term trends for the two phases of the System, the international and the national phases (for details, see annex, A brief presentation of the Patent Cooperation Treaty). Since the PCT first began operating, additional key global economic players have emerged – notably China – and innovation has shaped the development of new products, such as smartphones. These developments are apparent in the long-term statistics of the international phase of the PCT. We will also see which applicants have made the greatest use of the PCT and in which countries and regions of the world applicants have applied the most for patent protection through the PCT over time.

Complete data are available for the international phase. Analysis can therefore span in its entirety the period during which the System has been in existence. Since the first PCT filing was made on June 1, 1978, the full period covered by the analysis is 40 years and seven months. This is why 1979 – the first full year of operation – is also used as a reference year in the analysis. By contrast, data for PCT national phase entries (NPEs) are only partially complete, as few such data are available for the period before 1995. Given the time required to collect data from offices around the world, 2017 is the latest available year for NPEs. The NPEs period analyzed here is therefore 23 years.

Box 1.
Main changes to the PCT legal framework since 1978

Over the past four decades, the PCT System has constantly improved for both applicants and patent offices. One of the reasons for the PCT's success over the years has been member States' responsiveness and willingness to adapt the PCT System to the ever-changing needs of stakeholders. Through amendments to the PCT Regulations, the System has continually been modernized, made safer, more applicant friendly, and more useful as a filing tool for applicants and a work-sharing tool for offices.

While change is constantly underway in the PCT, three major reform processes deserve special mention:

- In 1984, the Assembly of the PCT adopted many amendments to the legal framework, affecting more than one third of PCT Regulations. Based on the experience gained since PCT operations first began in 1978, these amendments simplified the System, streamlined procedures and introduced greater safeguards against the possible mistakes that an applicant might make when filing.
- In 2000, member States launched a second major process of reform of the PCT legal framework, which continued until 2007. This process further harmonized requirements as to the form and contents of

a PCT application, introduced written opinions on patentability criteria at international search, provided for an optional supplementary international search, modified time limits, notably for national phase entry, and enabled electronic filing media.

- In 2010, member States endorsed the so-called "PCT roadmap recommendations", which have since guided work in the further development of the PCT System. These recommendations were a recognition that, while changes to the legal framework would continue to play an important supportive role, the key to future improvements lay in putting a renewed emphasis on the aim of "cooperation" underpinning the Treaty. It recognized the shared responsibility of contracting States and national and regional offices, together with the International Bureau, to put further life into that "cooperation" aim towards making the PCT System fully effective as a tool to support innovation, investment and development, as envisaged in the Treaty. Member States reconfirmed the underlying objectives of those PCT roadmap recommendations in 2018.

Furthermore, the PCT has helped bring together formal and procedural requirements for national and regional applications filed outside of the PCT System. Many States have chosen, of their own accord, to adapt their legislation applicable to national or regional applications to the requirements as to form or contents that apply to international applications filed under the PCT. In addition, the Patent Law Treaty (PLT), which entered into force in 2005, incorporates many of these requirements, thereby eliminating or greatly reducing procedural differences between national, regional and international patent systems.

Global trends in membership and in filing activity

Since the PCT first became operational, the number of member States has increased significantly: at the end of 1978, 20 states were members of the PCT (see figure S1); by 1990, this had increased to 45. The number of new members joining increased sharply during the 1990s, reaching 108 members by 2000. Between 2010 and 2018, the flow of new member States slowed, increasing from 142 to 152 – likely due to the by then already high global coverage.

By 2018, about 80% of the world's countries were members of the PCT. This includes more than 90% of all high-income countries; or, every high-income country with more than 300,000 inhabitants, with the exception of Argentina. About three-quarters of middle-income countries were also members of the PCT, as were just over 70% of low-income economies.

Up until 1990, high-income countries represented the majority of member States. Since when their share has gradually decreased from 55.6% in 1990 down to 35.5% in 2018. The shares of upper middle-income and lower middle-income countries have increased since 1978, reaching 26.3% and 22.4% of total membership, respectively, in 2018. The share of members in the low-income category has followed an opposite trend, decreasing from 30% of all members in 1978 down to 15.8% in 2018.

By 2004, 26 years after the System became operational, the total number of PCT applications filed since 1978 had reached one million (see figure S2). The two millionth PCT application was filed only seven years later and it took just a further five years to reach the three millionth application mark. Given that by 2018, 3.7 million PCT applications had been filed since 1978, the four millionth application is likely to have been filed by early 2020. If this proves to be the case, it would correspond to one million PCT applications filed in slightly under four years.

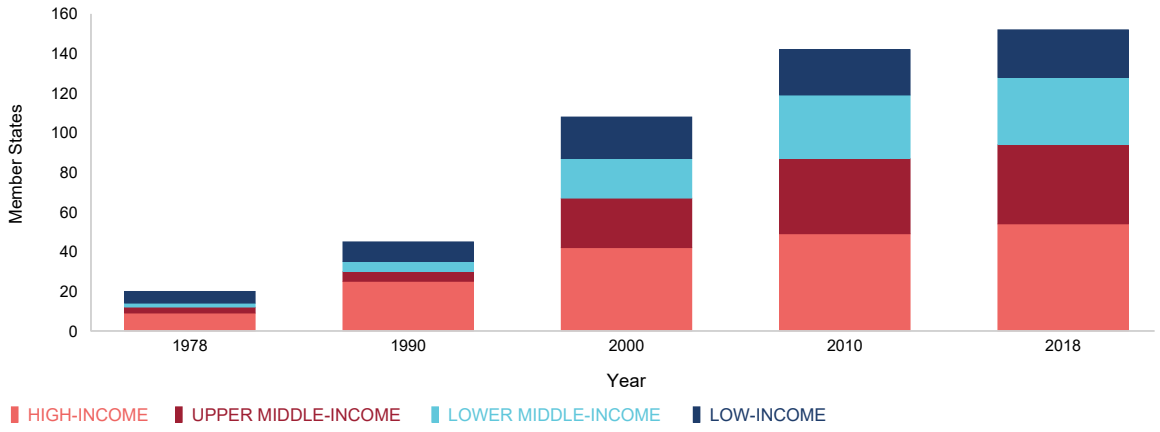
The proportion of filings from high-income countries decreased from 97.7% of total filings between 1978 and 2004 to 89.6% over the past 40 years. The share of PCT applications filed by upper middle- and lower middle-income countries has increased over the period, with filings from upper middle-income countries accounting for 9.7% of the total since 1978. The share for low-income economies has remained stable at 0.01% of total filings.

Long-term trends in filings of PCT applications

The number of PCT applications filed year-on-year has steadily increased to reach a quarter of a million applications filed in 2018 (253,000) (see figure S3). Only in 2009 did the number of PCT applications filed decrease compared to the previous year, coinciding with the most recent global economic downturn.

Up until the mid-1990s, Europe and North America, together, accounted for around 88% of total filings. However, since 1995, this combined share has been steadily decreasing, while at the same time filings in Asia have increased. In 2009, Asia surpassed North America in the number of PCT applications filed and, a

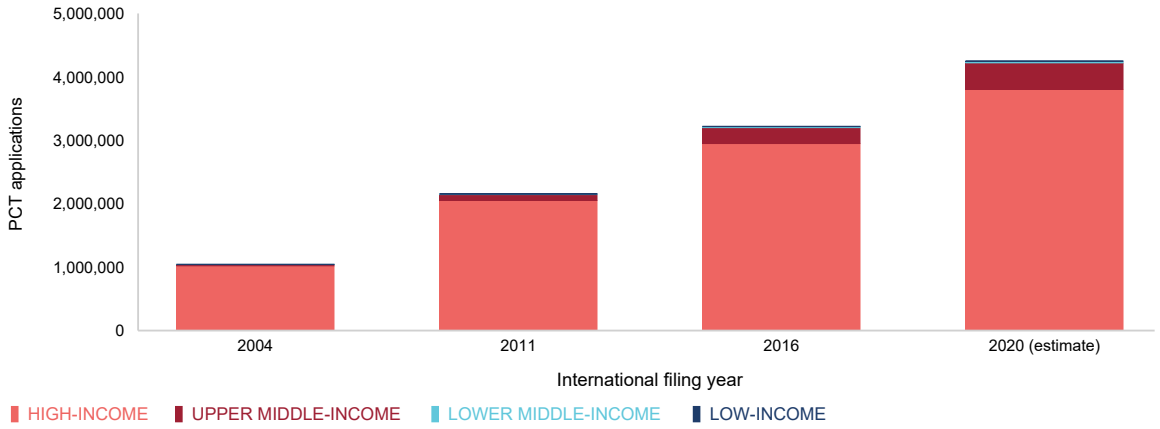
S1. PCT member States by income group, per decade



Note: member States are allocated to income groups based on the 2018 classification. For information on income group classification, see annex, Data description.

Source: WIPO Statistics Database, March 2019.

S2. Cumulative number of PCT applications filed by income group, per million filing



Note: Data for 2020 are WIPO estimate.

Source: WIPO Statistics Database, March 2019.

year later, it overtook Europe to become the most active region in terms of PCT filings. In 2018 – for the first time since the inception of the PCT – more than half of total filings originated from a single region: Asia (50.5%).

In 1978, the vast majority of PCT applications were published in English (63.5%) and, up until 2015, it was the language of publication for a majority of applications. In 2018, English accounted for under half (45.6%) of total published PCT applications, followed by Japanese (19.6%) and Chinese (17.9%). Similarly, the medium for filing of PCT applications has changed considerably over the past 40 years. In 1978, paper was the only filing medium available for PCT applications, whereas in 2018, only 2.9% of all filings were made on paper and the remainder (97.1%) was filed electronically.

Over the past 40 years, Europe (1,219,399), North America (1,213,077) and Asia (1,200,024) have filed a similar total number of PCT applications. Together, these three regions account for 97.6% of total filings made since 1978. Oceania (52,718), Latin America and the Caribbean (LAC) (21,620) and Africa (9,596) recorded much lower volumes over the same period.

Since 1978, applicants residing in the United States of America (U.S.) have filed 31.1% of total applications (see figure S4). Together with applicants from Japan (17.3%), they have accounted for almost half (48.3%) of total PCT filings. When Germany (10.4%), China (8.1%) and the Republic of Korea (4.6%) are added to this total, the top five countries, combined, filed 71.4% of total PCT applications during this period.

Compared to the filing activity since 1978, applications filed in 2018 were more concentrated among the top five origins (77.5%). In contrast, the share for those countries outside of the top five origins declined, from 28.5% over the entire period to 22.6% in 2018. Of the top five origins, China is the one to have experienced the largest increase in share, rising from a cumulative 8.1% over the past 40 years to 21.1% in 2018. This is particularly notable, given that between 1978 and 1993, Chinese applicants filed only five PCT applications. On current trends, China will exceed the U.S. in the course of 2020.

Most of the applications filed in Africa between 1978 and 2018 originated from South Africa (76.6%) (see table S5). In Asia, Japan (53.3%) filed the majority of applications. In North America and Oceania, the U.S. (95.3%) and Australia (86.1%) largely dominated filing activity. Only in Europe and LAC were filings less concentrated in a single country, where Germany and Brazil accounted each for the largest proportion of filings, with 31.8% and 41.6% of the total, respectively.

Only four countries, from three different regions, have filed more than a quarter of a million PCT applications in 40 years. Such is the case for the U.S. (1,156,062), Japan (641,903), Germany (387,338) and China (303,103). The Republic of Korea (169,455), France (152,356) and the U.K. (135,226) have each exceeded 100,000 PCT applications filed in 40 years.

Computer technology has been the field of technology to feature most often in published PCT applications over the past 40 years, with 233,932 applications (see figure S6). Medical technology (226,485), electrical machinery (207,018) and digital communication (203,446) have each also exceeded 200,000 applications during this time and, since 2017, have risen above 15,000 applications per year.

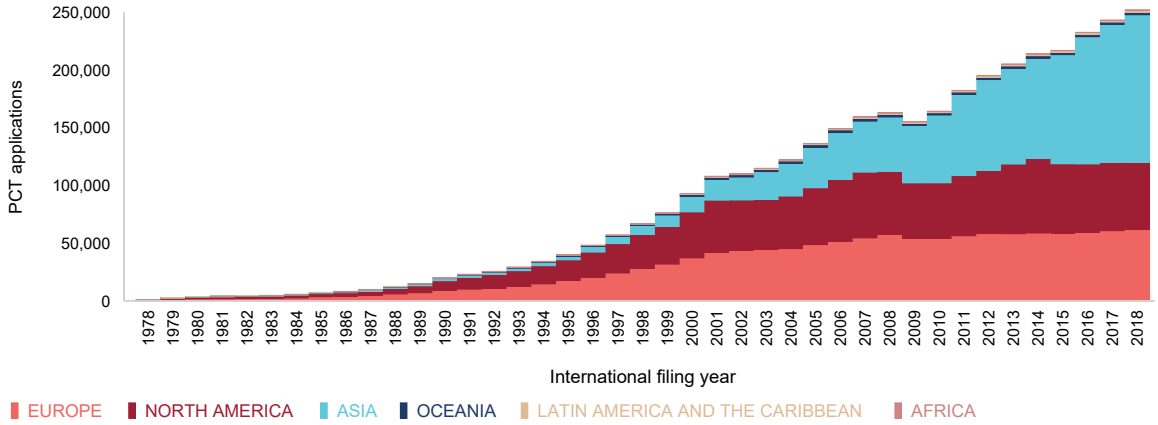
Of the top 10 technology fields since 1978, digital communication (+26%), pharmaceuticals (+19.7%) and computer technology (+19.6%) have seen the highest average annual growth rates. They are followed by biotechnology (+17.5%), audio-visual technology (+16.1%) and medical technology (+16%).

Between 1978 and 1998, medical technology (6.4%), biotechnology (6.2%), organic fine chemistry (6.1%), measurement (4.6%) and electrical machinery (4.6%) accounted for the highest proportions of published PCT applications (see figure S7). Combined, the top five technical fields represented 27.9% of total published applications during this period.

Between 1999 and 2018, the main fields of technology were computer technology (7.2%), medical technology (6.6%), digital communication (6.4%), electrical machinery (6.2%) and pharmaceuticals (4.7%), together accounting for 31.1% of total published applications. Of the top five technical fields of the past 20 years, medical technology and electrical machinery also featured as two of the top five fields of technology between 1978 and 1998. In contrast, digital communication (+4.9 percentage points) and computer technology (+4 percentage points) saw their respective shares increase sharply between these two periods.

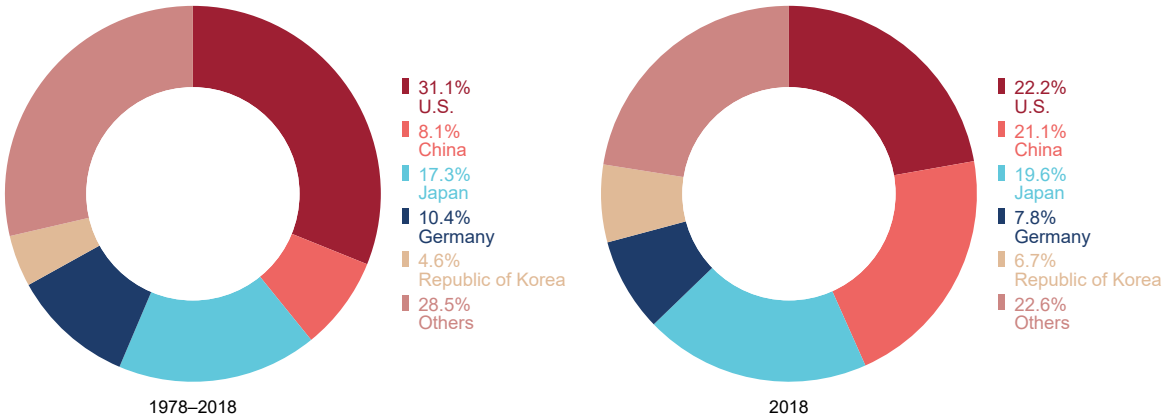
Panasonic of Japan had the highest number of published PCT applications since 1978, with 34,081 applications (see table S8). Huawei (33,899) from China – which started filing PCT applications only as recently as 2000 – ranked second with just 182 fewer published applications than Panasonic. They were followed by three companies based in Europe, namely, Philips Electronics from the Netherlands (32,783), Robert Bosch (27,654) and Siemens (27,403), both from Germany. Qualcomm (24,858), which ranked seventh, was the top U.S.-based applicant on the list.

S3. Trends in filings of PCT applications by region, 1978–2018



Source: WIPO Statistics Database, March 2019.

S4. Distribution of PCT applications filed by origin, 1978–2018 and 2018



Source: WIPO Statistics Database, March 2019.

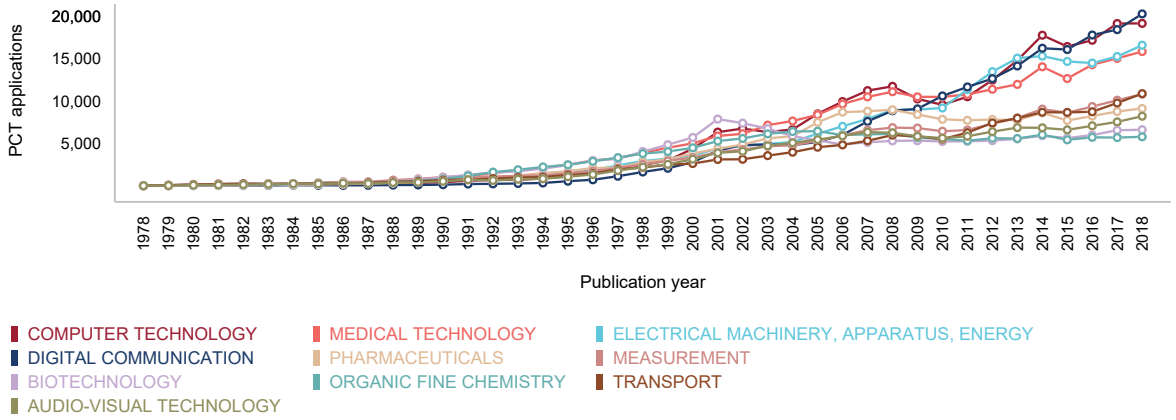
S5. PCT applications filed by the top 10 origins per region, 1978–2018

Region	Name	PCT applications	Regional share (%)
Africa	South Africa	7,346	76.6
	Egypt	699	7.3
	Morocco	466	4.9
	Algeria	137	1.4
	Tunisia	120	1.3
	Seychelles	113	1.2
	Kenya	103	1.1
	Mauritius	87	0.9
	Namibia	85	0.9
	Sudan	62	0.6
	Others	378	3.9
	Total*	**9,596**	**0.3**
Asia	Japan	641,903	53.5
	China	303,103	25.3
	Republic of Korea	169,455	14.1
	Israel	31,649	2.6
	India	20,275	1.7
	Singapore	11,994	1.0
	Turkey	10,017	0.8
	Saudi Arabia	3,065	0.3
	Malaysia	3,041	0.3
	Thailand	1,012	0.1
	Others	4,510	0.4
	Total*	**1,200,024**	**32.3**
Europe	Germany	387,338	31.8
	France	152,356	12.5
	United Kingdom	135,226	11.1
	Netherlands	91,443	7.5
	Sweden	87,896	7.2
	Switzerland	80,791	6.6
	Italy	56,699	4.6
	Finland	43,499	3.6
	Denmark	29,706	2.4
	Spain	26,799	2.2
	Others	127,646	10.5
	Total*	**1,219,399**	**32.8**
Latin America and the Caribbean	Brazil	8,986	41.6
	Mexico	3,936	18.2
	Barbados	3,206	14.8
	Chile	1,531	7.1
	Colombia	1,156	5.3
	Panama	487	2.3
	Argentina	460	2.1
	Bahamas	396	1.8
	Cuba	229	1.1
	Ecuador	212	1.0
	Others	1,021	4.7
	Total*	**21,620**	**0.6**
North America	United States of America	1,156,062	95.3
	Canada	57,015	4.7
	Total*	**1,213,077**	**32.6**
Oceania	Australia	45,375	86.1
	New Zealand	7,273	13.8
	Samoa	32	0.1
	Vanuatu	21	0.0
	Marshall Islands	7	0.0
	Fiji	4	0.0
	Papua New Guinea	3	0.0
	Micronesia (Federated States of)	2	0.0
	Tonga	1	0.0
	Total*	**52,718**	**1.4**
Unknown		4,507	n.a.
Total		**3,720,941**	**n.a.**

* indicates share of world total.

Source: WIPO Statistics Database, March 2019.

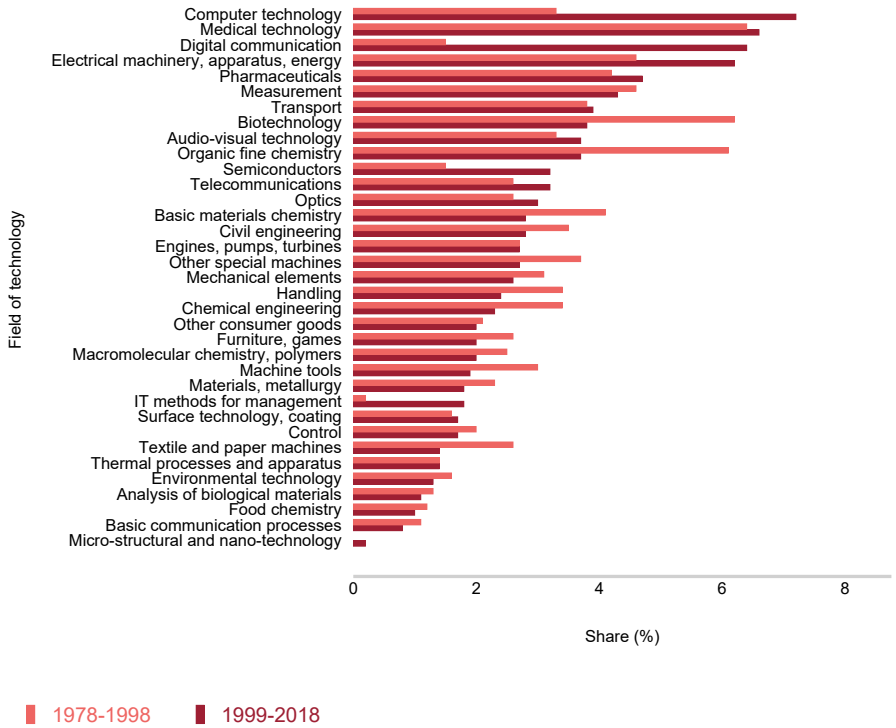
S6. Trend of the top 10 fields of technology, 1978–2018



Note: For confidentiality reasons, data are based on published applications and on the publication date. WIPO's IPC technology concordance table (available at: *www.wipo.int/ipstats*) was used to convert IPC symbols into 35 corresponding fields of technology.

Source: WIPO Statistics Database, March 2019.

S7. Distribution of published PCT applications by field of technology, 1978–1998 and 1999–2018



Note: For confidentiality reasons, data are based on published applications and on the publication date. WIPO's IPC technology concordance table (available at: *www.wipo.int/ipstats*) was used to convert IPC symbols into 35 corresponding fields of technology.

Source: WIPO Statistics Database, March 2019.

S8. Top 50 PCT applicants, 1978–2018

Ranking in					Applicant	Origin	PCT applications
1978–2018	1990	2000	2010	2018			1978–2018
1	23	6	1	12	PANASONIC IP MANAGEMENT CO., LTD.	Japan	34,081
2		6,896	4	1	HUAWEI TECHNOLOGIES CO., LTD.	China	33,899
3		2	5	18	KONINKLIJKE PHILIPS ELECTRONICS N.V.	Netherlands	32,783
4	2	5	6	10	ROBERT BOSCH CORPORATION	Germany	27,654
5	5	1	12	14	SIEMENS AKTIENGESELLSCHAFT	Germany	27,403
6			2	5	ZTE CORPORATION	China	25,746
7	1,510	16	3	4	QUALCOMM INCORPORATED	U.S.	24,858
8	98	3	9	9	TELEFONAKTIEBOLAGET LM ERICSSON (PUBL)	Sweden	22,429
9	72	19	14	2	MITSUBISHI ELECTRIC CORPORATION	Japan	19,342
10		22	62	3	INTEL CORPORATION	U.S.	17,963
11		378	7	8	LG ELECTRONICS INC.	Republic of Korea	17,349
12	833	261	8	16	SHARP KABUSHIKI KAISHA	Japan	16,593
13	1,510	37	17	6	SAMSUNG ELECTRONICS CO., LTD.	Republic of Korea	15,680
14	195	13	16	30	3M INNOVATIVE PROPERTIES COMPANY	U.S.	14,746
15	22	7	13	34	BASF SE	Germany	14,654
16	127	17	28	13	SONY CORPORATION	Japan	14,563
17	1,510	223	11	236	TOYOTA JIDOSHA KABUSHIKI KAISHA	Japan	14,201
18		4	27	36	PROCTER & GAMBLE COMPANY	U.S.	13,603
19		122	10	22	NEC CORPORATION	Japan	13,282
20		30	20	11	MICROSOFT TECHNOLOGY LICENSING, LLC	U.S.	12,870
21	1,510	160	18	15	HEWLETT-PACKARD DEVELOPMENT COMPANY, L.P.	U.S.	12,095
22		61	15	35	NOKIA TECHNOLOGIES OY	Finland	11,749
23	34	27	19	43	FUJITSU LIMITED	Japan	10,049
24	84	18	26	27	HITACHI, LTD.	Japan	9,854
25	6	12	116	329	MOTOROLA, INC.	U.S.	9,666
26	8	11	21	460	E I DU PONT DE NEMOURS	U.S.	9,352
27			48	21	FUJIFILM Corporation	Japan	8,736
28	21	23	38	38	UNIVERSITY OF CALIFORNIA	U.S.	8,096
29	195	62	22	100	INTERNATIONAL BUSINESS MACHINES CORPORATION	U.S.	7,706
30				7	BOE TECHNOLOGY GROUP CO.,LTD	China	7,443
31	84	13	50	15,525	GENERAL ELECTRIC COMPANY	U.S.	7,422
32	1,513	20	48	15,578	HENKEL KOMMANDITGESELLSCHAFT AUF AKTIEN	Germany	7,105
33		244	90	6,706	HALLIBURTON ENERGY SERVICES, INC.	U.S.	6,802
34		6,896	39	23	MURATA MANUFACTURING CO., LTD.	Japan	6,428
35		378	60	20	LG CHEM, LTD.	Republic of Korea	6,424
36	321	151	35	96	KABUSHIKI KAISHA TOSHIBA	Japan	5,966
37	1,510		206	25	OLYMPUS CORPORATION	Japan	5,935
38			71	24	GOOGLE INC.	U.S.	5,893
39	59	38	198	123	HONEYWELL INTERNATIONAL INC.	U.S.	5,580
40		77	32	166	THOMSON LICENSING	France	5,554
41	226	423	24	72	CANON KABUSHIKI KAISHA	Japan	5,440
42				40	SHENZHEN CHINA STAR OPTOELECTRONICS TECHNOLOGY CO., LTD	China	5,337
43		36	32	48	APPLIED MATERIALS, INC.	U.S.	5,233
44			51	45	DOW GLOBAL TECHNOLOGIES INC.	U.S.	5,013
45		2,190	862	19	DENSO CORPORATION	Japan	4,910
46	1	482	54	1,132	EASTMAN KODAK COMPANY	U.S.	4,808
47		46	52	68	CORNING INCORPORATED	U.S.	4,801
48	1,510	616	73	51	APPLE INC.	U.S.	4,733
49	833	77	53	66	DAIKIN INDUSTRIES, LTD.	Japan	4,688
50	1,510	6,896	47	47	KYOCERA CORPORATION	Japan	4,682

Note: For confidentiality reasons, data are based on published applications. Data for Panasonic Corporation are included in data for Panasonic IP Management Co., Ltd. Data for Microsoft Corporation are included in data for Microsoft Technology Licensing, LLC. Data for Nokia Corporation are included in data for Nokia Technologies Oy.

Source: WIPO Statistics Database, March 2019.

The top 50 list of PCT applicants comprises applicants from nine countries. The U.S. heads the list with 19 applicants, followed by Japan (16), Germany (4), China (4), the Republic of Korea (3), Finland (1), France (1), the Netherlands (1) and Sweden (1). The top 50 list comprises only businesses, with the exception of the University of California (8,096).

Seven of the top 10 applicants over the past 40 years appeared among the top 10 applicants in 2018. Exceptions were Panasonic (ranked 12th in 2018), Philips Electronics (18th) and Siemens (14th). Each of the top 10 applicants since 1978 has been mainly active in the electrical engineering sector.

PCT NPEs as a proportion of total non-resident applications

Patent applications from non-resident applicants received by offices worldwide have trended upward over the past two decades, growing at a compound annual growth rate of 9.6% for PCT NPEs and 1.9% for the Paris route (see figure S9). The faster rate of growth of non-resident NPEs allowed them to exceed the number of non-resident filings made through the Paris route in 2007, when they reached an estimated 526,000 NPEs. Applicants filed about 391,400 non-resident applications directly at offices the same year.

The driving force behind this increase in the number of non-resident NPEs is the filing activity witnessed in Asia and North America. Asia has shown a steady upward trend over the observed period, apart from a sharp decline during the global financial crisis in 2008, and since 2013, has received over 200,000 non-resident NPEs per year. Asia has been followed by North America, which received about 147,000 NPEs in 2017. Since 1995, Asia and North America have experienced annual growth rates of 11.5% and 7.9%, respectively, and, together, accounted for 70.5% of total non-resident NPEs. Africa, Europe, LAC and Oceania have also experienced an overall increase in the number of non-resident NPEs since 1995, but each received fewer non-resident NPEs in 2017 than in 2015.

North America, which is the main destination for filings made through the Paris route, with nearly 197,000 non-resident applications filed in 2017, is the only region to have received more non-resident applications through the Paris route than through the PCT route. It was followed by Asia (114,292) and Europe (58,755). Over the past two decades, the number of direct non-resident filings has tended to decline in Africa, Europe and LAC, whereas North America and Asia have experienced compound annual growth rates of 3.1% and 2.1%, respectively, since 1995.

Over the period 1995–2017, the PCT route has represented 49.5% of total non-resident filings (see figure S10). Applicants filed the majority of non-resident applications using the PCT System in every geographical region, except for North America (33.8%).

Oceania had the highest share of NPEs, comprising 74.8% of its total non-resident patent applications, followed by Africa (67.7%), LAC (63.3%), Asia (56.9%) and Europe (52%). The Paris route has remained the preferred filing route in North America, representing 66.2% of non-resident applications.

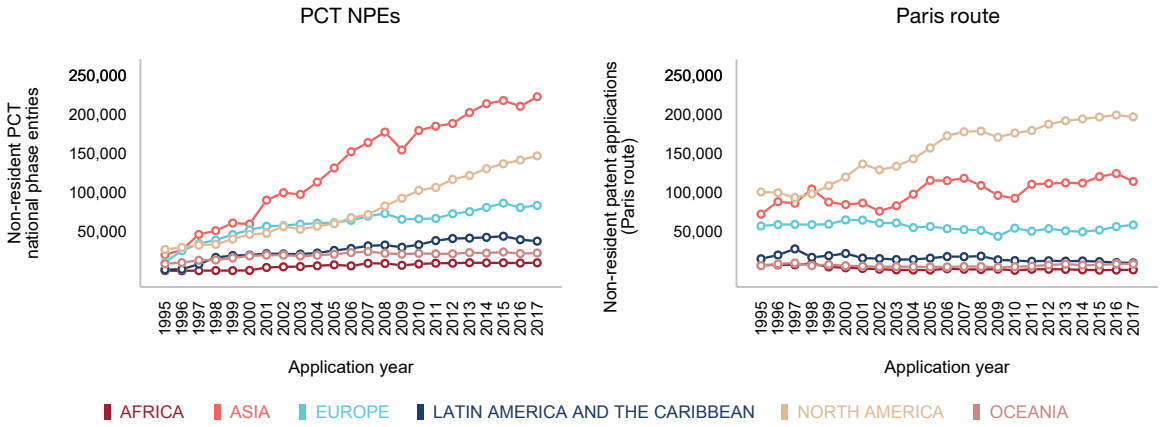
For offices of high-income group countries, the overall share of NPEs in total non-resident filings increased from 37.1% in 2000 to 51.8% in 2017 (see figure S11). Likewise, the average share for offices of middle-income countries grew from 49.2% to 70.7% during the same period.

In 1980, only 10.2% of non-resident filings at the EPO were NPEs. This share had increased to 16.1% a decade later. Between 1990 and 2000, the use of the PCT System increased sharply, with the majority (50.3%) of non-resident applications being NPEs in 2000. Since when, this share has continued to grow and represented over two thirds of non-resident filings made at the EPO in 2017.

Data for 1990 were also available for the office of Brazil and for the Korean Intellectual Property Office (KIPO) and show similar trends as for the EPO in the proportions of NPEs in total non-resident filings received over time. The increase in the NPE share since 1990 has been more gradual at the USPTO and reached a lower level (38.8%) than that found in other selected offices in 2017.

Of the selected offices of middle-income countries, all received more than three-quarters of their non-resident filings though the PCT route in 2017, except for the National Intellectual Property Administration of the People's Republic of China (CNIPA) (58.7%). It is likely that the NPE share either stagnated (Brazil) or decreased at all the selected offices of middle-income countries between 2010 and 2017 due to the high usage made of the PCT route since 2010. This was also the case for the offices of Australia and Canada, among high-income group countries.

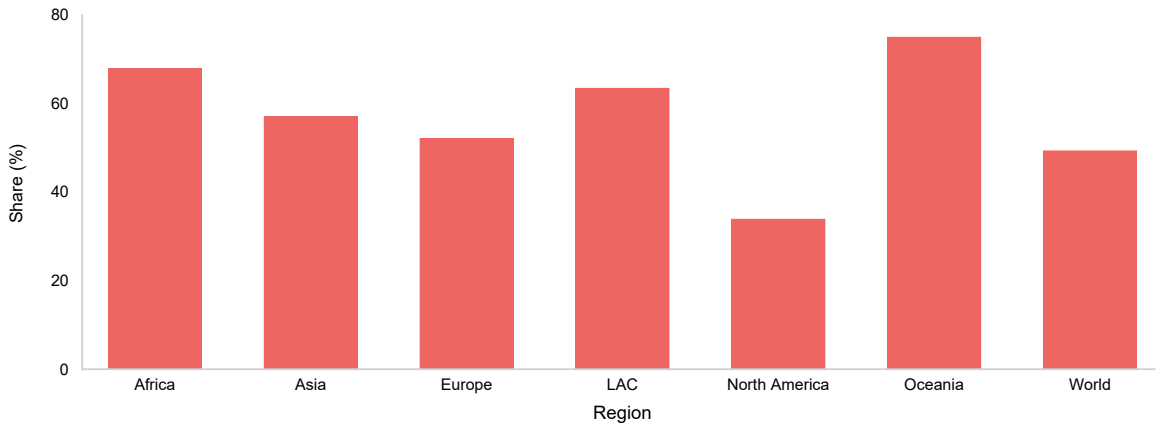
S9. Trends in non-resident patent applications by filing route and region, 1995–2017



Note: Data may be incomplete.

