Patent Cooperation Treaty Yearly Review 2018

The International Patent System

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Table of contents

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Further information

Online resources

The electronic version of the *Review*, as well as the images and 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

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Key numbers for 2017

615,400 (–1.4%)
PCT national phase entries

243,500 (+4.5%)
PCT applications filed

52,355 (+3%)
Applicants

126 (+1)
Countries in which PCT applications were filed

56.2% (–1.4 percentage points)
Share of PCT national phase entries in worldwide non-resident filings

31.2% (+0.7 percentage points)
Share of PCT applications with women inventors

Note: The latest available year for PCT national phase entry data is 2016. “Applicants” refers to first named applicants in published PCT applications.

Special theme: Applicant representatives named in PCT applications

Introduction

Managing a patent application – from its preparation to the patent office's final decision – requires a solid knowledge of patent law and patent office practices and procedures. This work is usually carried out under the responsibility of a patent agent or a patent attorney who prepares the application and acts for the applicant in the filing and prosecuting of the application before the patent office. In order to have the right to file a patent application before a particular patent office, an individual is generally required to have a relevant professional qualification and be on a register of representatives entitled to practice before that office. A patent office may also require an individual to meet a nationality or residency requirement in order to appear in its register.

More specifically, the Patent Cooperation Treaty (PCT) allows applicants to choose between appointing an agent, appointing a common representative when several applicants are listed on the PCT application form, or providing an address for correspondence (see box 1). We refer to these three categories as "applicant representatives". The aim of this section is to present data on all applicant representatives combined. While no distinction is made here between the three applicant representative categories, a distinction is made between *external* applicant representatives and *in-house* applicant representatives. The former are typically specialized intellectual property (IP) law firms appointed as agents, whereas the latter are applicants' internal IP departments and are listed as agents, common representatives, or addresses for correspondence on the application form. Most of the analysis focuses on external applicant representatives, since they account for the bulk of applicant representatives listed in PCT applications.

In order to generate data on applicant representatives, we harmonized for the first time the names of companies appointed as agents on PCT application forms to derive a list of top applicant representatives (see box 2 for details).

Box 1.
Who can represent the applicant in PCT applications?

Any person who can act as an agent before a receiving office may be appointed by an applicant for any PCT application filed with that receiving office. Where the PCT application is filed with the International Bureau (IB) of the World Intellectual Property Organization (WIPO) as the receiving office, any person who has the right to practice before the national or regional office of a country of which the applicant is a resident or national may be appointed as an agent. An appointed agent who has the right to represent the applicant before the receiving office is also automatically entitled to act before the IB, the international searching authority and the international preliminary examining authority.

An agent may be appointed by designation in a PCT application or by a self-standing power of attorney. In both cases, the applicant's signature is required. Where there are several applicants, an agent to represent them all may similarly be appointed by designation, by a separate power of attorney, or by a combination of both methods – provided that all the applicants have signed either the PCT application or a separate power of attorney.

A person who signs a PCT application for a corporate applicant can also be considered as an agent, but only if the applicant explicitly indicates this is the case by checking the relevant box on the PCT application form. When a PCT application includes several applicants

and a common agent is not appointed by all of the applicants, one of the applicants may be appointed by the other applicants as the common representative for all of the applicants. If neither a common agent nor a common representative is appointed, the first named applicant who has the right to file a PCT application with the receiving office concerned is automatically deemed to be the common representative for all of the applicants. An applicant can check the box "Address for Correspondence" on the application form if neither an agent nor a common representative has been appointed.

Box 2.
Extracting and cleaning agent names

Since WIPO has already cleaned applicant names (used here to identify common representatives and addresses for correspondence), analyzing applicant representatives requires identifying either companies appointed as agents or the employers of the individuals appointed as agents on PCT application forms.

Applicant representatives can be external companies (such as a specialized IP law firm appointed by the applicant) or the applicant's in-house IP department (listed as agent, common representative, or address for correspondence on the PCT application form). Some countries allow applicants to appoint a law firm as agent, but other countries require applicants to appoint an individual as their agent. We have identified companies appointed by applicants and companies employing individuals appointed as agents. To identify agent company names, we carried out a name-cleaning process based on a keyword search and manual verification.

The following three steps were applied to the data provided in the "Agent" field of PCT applications published in 2017 to clean and harmonize the data and establish an algorithm. This algorithm was then used to clean data for 2016. The first step in analyzing the agent data consisted of disaggregating agents' firm names from other information, such as the addresses (parsing the text reported in the "Agent" field of the PCT application form). The second step consisted of harmonizing agent names by grouping all variants of the same name recorded in the database. The third step consisted of identifying missing firm names using the addresses and names of individuals listed. This allowed the establishment of a dictionary of PCT agent names.

Usually one applicant representative is named in a PCT application. A PCT application may, however, list more than one representative in some situations. For example, when an international preliminary examination is requested, the applicant may choose a different representative for processing its application with the receiving office from the one processing its application with the international preliminary examining authority. PCT applications for which multiple representatives were named are counted multiple times in determining the number of representatives. Applicants can modify their representative(s) at any time during the international phase of the PCT. The data include all applicant representatives listed in PCT applications published in 2016 and 2017 at the time of data extraction (March 2018).

Who are the top external representatives for PCT applicants?

AFD China Intellectual Property Law Office was the external representative appointed in the largest number of PCT applications (top external PCT applicant representative) from 2016 to 2017, with 3,256 PCT applications published (see table 1). It was followed by Shiga International Patent Office of Japan (3,156) and Kangxin Partners of China (2,714). Sakai International Patent Office of Japan and China PAT Intellectual Property Office of China were also each appointed in over 2,000 PCT applications from 2016 to 2017.

The list of the top 50 representatives comprises external representatives originating from only five countries. With 18, China had the highest number of external representatives on this list, followed by 14 from Japan, 13 from the United States of America (U.S.), 3 from the Republic of Korea and 2 from Germany. Of the top 50 external representatives, 70% were located in Asia, 26% in the U.S. and only 4% in Europe.

Which PCT applicants are managing the most PCT applications in-house?

In-house PCT applicant representatives are the IP departments of applicants that are listed as agents, common representatives, or addresses for correspondence on the PCT application form.

China-based telecommunications company Huawei Technologies was the PCT applicant that used its IP department as its representative the most cases, doing so in 3,201 PCT applications from 2016 to 2017 (see table 2). It was followed by two U.S.-based companies which likewise used their IP departments as their representative, namely Hewlett-Packard (2,895) and Microsoft (2,870).

1. Top 50 external PCT applicant representatives, 2016–2017

Rank	Name	Origin	PCT applications
1	AFD CHINA INTELLECTUAL PROPERTY LAW OFFICE	China	3,256
2	SHIGA INTERNATIONAL PATENT OFFICE	Japan	3,156
3	KANGXIN PARTNERS P.C.	China	2,714
4	SAKAI INTERNATIONAL PATENT OFFICE	Japan	2,698
5	CHINA PAT INTELLECTUAL PROPERTY OFFICE	China	2,075
6	KBK & ASSOCIATES	Republic of Korea	1,696
7	FISH & RICHARDSON P.C.	United States of America	1,627
8	SCHWEGMAN LUNDBERG & WOESSNER	United States of America	1,537
9	TSINGYIHUA INTELLECTUAL PROPERTY LLC	China	1,531
10	Y.P. LEE, MOCK & PARTNERS	Republic of Korea	1,516
11	KILPATRICK TOWNSEND & STOCKTON LLP	United States of America	1,504
12	GUANGZHOU SCIHEAD PATENT AGENT CO., LTD.	China	1,425
13	CHINA PATENT AGENT (H.K.) LTD.	China	1,383
14	BEIJING SANYOU INTELLECTUAL PROPERTY AGENCY LTD.	China	1,281
15	LIU, SHEN & ASSOCIATES	China	1,270
16	UNITALEN ATTORNEYS AT LAW	China	1,259
17	SOEI PATENT AND LAW FIRM	Japan	1,236
18	TDIP & PARTNERS	China	1,225
19	IPICS CORPORATION	Japan	1,212
20	KNOBBE, MARTENS, OLSON & BEAR, LLP	United States of America	1,191
21	HAZUKI INTERNATIONAL YOTSUYA	Japan	1,144
22	FOLEY & LARDNER LLP	United States of America	1,122
23	FUKAMI PATENT OFFICE, P.C.	Japan	1,101
24	AOYAMA & PARTNERS	Japan	1,029
25	ADVANCE CHINA IP LAW OFFICE	China	1,020
26	BEYOND ATTORNEYS AT LAW	China	1,016
27	CHINA WISPRO INTELLECTUAL PROPERTY LLP	China	1,009
28	HARAKENZO WORLD PATENT & TRADEMARK	Japan	1,006
29	LEADER PATENT & TRADEMARK FIRM	China	953
30	WOLF, GREENFIELD & SACKS, P.C.	United States of America	950
31	EIKOH PATENT FIRM, P.C.	Japan	941
32	SUGIMURA & PARTNERS	Japan	918
33	CHINA SCIENCE PATENT & TRADEMARK AGENT LTD.	China	901
34	CANTOR COLBURN LLP	United States of America	888
35	SHENPAT INTELLECTUAL PROPERTY AGENCY	China	858
36	BOEHMERT & BOEHMERT ANWALTSPARTNERSCHAFT MBB	Germany	857
37	TAIYO, NAKAJIMA & KATO	Japan	849
38	KISA PATENT & TRADEMARK FIRM	Japan	848
39	NISHIKAWA & ASSOCIATES	Japan	846
40	TEE & HOWE INTELLECTUAL PROPERTY ATTORNEYS	United States of America	838
41	CO-HORIZON INTELLECTUAL PROPERTY INC.	China	833
42	ITOH INTERNATIONAL PATENT OFFICE	Japan	832
43	HAYNES AND BOONE, LLP	United States of America	828
44	COOLEY LLP	United States of America	795
45	WILSON SONSINI GOODRICH & ROSATI	United States of America	793
46	PATTERSON & SHERIDAN, LLP	United States of America	789
47	GRÜNECKER [PATENT- UND RECHTSANWÄLTE]	Germany	779
48	YOU ME PATENT & LAW FIRM	Republic of Korea	756
49	PERKINS COIE LLP	United States of America	720
50	DRAGON INTELLECTUAL PROPERTY LAW FIRM	China	710

Note: A PCT application can contain more than one applicant representative (see box 2). In this case, the PCT application is counted multiple times.

Source: WIPO Statistics Database, March 2018.

2. Top 10 in-house PCT applicant representatives, 2016–2017

Rank	Applicant	Origin	PCT applications with in-house representative	Share of total PCT applications (%)
1	HUAWEI TECHNOLOGIES CO., LTD.	China	3,201	41
2	HEWLETT-PACKARD DEVELOPMENT COMPANY, L.P.	United States of America	2,895	89
3	MICROSOFT TECHNOLOGY LICENSING, LLC	United States of America	2,870	94
4	ROBERT BOSCH CORPORATION	Germany	2,390	91
5	TELEFONAKTIEBOLAGET LM ERICSSON (PUBL)	Sweden	2,297	72
6	KONINKLIJKE PHILIPS ELECTRONICS N.V.	Netherlands	2,148	97
7	SIEMENS AKTIENGESELLSCHAFT	Germany	2,123	96
8	PANASONIC INTELLECTUAL PROPERTY MANAGEMENT CO., LTD.	Japan	2,090	85
9	3M INNOVATIVE PROPERTIES COMPANY	United States of America	1,280	96
10	PROCTER & GAMBLE COMPANY	United States of America	1,065	89

Source: WIPO Statistics Database, March 2018.

3. Top five external PCT applicant representatives acting before the top five receiving offices, 2016–2017

Receiving office	Applicant representative name	PCT applications	Share of total (%)
China		**67,607**	**100.0**
	AFD CHINA INTELLECTUAL PROPERTY LAW OFFICE	3,255	4.8
	KANGXIN PARTNERS P.C.	2,713	4.0
	CHINA PAT INTELLECTUAL PROPERTY OFFICE	2,072	3.1
	TSINGYIHUA INTELLECTUAL PROPERTY LLC	1,531	2.3
	GUANGZHOU SCIHEAD PATENT AGENT CO., LTD.	1,425	2.1
European Patent Office		**68,687**	**100.0**
	EPPING HERMANN FISCHER PATENTANWALTSGESELLSCHAFT MBH	619	0.9
	LAVOIX CABINET	466	0.7
	REGIMBEAU	441	0.6
	MEISSNER BOLTE PATENTANWALTE RECHTSANWALTE PARTNERSCHAFT MBB	415	0.6
	CABINET NONY	383	0.6
Japan		**87,097**	**100.0**
	SHIGA INTERNATIONAL PATENT OFFICE	3,155	3.6
	SAKAI INTERNATIONAL PATENT OFFICE	2,697	3.1
	SOEI PATENT AND LAW FIRM	1,236	1.4
	IPICS CORPORATION	1,212	1.4
	HAZUKI INTERNATIONAL YOTSUYA	1,114	1.3
Republic of Korea		**28,541**	**100.0**
	KBK & ASSOCIATES	1,696	5.9
	Y.P. LEE, MOCK & PARTNERS	1,513	5.3
	YOU ME PATENT & LAW FIRM	755	2.6
	K.J. LEE INTERNATIONAL PATENT & TRADEMARK OFFICE	662	2.3
	YOON & LEE INTERNATIONAL PATENT & LAW FIRM	621	2.2
United States of America		**112,025**	**100.0**
	FISH & RICHARDSON P.C.	1,561	1.4
	SCHWEGMAN LUNDBERG & WOESSNER	1,528	1.4
	KILPATRICK TOWNSEND & STOCKTON LLP	1,501	1.3
	KNOBBE, MARTENS, OLSON & BEAR, LLP	1,189	1.1
	FOLEY & LARDNER LLP	1,110	1.0

Note: Data include only external representatives appointed to manage PCT applications before receiving offices.

Source: WIPO Statistics Database, March 2018.

Of the 10 PCT applicants which used their in-house IP departments as representative in the most number of cases, four were from the U.S., two were from Germany and one each was from China, Japan, the Netherlands and Sweden.

Of the top 10 PCT applicants shown in table 2, nine used their internal IP departments as its representative in more than 70% of their total PCT applications published from 2016 to 2017. The only exception was Huawei Technologies, which instead appointed external representatives for the majority (59%) of its PCT applications published over this period.

Who are the main external PCT applicant representatives acting before the top five receiving offices?

Table 3 shows the top five external PCT applicant representatives acting before the top five receiving offices, based on PCT applications published from 2016 to 2017. Each of the top five external PCT applicant representatives acting before the State Intellectual Property Office of the People's Republic of China (SIPO) in its role as receiving office managed between 1,400 and 3,300 PCT applications. AFD China Intellectual Property Law Office accounted for 4.8% of all PCT applications filed with SIPO. It was followed by Kangxin Partners (4%) and China PAT Intellectual Property Office (3.1%). Combined, the top five external representatives represented 16.3% of the total PCT applications filed with SIPO. This represents the second highest concentration of applications among the top five receiving offices.

The external representative mentioned the most in PCT applications filed at the receiving office of the European Patent Office (EPO) was the Germany-based company Epping Hermann Fischer, with 619 PCT applications. It accounted for 0.9% of all PCT applications filed with the EPO, followed by two France-based firms, Lavoix Cabinet (0.7%) and Regimbeau (0.6%). When combined, the top five external representatives acting before the EPO accounted for the lowest proportion of total applications (3.4%) among the top five receiving offices.

Shiga International Patent Office was the main external representative in PCT applications filed at the Japan Patent Office (JPO), with 3,155 PCT applications or 3.6% of all applications filed with the JPO. Sakai International Patent Office ranked second and Soei Patent and Law Firm ranked third, accounting for 3.1% and 1.4% of the total, respectively. Together with IPICS Corporation (1.4%) and Hazuki International Yotsuya (1.3%), the top five external representatives accounted for 10.8% of all PCT applications filed at the JPO.

KBK & Associates and Y.P. Lee, Mock & Partners were each external representatives for between 1,500 and 1,700 PCT applications filed with the Korean Intellectual Property Office (KIPO), representing 5.9% and 5.3% of total PCT applications, respectively. Each of the next three external representatives accounted for 2.2% to 2.6% of the total. The top five firms combined represented 18.4% of all PCT applications filed with KIPO. This represents the highest concentration of applications among the top five receiving offices.

Among the external representatives managing the most PCT applications filed with the United States Patent and Trademark Office (USPTO) as receiving office, Fish & Richardson, Schwegman Lundberg & Woessner, and Kilpatrick Townsend & Stockton were named in a similar number of PCT applications (i.e., between 1,500 and 1,600) and each accounted for about 1.4% of all applications filed. The top five external representatives combined accounted for 6.2% of the total PCT applications filed at the USPTO.

Who are the main representatives of the top 20 PCT applicants?

PCT applicants can use in-house or external representation to manage their PCT applications before the offices in the international phase of the PCT System. Applicants can also appoint both, as the PCT allows applicants to have several representatives; however, in practice, most applicants appoint only one representative.

Huawei Technologies – which was the top PCT applicant from 2016 to 2017 – used its in-house IP department for 3,201 PCT applications (see table 4). Huawei Technologies' next four representatives each managed between 600 and 730 PCT applications over the same period. In contrast, ZTE Corporation – which during 2016 and 2017 occupied the number two spot – relied exclusively on external representation, with its top three representatives each managing over 1,000 PCT applications.

For five of the top 20 PCT applicants, the in-house IP department was the only representative managing over 100 PCT applications from 2016 to 2017. These five applicants are Hewlett-Packard, Ericsson, Robert Bosch, Philips Electronics and Siemens.

Microsoft used its in-house IP department for 94% of its total published PCT applications during 2016 and 2017 (see table 2). It also appointed a second representative in 54% of its PCT applications. This explains the relatively high volume of PCT applications managed on behalf of Microsoft by two Germany-based external

4. Top five PCT applicant representatives for the top 20 PCT applicants, 2016–2017

PCT applicants	Applicant's representative	PCT applications
HUAWEI TECHNOLOGIES CO., LTD.		
	HUAWEI TECHNOLOGIES CO., LTD.	3,201
	TDIP & PARTNERS	721
	LEADER PATENT & TRADEMARK FIRM	684
	LONGSUN LEAD IP LTD	677
	BEIJING ZBSD PATENT & TRADEMARK AGENT LTD	617
ZTE CORPORATION		
	AFD CHINA INTELLECTUAL PROPERTY LAW OFFICE	3,037
	KANGXIN PARTNERS, P.C.	2,329
	CHINA PAT INTELLECTUAL PROPERTY OFFICE	1,149
	BEYOND ATTORNEYS AT LAW	318
	LUNG TIN INTELLECTUAL PROPERTY AGENT LTD	235
QUALCOMM INCORPORATED		
	HOLLAND & HART LLP	551
	ARENT FOX LLP	518
	LOZA & LOZA LLP	382
	MUNCY, GEISSLER, OLDS & LOWE, P.C.	326
	KNOBBE, MARTENS, OLSON & BEAR, LLP	285
MITSUBISHI ELECTRIC CORPORATION		
	KISA PATENT & TRADEMARK FIRM	840
	SAKAI INTERNATIONAL PATENT OFFICE	824
	S. SOGA & CO.	561
	MITSUBISHI ELECTRIC CORPORATION	489
	SANNO PATENT OFFICE	395
INTEL CORPORATION		
	SCHWABE, WILLIAMSON & WYATT, P.C.	557
	SCHWEGMAN LUNDBERG & WOESSNER	488
	GREEN, HOWARD, & MUGHAL, LLP	259
	BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP	231
	PATENT CAPITAL GROUP	219
LG ELECTRONICS INC.		
	KBK & ASSOCIATES	1,685
	ROYAL PATENT & LAW OFFICE	544
	ENVISION PATENT & LAW FIRM	494
	PARK, KIM & PARTNER	362
	HANMIR PATENT & LAW FIRM	282
BOE TECHNOLOGY GROUP CO., LTD.		
	LIU, SHEN & ASSOCIATES	1,048
	TEE & HOWE INTELLECTUAL PROPERTY ATTORNEYS	733
	CHINA PATENT AGENT (H.K.) LTD.	581
	DRAGON INTELLECTUAL PROPERTY LAW FIRM	460
	CHINA SCIENCE PATENT & TRADEMARK AGENT LTD.	442
SAMSUNG ELECTRONICS CO., LTD.		
	Y.P. LEE, MOCK & PARTNERS	1,023
	K.J. LEE INTERNATIONAL PATENT & TRADEMARK OFFICE	626
	YOON & LEE INTERNATIONAL PATENT & LAW FIRM	577
	LEE & KWON INTELLECTUAL LAW GROUP	370
	SELIM INTELLECTUAL PROPERTY LAW FIRM	344
SONY CORPORATION		
	HAZUKI INTERNATIONAL YOTSUYA	975
	NISHIKAWA & ASSOCIATES	757
	HAZUKI INTERNATIONAL	416
	TSUBASA PATENT PROFESSIONAL CORPORATION	290
	DAIDO PATENT ATTORNEYS PARTNERSHIP CORPORATION	257
HEWLETT-PACKARD DEVELOPMENT COMPANY, L.P.		
	HEWLETT-PACKARD DEVELOPMENT COMPANY, L.P.	2,895
TELEFONAKTIEBOLAGET LM ERICSSON (PUBL)		
	TELEFONAKTIEBOLAGET LM ERICSSON (PUBL)	2,297

(Continued)

(4 continued)

PCT applicants	Applicant's representative	PCT applications
MICROSOFT TECHNOLOGY LICENSING, LLC		
	MICROSOFT TECHNOLOGY LICENSING, LLC	2,870
	GRÜNECKER [PATENT- UND RECHTSANWÄLTE]	466
	BOEHMERT & BOEHMERT ANWALTSPARTNERSCHAFT MBB	440
	OLSWANG LLP	386
	OLSWANG GERMANY LLP	155
ROBERT BOSCH CORPORATION		
	ROBERT BOSCH CORPORATION	2,390
PANASONIC INTELLECTUAL PROPERTY MANAGEMENT CO., LTD.		
	PANASONIC INTELLECTUAL PROPERTY MANAGEMENT CO., LTD.	2,090
	HOKUTO PATENT ATTORNEYS OFFICE	116
KONINKLIJKE PHILIPS ELECTRONICS N.V.		
	KONINKLIJKE PHILIPS ELECTRONICS N.V.	2,148
SIEMENS AKTIENGESELLSCHAFT		
	SIEMENS AKTIENGESELLSCHAFT	2,123
SHARP KABUSHIKI KAISHA		
	HARAKENZO WORLD PATENT & TRADEMARK	762
	SHIGA INTERNATIONAL PATENT OFFICE	223
	AKATSUKI UNION PATENT FIRM	134
	FUKAMI PATENT OFFICE, P.C.	131
	OKUDA & ASSOCIATES	115
SHENZHEN CHINA STAR OPTOELECTRONICS TECHNOLOGY CO., LTD.		
	COMIPS INTELLECTUAL PROPERTY OFFICE	482
	CHINA WISPRO INTELLECTUAL PROPERTY LLP	424
	ESSEN PATENT & TRADEMARK AGENCY	384
	MING & YUE INTELLECTUAL PROPERTY LAW FIRM	317
	YUHONG INTELLECTUAL PROPERTY LAW FIRM	257
OLYMPUS CORPORATION		
	ITOH-SHIN PATENT OFFICE	485
	SUZUYE & SUZUYE	393
	SAKAI INTERNATIONAL PATENT OFFICE	342
	OLIVE INTERNATIONAL PATENT OFFICE	287
	SHIGA INTERNATIONAL PATENT OFFICE	276
HITACHI, LTD.		
	HITACHI, LTD.	496
	WILLFORT INTERNATIONAL PATENT FIRM	250
	SEIRYO I.P.C.	197
	POLAIRE I.P.C.	183
	TOU-OU PATENT FIRM	173

Note: A PCT application can contain more than one applicant representative (see box 2). In this case, the PCT application is counted multiple times. This table shows the top applicant representatives for each of the top 20 PCT applicants (with a maximum of five representatives per applicant) whose representatives were appointed in more than 100 PCT applications published in 2016 and 2017.

Source: WIPO Statistics Database, March 2018.

5. The main PCT applicants of the top 10 external PCT applicant representatives, 2016–2017

External applicant representative	PCT applicant	PCT applications	Share of total (%)
AFD CHINA INTELLECTUAL PROPERTY LAW OFFICE		**3,256**	**100**
	ZTE CORPORATION	3,037	93
	NUBIA TECHNOLOGY CO., LTD.	122	4
	Others (52 applicants)	97	3
SHIGA INTERNATIONAL PATENT OFFICE		**3,156**	**100**
	OLYMPUS CORPORATION	276	9
	SHARP KABUSHIKI KAISHA	223	7
	MITSUBISHI HEAVY INDUSTRIES, LTD.	206	7
	MITSUBISHI MATERIALS CORPORATION	173	5
	NIPPON STEEL & SUMITOMO METAL CORPORATION	152	5
	Others (208 applicants)	2,126	67
KANGXIN PARTNERS P.C.		**2,714**	**100**
	ZTE CORPORATION	2,329	86
	Others (73 applicants)	385	14
SAKAI INTERNATIONAL PATENT OFFICE		**2,698**	**100**
	MITSUBISHI ELECTRIC CORPORATION	824	31
	OLYMPUS CORPORATION	342	13
	FUJITSU LIMITED	166	6
	KABUSHIKI KAISHA TOSHIBA	143	5
	MITSUBISHI HEAVY INDUSTRIES, LTD.	139	5
	KOMATSU LTD.	131	5
	RICOH COMPANY, LTD.	102	4
	Others (79 applicants)	851	32
CHINA PAT INTELLECTUAL PROPERTY OFFICE		**2,075**	**100**
	ZTE CORPORATION	1,149	55
	SANECHIPS TECHNOLOGY CO., LTD.	206	10
	NUBIA TECHNOLOGY CO., LTD.	175	8
	TENCENT TECHNOLOGY (SHENZHEN) CO. LTD.	139	7
	ZHONGXING MICROELECTRONICS TECHNOLOGY CO. LTD.	129	6
	Others (49 applicants)	277	13
KBK & ASSOCIATES		**1,696**	**100**
	LG ELECTRONICS INC.	1,685	99
	Others (7 applicants)	11	1
FISH & RICHARDSON P.C.		**1,627**	**100**
	GOOGLE INC.	281	17
	SAUDI ARABIAN OIL CO.	120	7
	Others (424 applicants)	1,226	75
SCHWEGMAN LUNDBERG & WOESSNER		**1,537**	**100**
	INTEL CORPORATION	488	32
	Others (305 applicants)	1,049	68
TSINGYIHUA INTELLECTUAL PROPERTY LLC		**1,531**	**100**
	BYD COMPANY LIMITED	288	19
	GUANG DONG OPPO MOBILE TELECOMMUNICATIONS CORP., LTD.	127	8
	XIAOMI INC.	122	8
	Others (110 applicants)	994	65
Y.P. LEE, MOCK & PARTNERS		**1,516**	**100**
	SAMSUNG ELECTRONICS CO., LTD.	1,023	67
	Others (144 applicants)	493	33

Note: A PCT application can contain more than one applicant representative (see box 2). In this case, the PCT application is counted multiple times. This table shows the main PCT applicants for each of the top 10 external PCT applicant representatives for applicants having appointed the external representative in more than 100 PCT applications published in 2016 and 2017.