Source: WIPO Statistics Database, March 2019.

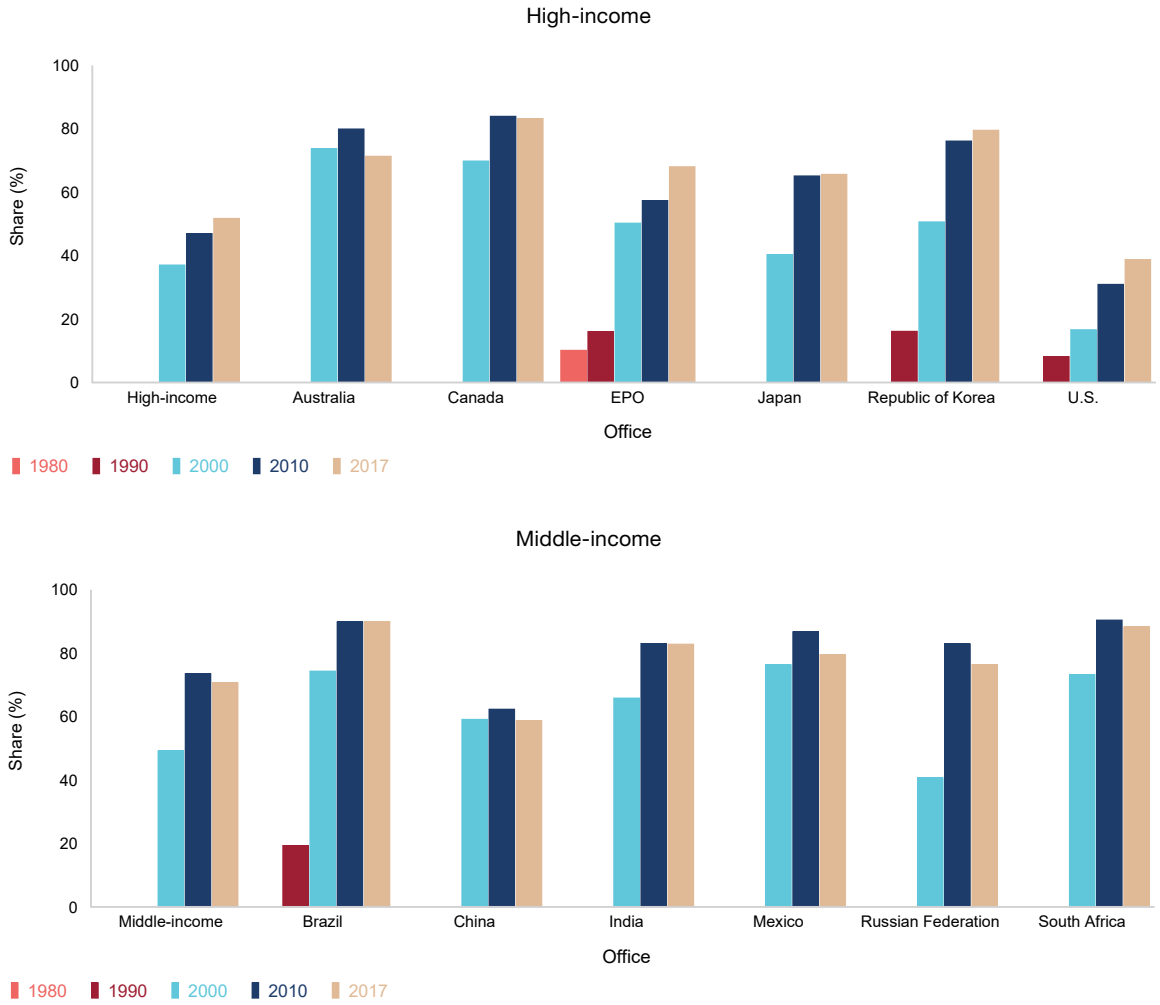
S10. Share of PCT NPEs in non-resident filings per region, 1995–2017



Note: Data may be incomplete. LAC is Latin America and the Caribbean.

Source: WIPO Statistics Database, March 2019.

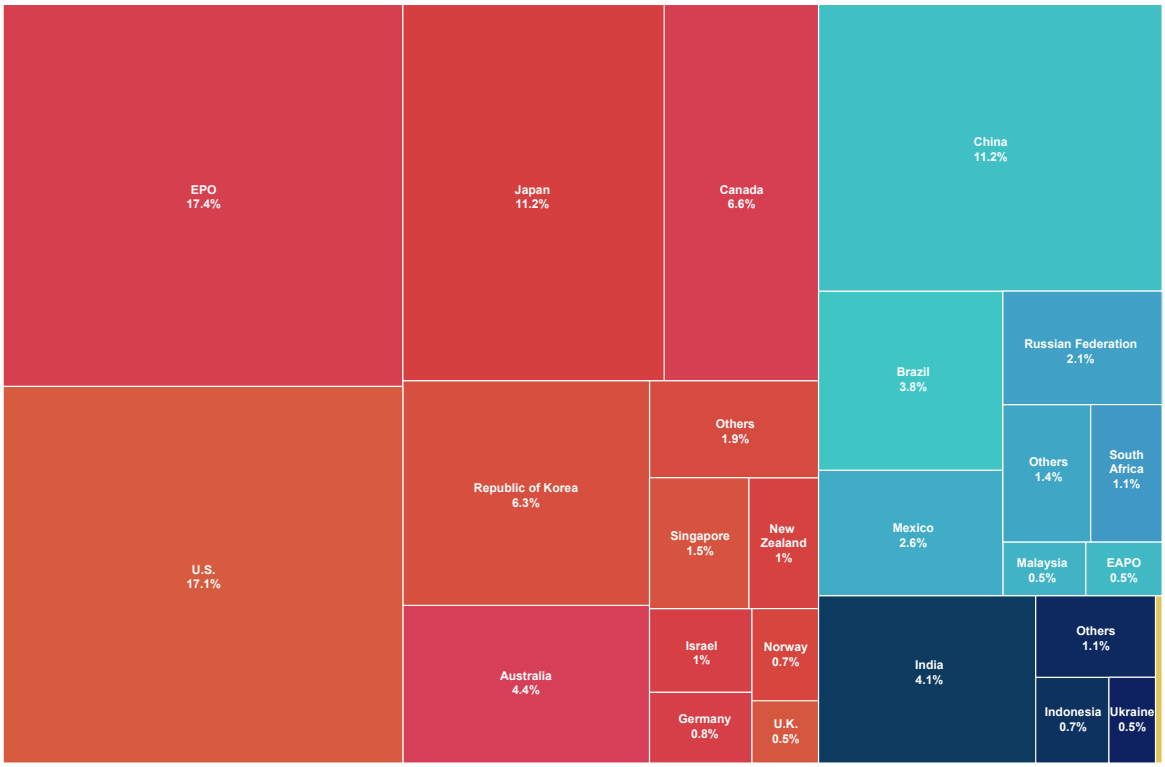
S11. Share of PCT NPEs in non-resident filings at selected offices



Note: Data are missing for some years and offices. Data for South Africa refer to 2001, 2011 and 2017. EPO is the European Patent Office. The data for calculating the EPO shares in 1980 and 1990 come from the EPO database based on the March 2019 status.

Source: WIPO Statistics Database, March 2019.

S12. Distribution of total PCT NPEs by office and income group, 1995–2017



Note: EAPO is the Eurasian Patent Organization and EPO is the European Patent Office. Data may be incomplete. Limited PCT NPE data are available before 1995.

Source: WIPO Statistics Database, March 2019.

The destinations of PCT NPEs

When considering all NPEs initiated worldwide – resident and non-resident – between 1995 and 2017, the vast majority (70.4%) were received by the offices in high-income countries (see figure S12). Offices in upper middle-income countries received 23.1% of total NPEs, followed by offices of lower middle-income (6.4%) and low-income (0.1%) countries.

The offices to have received the largest proportions of total NPEs since 1995 were the EPO (17.4%), the USPTO (17.1%), CNIPA (11.2%) and the JPO (11.2%); combined, they accounted for the majority of NPEs initiated worldwide. Several offices from middle-income countries other than the CNIPA received notable shares of total NPEs. This was the case for the offices of India (4.1%), Brazil (3.8%), Mexico (2.6%), the Russian Federation (2.1%) and South Africa (1.1%).

Conclusion

Since the PCT entered into force in 1978, the number of its member States has increased sharply from 13 to 152 in 2018. About 80% of the world's countries have joined the System, and 90% of high-income countries. In 2018, countries from the high-income (35.5%) and upper middle-income (26.3%) categories accounted for the largest proportions of total member States.

The number of PCT applications filed over the past 40 years has likewise grown markedly. It took 26 years to reach one million applications and only an estimated 16 more are needed before the four millionth PCT filing mark is reached. Applicants from Asia, Europe and North America have each filed slightly more than 1.2 million PCT applications since 1978. The U.S. (31.1%), Japan (17.3%) and Germany (10.4%), combined, account for the bulk of total filing activity. China has seen its share of PCT filings rise steeply over the past 40 years, up to 21.1% in 2018.

Since 1978, the four technology fields to have appeared the most in PCT applications were computer technology, medical technology, electrical apparatus and digital communication. Of the top 10 technology fields, digital communication (+26%), pharmaceuticals (+19.7%) and computer technology (+19.6%) have seen the highest average annual growth.

Panasonic is the top filer over the past 40 years, closely followed by Huawei, which only started filing PCT applications in 2000. Of the top 10 applicants over this period, seven featured among the top 10 in 2018, and all were primarily active in the electrical engineering sector.

Since 2007, Asia and North America have been the two main destinations of non-resident NPEs. Between 1995 and 2017, applicants used the PCT route for almost half (49.5%) of total non-resident applications. This share is highest for Oceania (74.8%) and lowest for North America (33.8%).

Among a selection of patent offices, long-term trends show that applicants have sharply increased their use of the PCT System over time, especially so up until 2010. Between 2010 and 2017, the share of NPEs in total non-resident filings decreased at seven of the 12 selected offices, most likely due to their already high percentage levels.

When considering all NPEs initiated worldwide between 1995 and 2017, offices of high-income (70.4%) and upper middle-income (23.1%) countries were the main destinations, among which the CNIPA, the EPO, the JPO and the USPTO each received more than 10% of total NPEs. Among offices of middle-income countries, Brazil, India, Mexico, the Russian Federation and South Africa also received substantial proportions of total NPEs.

Section A
Statistics on the international phase: PCT applications

Highlights

A new record is set for the number of PCT applications filed

An estimated 253,000 international patent applications (PCT applications) were filed under WIPO's Patent Cooperation Treaty (PCT) in 2018 (see figure A1). This represents an annual growth of 3.9% and a ninth consecutive year of growth. Altogether, about 3.7 million PCT applications have been filed since the PCT System became operational in 1978 (see Special theme). Over the past 40 years, PCT filings have grown every year except for 2009, when the global financial crisis led to an economic downturn.

Applicants from 127 different countries filed PCT applications

In 2018, 152 states were members of the PCT and applicants from 127 countries in six geographical regions filed PCT applications at 84 receiving offices (ROs). Despite this wide geographical spread, most filing activity is concentrated in a small number of economies.

Combined, the top 10 ROs accounted for 93.8% of applications received in 2018. With 55,330 filings and 55,211 filings, respectively, the United States Patent and Trademark Office (USPTO) and the National Intellectual Property Administration of the People's Republic of China (CNIPA) received the highest numbers of PCT applications. They were followed by the Japan Patent Office (JPO) (48,630), the European Patent Office (EPO) (37,975), the Korean Intellectual Property Office (KIPO) (17,002) and the International Bureau (IB) of WIPO (12,259) (see figure A4).

Applicants from the U.S. remained the largest users of the PCT System

Applicants residing in the United States of America (U.S.) filed the most PCT applications in 2018, with 56,142 applications. U.S. applicants were followed by applicants from China (53,345), Japan (49,702), Germany (19,883) and the Republic of Korea (17,014) (see figure A7). Combined, the top five countries accounted for 77.5% of all PCT applications filed in 2018. Driven mainly by a rapid increase in filings by applicants from China and Japan, the combined share of the top five has increased every year since 2009, when it was 69.2%.

The top 20 origins included 17 high-income countries – mostly European – and three middle-income countries, namely, China, India (2,013 applications) and Turkey (1,578) (see figure A8). Outside the top 20 origins, other large middle-income economies with notable numbers of PCT applications were the Russian Federation (963), Brazil (619), Mexico (274) and South Africa (274). Applicants from low-income countries filed a total of 16 PCT applications in 2018. Within this category, applicants from Senegal (4), the Democratic People's Republic of Korea (2) and the United Republic of Tanzania (2) accounted for the highest numbers of applications (see table A28).

Compared to 2017, 15 of the top 20 origins filed more PCT applications in 2018. The three countries to record double-digit increases were India (+27.2%), Turkey (+26.1%) and Finland (+14.7%). With a 9.1% growth rate in 2018, China experienced its nineteenth consecutive year of growth, but the first one not to have been in double-digits during this period. The Republic of Korea (+8%) and Japan (+3.1%) both saw solid growth also. The five countries within the top 20 list to experience decreases were the Netherlands (–6.6%), Australia (–1.5%), France (–1.2%), the U.S. (–0.9%) and Spain (–0.6%).

Among the large middle-income economies not to feature among the top 20 origins, the Islamic Republic of Iran (+100%), Colombia (+14%) and Ukraine (+10.6%) exhibited a sharp increase in PCT applications filed, whereas Thailand (–32.7%), the Russian Federation (–9%) and South Africa (–7.1%) saw large decreases in filings.

The majority of PCT filings originated from Asia

For the first time since the PCT System came into force in 1978, applicants originating from a single region accounted for the majority of filings. Countries located in Asia accounted for 50.5% of all PCT applications in 2018. Applicants in Europe (24.5%) and North America (23.1%) also made a substantial proportion of the filings. The combined share for Africa, Latin America and the Caribbean (LAC) and Oceania amounted to 1.7% of total PCT filings. Asia's share has increased every year since 1993 and has grown from 28.9% in 2008 to 50.5% in 2018, primarily due to increases in filings from China, Japan and the Republic of Korea (see figure A3).

The business sector accounted for about 85% of all PCT applications

In 2018, the IB published almost 237,400 PCT applications filed by 54,341 applicants. This represents a 6.2% increase in published applications on 2017. The business sector accounted for 85.3% of all published PCT applications, followed by individuals (7.5%), the university sector (5.4%) and the government and public research organization (PRO) sector (1.9%) (see figure A11).

The business sector accounted for the majority of published applications in each of the top 20 origins from the high-income group. The business sector share was particularly high for Sweden (97.6%) and Japan (95.8%). Of the top 20 origins from the middle-income category, the business sector accounted for the majority of published applications in seven countries and individual applicants filed the most in eight countries. In the Islamic Republic of Iran (93.3%) and Egypt (91.4%), individual applicants accounted for the vast majority of published applications (see figure A12).

The university sector accounted for a particularly high proportion of applications in Ecuador (68.2%), Morocco (52.5%) and Colombia (47.1%). It also accounted for high shares among several high-income economies, such as Singapore (19.7%), Spain (13.6%) and Israel (12%). Governments and PROs were responsible for a relatively high proportion of applications originating from Singapore (16.6%), France (8.7%) and Spain (5.2%). Of the top 20 middle-income origins, India (3.7%), South Africa (3.4%) and Malaysia (3.4%) had the highest shares of applications from the government and PRO sector.

Huawei remained the top PCT applicant

In 2018, Huawei Technologies of China was the top PCT applicant among the business sector, for the fourth time since 2014 (see table A15). With 5,405 published PCT applications, Huawei Technologies became the first company to have had more than 5,000 PCT applications published within the period of a year. With 2,812 published PCT applications, Mitsubishi Electric Corporation of Japan moved up two spots to rank second thanks to an increase of 291 published applications compared to 2017. These two companies were followed by Intel Corporation (2,499) and Qualcomm Incorporated (2,404), both U.S.-based companies.

ZTE Corporation of China (2,080), which ranked second in 2017, moved down three positions. Sony Semiconductor Solutions Corporation of Japan was the company that climbed the most places in the top 50 ranking, up 304 places. Other sharp climbs in the ranking came from SZ DJI Technology Co., Ltd of China (+52 positions), Nokia Technologies Oy of Finland (+24) and Guang Dong Oppo Mobile Telecommunications Corp., Ltd of China (+23).

The top 50 applicants list for 2018 is composed of applicants from 10 origins. Japan had 16 of the top applicants, followed by the U.S. (12), China (8), Germany (5) and the Republic of Korea (3) and the Netherlands (2). Finland, France, Sweden and Switzerland had each one applicant within this list.

Companies active in digital communication head the list of top 50 PCT filers in 2018. Of the top 10 applicants, seven filed mainly in digital communication, namely, Ericsson, Huawei Technologies, Intel Corporation, LG Electronics, Qualcomm Incorporated, Samsung Electronics and ZTE Corporation (see table A16).

Of the top 10 universities, five are from the U.S. and four from China

With 501 published PCT applications, the University of California remained the largest user of the PCT System among educational institutions in 2018 (see table A17). The Massachusetts Institute of Technology (216) retained its second spot, despite a drop in published applications of 63 compared to 2017. It was followed by the Shenzhen University (201), the South China University of Technology (170) and Harvard University (169).

This is the first time that Chinese universities have ranked among the top 10. Universities based in the U.S. have traditionally largely dominated the top 10 ranking. In 2018, only half of the top 10 universities were located in the U.S., four were from China and one from the Republic of Korea. Of the top 50 universities, 23 were located in the U.S., 10 in China, 6 in the Republic of Korea, 5 in Japan, 2 in Singapore and 1 each in India, Saudi Arabia, Switzerland and the United Kingdom (U.K.).

Fraunhofer-Gesellschaft became the top PCT applicant in the government and PRO sector

With 345 published applications, the German-based Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung heads the list of the top 30 government and PRO applicants in 2018, followed by the China Academy of Telecommunications Technology (303) (see table A18). These two PROs overtook the Commissariat à l'Énergie Atomique et aux Énergies Alternatives (289) of France, which had been the top filer for seven consecutive years until 2017.

Applicants from 12 countries are represented in the top 30 list for 2018. The Republic of Korea (8) had the highest number of applicants, followed by the U.S. (6) and China (4).

Digital communication became the main field of technology in PCT applications

Digital communication (20,271) regained the top position that it held in 2016 by being the most frequently featured technology field in published PCT applications in 2018. It was followed by computer technology (19,152), electrical machinery, apparatus, energy (16,577), medical technology (15,826) and transport (10,867) (see table A20). These top five fields of technology, combined, accounted for more than one third (34.9%) of all published PCT applications made in 2018.

The number of published PCT applications grew for each of the 35 fields of technology, except for micro-structural and nano-technology (–7%) and basic materials chemistry (–1.3%). Of the top 10 technology fields, transport (+11.3%), digital communication (+10.1%) and semiconductors (+9.8%) saw the sharpest growth on 2017.

Only 17.1% of inventors listed in PCT applications were women

In 2018, women accounted for 17.1% of all inventors listed in PCT applications and men the remaining 82.9% (see figure A22). The share of women inventors increased by almost 0.8 percentage points compared to 2017 (16.4%). Since 2005, this share has continuously increased, from 11.8% to 17.1%. Moreover, the share of women inventors has increased in each of the world's geographical regions over the past five years, except for Africa (13.1%), where it decreased slightly by 0.5 percentage points. The LAC region (23.6%) had the highest share of women among PCT inventors and was followed by Asia (19.8%), Oceania (16.1%), North America (15.9%) and Europe (13.4%) (see figure A24).

About 94% of PCT applications named at least one man as inventor in 2018, and 32.6% named at least one woman as inventor (see figure A23). The share of PCT applications with at least one woman as inventor has risen from 22.4% in 2004 to 32.6% in 2018, while the share for inventors who are men decreased within the same period from 97.1% to 94.3%.

The gender gap among PCT inventors varies considerably across countries. Within the top 20 origins, China (28.9%), the Republic of Korea (26.8%) and Spain (24.4%) had the highest shares of inventors who were women in 2018 (see figure A25). These three were the only origins among the top 20 to have more than one-fifth of all inventors being women. Conversely, Germany (10.3%), Japan (10.1%) and Austria (9.4%) had the lowest shares among the top 20 origins.

Fields of technology related to the life sciences had comparatively high shares of women among PCT inventors (see figure A26). Women represented more than a quarter of inventors listed in PCT applications in the fields of biotechnology (29.9%), pharmaceuticals (29.2%), food chemistry (28.6%), analysis of biological materials (26.5%) and organic fine chemistry (26.1%). Women accounted for more than a third of inventors listed in PCT applications relating to pharmaceuticals filed by applicants residing in France (37.4%), China (36.5%) and the Republic of Korea (35.2%) (see figure A27).

Global trends in PCT applications

PCT applications by receiving office

PCT applications by origin

PCT applications by applicant type

Top PCT applicants

PCT applications by fields of technology

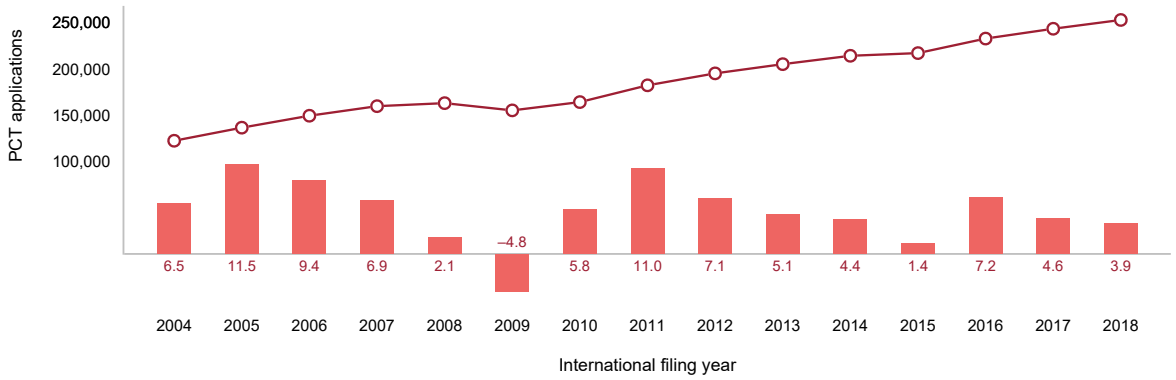
Participation of women inventors in PCT applications

Statistical table

Global trends in PCT applications

The total number of PCT applications grew by 3.9% in 2018.

A1. Trend in filings of PCT applications, 2004–2018

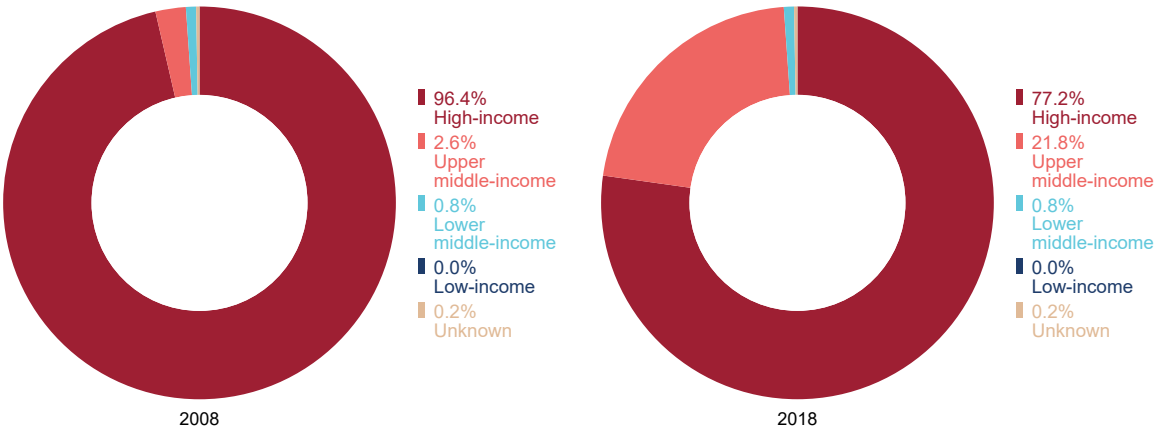


Note: Data for 2018 are WIPO estimates.

Source: WIPO Statistics Database, March 2019.

Upper middle-income countries have seen their share increase sharply over the past decade.

A2. Distribution of PCT applications by income group, 2008 and 2018

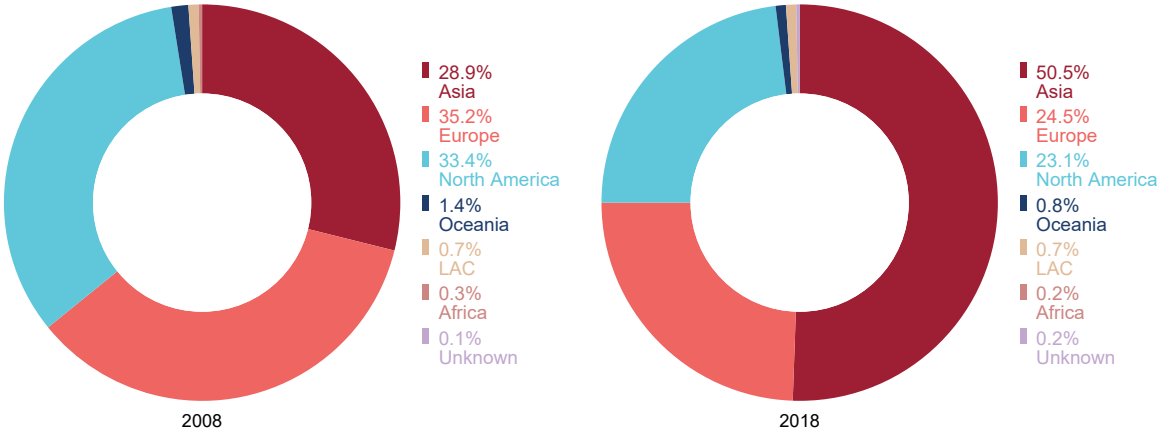


Note: Data for 2018 are WIPO estimates. Each income group includes the following number of origins: high-income (58), upper middle-income (36), lower middle-income (21) and low-income (11). For information on income group classification, see annex, Data description.

Source: WIPO Statistics Database, March 2019.

Asia accounted for the bulk of PCT applications filed in 2018.

A3. Distribution of PCT applications by region, 2008 and 2018



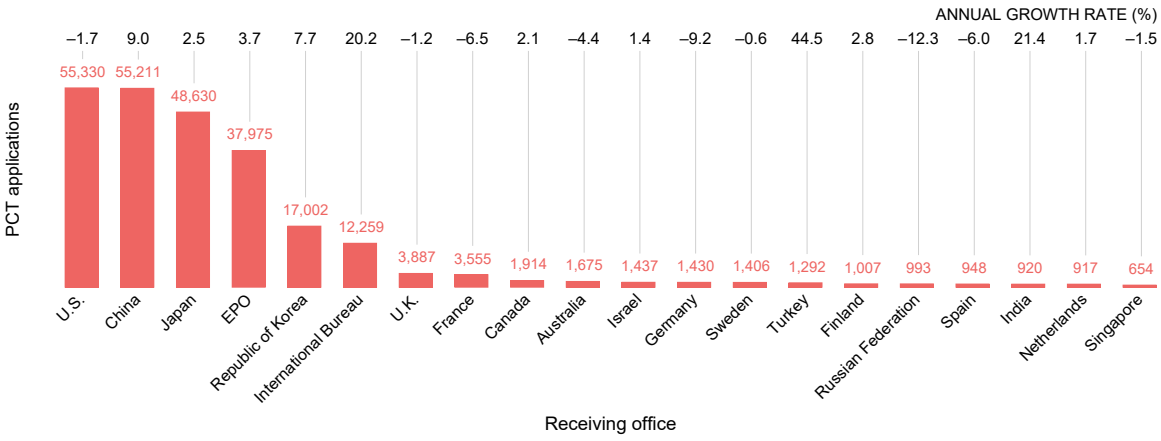
Note: Data for 2018 are WIPO estimates. Each region includes the following number of offices: Africa (22), Asia (34), Europe (42), Latin America and the Caribbean (LAC) (22), North America (2) and Oceania (4).

Source: WIPO Statistics Database, March 2019.

PCT applications by receiving office

The USPTO and the CNIPA each received around 55,000 PCT applications in 2018.

A4. PCT applications for the top 20 receiving offices, 2018

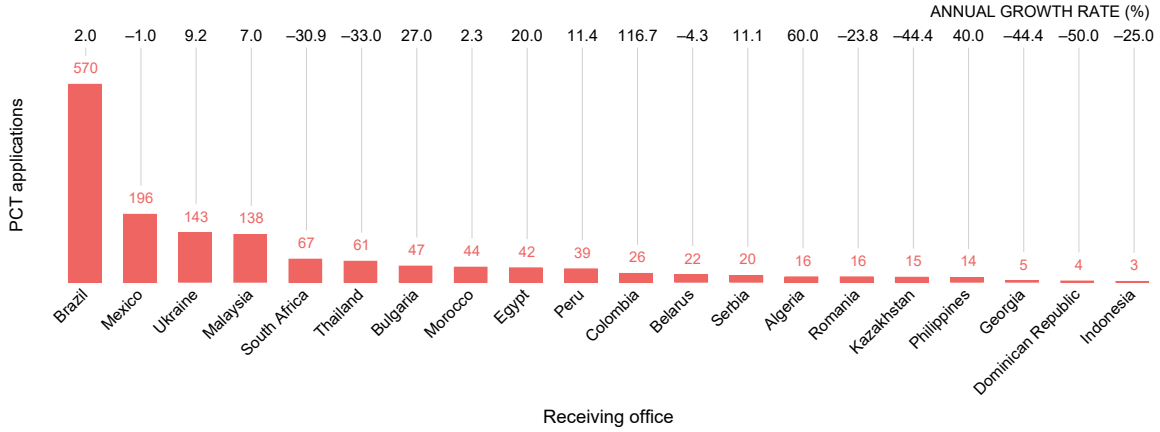


Note: Data for 2018 are WIPO estimates. EPO is the European Patent Office and CNIPA is the National Intellectual Property Administration of the People's Republic of China.

Source: WIPO Statistics Database, March 2019.

The office of Brazil received 570 PCT applications in 2018.

A5. PCT applications for selected receiving offices of low- and middle-income countries, 2018



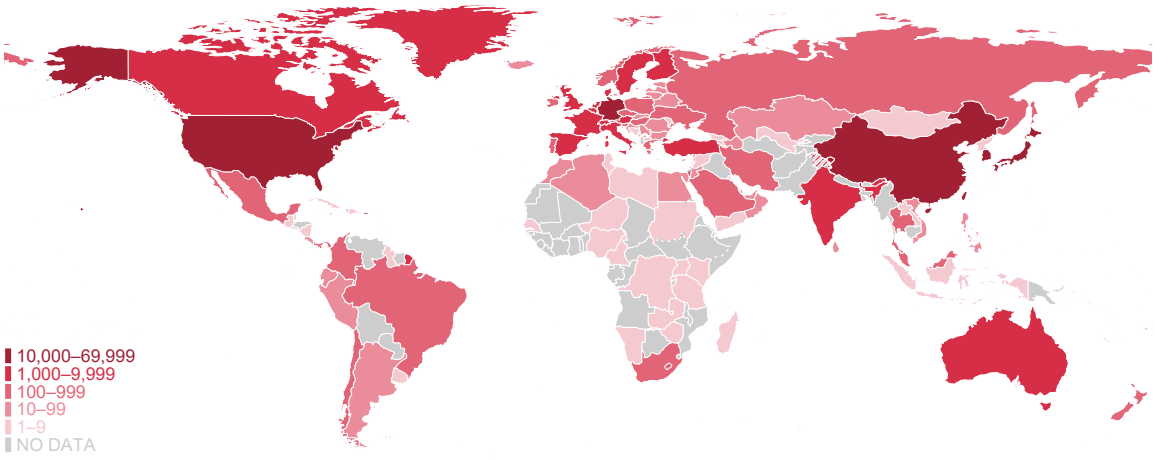
Note: Data for 2018 are WIPO estimates. The selected offices are from different world regions and income groups (low-income, lower middle-income and upper middle-income). Where available, data for all offices are presented in statistical table A28.

Source: WIPO Statistics Database, March 2019.

PCT applications by origin

PCT applications are highly concentrated among a few origins.

A6. PCT applications by origin, 2018

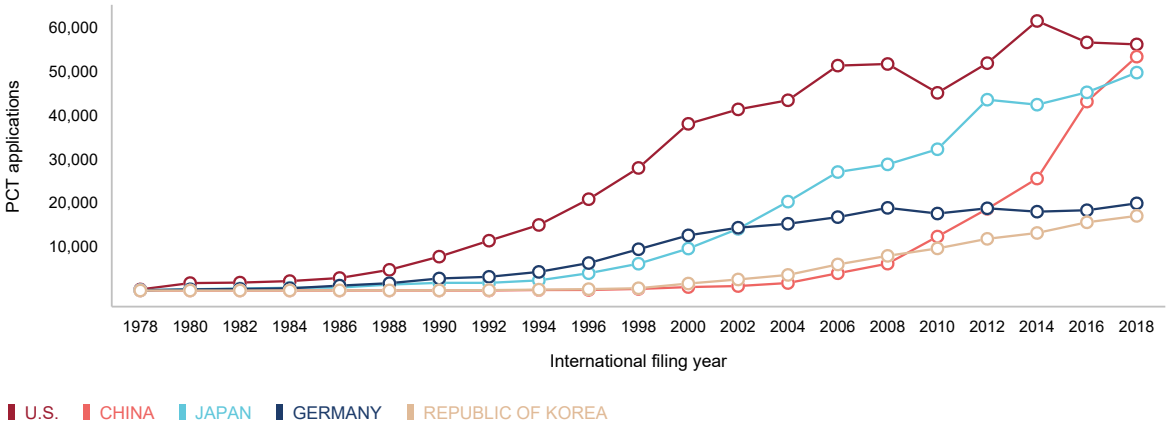


Note: Data for 2018 are WIPO estimates.

Source: WIPO Statistics Database, March 2019.

U.S.-based applicants have filed the largest number of PCT applications every year since the PCT System came into force in 1978.

A7. Trend in PCT applications for the top five origins, 1978–2018

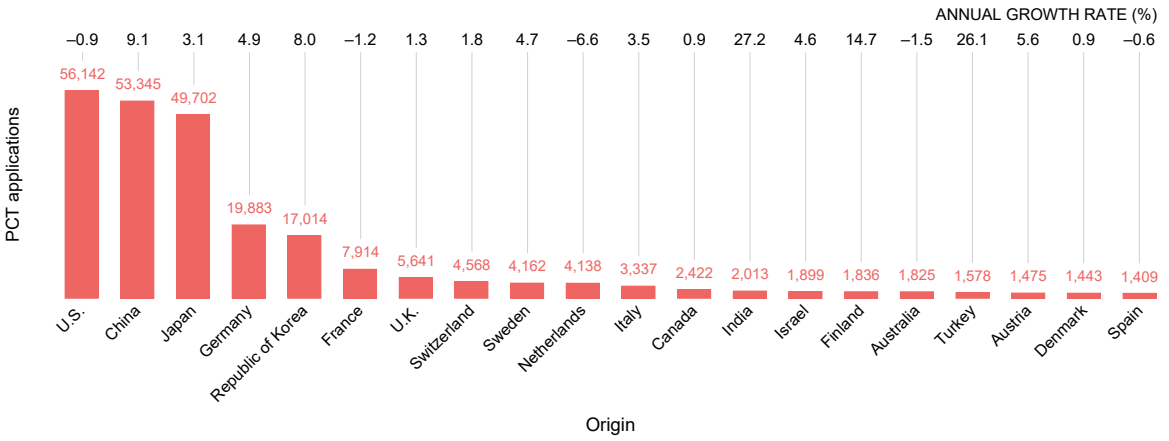


Note: Data for 2018 are WIPO estimates.

Source: WIPO Statistics Database, March 2019.

Applicants residing in China, Japan and the U.S. filed by far the most PCT applications in 2018.

A8. PCT applications for the top 20 origins, 2018



Note: Data for 2018 are WIPO estimates.

Source: WIPO Statistics Database, March 2019.

With growth of 28%, Latin America and the Caribbean saw the steepest increase in filings among all geographical regions in 2018.

A9. PCT applications for the top countries by region, 2016–2018

Region	Name	Year of international filing			Regional share 2018 (%)	Change from 2017 (%)
		2016	2017	2018		
Africa	South Africa	287	295	274	63.3	–7.1
	Morocco	35	47	49	11.3	4.3
	Egypt	44	36	44	10.2	22.2
	Others	59	91	66	15.2	–27.5
	Total*	**425**	**469**	**433**	**0.2**	**–7.7**
Asia	China	43,091	48,905	53,345	41.7	9.1
	Japan	45,209	48,205	49,702	38.9	3.1
	Republic of Korea	15,555	15,751	17,014	13.3	8.0
	India	1,528	1,583	2,013	1.6	27.2
	Israel	1,838	1,816	1,899	1.5	4.6
	Turkey	1,065	1,251	1,578	1.2	26.1
	Singapore	864	867	930	0.7	7.3
	Saudi Arabia	294	378	661	0.5	74.9
	Malaysia	189	141	143	0.1	1.4
	Thailand	155	156	105	0.1	–32.7
	Others	345	414	485	0.4	17.1
	Total*	**110,133**	**119,467**	**127,875**	**50.5**	**7.0**
Europe	Germany	18,307	18,951	19,883	32.1	4.9
	France	8,210	8,014	7,914	12.8	–1.2
	United Kingdom	5,504	5,568	5,641	9.1	1.3
	Switzerland	4,369	4,488	4,568	7.4	1.8
	Sweden	3,719	3,975	4,162	6.7	4.7
	Netherlands	4,675	4,430	4,138	6.7	–6.6
	Italy	3,362	3,225	3,337	5.4	3.5
	Finland	1,525	1,601	1,836	3.0	14.7
	Austria	1,422	1,397	1,475	2.4	5.6
	Spain	1,507	1,418	1,409	2.3	–0.6
	Others	6,981	7,624	7,532	12.2	–1.2
	Total*	**59,581**	**60,691**	**61,895**	**24.5**	**2.0**
Latin America and the Caribbean	Brazil	567	589	619	33.7	5.1
	Mexico	289	270	274	14.9	1.5
	Chile	197	167	245	13.3	46.7
	Panama	60	9	185	10.1	1,955.6
	Colombia	100	143	163	8.9	14.0
	Barbados	114	67	96	5.2	43.3
	Antigua and Barbuda		57	96	5.2	68.4
	Argentina	46	36	42	2.3	16.7
	Peru	24	33	38	2.1	15.2
	Others	91	66	81	4.4	22.7
	Total*	**1,488**	**1,437**	**1,839**	**0.7**	**28.0**
North America	United States of America	56,591	56,676	56,142	95.9	–0.9
	Canada	2,336	2,400	2,422	4.1	0.9
	Total*	**58,927**	**59,076**	**58,564**	**23.1**	**–0.9**
Oceania	Australia	1,835	1,852	1,825	86.7	–1.5
	New Zealand	307	273	278	13.2	1.8
	Others	3	2	2	0.1	0.0
	Total*	**2,145**	**2,127**	**2,105**	**0.8**	**–1.0**
Unknown		208	244	289	n.a.	n.a.
Total		**232,907**	**243,511**	**253,000**	**n.a.**	**3.9**

* indicates share of world total.

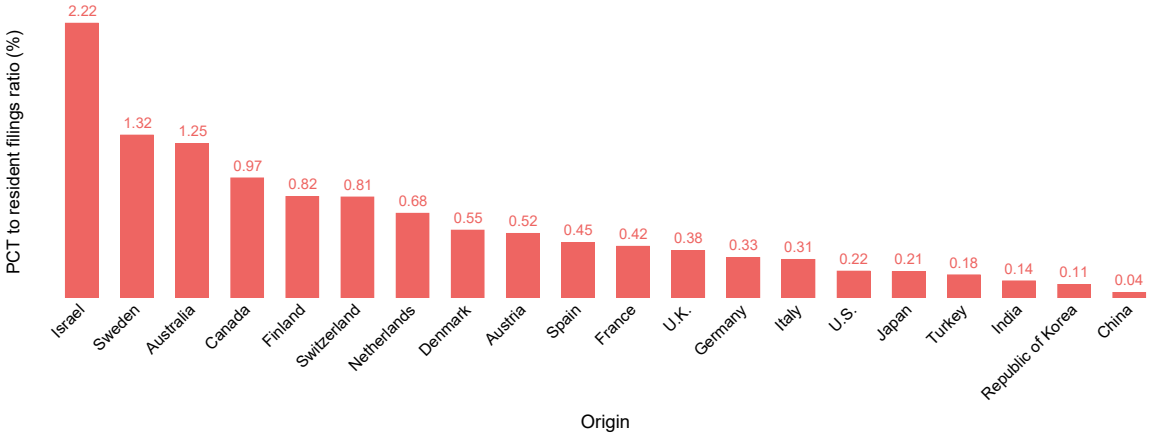
n.a. indicates not applicable.

Note: Data for 2018 are WIPO estimates. This table shows the top countries in each region (with a maximum of 10 countries per region) whose applicants filed more than 20 PCT applications in 2018. Data for all origins are reported in statistical table A28.

Source: WIPO Statistics Database, March 2019.

China, India and the Republic of Korea have low conversion rates of resident patent applications to PCT applications compared to European origins.

A10. Conversion ratio of direct resident patent applications to PCT applications for the top 20 origins, 2018



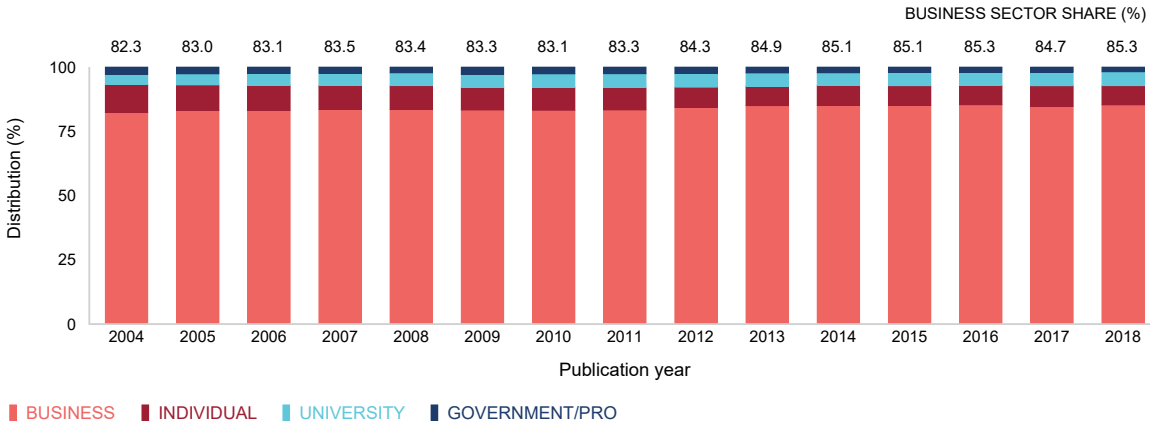
Note: Data for 2018 are WIPO estimates. This hypothetical "conversion ratio" reflects the proportion of direct resident patent applications converted into PCT applications. The ratio is defined for the top 20 origins in terms of PCT applications filed in 2018 divided by resident patent applications (including regional applications and excluding PCT national phase entries) filed in 2017. In theory, the conversion ratio should be between 0 and 1. However, it may exceed 1, because some applications do not have priority claims associated with prior resident filings. For example, an applicant from Israel may forego filing an application at the Israel Patent Office and opt to file a first application at the USPTO, then convert that prior filing into a PCT application.

Source: WIPO Statistics Database, March 2019.

PCT applications by applicant type

The business sector accounted for 85.3% of all PCT applications filed in 2018.

A11. Distribution of PCT applications by applicant type, 2004–2018

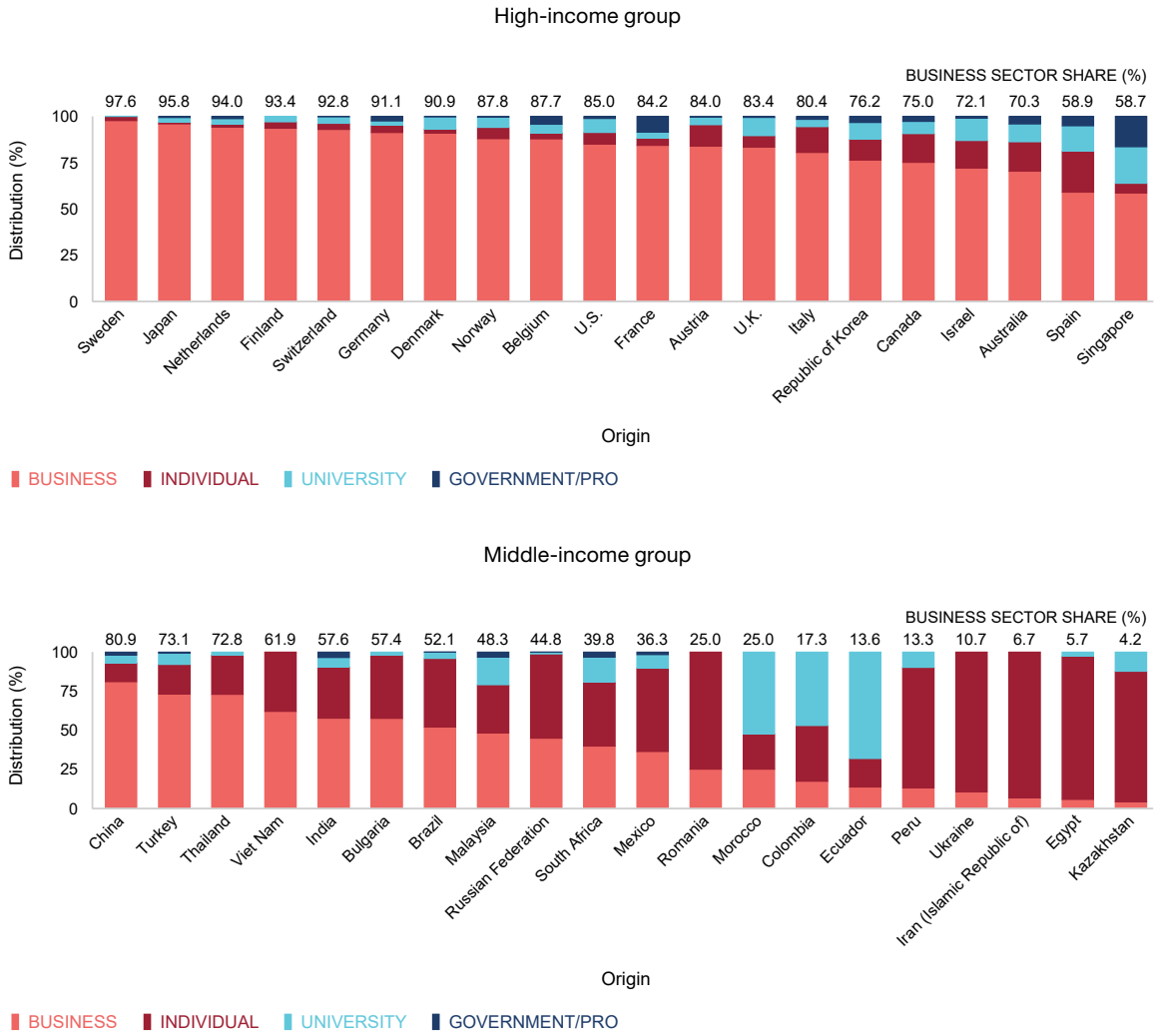


Note: The government and public research organizations (PROs) sector includes private non-profit organizations and hospitals. The university sector includes all educational institutions. For confidentiality reasons, data are based on the publication date.

Source: WIPO Statistics Database, March 2019.

More than 95% of PCT applications originating in Sweden and Japan were filed by businesses.

A12. Distribution of PCT applications by applicant type for the top 20 origins by income group, 2018

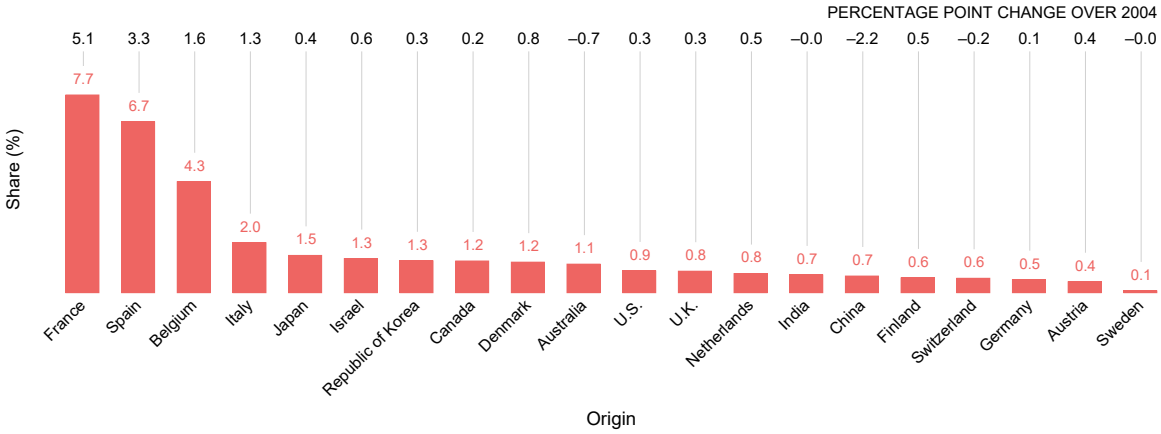


Note: The government and PROs sector includes private non-profit organizations and hospitals. The university sector includes all educational institutions. For confidentiality reasons, data are based on published applications and on the publication date.

Source: WIPO Statistics Database, March 2019.

Belgium, France and Spain exhibit a comparatively high level of collaboration between the business and public sectors.

A13. Share of PCT applications with business and public sector co-applicants for the top 20 origins, 2018

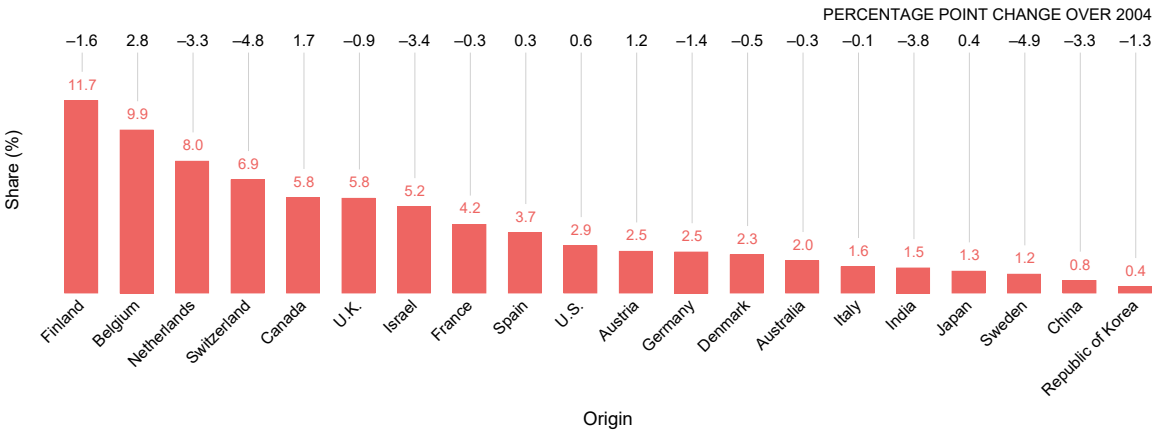


Note: The public sector comprises the university sector and the government and PROs sector. The government and PROs sector includes private non-profit organizations and hospitals. The university sector includes all educational institutions. For confidentiality reasons, data are based on published applications and on the publication date.

Source: WIPO Statistics Database, March 2019.

A relatively high proportion of PCT applications filed by applicants residing in Belgium, Finland and the Netherlands included foreign co-applicants.

A14. Share of PCT applications with foreign co-applicants for the top 20 origins, 2018



Note: Counts are based on corporate applicants only (excluding natural persons) and on all applicants named in PCT applications (not only the first named applicant). For confidentiality reasons, data are based on published applications and on the publication date.

Source: WIPO Statistics Database, March 2019.

Top PCT applicants

Huawei Technologies set a new record in the number of applications published by one applicant in a single year.

A15. Top 50 business PCT applicants, 2016–2018

Ranking	Change in position from 2017	Applicant	Origin	Published PCT applications		
				2016	2017	2018
1	0	HUAWEI TECHNOLOGIES CO., LTD.	China	3,692	4,024	5,405
2	2	MITSUBISHI ELECTRIC CORPORATION	Japan	2,053	2,521	2,812
3	0	INTEL CORPORATION	U.S.	1,692	2,637	2,499
4	1	QUALCOMM INCORPORATED	U.S.	2,466	2,163	2,404
5	–3	ZTE CORPORATION	China	4,123	2,965	2,080
6	2	SAMSUNG ELECTRONICS CO., LTD.	Republic of Korea	1,672	1,757	1,997
7	0	BOE TECHNOLOGY GROUP CO.,LTD	China	1,673	1,818	1,813
8	–2	LG ELECTRONICS INC.	Republic of Korea	1,888	1,945	1,697
9	1	TELEFONAKTIEBOLAGET LM ERICSSON (PUBL)	Sweden	1,608	1,564	1,645
10	4	ROBERT BOSCH CORPORATION	Germany	1,274	1,354	1,524
11	0	MICROSOFT TECHNOLOGY LICENSING, LLC	U.S.	1,528	1,536	1,476
12	3	PANASONIC INTELLECTUAL PROPERTY MANAGEMENT CO., LTD.	Japan	1,189	1,280	1,465
13	–4	SONY CORPORATION	Japan	1,665	1,735	1,342
14	3	SIEMENS AKTIENGESELLSCHAFT	Germany	1,138	1,063	1,211
15	–3	HEWLETT-PACKARD DEVELOPMENT COMPANY, L.P.	U.S.	1,743	1,519	1,170
16	5	SHARP KABUSHIKI KAISHA	Japan	1,205	963	1,132
17	23	GUANG DONG OPPO MOBILE TELECOMMUNICATIONS CORP., LTD	China	80	474	1,042
18	–2	KONINKLIJKE PHILIPS ELECTRONICS N.V.	Netherlands	1,137	1,077	1,033
19	1	DENSO CORPORATION	Japan	986	968	998
20	5	LG CHEM, LTD.	Republic of Korea	671	850	969
21	–2	FUJIFILM CORPORATION	Japan	968	970	962
22	2	NEC CORPORATION	Japan	1,056	899	947
23	6	MURATA MANUFACTURING CO., LTD.	Japan	681	684	889
24	3	GOOGLE INC.	U.S.	587	789	836
25	–3	OLYMPUS CORPORATION	Japan	1,077	934	750
26	19	GENERAL ELECTRIC COMPANY	U.S.	365	408	729
27	–4	HITACHI, LTD.	Japan	1,047	923	714
28	4	TENCENT TECHNOLOGY (SHENZHEN) COMPANY LIMITED	China	172	560	661
29	56	SZ DJI TECHNOLOGY CO., LTD	China	197	241	656
30	0	3M INNOVATIVE PROPERTIES COMPANY	U.S.	653	678	648
31	–5	HALLIBURTON ENERGY SERVICES, INC.	U.S.	1,103	808	634
32	5	SCHAEFFLER TECHNOLOGIES AG & CO. KG	Germany	406	489	613
33	2	HITACHI AUTOMOTIVE SYSTEMS, LTD.	Japan	396	503	582
34	–1	BASF SE	Germany	598	556	557
35	24	NOKIA TECHNOLOGIES OY	Finland	310	315	551
36	–5	PROCTER & GAMBLE COMPANY	U.S.	624	566	513
37	19	HONDA MOTOR CO., LTD.	Japan	267	323	504
38	304	SONY SEMICONDUCTOR SOLUTIONS CORPORATION	Japan	57	69	467
39	–22	SHENZHEN CHINA STAR OPTOELECTRONICS TECHNOLOGY CO., LTD	China	1,163	972	463
40	16	NTT DOCOMO, INC.	Japan	209	318	450
41	–4	SABIC GLOBAL TECHNOLOGIES B.V.	Netherlands	359	488	446
42	8	FUJITSU LIMITED	Japan	312	338	442
43	10	ABB SCHWEIZ AG	Switzerland	50	330	419
44	–3	DOW GLOBAL TECHNOLOGIES INC.	U.S.	415	421	417
45	–3	BAYERISCHE MOTOREN WERKE AKTIENGESELLSCHAFT	Germany	383	414	414
46	0	KYOCERA CORPORATION	Japan	427	377	413
47	0	APPLIED MATERIALS, INC.	U.S.	336	360	407
48	–5	COMPAGNIE GÉNÉRALE DES ÉTABLISSEMENTS MICHELIN	France	344	411	406
49	19	WUHAN CHINA STAR OPTOELECTRONICS TECHNOLOGY CO., LTD	China	86	290	395
50	26	APPLE INC.	U.S.	450	277	390

Note: For confidentiality reasons, data are based on published applications and on the publication date.

Source: WIPO Statistics Database, March 2019.

The bulk of PCT applications filed by Ericsson (74.4%), Huawei Technologies (59.9%), ZTE Corporation (59.6%) and Qualcomm (55.2%) related to digital communication technologies.

A16. Share of technology fields for the top 10 business applicants, 2018

Field of technology	Applicant									
	Huawei Tech.	Mitsubishi Electr.	Intel Corp.	Qualcomm	ZTE Corp.	Samsung Electr.	BOE Tech. Group	LG Electr.	LM Ericsson	Robert Bosch Corp.
Electrical machinery, apparatus, energy	2.4	16.7	1.9	2.0	3.0	4.6	1.5	3.4	0.4	16.6
Audio-visual technology	3.9	3.3	3.0	5.8	4.9	10.3	21.7	8.0	1.3	3.9
Telecommunications	10.8	5.4	7.9	9.7	10.8	11.1	0.6	10.1	12.2	0.7
Digital communication	59.9	4.7	31.5	55.2	59.6	31.0	1.1	48.6	74.4	2.2
Basic communication processes	2.2	2.3	2.6	5.4	0.6	0.5	0.4	0.7	2.9	0.9
Computer technology	14.6	7.5	22.7	12.3	15.6	21.6	16.3	2.4	5.2	3.5
IT methods for management	0.7	1.4	0.2	0.2	0.6	2.3	0.2	0.6	0.5	0.3
Semiconductors	1.0	5.9	24.1	3.5	0.0	0.4	21.8	1.4	0.1	1.2
Optics	1.5	2.7	1.6	0.2	0.7	3.1	25.7	1.6	0.4	1.0
Measurement	1.3	5.2	1.8	3.4	1.7	1.9	1.4	1.2	1.2	15.5
Analysis of biological materials	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.5
Control	0.5	5.0	0.7	1.0	1.2	0.8	0.5	0.7	0.9	4.5
Medical technology	0.4	0.5	0.5	0.6	0.2	1.8	1.3	0.6	0.1	0.5
Organic fine chemistry	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0
Biotechnology	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.0	0.0	0.3
Pharmaceuticals	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Macromolecular chemistry, polymers	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1
Food chemistry	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0
Basic materials chemistry	0.0	0.1	0.0	0.0	0.0	0.2	0.5	0.2	0.0	0.3
Materials, metallurgy	0.1	0.2	0.0	0.0	0.1	0.0	0.0	0.4	0.0	0.5
Surface technology, coating	0.1	0.3	0.1	0.0	0.0	0.3	2.4	0.1	0.0	0.6
Micro-structural and nano-technology	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	1.3
Chemical engineering	0.0	0.3	0.1	0.0	0.0	0.4	0.3	0.7	0.0	1.5
Environmental technology	0.0	0.5	0.0	0.0	0.0	0.1	0.3	0.1	0.0	1.6
Handling	0.1	7.4	0.1	0.0	0.0	0.3	0.8	1.9	0.1	1.3
Machine tools	0.0	1.5	0.1	0.0	0.0	0.1	0.4	0.4	0.0	4.8
Engines, pumps, turbines	0.0	3.4	0.0	0.0	0.0	0.2	0.0	2.0	0.0	12.9
Textile and paper machines	0.0	0.2	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.1
Other special machines	0.0	0.2	0.0	0.0	0.0	0.1	0.1	0.2	0.0	1.7
Thermal processes and apparatus	0.1	17.0	0.0	0.1	0.1	2.2	0.2	2.4	0.0	0.3
Mechanical elements	0.1	0.9	0.0	0.0	0.1	0.2	0.1	0.2	0.0	5.7
Transport	0.2	4.4	0.6	0.6	0.4	1.3	0.7	2.1	0.2	14.7
Furniture, games	0.1	1.0	0.1	0.0	0.0	1.1	0.2	3.9	0.2	0.2
Other consumer goods	0.1	1.6	0.1	0.0	0.1	4.0	0.2	5.3	0.0	0.4
Civil engineering	0.0	0.3	0.0	0.0	0.0	0.3	0.1	0.3	0.0	0.4

Note: For confidentiality reasons, data are based on published applications and on the publication date. WIPO's IPC technology concordance table (available at: *www.wipo.int/ipstats*) was used to convert IPC symbols into 35 corresponding fields of technology.

Source: WIPO Statistics Database, March 2019.

Since 1993, the University of California has been the top PCT applicant for the university sector.

A17. Top 50 university PCT applicants, 2016–2018

Ranking	Change in position from 2017	Applicant	Origin	Published PCT applications		
				2016	2017	2018
38	1	UNIVERSITY OF CALIFORNIA	U.S.	434	482	501
108	–32	MASSACHUSETTS INSTITUTE OF TECHNOLOGY	U.S.	236	279	216
119	103	SHENZHEN UNIVERSITY	China	87	108	201
145	192	SOUTH CHINA UNIVERSITY OF TECHNOLOGY	China	50	70	170
147	–26	HARVARD UNIVERSITY	U.S.	163	179	169
158	–22	UNIVERSITY OF TEXAS SYSTEM	U.S.	155	161	158
181	20	SEOUL NATIONAL UNIVERSITY	Republic of Korea	122	119	137
181	91	TSINGHUA UNIVERSITY	China	84	90	137
211	0	LELAND STANFORD JUNIOR UNIVERSITY	U.S.	104	113	121
219	25	CHINA UNIVERSITY OF MINING AND TECHNOLOGY	China	84	99	114
242	78	OSAKA UNIVERSITY	Japan	65	75	105
259	–77	JOHNS HOPKINS UNIVERSITY	U.S.	158	129	99
273	–53	KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY	Republic of Korea	87	109	94
280	–49	UNIVERSITY OF TOKYO	Japan	108	104	92
294	–84	HANYANG UNIVERSITY	Republic of Korea	101	114	89
300	–20	TOHOKU UNIVERSITY	Japan	56	88	87
304	0	KYOTO UNIVERSITY	Japan	72	80	86
324	–80	UNIVERSITY OF MICHIGAN	U.S.	94	100	81
332	–12	OXFORD UNIVERSITY INNOVATION LIMITED	U.K.	32	75	79
332	–143	UNIVERSITY OF FLORIDA	U.S.	97	126	79
332	–35	UNIVERSITY OF ARIZONA	U.S.	47	81	79
338	–86	KING ABDULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY	Saudi Arabia	72	97	78
348	67	CORNELL UNIVERSITY	U.S.	42	55	76
351	0	PEKING UNIVERSITY	China	54	67	75
355	7	JIANGNAN UNIVERSITY	China	37	65	74
365	–77	DUKE UNIVERSITY	U.S.	62	84	72
365	–93	KOREA UNIVERSITY	Republic of Korea	87	90	72
379	–46	UNIVERSITY OF PITTSBURGH	U.S.	49	71	70
379	9	NORTHWESTERN UNIVERSITY	U.S.	67	59	70
379	268	NATIONAL UNIVERSITY OF SINGAPORE	Singapore	45	37	70
390	–39	NANYANG TECHNOLOGICAL UNIVERSITY	Singapore	64	67	68
400	–5	CALIFORNIA INSTITUTE OF TECHNOLOGY	U.S.	73	58	66
410	49	JIANGSU UNIVERSITY	China	30	50	64
413	88	YONSEI UNIVERSITY	Republic of Korea	56	46	63
425	455	VANDERBILT UNIVERSITY	U.S.	30	27	62
431	148	KYUSHU UNIVERSITY	Japan	56	41	61
440	–214	COLUMBIA UNIVERSITY	U.S.	67	107	59
440	–13	ARIZONA BOARD OF REGENTS, A BODY CORPORATE OF THE STATE OF ARIZONA, ACTING FOR AND ON BEHALF OF ARIZONA STATE UNIVERSITY	U.S.	37	53	59
449	38	UNIVERSITY OF MASSACHUSETTS	U.S.	37	47	58
449	23	UNIVERSITY OF MARYLAND	U.S.	47	49	58
449	–5	ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE	Switzerland	60	51	58
465	306	CASE WESTERN RESERVE UNIVERSITY	U.S.	34	31	56
480	–212	UNIVERSITY OF PENNSYLVANIA	U.S.	96	91	55
494	303	NORTH CAROLINA STATE UNIVERSITY	U.S.	22	30	53
494	836	DALIAN UNIVERSITY OF TECHNOLOGY	China	3	17	53
505	292	RESEARCH & BUSINESS FOUNDATION SUNGKYUNKWAN UNIVERSITY	Republic of Korea	14	30	52
505	37	STATE UNIVERSITY OF NEW YORK	U.S.	44	43	52
535	893	SHANDONG UNIVERSITY	China	15	16	49
552	78	INDIAN INSTITUTE OF TECHNOLOGY	India	19	38	48
552	778	SUN YAT-SEN UNIVERSITY	China	17	17	48

Note: The university sector includes all types of educational institutions. For confidentiality reasons, data are based on published applications and on the publication date.

Source: WIPO Statistics Database, March 2019.

Fraunhofer-Gesellschaft has become the top PCT applicant for the government and PROs sector.

A18. Top 30 government and PRO PCT applicants, 2016–2018

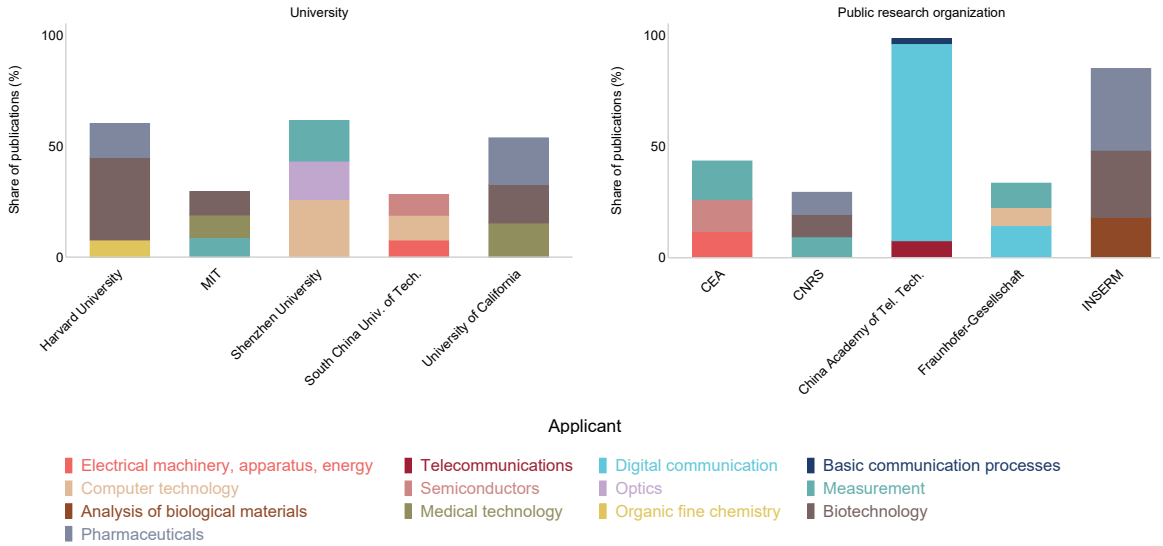
Ranking	Change in position from 2017	Applicant	Origin	Published PCT applications		
				2016	2017	2018
57	18	FRAUNHOFER-GESELLSCHAFT ZUR FÖRDERUNG DER ANGEWANDTEN FORSCHUNG E.V.	Germany	252	279	345
69	37	CHINA ACADEMY OF TELECOMMUNICATIONS TECHNOLOGY	China	145	204	303
75	–12	COMMISSARIAT À L'ÉNERGIE ATOMIQUE ET AUX ÉNERGIES ALTERNATIVES	France	329	300	289
164	–54	INSTITUT NATIONAL DE LA SANTÉ ET DE LA RECHERCHE MÉDICALE (INSERM)	France	146	199	149
175	–7	NATIONAL INSTITUTE OF ADVANCED INDUSTRIAL SCIENCE AND TECHNOLOGY	Japan	122	134	139
175	–16	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE (CNRS)	France	135	143	139
196	–36	AGENCY OF SCIENCE, TECHNOLOGY AND RESEARCH	Singapore	162	142	130
201	119	SHENZHEN INSTITUTE OF ADVANCED TECHNOLOGY	China	31	75	128
259	–21	UNITED STATES OF AMERICA, AS REPRESENTED BY THE SECRETARY, DEPARTMENT OF HEALTH & HUMAN SERIVCES	U.S.	89	103	99
374	–31	MAYO FOUNDATION FOR MEDICAL EDUCATION AND RESEARCH	U.S.	55	69	71
406	–99	KOREA ELECTRONICS TECHNNOLOGY INSTITUTE	Republic of Korea	44	79	65
460	56	RIKEN (THE INSTITUTE OF PHYSICAL AND CHEMICAL RESEARCH)	Japan	48	45	57
465	–93	SLOAN-KETTERING INSTITUTE FOR CANCER RESEARCH	U.S.	73	62	56
465	197	ELECTRONICS AND TELECOMMUNICATIONS RESEARCH INSTITUTE OF KOREA	Republic of Korea	38	36	56
488	91	KOREA INSTITUTE OF INDUSTRIAL TECHNOLOGY	Republic of Korea	83	41	54
516	63	KOREA RESEARCH INSTITUTE OF CHEMICAL TECHNOLOGY	Republic of Korea	25	41	51
516	93	UNITED STATES OF AMERICA AS REPRESENTED BY THE SECRETARY OF THE NAVY	U.S.	36	39	51
535	–91	COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION	Australia	44	51	49
552	–193	COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH	India	109	66	48
552	–51	NEDERLANDSE ORGANISATIE VOOR TOEGEPAST-NATUURWETENSCHAPPELIJK ONDERZOEK TNO	Netherlands	42	46	48
603	–227	CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS (CSIC)	Spain	68	61	44
652	–73	MAX-PLANCK-GESELLSCHAFT ZUR FÖRDERUNG DER WISSENSCHAFTEN E.V.	Germany	42	41	41
684	371	DALIAN INSTITUTE OF CHEMICAL PHYSICS, CHINESE ACADEMY OF SCIENCES	China	31	22	39
696	–34	DEUTSCHES ZENTRUM FÜR LUFT- UND RAUMFAHRT E.V.	Germany	18	36	38
758	184	NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	Japan	17	25	35
797	115	SHANGHAI INSTITUTE OF MATERIA MEDICA, CHINESE ACADEMY OF SCIENCES	China	24	26	33
841	174	KOREA INSTITUTE OF SCIENCE AND TECHNOLOGY	Republic of Korea	33	23	31
841	–194	SCRIPPS RESEARCH INSTITUTE	U.S.	23	37	31
865	–43	KOREA RESEARCH INSTITUTE OF BIOSCIENCE AND BIOTECHNOLOGY	Republic of Korea	39	29	30
865	–364	CEDARS-SINAI MEDICAL CENTER	U.S.	30	46	30
865	–438	KOREA INSTITUTE OF MACHINERY & MATERIALS	Republic of Korea	29	53	30
865	77	KOREA ELECTROTECHNOLOGY RESEARCH INSTITUTE	Republic of Korea	18	25	30
865	725	NATIONAL RESEARCH COUNCIL OF CANADA	Canada	18	14	30

Note: The government and PRO sector includes private non-profit organizations and hospitals. For confidentiality reasons, data are based on published applications and on the publication date.