Source: WIPO Statistics Database, March 2018.

representatives, Grünecker Patent- und Rechtsanwälte and Boehmert & Boehmert. Microsoft filed most of its PCT applications at the receiving office of the USPTO and selected the EPO as the international searching authority and, in a number of cases, as the international preliminary examining authority.

Which PCT applicants are mainly appointing the top 10 external representatives?

Among the top 10 external PCT applicant representatives shown in table 5 opposite, KBK & Associates and AFD China Intellectual Property Law Office managed more than 90% of their total PCT applications on behalf of only one applicant. In contrast, seven PCT applicants each appointed Sakai International Patent Office in more than 100 PCT applications.

AFD China Intellectual Property Law Office and China PAT Intellectual Property Office had both ZTE Corporation and Nubia Technology among their main PCT applicants. Similarly, Sakai International Patent Office and Shiga International Patent Office were both frequently appointed by Mitsubishi Heavy Industries and Olympus Corporation.

Whereas KBK & Associates managed PCT applications for fewer than 10 PCT applicants in total, the other nine representatives each managed PCT applications for between 50 and 430 PCT applicants. With 426 PCT applicants, Fish & Richardson was the external representative appointed by the largest number of PCT applicants; however, of these applicants, only Google and Saudi Arabian Oil appointed Fish & Richardson for more than 100 PCT applications.

Conclusion

This is the first time that WIPO has produced statistics on PCT applicant representatives. The data show some new and interesting facts about the use of in-house and external applicant representatives in PCT applications.

Two external PCT applicant representatives were appointed for more than 3,000 PCT applications published during 2016 and 2017, namely China-based AFD China Intellectual Property Law Office and Japan-based Shiga International Patent Office. Five of the top 50 external representatives managed more than 2,000 PCT applications each. By origin, China had the most firms in the top 50 list (18), followed by Japan (14) and the U.S. (13).

Huawei Technologies ranked first in the top 10 in-house PCT applicant representatives even though it appointed external representatives for the bulk of its PCT applications. The nine other PCT applicants in the top 10 used their IP departments for between 72% and 97% of their applications. Of the top 10 in-house representatives, eight managed more than 2,000 PCT applications in-house in 2016 and 2017.

The combined total PCT applications managed by the top five external representatives acting before the receiving offices of KIPO and SIPO accounted for a large proportion of the total PCT applications filed at these offices, with 18.4% and 16.3% of the total, respectively. In contrast, the combined total PCT applications managed by the top five external representatives acting before the EPO and the USPTO accounted for 3.4% and 6.2% of the total, respectively.

Of the top 20 PCT applicants, five relied almost exclusively on their in-house IP departments to manage their PCT applications; most of the other applicants relied mainly on external representatives to manage their applications. Unlike the other top 20 PCT applicants, Microsoft appointed two representatives in most of its PCT applications.

The vast majority of PCT applications (93%) managed by AFD China Intellectual Property Law Office – the top applicant representative – were filed by ZTE. Similarly, KBK & Associates almost exclusively represented LG Electronics (99%). Among the top 10 external representatives, only a few shared the same main PCT applicants. For example, this was the case for Japan-based Sakai International Patent Office and Shiga International Patent Office. U.S.-based Fish & Richardson was appointed by a total of more than 400 different PCT applicants for PCT applications published in 2016 and 2017.

Cleaning and harmonizing applicant representative information is a time-consuming exercise; however, it provides valuable information on different aspects of the international phase of the PCT System, such as the external PCT applicant representative markets or applicants' use of in-house as opposed to external representatives. The PCT database only includes data relating to the international phase of the PCT System; however, analyzing the applicant representative data of national and regional offices could provide further relevant information on the applicant representatives appointed for the national phase of the PCT System.

Section A
Statistics on the international phase: PCT applications

Highlights

A record year for PCT application filings in 2017

An estimated 243,500 international patent applications were filed under WIPO's Patent Cooperation Treaty (PCT) in 2017 (see figure A1). This represents an annual increase of 4.5% and the eighth consecutive year of growth. Altogether, almost 3.5 million PCT applications have been filed since the PCT System became operational in 1978. Filings have grown each year except for 2009, when the global financial crisis led to a downturn.

The PCT System spans the globe

Jordan joined the PCT System in 2017, bringing the total number of member states to 152. During 2017, applicants based in 126 countries filed PCT applications, while 85 receiving offices (ROs) each received at least one PCT application, reflecting the wide geographical coverage of the System. Combined, the top six ROs – each of which received more than 10,000 PCT applications – accounted for almost 90% of all applications filed in 2017. With 56,158 filings, the United States Patent and Trademark Office (USPTO) received the highest number of PCT applications; it was followed by the State Intellectual Property Office of the People's Republic of China (SIPO; 50,674), the Japan Patent Office (JPO; 47,425), the European Patent Office (EPO; 36,714), the Korean Intellectual Property Office (KIPO; 15,830) and the International Bureau (IB) of WIPO (10,212).

China becomes the second largest user of the PCT System

Applicants residing in the United States of America (U.S.) filed the largest number of PCT applications in 2017 with 56,624, followed by applicants from China (48,882), Japan (48,208), Germany (18,982) and the Republic of Korea (15,763) (see figure A8). China has posted double-digit annual growth rates in PCT applications since 2003. In 2017, this continued rapid growth culminated in China becoming the second largest origin of PCT filings, pulling ahead of Japan, which had held the number two spot since 2003.

Combined, applicants from China, Japan and the U.S. filed nearly two-thirds of all PCT applications in 2017 (63.1%). When filings from Germany and the Republic of Korea are added to the total, these top five countries accounted for 77.4% of all PCT applications filed. The combined share of the top five origins has increased each year since 2009, from 69.2% in 2009 to 77.4% in 2017. This growth has been driven mainly by a rapid increase in filings by applicants from both China and Japan.

The top 20 origins includes 18 high-income countries – the majority European – and two middle-income countries, namely China and India (the latter with 1,603 applications). Outside the top 20 origins, other large middle-income countries with notable numbers of PCT applications were Turkey (1,235), the Russian Federation (1,097), Brazil (593), South Africa (301) and Mexico (269) (see table A27). Applicants from low-income countries filed a total of 29 PCT applications in 2017; within this category, applicants from Zimbabwe (21) and Senegal (4) accounted for the highest numbers of applications.

Compared with 2016, 14 of the top 20 origins filed more PCT applications in 2017. Two countries recorded double-digit increases, namely China (+13.4%) and Belgium (+10.7%). Sweden (+7%), Japan (+6.6%) and Denmark (+5.5%) also saw strong increases (see figure A8). In contrast, Spain (–7.2%), the Netherlands (–5.2%) and Italy (–4.5%) saw the sharpest decreases.

Among large middle-income origins, Colombia (+42%), the Islamic Republic of Iran (+41.9%), the Russian Federation (+22.7%) and Turkey (+16%) exhibited a sharp increase in the number of PCT applications, whereas Malaysia (–25.4%), Ukraine (–13%) and Mexico (–6.9%) saw a large decrease in filings.

Continued shift toward Asia

Countries located in Asia accounted for 49.1% of all PCT applications in 2017. This is almost equal to the combined share for Europe (24.9%) and North America (24.2%). Countries in Africa (0.2%), Latin America and the Caribbean (LAC; 0.6%) and Oceania (0.9%) accounted for the lowest shares of total PCT filings. Asia's share has increased each year since 1993 and has grown from 27.6% in 2007 to 49.1% in 2017 primarily due to increases in filings from China, Japan and the Republic of Korea (see figure A3).

The business sector accounts for the bulk of PCT filings

In 2017, almost 223,600 PCT applications from 52,355 applicants were published by the IB, representing a 3% increase in published applications on 2016. The business sector accounted for 84.8% of all published PCT applications, followed by individuals (8%), the university sector (5.4%) and the government and public research organizations (PROs) sector (1.9%) (see figure A11). The business sector's share of PCT applications increased from 83.2% in 2010 to 85.4% in 2016.

The business sector in 2017 accounted for more than 95% of all published applications from Sweden (97%) and Japan (95.9%). In contrast, the business sector's share of PCT applications for Egypt (6.8%), Ukraine (6.5%), the Islamic Republic of Iran (6.2%) and Kazakhstan (4.8%) was low (see figure A12).

The university sector accounted for the bulk of applications in Panama (89.7%) and Morocco (53.8%). It also represented high shares in Spain (15.1%), Israel (11.5%) and the United Kingdom (U.K.; 9%). Government and research institutions were responsible for the high share of applications originating from Singapore (16.8%), France (9.6%), Malaysia (7.5%), India (6.4%) and Spain (5.4%). Individuals accounted for more than 90% of all filings originating in the Islamic Republic of Iran (93.8%), Egypt (93.2%) and Ukraine (92.8%), as well as a large proportion of filings originating in Mexico (55.2%) and the Russian Federation (54.4%).

Huawei was the top business-sector PCT applicant

For the third time since 2014, Huawei Technologies was the top PCT applicant in 2017, with 4,024 published PCT applications, 332 more than in 2016 (see table A15). With 2,965 published PCT applications, ZTE Corporation moved from first to second place due to a sharp decrease of 1,158 published applications compared with 2016. These two Shenzhen-based companies were followed by U.S.-based Intel Corporation (2,637), Mitsubishi Electric Corporation of Japan (2,521) and Qualcomm Incorporated of the U.S. (2,163). Of the top 10 applicants, 7 are located in Asia, 2 are located in North America and 1 is located in Europe.

The list of the top 50 applicants for 2017 is composed of applicants from just eight origins. Japan had 15 of the top applicants, followed by the U.S. (13), China (10), Germany (5), the Republic of Korea (3), the Netherlands (2), France (1) and Sweden (1). The number of China-based companies listed among the top 50 PCT applicants has doubled since 2016.

The list of the top PCT filers in 2017 is headed by telecommunications companies. Among the top 10 applicants, six filed mainly in digital communication, namely Ericsson, Huawei Technologies, LG Electronics, Qualcomm Incorporated, Samsung Electronics and ZTE Corporation (see table A16).

University of California continued to lead the university sector

Among educational institutions, the University of California (482 published PCT applications) has remained the largest user of the PCT System since 1993 (see table A17). The Massachusetts Institute of Technology (278) ranked second, followed by Harvard University (179), the University of Texas System (161) and Johns Hopkins University (129). Seven of the top 10 universities are located in the U.S. and three are located in the Republic of Korea.

Among the universities that appear in the top 50 list, 24 are located in the U.S., 23 in Asia, 4 in Europe and 1 in Panama. The Universidad Tecnológica de Panamá is the only university from a middle-income country apart from those from China.

The CEA remained the top PCT applicant of the government and PRO sector

For the seventh consecutive year, the Commissariat à l'Énergie Atomique et aux Énergies Alternatives (CEA) of France is the top PCT applicant in the government and PRO sector, with 300 published PCT applications in 2017 (see table A18). It was followed by Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung of Germany (279) and the China Academy of Telecommunications Technology (204).

Applicants from seven countries are represented in the top 10 list for 2017. France has the highest number of applicants with three, followed by China (2), Germany (1), Japan (1), the Republic of Korea (1), Singapore (1) and the U.S. (1).

PCT applications related to computer technology account for the largest share of the total

Computer technology (19,122) was the most frequently featured technology field in published PCT applications in 2017, followed by digital communication (18,400), electrical machinery, apparatus, energy (15,223) and medical technology (15,024) (see table A20). Each of these fields had more than 15,000 published PCT applications in 2017. Computer technology overtook digital communication – which held the top position in 2016 – to become the top technological field in 2017. The top four technology fields accounted for nearly a third (30.3%) of all published PCT applications in 2017.

Of the 35 fields of technology, 30 saw growth in the number of PCT applications filed in 2017 compared with 2016, among which control (+16.7%), thermal processes and apparatus (+14.9%), transport (+11.8%), computer technology (+11.4%) and other special machines (+11.4%) saw double-digit growth.

The share of PCT applications with women inventors is rising

In 2017, about 95% of PCT applications named at least one man inventor and 31.2% named at least one woman inventor (see figure A22). Although the share of PCT applications with at least one woman inventor has increased from 22.1% in 2003 to 31.2% in 2017, it remains quite low. In terms of volume, the total number of PCT applications with at least one woman inventor almost tripled between 2003 (24,004) and 2017 (68,270). Of all inventors named in PCT applications, only 16.4% were women.

Among the top 20 origins, the Republic of Korea (50.3% of PCT applications named women inventors) and China (47.9%) were the most gender-equal (see figure A24), but remained far from gender-balanced. Belgium (35.7%), Spain (35.4%), the U.S. (32.8%) and France (32.5%) also had relatively high shares of PCT applications with women inventors. In contrast, less than one-fifth of PCT applications originating in Japan (20%), Germany (19%), Italy (18.6%) and Austria (15.9%) included women inventors.

Fields of technology related to the life sciences had comparatively high shares of PCT applications with women inventors in 2017 (see figure A25). More than half of PCT applications in the fields of biotechnology (58.3%), pharmaceuticals (56.3%), organic fine chemistry (55.1%), food chemistry (50.7%) and analysis of biological materials (50.6%) included at least one woman inventor.

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

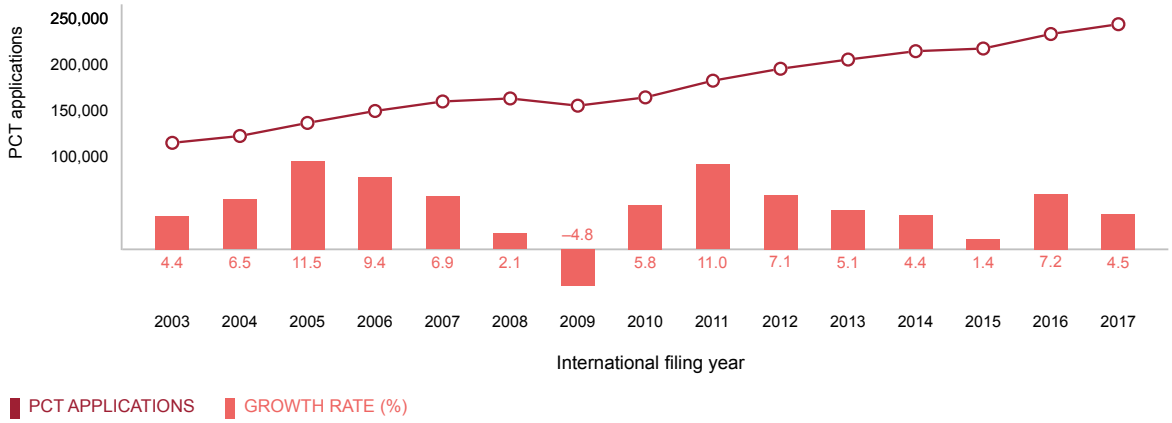
PCT applications by gender

Statistical table

Global trends in PCT applications

The total number of PCT applications grew by 4.5% in 2017.

A1. Trend in filings of PCT applications, 2003–2017

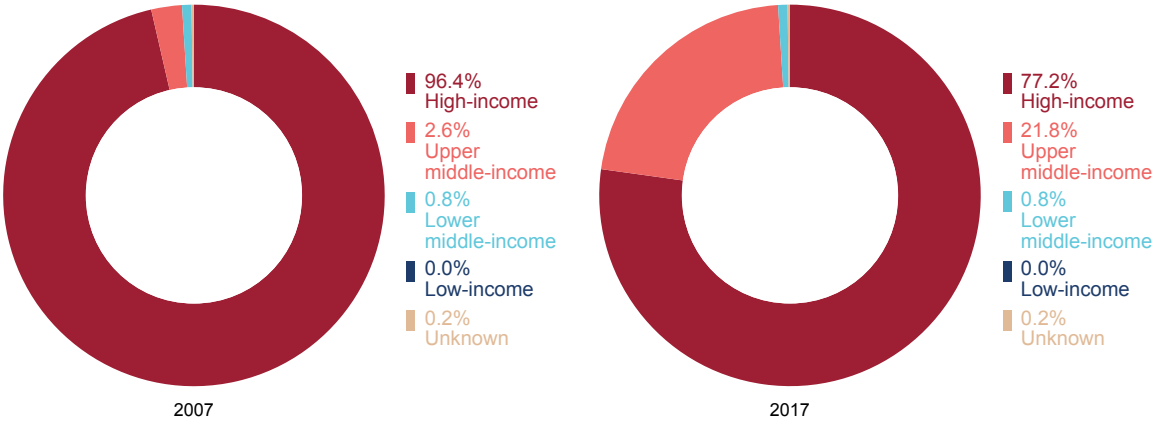


Note: Data for 2017 are WIPO estimates.

Source: WIPO Statistics Database, March 2018.

Upper middle-income countries have seen their share of all PCT applications increase considerably since 2007, mainly due to a growth in the number of filings from China.

A2. Distribution of PCT applications by income group, 2007 and 2017

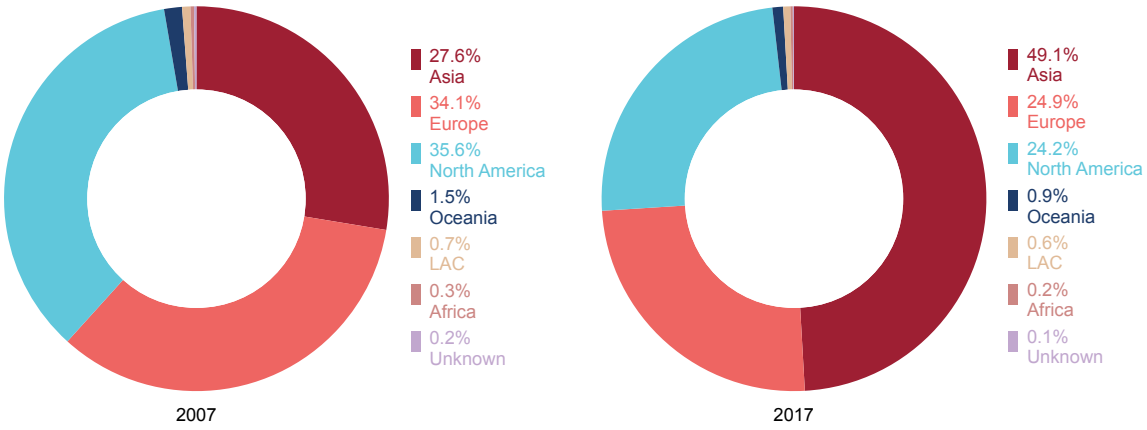


Note: Data for 2017 are WIPO estimates. Each income group includes the following number of origins: high-income (55), upper middle-income (39), lower middle-income (30) and low-income (11). For information on income group classification, see the Data description section.

Source: WIPO Statistics Database, March 2018.

Asia accounted for nearly half of all PCT applications filed in 2017.

A3. Distribution of PCT applications by region, 2007 and 2017



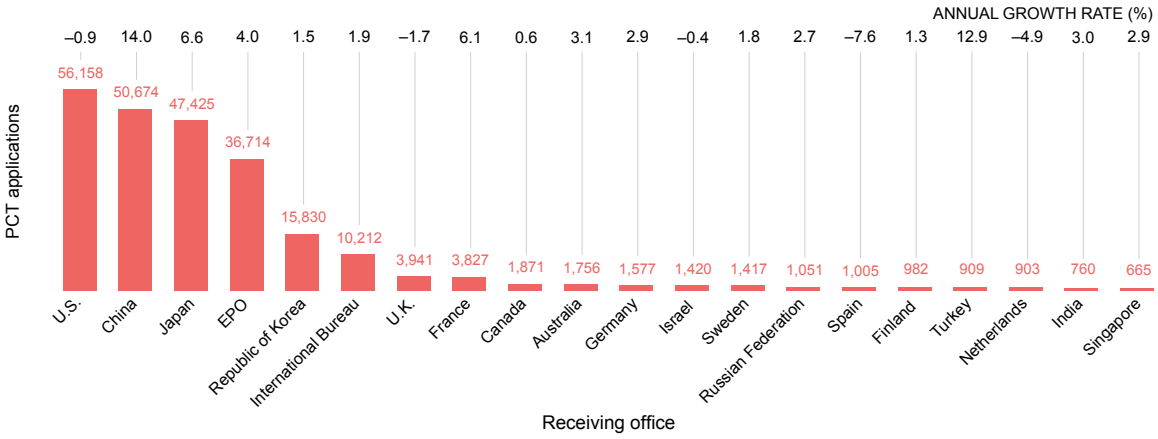
Note: Data for 2017 are WIPO estimates. Each region includes the following number of offices: Africa (29), Asia (35), Europe (43), Latin America and the Caribbean (LAC; 21), North America (2) and Oceania (5).

Source: WIPO Statistics Database, March 2018.

PCT applications by receiving office

The USPTO and SIPO each received more than 50,000 PCT applications in 2017.

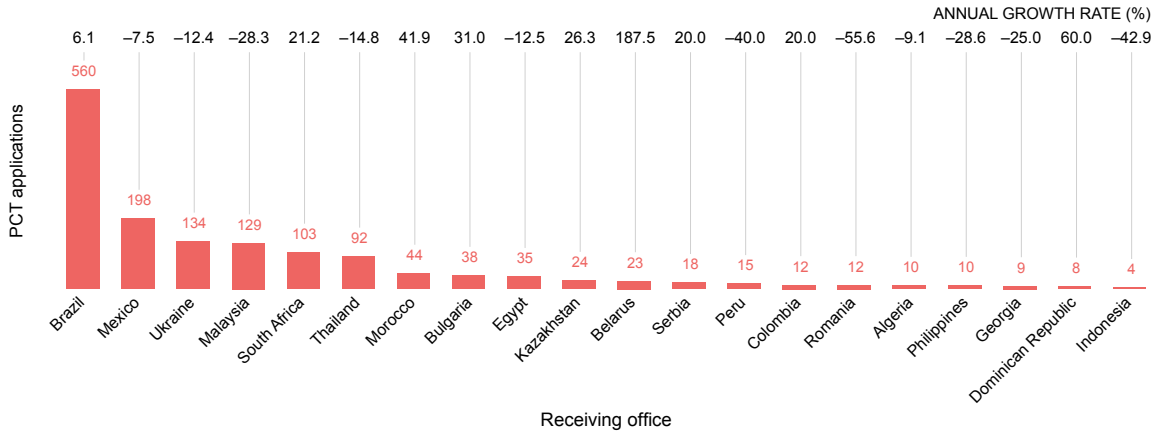
A4. PCT applications for the top 20 receiving offices, 2017



Source: WIPO Statistics Database, March 2018.

The receiving office of Brazil received 560 PCT applications in 2017.

A5. PCT applications for selected receiving offices of low- and middle-income countries, 2017



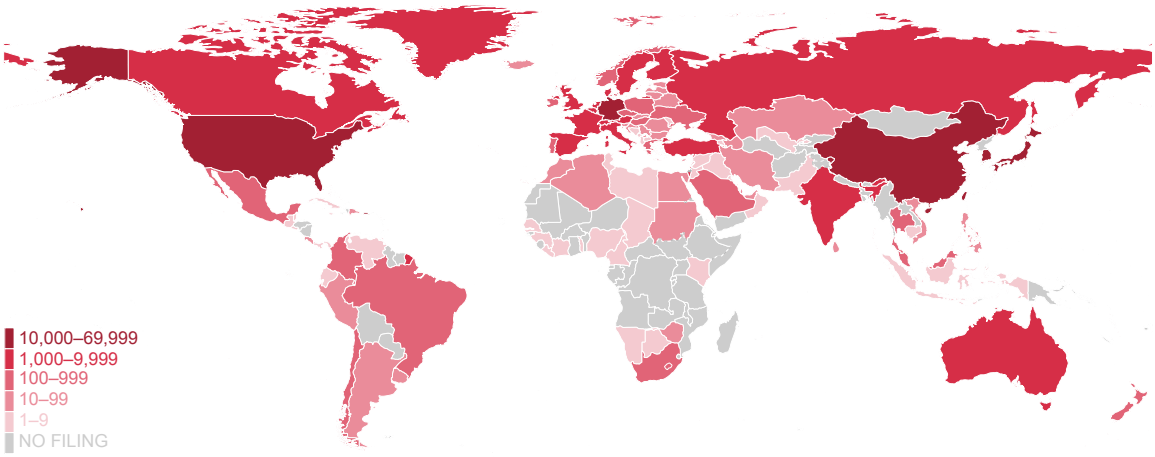
Note: The selected offices are from different world regions and income groups (low-income, lower middle-income and upper middle-income). Where available, data for all offices are presented in the statistical table A27.

Source: WIPO Statistics Database, March 2018.

PCT applications by origin

PCT applications are highly concentrated among a few origins.

A6. PCT applications by origin, 2017

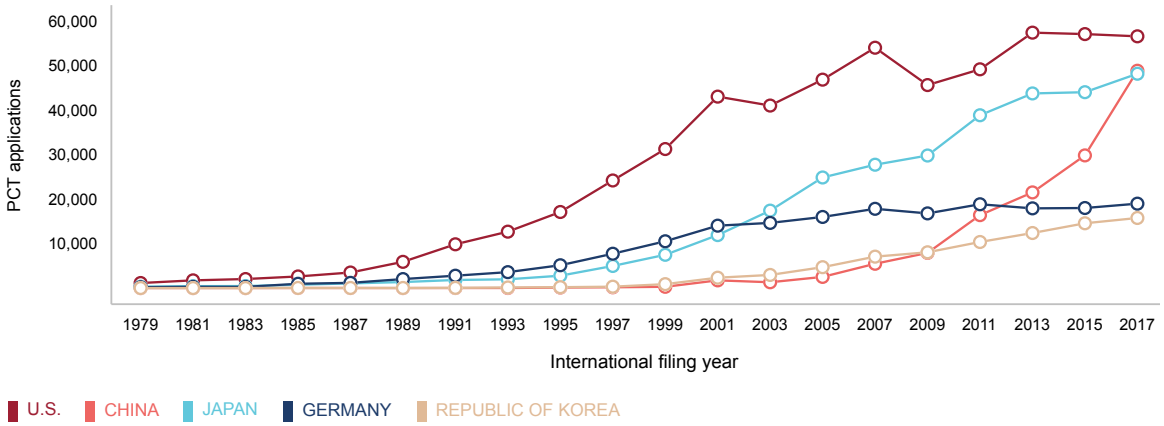


Note: Data for 2017 are WIPO estimates.