Source: WIPO Statistics Database, March 2019.

Digital communication accounted for the highest shares of PCT applications for two of the top five PROs.

A19. Share of the top three technology fields for the top five universities and PROs, 2018



Note: CEA is the Commissariat à l'Énergie Atomique et aux Énergies Alternatives, CNRS is the Centre National de la Recherche Scientifique, China Academy of Tel. Tech. is the China Academy of Telecommunications Technology, INSERM is the Institut National de la Santé et de la Recherche Médicale, MIT is the Massachusetts Institute of Technology, and the South China Univ. of Tech. is the South China University of Technology. PROs include private non-profit organizations and hospitals. For confidentiality reasons, data are based on published applications and on the publication date. WIPO's IPC technology concordance table (available at: *www.wipo.int/ipstats*) was used to convert IPC symbols into 35 corresponding fields of technology.

Source: WIPO Statistics Database, March 2019.

PCT applications by fields of technology

With a 10.1% growth rate, digital communication became the technology field with the most PCT applications published in 2018.

A20. PCT applications by field of technology, 2014–2018

	Technical field	Publication year					2018 share (%)	Change from 2017 (%)
		2014	2015	2016	2017	2018		
I	**Electrical engineering**							
1	Electrical machinery, apparatus, energy	15,294	14,660	14,474	15,245	16,577	7.0	8.7
2	Audio-visual technology	6,836	6,595	7,069	7,534	8,203	3.5	8.9
3	Telecommunications	5,437	4,865	5,203	5,626	6,097	2.6	8.4
4	Digital communication	16,217	16,065	17,779	18,416	20,271	8.6	10.1
5	Basic communication processes	1,296	1,261	1,380	1,315	1,703	0.7	29.5
6	Computer technology	17,757	16,422	17,164	19,137	19,152	8.1	0.1
7	IT methods for management	4,228	4,053	4,342	4,705	4,789	2.0	1.8
8	Semiconductors	7,197	6,441	6,545	6,537	7,180	3.0	9.8
II	**Instruments**							
9	Optics	5,981	5,861	6,609	7,144	7,606	3.2	6.5
10	Measurement	9,035	8,610	9,340	10,087	10,798	4.6	7.0
11	Analysis of biological materials	1,841	1,662	1,742	1,891	1,914	0.8	1.2
12	Control	3,140	3,017	3,668	4,283	5,190	2.2	21.2
13	Medical technology	14,036	12,651	14,272	15,031	15,826	6.7	5.3
III	**Chemistry**							
14	Organic fine chemistry	6,010	5,417	5,713	5,683	5,773	2.4	1.6
15	Biotechnology	5,901	5,625	5,972	6,550	6,608	2.8	0.9
16	Pharmaceuticals	8,601	7,703	8,216	8,759	9,114	3.8	4.1
17	Macromolecular chemistry, polymers	3,781	3,697	3,806	3,917	4,238	1.8	8.2
18	Food chemistry	1,879	1,823	1,947	1,957	2,100	0.9	7.3
19	Basic materials chemistry	5,716	5,453	5,475	5,640	5,565	2.3	–1.3
20	Materials, metallurgy	4,068	3,769	3,894	4,090	4,327	1.8	5.8
21	Surface technology, coating	3,496	3,295	3,280	3,576	3,703	1.6	3.6
22	Micro-structural and nano-technology	412	359	369	387	360	0.2	–7.0
23	Chemical engineering	4,609	4,312	4,357	4,674	4,873	2.1	4.3
24	Environmental technology	2,771	2,549	2,587	2,646	2,729	1.2	3.1
IV	**Mechanical engineering**							
25	Handling	4,800	4,705	5,046	5,499	5,868	2.5	6.7
26	Machine tools	3,773	3,627	3,633	3,586	4,084	1.7	13.9
27	Engines, pumps, turbines	6,906	6,201	5,607	5,623	5,651	2.4	0.5
28	Textile and paper machines	2,291	2,408	2,532	2,601	2,750	1.2	5.7
29	Other special machines	5,377	5,615	5,754	6,417	6,969	2.9	8.6
30	Thermal processes and apparatus	3,008	3,015	3,146	3,616	3,864	1.6	6.9
31	Mechanical elements	5,883	5,927	5,759	6,110	6,174	2.6	1.0
32	Transport	8,667	8,651	8,725	9,760	10,867	4.6	11.3
V	**Other fields**							
33	Furniture, games	3,814	3,816	4,032	4,406	4,656	2.0	5.7
34	Other consumer goods	4,004	4,391	4,743	4,992	5,386	2.3	7.9
35	Civil engineering	6,494	6,367	6,260	6,104	6,108	2.6	0.1

Note: For confidentiality reasons, data are based on published applications and on the publication date. WIPO's IPC technology concordance table (available at: *www.wipo.int/ipstats*) was used to convert IPC symbols into 35 corresponding fields of technology.

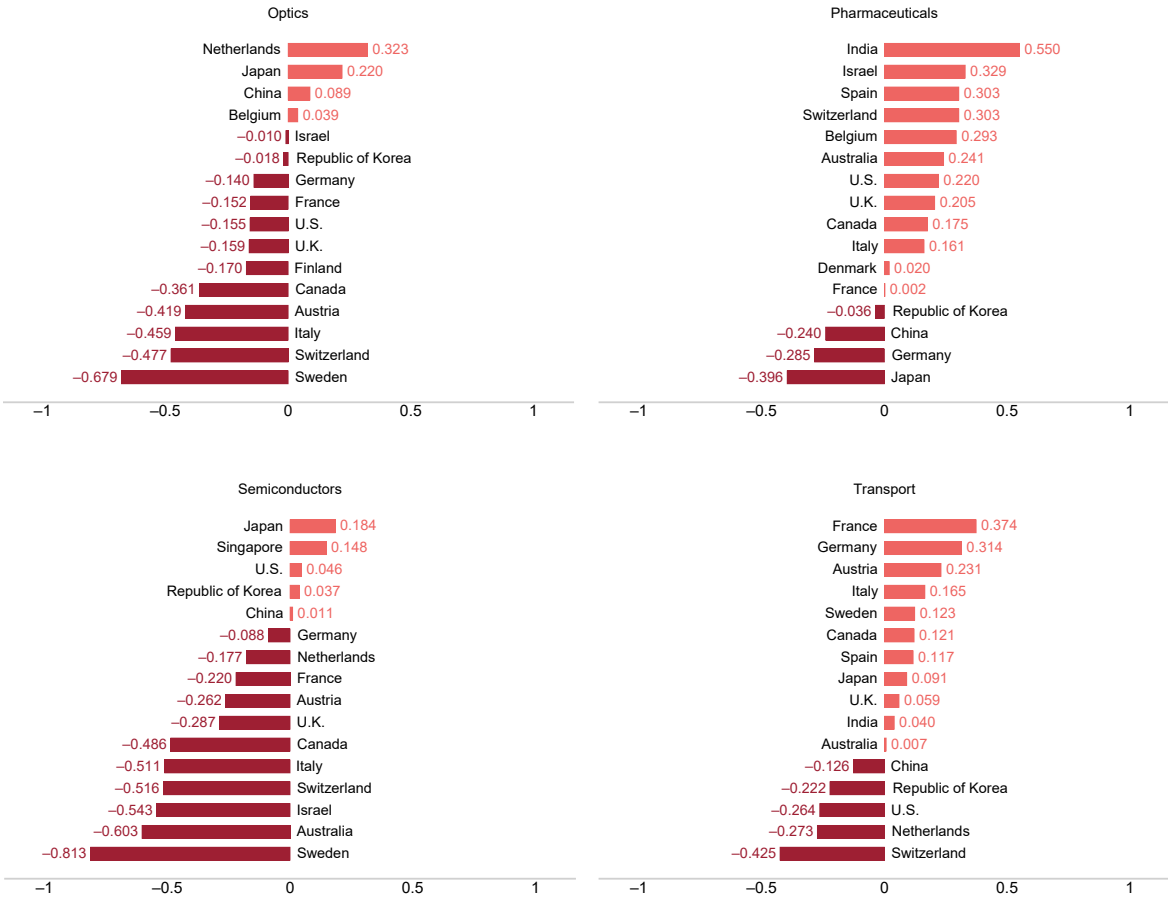
Source: WIPO Statistics Database, March 2019.

A high share of PCT filings from India related to pharmaceuticals, while many of those from Singapore related to semiconductors.

A21. Relative specialization index for published PCT applications by selected fields of technology, 2018

(Continued)

(A21 continued)



Note: This index corrects for the effects of country size and focuses on concentration in specific technology fields; it captures whether applicants in a country tend to have a lower or a higher propensity to file in certain technology fields. It is calculated using the following formula:

$$RSI = Log\left(\frac{F_{cr} \sum F_{cr}}{\sum F_c \sum F_r}\right)$$

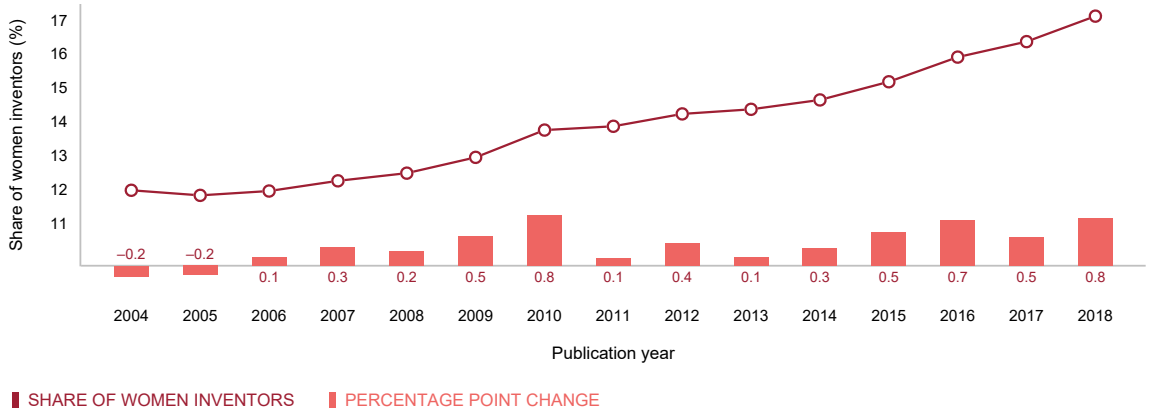
where F_c and F_r denote applications from country C and in a field of technology R. A positive value for a technology indicates that a country has a relatively high share of PCT filings related to that field of technology. For confidentiality reasons, data are based on published applications and on the publication date. WIPO's IPC technology concordance table (available at: *www.wipo.int/ipstats*) was used to convert IPC symbols into 35 corresponding fields of technology.

Source: WIPO Statistics Database, March 2019.

Participation of women inventors in PCT applications

In 2018, 17.1% of all inventors listed in PCT applications were women; this is almost 0.8 percentage points higher than for 2017 (16.4%).

A22. Share of women among listed inventors in PCT applications, 2004–2018

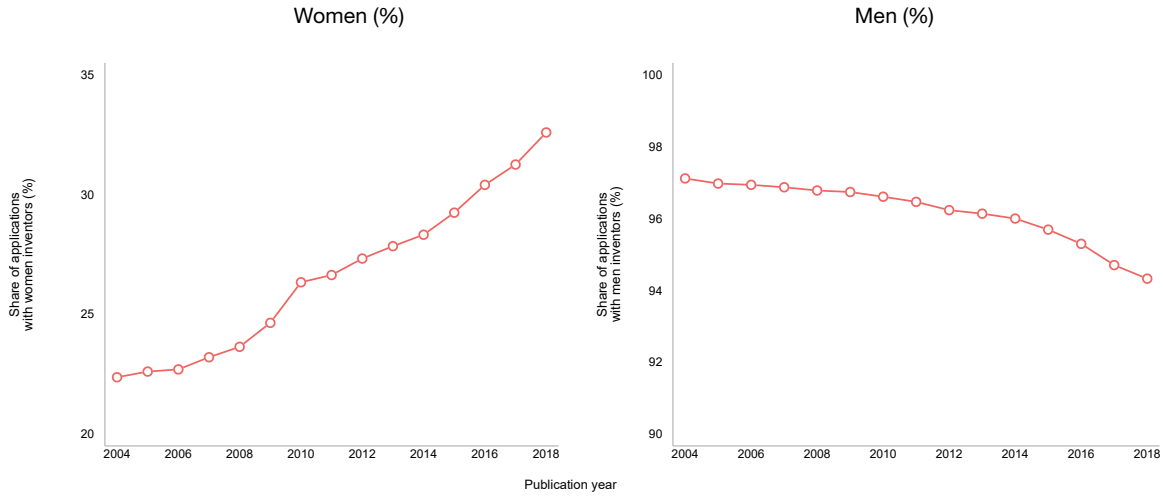


Note: For further details on methodology, refer to Martínez, G.L., J. Raffo and K. Saito (2016). Identifying the Gender of PCT Inventors. *Economic Research Working Paper No. 33*. Geneva: WIPO. Available at: *www.wipo.int/publications/en/details.jsp?id=4125&plang=EN*.

Source: WIPO Statistics Database, March 2019.

In 2018, about 94% of PCT applications listed at least one man as inventor and 32.6% of all PCT applications listed at least one woman as inventor.

A23. Share of PCT applications with at least one woman as inventor and with at least one man as inventor, 2004–2018

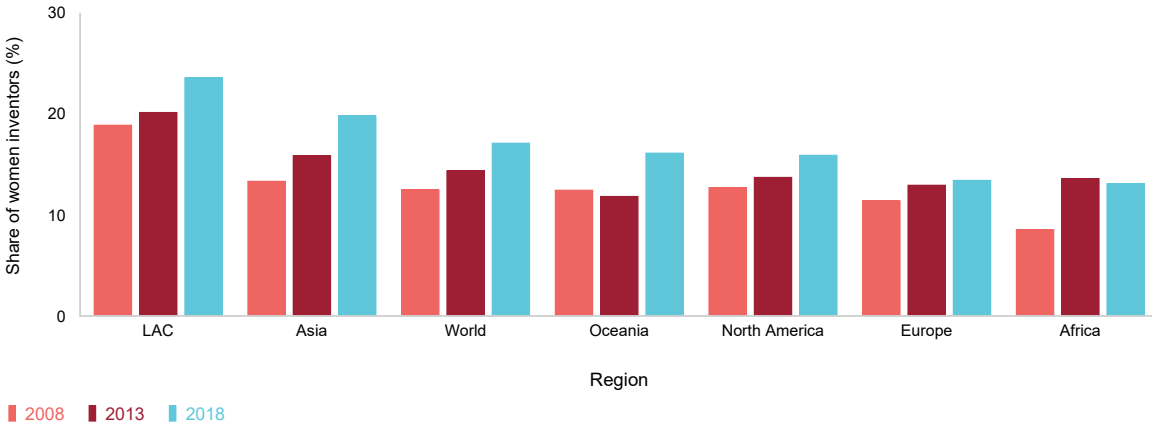


For further details on methodology, refer to Martínez, G.L., J. Raffo and K. Saito (2016). Identifying the Gender of PCT Inventors. *Economic Research Working Paper No. 33*. Geneva: WIPO. Available at: *www.wipo.int/publications/en/details.jsp?id=4125&plang=EN*.

Source: WIPO Statistics Database, March 2019.

The share of PCT applications with women as inventors rose in each of the world's geographical regions between 2013 and 2018, except for Africa.

A24. Share of women among listed inventors in PCT applications by geographical region, 2008, 2013 and 2018

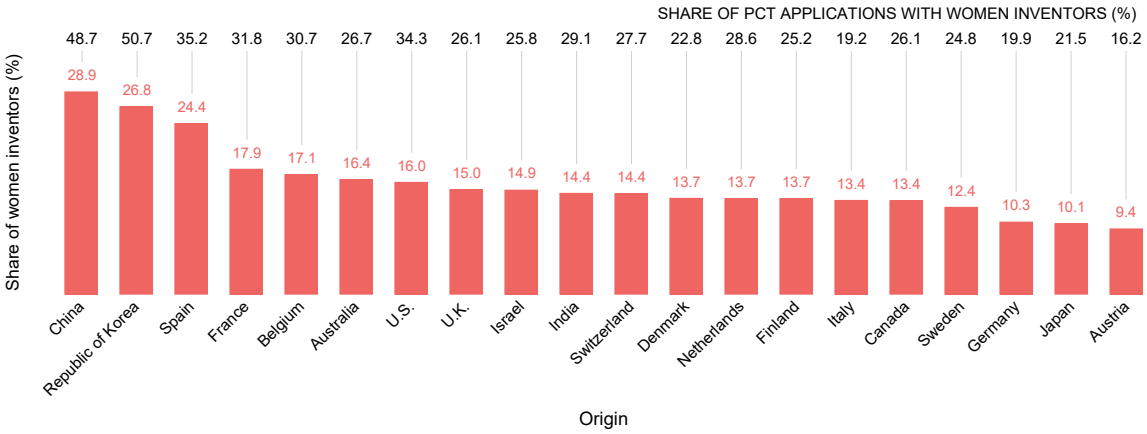


Note: LAC is Latin America and the Caribbean. For further details on methodology, refer to Martínez, G.L., J. Raffo and K. Saito (2016). Identifying the Gender of PCT Inventors. *Economic Research Working Paper No. 33*. Geneva: WIPO. Available at: *www.wipo.int/publications/en/details.jsp?id=4125*.

Source: WIPO Statistics Database, March 2019.

Women accounted for at least 24% of inventors listed in PCT applications in China, the Republic of Korea and Spain.

A25. Share of women among listed inventors and share of PCT applications with at least one woman as inventor for the top 20 origins, 2018

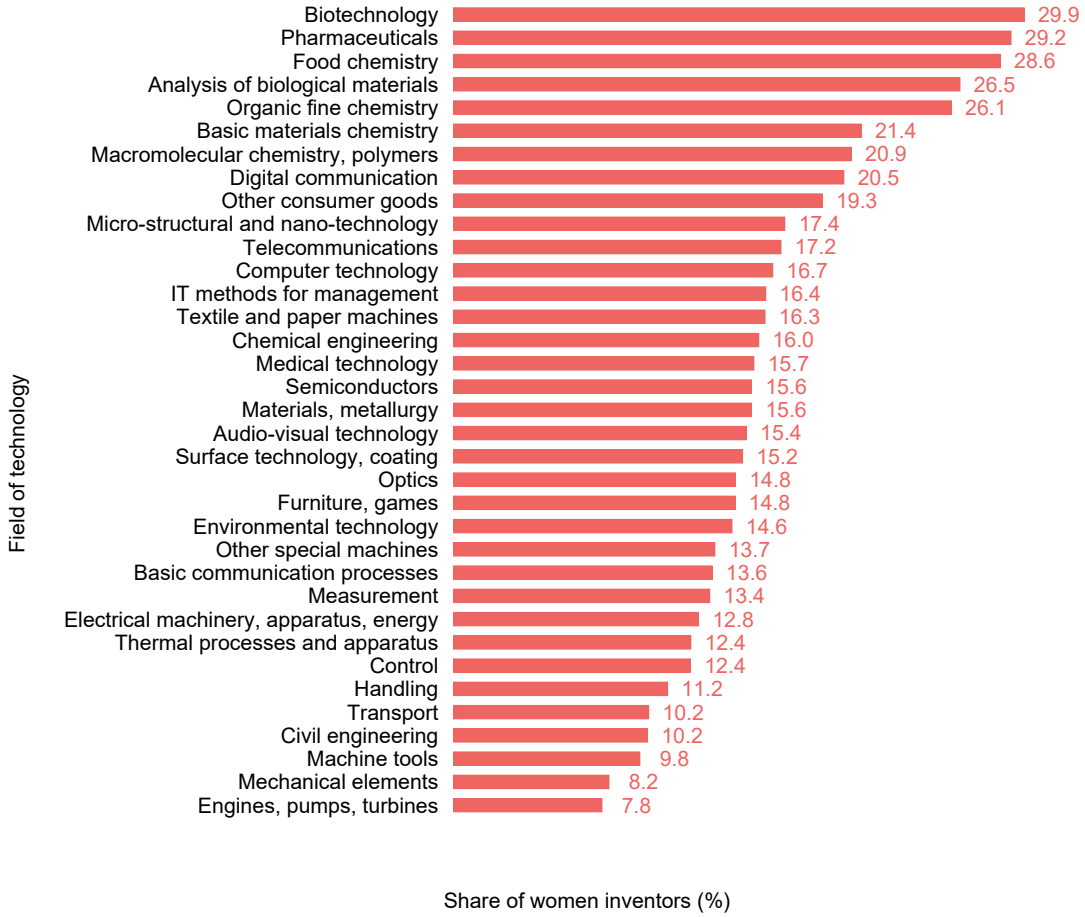


Note: For further details on methodology, refer to Martínez, G.L., J. Raffo and K. Saito (2016). Identifying the Gender of PCT Inventors. *Economic Research Working Paper No. 33*. Geneva: WIPO. Available at: *www.wipo.int/publications/en/details.jsp?id=4125*.

Source: WIPO Statistics Database, March 2019.

Women inventors represented a relatively high proportion of inventors in biotechnology, food chemistry and pharmaceuticals.

A26. Share of women among listed inventors in PCT applications by field of technology, 2018



Note: For further details on methodology, refer to Martínez, G.L., J. Raffo and K. Saito (2016). Identifying the Gender of PCT Inventors. *Economic Research Working Paper No. 33*. Geneva: WIPO. Available at: *www.wipo.int/publications/en/details.jsp?id=4125*. WIPO's IPC technology concordance table (available at: *www.wipo.int/ipstats*) was used to convert IPC symbols into 35 corresponding fields of technology.

Source: WIPO Statistics Database, March 2019.

In PCT applications filed by applicants from China (38.7%), France (37.1%) and the Republic of Korea (35.3%), more than one third of inventors working in the field of biotechnology were women.

A27. Share of women among listed inventors in PCT applications for the top 10 origins by field of technology, 2018

	Origin									
Field of technology	U.S.	China	Japan	Germany	Republic of Korea	France	U.K.	Switzerland	Sweden	Netherlands
Electrical machinery, apparatus, energy	12.1	26.3	8.1	6.3	24.3	9.7	9.7	9.4	4.1	10.4
Audio-visual technology	15.8	27.1	7.9	6.2	25.2	6.3	6.8	9.7	7.1	5.9
Telecommunications	14.4	29.6	8.5	4.0	27.6	11.2	10.8	3.3	8.6	7.4
Digital communication	15.9	30.5	12.5	2.9	29.9	11.8	8.0	4.9	13.8	9.1
Basic communication processes	16.2	23.0	6.7	1.7	22.4	9.5	15.1	10.9	13.2	0.0
Computer technology	13.6	27.7	10.7	8.9	25.3	12.8	9.5	10.3	10.6	15.7
IT methods for management	14.2	28.3	11.7	10.0	24.4	9.2	10.2	5.2	11.7	12.0
Semiconductors	15.5	28.0	9.3	11.4	26.9	15.6	17.3	12.7	6.1	9.8
Optics	13.2	27.1	9.7	8.4	25.9	18.5	9.5	11.0	9.6	10.6
Measurement	13.1	27.5	8.7	7.6	23.9	11.7	11.9	7.5	11.4	7.8
Analysis of biological materials	25.5	37.9	19.3	21.4	32.8	32.5	25.9	21.4	20.1	16.6
Control	10.9	24.0	8.4	7.3	24.8	9.5	6.0	8.4	9.1	16.1
Medical technology	14.8	29.9	11.4	11.3	24.6	15.1	14.0	9.9	20.7	13.8
Organic fine chemistry	23.9	33.7	18.1	24.0	33.9	40.1	23.6	22.6	19.9	17.1
Biotechnology	27.9	38.7	18.9	29.7	35.2	37.0	28.7	28.9	25.2	26.4
Pharmaceuticals	26.5	36.5	19.3	28.5	35.2	37.4	28.4	29.0	30.3	29.1
Macromolecular chemistry, polymers	21.3	27.1	13.6	20.6	30.5	28.6	25.8	18.2	28.4	17.2
Food chemistry	24.9	35.2	23.4	25.3	34.3	33.8	31.1	31.6	20.0	25.3
Basic materials chemistry	21.3	32.8	14.5	22.9	28.5	24.8	23.6	18.0	24.1	18.4
Materials, metallurgy	15.0	29.3	9.9	10.4	23.9	22.0	13.1	14.2	16.7	13.4
Surface technology, coating	18.0	26.0	10.7	10.1	26.2	18.6	10.9	13.1	9.6	12.7
Micro-structural and nano-technology	18.7	33.3	7.6	10.8	18.2	24.5	9.4	5.6	8.0	12.1
Chemical engineering	15.1	31.5	10.9	10.1	24.5	18.5	14.5	13.4	10.3	12.0
Environmental technology	13.1	30.6	8.8	8.9	22.1	18.9	11.6	7.2	3.5	12.0
Handling	10.7	26.8	8.3	5.8	26.2	7.8	14.7	7.3	5.1	8.2
Machine tools	9.0	29.8	6.6	3.1	22.0	11.4	6.0	6.1	5.2	7.9
Engines, pumps, turbines	6.3	25.5	5.6	5.0	19.9	7.3	4.3	9.4	1.6	10.7
Textile and paper machines	15.5	32.3	12.3	10.6	25.8	19.8	12.4	12.9	10.3	11.2
Other special machines	12.5	28.6	9.5	8.9	27.7	11.7	8.3	11.7	15.5	11.7
Thermal processes and apparatus	10.1	27.2	6.8	7.2	20.1	11.2	5.0	6.1	7.4	6.2
Mechanical elements	7.1	26.7	6.4	4.5	20.5	6.8	7.5	5.8	5.5	5.5
Transport	8.0	28.0	8.0	5.4	21.6	9.8	6.9	5.9	7.4	2.4
Furniture, games	11.7	26.9	11.2	8.6	24.1	12.2	9.2	5.7	9.6	21.1
Other consumer goods	18.7	27.1	13.4	12.3	28.5	20.0	16.2	10.4	15.6	11.8
Civil engineering	8.3	25.4	7.0	5.2	21.0	9.9	5.0	7.6	4.9	8.5

Note: For further details on methodology, refer to Martínez, G.L., J. Raffo and K. Saito (2016). Identifying the Gender of PCT Inventors. *Economic Research Working Paper No. 33*. Geneva: WIPO. Available at: *www.wipo.int/publications/en/details.jsp?id=4125*. WIPO's IPC technology concordance table (available at: *www.wipo.int/ipstats*) was used to convert IPC symbols into 35 corresponding fields of technology.

Source: WIPO Statistics Database, March 2019.

Statistical table

A28. PCT applications by office and origin, 2017–2018

Name	PCT applications filed in 2018 (international phase)		PCT applications filed in 2017 (international phase)	
	At receiving office	By country of origin	At receiving office	By country of origin
African Intellectual Property Organization	0	n.a.	3	n.a.
African Regional Intellectual Property Organization	2	n.a.	1	n.a.
Albania	0	0	1	7
Algeria	16	17	10	12
Andorra	0	7	0	5
Antigua and Barbuda	0	96	0	57
Argentina	0	42	0	36
Armenia	0	6	4	5
Australia	1,675	1,825	1,752	1,852
Austria	441	1,475	453	1,397
Azerbaijan	14	15	7	10
Bahamas	0	4	0	5
Bahrain	0	1	0	1
Barbados (c)	n.a.	96	n.a.	67
Belarus	22	23	23	28
Belgium	0	1,295	49	1,354
Belize	0	1	0	2
Bosnia and Herzegovina	3	4	3	5
Botswana	0	0	0	1
Brazil	570	619	559	589
Brunei Darussalam	1	1	0	2
Bulgaria	47	60	37	50
Cambodia	0	0	0	1
Cameroon (d)	n.a.	1	n.a.	1
Canada	1,914	2,422	1,875	2,400
Chad (d)	n.a.	0	n.a.	1
Chile	204	245	141	167
China	55,211	53,345	50,655	48,905
Colombia	26	163	12	143
Costa Rica	11	13	2	10
Côte d'Ivoire (d)	n.a.	0	n.a.	2
Croatia	24	40	19	35
Cuba	7	7	8	8
Cyprus	2	40	3	51
Czech Republic	124	180	144	184
Democratic People's Republic of Korea	2	2	2	2
Democratic Republic of the Congo	0	1	0	0
Denmark	457	1,443	474	1,430
Dominican Republic	4	4	8	13
Ecuador	2	31	0	5
Egypt	42	44	35	36
El Salvador	0	1	0	1
Estonia	4	48	8	47
Eurasian Patent Organization	11	n.a.	4	n.a.
European Patent Office	37,975	n.a.	36,619	n.a.
Fiji	0	1	0	0
Finland	1,007	1,836	980	1,601
France	3,555	7,914	3,804	8,014
Georgia	5	6	9	10
Germany	1,430	19,883	1,575	18,951
Greece	60	115	69	110
Guatemala	0	1	0	1
Guinea (d)	n.a.	0	n.a.	1
Guyana	0	1	0	0
Hungary	113	153	111	147
Iceland	14	49	14	39
India	920	2,013	758	1,583
Indonesia	3	7	4	8
International Bureau	12,259	0	10,202	0

(Continued)

(A28 continued)

Name	PCT applications filed in 2018 (international phase)		PCT applications filed in 2017 (international phase)	
	At receiving office	By country of origin	At receiving office	By country of origin
Iran (Islamic Republic of)	27	176	2	88
Iraq	0	0	0	2
Ireland	16	620	15	486
Israel	1,437	1,899	1,417	1,816
Italy	434	3,337	311	3,225
Jamaica	0	0	0	1
Japan	48,630	49,702	47,425	48,205
Jordan	9	13	1	6
Kazakhstan	15	18	27	27
Kenya	3	8	3	8
Kuwait	0	6	0	4
Lao People's Democratic Republic (c)	n.a.	3	n.a.	0
Latvia	0	31	1	26
Lebanon	0	6	0	5
Liberia	0	0	0	1
Libya	0	2	0	3
Liechtenstein (b)	n.a.	263	n.a.	263
Lithuania	0	37	0	30
Luxembourg	0	392	0	499
Madagascar (c)	n.a.	1	n.a.	0
Malaysia	138	143	129	141
Malta	0	45	1	97
Mauritius	0	4	0	3
Mexico	196	274	198	270
Monaco	0	21	0	15
Mongolia	0	2	0	0
Montenegro (c)	n.a.	8	n.a.	1
Morocco	44	49	43	47
Namibia (a)	n.a.	3	n.a.	2
Netherlands	917	4,138	902	4,430
New Zealand	186	278	179	273
Nicaragua	1	1	0	0
Niger (d)	n.a.	1	n.a.	0
Nigeria (c)	n.a.	2	n.a.	6
North Macedonia	5	6	0	2
Norway	346	766	376	820
Oman	11	14	1	3
Pakistan	0	0	0	3
Panama	22	185	2	9
Peru	39	38	35	33
Philippines	14	18	10	18
Poland	201	335	207	330
Portugal	68	250	55	201
Qatar	7	15	6	26
Republic of Korea	17,002	17,014	15,790	15,751
Republic of Moldova	5	5	8	8
Romania	16	28	21	31
Russian Federation	993	963	1,132	1,058
Rwanda	0	1	0	0
Saint Kitts and Nevis	0	4	0	1
Samoa	0	1	0	1
San Marino	0	3	1	5
Saudi Arabia	40	661	26	378
Senegal (d)	n.a.	4	n.a.	4
Serbia	20	20	18	19
Seychelles	0	2	0	4
Singapore	654	930	664	867
Slovakia	28	50	24	52
Slovenia	63	116	45	99
South Africa	67	274	97	295
Spain	948	1,409	1,008	1,418

(Continued)

(A28 continued)

Name	PCT applications filed in 2018 (international phase)		PCT applications filed in 2017 (international phase)	
	At receiving office	By country of origin	At receiving office	By country of origin
Sri Lanka (c)	n.a.	18	n.a.	19
Sudan	6	6	5	11
Sweden	1,406	4,162	1,414	3,975
Switzerland	78	4,568	109	4,488
Syrian Arab Republic	1	1	0	1
Thailand	61	105	91	156
Togo (d)	n.a.	0	n.a.	1
Trinidad and Tobago	2	5	0	3
Tunisia	6	7	8	9
Turkey	1,292	1,578	894	1,251
Uganda (a)	n.a.	1	n.a.	0
Ukraine	143	156	131	141
United Arab Emirates (c)	n.a.	92	n.a.	95
United Kingdom	3,887	5,641	3,933	5,568
United Republic of Tanzania (a)	n.a.	2	n.a.	0
United States of America	55,330	56,142	56,297	56,676
Uruguay	0	8	0	14
Uzbekistan	1	2	2	4
Vanuatu	0	0	0	1
Venezuela (Bolivarian Republic of)	0	0	0	2
Viet Nam	8	22	9	23
Yemen	0	1	0	0
Zambia	0	2	0	0
Zimbabwe	0	1	0	21
Others	0	289	0	244
Total	**253,000**	**253,000**	**243,511**	**243,511**

(a) The African Regional Intellectual Property Organization (ARIPO) is the competent receiving office.

(b) The Office of Switzerland is the competent receiving office.

(c) The International Bureau (IB) is the competent receiving office.

(d) The African Intellectual Property Organization (OAPI) is the competent receiving office.

n.a. indicates not applicable, as it is not an office of a PCT member State.

Note: Data for 2018 are WIPO estimates.

Source: WIPO Statistics Database, March 2019.

Section B
Statistics on PCT national phase entries

Highlights

After a slight decline in 2016, growth in PCT national phase entries resumes

An estimated 630,000 PCT national phase entries (NPEs) were initiated worldwide in 2017 – the latest year for which NPEs data are available. This represents an increase of 2.3% on the previous year (see figure B1). NPEs decreased in only three of the past 15 years, 2003, 2009 and 2016. Other years saw increases of between 4.3% and 11%, except for 2017, which registered a comparatively moderate growth rate of 2.3%. In 2017, the number of NPEs originating from several European countries fell and those from China and the Republic of Korea experienced growth slower than seen in recent years.

NPEs initiated by non-resident applicants represented about 83% of total NPEs in 2017. This share has tended to decrease slightly in recent years, mainly due to a strong growth in resident NPEs at the Japan Patent Office (JPO) and at the United States Patent and Trademark Office (USPTO). In 2017, resident NPEs accounted for 38.8% and 21.5% of total NPEs at these respective offices.

Asia and Europe each accounted for a third of initiated PCT NPEs

In 2017, applicants based in Europe initiated the largest proportion of total NPEs (33.4%), followed closely by those in Asia (33.1%) and North America (30.5%). The combined share of those countries and territories located in Africa, Latin America and the Caribbean (LAC) and Oceania was 2%. The share of Asia increased by 12 percentage points between 2007 and 2017 (see figure B3).

A quarter of PCT NPEs initiated worldwide were destined for the U.S.

In 2017, the USPTO remained the office to receive by far the most patent applications via the PCT System, with 154,403 NPEs; or, 24.5% of all NPEs initiated worldwide (see figure B9). The USPTO was followed by the European Patent Office (EPO) (98,431), the National Intellectual Property Administration of the People's Republic of China (CNIPA) (80,301), the JPO (62,327) and the Korean Intellectual Property Office (KIPO) (37,248). Combined, the top five offices accounted for around 68.7% of all NPEs initiated in 2017.

Included in the list of top 20 offices are patent offices from 10 high-income economies and 10 middle-income countries. Aside from the CNIPA, the offices from middle-income economies to receive the most NPEs were India (26,373), Brazil (18,268), Mexico (12,664) and the Russian Federation (10,838). All six geographical regions were represented among the top 20 offices: 10 offices were located in Asia, 3 in Europe, 1 in Africa, and LAC, North America and Oceania had 2 offices each (see figure B11).

Seven of the top 10 offices received more NPEs in 2017 than in the previous year, among which the USPTO (+5.1%), the JPO (+4.1%) and the EPO (+4%) saw the sharpest growth. The three offices to experience a drop in NPEs were Brazil (–8%), Mexico (–1.7%) and the CNIPA (–0.9%).

Half of PCT NPEs initiated worldwide originated from applicants based in either Japan or the U.S.

In 2017, applicants residing in the United States of America (U.S.) initiated 183,532 NPEs and those based in Japan 129,108 (see table B7). They were followed by applicants from Germany (57,556), China (35,289) and France (29,538). The top two countries, combined, accounted for 49.6% of all NPEs initiated in 2017, and the top five, combined, for 69.1% of total NPEs. Beside this high concentration among just a few origins, applicants from over 130 countries initiated NPEs in 2017.

Of the top 10 origins, the United Kingdom (U.K.) (+7.1%), Japan (+6.7%) and the U.S. (+5.3%) reported the highest annual growth in NPEs. The Republic of Korea (+3.3%) and China (+2.7%) saw quite moderate growth compared to what they have had over the past decade. China and the Republic of Korea were the only two countries in the top 10 list to have experienced constant annual growth in NPEs between 2008 and 2017. Except in 2013 (+6.6%) and again in 2017 (+2.7%), applicants based in China had annual growth rates of between 16.1% and 67.2%. Applicants residing in the Republic of Korea have experienced annual growth rates above 7.5% for seven of the past 10 years. Of the top 10 origins, the four countries to have initiated fewer NPEs in 2017 were Switzerland (–4.3%), Germany (–1.4%), France (–0.9%) and Sweden (–0.4%) (see figure B6).

Of the 154,403 NPEs received at the USPTO, applicants residing in Japan (21.6%) and in the U.S. (21.5%) each accounted for around one-fifth of the total (see figure B12). U.S.-based applicants accounted for the largest shares of NPEs at 13 of the top 20 offices, and applicants residing in Japan accounted for the largest shares at the remaining 7 offices. Specifically, U.S.-based applicants accounted for more than 45% of all NPEs initiated at the offices of Australia, Canada, Israel and Mexico. Japan-based applicants accounted for more than 45% of all NPEs initiated at the offices of Germany and Thailand.

The PCT System accounted for 57.3% of all non-resident filings in 2017

An estimated 526,000 non-resident NPEs were initiated worldwide in 2017 (the PCT route). By comparison, about 391,400 patent applications were filed directly at offices by non-resident applicants (the Paris route). Thus, 57.3% of non-resident applications were filed via the PCT route in 2017. This is one percentage point more than in 2016 (56.3%) and much higher than the 2003 share (46.3%). The long-term data show that the number of filings via both routes has trended upward, although the PCT route has grown at the faster pace (see figure B13).

The increase in the share of non-resident NPEs – rising from 56.3% in 2016 to 57.3% in 2017 – was due to a fall in non-resident direct filings (–1.5%) in combination with an increase in non-resident NPEs (+2.6%). The 2016 share (56.3%) was also much lower than the 2015 share (57.6%). Non-resident NPEs initiated by U.S. applicants increased sharply in 2015 (+12.3%) and then fell drastically in 2016 (–12.9%), causing an overall decrease in NPEs. It is most likely that the peak in 2015 was a consequence of the spike in the number of PCT international applications filed by U.S. applicants in 2014 due to the enactment of the Leahy-Smith America Invents Act.

Of the top 20 offices in terms of non-resident patent applications, 17 received the majority of their non-resident filings via the PCT route, with the offices of Israel (96%), Brazil (90%) and South Africa (88.3%) having the highest shares, and those of Germany (26.1%), the U.K. (28.2%) and the U.S. (38.8%) the lowest shares (see figure B15).

When looking at the top 20 origins filing most applications abroad, applicants from Sweden (72.2%), the Netherlands (70%), Australia (69.3%) and the U.S. (68.5%) were the ones who relied most heavily on the PCT route when filing internationally. Those from India (31%), the Republic of Korea (37.3%) and Canada (37.6%) had the lowest shares of filings abroad using the PCT route (see figure B14).

Applicants residing in Belgium, Denmark and Switzerland tended to initiate a large number of NPEs for each PCT international application filed, averaging more than 4.4 NPEs per PCT application. In contrast, applicants from China and the Republic of Korea averaged just 1 and 1.7 NPEs per PCT application, respectively (see figure B8).

Huawei Technologies created the largest number of foreign-oriented patent families using the PCT route

Huawei Technologies of China had the largest number of foreign-oriented patent families (for a definition, see annex, Glossary) using the PCT route, with 5,675 such families created between 2013 and 2015 (see figure B17). It was followed by Samsung Electronics of the Republic of Korea (4,371) and Mitsubishi Electric Corporation of Japan (4,049).

Of the top 50 applicants in terms of foreign-oriented patent families, 22 relied mostly on the PCT System to protect their innovations abroad between 2013 and 2015 (see table B18). Within this list, two China-based companies – ZTE Corporation (99.7%) and Shenzhen China Star Optoelectronics Technology Co. (99.6%) – had the highest shares of foreign-oriented patent families using the PCT. They were followed by three U.S.-based companies – Qualcomm Incorporated (98.2%), Halliburton Energy (98.1%) and Hewlett-Packard Development Co. (97.1%). In contrast, several applicants with large numbers of foreign-oriented patent families relied very little on the PCT System, such as Samsung Display Co. (0.1%) and Ford Global Tech (1.2%).

Global trends in PCT national phase entries

National phase entries by origin

National phase entries by office

Patent applications by filing route

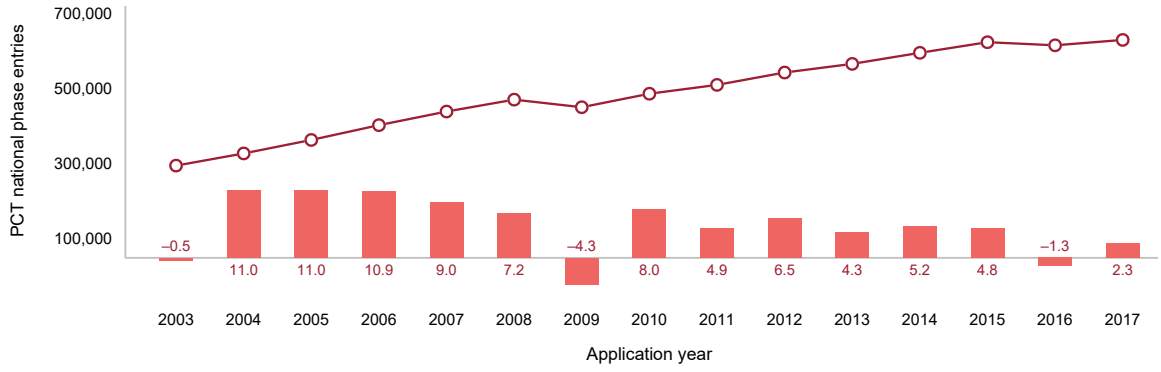
Top applicants in foreign-oriented patent families

Statistical table

Global trends in PCT national phase entries

In 2017, the number of PCT national phase entries increased by 2.3%.

B1. Trend in PCT national phase entries, 2003–2017

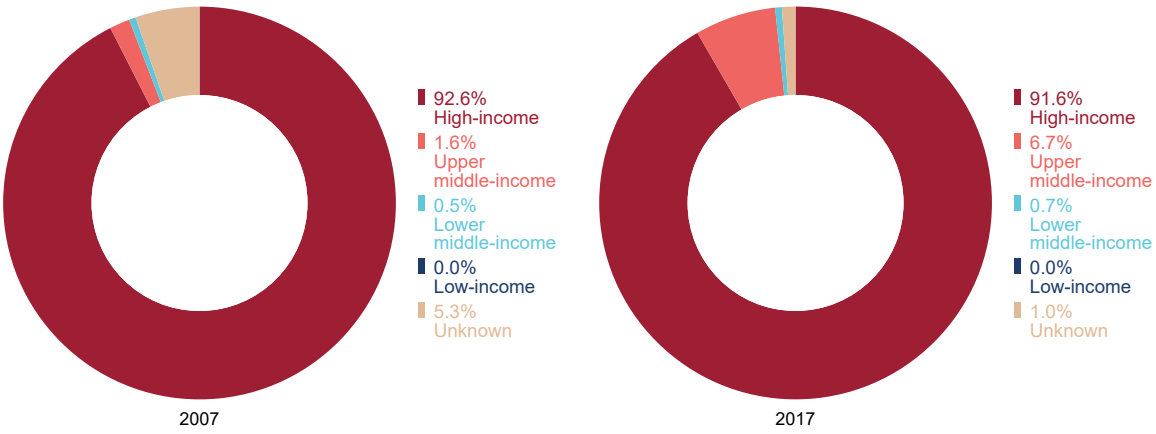


Note: These are WIPO estimates. National phase data from patent offices are only available up to 2017.

Source: WIPO Statistics Database, March 2019.

High-income economies initiated more than 90% of total national phase entries in 2017.

B2. PCT national phase entries by income group, 2007 and 2017

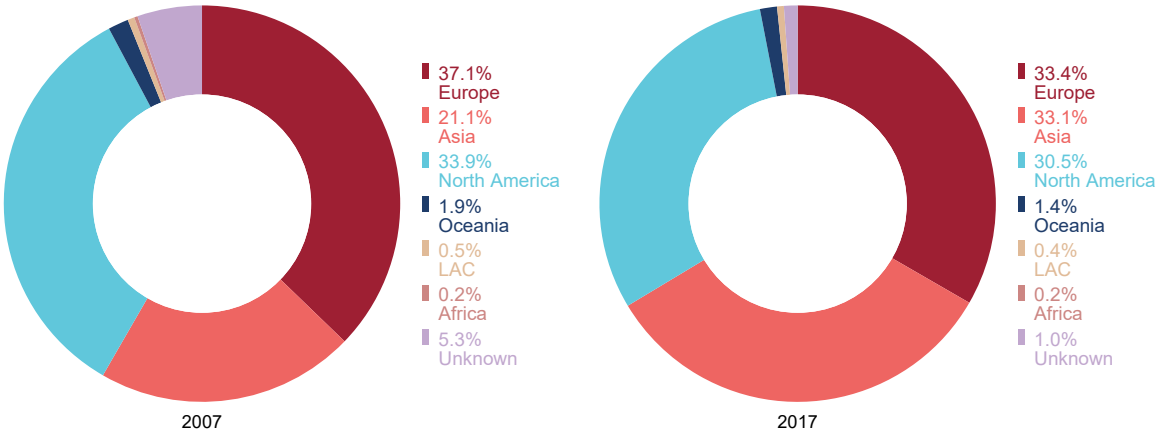


Note: Each category includes the following number of origins: high-income (58), upper middle-income (47), lower middle-income (32) and low-income (19). For information on income group classification, see annex, Data description.

Source: WIPO Statistics Database, March 2019.

Europe and Asia each accounted for around a third of all PCT national phase entries in 2017.

B3. PCT national phase entries by region, 2007 and 2017



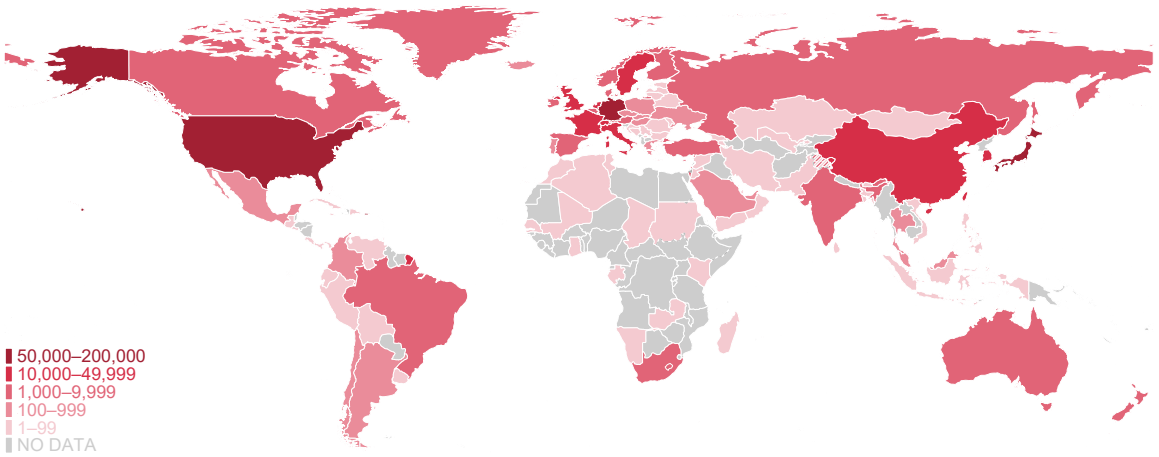
Note: Each region includes the following number of origins: Africa (31), Asia (43), Europe (45), Latin America and the Caribbean (LAC) (31), North America (2) and Oceania (4).

Source: WIPO Statistics Database, March 2019.

National phase entries by origin

More than 130 countries initiated PCT national phase entry in 2017.

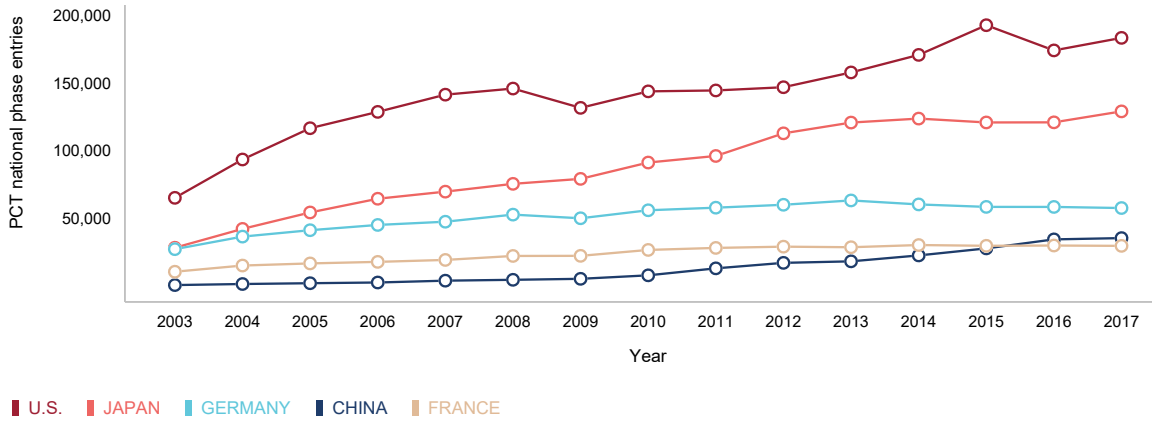
B4. PCT national phase entries by origin, 2017



Source: WIPO Statistics Database, March 2019.

Since beginning of the PCT System, applicants from the U.S. have initiated the largest numbers of PCT national phase entries worldwide.

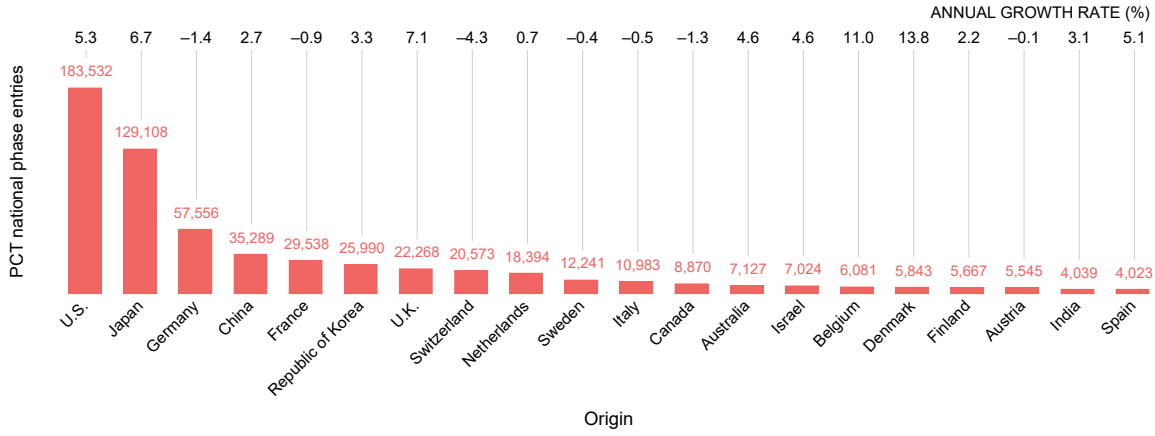
B5. Trends in PCT national phase entries for the top five origins, 2003–2017



Source: WIPO Statistics Database, March 2019.

After three consecutive years with growth rates around 24%, in 2017, China experienced its slowest growth in PCT national phase entries since 2001.

B6. PCT national phase entries for the top 20 origins, 2017



Source: WIPO Statistics Database, March 2019.

The number of PCT national phase entries initiated by applicants from each of the six geographical regions increased in 2017.

B7. PCT national phase entries for the top origins by region, 2015–2017

Region	Origin	2015	2016	2017	Regional share 2017 (%)	Change from 2016 (%)
Africa	South Africa	1,018	957	1,009	85.4	5.4
	Morocco	18	11	23	1.9	109.1
	Kenya	19	15	20	1.7	33.3
	Others	137	171	130	11.0	–24.0
	Total*	**1,192**	**1,154**	**1,182**	**0.2**	**2.4**
Asia	Japan	120,930	120,990	129,108	62.0	6.7
	China	27,656	34,360	35,289	16.9	2.7
	Republic of Korea	23,147	25,158	25,990	12.5	3.3
	Israel	6,391	6,718	7,024	3.4	4.6
	India	3,625	3,919	4,039	1.9	3.1
	Singapore	2,605	2,880	2,940	1.4	2.1
	Turkey	940	994	1,240	0.6	24.7
	Saudi Arabia	776	1,127	689	0.3	–38.9
	Malaysia	441	335	456	0.2	36.1
	Thailand	146	253	436	0.2	72.3
	Others	1,274	1,079	1,181	0.6	9.5
	Total*	**187,931**	**197,813**	**208,392**	**33.1**	**5.3**
Europe	Germany	58,408	58,363	57,556	27.3	–1.4
	France	29,607	29,810	29,538	14.0	–0.9
	United Kingdom	20,395	20,800	22,268	10.6	7.1
	Switzerland	21,143	21,496	20,573	9.7	–4.3
	Netherlands	17,589	18,260	18,394	8.7	0.7
	Sweden	12,967	12,285	12,241	5.8	–0.4
	Italy	10,647	11,038	10,983	5.2	–0.5
	Belgium	5,351	5,478	6,081	2.9	11.0
	Denmark	5,339	5,136	5,843	2.8	13.8
	Finland	5,510	5,544	5,667	2.7	2.2
	Others	21,056	21,117	21,891	10.4	3.7
	Total*	**208,012**	**209,327**	**211,035**	**33.5**	**0.8**
Latin America and the Caribbean	Brazil	1,234	1,130	1,158	39.0	2.5
	Mexico	569	526	547	18.4	4.0
	Chile	283	367	379	12.8	3.3
	Argentina	130	84	165	5.6	96.4
	Colombia	191	150	140	4.7	–6.7
	Peru	32	56	40	1.3	–28.6
	Guatemala	2	1	34	1.1	3,300.0
	Panama	40	31	26	0.9	–16.1
	Bahamas	52	37	24	0.8	–35.1
	Costa Rica	28	12	21	0.7	75.0
	Others	611	427	438	14.7	2.6
	Total*	**3,172**	**2,821**	**2,972**	**0.5**	**5.4**
North America	United States of America	192,933	174,260	183,532	95.4	5.3
	Canada	9,084	8,988	8,870	4.6	–1.3
	Total*	**202,092**	**183,294**	**192,442**	**30.5**	**5.0**
Oceania	Australia	6,725	6,815	7,127	81.5	4.6
	New Zealand	1,431	1,385	1,579	18.1	14.0
	Papua New Guinea	1	0	0	0.0	n.a.
	Total*	**8,175**	**8,215**	**8,744**	**1.4**	**6.4**
Unknown*		13,326	12,976	5,233	0.8	–59.7
World (estimates)		**623,900**	**615,600**	**630,000**	**100.0**	**2.3**

Note: World totals are WIPO estimates. This table shows the top countries in each region (with a maximum of 10 countries per region) whose applicants filed more than 20 PCT national phase entries in 2017. Data for all origins are reported in statistical table B19.

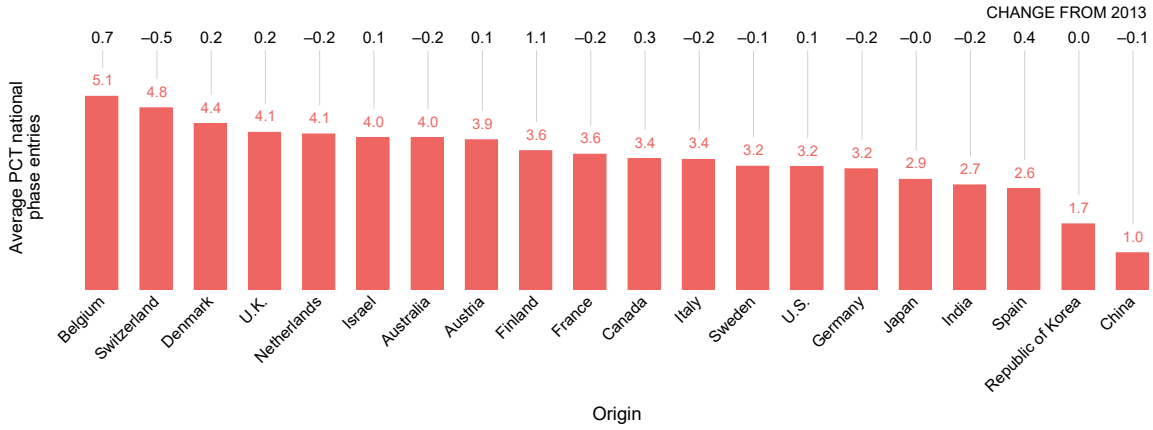
* indicates share of world total.

n.a. indicates not applicable.

Source: WIPO Statistics Database, March 2019.

Applicants residing in Belgium and Switzerland initiated around five NPEs per PCT application, on average.

B8. Average number of national phase entries per PCT application for selected origins, 2017



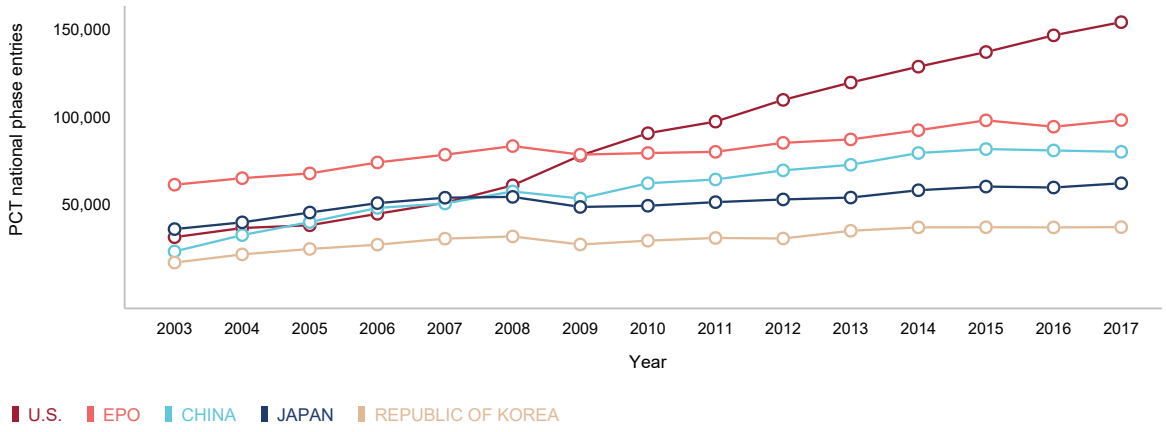
Note: The average is defined as the number of national phase entries initiated in 2017 divided by the average number of PCT applications filed in the two preceding years.

Source: WIPO Statistics Database, March 2019.

National phase entries by office

PCT national phase entries destined for the U.S. have increased sharply since 2008, accounting for one quarter of the total in 2017.

B9. Trends in PCT national phase entries for the top five offices, 2003–2017



Note: EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2019.

Applicants residing in Asia initiated 39.6% of total national phase entries in their home region and nearly all the remainder in Europe (29.6%) and North America (29.6%).

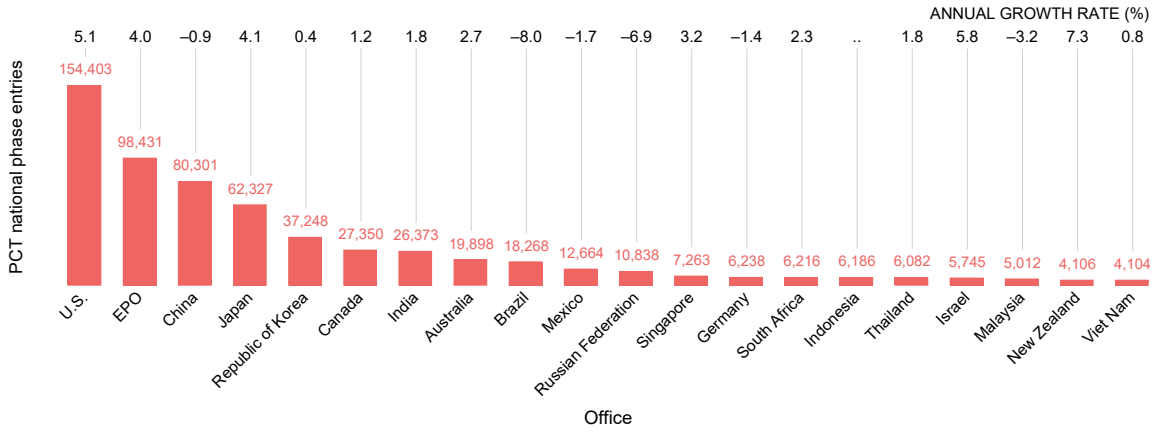
B10. Flow of national phase entries between regions of origin and regions of destination, 2017

Note: LAC is Latin America and the Caribbean.

Source: WIPO Statistics Database, March 2019.

Of the top 20 offices, those of Israel, New Zealand and the U.S. exhibited the fastest growth in PCT national phase entries.

B11. PCT national phase entries for the top 20 offices, 2017



Note: This graph shows the top 20 offices for which NPE data by origin are available. EPO is the European Patent Office.

.. indicates data are unknown.

Source: WIPO Statistics Database, March 2019.

Almost 39% of total national phase entries initiated at the JPO originated from applicants residing in Japan.

B12. Flow of national phase entries for the top 20 offices and the top 10 origins as a percentage of total national phase entries at respective offices, 2017

	Origin										
Office	U.S.	Japan	Germany	China	France	Republic of Korea	U.K.	Switzerland	Netherlands	Sweden	Other Origins
U.S.	21.5	21.6	9.8	8.5	5.1	6.1	4.7	1.9	2.3	2.2	16.4
EPO	30.0	15.4	11.5	6.8	6.2	3.7	3.5	3.1	3.3	2.7	13.9
China	28.9	28.0	11.0	0.7	4.4	6.3	2.2	3.1	3.4	1.8	10.2
Japan	24.1	38.8	7.0	5.4	3.7	4.2	2.2	2.6	3.1	1.1	7.8
Republic of Korea	32.1	28.0	9.1	6.8	4.0	2.4	2.5	2.7	2.3	1.4	8.7
Canada	47.2	6.0	6.8	2.9	5.0	1.0	3.9	4.1	1.8	1.4	20.0
India	33.2	13.5	8.1	8.2	3.8	3.8	3.6	3.7	5.0	3.7	13.2
Australia	45.1	5.9	5.5	4.7	3.4	1.9	5.2	4.3	2.0	1.9	20.4
Brazil	39.0	8.0	9.4	3.5	6.5	1.2	3.5	5.6	4.6	2.4	16.3
Mexico	47.2	9.0	7.6	2.0	4.1	1.5	2.8	6.4	2.7	1.7	14.8
Russian Federation	22.5	10.0	11.6	7.6	6.9	2.1	3.5	6.7	7.0		22.2
Singapore	34.4	18.0	5.3	5.3	3.5	2.0	4.4	5.2	1.8	1.0	18.9
Germany	19.2	50.2	16.8	3.8	0.9	2.0	0.7	0.7	0.2	1.0	4.6
South Africa	33.4	3.4	9.0	5.4	5.0	0.8	6.6	5.8	2.7	3.3	24.5
Indonesia	25.1	31.4	5.9	6.9	3.6	5.3		5.9	4.4		11.5
Thailand	17.7	46.0	5.4	4.2	3.1	2.5	2.0	5.0	2.5	1.2	10.4
Israel	46.2	3.7	6.4	1.3	4.3	0.8	4.7	6.4	1.9	1.6	22.6
Malaysia	23.9	24.3	7.2	6.0	3.6	3.9	4.5	6.6	2.9	2.5	14.7
Viet Nam	18.6	29.0	4.8	12.4	2.4	11.3	1.5	3.9	2.6	1.3	12.3
New Zealand	40.9	4.7	5.5	2.5	3.2	0.8	6.4	5.8	2.3	1.7	26.1

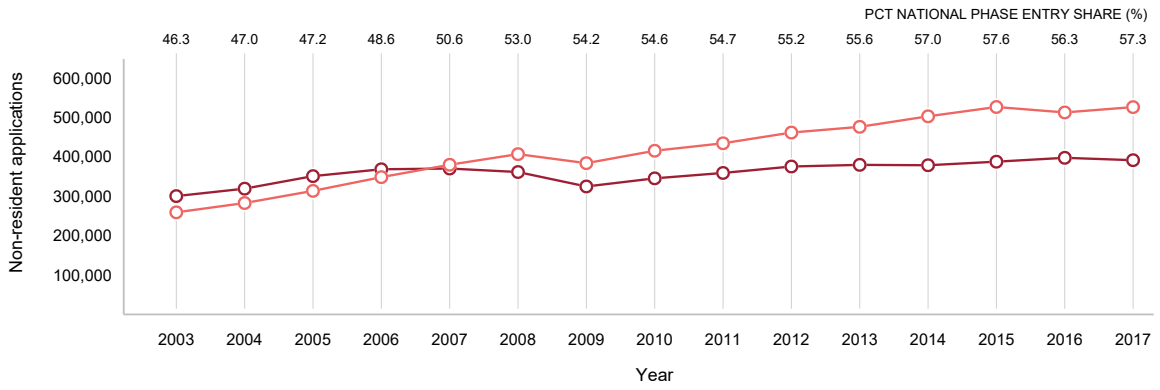
Note: This table shows the top 10 origins for which national phase entry office data are available. EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2019.

Patent applications by filing route

In 2017, PCT national phase entries accounted for 57.3% of total non-resident filings.