Source: WIPO Statistics Database, March 2018.

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

A7. Trend in PCT applications for the top five origins, 1979–2017

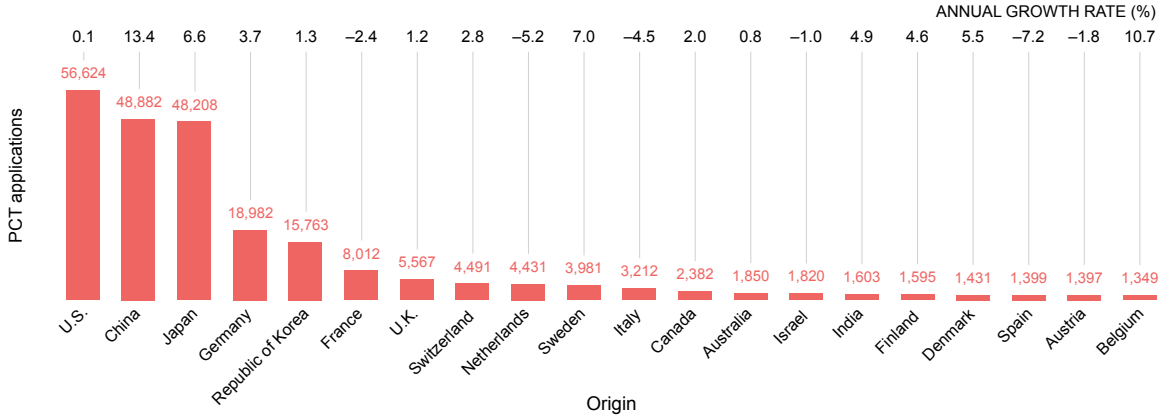


Note: Data for 2017 are WIPO estimates.

Source: WIPO Statistics Database, March 2018.

China has become the second largest origin of PCT filings.

A8. PCT applications for the top 20 origins, 2017



Note: Data for 2017 are WIPO estimates.

Source: WIPO Statistics Database, March 2018.

Africa and Asia saw the greatest increases in PCT filings in 2017, with annual growth rates of around 12% and 9%, respectively.

A9. PCT applications for the top countries by region, 2015–2017

Region	Name	Year of international filing			Regional share 2017 (%)	Change from 2016 (%)
		2015	2016	2017		
Africa	South Africa	313	287	301	63.4	4.9
	Morocco	34	35	48	10.1	37.1
	Egypt	58	44	36	7.6	–18.2
	Zimbabwe	2	2	21	4.4	950.0
	Others	82	57	69	14.5	21.1
	Total*	**489**	**425**	**475**	**0.2**	**11.8**
Asia	China	29,838	43,091	48,882	40.9	13.4
	Japan	44,053	45,209	48,208	40.4	6.6
	Republic of Korea	14,564	15,555	15,763	13.2	1.3
	Israel	1,685	1,838	1,820	1.5	–1.0
	India	1,412	1,528	1,603	1.3	4.9
	Turkey	1,010	1,065	1,235	1.0	16.0
	Singapore	907	864	867	0.7	0.3
	Saudi Arabia	274	294	378	0.3	28.6
	Thailand	133	155	157	0.1	1.3
	Malaysia	267	189	141	0.1	–25.4
	Others	367	346	408	0.3	17.9
	Total*	**94,510**	**110,134**	**119,462**	**49.2**	**8.5**
Europe	Germany	18,004	18,307	18,982	31.3	3.7
	France	8,421	8,210	8,012	13.2	–2.4
	United Kingdom	5,290	5,502	5,567	9.2	1.2
	Switzerland	4,257	4,367	4,491	7.4	2.8
	Netherlands	4,334	4,676	4,431	7.3	–5.2
	Sweden	3,843	3,720	3,981	6.6	7.0
	Italy	3,072	3,362	3,212	5.3	–4.5
	Finland	1,584	1,525	1,595	2.6	4.6
	Denmark	1,327	1,356	1,431	2.4	5.5
	Spain	1,530	1,507	1,399	2.3	–7.2
	Others	6,998	7,048	7,608	12.5	7.9
	Total*	**58,660**	**59,580**	**60,709**	**25.0**	**1.9**
Latin America and the Caribbean	Brazil	548	567	593	41.7	4.6
	Mexico	317	289	269	18.9	–6.9
	Chile	166	197	168	11.8	–14.7
	Colombia	87	100	142	10.0	42.0
	Barbados	125	114	67	4.7	–41.2
	Antigua and Barbuda	0	0	57	4.0	n.a.
	Argentina	29	46	36	2.5	–21.7
	Others	87	175	89	6.3	–49.1
	Total*	**1,359**	**1,488**	**1,421**	**0.6**	**–4.5**
North America	United States of America	57,131	56,594	56,624	96.0	0.1
	Canada	2,822	2,336	2,382	4.0	2.0
	Total*	**59,953**	**58,930**	**59,006**	**24.3**	**0.1**
Oceania	Australia	1,741	1,835	1,850	87.0	0.8
	New Zealand	358	307	274	12.9	–10.7
	Others	5	3	2	0.1	–33.3
	Total*	**2,104**	**2,145**	**2,126**	**0.9**	**–0.9**
Unknown		158	211	301	n.a.	n.a.
Total		**217,233**	**232,913**	**243,500**	**n.a.**	**4.5**

* indicates share of world total.

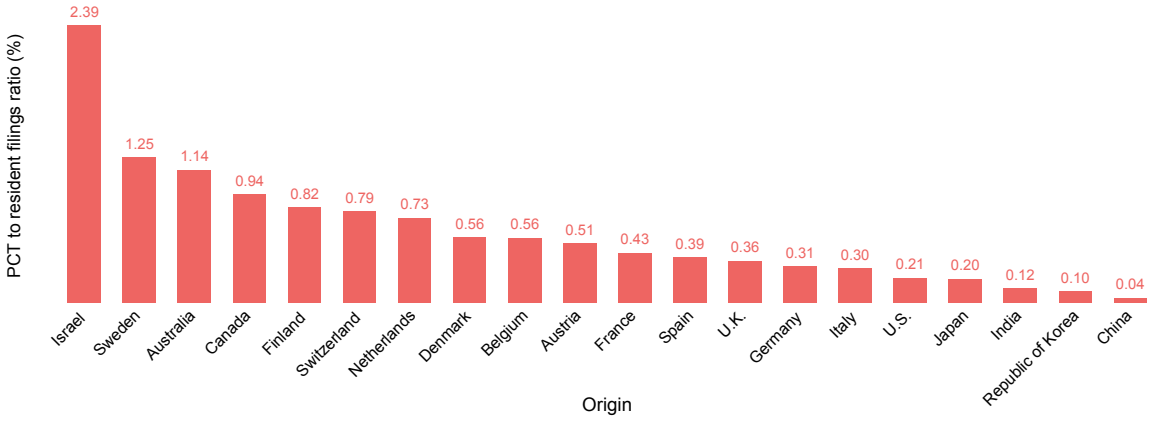
n.a. indicates not applicable.

Note: Data for 2017 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 2017.

Source: WIPO Statistics Database, March 2018.

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

A10. Conversion ratio of direct resident patent applications to PCT applications for the top 20 origins, 2017



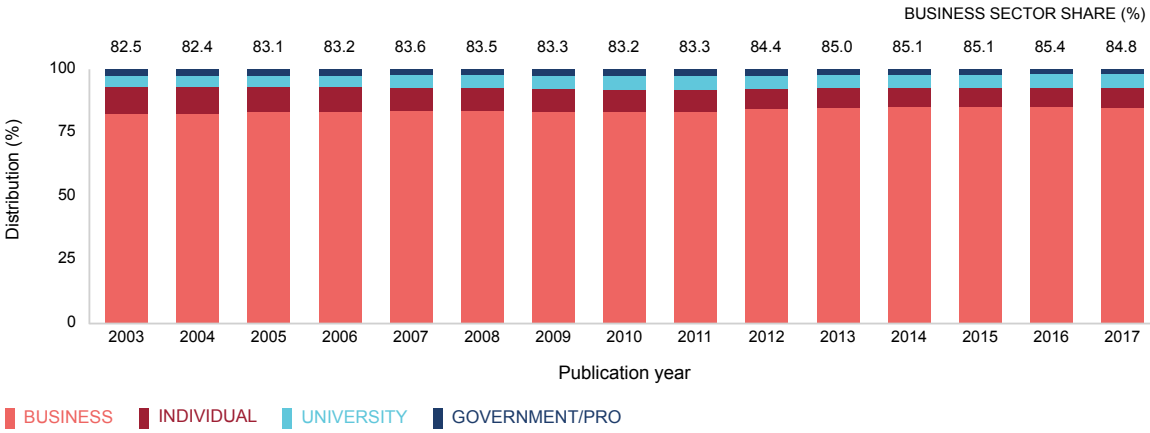
Note: Data for 2017 are WIPO estimates. This hypothetical "conversion ratio" reflects the proportion of direct resident patent applications converted into PCT applications. The ratio is defined for the top 20 origins in terms of PCT applications filed in 2017 divided by resident patent applications (including regional applications and excluding PCT national phase entries) filed in 2016. 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 2018.

PCT applications by applicant type

The business sector accounted for about 85% of all PCT applications filed in 2017.

A11. Distribution of PCT applications by applicant type, 2003–2017

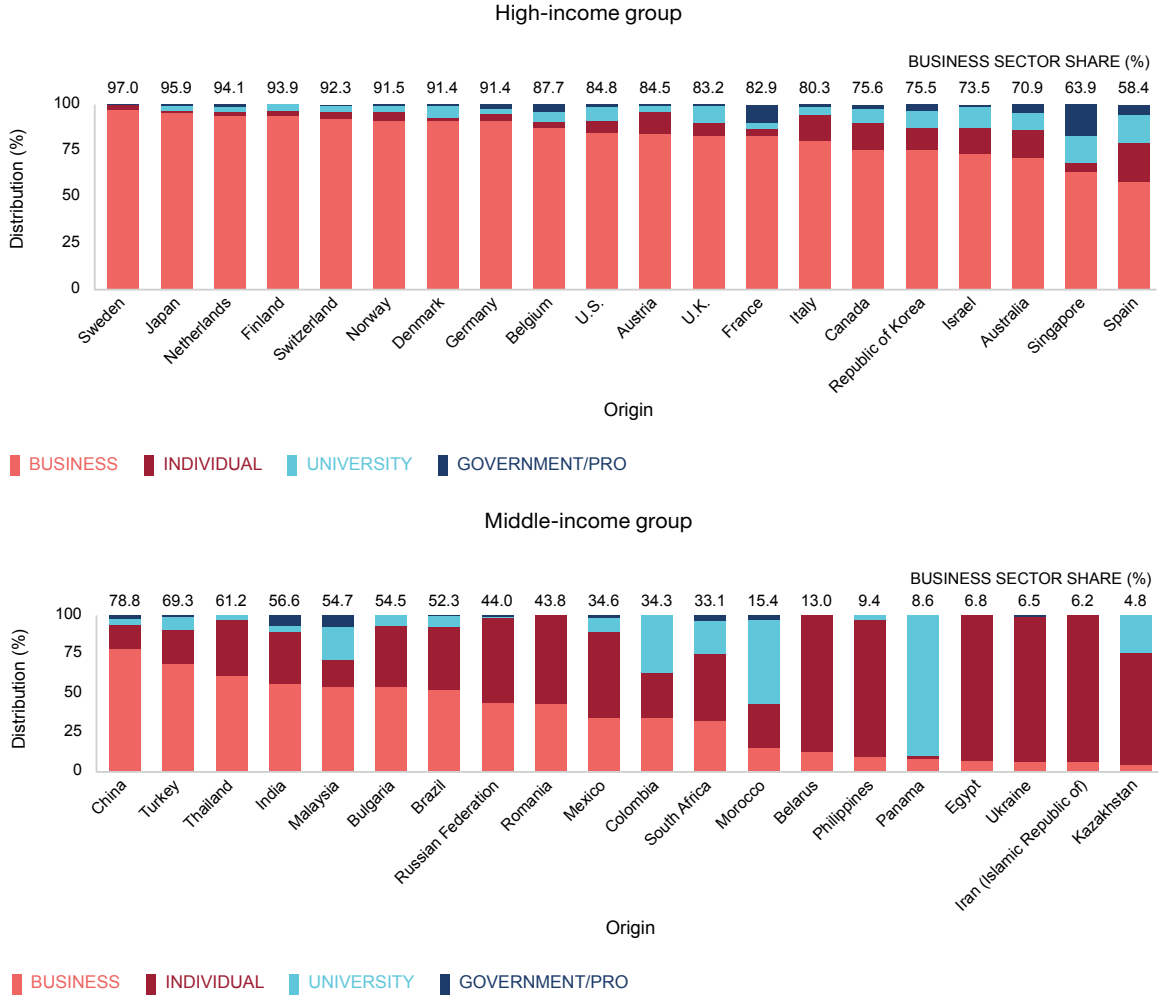


Note: The government and public research organizations (PROs) sector includes private non-profit organizations and hospitals. The university sector includes all educational institutions. For confidentiality reasons, data are based on the publication date.

Source: WIPO Statistics Database, March 2018.

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, 2017

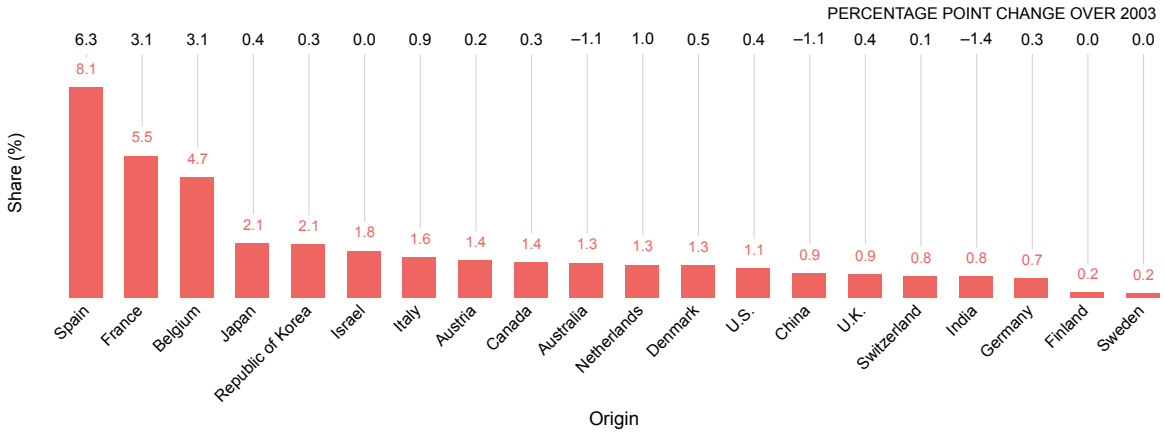


Note: The government and PROs sector includes private non-profit organizations and hospitals. The university sector includes all educational institutions. For confidentiality reasons, data are based on the publication date.

Source: WIPO Statistics Database, March 2018.

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

A13. Share of PCT applications with business and public sector co-applicants for the top 20 origins, 2017

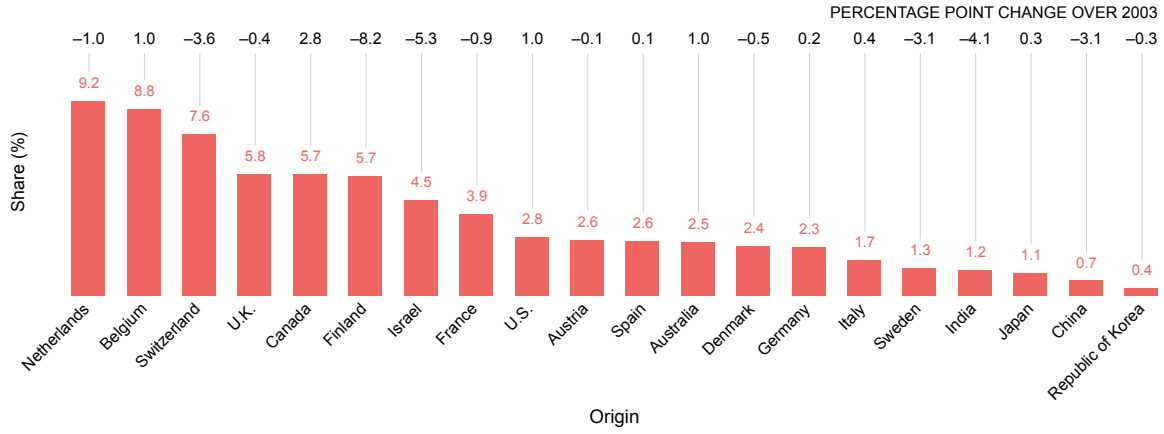


Note: The public sector comprises the university sector and the government and PROs sector. The government and PROs sector includes private non-profit organizations and hospitals. The university sector includes all educational institutions. For confidentiality reasons, data are based on the publication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

Source: WIPO Statistics Database, March 2018.

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

A14. Share of PCT applications with foreign co-applicants for the top 20 origins, 2017



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, PCT data are based on the publication date.

Source: WIPO Statistics Database, March 2018.

Top PCT applicants

Huawei Technologies or ZTE Corporation have been the top PCT applicants since 2015 and have set several records for the largest number of filings by one applicant in a single year.

A15. Top 50 business PCT applicants, 2015–2017

Overall PCT ranking	Change in position from 2016 ranking	Applicant	Origin	Published PCT applications		
				2015	2016	2017
1	1	HUAWEI TECHNOLOGIES CO., LTD.	China	3,898	3,692	4,024
2	–1	ZTE CORPORATION	China	2,155	4,123	2,965
3	4	INTEL CORPORATION	United States of America	1,250	1,692	2,637
4	0	MITSUBISHI ELECTRIC CORPORATION	Japan	1,593	2,053	2,521
5	–2	QUALCOMM INCORPORATED	United States of America	2,442	2,466	2,163
6	–1	LG ELECTRONICS INC.	Republic of Korea	1,457	1,888	1,945
7	1	BOE TECHNOLOGY GROUP CO., LTD.	China	1,227	1,673	1,818
8	1	SAMSUNG ELECTRONICS CO., LTD.	Republic of Korea	1,683	1,672	1,757
9	1	SONY CORPORATION	Japan	1,381	1,665	1,735
10	1	TELEFONAKTIEBOLAGET LM ERICSSON (PUBL)	Sweden	1,481	1,608	1,564
11	1	MICROSOFT TECHNOLOGY LICENSING, LLC	United States of America	860	1,528	1,536
12	–6	HEWLETT-PACKARD DEVELOPMENT COMPANY, L.P.	United States of America	1,310	1,743	1,519
13	2,257	LE HOLDINGS (BEIJING) CO., LTD.	China	0	9	1,397
14	–1	ROBERT BOSCH CORPORATION	Germany	1,247	1,274	1,354
15	0	PANASONIC INTELLECTUAL PROPERTY MANAGEMENT CO., LTD.	Japan	1,185	1,189	1,280
16	2	KONINKLIJKE PHILIPS ELECTRONICS N.V.	Netherlands	1,378	1,137	1,077
17	0	SIEMENS AKTIENGESELLSCHAFT	Germany	1,292	1,138	1,063
18	–2	SHENZHEN CHINA STAR OPTOELECTRONICS TECHNOLOGY CO., LTD.	China	710	1,163	972
19	5	FUJIFILM CORPORATION	Japan	947	968	970
20	3	DENSO CORPORATION	Japan	704	986	968
21	–7	SHARP KABUSHIKI KAISHA	Japan	1,073	1,205	963
22	–2	OLYMPUS CORPORATION	Japan	614	1,077	934
23	–1	HITACHI, LTD.	Japan	1,165	1,047	923
24	–3	NEC CORPORATION	Japan	895	1,056	899
25	1	LG CHEM, LTD.	Republic of Korea	739	671	850
26	–7	HALLIBURTON ENERGY SERVICES, INC.	United States of America	1,121	1,103	798
27	3	GOOGLE INC.	United States of America	721	587	789
28	4	ALIBABA GROUP HOLDING LIMITED	China	152	699	707
29	–4	MURATA MANUFACTURING CO., LTD.	Japan	658	681	684
30	–3	3M INNOVATIVE PROPERTIES COMPANY	United States of America	676	653	678
31	–3	PROCTER & GAMBLE COMPANY	United States of America	546	624	566
32	77	TENCENT TECHNOLOGY (SHENZHEN) COMPANY LIMITED	China	981	172	560
33	–4	BASF SE	Germany	735	598	556
34	45	YULONG COMPUTER TELECOMMUNICATION SCIENTIFIC (SHENZHEN) CO., LTD.	China	71	256	517
35	4	HITACHI AUTOMOTIVE SYSTEMS, LTD.	Japan	343	396	503
36	–2	KONICA MINOLTA, INC.	Japan	516	449	492
37	1	SCHAEFFLER TECHNOLOGIES AG & CO. KG	Germany	608	406	489
38	8	SABIC GLOBAL TECHNOLOGIES B.V.	Netherlands	196	359	488
39	–4	UNIVERSITY OF CALIFORNIA	United States of America	361	434	482
40	240	GUANG DONG OPPO MOBILE TELECOMMUNICATIONS CORP., LTD.	China	27	80	474
41	15	AUTONETWORKS TECHNOLOGIES, LTD.	Japan	162	320	452
42	–5	DOW GLOBAL TECHNOLOGIES INC.	United States of America	411	415	421
43	–3	BAYERISCHE MOTOREN WERKE AKTIENGESELLSCHAFT	Germany	340	383	414
44	6	COMPAGNIE GÉNÉRALE DES ÉTABLISSEMENTS MICHELIN	France	313	344	411
45	–1	GENERAL ELECTRIC COMPANY	United States of America	500	365	407
46	11	NTN CORPORATION	Japan	267	318	398
47	–11	KYOCERA CORPORATION	Japan	459	427	377
48	3	APPLIED MATERIALS, INC.	United States of America	376	336	359
49	15	XIAOMI INC.	China	126	298	354
50	–9	CORNING INCORPORATED	United States of America	318	379	340

Note: For confidentiality reasons, data are based on publication date.

Source: WIPO Statistics Database, March 2018.

The bulk of PCT applications filed by Ericsson (76.1%), Huawei Technologies (59.5%) and ZTE Corporation (59.3%) relate to digital communication technology.

A16. Share of technology fields for the top 10 business applicants, 2017

Field of technology	Applicant: Huawei Tech.	ZTE Corp.	Intel Corp.	Mitsubishi Electr.	Qualcomm	LG Electr.	BOE Tech. Group	Samsung Electr.	Sony Corp.	LM Ericsson
Electrical machinery, apparatus, energy	1.7	2.6	3.5	18.6	3.5	2.0	3.0	3.6	5.1	1.2
Audio-visual technology	3.6	4.9	4.1	3.2	5.9	6.5	19.4	12.8	20.2	1.3
Telecommunications	11.0	10.2	5.2	5.0	8.5	12.7	0.4	10.5	5.8	12.1
Digital communication	59.5	59.3	28.3	4.7	45.3	46.1	1.0	28.6	18.4	76.1
Basic communication processes	1.8	0.7	1.7	2.0	5.2	0.2	0.4	0.3	1.4	1.7
Computer technology	16.7	17.6	31.4	7.1	20.7	4.5	16.3	20.0	16.5	5.1
IT methods for management	0.5	0.7	0.5	1.3	0.3	1.4	0.4	3.0	2.0	0.7
Semiconductors	0.5	0.1	18.6	5.6	3.3	0.8	17.8	0.4	6.7	0.1
Optics	1.5	0.6	1.2	2.0	0.4	2.0	28.7	2.6	7.0	0.4
Measurement	1.4	1.1	2.0	5.9	3.3	1.3	1.9	2.6	4.6	0.5
Analysis of biological materials	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.4	0.0
Control	0.7	1.3	1.1	4.4	1.5	0.7	1.0	0.7	2.0	0.6
Medical technology	0.2	0.1	0.7	0.6	1.0	0.5	1.8	3.6	3.8	0.0
Organic fine chemistry	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0
Biotechnology	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.6	0.0
Pharmaceuticals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Macromolecular chemistry, polymers	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.0
Food chemistry	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Basic materials chemistry	0.0	0.1	0.0	0.2	0.0	0.1	0.4	0.1	0.2	0.0
Materials, metallurgy	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.0
Surface technology, coating	0.1	0.0	0.1	0.2	0.0	0.1	2.4	0.2	0.3	0.0
Micro-structural and nano-technology	0.0	0.0	0.2	0.0	0.0	0.1	0.1	0.0	0.1	0.0
Chemical engineering	0.0	0.0	0.0	0.2	0.1	0.5	0.4	0.4	0.1	0.0
Environmental technology	0.0	0.0	0.0	0.6	0.0	0.3	0.1	0.2	0.1	0.0
Handling	0.0	0.0	0.2	6.1	0.0	0.9	1.0	0.5	0.7	0.0
Machine tools	0.0	0.1	0.0	1.1	0.0	0.1	0.5	0.0	0.1	0.0
Engines, pumps, turbines	0.0	0.1	0.0	4.2	0.0	0.8	0.1	0.3	0.0	0.0
Textile and paper machines	0.0	0.0	0.1	0.1	0.0	0.0	0.4	0.0	0.1	0.0
Other special machines	0.0	0.0	0.0	0.2	0.0	0.2	0.3	0.1	0.9	0.0
Thermal processes and apparatus	0.1	0.1	0.0	19.2	0.0	2.4	0.1	3.0	0.1	0.0
Mechanical elements	0.0	0.1	0.0	0.8	0.0	0.7	0.3	0.1	0.1	0.0
Transport	0.1	0.1	0.3	3.8	0.7	2.2	0.8	0.4	1.3	0.1
Furniture, games	0.0	0.0	0.2	0.7	0.0	4.1	0.6	1.7	0.7	0.0
Other consumer goods	0.0	0.1	0.2	1.8	0.0	7.7	0.3	2.3	0.5	0.0
Civil engineering	0.0	0.1	0.0	0.2	0.0	0.3	0.0	0.2	0.1	0.0

Note: For confidentiality reasons, data are based on 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 2018.

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

A17. Top 50 university PCT applicants, 2015–2017

Overall PCT ranking	Change in position from 2016 ranking	Applicant	Origin	Published PCT applications		
				2015	2016	2017
39	–4	UNIVERSITY OF CALIFORNIA	United States of America	361	434	482
76	7	MASSACHUSETTS INSTITUTE OF TECHNOLOGY	United States of America	213	236	278
121	–2	HARVARD UNIVERSITY	United States of America	158	163	179
136	–7	UNIVERSITY OF TEXAS SYSTEM	United States of America	164	155	161
182	–57	JOHNS HOPKINS UNIVERSITY	United States of America	170	158	129
189	43	UNIVERSITY OF FLORIDA	United States of America	108	97	126
201	–28	SEOUL NATIONAL UNIVERSITY	Republic of Korea	95	122	119
210	10	HANYANG UNIVERSITY	Republic of Korea	68	101	114
211	–4	LELAND STANFORD JUNIOR UNIVERSITY	United States of America	99	104	113
220	42	KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY	Republic of Korea	57	87	109
222	40	SHENZHEN UNIVERSITY	China	29	87	108
226	104	COLUMBIA UNIVERSITY	United States of America	80	67	107
231	–33	UNIVERSITY OF TOKYO	Japan	101	108	104
244	26	CHINA UNIVERSITY OF MINING AND TECHNOLOGY	China	43	84	99
244	–1	UNIVERSITY OF MICHIGAN	United States of America	116	94	99
252	62	KING ABDULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY	Saudi Arabia	40	72	97
268	–33	UNIVERSITY OF PENNSYLVANIA	United States of America	76	96	91
272	–10	KOREA UNIVERSITY	Republic of Korea	75	87	90
272	–2	TSINGHUA UNIVERSITY	China	102	84	90
280	116	TOHOKU UNIVERSITY	Japan	56	56	88
288	63	DUKE UNIVERSITY	United States of America	52	62	84
297	189	UNIVERSITY OF ARIZONA	United States of America	40	46	81
304	10	KYOTO UNIVERSITY	Japan	76	72	80
320	23	OSAKA UNIVERSITY	Japan	72	65	75
320	369	OXFORD UNIVERSITY INNOVATION LIMITED	United Kingdom	0	32	75
333	116	UNIVERSITY OF PITTSBURGH	United States of America	43	49	71
337	98	SOUTH CHINA UNIVERSITY OF TECHNOLOGY	China	49	50	70
351	60	PEKING UNIVERSITY	China	81	54	67
351	–7	NANYANG TECHNOLOGICAL UNIVERSITY	Singapore	63	64	67
362	224	JIANGNAN UNIVERSITY	China	12	37	65
388	–58	NORTHWESTERN UNIVERSITY	United States of America	42	67	59
395	–88	CALIFORNIA INSTITUTE OF TECHNOLOGY	United States of America	74	73	58
415	103	CORNELL UNIVERSITY	United States of America	77	42	55
424	–73	DANMARKS TEKNISKE UNIVERSITET	Denmark	74	62	54
427	159	ZHEJIANG UNIVERSITY	China	28	37	53
427	103	IMPERIAL INNOVATIONS LTD.	United Kingdom	40	41	53
433	n.a.	UNIVERSIDAD TECNOLÓGICA DE PANAMÁ	Panama	0	0	52
444	761	ZHANGJIAGANG INSTITUTE OF INDUSTRIAL TECHNOLOGIES SOOCHOW UNIVERSITY	China	18	18	51
444	–82	ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE	Switzerland	43	60	51
444	–24	UNIVERSITY OF COLORADO	United States of America	37	52	51
459	269	JIANGSU UNIVERSITY	China	9	30	50
472	–4	INDIANA UNIVERSITY	United States of America	25	47	49
472	402	UNIVERSITY OF MINNESOTA	United States of America	28	25	49
472	–4	UNIVERSITY OF MARYLAND	United States of America	35	47	49
481	247	SHANGHAI JIAOTONG UNIVERSITY	China	32	30	48
481	–119	UNIVERSITY OF NORTH CAROLINA	United States of America	45	60	48
487	85	PURDUE UNIVERSITY	United States of America	31	38	47
487	99	UNIVERSITY OF MASSACHUSETTS	United States of America	39	37	47
487	–166	NAGOYA UNIVERSITY	Japan	29	69	47
501	–105	YONSEI UNIVERSITY	Republic of Korea	70	56	46
501	–6	YALE UNIVERSITY	United States of America	42	44	46
501	131	HEBREW UNIVERSITY OF JERUSALEM	Israel	47	35	46

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

n.a. indicates not applicable.

Source: WIPO Statistics Database, March 2018.

The Commissariat à l'Énergie Atomique has been the top PCT applicant for the government and PROs sector since 2010.

A18. Top 30 government and PRO PCT applicants, 2015–2017

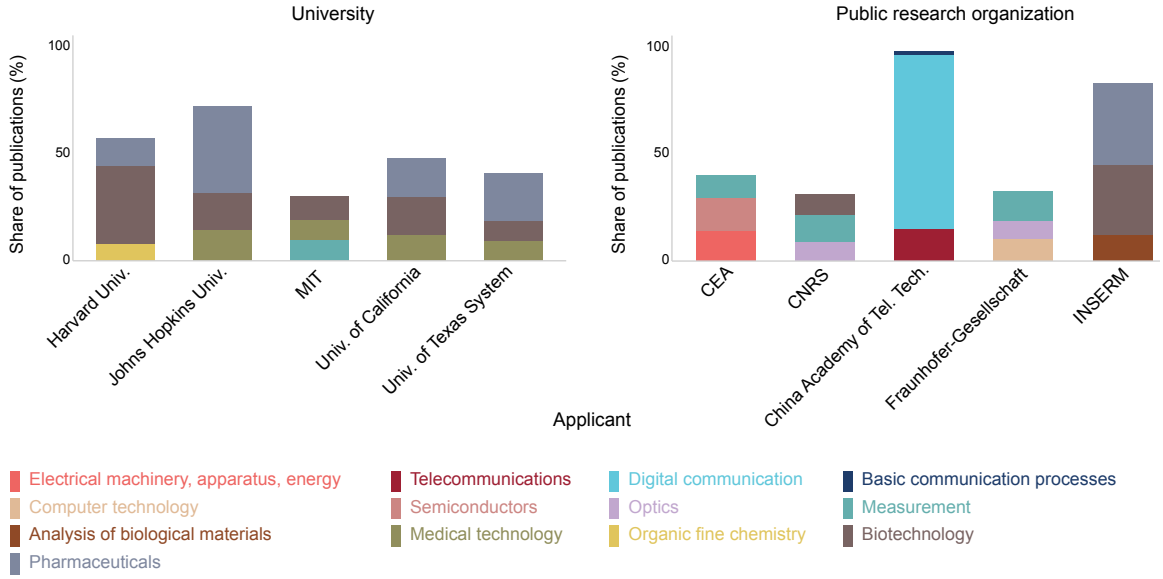
Overall PCT ranking	Change in position from 2016 ranking	Applicant	Origin	Published PCT applications		
				2015	2016	2017
63	–11	COMMISSARIAT À L'ÉNERGIE ATOMIQUE ET AUX ÉNERGIES ALTERNATIVES	France	409	329	300
75	6	FRAUNHOFER-GESELLSCHAFT ZUR FÖRDERUNG DER ANGEWANDTEN FORSCHUNG E.V.	Germany	323	252	279
106	40	CHINA ACADEMY OF TELECOMMUNICATIONS TECHNOLOGY	China	118	145	204
110	33	INSTITUT NATIONAL DE LA SANTÉ ET DE LA RECHERCHE MÉDICALE (INSERM)	France	137	146	199
159	–3	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE (CNRS)	France	137	135	143
160	–41	AGENCY OF SCIENCE, TECHNOLOGY AND RESEARCH	Singapore	148	162	142
168	5	NATIONAL INSTITUTE OF ADVANCED INDUSTRIAL SCIENCE AND TECHNOLOGY	Japan	112	122	134
307	188	KOREA ELECTRONICS TECHNONLOGY INSTITUTE	Republic of Korea	41	44	79
320	389	SHENZHEN INSTITUTE OF ADVANCED TECHNOLOGY	China	18	31	75
343	60	MAYO FOUNDATION FOR MEDICAL EDUCATION AND RESEARCH	United States of America	67	55	69
359	–165	COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH	India	110	109	66
372	–65	SLOAN-KETTERING INSTITUTE FOR CANCER RESEARCH	United States of America	56	73	62
376	–52	CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS (CSIC)	Spain	59	68	61
427	328	KOREA INSTITUTE OF MACHINERY & MATERIALS	Republic of Korea	22	29	53
444	51	COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION	Australia	35	44	51
501	227	CEDARS-SINAI MEDICAL CENTER	United States of America	28	30	46
501	17	NEDERLANDSE ORGANISATIE VOOR TOEGEPAST-NATUURWETENSCHAPPELIJK ONDERZOEK TNO	Netherlands	64	42	46
516	–57	RIKEN (THE INSTITUTE OF PHYSICAL AND CHEMICAL RESEARCH)	Japan	29	48	45
578	–305	KOREA INSTITUTE OF INDUSTRIAL TECHNOLOGY	Republic of Korea	71	83	41
578	–60	MAX-PLANCK-GESELLSCHAFT ZUR FÖRDERUNG DER WISSENSCHAFTEN E.V.	Germany	28	42	41
578	296	KOREA RESEARCH INSTITUTE OF CHEMICAL TECHNOLOGY	Republic of Korea	26	25	41
644	–12	UNITED STATES OF AMERICA AS REPRESENTED BY THE SECRETARY OF THE NAVY	United States of America	18	35	37
644	317	SCRIPPS RESEARCH INSTITUTE	United States of America	36	23	37
660	–88	ELECTRONICS AND TELECOMMUNICATIONS RESEARCH INSTITUTE OF KOREA	Republic of Korea	33	38	36
660	545	DEUTSCHES ZENTRUM FÜR LUFT- UND RAUMFAHRT E.V.	Germany	20	18	36
722	33	KOREA RESEARCH INSTITUTE OF STANDARDS AND SCIENCE	Republic of Korea	30	29	33
749	2,495	CHINA ELECTRIC POWER RESEARCH INSTITUTE	China	1	6	32
820	–259	KOREA RESEARCH INSTITUTE OF BIOSCIENCE AND BIOTECHNOLOGY	Republic of Korea	55	39	29
820	54	KOREA INSTITUTE OF OCEAN SCIENCE & TECHNOLOGY	Republic of Korea	20	25	29
820	805	KOREA AEROSPACE RESEARCH INSTITUTE	Republic of Korea	11	13	29

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

Source: WIPO Statistics Database, March 2018.

Biotechnology and pharmaceuticals accounted for high shares of PCT applications filed by the top five universities.

A19. Share of the top three technology fields for the top five universities and PROs, 2017



Note: CEA is the Commissariat à l'Énergie Atomique et aux Énergies Alternatives, CNRS is the Centre national de la recherche scientifique, INSERM is the Institut national de la santé et de la recherche médicale, and MIT is the Massachusetts Institute of Technology. Public research organizations include private non-profit organizations and hospitals. For confidentiality reasons, data are based on 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 2018.

PCT applications by fields of technology

Digital communication, computer technology and electrical machinery together accounted for nearly a quarter of all PCT applications published in 2017.

A20. PCT applications by field of technology, 2013–2017

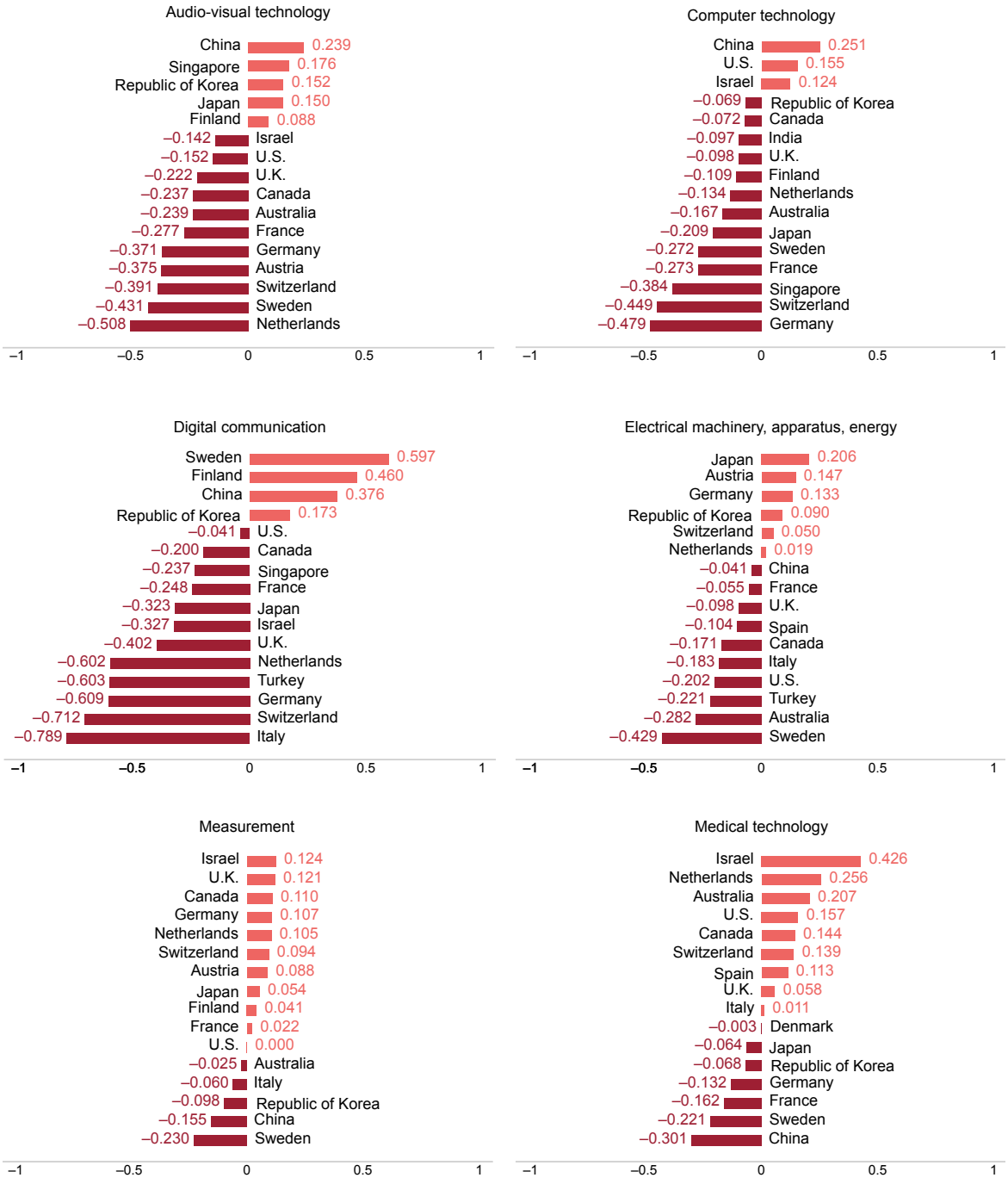
	Field of technology	Publication year					2017 share (%)	Change from 2016 (%)
		2013	2014	2015	2016	2017		
I	**Electrical engineering**							
1	Electrical machinery, apparatus, energy	15,050	15,294	14,659	14,474	15,223	6.8	5.2
2	Audio-visual technology	6,855	6,836	6,595	7,069	7,520	3.4	6.4
3	Telecommunications	5,269	5,437	4,865	5,203	5,610	2.5	7.8
4	Digital communication	14,124	16,217	16,065	17,779	18,400	8.2	3.5
5	Basic communication processes	1,292	1,296	1,261	1,380	1,315	0.6	–4.7
6	Computer technology	14,791	17,757	16,422	17,162	19,122	8.6	11.4
7	IT methods for management	3,780	4,228	4,053	4,342	4,701	2.1	8.3
8	Semiconductors	7,332	7,197	6,441	6,545	6,534	2.9	–0.2
II	**Instruments**							
9	Optics	6,302	5,981	5,861	6,608	7,141	3.2	8.1
10	Measurement	7,995	9,035	8,610	9,339	10,082	4.5	8.0
11	Analysis of biological materials	1,855	1,841	1,662	1,742	1,886	0.8	8.3
12	Control	2,579	3,140	3,017	3,668	4,279	1.9	16.7
13	Medical technology	11,956	14,036	12,651	14,271	15,024	6.7	5.3
III	**Chemistry**							
14	Organic fine chemistry	5,567	6,010	5,417	5,711	5,678	2.5	–0.6
15	Biotechnology	5,527	5,901	5,625	5,972	6,545	2.9	9.6
16	Pharmaceuticals	7,742	8,601	7,703	8,216	8,750	3.9	6.5
17	Macromolecular chemistry, polymers	3,547	3,781	3,696	3,805	3,915	1.8	2.9
18	Food chemistry	1,760	1,879	1,823	1,947	1,954	0.9	0.4
19	Basic materials chemistry	5,123	5,716	5,453	5,475	5,637	2.5	3.0
20	Materials, metallurgy	3,764	4,068	3,769	3,894	4,088	1.8	5.0
21	Surface technology, coating	3,248	3,496	3,295	3,279	3,574	1.6	9.0
22	Micro-structural and nano-technology	402	412	359	369	386	0.2	4.6
23	Chemical engineering	4,299	4,609	4,312	4,356	4,672	2.1	7.3
24	Environmental technology	2,719	2,771	2,549	2,586	2,645	1.2	2.3
IV	**Mechanical engineering**							
25	Handling	4,269	4,800	4,705	5,044	5,495	2.5	8.9
26	Machine tools	3,511	3,773	3,627	3,633	3,585	1.6	–1.3
27	Engines, pumps, turbines	6,171	6,906	6,201	5,606	5,620	2.5	0.2
28	Textile and paper machines	2,251	2,291	2,408	2,531	2,601	1.2	2.8
29	Other special machines	4,862	5,377	5,615	5,754	6,411	2.9	11.4
30	Thermal processes and apparatus	2,993	3,008	3,015	3,146	3,615	1.6	14.9
31	Mechanical elements	5,152	5,882	5,927	5,759	6,109	2.7	6.1
32	Transport	7,965	8,667	8,651	8,724	9,753	4.4	11.8
V	**Other fields**							
33	Furniture, games	3,571	3,814	3,816	4,031	4,397	2.0	9.1
34	Other consumer goods	3,411	4,004	4,391	4,743	4,989	2.2	5.2
35	Civil engineering	5,547	6,494	6,367	6,259	6,102	2.7	–2.5

Note: For confidentiality reasons, data are based on 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 2018.

A relatively 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, 2017



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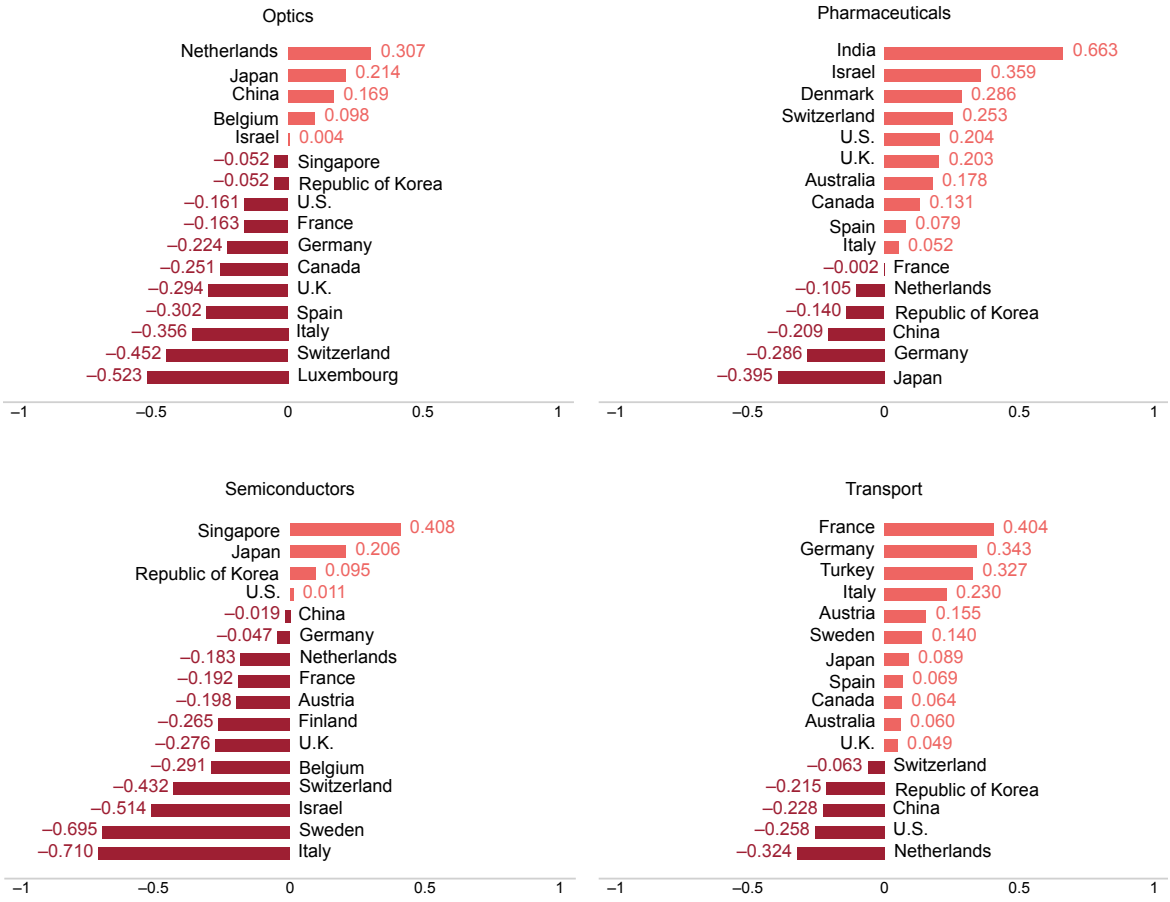
(A21 continued)



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:

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

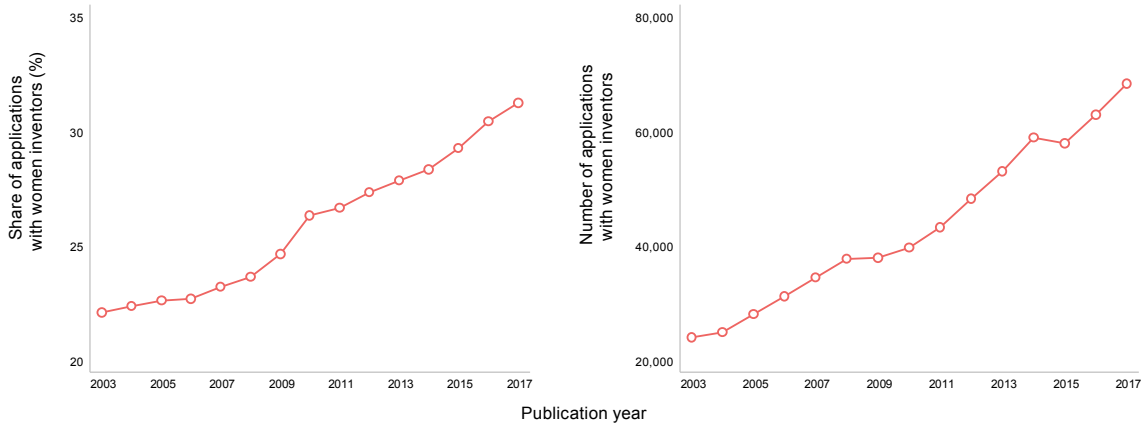
Where F_c and F_r denote applications from country *C* and in a field of technology *T*. A positive value for a technology indicates that a country has a relatively high share of PCT filings related to that field of technology. For confidentiality reasons, data are based on publication date. WIPO's IPC 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 2018.

PCT applications by gender

In 2017, 31.2% of all PCT applications included women inventors.

A22. Share and number of PCT applications with women inventors, 2003–2017

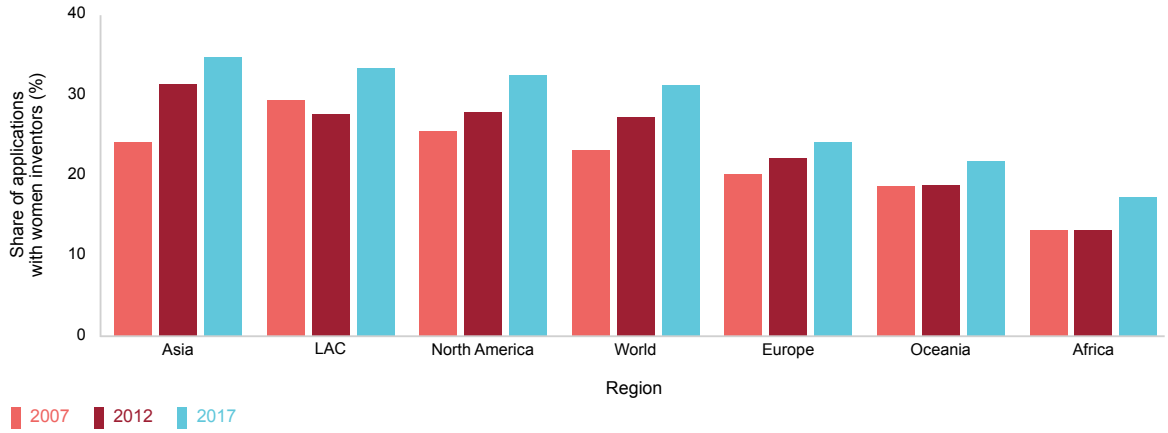


Note: For further details on methodology, refer to Martínez, G.L., J. Raffo and K. Saito (2016). Identifying the Gender of PCT Inventors. *WIPO Economic Research Working Paper No. 33*. Geneva: WIPO. Available at: *www.wipo.int/publications/en/details.jsp?id=4125&plang=EN*.

Source: WIPO Statistics Database, March 2018.

The share of PCT applications with women inventors has risen in each geographical region in the world between 2007 and 2017.

A23. Share of PCT applications with women inventors by geographical region, 2007, 2012 and 2017

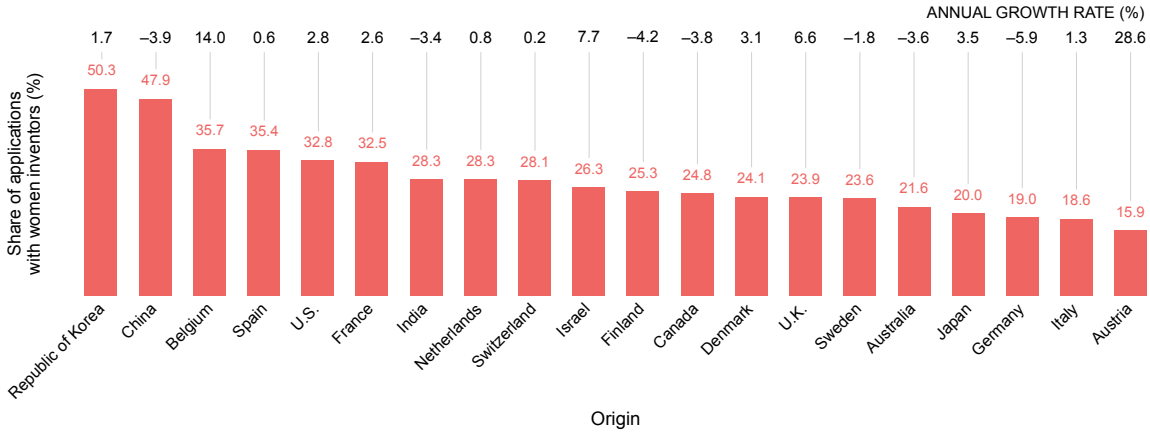


Note: For further details on methodology, refer to Martínez, G.L., J. Raffo and K. Saito (2016). Identifying the Gender of PCT Inventors. *WIPO Economic Research Working Paper No. 33*. Geneva: WIPO. Available at: *www.wipo.int/publications/en/details.jsp?id=4125&plang=EN*.