B13. Trend in non-resident patent applications by filing route, 2003–2017

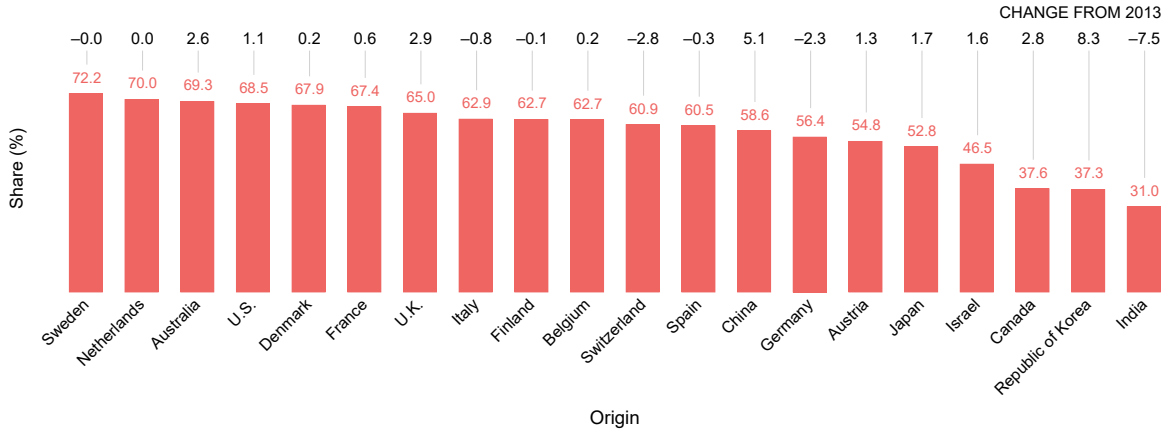


Note: These data are WIPO estimates.

Source: WIPO Statistics Database, March 2019.

Applicants from Sweden filed 72.2% of their applications abroad using the PCT route.

B14. Share of PCT national phase entries in total filings abroad for the top 20 origins, 2017

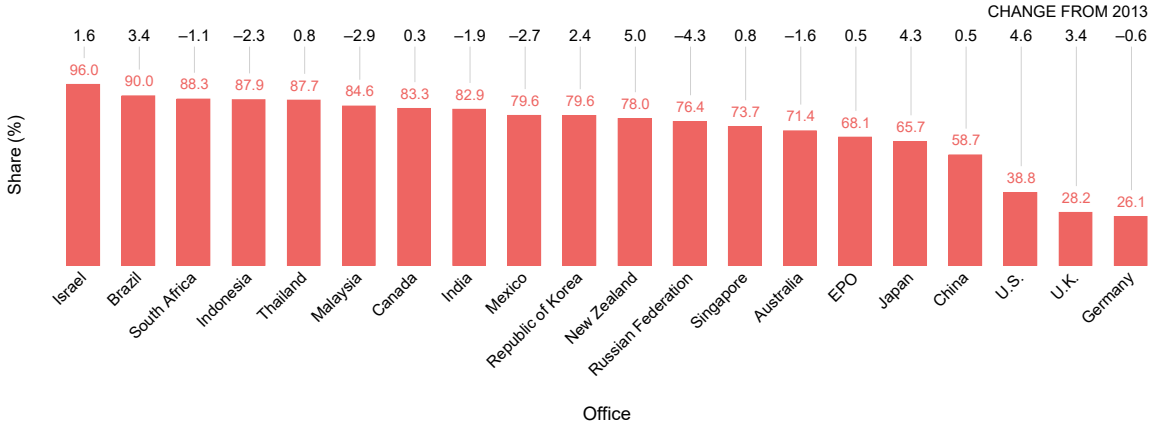


Note: The share is defined as the number of PCT national phase entries initiated abroad divided by the total number of patent applications filed abroad. It includes data from the 20 origins that filed the most applications abroad in 2017.

Source: WIPO Statistics Database, March 2019.

Offices of middle-income countries such as Brazil, Indonesia and South Africa received the bulk of their non-resident filings via the PCT System.

B15. Share of PCT national phase entries in total non-resident filings for the top 20 offices, 2017



Note: The share is defined as non-resident PCT national phase entries initiated divided by the total number of non-resident patent applications filed. It includes data from the 20 offices that received the most non-resident filings in 2017; that is, data from countries that are members of the PCT System and that provided data broken down by filing route. EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2019.

Applicants from Germany (48.9%) used the PCT route for nearly half of their filings at the office of the U.S.

B16. Share of PCT national phase entries in total non-resident filings for the top 10 origins and the top 20 offices, 2017

	Origin									
Office	U.S.	Japan	Germany	China	France	Republic of Korea	U.K.	Switzerland	Netherlands	Sweden
U.S.		38.6	48.9	44.1	61.8	26.4	51.2	51.4	67.2	67.2
EPO	69.1	69.3		76.8		56.7				
China	62.7	54.9	61.6		72.2	38.2	76.8	72.0	83.1	79.8
Japan	62.4		69.6	80.6	77.6	55.1	75.1	64.3	84.0	78.0
Republic of Korea	88.4	68.8	83.5	83.4	84.8		91.5	87.2	91.5	89.1
Canada	78.6	88.5	88.6	85.8	85.2	91.2	93.2	90.3	96.8	93.5
India	85.0	79.1	78.6	84.2	80.9	60.7	89.7	76.0	95.6	97.5
Australia	66.6	71.5	81.5	87.3	83.0	76.3	82.2	78.3	76.0	85.9
Brazil	89.0	84.9	88.8	93.3	86.9	95.3	95.7	94.4	97.7	94.3
Mexico	71.3	89.0	87.3	91.8	89.2	75.9	95.0	90.9	92.5	93.6
Russian Federation	62.0	74.2	81.6	90.1	83.5	71.2	88.8	88.7	92.6	
Singapore	68.8	75.6	78.5	73.8	80.6	70.7	80.4	84.1	81.2	90.0
Germany	19.7	42.9		36.7	22.8	10.8	21.0	4.7	9.4	13.1
South Africa	90.4	89.4	89.5	60.0	89.8	90.7	94.9	95.5	94.4	95.3
Indonesia	98.2	80.8	92.2	86.6	94.9	84.7		97.8	99.3	
Thailand	95.8	82.8	92.6	86.4	94.9	86.9	98.4	97.1	100.0	97.3
Israel	95.9	98.1	95.8	94.9	92.8	92.2	98.2	98.1	98.2	98.9
Malaysia	85.2	77.8	90.2	88.7	92.2	82.1	95.3	95.4	95.4	98.4
Viet Nam	95.6	86.4	94.2	94.4	97.0	66.3	98.4	94.1	100.0	100.0
New Zealand	74.2	86.0	87.5	80.8	85.1	78.6	92.3	87.8	85.3	91.0

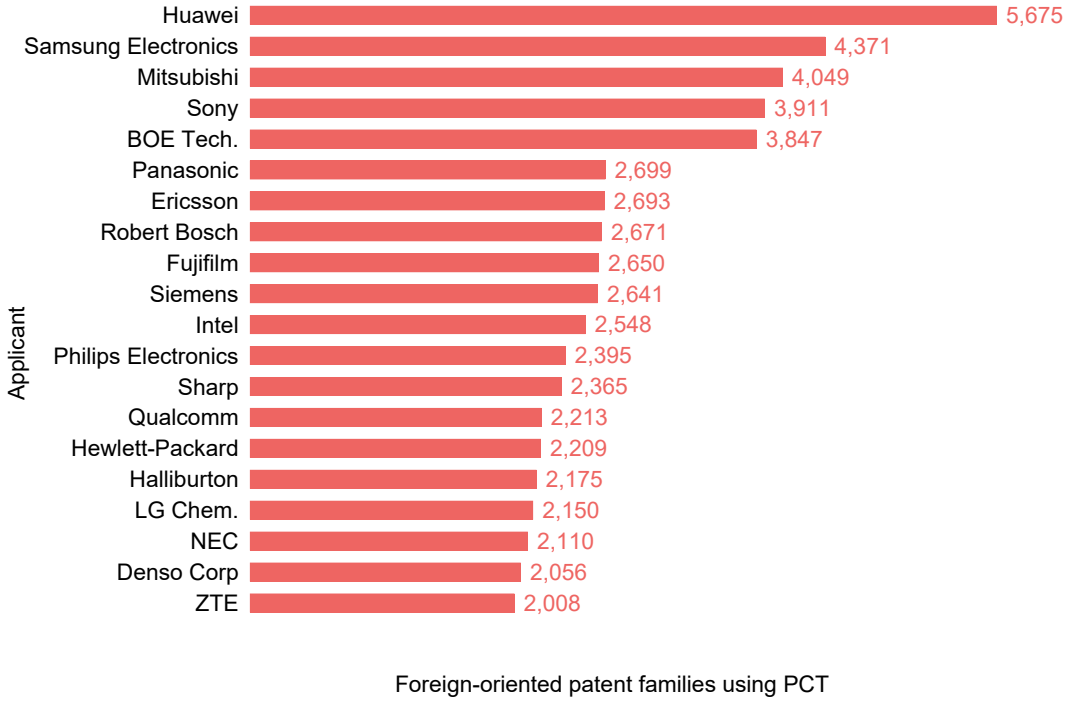
Note: This figure includes data from the 20 offices that received the most non-resident filings in 2017; that is, data from countries that are members of the PCT System and that provided data broken down by filing route. In general, national offices of European Patent Office (EPO) member States receive relatively low proportions of national phase entries, because applicants may apply via the EPO to seek protection within any EPO member State.

Source: WIPO Statistics Database, March 2019.

Top applicants in foreign-oriented patent families

Huawei Technologies had by far the largest number of foreign-oriented patent families using the PCT route.

B17. Top 20 applicants in foreign-oriented patent families using the PCT System, 2013–2015



Note: The number of patent applications in foreign-oriented patent families as reported in the autumn 2018 edition of PATSTAT may be incomplete for the most recent years. A patent family is a set of interrelated patent applications filed in one or more offices to protect the same invention. The patent applications in a family are interlinked by one or more of the following: priority claim, PCT national phase entry, continuation, continuation-in-part, internal priority, and addition or division. Foreign-oriented patent families have at least one filing in an office that is not the applicant's home office.

Source: WIPO Statistics Database and EPO PATSTAT Database, March 2019.

Twenty-two of the top 50 applicants relied mainly on the PCT System to protect their innovations abroad between 2013 and 2015.

B18. Top 50 applicants in foreign-oriented patent families, 2010–2012 and 2013–2015

		Foreign-oriented patent families		Share of foreign-oriented patent families using the PCT route (%)	
Rank	Applicant	2010–2012	2013–2015	2010–2012	2013–2015
1	SAMSUNG ELECTRONICS CO., LTD.	14,328	17,672	16.7	24.7
2	CANON INC	10,292	10,255	14.3	9.2
3	SAMSUNG DISPLAY CO LTD	2,570	7,265	0.3	0.1
4	TOSHIBA KK	8,137	6,501	16.7	21.2
5	ROBERT BOSCH GMBH	6,753	6,371	53.7	41.9
6	HUAWEI TECHNOLOGIES CO., LTD.	3,545	6,033	93.4	94.1
7	TOYOTA JIDOSHA KABUSHIKI KAISHA	5,354	5,730	81.1	34.7
8	SIEMENS AG	6,085	5,587	44.7	47.3
9	SONY CORP	7,125	5,383	28.9	72.7
10	FUJITSU LTD	5,483	5,354	28.2	15.7
11	FORD GLOBAL TECH LLC	1,886	5,339	2.7	1.2
12	SEIKO EPSON CORP	4,492	5,297	4.7	11.1
13	MITSUBISHI ELECTRIC CORP	4,302	5,288	67.0	76.6
14	BOE TECHNOLOGY GROUP CO., LTD.	832	5,232	41.5	73.5
15	PANASONIC IP MAN CORP	444	5,042	79.3	53.5
16	HYUNDAI MOTOR CO LTD	2,380	4,811	0.5	0.7
17	ALIBABA GROUP HOLDING LTD	1,180	4,512	18.3	30.1
18	DENSO CORP	3,785	4,438	16.8	46.3
19	RICOH CO LTD	4,104	4,411	9.6	11.8
20	HONDA MOTOR CO LTD	4,080	4,034	31.4	21.8
21	LG ELECTRONICS INC	3,080	3,795	32.4	42.7
22	HONGHAI PRECISION INDUSTRY CO., LTD.	9,489	3,698	0.1	0.2
23	FUJIFILM CORP	4,731	3,660	50.2	72.4
24	GM GLOBAL TECH OPERATIONS INC	4,544	3,300	0.4	1.5
25	GEN ELECTRIC	5,181	3,282	16.1	23.3
26	INTEL CORP	2,597	3,148	89.9	80.9
27	KOREA ELECTRONICS TELECOMM	3,703	3,037	10.7	4.6
28	TELEFONAKTIEBOLAGET LM ERICSSON (PUBL)	2,791	2,890	90.9	93.2
29	HITACHI LTD	3,432	2,840	47.7	54.5
30	SHARP CORP	4,643	2,768	77.2	85.4
31	KONINKLIJKE PHILIPS ELECTRONICS N.V.	1,467	2,580	92.2	92.8
32	SAMSUNG ELECTRO MECH	3,176	2,510	0.1	0.2
33	INTERNATIONAL BUSINESS MACHINES CORPORATION	5,573	2,460	26.2	18.5
34	NEC CORP	2,889	2,427	87.7	86.9
35	OLYMPUS CORP	1,356	2,402	53.8	80.0
36	SK HYNIX INC	1,662	2,375	0.0	0.0
37	LG CHEMICAL LTD	1,340	2,298	89.7	93.6
38	HEWLETT PACKARD DEVELOPMENT CO	1,813	2,275	74.7	97.1
39	KYOCERA DOCUMENT SOLUTIONS INC	796	2,263	3.5	10.2
40	QUALCOMM INCORPORATED	1,313	2,253	94.1	98.2
41	HALLIBURTON ENERGY SERV INC	1,028	2,216	91.6	98.1
42	KONICA CORP	917	2,106	56.8	33.1
43	MURATA MANUFACTURING CO	1,488	2,053	75.6	72.8
44	BROTHER IND LTD	2,555	2,048	3.7	5.3
45	BASF SE	2,149	2,015	87.5	88.7
46	ZTE CORPORATION	2,266	2,014	99.2	99.7
47	FUJI XEROX CO LTD	1,882	1,949	1.6	2.5
48	TAIWAN SEMICONDUCTOR MFG	1,480	1,867	0.1	0.0
49	SHENZHEN CHINA STAR OPTOELECTRONICS TECHNOLOGY CO., LTD.	244	1,867	95.9	99.6
50	SCHAEFFLER TECHNOLOGIES GMBH & CO KG	1,152	1,840	65.3	57.1

Note: The number of patent applications in foreign-oriented patent families as reported in the autumn 2018 edition of PATSTAT may be incomplete for the most recent years. A patent family is a set of interrelated patent applications filed in one or more offices to protect the same invention. The patent applications in a family are interlinked by one or more of the following: priority claim, PCT national phase entry, continuation, continuation-in-part, internal priority, and addition or division. Foreign-oriented patent families have at least one filing in an office that is not the applicant's home office.

Source: WIPO Statistics Database and EPO PATSTAT Database, March 2019.

Statistical table

B19. PCT national phase entries by office and origin, 2016–2017

Name	PCT national phase entries in 2017		PCT national phase entries in 2016	
	At designated office	By country of origin	At designated office	By country of origin
African Intellectual Property Organization	400	n.a.	361	n.a.
African Regional Intellectual Property Organization	701	n.a.	657	n.a.
Algeria	574	3	535	0
Andorra	..	28	..	2
Antigua and Barbuda	8	11	12	0
Argentina	..	165	..	84
Armenia	2	18	1	12
Aruba	..	0	..	..
Australia	19,898	7,127	19,375	6,815
Austria	565	5,545	506	5,549
Azerbaijan	..	..	8	9
Bahamas	..	24	..	37
Bahrain	229	5	170	4
Bangladesh	..	3	..	13
Barbados	..	..	41	258
Belarus	59	6	44	18
Belgium (c)	n.a.	6,081	n.a.	5,478
Belize	..	..	37	11
Benin (d)	n.a.	0	n.a.	0
Bhutan	..	1	..	0
Bolivia (Plurinational State of)	..	2	..	3
Bonaire, Sint Eustatius and Saba	..	..	..	0
Bosnia and Herzegovina	..	2	..	2
Botswana	..	0	..	1
Brazil	18,268	1,158	19,857	1,130
Brunei Darussalam	97	3	..	..
Bulgaria	3	82	5	53
Burkina Faso (d)	n.a.	0	n.a.	1
Burundi	..	..	..	0
Cambodia	..	0	..	..
Cameroon (d)	n.a.	0	n.a.	0
Canada	27,350	8,870	27,021	8,988
Central African Republic (d)	n.a.	0	n.a.	0
Chad (d)	n.a.	1	n.a.	0
Chile	2,362	379	2,401	367
China	80,301	35,289	81,055	34,360
China, Hong Kong SAR	..	408	..	341
China, Macao SAR	..	14	..	5
Colombia	1,692	140	1,583	150
Community Plant Variety Office	..	0	..	0
Comoros (d)	n.a.	0	n.a.	0
Congo (d)	n.a.	0	n.a.	0
Cook Islands	..	0	..	0
Costa Rica	495	21	477	12
Côte d'Ivoire (d)	n.a.	0	n.a.	0
Croatia	5	62	6	39
Cuba	143	18	157	80
Cyprus (c)	n.a.	185	n.a.	123
Czech Republic	25	481	33	455
Democratic Republic of the Congo	..	0	..	..
Denmark	81	5,843	106	5,136
Djibouti	..	0	..	0
Dominica	..	0	..	0
Dominican Republic	..	7	234	1
Ecuador	385	3	284	2
Egypt	..	..	1,172	21
El Salvador	167	3	167	3
Equatorial Guinea (d)	n.a.	0	n.a.	0
Eritrea	..	0	..	..

(Continued)

(B19 continued)

Name	PCT national phase entries in 2017		PCT national phase entries in 2016	
	At designated office	By country of origin	At designated office	By country of origin
Estonia	4	63	..	70
Ethiopia	..	0	..	0
Eurasian Patent Organization	2,523	n.a.	2,688	n.a.
European Patent Office	98,431	n.a.	94,625	n.a.
European Union	..	0	..	0
Fiji	..	0	..	0
Finland	32	5,667	27	5,543
France (c)	n.a.	29,538	n.a.	29,810
Gabon (d)	n.a.	1	n.a.	3
Gambia	..	0	..	1
Georgia	147	10	174	5
Germany	6,238	57,556	6,325	58,363
Ghana	..	1	17	11
Greece (c)	n.a.	339	n.a.	312
Grenada	..	0	3	0
Guatemala	268	34	253	1
Guinea (d)	n.a.	0	n.a.	0
Guinea-Bissau (d)	n.a.	0	n.a.	0
Guyana	..	0	..	0
Haiti	..	0	..	0
Holy See	..	0	..	..
Honduras	184	0	185	0
Hungary	14	409	17	462
Iceland	1	142	3	96
India	26,373	4,039	25,896	3,919
Indonesia	6,186	10	..	19
International Bureau	..	0	..	0
Iran (Islamic Republic of)	..	33	582	11
Iraq	..	0	..	..
Ireland (c)	n.a.	1,790	n.a.	1,739
Israel	5,745	7,024	5,430	6,718
Italy (c)	n.a.	10,983	n.a.	11,038
Jamaica	..	5	..	2
Japan	62,327	129,108	59,893	120,990
Jordan	..	9	..	36
Kazakhstan	..	19	190	16
Kenya	38	20	56	15
Kiribati	..	0	..	0
Kyrgyzstan	..	0	..	0
Lao People's Democratic Republic	..	0	..	..
Latvia (c)	n.a.	33	n.a.	69
Lesotho	..	0	..	0
Liberia	..	..	..	0
Libya	..	0	..	0
Liechtenstein (b)	n.a.	565	n.a.	649
Lithuania (c)	n.a.	57	n.a.	45
Luxembourg	..	1,854	..	1,647
Madagascar	41	2	30	1
Malawi	..	0	..	0
Malaysia	5,012	456	5,178	335
Maldives	..	..	..	0
Mali (d)	n.a.	7	n.a.	1
Malta (c)	n.a.	..	n.a.	234
Marshall Islands	..	0	..	..
Mauritania (d)	n.a.	0	n.a.	1
Mauritius	..	16	..	50
Mexico	12,664	547	12,884	526
Micronesia (Federated States of)	..	0	..	0
Monaco (c)	n.a.	75	n.a.	99
Mongolia	85	1	101	0
Montenegro	..	0	..	0

(Continued)

(B19 continued)

Name	PCT national phase entries in 2017		PCT national phase entries in 2016	
	At designated office	By country of origin	At designated office	By country of origin
Morocco	1,668	23	883	11
Mozambique	..	0	17	0
Myanmar	..	..	..	0
Namibia	7	2	6	1
Nauru	..	0	..	0
Nepal	..	0	..	0
Netherlands (c)	n.a.	18,394	n.a.	18,260
New Zealand	4,106	1,579	3,826	1,385
Nicaragua	..	..	..	0
Niger (d)	n.a.	0	n.a.	1
Nordic Patent Institute	..	0	..	0
North Macedonia	..	0	..	..
Norway	818	2,708	745	2,550
Oman	379	15	362	1
Others	..	0	..	0
Pakistan	..	9	..	3
Palau	..	0	..	0
Panama	364	26	330	31
Papua New Guinea	..	0	..	0
Patent Office of the Cooperation Council for the Arab States of the Gulf	..	n.a.	..	n.a.
Peru	1,061	40	1,025	56
Philippines	2,798	43	2,849	75
Poland	43	855	45	606
Portugal	17	453	8	544
Qatar	558	46	539	41
Republic of Korea	37,248	25,990	37,093	25,158
Republic of Moldova	34	5	64	2
Romania	17	74	6	82
Russian Federation	10,838	1,524	11,638	1,462
Rwanda	451	0	123	0
Saint Kitts and Nevis	9	9	5	10
Saint Lucia	..	0	..	0
Saint Vincent and the Grenadines	3	0	..	0
San Marino	..	..	..	18
Sao Tome and Principe	..	0	..	0
Saudi Arabia	2,325	689	2,246	1,127
Senegal (d)	n.a.	1	n.a.	0
Serbia	1	39	6	35
Sierra Leone	..	..	..	0
Singapore	7,263	2,940	7,040	2,880
Sint Maarten (Dutch Part)	..	0	..	0
Slovakia	7	101	6	68
Solomon Islands	..	0	..	0
Somalia	..	0	..	0
South Africa	6,216	1,009	6,078	957
South Sudan	..	0	..	0
Spain	57	4,023	73	3,829
Sri Lanka	227	23	288	13
Sudan	..	7	..	0
Suriname	..	0	..	0
Sweden	86	12,241	73	12,285
Switzerland	72	20,573	63	21,496
Syrian Arab Republic	16	3	27	..
Tajikistan	..	0	..	0
Thailand	6,082	436	5,973	253
Timor-Leste	..	0	..	0
Togo (d)	n.a.	0	n.a.	0
Tonga	..	0	..	..
Trinidad and Tobago	171	1	133	9
Tunisia	383	1	336	10
Turkey	359	1,240	300	994

(Continued)

(B19 continued)

Name	PCT national phase entries in 2017		PCT national phase entries in 2016	
	At designated office	By country of origin	At designated office	By country of origin
Turkmenistan	..	0	..	..
Tuvalu	..	0	..	0
Uganda	..	0	..	0
Ukraine	1,555	190	1,673	143
United Arab Emirates	1,744	217	1,336	..
United Kingdom	2,873	22,268	2,535	20,800
United Republic of Tanzania	..	..	..	0
United States of America	154,403	183,532	146,867	174,260
Uruguay	..	11	..	..
Uzbekistan	185	5	194	10
Venezuela (Bolivarian Republic of)	..	3	..	7
Viet Nam	4,104	26	4,072	21
Visegrad Patent Institute	..	0	..	0
Yemen	..	1	..	0
Zambia	10	2	18	0
Zimbabwe	..	..	..	0
Others	1,319	6,222	5,830	13,706
Total	**630,000**	**630,000**	**615,600**	**615,600**

Note: World totals are WIPO estimates. Offices of destination are designated and/or elected offices.

(a) The African Regional Intellectual Property Organization is the competent designated or elected office.

(b) The Office of Switzerland is the competent designated or elected office.

(c) The European Patent Office is the competent designated or elected office.

(d) The African Intellectual Property Organization is the competent designated or elected office.

.. indicates data are unknown.

n.a. indicates not applicable.

Source: WIPO Statistics Database, March 2019.

Section C
Statistics on the performance of the PCT System

Highlights

The International Bureau

In addition to its role as a receiving office (RO), the International Bureau (IB) of WIPO is responsible for functions related to the international phase of the PCT System, including examining formalities; translating abstracts, titles and patentability reports; and publishing PCT applications.

Around 46% of PCT applications were published in English

In 2018, 45.6% of all PCT applications were published in English, followed by Japanese (19.6%) and Chinese (17.9%). These three languages, combined, represented 83.1% of all applications published (see figure C1). Whereas the combined share of these three languages has remained relatively stable between 2013 and 2018, their respective contributions have changed drastically. In 2013, the bulk of applications were published in English (53.5%) and Chinese accounted for a comparatively low share (8%) of total publications. While the use of Japanese has remained stable over this period, under half of publications in 2018 were published in English.

Applicants in 2018 filed 97.1% of their PCT applications electronically and the remaining 2.9% on paper (see figure C2). The share of electronic filings has continuously increased, since such filing media were introduced. A decade earlier, in 2008, less than two-thirds of PCT applications were filed electronically.

The IB examined 98% of all PCT applications within a month of receipt

In 2018, the IB performed a formalities examination of 72.8% of PCT applications within a week of receipt of the application, and had processed almost 98% of them within a month (see figure C3).

Nearly 77% of publications occurred during the week following the expiration of the 18-month period from the priority date, and almost all publications (99.5%) occurred within no more than two weeks of that period (see figure C4). When the international search report (ISR) is unavailable at the time of publication, an application is republished together with the ISR once it is available. The proportion of applications republished within two months of the receipt of the ISR was 91.5%. Nearly all republications (99.5%) occurred within three months of receipt of the ISRs at the IB. These were the fastest processing times observed over the past 15 years (see figure C5).

The receiving offices

A PCT application is filed with an RO, which may be a national or regional patent office or the IB. ROs are responsible for receiving PCT applications, examining compliance with PCT formality requirements, receiving payment of fees, and transmitting copies of the application for further processing to the IB and the international searching authority (ISA).

Applicants used ePCT to file nearly 10% of PCT applications

By the end of 2018, 56 ROs were accepting PCT filings using the ePCT-filing portal. This figure includes the offices of Costa Rica, Croatia and Serbia, which had declared that they were prepared to accept such filings.

In 2018, applicants filed about 24,070 PCT applications using the ePCT-filing portal. This represents a 44.1% increase on the previous year (see figure C27) and corresponds to 9.5% of the total of 253,000 PCT applications filed in 2018. Applicants from the U.S. (3,873) filed the most applications via the ePCT portal, followed by those from Australia (1,482) and India (1,240), representing respectively, 6.9%, 81.2% and 61.6% of total filings from applicants residing in these three countries (see figure C28).

Nineteen of the top 20 offices received more than 80% of applications electronically

Of the top 20 ROs, the United States Patent and Trademark Office (USPTO), the National Intellectual Property Administration of the People's Republic of China (CNIPA), the Japan Patent Office (JPO) and the office of Israel received more than 99% of their PCT applications electronically in 2018. The share of electronic filings exceeded 80% for 19 of the top 20 offices. The only exception was the office of the Russian Federation, which received 81.9% of PCT applications on paper (see figure C10).

Australia, Finland and India transmitted all their PCT applications to the IB within four weeks

On average, in 2018, ROs transmitted their PCT applications to the IB within 2.8 weeks of the international filing date (see figure C12). Australia, Finland and India transmitted all their applications to the IB within four weeks of this date. The offices of Israel, Japan, the Republic of Korea, Sweden and the United Kingdom (U.K.) had transmittal rates above 99% also (see figure C13). In contrast, the offices of Spain (1.1%) and Turkey (2.2%) transmitted a very small proportion of their applications to the IB within four weeks of the international filing date.

The shares of PCT applications transmitted by ROs to the ISAs within four weeks varied slightly compared to those transmitted to the IB. The share was above 90% for the JPO (98.4%) and the office of Sweden (96.8%). Of the top 20 ROs, 15 transmitted the majority of their PCT applications to the ISAs within a four-week period. The five exceptions were the offices of France (45.9%), India (45%), the Russian Federation (8.9%), Turkey (1.1%) and Spain (0.4%) (see figure C14).

International searching authorities

Each PCT application must undergo an international search by an ISA. Once the ISA has performed this search, the applicant receives an ISR containing a list of documents relevant to assessing the invention's patentability. The ISA also establishes a written opinion, providing a detailed analysis of the potential patentability of the invention in light of the documents found in the search.

The EPO issued one third of all ISRs

In 2018, almost 242,000 ISRs were issued by the 22 existing ISAs. The EPO issued 80,780 ISRs and was followed by the CNIPA (52,038), which overtook the JPO (47,934) to become the second ISA in terms of ISRs issued in 2018. The Korean Intellectual Property Office (KIPO) (24,138) and the USPTO (21,109) ranked, in fourth and fifth positions, respectively (see figure C15). While the European Patent Office (EPO) accounted for 33.4% of all ISRs issued in 2018, the top five ISAs, combined, issued 93.4% of total ISRs. Of the top 10 ISAs, the office of India (+48.7%) and the CNIPA (+18.1%) recorded the most pronounced growth, whereas KIPO (–7%) and the office of Israel (–5.9%) experienced the sharpest decreases.

Of all ISRs that were required to be transmitted to the IB within three months from the date of receipt of the application, 85% were transmitted within this timeframe in 2018 (see figure C18). The JPO, the Visegrad Patent Institute and the offices of Chile and India transmitted more than 99% of such ISRs within three months. As for those that were required to be transmitted within 9 months from the priority date, 81.7% were transmitted within this timeframe (see figure C19). The office of Ukraine and the Visegrad Patent Institute transmitted all ISRs within 9 months in 2018.

PCT applications by publication language and filing medium

Timeliness in processing PCT applications by the International Bureau

Efficiency in processing PCT applications by the International Bureau

Receiving offices

International searching authorities

Supplementary international searching authorities

International preliminary examining authorities

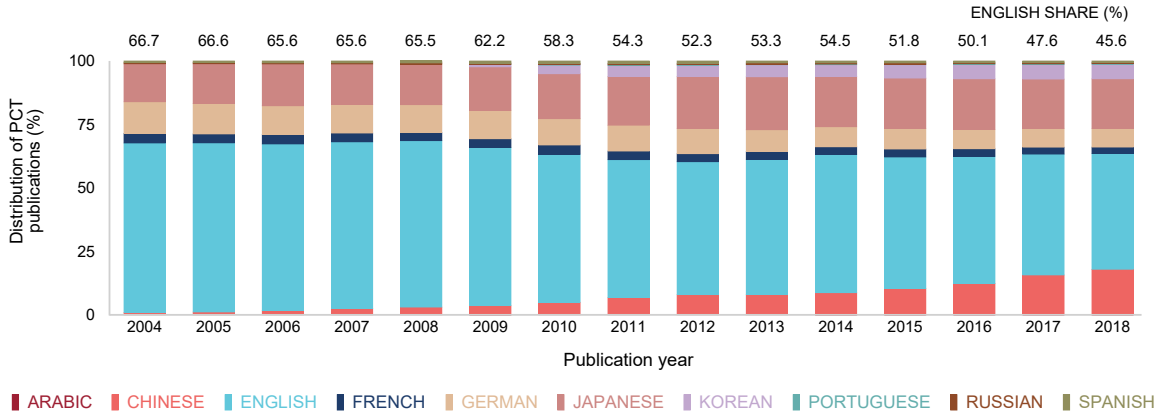
PCT-Patent Prosecution Highway pilots

PCT applications filed via ePCT

PCT applications by publication language and filing medium

Around 46% of PCT applications were published in English in 2018.

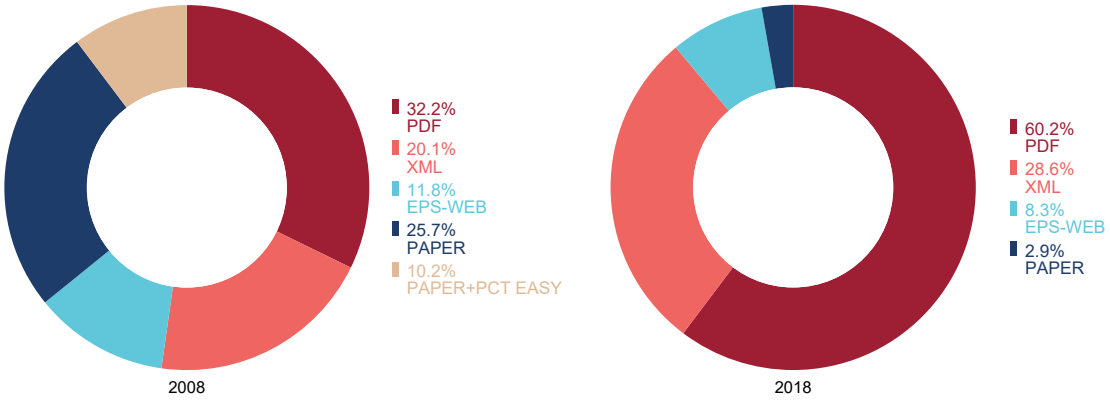
C1. Distribution of PCT applications by language of publication, 2004–2018



Source: WIPO Statistics Database, March 2019.

Around 97% of all PCT applications were filed electronically in 2018.

C2. Distribution of PCT applications by filing medium, 2008 and 2018



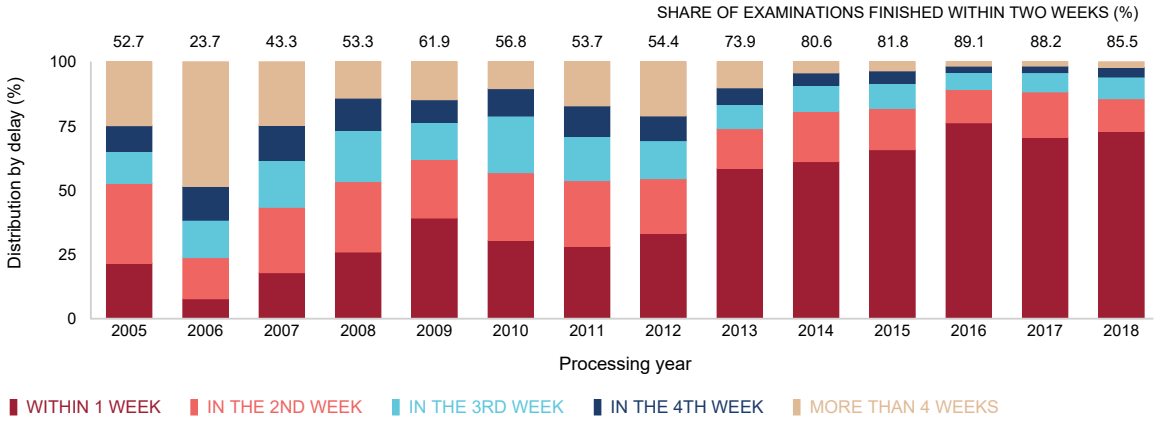
Note: PDF, EFS-WEB and XML are the three fully electronic filing mediums. Since mid-2015, PCT applications can no longer be filed using PCT-EASY.