Source: WIPO Statistics Database, March 2018.

Women inventors were represented in notably high shares of PCT applications in China and the Republic of Korea.

A24. Share of PCT applications with women inventors for the top 20 origins, 2017



Note: For further details on methodology, refer to Martínez, G.L., J. Raffo and K. Saito (2016). Identifying the Gender of PCT Inventors. *WIPO 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 2018.

Women inventors were represented in high shares of PCT applications relating to biotechnology and pharmaceuticals.

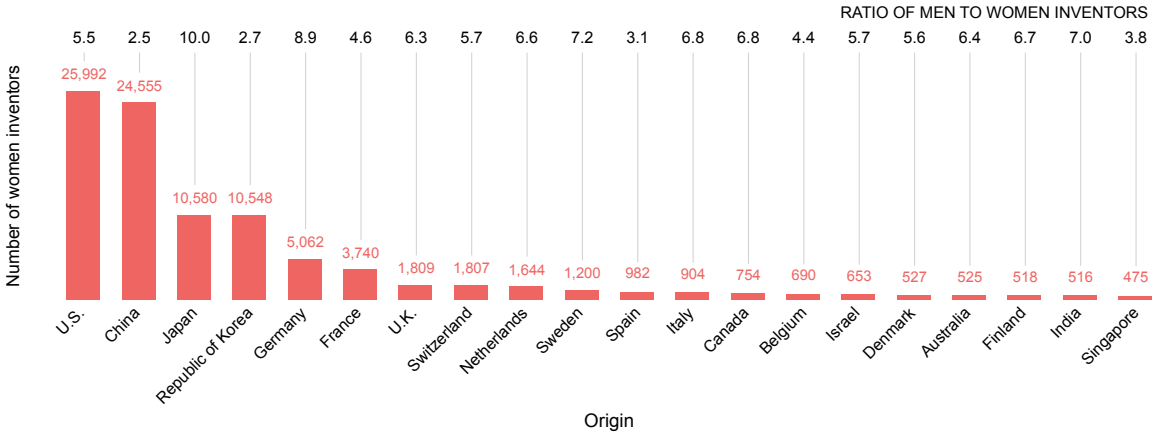
A25. Share of PCT applications with women inventors by field of technology, 2017

Note: For further details on methodology, refer to Martínez, G.L., J. Raffo and K. Saito (2016). Identifying the Gender of PCT Inventors. *WIPO Economic Research Working Paper No. 33*. Geneva: WIPO. Available at: *www.wipo.int/publications/en/details.jsp?id=4125&plang=EN*. 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 2018.

Although Japan had the third highest number of women inventors listed in PCT applications, it had a ratio of one woman for every 10 men listed.

A26. Number of women inventors and ratio of men to women inventors for the top 20 origins, 2017



Note: For further details on methodology, refer to *Economic Research Working Paper No. 33, Identifying the Gender of PCT Inventors* (WIPO, 2017), available at: *www.wipo.int/econ_ stat/en/economics*.

Source: WIPO Statistics Database, March 2018.

Statistical table

A27. PCT applications by office and origin, 2016–2017

Name	PCT applications filed in 2017 (international phase)		PCT applications filed in 2016 (international phase)	
	at receiving office	by country of origin	at receiving office	by country of origin
African Intellectual Property Organization	3	n.a.	2	n.a.
African Regional Intellectual Property Organization	1	n.a.	0	n.a.
Albania	1	7	0	0
Algeria	10	12	11	13
Andorra	0	5	0	8
Antigua and Barbuda	0	57	0	0
Argentina	0	36	0	46
Armenia	4	5	4	9
Australia	1,756	1,850	1,703	1,835
Austria	454	1,397	507	1,422
Azerbaijan	8	11	3	4
Bahamas	0	6	0	5
Bahrain	0	1	0	6
Barbados (c)	n.a.	67	n.a.	114
Belarus	23	28	8	14
Belgium	49	1,349	55	1,219
Belize	0	2	0	8
Bosnia and Herzegovina	3	6	1	4
Botswana	0	1	0	1
Brazil	560	593	528	567
Brunei Darussalam	0	2	1	5
Bulgaria	38	50	29	58
Burundi	0	0	0	2
Cambodia	0	1	0	0
Cameroon (d)	n.a.	1	n.a.	2
Canada	1,871	2,382	1,859	2,336
Chad (d)	n.a.	1	n.a.	0
Chile	142	168	163	197
China	50,674	48,882	44,462	43,091

(Continued)

(A27 continued)

Name	PCT applications filed in 2017 (international phase)		PCT applications filed in 2016 (international phase)	
	at receiving office	by country of origin	at receiving office	by country of origin
Colombia	12	142	10	100
Congo (d)	n.a.	0	n.a.	1
Costa Rica	2	10	1	4
Côte d'Ivoire (d)	n.a.	2	n.a.	2
Croatia	19	35	27	39
Cuba	8	8	2	2
Cyprus	3	51	2	37
Czech Republic	144	184	180	199
Democratic People's Republic of Korea	0	0	4	4
Democratic Republic of the Congo	0	0	0	1
Denmark	475	1,431	524	1,356
Djibouti	0	0	1	0
Dominican Republic	8	13	5	6
Ecuador	0	4	2	9
Egypt	35	36	40	44
El Salvador	0	1	1	1
Estonia	8	47	3	24
Eurasian Patent Organization	4	n.a.	3	n.a.
European Patent Office	36,714	n.a.	35,288	n.a.
Finland	982	1,595	969	1,525
France	3,827	8,012	3,606	8,210
Gabon (d)	n.a.	0	n.a.	1
Georgia	9	10	12	13
Germany	1,577	18,982	1,533	18,307
Ghana	0	0	0	2
Greece	68	109	68	111
Guatemala	0	1	0	2
Guinea (d)	n.a.	1	n.a.	0
Honduras	0	0	0	1
Hungary	111	147	148	177
Iceland	14	38	20	56
India	760	1,603	738	1,528
Indonesia	4	8	7	8
International Bureau	10,212	0	10,022	0
Iran (Islamic Republic of)	2	88	2	62
Iraq	0	2	0	1
Ireland	15	477	23	441
Israel	1,420	1,820	1,425	1,838
Italy	315	3,212	309	3,362
Jamaica	0	1	0	0
Japan	47,425	48,208	44,495	45,209
Jordan	1	6	0	1
Kazakhstan	24	24	19	21
Kenya	3	8	2	4
Kuwait	0	4	0	3
Lao People's Democratic Republic (c)	n.a.	0	n.a.	2
Latvia	1	27	3	24
Lebanon	0	5	0	6
Liberia	0	1	0	0
Libya	0	3	0	0
Liechtenstein (b)	n.a.	263	n.a.	249
Lithuania	0	30	2	28
Luxembourg	0	498	1	431
Malawi	0	0	0	1
Malaysia	129	141	180	189
Malta	1	97	0	87
Mauritius	0	3	0	4
Mexico	198	269	214	289
Micronesia (Federated States of)	0	0	0	2
Monaco	0	16	0	13
Mongolia	0	0	0	1
Montenegro (c)	n.a.	1	n.a.	3
Morocco	44	48	31	35

(A27 continued)

Name	PCT applications filed in 2017 (international phase)		PCT applications filed in 2016 (international phase)	
	at receiving office	by country of origin	at receiving office	by country of origin
Mozambique (a)	n.a.	0	n.a.	1
Namibia (a)	n.a.	2	n.a.	2
Netherlands	903	4,431	950	4,676
New Zealand	180	274	210	307
Nigeria (c)	n.a.	6	n.a.	4
Norway	376	821	300	653
Oman	1	3	3	8
Pakistan	0	3	0	0
Panama	2	9	4	60
Peru	15	15	25	24
Philippines	10	18	14	29
Poland	207	330	218	344
Portugal	55	201	46	184
Qatar	8	26	8	14
Republic of Korea	15,830	15,763	15,595	15,555
Republic of Moldova	8	8	7	10
Romania	12	22	27	44
Russian Federation	1,051	1,097	1,023	894
Saint Kitts and Nevis	0	1	0	0
Samoa	0	1	0	1
San Marino	1	5	6	8
Saudi Arabia	26	378	20	294
Senegal (d)	n.a.	4	n.a.	7
Serbia	18	19	15	15
Seychelles	0	4	0	3
Singapore	665	867	646	864
Slovakia	24	52	19	55
Slovenia	45	99	29	69
South Africa	103	301	85	287
Spain	1,005	1,399	1,088	1,507
Sri Lanka (c)	n.a.	19	n.a.	16
Sudan	4	10	0	0
Sweden	1,417	3,981	1,392	3,720
Switzerland	109	4,491	160	4,367
Syrian Arab Republic	0	1	0	2
Thailand	92	157	108	155
The Former Yugoslav Republic of Macedonia	0	2	1	3
Togo (d)	n.a.	1	n.a.	0
Trinidad and Tobago	0	3	0	38
Tunisia	8	9	5	6
Turkey	909	1,235	805	1,065
Ukraine	134	141	153	162
United Arab Emirates (c)	n.a.	94	n.a.	81
United Kingdom	3,941	5,567	4,008	5,502
United States of America	56,158	56,624	56,678	56,594
Uruguay	0	13	0	14
Uzbekistan	2	4	1	2
Vanuatu	0	1	0	0
Venezuela (Bolivarian Republic of)	0	2	0	1
Viet Nam	9	22	6	10
Yemen	0	0	0	1
Zimbabwe	0	21	0	2
Others	0	301	0	211
Total	**243,500**	**243,500**	**232,913**	**232,913**

(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: Total PCT applications for 2017 are WIPO estimates.

Source: WIPO Statistics Database, March 2018.

Section B
Statistics on PCT national phase entries

Highlights

After six years of growth, PCT national phase entries decreased by 1.4% in 2016

There were an estimated 615,400 PCT national phase entries (NPEs) in 2016, a 1.4% decrease on the previous year (see figure B1).[1] This marks the first decline in NPEs since 2009. Filings originating in the U.S. accounted for the bulk of the total decrease: NPEs originating in the U.S. fell from 192,933 in 2015 to 174,417 in 2016.

NPEs initiated by non-resident applicants represented about 83% of the total in 2016. 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 the United States Patent and Trademark Office (USPTO). For example, the share of NPEs initiated at the JPO by Japan-resident applicants has more than doubled from 15.2% in 2004 to 37% in 2016 (see figure B12).

Europe accounted for around a third of all PCT national phase entries

Countries and territories located in Europe accounted for the largest share of PCT NPEs (34.0%) in 2016, followed by those in Asia (32.1%) and North America (29.8%). The combined share of countries and territories located in Africa, Latin America and the Caribbean (LAC) and Oceania was 2%. Between 2006 and 2016, Asia's share increased by almost 12 percentage points (see figure B3).

Around a quarter of all PCT NPEs were destined for the U.S.

The USPTO remained the office receiving the most applications via the PCT System in 2016, with 146,867 NPEs – 24% of all NPEs initiated worldwide (see figure B9).

The USPTO was followed by the European Patent Office (EPO; 94,625), the State Intellectual Property Office of the People's Republic of China (SIPO; 81,055), the JPO (59,893) and the Korean Intellectual Property Office (KIPO; 37,093). Combined, the top five offices accounted for about 68% of all NPEs initiated in 2016.

The list of the top 20 offices includes patent offices from 10 high-income countries and territories and 10 middle-income countries and territories. Aside from SIPO, the offices among middle-income origins that had the most PCT NPEs were those of India (25,896), Brazil (19,857), Mexico (12,884) and the Russian Federation (11,638).

All six geographical regions were represented among the top 20 offices: 10 offices were located in Asia, 3 in Europe and 1 in Africa. LAC, North America and Oceania each counted 2 offices (see figure B10).

Only three of the top 20 offices – the offices of the U.S. (+6.9%), South Africa (+5.7%) and Viet Nam (+3.5%) – received more NPEs via the PCT System in 2016 than in 2015. Among the 17 offices that saw a reduction in PCT NPEs, those of Brazil (–11.6%) and the Russian Federation (–10.1%) recorded double-digit declines, and the Philippines (–9.8%), Israel (–8.1%) and Canada (–8.1%) also experienced marked decreases. The decrease in NPEs at these offices was mostly due to fewer filings from U.S.-based applicants; for example, 46% of the total reduction in NPEs at the office of Brazil resulted from a decrease in NPE filings by U.S.-based applicants.

1 National phase data from national and regional intellectual property (IP) offices are available only up to 2016.

Despite a 9.6% decrease, U.S.-based applicants initiated the largest number of PCT national phase entries

In 2016, applicants residing in the U.S. initiated about 174,417 NPEs, a 9.6% decrease on the previous year (see table B7). The U.S. was followed by applicants from Japan (121,006), Germany (58,386), China (34,395) and France (29,859).

Among the top 20 origins, China (+24.4%) reported the greatest annual growth in NPEs – it has now experienced over 20% growth for three consecutive years. The Republic of Korea (+8.7%) and India (+8.3%) also reported strong growth in NPEs. U.S.-based applicants recorded their first drop in NPEs since 2009. Sweden (–5.3%) and Denmark (–3.8%) also saw substantial declines in NPEs (see figure B6).

Of the 146,453 NPEs received at the USPTO, applicants residing in Japan (21.8%) and the U.S. (20.9%) each accounted for around one-fifth of the total (see figure B12). In addition, U.S.-based applicants accounted for the largest shares of NPEs at 15 of the top 20 offices, and applicants residing in Japan accounted for the largest shares at the remaining 5 offices. Specifically, U.S.-based applicants accounted for more than 45% of all NPEs initiated at the offices of Canada and Mexico. Japan-based applicants accounted for 47% of all NPEs initiated at the office of Germany and 40% of those initiated at the office of Viet Nam.

The PCT System accounted for 56.2% of all non-resident filings in 2016

An estimated 512,200 non-resident NPEs were initiated worldwide in 2016 (the PCT route). By comparison, about 398,900 patent applications were filed directly at offices by non-resident applicants (the "Paris route"). Thus, 56.2% of non-resident applications were filed via the PCT route in 2016, which is slightly lower than the share in 2015 (57.6%) but considerably higher than in 2002 (47.8%). The long-term data show that the number of filings via both routes has trended upward, although the PCT route has grown at a faster pace. On average, the Paris route grew by 2.3% per year from 2002 to 2016, whereas the share of PCT NPEs in non-resident applications increased by 4.8% per year over the same period (see figure B13).

Among 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 (95.5%) and South Africa (90.4%) having the highest shares, and those of Germany (26.5%), the U.K. (27.4%) and the U.S. (37.5%) reporting the lowest shares (see figure B15).

When looking at the top 20 origins of applications filed abroad, applicants from Sweden (71.5%), France (67.8%) and the Netherlands (67.8%) relied most heavily on the PCT route when filing internationally, whereas those from India (31.5%) and the Republic of Korea (34.3%) had the lowest shares of filings abroad using the PCT route (see figure B14).

Applicants residing in Belgium, Israel, the Netherlands and Switzerland tended to initiate a large number of PCT NPEs for each PCT application filed, with more than four NPEs per PCT application on average. In contrast, applicants from China and the Republic of Korea averaged just 1.2 and 1.8 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 created the largest number of foreign-oriented patent families (see Glossary) using the PCT route, with 4,852 foreign-oriented patent families created between 2012 and 2014 (see figure B17). It was followed by Samsung Electronics of the Republic of Korea (3,796) and Mitsubishi Electric Corporation of Japan (3,522).

Among the top 50 applicants in terms of foreign-oriented patent families, ZTE Corporation of China (99.7%) had the highest share of foreign-oriented patent families using the PCT route (see figure B18). It was followed by three U.S.-based companies – Qualcomm Incorporated (97.3%), Halliburton Energy (97.1%) and Hewlett-Packard Development (92.2%) – then LG Chemical of the Republic of Korea (92.2%) and Huawei Technologies of China (92.1%).

Global trends in PCT national phase entries

National phase entries by origin

National phase entries by office

Patent applications by filing route

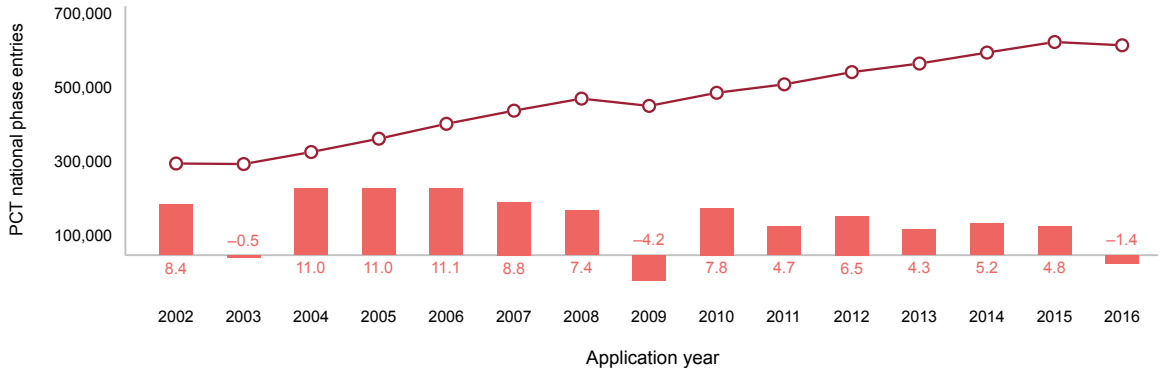
Top applicants in foreign-oriented patent families

Statistical table

Global trends in PCT national phase entries

Following six consecutive years of growth, PCT national phase entries saw a small decline in 2016.

B1. Trend in PCT national phase entries, 2002–2016

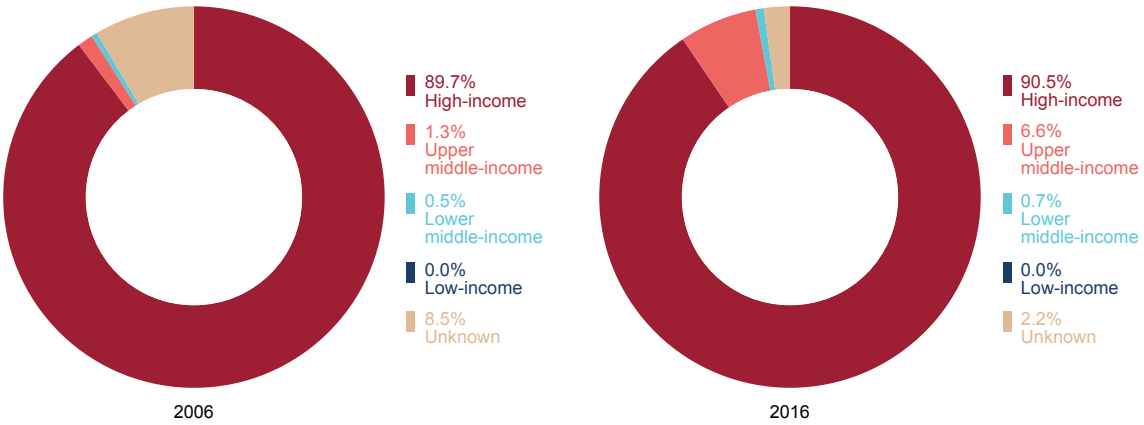


Note: These are WIPO estimates. National phase data from national and regional intellectual property (IP) offices are only available up to 2016.

Source: WIPO Statistics Database, March 2018.

High-income economies initiated the bulk of national phase entries.

B2. PCT national phase entries by income group, 2006 and 2016

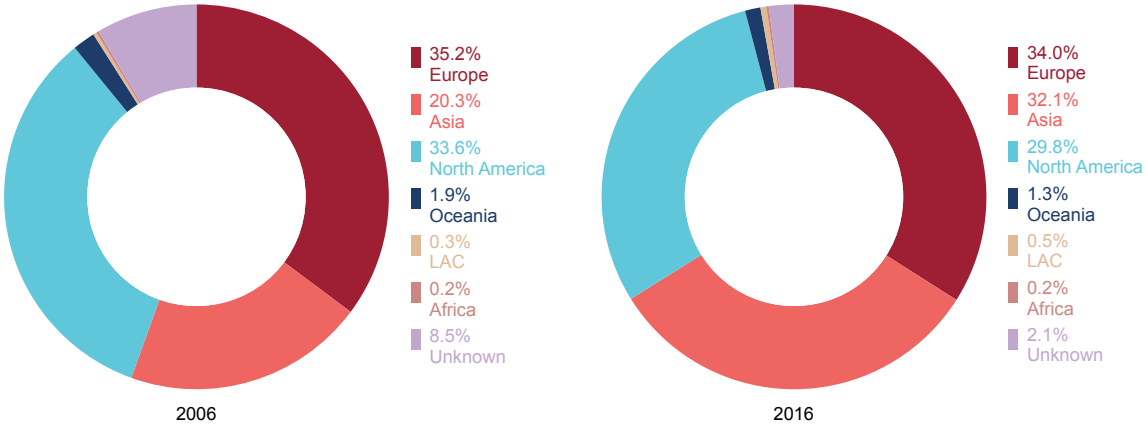


Note: Each category includes the following number of origins: high-income (64), upper middle-income (40), lower middle-income (29) and low-income (9). For information on income group classification, see the Data description section.

Source: WIPO Statistics Database, March 2018.

Europe and Asia each accounted for around a third of all PCT national phase entries in 2016.

B3. PCT national phase entries by region, 2006 and 2016



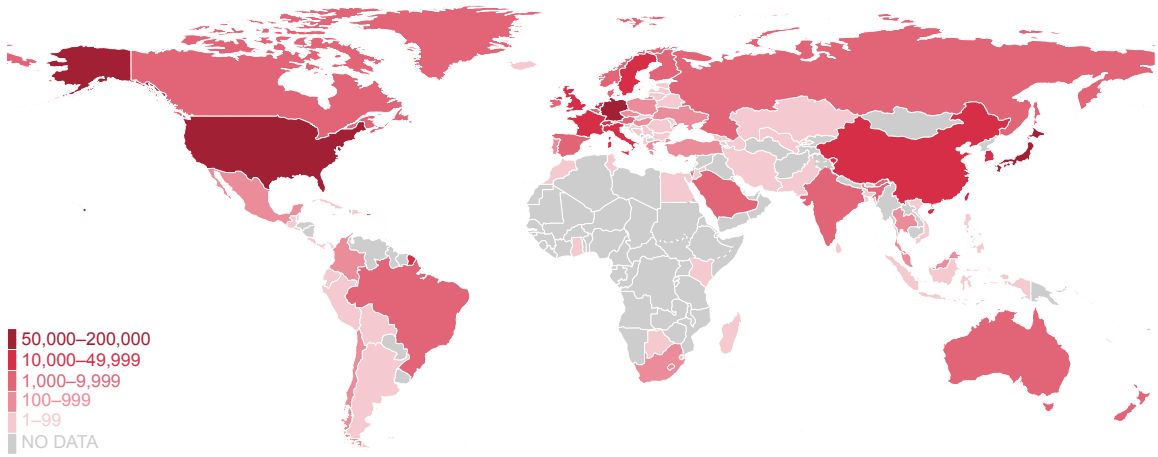
Note: Each region includes the following number of origins: Africa (23), Asia (40), Europe (44), Latin America and the Caribbean (LAC; 26), North America (3) and Oceania (6).

Source: WIPO Statistics Database, March 2018.

National phase entries by origin

More than 100 origins initiated at least one PCT national phase entry in 2016.

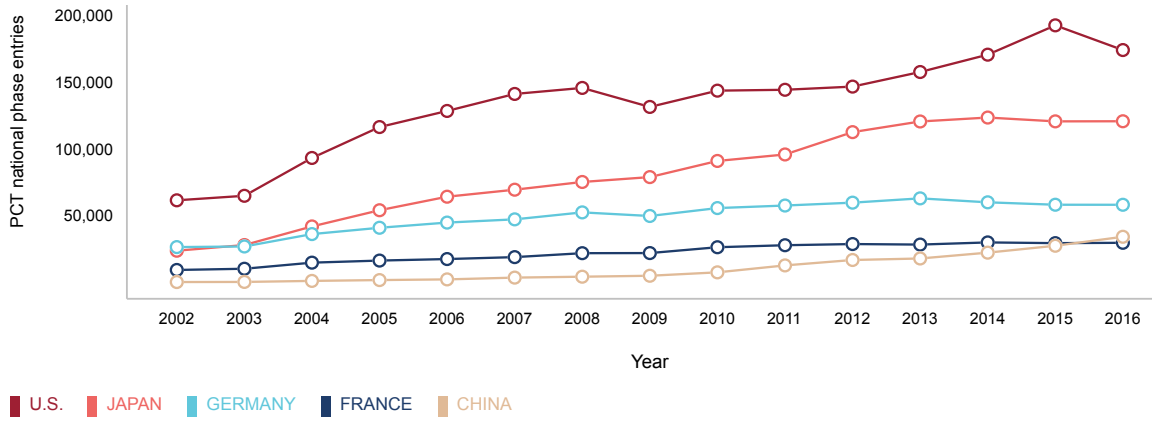
B4. PCT national phase entries by origin, 2016



Source: WIPO Statistics Database, March 2018.

The top five origins accounted for more than two-thirds of all PCT national phase entries in 2016.

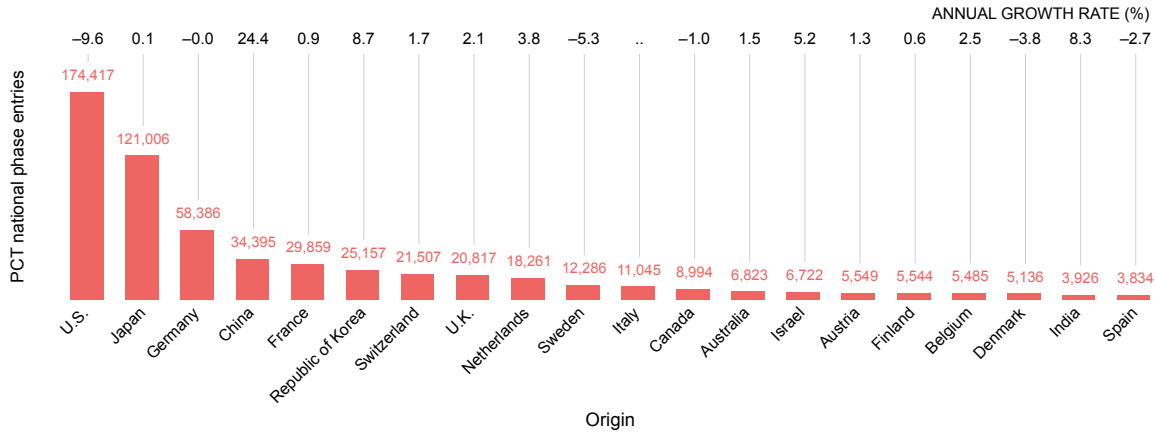
B5. Trends in PCT national phase entries for the top five origins, 2002–2016



Source: WIPO Statistics Database, March 2018.