Source: WIPO Statistics Database, March 2019.

Timeliness in processing PCT applications by the International Bureau

The formalities examination was completed within two weeks for 85.5% of PCT applications in 2018.

C3. Timeliness of formalities examination, 2005–2018

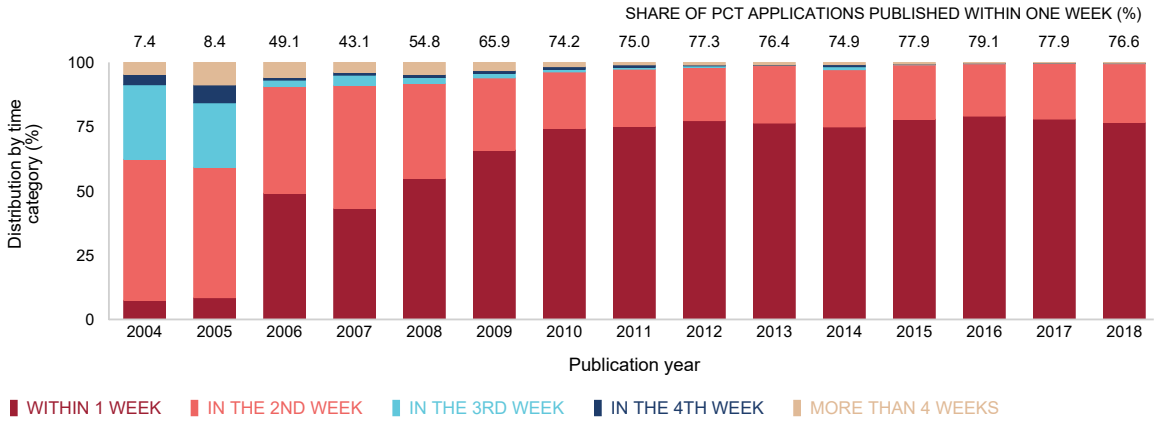


Note: The International Bureau (IB) performs a formality examination of PCT applications and related documents promptly after receipt. Once the formality examination of a PCT application is completed, the IB sends a form to the applicant acknowledging receipt of the application. Timeliness is calculated as the time elapsed between the date of receipt of the record copy of the PCT application and the date of issuance of form PCT/IB/301.

Source: WIPO Statistics Database, March 2019.

Since 2011, at least three-quarters of PCT applications have been published within a week of the expiration of the 18-month limit.

C4. Timeliness in publishing PCT applications, 2004–2018

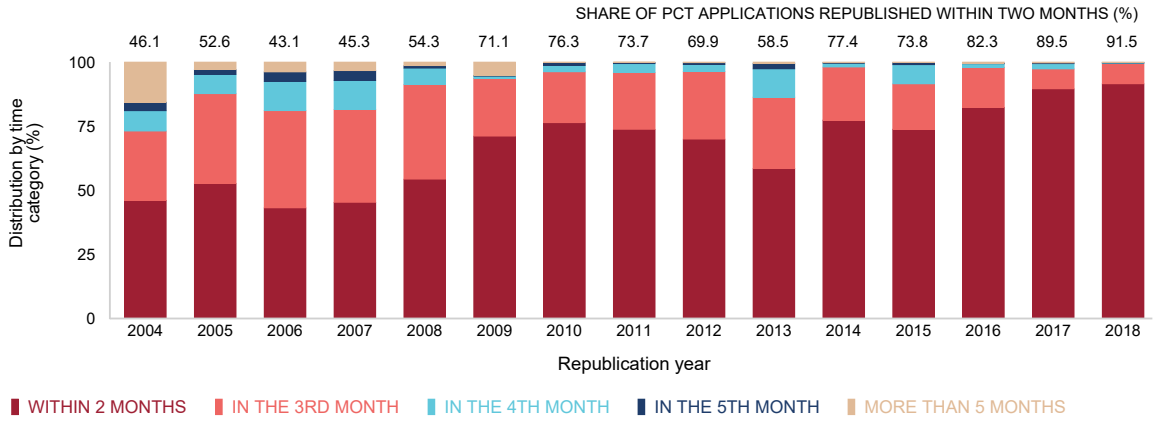


Note: PCT applications and related documents are to be published "promptly" after the expiration of 18 months from the priority date, unless the applicant requests early publication, or the application is withdrawn or considered withdrawn. Timeliness is calculated as the time elapsed between the time limit of 18 months from the priority date and the actual publication date.

Source: WIPO Statistics Database, March 2019.

In 2018, over 90% of republications occurred within two months of the receipt of the ISRs.

C5. Timeliness in republishing PCT applications with international search reports, 2004–2018



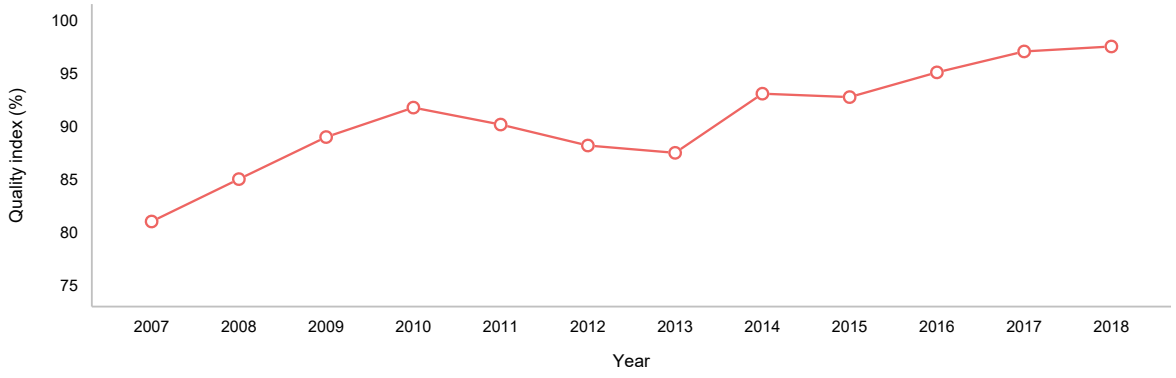
Note: The International Bureau (IB) is required to publish applications even in the absence of an international search report (ISR). In such cases, the application is republished along with the ISR after the report is received. Timeliness is calculated as the time elapsed between the date of receipt of the ISR at the IB and the date of republication by the IB.

Source: WIPO Statistics Database, March 2019.

Efficiency in processing PCT applications by the International Bureau

The overall quality of the formalities examination has improved markedly, from an average of around 81% in 2007 to 97.5% in 2018.

C6. Formalities examination quality index, 2007–2018

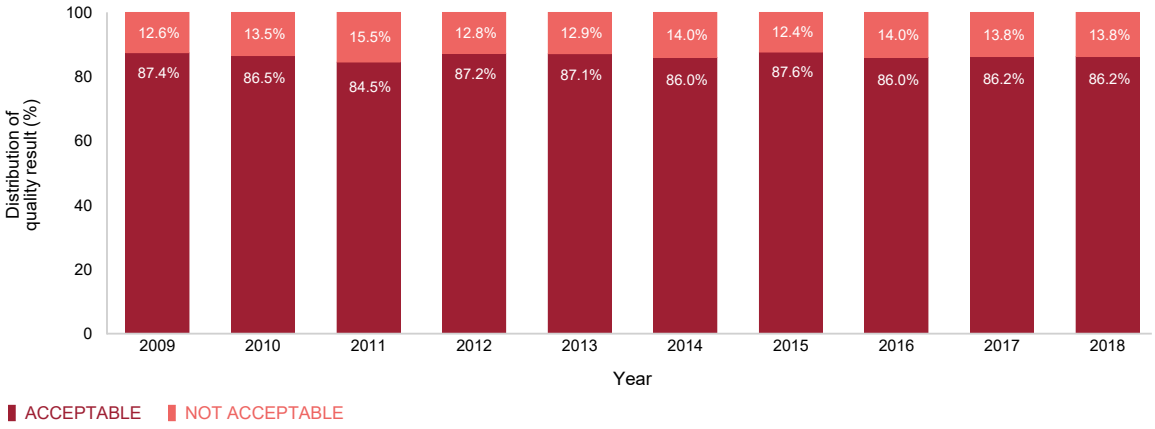


Note: In order to measure the quality of the formalities examination by the International Bureau (IB) in a simple and comprehensive manner, the IB has developed an aggregate quality index, calculated as the average of four lead quality indicators. Three of these are based on the timeliness of key transactions. The quality index is the simple average of: (i) the percentage of forms PCT/IB/301 (notification of receipt of a PCT application) sent within five weeks of the IB receiving a PCT application; (ii) the percentage of PCT applications published within six months and three weeks after the international filing date; (iii) the percentage of republications with international search reports (ISRs) within two months after the IB receives the ISR; and (iv) the percentage of corrections to bibliographic data in the published PCT application (from 2008 to 2011) and the PCT operation quality control error rate (from 2012 onwards).

Source: WIPO Statistics Database, March 2019.

The share of acceptable translations remained unchanged at 86.2% in 2018.

C7. Translation quality indicator, 2009–2018



Note: The translation quality indicator shows the average quality of abstracts and reports translated by external suppliers and in-house translators combined, based on the results of the International Bureau (IB)'s regular quality control checks. This indicator aggregates the results of such quality control performed by the IB across all language combinations and document types.

Source: WIPO Statistics Database, March 2019.

Since 2017, more than 90% of abstract and report translations have been outsourced.

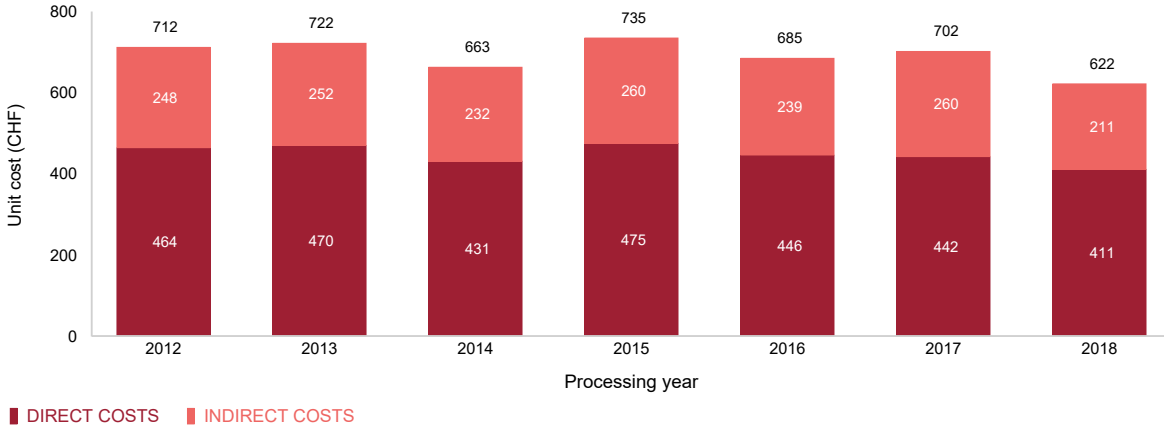
C8. Distribution of translation work, 2008–2018

Note: Translations by the International Bureau (IB) are intended to enhance the patent system's disclosure function by making the technological information in PCT applications accessible in languages other than the languages in which the original documents were filed. In order to meet this objective, the IB ensures that all titles and abstracts of PCT applications are available in English and French, and that all international search and preliminary examination reports are available in English.

Source: WIPO Statistics Database, March 2019.

The average cost of processing a published PCT application in 2018 was 622 Swiss francs (CHF).

C9. Unit cost of processing a published PCT application, 2012–2018



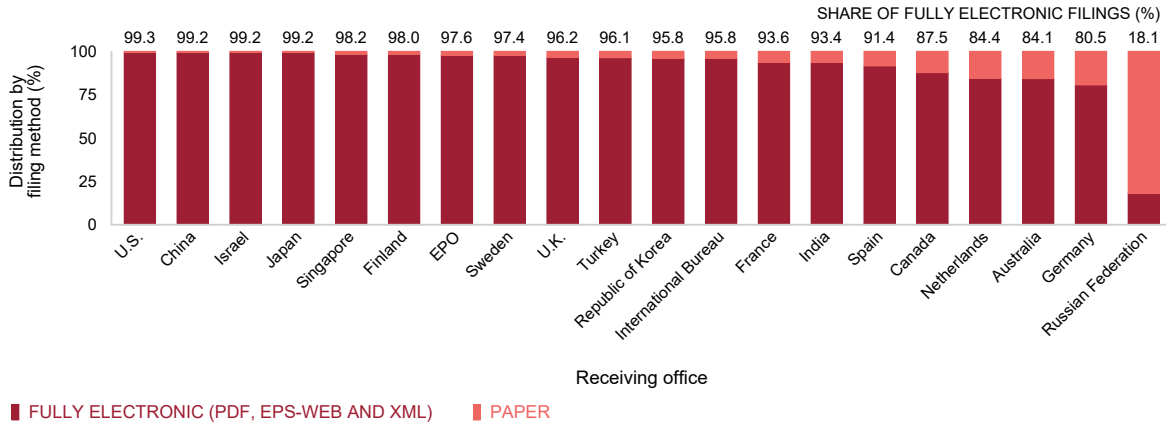
Note: The International Bureau (IB)'s efficiency in processing PCT applications can be measured by the unit cost of processing, defined as the average total cost of publishing a PCT application. Average total cost is determined by total PCT System expenditure, plus a proportion of expenditure on support and management activities. The unit cost includes the cost of all PCT activities, including translation, communication, management, etc. Costs have direct and indirect components. Direct costs reflect expenditure incurred by the IB in administering the PCT System and related programs. Indirect costs reflect expenditure for supporting activities, such as buildings and information technology. Indirect costs are weighted in order to take into account only the share that is attributable to the PCT System. The unit cost is calculated by dividing the total cost of production by the number of PCT applications published.

Source: WIPO Statistics Database, March 2019.

Receiving offices

The offices of China, Israel, Japan and the U.S. received more than 99% of all their PCT filings electronically.

C10. Distribution of PCT applications by filing medium, top 20 receiving offices, 2018

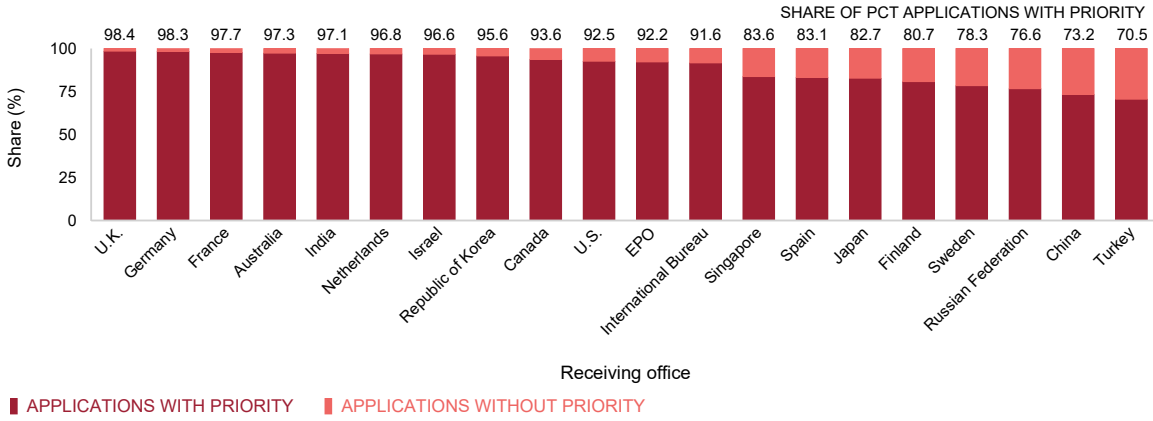


Note: EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2019.

More than 98% of PCT applications filed at the offices of Germany and the U.K. were based on priority filings.

C11. Share of PCT applications with priority filings, top 20 receiving offices, 2018

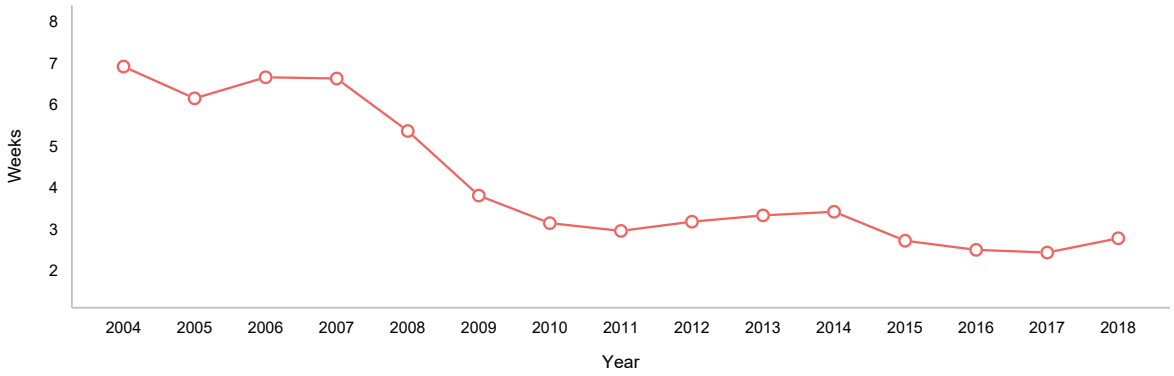


Note: EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2019.

After three consecutive years of decline, receiving offices' average timeliness in transmitting PCT applications to the International Bureau increased slightly to 2.8 weeks in 2018.

C12. Average timeliness in transmitting PCT applications to the International Bureau, 2004–2018

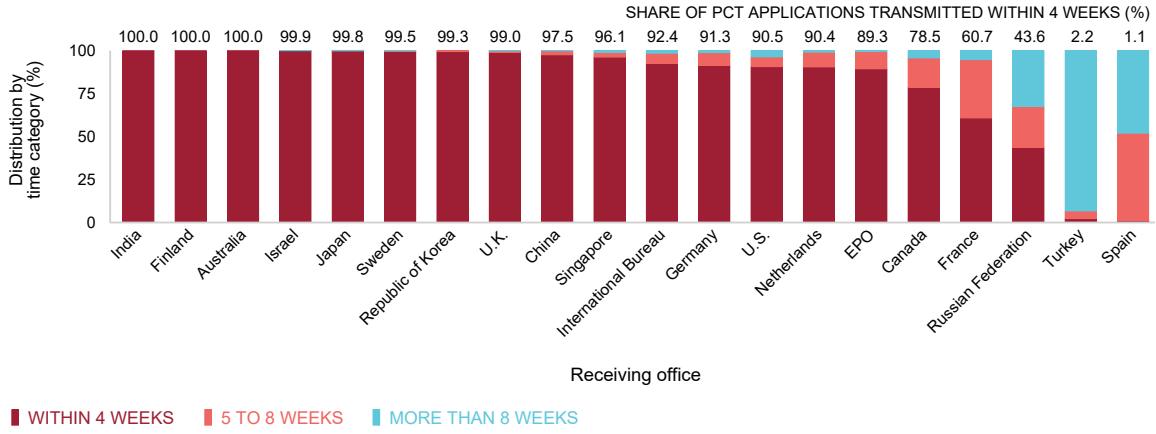


Note: The copy of the PCT application – known as the record copy – sent by the receiving office (RO) must reach the International Bureau (IB) before the expiration of the 13th month from the priority date. PCT applications are usually filed before the expiration of 12 months from the priority date. Where this occurs, the IB should receive the application within one month of the international filing date. Timeliness is calculated as the time elapsed between the international filing date and the date on which the IB received the PCT application from the RO. Applications transmitted under PCT Rule 19.4 are excluded.

Source: WIPO Statistics Database, March 2019.

Australia, Finland and India transmitted all of their PCT applications to the International Bureau within four weeks.

C13. Timeliness in transmitting PCT applications to the International Bureau, top 20 receiving offices, 2018

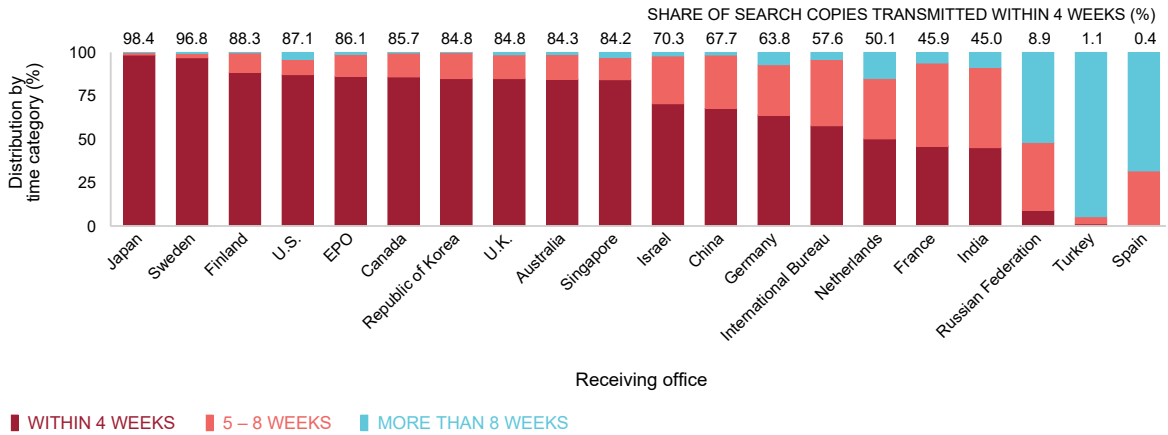


Note: The copy of the PCT application – known as the record copy – sent by the RO must reach the IB before the expiration of the thirteenth month from the priority date. PCT applications are usually filed before the expiration of 12 months from the priority date. Where this occurs, the IB should receive the application within one month of the international filing date. Timeliness is calculated as the time elapsed between the international filing date and the date on which the IB received the PCT application from the RO. Applications transmitted under PCT Rule 19.4 are excluded. EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2019.

The offices of Japan and Sweden transmitted more than 90% of all PCT applications to international searching authorities within four weeks.

C14. Timeliness in transmitting PCT applications to international searching authorities, top 20 receiving offices, 2018



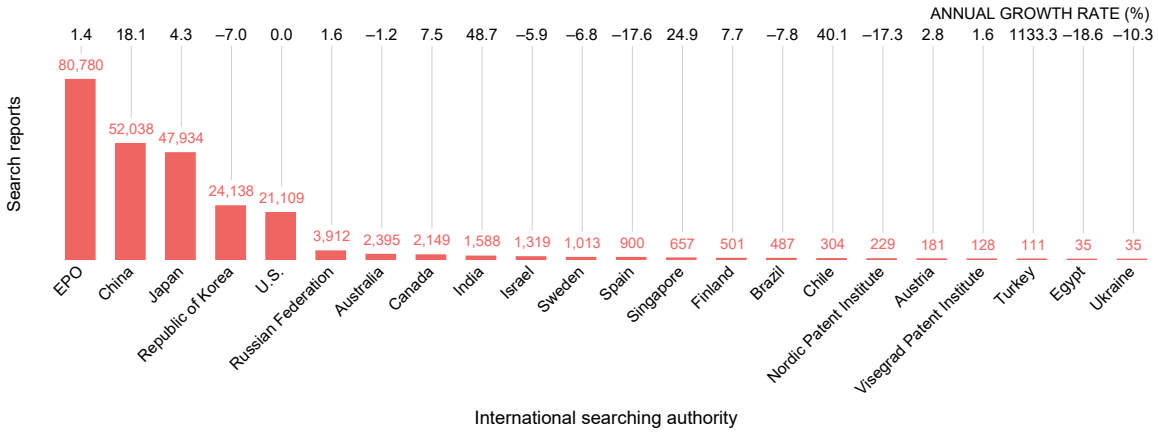
Note: Timeliness is calculated as the time elapsed between the international filing date and the date on which the international searching authority (ISA) received the PCT application – known as the search copy – from the receiving office. Dates of search fee payments are not used, due to the unavailability of data. Applications transmitted under the terms of PCT Rule 19.4 are excluded. EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2019.

International searching authorities

The European Patent Office issued nearly 81,000 international search reports.

C15. International search reports issued by international searching authority, 2018

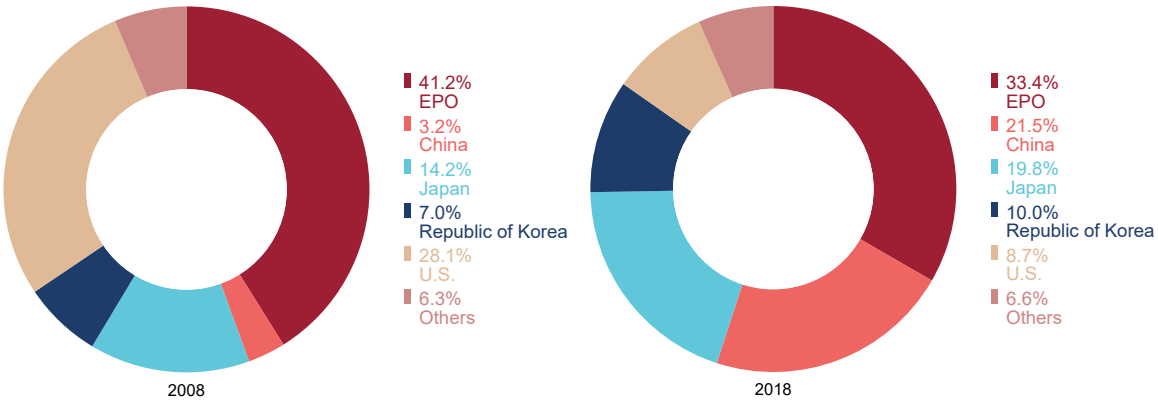


Note: EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2019.

The European Patent Office established a third of all international search reports in 2018.

C16. Distribution of international search reports issued by international searching authority, 2008 and 2018



Note: EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2019.

Since 2008, there has been a near continuous improvement in timeliness in transmitting international search reports to the International Bureau.

C17. Average timeliness in transmitting international search reports to the International Bureau, measured from the date of receipt of the search copy, 2004–2018

Note: The international searching authority (ISA) must establish the international search report (ISR) within three months of receiving a copy of the application – known as the search copy – or nine months from the priority date (or, if no priority is claimed, from the international filing date), whichever expires later. Timeliness is calculated as the time between the date the ISA receives a copy of the PCT application and the date when it transmits the ISR to the International Bureau (or, if applicable, the date of receipt of the declaration under Article 17(2)(a)). This figure shows timeliness in establishing the ISR where the applicable time limit for establishing the ISR under Rule 42 is three months after the date of receipt of the search copy.

Source: WIPO Statistics Database, March 2019.

At all international searching authorities, the bulk of those international search reports that should be transmitted to the International Bureau within three months from the date of receipt of the search copy met this deadline.

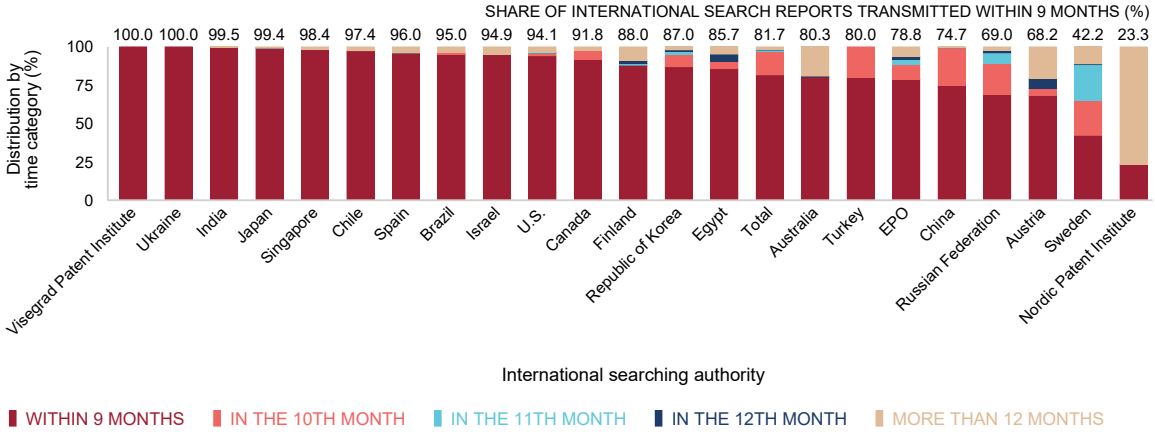
C18. Timeliness in transmitting international search reports to the International Bureau, measured from date of receipt of the search copy by international searching authority, 2018

Note: The international searching authority (ISA) must establish the international search report (ISR) within three months of receiving a copy of the application – known as the search copy – or nine months from the priority date (or, if no priority is claimed, from the international filing date), whichever expires later. Timeliness is calculated as the time between the date when the ISA receives a copy of the PCT application and the date when it transmits the ISR to the International Bureau (or, if applicable, the date of receipt of the declaration under Article 17(2)(a)). This figure shows timeliness in establishing the ISR where the applicable time limit for establishing the ISR under Rule 42 is three months from receipt of the search copy. When the date of receipt of the search copy is unknown and the ISA is the same office as the receiving office, we consider the search copy to have been received on the international filing date and calculate the timeliness accordingly. EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2019.

For 20 of the 22 international searching authorities, the majority of those international search reports that should be transmitted to the International Bureau within nine months of the priority date met this deadline.

C19. Timeliness in transmitting international search reports to the International Bureau, measured from priority date by international searching authority, 2018



Note: The international searching authority (ISA) must establish the international search report (ISR) within three months of receiving a copy of the application – known as the search copy – or nine months from the priority date (or, if no priority is claimed, from the international filing date), whichever expires later. Timeliness is calculated as the time elapsed between the priority date and the date on which the ISA transmits the ISR to the International Bureau (or, if applicable, the date of receipt of the declaration under Article 17(2)(a)) for ISRs where the deadline is nine months from the priority date. This figure shows timeliness in establishing the ISR where the applicable time limit for establishing the ISR under Rule 42 is nine months from the priority date (or international filing date if no priority is claimed). When the date of receipt of the search copy is unknown and the ISA is not the same office as the receiving office, we calculate the timeliness from the priority date. EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2019.

For 16 international searching authorities, the share of PCT applications published by the International Bureau with an international search report they have issued exceeded 95%.

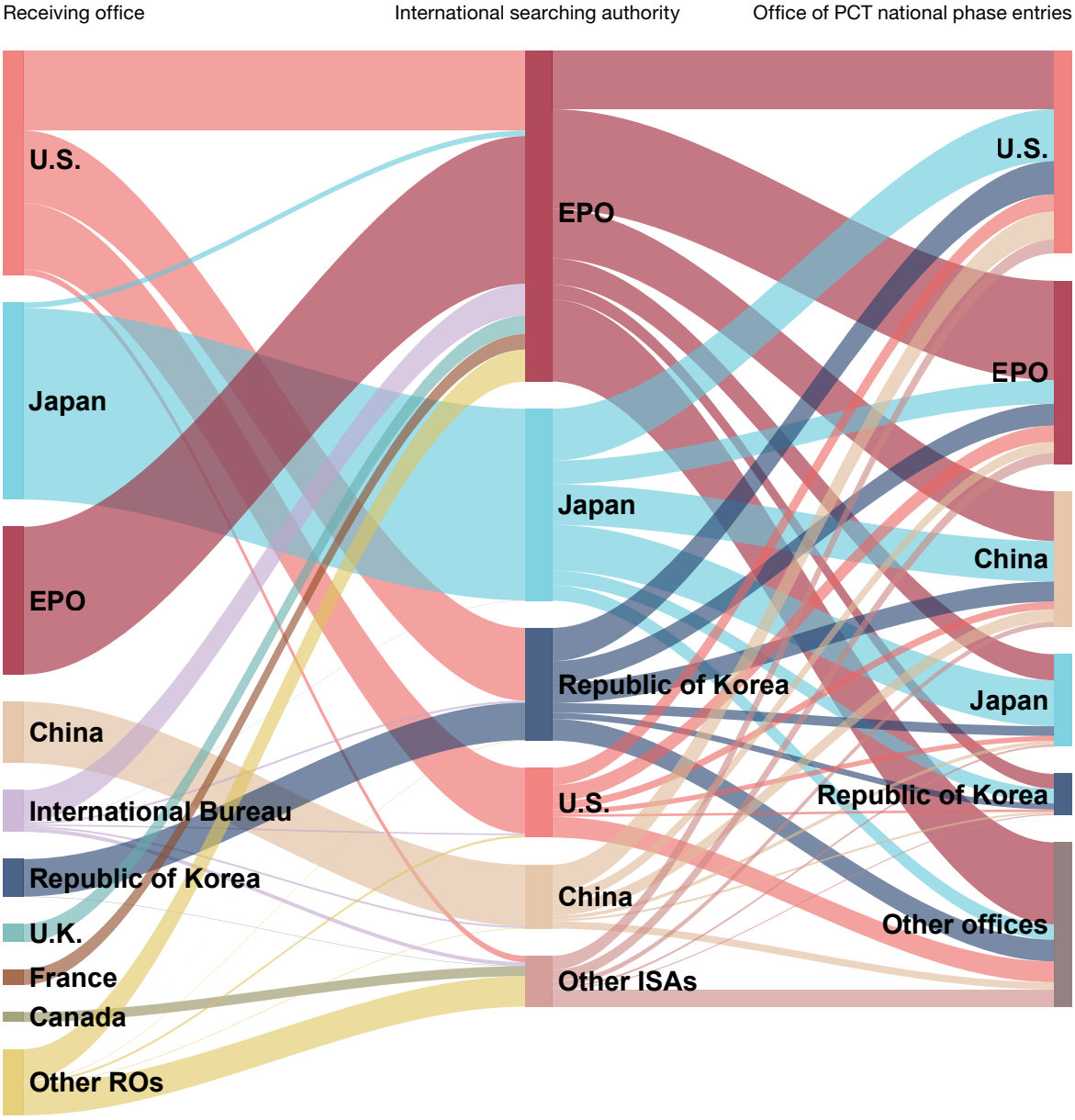
C20. Share of published PCT applications with and without international search reports by international searching authority, 2018

Note: A further measure of the performance of an ISA is the proportion of ISRs that are transmitted to the IB in time for publication with the PCT application, known as A1 publication. EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2019.

Of all PCT applications filed at the Japan Patent Office between 2011 and 2013, a large proportion entered the national phase in the U.S. based on an international search report produced by the Japan Patent Office.