Among the top 20 origins, China reported the fastest growth in PCT national phase entries, marking three consecutive years of growth exceeding 20%.

B6. PCT national phase entries for the top 20 origins, 2016



.. indicates data are unknown.

Source: WIPO Statistics Database, March 2018.

Latin America and the Caribbean was the region with the greatest decrease in PCT national phase entries in 2016.

B7. PCT national phase entries for the top origins by region, 2014–2016

Region	Origin	2014	2015	2016	Regional share 2016 (%)	Change from 2015 (%)
Africa	South Africa	1,364	1,018	966	83.4	–5.1
	Mauritius	17	21	50	4.3	138.1
	Egypt	32	47	21	1.8	–55.3
	Others	223	106	121	10.4	14.2
	Total*	**1,636**	**1,192**	**1,158**	**0.2**	**–2.9**
Asia	Japan	123,787	120,930	121,006	61.2	0.1
	China	22,473	27,656	34,395	17.4	24.4
	Republic of Korea	21,090	23,147	25,157	12.7	8.7
	Israel	6,055	6,391	6,722	3.4	5.2
	India	3,681	3,625	3,926	2.0	8.3
	Singapore	2,581	2,605	2,880	1.5	10.6
	Saudi Arabia	945	776	1,127	0.6	45.2
	Turkey	814	940	994	0.5	5.7
	China, Hong Kong SAR	279	343	341	0.2	–0.6
	Malaysia	682	441	335	0.2	–24.0
	Others	928	1,077	997	0.5	–7.4
	Total*	**183,315**	**187,931**	**197,880**	**32.1**	**5.3**
Europe	Germany	60,224	58,408	58,386	27.9	0.0
	France	30,153	29,607	29,859	14.3	0.9
	Switzerland	21,095	21,143	21,507	10.3	1.7
	United Kingdom	20,277	20,395	20,817	9.9	2.1
	Netherlands	18,035	17,589	18,261	8.7	3.8
	Sweden	12,663	12,967	12,286	5.9	–5.3
	Italy	10,370	..	11,045	5.3	n.a.
	Austria	5,302	5,477	5,549	2.6	1.3
	Finland	6,093	5,510	5,544	2.6	0.6
	Belgium	5,419	5,351	5,485	2.6	2.5
	Denmark	5,662	5,339	5,136	2.5	–3.8
	Spain	4,072	3,942	3,834	1.8	–2.7
	Others	10,982	11,637	11,742	5.6	0.9
	Total*	**210,347**	**208,012**	**209,451**	**34.0**	**0.7**
Latin America and the Caribbean	Brazil	1,292	1,234	1,136	40.1	–7.9
	Mexico	487	569	526	18.6	–7.6
	Chile	406	283	370	13.1	30.7
	Barbados	364	324	258	9.1	–20.4
	Colombia	147	191	150	5.3	–21.5
	Others	467	571	391	13.8	–31.5
	Total*	**3,163**	**3,172**	**2,831**	**0.5**	**–10.8**
North America	United States of America	170,928	192,933	174,417	95.1	–9.6
	Canada	8,920	9,084	8,994	4.9	–1.0
	Others	77	75	46	0.0	–38.7
	Total*	**179,925**	**202,092**	**183,457**	**29.8**	**–9.2**
Oceania	Australia	6,940	6,725	6,823	82.9	1.5
	New Zealand	1,307	1,431	1,390	16.9	–2.9
	Others	12	19	15	0.2	–21.1
	Total*	**8,259**	**8,175**	**8,228**	**1.3**	**0.6**
Unknown*		9,055	13,726	12,395	2.1	–9.7
World (estimates)		**595,700**	**624,300**	**615,400**	**100.0**	**–1.4**

Note: World totals are WIPO estimates. The table shows the top origins for each region. Data for all origins are reported in table B19.

* indicates share of world total.

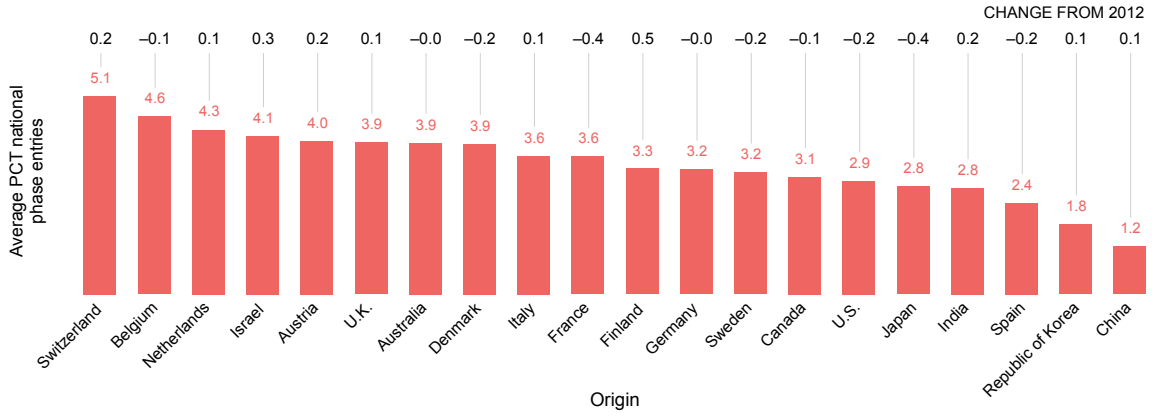
.. indicates data are unknown.

n.a. indicates not applicable.

Source: WIPO Statistics Database, March 2018.

Applicants residing in Belgium, Israel, the Netherlands and Switzerland initiated more than four NPEs per PCT application on average.

B8. Average number of national phase entries per PCT application for selected origins, 2016



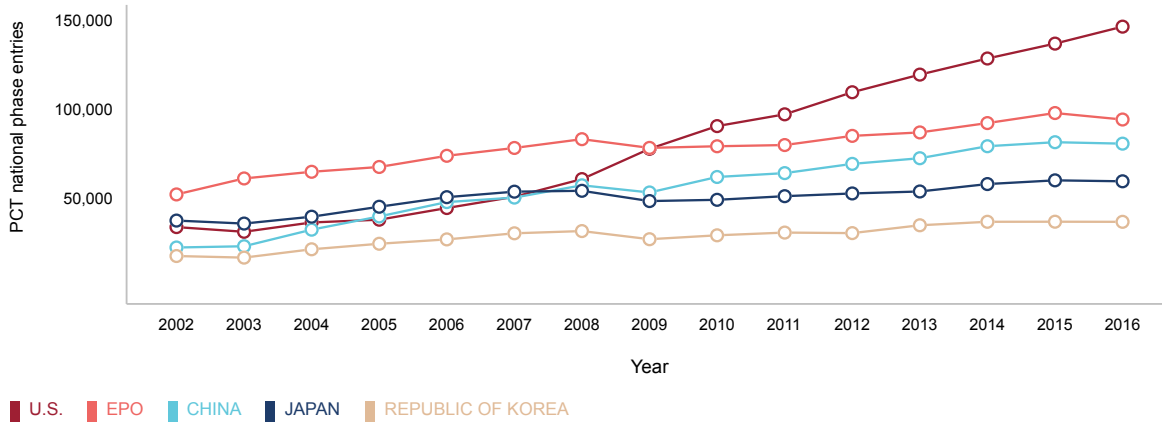
Note: The average is defined as the number of NPEs initiated in 2016 divided by the average number of PCT applications filed in the two preceding years.

Source: WIPO Statistics Database, March 2018.

National phase entries by office

Around a quarter of all PCT national phase entries were destined for the U.S.

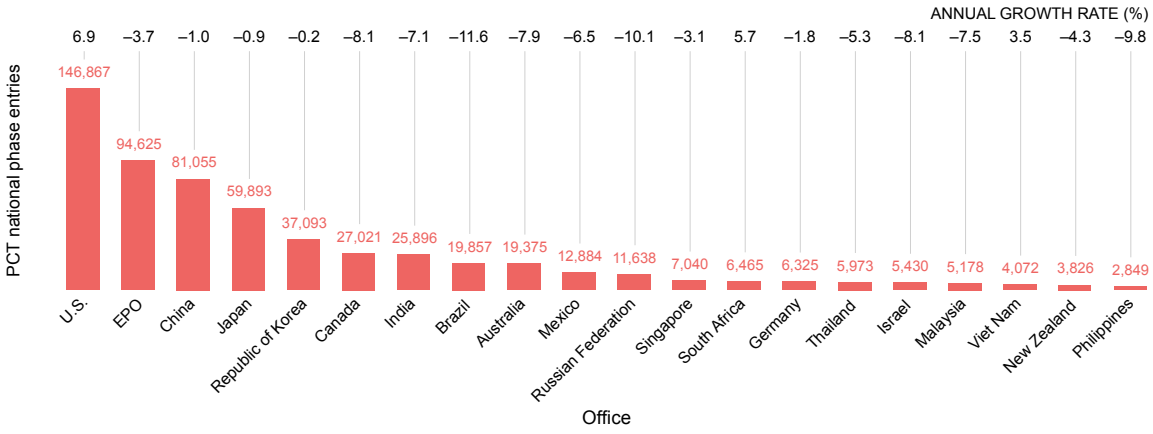
B9. Trends in PCT national phase entries for the top five offices, 2002–2016



Source: WIPO Statistics Database, March 2018.

Among the top 20 offices, only the offices of South Africa, the U.S. and Viet Nam exhibited growth in PCT national phase entries in 2016.

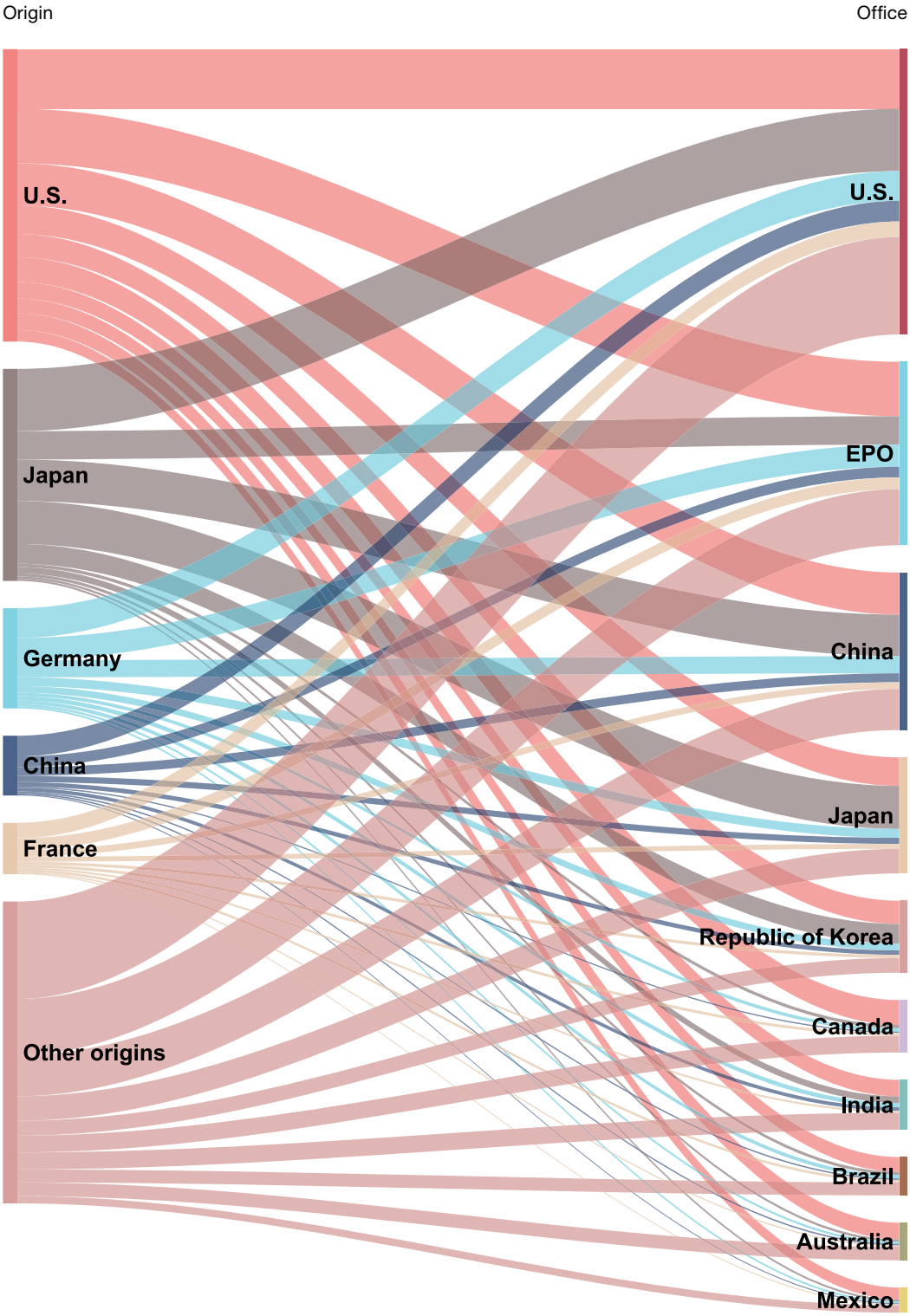
B10. PCT national phase entries for the top 20 offices, 2016



Source: WIPO Statistics Database, March 2018.

More than a third of all PCT national phase entries received by the offices of Brazil and India originated from U.S.-based applicants.

B11. Flow of national phase entries for the top 10 offices and the top five origins, 2016



Note: This graph shows the top 10 offices for which NPE data by origin are available.

Source: WIPO Statistics Database, March 2018.

Applicants residing in Japan initiated the largest share of PCT national phase entries at the Japan Patent Office (JPO), with 37% of total national phase entries.

B12. Flow of national phase entries for the top 10 offices and the top 20 origins as a percentage of total national phase entries at respective offices, 2016

Origin	Office									
	U.S.	EPO	China	Japan	Republic of Korea	Canada	India	Brazil	Australia	Mexico
U.S.	20.9	29.7	26.7	24.6	32.3	47.4	33.1	38.4	44.2	46.5
Japan	21.8	15.5	26.4	37.0	27.4	6.2	13.2	7.8	6.2	8.0
Germany	10.4	12.1	10.9	7.6	9.3	6.5	8.7	9.6	6.0	7.7
China	7.2	5.8	5.7	5.3	6.2	2.5	7.3	3.8	4.0	4.2
France	5.5	6.4	4.2	4.3	4.2	5.4	3.7	6.5	3.5	4.1
Republic of Korea	6.1	3.8	6.1	4.4	3.1	1.1	4.1	1.3	1.6	1.3
Switzerland	1.8	3.2	3.0	2.7	3.0	4.3	4.3	6.1	4.8	6.3
U.K.	4.9	3.5	2.1	2.1	2.2	3.8	3.6	3.2	4.8	2.3
Netherlands	2.5	3.3	3.1	3.2	2.2	1.9	5.2	4.7	2.5	3.2
Sweden	2.4	2.5	1.8	1.0	1.4	1.4	2.9	2.9	2.3	1.7
Italy	2.0	2.3	1.4	1.1	1.2	1.8	1.9	2.9	1.4	2.2
Canada	2.0	1.2	0.9	0.6	0.8	5.7	1.1	1.0	2.0	1.4
Australia	1.3	0.7	0.6	0.5	0.5	1.5	0.9	0.8	5.2	0.8
Israel	1.7	1.0	0.7	0.6	0.6	1.1	1.1	0.9	1.2	0.8
Austria	0.8	1.0	0.8	0.5	0.7	0.8	1.0	1.0	0.9	1.0
Finland	1.0	1.2	0.9	0.6	0.7	0.9	0.8	0.8	0.8	0.6
Belgium	1.1	0.9	0.7	0.5	0.7	1.1	1.0	1.4	1.1	0.9
Denmark	1.0	0.9	0.8	0.4	0.4	0.9	1.1	1.0	0.9	0.9
India	1.0	0.5	0.2	0.3	0.3	0.5	0.5	0.7	0.8	0.8
Spain	0.7	0.7	0.4	0.3	0.3	0.6	0.5	0.8	0.6	1.3
Other origins	3.9	3.9	2.6	2.2	2.6	4.5	3.8	4.3	5.3	3.9

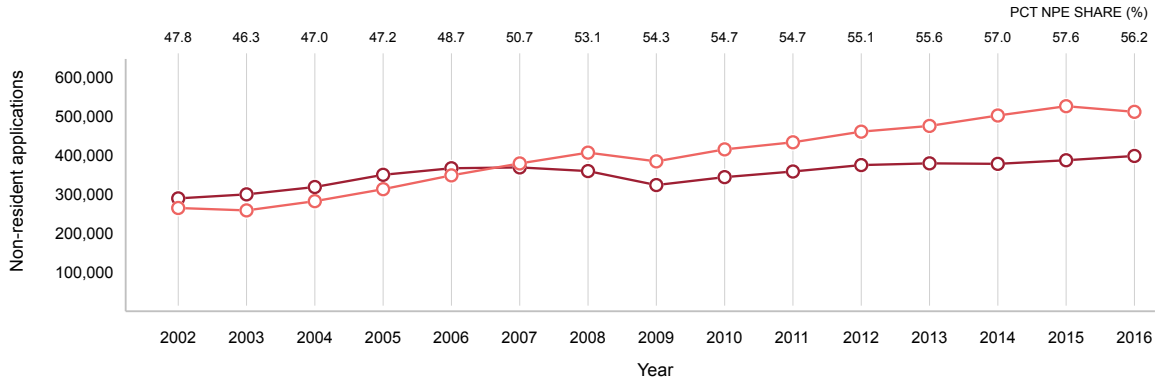
Note: This table shows the top 10 offices for which NPE origin data are available.

Source: WIPO Statistics Database, March 2018.

Patent applications by filing route

PCT national phase entries accounted for 56.2% of all non-resident filings in 2016.

B13. Trend and share of PCT national phase entries in non-resident applications by filing route, 2002–2016

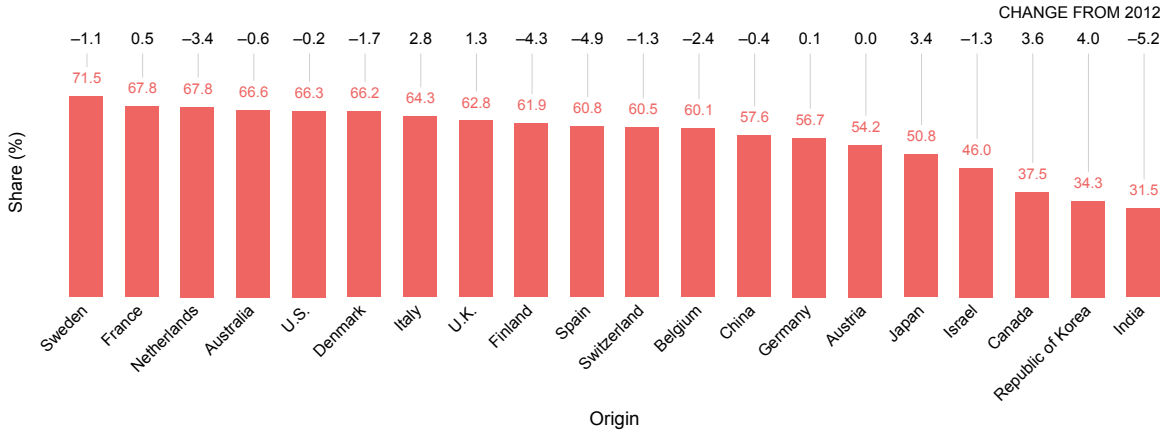


Note: These data are WIPO estimates.

Source: WIPO Statistics Database, March 2018.

Applicants from Sweden filed about 72% of their applications abroad using the PCT System.

B14. Share of PCT national phase entries in total filings abroad for selected origins, 2016

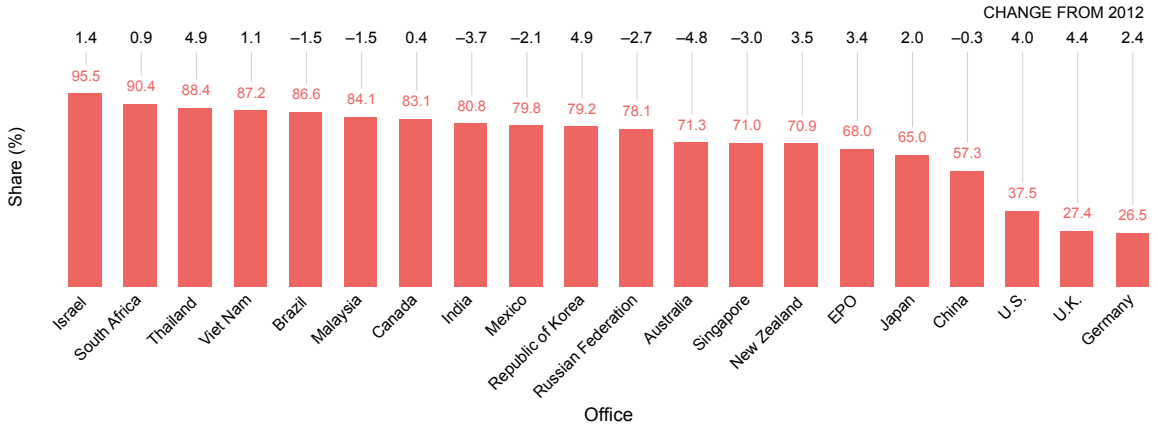


Note: The share is defined as the number of PCT NPEs initiated abroad divided by the total number of patent applications filed abroad. It includes data from the 20 origins that filed the most applications abroad in 2016.

Source: WIPO Statistics Database, March 2018.

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

B15. Share of PCT national phase entries in total non-resident filings by office, 2016



Note: The share is defined as non-resident PCT NPEs 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 2016; that is, data from countries that are members of the PCT System and that provided data broken down by filing route.

Source: WIPO Statistics Database, March 2018.

Applicants from Germany used the PCT route for nearly half of their filings at the United States Patent and Trademark Office.

B16. Share of PCT national phase entries in total non-resident filings for the top 10 origins and the top 20 offices, 2016

Office \ Origin	U.S.	Japan	Germany	Republic of Korea	China	France	Switzerland	U.K.	Netherlands	Canada
U.S.		37.1	48.9	24.0	40.8	62.1	50.9	50.6	65.8	21.4
China	60.2	54.4	62.0	35.8		74.2	70.4	70.9	79.9	73.2
EPO	69.7	69.3		52.8	76.4					72.5
Japan	61.2		71.0	50.2	82.3	78.7	62.9	71.8	85.1	70.8
Republic of Korea	87.4	68.5	83.4		80.9	87.3	78.9	88.7	88.8	85.7
India	81.1	79.8	77.9	69.0	86.1	84.2	75.5	91.3	95.1	92.6
Canada	79.0	89.7	86.5	93.0	85.6	85.3	92.9	88.6	94.2	
Australia	66.1	74.9	82.6	66.9	86.1	82.7	80.8	79.5	80.1	70.6
Brazil	83.1	83.7	85.4	90.3	93.6	87.7	88.9	90.7	96.2	94.7
Germany	20.8	43.3		10.5	28.1	20.4	4.2	38.7	12.9	67.0
Mexico	72.4	87.5	86.0	73.4	97.5	88.0	84.3	93.4	93.1	79.9
Russian Federation	66.4	78.9	82.4	65.2	94.3	85.3	88.6	87.4	94.2	88.1
Singapore	66.1	72.0	70.5	76.5	81.9	80.5	82.9	73.9	81.0	72.2
U.K.	46.4	33.3	7.0	29.5	32.5	32.7	5.1		14.7	15.7
South Africa	89.6	91.0	94.9	77.8	90.7	91.8	96.1	93.6	89.2	84.9
Malaysia	87.8	77.1	87.6	71.6	86.8	93.2	96.1	97.1	90.3	95.5
Thailand	97.1	83.6	96.3	83.9	70.5	95.2	98.4	97.8	99.3	100.0
New Zealand	65.1	83.6	79.3	83.3	68.5	87.4	87.4	81.1	78.2	66.7
Israel	95.5	99.1	92.8	97.8	92.3	90.5	98.9	97.7	100.0	99.1
Viet Nam	97.1	86.3	95.8	70.1	94.5	94.7	95.7	100.0	100.0	96.8

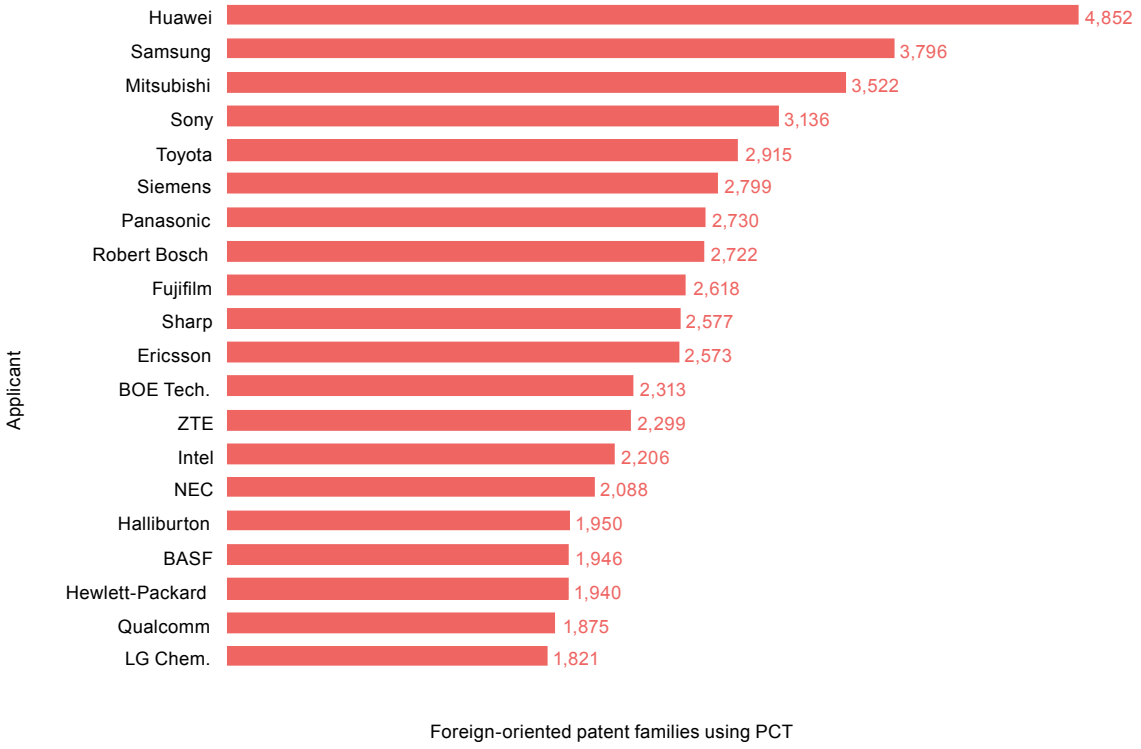
Note: This figure includes data from the 20 offices that received the most non-resident filings in 2016; that is, data from countries that are members of the PCT System and that provided data broken down by filing route. In general, national offices of European Patent Office (EPO) member states receive relatively low proportions of NPEs because applicants may apply via the EPO to seek protection within any EPO member state.

Source: WIPO Statistics Database, March 2018.

Top applicants in foreign-oriented patent families

Huawei Technologies created 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, 2012–2014



Note: The number of patent applications in foreign-oriented patent families as reported in the autumn 2017 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 2018.

Halliburton Energy, Qualcomm Incorporated and ZTE Corporation relied heavily on the PCT System to protect their innovations abroad in the period from 2012 to 2014.

B18. Top 50 applicants in foreign-oriented patent families, 2009–2011 and 2012–2014

		Foreign-oriented patent families		Share of foreign-oriented patent families using the PCT route (%)	
Rank	Applicant	2009–2011	2012–2014	2009–2011	2012–2014
1	SAMSUNG ELECTRONICS CO., LTD.	14,141	17,171	14.1	22.1
2	CANON INC.	9,764	10,602	15.6	9.6
3	TOSHIBA KK	7,836	7,436	14.5	22.4
4	ROBERT BOSCH GMBH	6,555	6,468	57.5	42.1
5	SAMSUNG DISPLAY CO LTD.	1,012	6,310	0.2	0.2
6	SIEMENS AG	5,573	6,285	45.0	44.5
7	SONY CORP.	7,393	5,706	21.5	55.0
8	FUJITSU LTD.	5,164	5,431	28.9	19.5
9	TOYOTA JIDOSHA KABUSHIKI KAISHA	5,197	5,317	82.6	54.8
10	HUAWEI TECHNOLOGIES CO., LTD.	2,663	5,269	94.0	92.1
11	MITSUBISHI ELECTRIC CORP.	3,692	5,021	64.4	70.1
12	SEIKO EPSON CORP.	4,491	4,904	2.2	9.4
13	RICOH CO LTD.	3,721	4,363	10.4	10.3
14	PANASONIC CORP.	9,350	4,183	75.7	65.3
15	FORD GLOBAL TECH LLC	1,549	4,106	3.9	0.9
16	HYUNDAI MOTOR CO LTD.	1,786	4,097	0.6	0.6
17	DENSO CORP.	3,377	4,040	8.3	35.4
18	INTERNATIONAL BUSINESS MACHINES CORP.	5,282	3,998	28.9	19.0
19	HONDA MOTOR CO LTD.	4,262	3,878	31.8	23.1
20	FUJIFILM CORP.	4,819	3,719	36.5	70.4
21	GM GLOBAL TECH OPERATIONS INC.	4,386	3,719	1.0	0.9
22	GEN ELECTRIC	4,801	3,631	14.0	23.1
23	HONGHAI PRECISION INDUSTRY CO., LTD.	6,490	3,562	0.1	0.1
24	KOREA ELECTRONICS TELECOMM	3,671	3,506	11.4	6.2
25	BOE TECHNOLOGY GROUP CO., LTD.	329	3,321	37.7	69.6
26	LG ELECTRONICS INC.	3,585	3,270	40.4	29.8
27	PANASONIC IP MAN CORP.	333	3,220	83.8	55.2
28	SAMSUNG ELECTRO MECH	2,606	3,122	0.0	0.3
29	HITACHI LTD.	3,332	3,105	41.6	50.5
30	SHARP CORP.	5,153	3,010	73.5	85.6
31	TELEFONAKTIEBOLAGET LM ERICSSON (PUBL)	2,511	2,823	91.8	91.1
32	INTEL CORP.	2,030	2,765	82.7	79.8
33	NEC CORP.	2,980	2,392	87.0	87.3
34	ZTE CORP.	2,431	2,306	99.2	99.7
35	SK HYNIX INC.	899	2,270	0.0	0.0
36	ALIBABA GROUP HOLDING LTD.	883	2,258	20.7	25.8
37	BROTHER IND LTD.	2,500	2,242	4.4	3.3
38	HONGFUJIN PRECISION INDUSTRY (SHENZHEN) CO., LTD.	5,548	2,222	0.1	0.2
39	BASF SE	2,238	2,194	88.0	88.7
40	ALCATEL LUCENT	2,199	2,115	54.4	44.8
41	HEWLETT PACKARD DEVELOPMENT CO	1,676	2,104	71.6	92.2
42	HALLIBURTON ENERGY SERV INC.	625	2,008	87.7	97.1
43	KYOCERA DOCUMENT SOLUTIONS INC.	305	2,004	0.7	7.7
44	LG CHEMICAL LTD.	1,030	1,976	87.3	92.2
45	KONINKLIJKE PHILIPS ELECTRONICS N.V.	2,448	1,966	93.6	91.9
46	QUALCOMM INC.	1,359	1,928	95.2	97.3
47	KONICA CORP.	418	1,913	88.5	35.1
48	FUJI XEROX CO LTD.	1,933	1,882	0.2	3.7
49	MURATA MANUFACTURING CO.	1,304	1,840	72.9	73.8
50	OLYMPUS CORP.	1,316	1,798	41.6	74.4

Note: The number of patent applications in foreign-oriented patent families as reported in the autumn 2017 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 2018.

Statistical table

B19. PCT national phase entries by office and origin, 2015–2016

Name	PCT national phase entries in 2016		PCT national phase entries in 2015	
	at designated office	by country of origin	at designated office	by country of origin
Afghanistan	..	..	..	..
African Intellectual Property Organization	361	n.a.	414	n.a.
African Regional Intellectual Property Organization	657	n.a.	738	n.a.
Albania	2	8	2	0
Algeria	535	0	696	13
Andorra	..	2	..	0
Angola	..	..	..	..
Antigua and Barbuda	12	0	10	0
Argentina	..	84	..	130
Armenia	1	12	1	15
Aruba	..	..	..	0
Australia	19,375	6,823	21,033	6,725
Austria	506	5,549	487	5,477
Azerbaijan	8	9	4	10
Bahamas	..	37	..	52
Bahrain	170	4	185	13
Bangladesh	..	13	..	57
Barbados	41	258	45	324
Belarus	44	18	89	15
Belgium (c)	n.a.	5,485	n.a.	5,351
Belize	37	11	26	15
Bermuda	..	..	..	..
Bolivia (Plurinational State of)	..	3	..	..
Bosnia and Herzegovina	..	2	..	..
Botswana	..	1	..	0
Brazil	19,857	1,136	22,468	1,234
Brunei Darussalam	..	..	..	0
Bulgaria	5	53	1	96
Burkina Faso (d)	n.a.	..	n.a.	0
Cabo Verde	..	..	..	0
Cambodia	..	..	..	0
Canada	27,021	8,994	29,393	9,084
Chile	2,401	370	2,700	283
China	81,055	34,395	81,866	27,656
China, Hong Kong SAR	..	341	..	343
China, Macao SAR	..	5	..	1
Colombia	1,583	150	1,855	191
Cook Islands	..	0	..	..
Costa Rica	477	12	569	28
Croatia	6	39	4	38
Cuba	157	81	..	..
Curaçao	..	..	..	..
Cyprus (c)	n.a.	123	n.a.	167
Czech Republic	33	455	22	497
Democratic People's Republic of Korea	..	..	..	..
Democratic Republic of the Congo	..	..	..	0
Denmark	106	5,136	82	5,339
Dominica	..	0	..	..
Dominican Republic	234	1	224	10
Ecuador	284	2	464	1
Egypt	1,172	21	1,312	47
El Salvador	167	3	193	0
Eritrea	..	..	..	..
Estonia	..	70	2	58
Ethiopia	..	0	..	..
Eurasian Patent Organization	2,688	n.a.	2,832	n.a.
European Patent Office	94,625	n.a.	98,278	n.a.
Finland	27	5,544	43	5,510
France (c)	n.a.	29,859	n.a.	29,607

(Continued)

(B19 continued)

Name	PCT national phase entries in 2016		PCT national phase entries in 2015	
	at designated office	by country of origin	at designated office	by country of origin
Gabon (d)	n.a.	..	n.a.	..
Gambia	..	..	..	0
Georgia	174	5	171	22
Germany	6,325	58,386	6,443	58,408
Ghana	17	11	..	0
Greece (c)	n.a.	312	n.a.	274
Grenada	3	0	..	0
Guatemala	253	1	326	2
Holy See	..	..	..	0
Honduras	185	0	224	0
Hungary	17	462	10	496
Iceland	3	96	4	95
India	25,896	3,926	27,882	3,625
Indonesia	7	19	6	45
Iran (Islamic Republic of)	582	11	300	..
Iraq	..	..	..	1
Ireland (c)	n.a.	1,739	n.a.	2,024
Israel	5,430	6,722	5,907	6,391
Italy (c)	n.a.	11,045	n.a.	..
Jamaica	..	2	..	8
Japan	59,893	121,006	60,431	120,930
Jordan	..	36	..	54
Kazakhstan	190	16	..	29
Kenya	56	16	52	19
Kingdom of Eswatini (a)	n.a.	..	n.a.	6
Kuwait	..	..	..	..
Kyrgyzstan	..	0	1	0
Lao People's Democratic Republic	..	..	..	..
Latvia (c)	n.a.	70	n.a.	56
Lebanon	..	..	..	16
Liechtenstein (b)	n.a.	649	n.a.	553
Lithuania (c)	n.a.	45	n.a.	70
Luxembourg	..	1,647	..	1,339
Madagascar	30	1	..	1
Malaysia	5,178	335	5,598	441
Mali (d)	n.a.	..	n.a.	..
Malta (c)	n.a.	234	n.a.	215
Marshall Islands	..	..	..	..
Mauritania (d)	n.a.	..	n.a.	0
Mauritius	..	50	..	21
Mexico	12,884	526	13,787	569
Monaco (c)	n.a.	99	n.a.	77
Mongolia	101	0	115	1
Morocco	883	11	753	18
Mozambique	17	0	27	0
Namibia	..	..	..	0
Nepal	..	0	..	11
Netherlands (c)	n.a.	18,261	n.a.	17,589
New Zealand	3,826	1,390	3,998	1,431
Niger (d)	n.a.	..	n.a.	..
Nigeria	..	..	..	..
Norway	745	2,550	556	2,586
Oman	..	..	..	..
Pakistan	..	3	..	1
Panama	330	31	372	40
Papua New Guinea	..	0	41	1
Paraguay	..	..	..	..
Peru	1,025	56	1,117	32
Philippines	2,849	75	3,158	138
Poland	45	606	42	787
Portugal	8	544	11	401

(B19 continued)

Name	PCT national phase entries in 2016		PCT national phase entries in 2015	
	at designated office	by country of origin	at designated office	by country of origin
Qatar	539	41	..	..
Republic of Korea	37,093	25,157	37,170	23,147
Republic of Moldova	64	2	58	3
Romania	6	82	7	60
Russian Federation	11,638	1,464	12,951	1,414
Rwanda	123	0	..	0
Saint Kitts and Nevis	..	..	..	..
Saint Lucia	..	0	..	..
Saint Vincent and the Grenadines	..	0	7	13
Samoa	..	..	..	0
San Marino	..	18	1	3
Saudi Arabia	2,246	1,127	1,635	776
Serbia	6	35	4	30
Seychelles	..	..	..	..
Sierra Leone	..	0	..	..
Singapore	7,040	2,880	7,264	2,605
Slovakia	6	68	10	108
Slovenia (c)	n.a.	..	n.a.	..
South Africa	6,465	966	6,116	1,018
Spain	73	3,834	138	3,942
Sri Lanka	288	13	263	16
Sudan	..	0	..	1
Sweden	73	12,286	73	12,967
Switzerland	63	21,507	82	21,143
Syrian Arab Republic	27	..	..	10
Thailand	5,973	253	6,304	146
The Former Yugoslav Republic of Macedonia	..	..	..	0
Tonga	..	..	..	0
Trinidad and Tobago	133	9	165	1
Tunisia	336	10	407	18
Turkey	300	994	288	940
Turkmenistan	..	..	..	0
Ukraine	1,673	143	1,992	143
United Arab Emirates	1,336	..	1,651	163
United Kingdom	2,535	20,817	2,418	20,395
United Republic of Tanzania	..	0	..	1
United States of America	146,867	174,417	137,331	192,933
Uruguay	..	..	..	50
Uzbekistan	194	10	213	2
Vanuatu	..	..	..	..
Venezuela (Bolivarian Republic of)	..	..	..	..
Viet Nam	4,072	21	3,935	60
Zimbabwe	..	0	2	0
Others	5,632	13,143	6,445	24,982
Total	**615,400**	**615,400**	**624,300**	**624,300**

(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.

Note: PCT national phase entries by origin; world totals are WIPO estimates. Offices of destination are designated and/or elected offices.

Source: WIPO Statistics Database, March 2018.

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.

Less than half of all PCT applications were published in English

Applicants filed 96.2% of their PCT applications electronically in 2017; the remaining 3.8% of applications were filed on paper (see figure C1). The share of electronic filings has continuously increased since its introduction. In 2003, only 1.0% of PCT applications were filed electronically.

In 2017, less than half of all PCT applications (47.6%) were published in English, followed by Japanese (19.4%) and Chinese (15.7%). These three languages combined represented 82.7% of all applications published (see figure C2). In 2017, the majority of PCT applications were published in languages other than English for the first time since the PCT System began operating in 1978. Since 2002, the share of PCT applications published in English has decreased from nearly 70% to 47.6%. In contrast, the combined share of PCT applications published in the Chinese, Japanese and Korean languages has risen from 21.8% in 2009 – when Korean became a language of publication – to reach 40.9% in 2017.

The IB processed over 95% of PCT applications within three weeks

In 2017, the IB performed the formalities examination of 87.5% of all PCT applications within two weeks of receiving the application, and it processed 95.5% within three weeks. These were among the fastest processing times observed since 2007 (see figure C3).

About 78% of all publications occurred within one week after the expiration of the 18-month period, and nearly all publications (99.6%) occurred within two weeks (see figures C4 and C5). When the international search report (ISR) is not available at the time of publication, the application is republished together with the ISR once it is available. The proportion of those applications that were republished within two months of the receipt of the ISR was 89.5%. Nearly all republications (97.3%) occurred within three months of the IB receiving the ISR.

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 their compliance with PCT formality requirements, receiving the payment of fees, and transmitting copies of the application for further processing to the IB and the international searching authority (ISA).

ePCT-filing portal

By the end of 2017, 53 ROs were accepting PCT filings using the ePCT-filing portal. This figure includes the offices of eight countries which announced that they were prepared to accept such filings in the course of the year: Egypt, Georgia, Italy, Jordan, Morocco, Peru, Slovenia and Switzerland.

In addition to an improved user interface, there were additional new options made available to sign in to ePCT, including one-time generated codes, which are more efficient than digital certificates.

Nineteen of the top 20 offices received the bulk of applications electronically

Among the top 20 ROs, the United States Patent and Trademark Office (USPTO) and the Japan Patent Office (JPO) received over 99% of their PCT applications electronically in 2017, and the share exceeded 95% for 11 of the offices. The office of the Russian Federation was the only office to receive the bulk of its PCT applications on paper (86.6%) (see figure C10).

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

On average, ROs transmitted their PCT applications to the IB within about two-and-a-half weeks from the international filing date (see figure C12). In 2017, Australia and Finland transmitted all their applications to the IB within four weeks. The offices of Israel, Japan, the Republic of Korea, Singapore and the United Kingdom (U.K.) also had extremely high transmittal rates – each sending more than 99.5% of their applications to the IB within a four-week period (see figure C13). In contrast, the offices of Turkey (36.6%) and the Russian Federation (30.5%) transmitted a substantial proportion of their applications to the IB more than eight weeks after the international filing date.

The share of PCT applications ROs transmitted to ISAs within four weeks was above 90% for the JPO (97.8%), the office of Sweden (96%), the USPTO (94.8%) and the European Patent Office (EPO; 91.1%). Of the top 20 ROs, 17 transmitted the majority of their PCT applications to ISAs within this time frame. The three exceptions were the offices of Spain (32.7%), India (21.3%) and the Russian Federation (7.3%) (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 remains the most selected ISA

In 2017, around 231,400 ISRs were issued by the 22 existing ISAs. The EPO issued almost 80,000 ISRs, representing slightly more than a third of the total. It was followed by the JPO (45,949), the State Intellectual Property Office of the People's Republic of China (SIPO; 44,131), the Korean Intellectual Property Office (KIPO; 25,252) and the USPTO (21,082) (see figure C15). Together, these top five ISAs accounted for 93.4% of all ISRs issued in 2017. Among the top 10 ISAs, the office of the Russian Federation (+44.7%) and SIPO (+20.9%) recorded the most pronounced growth, whereas KIPO (–10.5%) experienced the sharpest decrease.

Of all ISRs that were required to be transmitted to the IB within three months from the date of receipt of the application, 84.1% were actually transmitted within this time frame in 2017 (see figure C18). The offices of Japan, Singapore and Ukraine transmitted more than 99.5% of such ISRs within three months.

PCT applications by filing medium and publication language

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

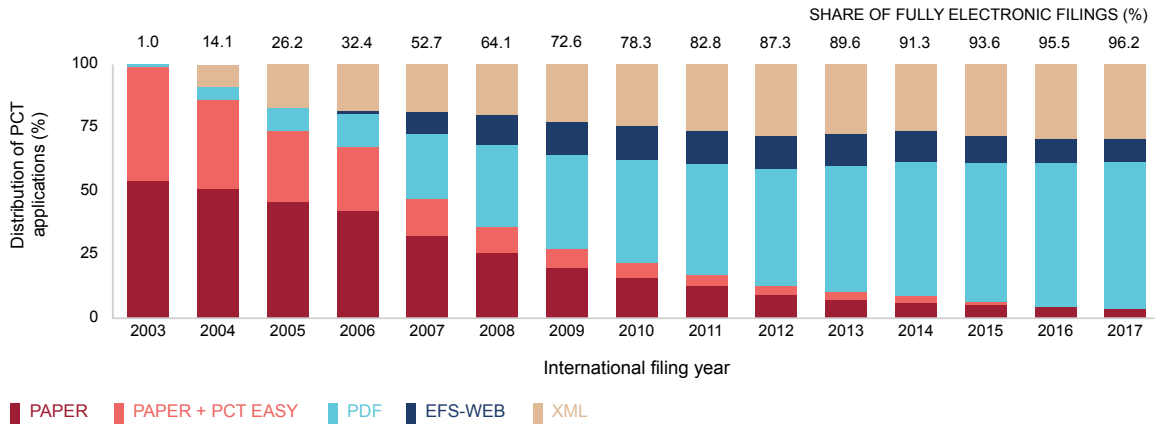
International preliminary examining authorities

PCT-Patent Prosecution Highway pilots

PCT applications by filing medium and publication language

For the second consecutive year, more than 95% of all PCT applications were filed electronically.

C1. Distribution of PCT applications by filing medium, 2003–2017

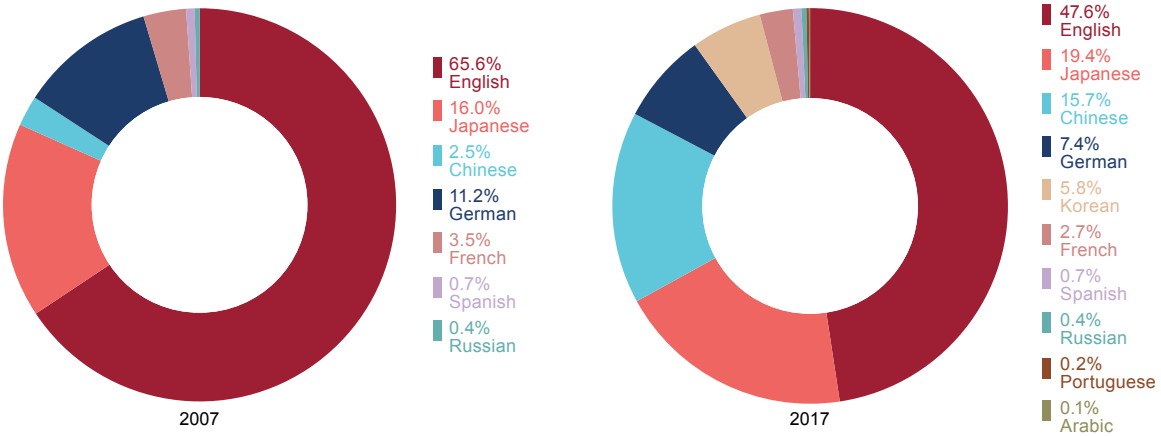


Note: PDF, EFS-WEB and XML are the three fully electronic filing mediums.

Source: WIPO Statistics Database, March 2018.

Almost half of PCT applications were published in English in 2017.

C2. Distribution of PCT applications by language of publication and year of publication, 2007 and 2017

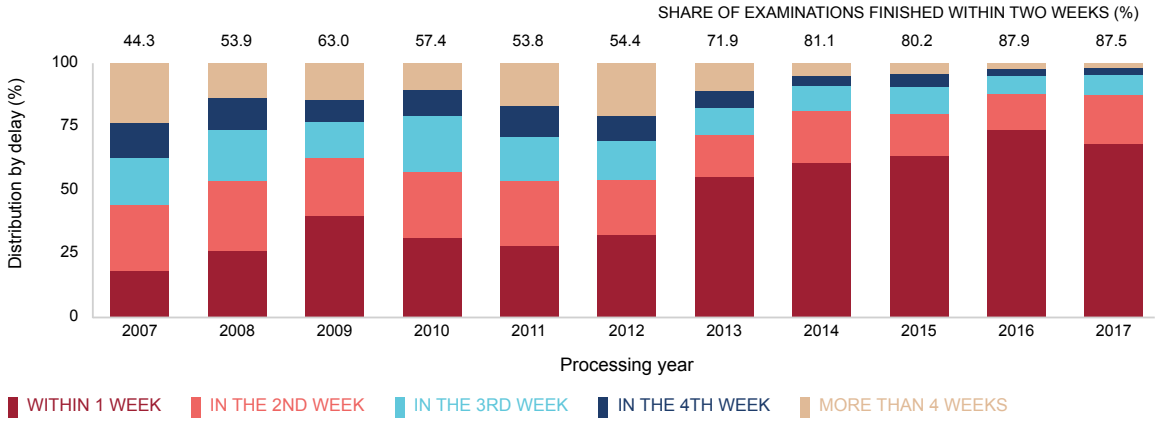


Source: WIPO Statistics Database, March 2018.

Timeliness in processing PCT applications by the International Bureau

The formalities examination was completed within two weeks for 87.5% of PCT applications in 2017.

C3. Timeliness of formalities examination, 2007–2017

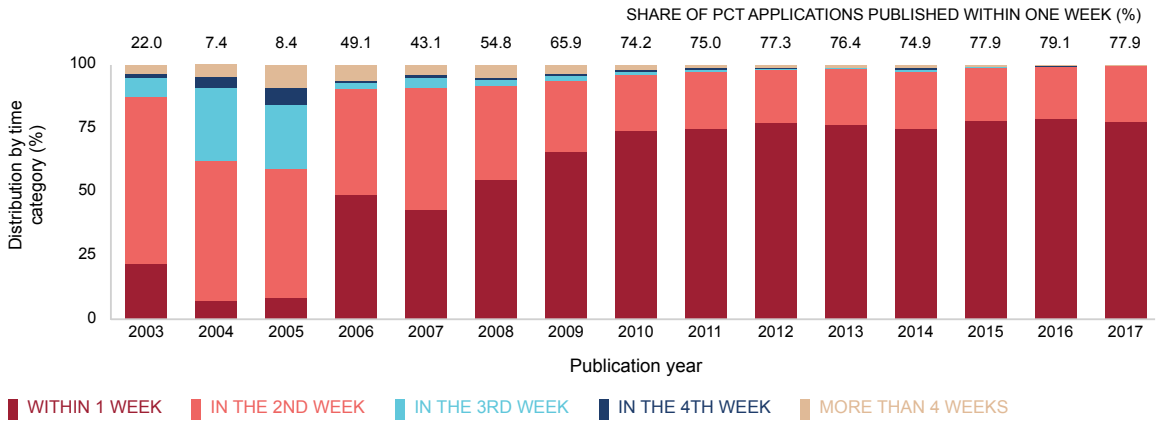


Note: The International Bureau (IB) performs a formality examination of PCT applications and related documents promptly after their receipt. Once the formality examination of a PCT application is completed, the IB sends a form to the applicant acknowledging receipt of the application. Timeliness is calculated 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 2018.

Since 2015, nearly 80% of PCT applications have been published within a week of the expiration of the 18-month limit.

C4. Timeliness in publishing PCT applications, 2003–2017

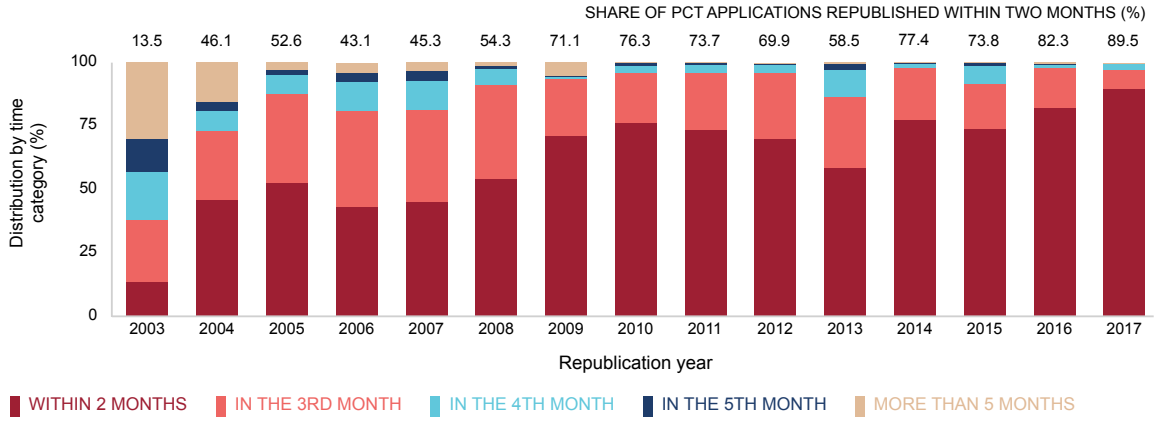


Note: PCT applications and related documents are to be published "promptly" after the expiration of 18 months from the priority date, unless the applicant requests early publication, or the application is withdrawn or considered withdrawn. Timeliness is calculated as the time elapsed between the time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

Source: WIPO Statistics Database, March 2018.