C21. Flow of PCT applications transmitted from selected receiving offices to the top five international searching authorities and the top five offices of PCT national phase entries, 2011–2013



Note: National phase entry (NPE) data may be incomplete. This figure shows the flow of PCT applications between selected receiving offices (ROs), international searching authorities (ISAs) and offices of NPEs. Data for the offices of NPEs are based on fractional counts of PCT applications. Each RO may specify one or more ISAs as competent for PCT applications filed with it. EPO is the European Patent Office.

Source: WIPO Statistics Database and EPO PATSTAT Database, March 2019.

Supplementary international searching authorities

In 2018, about 60 supplementary international search reports were issued.

C22. Distribution of supplementary international search reports by supplementary international searching authority, 2013–2018

Supplementary international searching authority	Year					
	2013	2014	2015	2016	2017	2018
Austria	2	2	2		1	1
European Patent Office	30	61	40	44	40	54
Russian Federation	32	46	22	3	6	
Singapore				1		3
Sweden	3					3
Turkey						**1**
Ukraine					2	1
Total	**67**	**109**	**64**	**48**	**49**	**63**

Note: The data for 2018 may be incomplete.

Source: WIPO Statistics Database, March 2019.

International preliminary examining authorities

The European Patent Office issued 60% of all international preliminary reports on patentability in 2018.

C23. Distribution of international preliminary reports on patentability by international preliminary examining authority, 2016–2018

International preliminary examining authority	Year			2018 share (%)	Change from 2017 (%)
	2016	2017	2018		
Australia	599	548	592	4.6	8.0
Austria	5	9	3	0.0	–66.7
Brazil	47	50	67	0.5	34.0
Canada	231	213	172	1.3	–19.2
Chile	5	8	16	0.1	100.0
China	382	316	399	3.1	26.3
Egypt		1	2	0.0	100.0
European Patent Office	9,075	8,365	7,722	60.4	–7.7
Finland	60	76	66	0.5	–13.2
India	25	28	41	0.3	46.4
Israel	81	98	69	0.5	–29.6
Japan	2,019	1,945	2,130	16.7	9.5
Nordic Patent Institute	31	32	36	0.3	12.5
Republic of Korea	209	162	135	1.1	–16.7
Russian Federation	71	51	50	0.4	–2.0
Singapore	26	106	111	0.9	4.7
Spain	60	47	40	0.3	–14.9
Sweden	206	134	128	1.0	–4.5
Turkey			4	0.0	n.a.
Ukraine		4	7	0.1	75.0
United States of America	1,227	1,061	993	7.8	–6.4
Visegrad Patent Institute		3	6	0.0	100.0
Total	**14,359**	**13,257**	**12,789**	**100.0**	**–3.5**

Note: The data for 2018 may be incomplete.

n.a. indicates not applicable.

Source: WIPO Statistics Database, March 2019.

Despite a slight increase in time taken in 2018, the timeliness in transmitting international preliminary reports on patentability to the International Bureau has improved markedly since 2011.

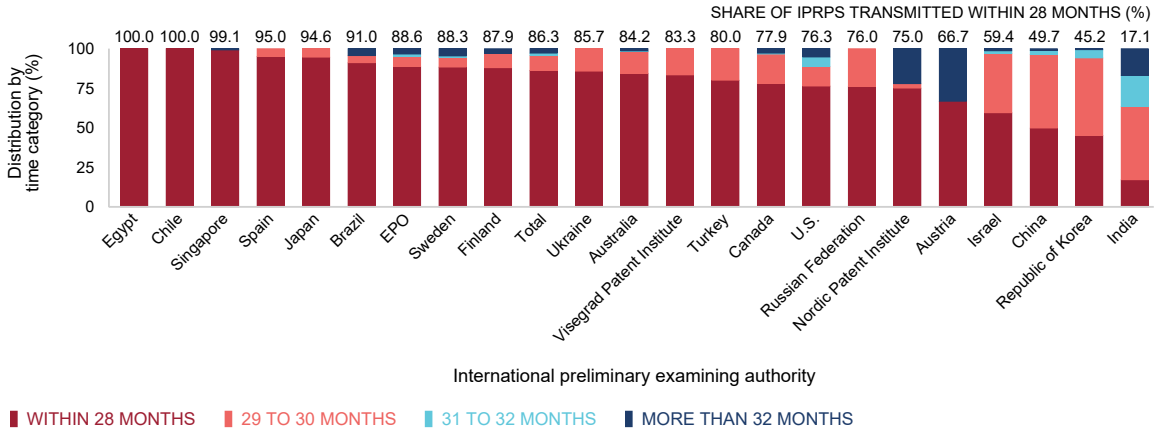
C24. Average timeliness in transmitting international preliminary reports on patentability to the International Bureau, 2004–2018

Note: Timeliness is calculated as the time elapsed between the priority date and the date on which the International Bureau received the international preliminary report on patentability (IPRP) from the international preliminary examining authority (IPEA).

Source: WIPO Statistics Database, March 2019.

The offices of Chile and Egypt transmitted all international preliminary reports on patentability to the International Bureau within 28 months.

C25. Timeliness in transmitting international preliminary reports on patentability to the International Bureau by international preliminary examining authority, 2018



Note: This figure presents the same timeliness information for 2018 as that presented in the figure C24, but breaks it down by international preliminary examining authority (IPEA) and time category. Timeliness is calculated as the time elapsed between the priority date and the date when the International Bureau received the international preliminary report on patentability (IPRP) from the IPEA. EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2019.

PCT-Patent Prosecution Highway pilots

The office of China received a total of 1,651 PCT-Patent Prosecution Highway (PPH) requests, most of which originated from Japan.

C26. Distribution of PCT-PPH requests by international authority and office of PCT national phase entry, 2018

	Office of earlier examination										
Office of later examination	Japan	European Patent Office	U.S.	Republic of Korea	China	Canada	Israel	Russian Federation	Sweden	Others	Total
Japan	1,475	578	66	45	85	4	5	3	1	5	2,267
China	719	660	101	104	0	6	12	20	24	5	1,651
Republic of Korea	282	266	73	48	35	5	2	3	5	30	749
Canada	158	235	97	37	24	154	13	6	2	4	730
European Patent Office	383	0	103	55	100	10	28	12	0	5	696
Russian Federation	112	160	16	14	33	1	3	1	1	2	343
Mexico	155	63	12	0	0	0	0	0	0	9	239
Australia	27	101	47	28	0	10	6	3	1	8	231
Israel	7	76	22	5	1	0	39	0	0	3	153
Malaysia	84	0	0	0	0	0	0	0	0	0	84
Colombia	2	20	38	0	0	1	0	0	1	5	67
United Kingdom	11	0	10	2	16	0	0	0	0	4	43
New Zealand	3	0	17	5	0	3	0	0	0	10	38
Eurasian Patent Organization	10	13	0	0	2	0	0	0	0	0	25
Others	10	0	6	1	1	1	0	0	0	9	28
Total	**3,438**	**2,172**	**608**	**344**	**297**	**195**	**108**	**48**	**35**	**99**	**7,344**

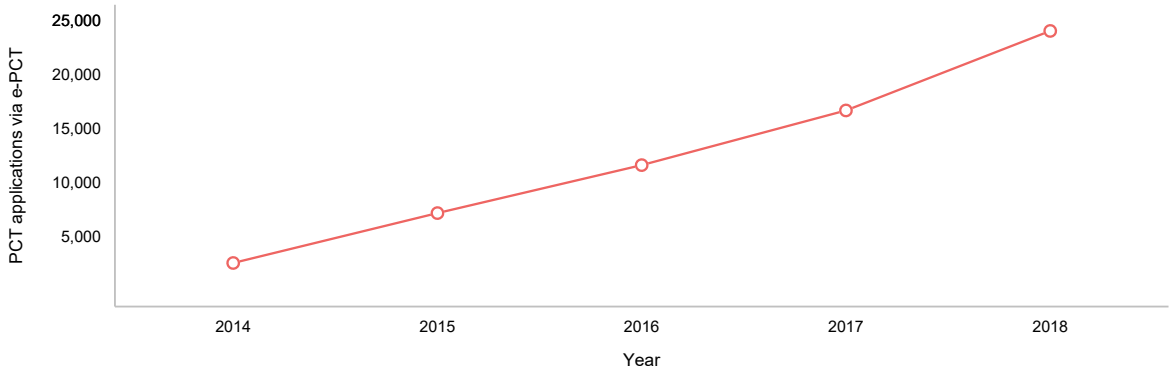
Note: Data for several offices of later examination, such as Germany, Indonesia and the United States Patent and Trademark Office (USPTO) are missing.

Source: WIPO, based on data from the Japan Patent Office, March 2019.

PCT applications filed via ePCT

Applicants filed 24,070 PCT applications using ePCT in 2018, representing an increase of 44.1% on 2017.

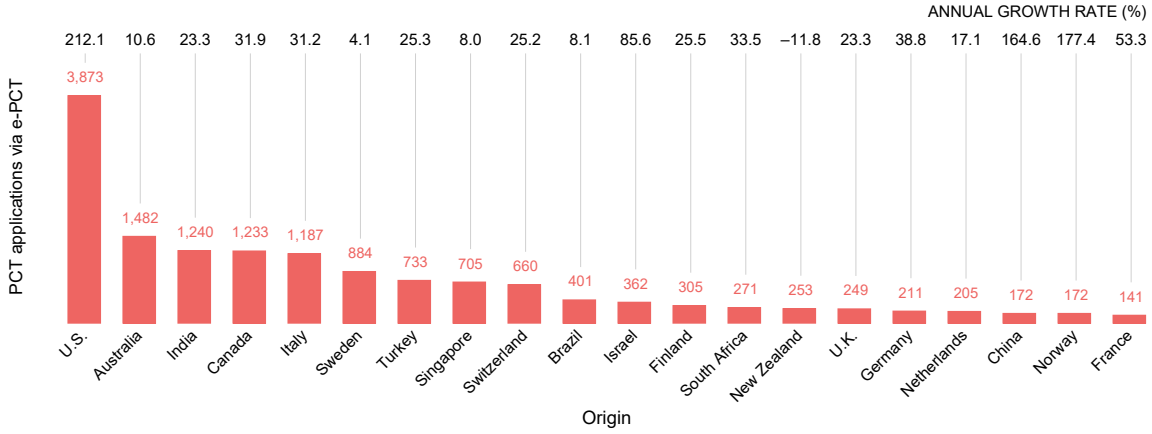
C27. Trend in PCT applications filed using ePCT, 2014–2018



Source: WIPO Statistics Database, March 2019.

The number of PCT applications filed via ePCT in 2018 by applicants residing in the U.S. has more than tripled in one year.

C28. PCT applications filed using ePCT for the top 20 origins, 2018



Source: WIPO Statistics Database, March 2019.

A brief presentation of the Patent Cooperation Treaty

The Patent Cooperation Treaty (PCT) is an international treaty administered by the World Intellectual Property Organization (WIPO). Since entering into force in 1978, the PCT has served as an alternative to the Paris Convention route for pursuing patent rights in different countries. The PCT System makes it possible to seek patent protection for an invention simultaneously in multiple countries by filing a single "international" patent application instead of filing several separate national or regional patent applications. When it was first established, the PCT System comprised 18 members. By the end of 2018, it comprised 152 Contracting States, as shown on the map below. A table listing all PCT Contracting States is provided at the end of this review.

Advantages of the Patent Cooperation Treaty

Applicants and patent offices of Contracting States benefit from uniform formality requirements, international search, supplementary international search and preliminary examination reports, and centralized international publication.

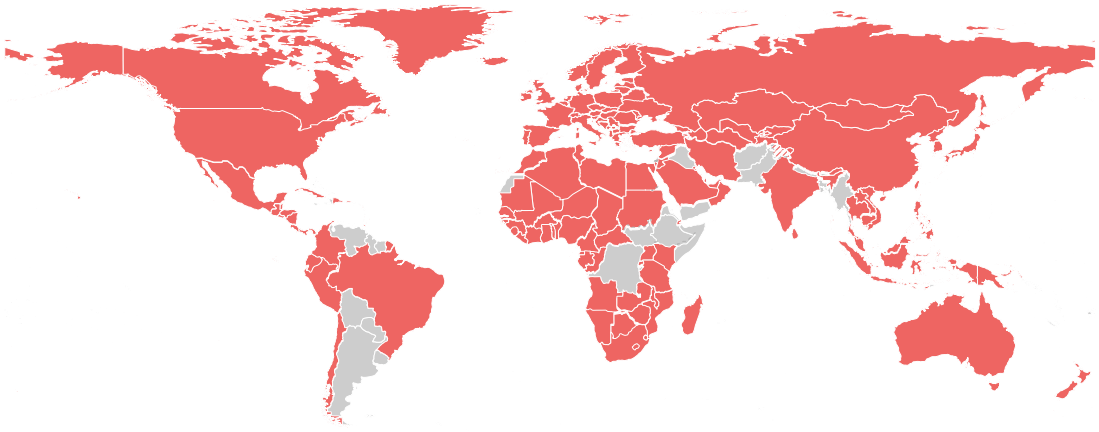
Compared with the Paris Convention route, applicants can delay examination procedures at national patent offices, as well as the payment of associated legal fees and translation costs. By deferring national and regional procedures, applicants gain time to make decisions on the potential commercialization of their invention and the markets in which to seek patent protection.

The reports produced by the international authorities that applicants receive during the international phase – about relevant prior art and the potential patentability of their inventions – help them make well-informed decisions.

In addition, the PCT System is intended to reduce unnecessary duplication among patent offices and to support work sharing between these offices.

Under the PCT System, an applicant must file a patent application with a receiving office (RO) and choose an international searching authority (ISA) to provide an international search report (ISR) and a written opinion on the potential patentability of the invention. The International Bureau (IB) of WIPO then publishes the application in PATENTSCOPE, its online database. Following receipt of the ISR and written opinion, the applicant can choose to request a supplementary international search (SIS) by a supplementary international searching authority (SISA), have an international preliminary examination (IPE) of this application undertaken by an international preliminary examining authority

Contracting States in 2018



Source: WIPO, March 2019.

(IPEA) or take no further action. The applicant generally has at least 30 months from the earliest filing (priority) date to decide whether to enter the national phase in the countries or regions in which protection is sought.

International phase

The international phase usually continues for a period of 18 months and mainly involves the filing and formal examination of the application, international search, international publication, optional SIS and optional IPE. Published applications are accessible free of charge through PATENTSCOPE, WIPO's online database.

Filing applications

Typically, applicants seeking to protect an invention in more than one country first file a national or regional patent application with their national or regional patent office. Within 12 months from the filing date of that first application (a time limit set by the Paris Convention), applicants then file an international application under the PCT with a RO – the respective national or regional patent office, or the IB – thereby beginning the international phase. Only a national or resident of a PCT Contracting State can file a PCT application. Where several applicants are named in the PCT application, only one needs to comply with this requirement.

Because the application has legal effect in all Contracting States, applicants can effectively postpone the requirement to pay certain substantial fees and costs, such as the cost of translating the application into national languages.

The RO transmits a copy of the application to the IB, which is responsible for:

- receiving and storing all application documents;
- performing a second formalities examination;
- translating the title and abstract of the application and certain associated documents into English and/or French, where necessary;
- publishing the application and related documents in PATENTSCOPE; and
- communicating documents to offices and third parties.

International search

Applications are subject to an international search by an ISA, which identifies the prior art relevant to the patentability of the invention, establishes an ISR and provides a written opinion on the invention's potential patentability. That opinion can assist the applicant in deciding whether to continue to seek protection for the invention. If the written opinion is unfavorable, the applicant may choose to amend the application to improve the probability of obtaining a patent, to withdraw the application before international publication and before incurring additional costs, or to do nothing.

Supplementary international search

Since January 1, 2009, the SIS service has offered applicants the option of requesting additional searches from ISAs other than the one that carried out the initial search. This service aims to give applicants the option of obtaining a more complete overview of the prior art in the international phase by allowing them to have an additional search performed in the ISA's specialty language. Applicants can request an SIS report by an SISA up to 22 months from the filing (priority) date.

International preliminary examination

After receiving the ISA's written opinion, applicants can request an optional IPE – a second evaluation of the invention's patentability – to be carried out by an IPEA, usually on an amended version of the application (all ISAs are also IPEAs). The resultant international preliminary report on patentability (IPRP) further assists the applicant in determining whether to enter the national phase and contains useful information for elected offices in the national phase.

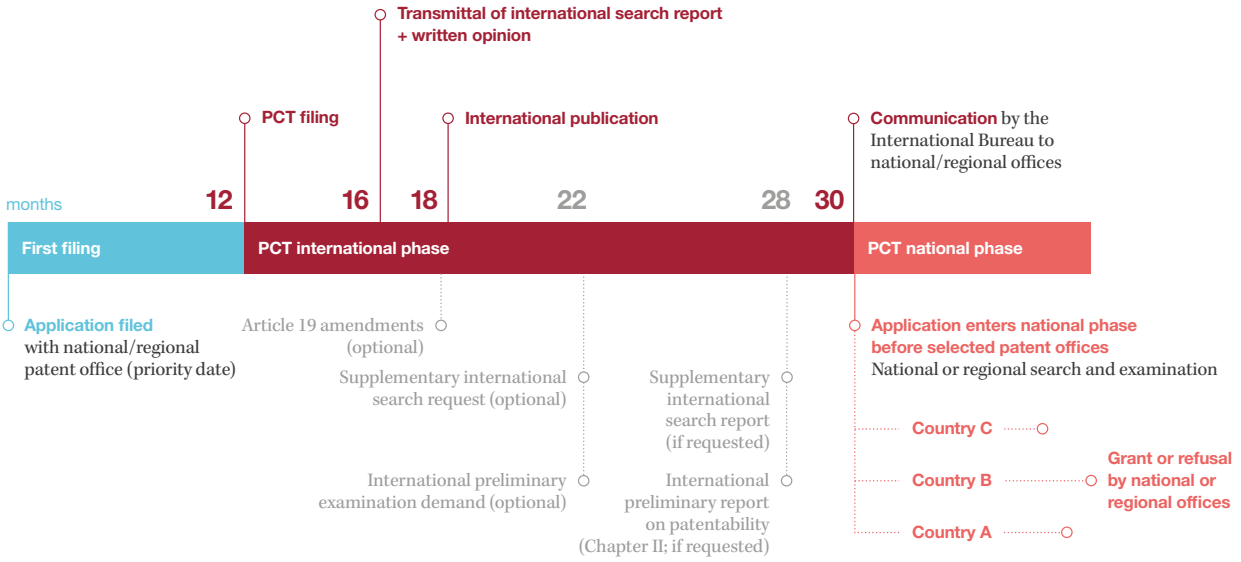
National phase

Applicants have at least 18 months from the filing date of their applications before their applications need to enter the national phase at individual patent offices. This delay affords additional time – compared to that allowed under the Paris Convention – to evaluate the chances of obtaining a patent and to plan how to use the invention commercially in the countries in which protection is sought. In the national phase, certain PCT protections continue to apply. During this phase, the particular patent office processes the application in accordance with its national patent laws and decides whether to grant patent protection. The time required for processing varies across patent offices.

Patent Prosecution Highway

The PCT-Patent Prosecution Highway (PCT-PPH) pilots comprise bilateral agreements between patent offices to enable applicants to request an accelerated processing of their national phase applications. Under these agreements, an applicant receiving a written opinion or an IPRP indicating that at least one claim in the PCT application has novelty, an inventive step

Overview of the PCT System



Benefits

- One PCT application with legal effect in all PCT Contracting States
- Harmonized formal requirements
- Receive patentability information to support strategic decision-making
- Postpone significant costs for national processing by 18 months

Source: WIPO, April 2019.

and industrial applicability, may request that the other participating patent offices take up the processing of that application out of turn. The applicant may request the PCT-PPH procedure when entering the national phase of the PCT in a participating designated state. The advantage for PCT applicants is that patent applications are processed faster and more efficiently by designated (or elected) offices. Participating offices also benefit from a reduced examination workload and additional knowledge sharing.

The Global Patent Prosecution Highway (GPPH) was launched in 2014. The GPPH pilot is a single, multilateral agreement between a group of offices. It enables applicants to make a request for accelerated processing at any participating office, based on work products (including PCT reports) from any of the other participating offices, using a single set of qualifying requirements.

For more information on the PCT, please visit *www.wipo.int/pct/*.

Data description

Data presented in this review were drawn from the WIPO Statistics Database. Due to a delay in transmitting PCT applications to WIPO, the figures for 2018 are estimates. For top filing countries, estimates are made using several statistical and econometric models. For other countries, the estimates adjust actual received applications according to each country's share of the estimated total PCT filings.

In 2015, the number of published PCT applications decreased by nearly 5%. This was partly due to the fact that in the previous year – as happens every five to six years – the number of weeks of publication was 53 instead of 52, resulting in an increase in the number of publications recorded for 2014. This may affect the annual growth rates presented in indicators based on published PCT applications.

For confidentiality reasons, the lists of top applicants and PCT applications by fields of technology are based on the publication date.

For the national phase of the PCT System, statistics are based on data supplied to WIPO by national and regional patent offices – data which WIPO often receives six months or more after the end of the year in question. Therefore, the latest year for which data are available is 2017. Data may be missing for some offices and may be incomplete for some origins. Data by origin are not available for countries whose patent offices have not provided their annual patent statistics. Data are available for the majority of larger offices. With the 2017 data supplied to WIPO corresponding to 99.5% of the world total, only a small proportion of the total is estimated. Missing data are estimated using such methods as linear extrapolation and averaging adjacent data points. The equivalent patent application concept for patent statistics by origin is not used in this review. National phase entry data by origin may therefore differ slightly from other sources, such as WIPO's IP Statistics Data Center.

Income groups correspond to those used by the World Bank[1] and groupings by region are based on the United Nations (UN) definition of regions.[2]

The figures in this review are subject to change.[3]

1 Available at: *https://datahelpdesk.worldbank.org/knowledgebase/articles/906519*
2 Available at: *https://unstats.un.org/unsd/methodology/m49/*. Although the geographical terms used by WIPO may differ slightly from those defined by the UN, the composition of regions and sub regions remains identical.
3 Regular updates are available at: *www.wipo.int/ipstats*

Acronyms

ARIPO	African Regional Intellectual Property Organization
CNIPA	National Intellectual Property Administration of the People's Republic of China
EPO	European Patent Office
GPPH	Global Patent Prosecution Highway
IB	International Bureau of WIPO
IP	Intellectual property
IPC	International Patent Classification
IPE	International preliminary examination
IPEA	International preliminary examining authority
IPRP	International preliminary report on patentability
ISA	International searching authority
ISR	International search report
JPO	Japan Patent Office
KIPO	Korean Intellectual Property Office
LAC	Latin America and the Caribbean
NPE	National phase entry
OAPI	African Intellectual Property Organization
PCT	Patent Cooperation Treaty
PCT-PPH	Patent Cooperation Treaty-Patent Prosecution Highway
PDF	Portable document format
PRO	Public research organization
RO	Receiving office
SIS	Supplementary international search
SISA	Authority specified for supplementary search (supplementary international searching authority)
SISR	Supplementary international search report
U.K.	United Kingdom
U.S.	United States of America
USPTO	United States Patent and Trademark Office
WIPO	World Intellectual Property Organization
XML	Extensible markup language

Glossary

Applicant: An individual or legal entity that files a patent application. There may be more than one applicant in an application. For PCT statistics, the place of residence of the first named applicant is used to determine the origin of a PCT application.

Application: The procedure for requesting IP rights at a patent office which then examines the application and decides whether to grant protection. Also refers to a set of documents submitted to an office by the applicant.

Application abroad: See "Filing abroad".

Authority specified for supplementary international search (SISA): An international searching authority (ISA) that provides a supplementary international search service – also known as a supplementary international searching authority (SISA).

Chapter I of the PCT: The provisions in the PCT that regulate the filing of PCT applications, the international searches and written opinions of ISAs, and the international publication of PCT applications – and that provide for the communication of PCT applications and related documents to designated offices.

Chapter II of the PCT: The provisions in the PCT that regulate the optional international preliminary examination (IPE) procedure.

Designated office: A national or regional office of, or acting for, a state designated in a PCT application under Chapter I of the PCT.

Designated state: A Contracting State in which protection for the invention is sought, as specified in the PCT application.

Elected office: The national or regional office of, or acting for, a state elected by the applicant under Chapter II of the PCT where the applicant intends to use the results of the international preliminary examination.

Filing abroad: For statistical purposes, an application filed by a resident of a given state or jurisdiction with an IP office of another state or jurisdiction. For example, an application filed by an applicant domiciled in France with the Japan Patent Office (JPO) is considered an application abroad from the perspective of France. This differs from a "non-resident application", which describes an application filed by a resident of a foreign state or jurisdiction from the perspective of the office receiving the application; so, the example above would be a non-resident application from the JPO's point of view.

Foreign-oriented patent families: A patent family is a set of interrelated patent applications filed in one or more offices to protect the same invention. The patent applications in a family are interlinked by one or more of the following: priority claim, PCT national phase entry, continuation, continuation-in-part, internal priority, and addition or division. Foreign-oriented patent families have at least one filing in an office that is not the applicant's home office.

Global Patent Prosecution Highway (GPPH): The GPPH pilot is a single multilateral agreement between a group of offices. It allows applicants to make a request for accelerated processing at any participating office, based on work products from any of the other participating offices (including PCT reports), using a single set of qualifying requirements.

International application: See "PCT application".

International authority: A national or regional patent office or intergovernmental organization that fulfills specific tasks, as prescribed by the PCT.

International Bureau (IB) of WIPO: In the context of the PCT, the IB of WIPO acts as a receiving office for PCT applications from all Contracting States. It also handles certain processing tasks for all PCT applications filed with all receiving offices worldwide.

International filing date: The date on which the receiving office receives a PCT application, provided certain formal requirements have been met.

International Patent Classification (IPC): An internationally recognized patent classification system, the IPC has a hierarchical structure of language-independent symbols and is divided into sections, classes, subclasses, and groups. IPC symbols are assigned according to the technical features in patent applications. A patent application that relates to multiple technical features can be assigned several IPC symbols.

International phase of the PCT: The international phase consists of five main stages:

1. Filing of a PCT application by the applicant and its processing by the receiving office;
2. Establishment of an ISR and a written opinion by an ISA;
3. Publication of the PCT application and related documents, as well as their communication to designated and elected offices by the IB;
4. Optional establishment of an SISR by an SISA;
5. Optional establishment of an IPRP by an IPEA.

For further details on the international phase, see annex, A brief presentation of the Patent Cooperation Treaty.

International preliminarily examining authority (IPEA): A national or regional patent office or intergovernmental organization appointed by the PCT Assembly to carry out international preliminary examinations (IPEs). Its task is to establish the IPRP (Chapter II of the PCT).

International preliminary report on patentability (Chapter II of the PCT) (IPRP): A preliminary non-binding opinion, established by an IPEA at the request of the applicant, on whether the claimed invention appears to be novel, to involve an inventive step (i.e., is not obvious), and to be industrially applicable. Prior to January 1, 2004, this report was known as the "International Preliminary Examination Report".

International search report (ISR): A report established by an ISA containing citations of documents (prior art) considered relevant for determining, in particular, the novelty and inventive step of the invention as claimed. The ISR also includes the classification of the subject matter of the invention and an indication of the fields searched, as well as any electronic databases searched.

I**nternational searching authority (ISA):** A national patent office or intergovernmental organization appointed by the PCT Assembly to carry out international searches. ISAs establish ISRs and written opinions on PCT applications.

Invention: A new solution to a technical problem. To obtain patent rights, an invention must be novel, involve an inventive step and be industrially applicable, as judged by a person skilled in the art.

National phase entry (NPE): The national phase under the PCT follows the international phase of the PCT procedure and consists of the entry and processing of the international application in the individual countries or regions in which the applicant seeks protection for an invention. The entry must in general take place within 30 months from the priority date of the application, although longer time periods are allowed by some offices. NPE involves the payment of fees and, where necessary, the submission of a translation of the PCT application.

Non-resident application: For statistical purposes, a "non-resident" application refers to an application filed with the IP office of, or acting for, a state or jurisdiction in which the first named applicant in the application is not domiciled. For example, an application filed with the Japan Patent Office (JPO) by an applicant residing in France is considered a non-resident application from the perspective of the JPO. Non-resident applications are sometimes referred to as foreign applications.

Origin: For statistical purposes, the origin of an application means the country or territory of residence (or nationality, in the absence of a valid residence) of the first named applicant in the application.

Paris Convention: The Paris Convention for the Protection of Industrial Property is an international convention signed in Paris (France) on March 20, 1883. It is one of the first and most important intellectual property treaties. The Paris Convention establishes, among other things, the "right of priority" principle, which enables a patent applicant to claim a priority of up to 12 months when filing an application in countries other than the original country of filing.

Paris route: Applications for patent protection filed directly with the national/regional office of, or acting for, the relevant state or jurisdiction (as opposed to the "national phase under the PCT"). The Paris route is also called the "direct route" or "national route".

Patent: An exclusive right granted by law to an applicant for an invention for a limited period of time (generally 20 years from the date of filing). The patent system is designed to encourage innovation by providing innovators with time-limited exclusive legal rights, which enable them to appropriate the returns from their innovative activity. In return, the applicant is obliged to disclose the invention to the public in a manner that enables others skilled in the art to replicate it. The patent system is also designed to balance the interests of applicants (exclusive rights) with the interests of society (disclosure of the invention). Patents are granted by national or regional patent offices and are limited to the jurisdiction of the issuing authority. Patent rights can be sought by filing an application directly with the relevant national or regional office(s), or by filing a PCT application.

Patent Cooperation Treaty (PCT): An international treaty administered by WIPO, the PCT allows applicants to seek patent protection for an invention simultaneously in a large number of countries (PCT Contracting States) by filing a single PCT international application. The granting of patents, which remains under the control of national or regional patent offices, is carried out in what is called the "national phase under the PCT".

PATENTSCOPE search system: Provides access, free of charge, to all published PCT applications along with their related documents, and to the national or regional patent collections from numerous offices worldwide. Since April 2006, the PATENTSCOPE search system is the authentic publication source for PCT applications.

PCT application: A patent application filed through the WIPO-administered PCT, also known as an international application.

PCT route: The procedure outlined in the PCT, as opposed to the Paris route.

PCT-Patent Prosecution Highway pilots (PCT-PPH): A number of bilateral agreements signed between patent offices that enable applicants to request an accelerated examination procedure because of positive patentability findings made by the international searching and/or international preliminary examining authority, in the written opinion by an international searching authority, the written opinion of an international preliminary examining authority or the international preliminary report on patentability.

Prior art: All information disclosed to the public about an invention, in any form, before a given date. Information on the prior art can assist in determining whether the claimed invention is new and involves an inventive step (i.e., is not obvious) for the purposes of international searches and international preliminary examination (IPE).

Priority date: The filing date of the application on the basis of which priority is claimed.

Publication of PCT application: The IB publishes the PCT application and related documents promptly after the expiration of 18 months from the priority date. If the PCT application is withdrawn or considered withdrawn before the technical preparations for publication are completed, the application is not published. An applicant can request early publication of a PCT application.

Receiving office (RO): A patent office – or the IB – with which the PCT application is filed. The role of the RO is to check and process the application in accordance with the PCT and its regulations.

Resident application: For statistical purposes, a resident application refers to an application filed with the IP office of, or acting for, the state or jurisdiction in which the first named applicant in the application has residence. For example, an application filed with the Japan Patent Office (JPO) by a resident of Japan is considered a resident application for the JPO. Resident applications are sometimes referred to as "domestic applications".

Supplementary international search report (SISR): A report, similar to the ISR, established during the supplementary international search, that allows the applicant to request, in addition to the main international search, one or more supplementary international searches, each to be carried out by an international authority other than the ISA undertaking the main international search. The SISR primarily focuses on the patent documentation in the language in which the SISA specializes.

Supplementary international searching authority (SISA): See "Authority specified for supplementary international search".

World Intellectual Property Organization (WIPO): A United Nations specialized agency dedicated to the promotion of innovation and creativity for the economic, social and cultural development of all countries through a balanced and effective international intellectual property (IP) system. Established in 1967, WIPO's mandate is to promote the protection of IP globally through cooperation among states and in collaboration with other international organizations.

Written opinion of the ISA (WOSA): For every PCT application filed on or after January 1, 2004, an ISA establishes, at the same time that it establishes the ISR, a preliminary and non-binding written opinion on whether the claimed invention appears to be novel, to involve an inventive step and to be industrially applicable.

PCT Contracting States

In 2018, the number of Contracting States was of 152.

Albania	Djibouti	Lesotho	Rwanda
Algeria	Dominica	Liberia	Saint Kitts and Nevis
Angola	Dominican Republic	Libya	Saint Lucia
Antigua and Barbuda	Ecuador	Liechtenstein	Saint Vincent and the Grenadines
Armenia	Egypt	Lithuania	San Marino
Australia	El Salvador	Luxembourg	Sao Tome and Principe
Austria	Equatorial Guinea	Madagascar	Saudi Arabia
Azerbaijan	Estonia	Malawi	Senegal
Bahrain	Eswatini	Malaysia	Serbia
Barbados	Finland	Mali	Seychelles
Belarus	France	Malta	Sierra Leone
Belgium	Gabon	Mauritania	Singapore
Belize	Gambia	Mexico	Slovakia
Benin	Georgia	Monaco	Slovenia
Bosnia and Herzegovina	Germany	Mongolia	South Africa
Botswana	Ghana	Montenegro	Spain
Brazil	Greece	Morocco	Sri Lanka
Brunei Darussalam	Grenada	Mozambique	Sudan
Bulgaria	Guatemala	Namibia	Sweden
Burkina Faso	Guinea	Netherlands	Switzerland
Cambodia	Guinea-Bissau	New Zealand	Syrian Arab Republic
Cameroon	Honduras	Nicaragua	Tajikistan
Canada	Hungary	Niger	Thailand
Central African Republic	Iceland	Nigeria	Togo
Chad	India	North Macedonia	Trinidad and Tobago
Chile	Indonesia	Norway	Tunisia
China	Iran (Islamic Republic of)	Oman	Turkey
Colombia	Ireland	Panama	Turkmenistan
Comoros	Israel	Papua New Guinea	Uganda
Congo	Italy	Peru	Ukraine
Costa Rica	Japan	Philippines	United Arab Emirates
Côte d'Ivoire	Jordan	Poland	United Kingdom
Croatia	Kazakhstan	Portugal	United Republic of Tanzania
Cuba	Kenya	Qatar	United States of America
Cyprus	Kuwait	Republic of Korea	Uzbekistan
Czech Republic	Kyrgyzstan	Republic of Moldova	Viet Nam
Democratic People's Republic of Korea	Lao People's Democratic Republic	Romania	Zambia
Denmark	Latvia	Russian Federation	Zimbabwe

Source: WIPO, March 2019.

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WIPO Publication No. 901E/18
ISBN 978-92-805-3031-5