Nearly 90% of republications with international search reports were completed within two months in 2017.

C5. Timeliness in republishing PCT applications with international search reports, 2003–2017



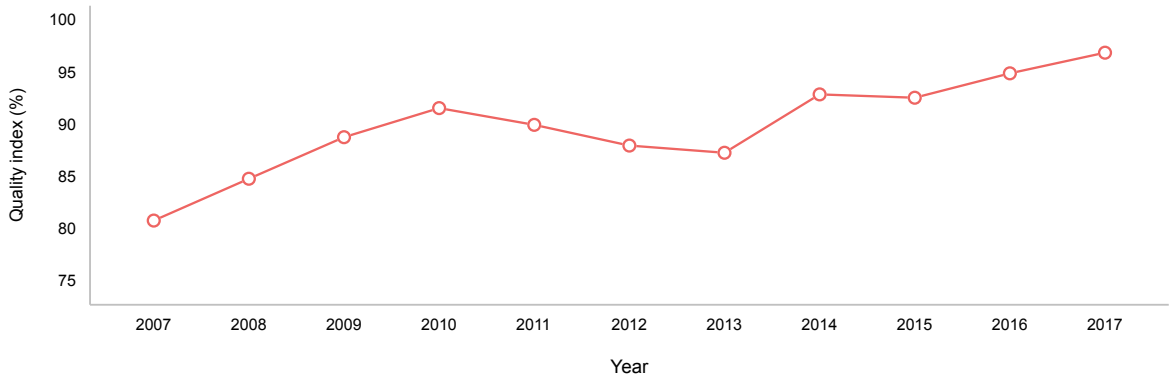
Note: The IB is required to publish applications even in the absence of an international search report (ISR). In such cases, the application is republished along with the ISR after the report is received. Timeliness is calculated as the time elapsed between the date of receipt of the ISR at the IB and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

Source: WIPO Statistics Database, March 2018.

Efficiency in processing PCT applications by the International Bureau

The overall quality of the formalities examination has improved markedly, from an average of about 81% in 2007 to about 97% in 2017.

C6. Formalities examination quality index, 2007–2017

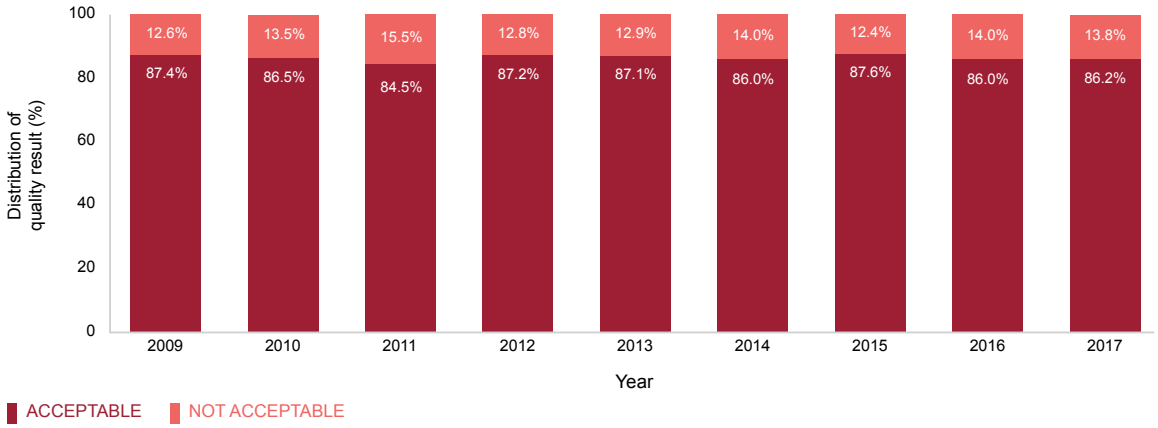


Note: In order to measure the quality of the formalities examination by the IB in a simple and comprehensive manner, the IB has developed an aggregate quality index, calculated as the average of four lead quality indicators. Three of these are based on the timeliness of key transactions. The quality 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 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 2007 to 2011) and the PCT operation quality control error rate (from 2012 onwards).

Source: WIPO Statistics Database, March 2018.

In 2017, the share of acceptable translations was 86.2%.

C7. Translation quality indicator, 2009–2017



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 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 2018.

More than 90% of abstract and report translations were outsourced in 2017.

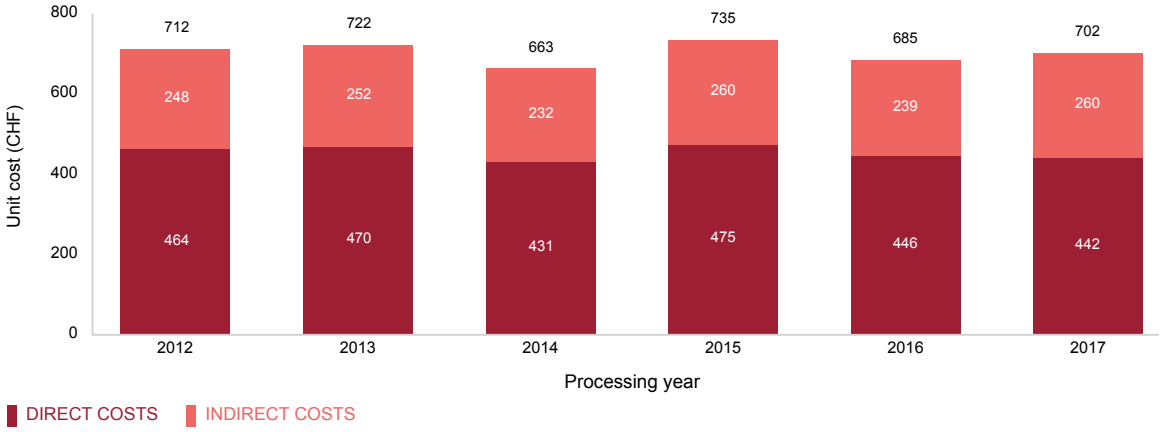
C8. Distribution of translation work, 2008–2017

Note: Translations by the 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 2018.

The average cost of processing a published PCT application in 2017 was 702 Swiss francs (CHF).

C9. Unit cost of processing a published PCT application, 2012–2017



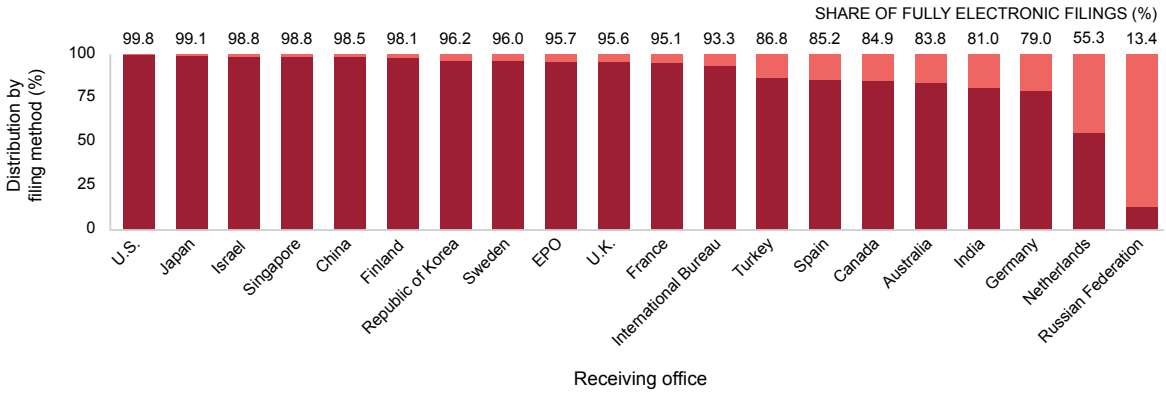
Note: The IB's efficiency in processing PCT applications can be measured by the unit cost of processing, defined as the average total cost of publishing a PCT application. Average total cost is determined by total PCT System expenditure, plus a proportion of expenditure on support and management activities. 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 2018.

Receiving offices

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

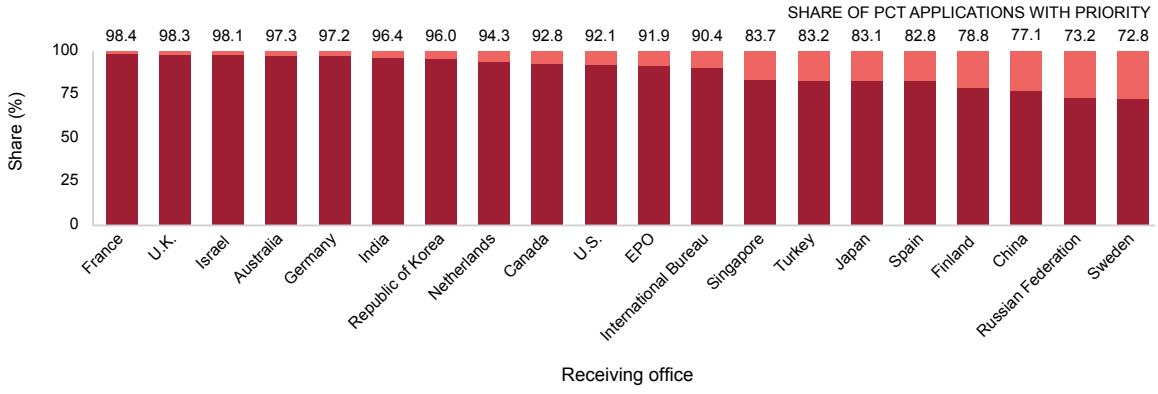
C10. Distribution of PCT applications by filing medium, top 20 receiving offices, 2017



Source: WIPO Statistics Database, March 2018.

More than 98% of PCT applications received at the offices of France, Israel and the U.K. had priority filings in 2017.

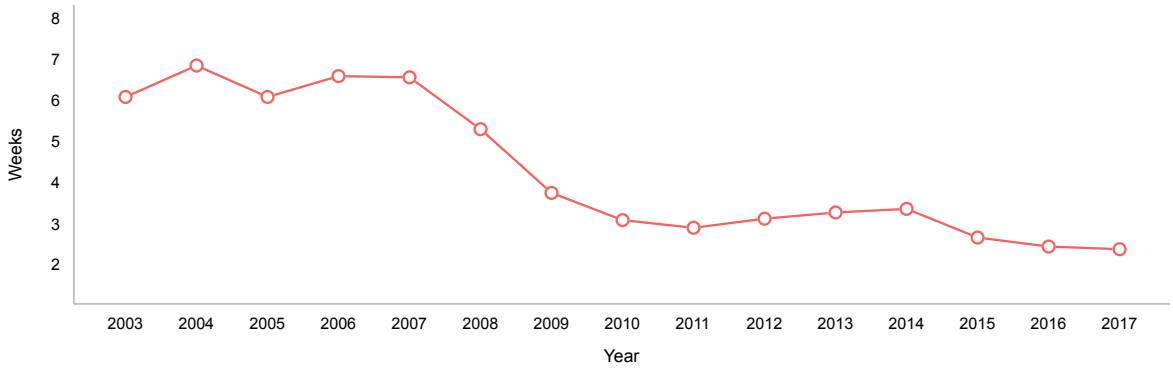
C11. Share of PCT applications with priority filings, top 20 receiving offices, 2017



Source: WIPO Statistics Database, March 2018.

Receiving offices' timeliness in transmitting PCT applications to the International Bureau improved for the third consecutive year.

C12. Average timeliness in transmitting PCT applications to the International Bureau, 2003–2017

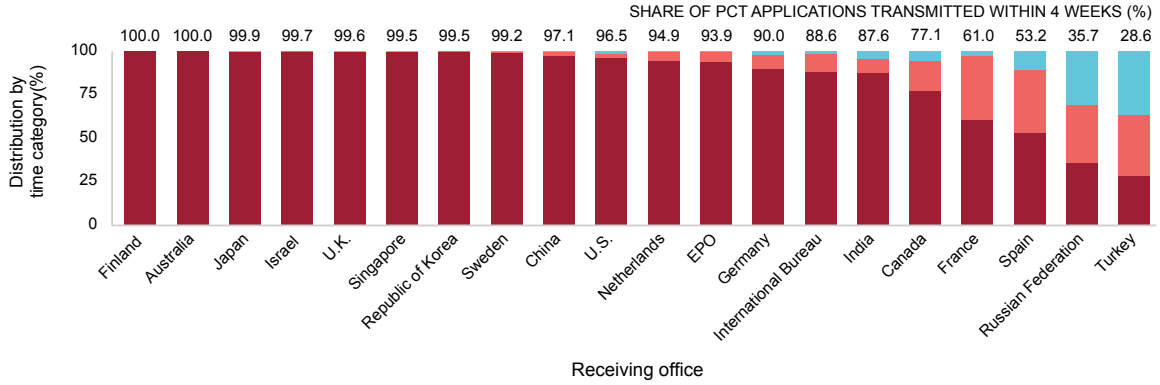


Note: The copy of the PCT application – known as the record copy – sent by the RO must reach the IB before the expiration of the thirteenth month from the priority date. PCT applications are usually filed before the expiration of 12 months from the priority date. Where this occurs, the IB should receive 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.

Source: WIPO Statistics Database, March 2018.

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

C13. Timeliness in transmitting PCT applications to the International Bureau, top 20 receiving offices, 2017

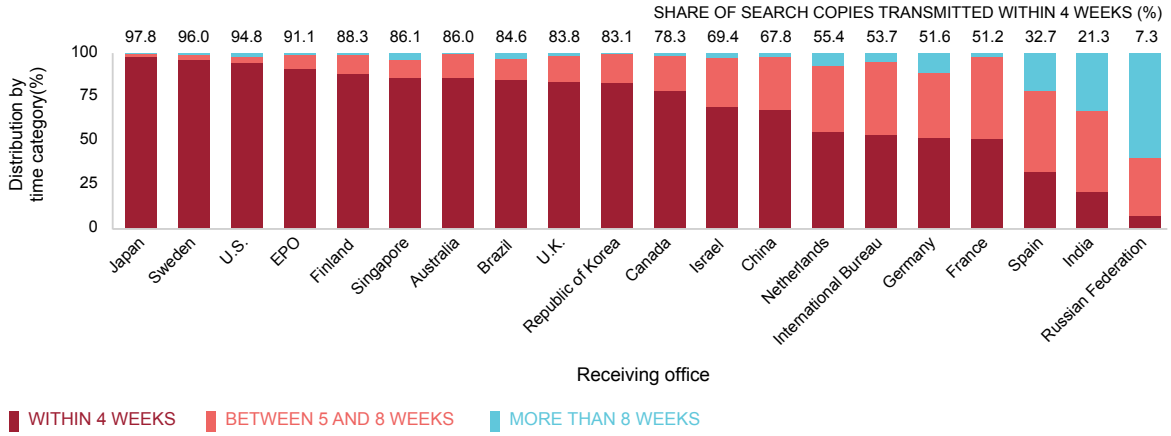


Note: The copy of the PCT application – known as the record copy – sent by the RO must reach the IB before the expiration of the thirteenth month from the priority date. PCT applications are usually filed before the expiration of 12 months from the priority date. Where this occurs, the IB should receive 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.

Source: WIPO Statistics Database, March 2018.

The office of Japan transmitted almost 98% 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, 2017



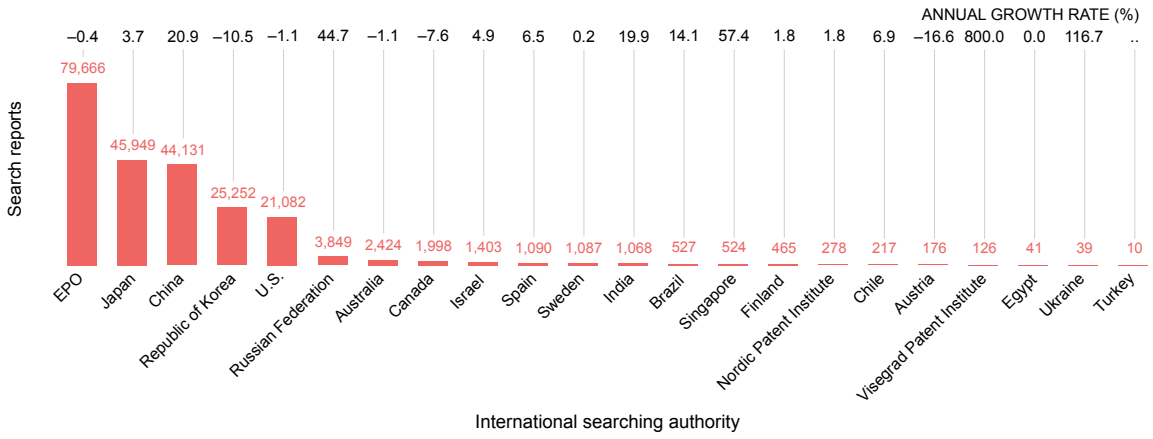
Note: Timeliness is calculated as the time elapsed between the international filing date and the date on which the international searching authority (ISA) received the PCT application – known as the search copy – from the receiving office. Dates of search fee payments are not used, due to the unavailability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

Source: WIPO Statistics Database, March 2018.

International searching authorities

The European Patent Office (EPO) issued nearly 80,000 international search reports in 2017.

C15. International search reports issued by international searching authority, 2017

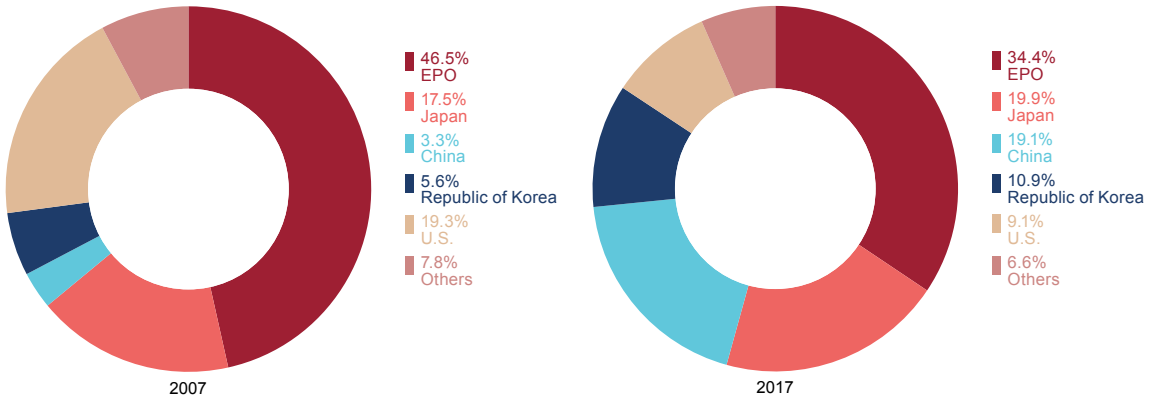


n.a. indicates not applicable.

Source: WIPO Statistics Database, March 2018.

The top five international searching authorities established 93.4% of all international search reports in 2017.

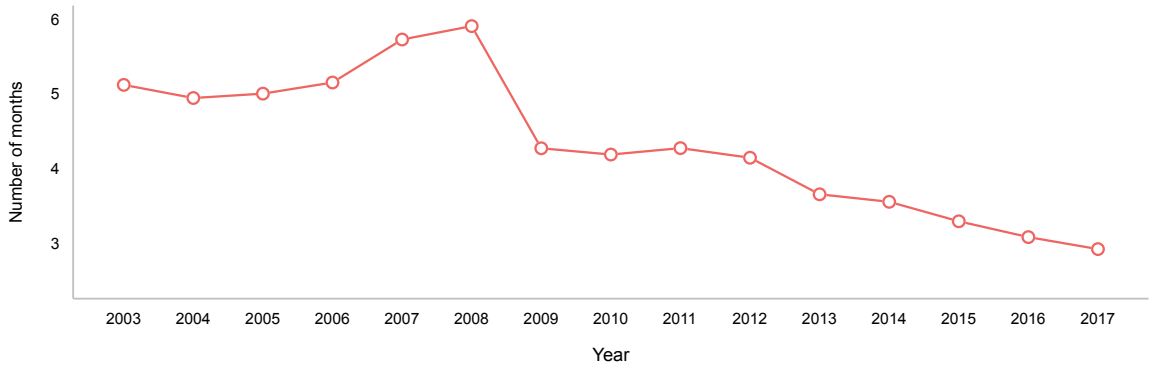
C16. Distribution of international search reports issued by international searching authority, 2007 and 2017



Source: WIPO Statistics Database, March 2018.

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, 2003–2017

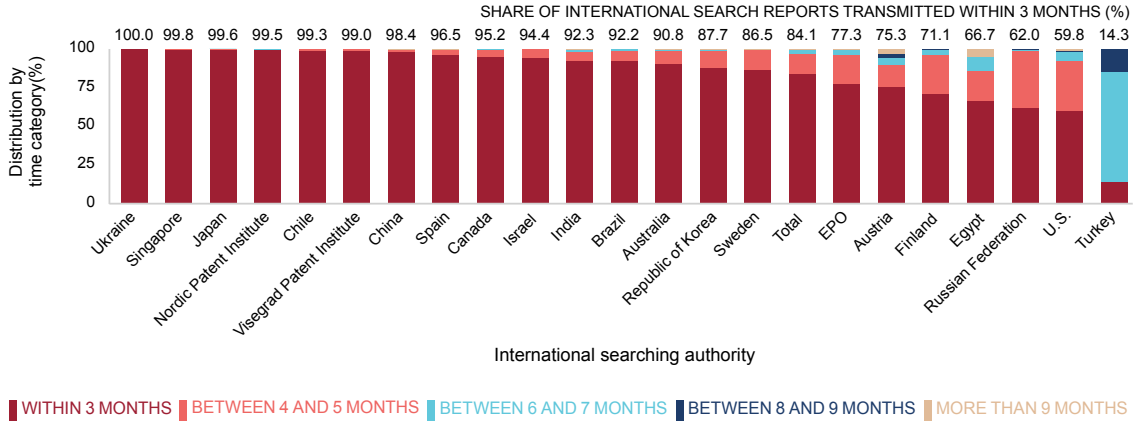


Note: The ISA must establish the ISR within three months of receiving a copy of the application – known as the search copy – or nine months from the priority date (or, if no priority is claimed, from the international filing date), whichever expires later. Timeliness is calculated as the time between the date the ISA receives a copy of the PCT application and the date when it transmits the ISR to the IB (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 2018.

For almost 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, 2017

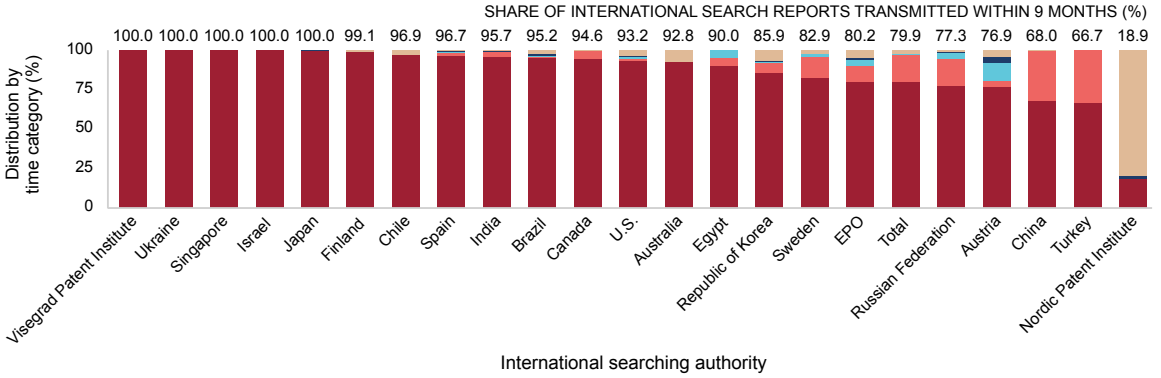


Note: The ISA must establish the ISR within three months of receiving a copy of the application – known as the search copy – or nine months from the priority date (or, if no priority is claimed, from the international filing date), whichever expires later. Timeliness is calculated as the time between the date when the ISA receives a copy of the PCT application and the date when it transmits the ISR to the IB (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 RO, we consider the search copy to have been received on the international filing date and calculate the timeliness accordingly.

Source: WIPO Statistics Database, March 2018.

For almost all international searching authorities, more than two-thirds of those international search reports that should be transmitted to the International Bureau within nine months from 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, 2017



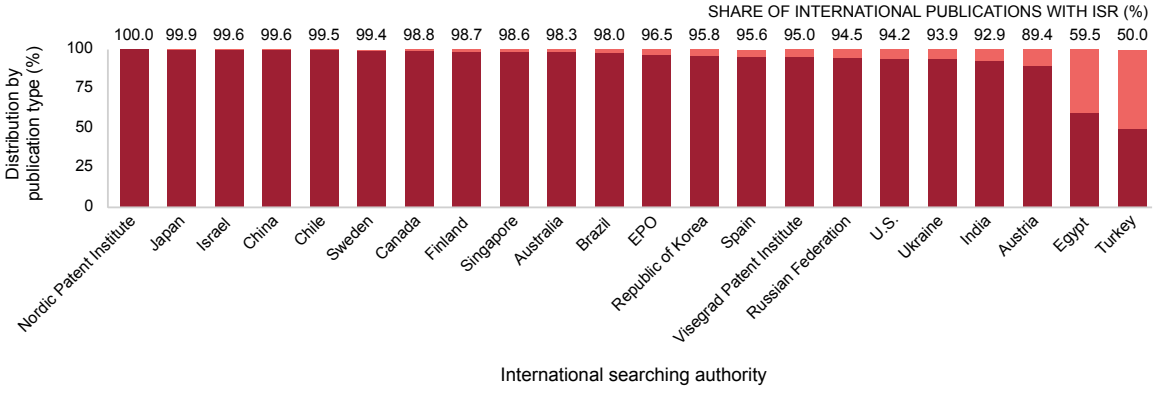
WITHIN 9 MONTHS | IN THE 10TH MONTH | IN THE 11TH MONTH | IN THE 12TH MONTH | IN MORE THAN 12 MONTHS

Note: The ISA must establish the 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 IB (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 RO, we calculate the timeliness from the priority date.

Source: WIPO Statistics Database, March 2018.

The share of PCT applications published with an international search report by the International Bureau exceeded 99% for six international searching authorities.

C20. Share of published PCT applications with and without international search reports by international searching authority, 2017



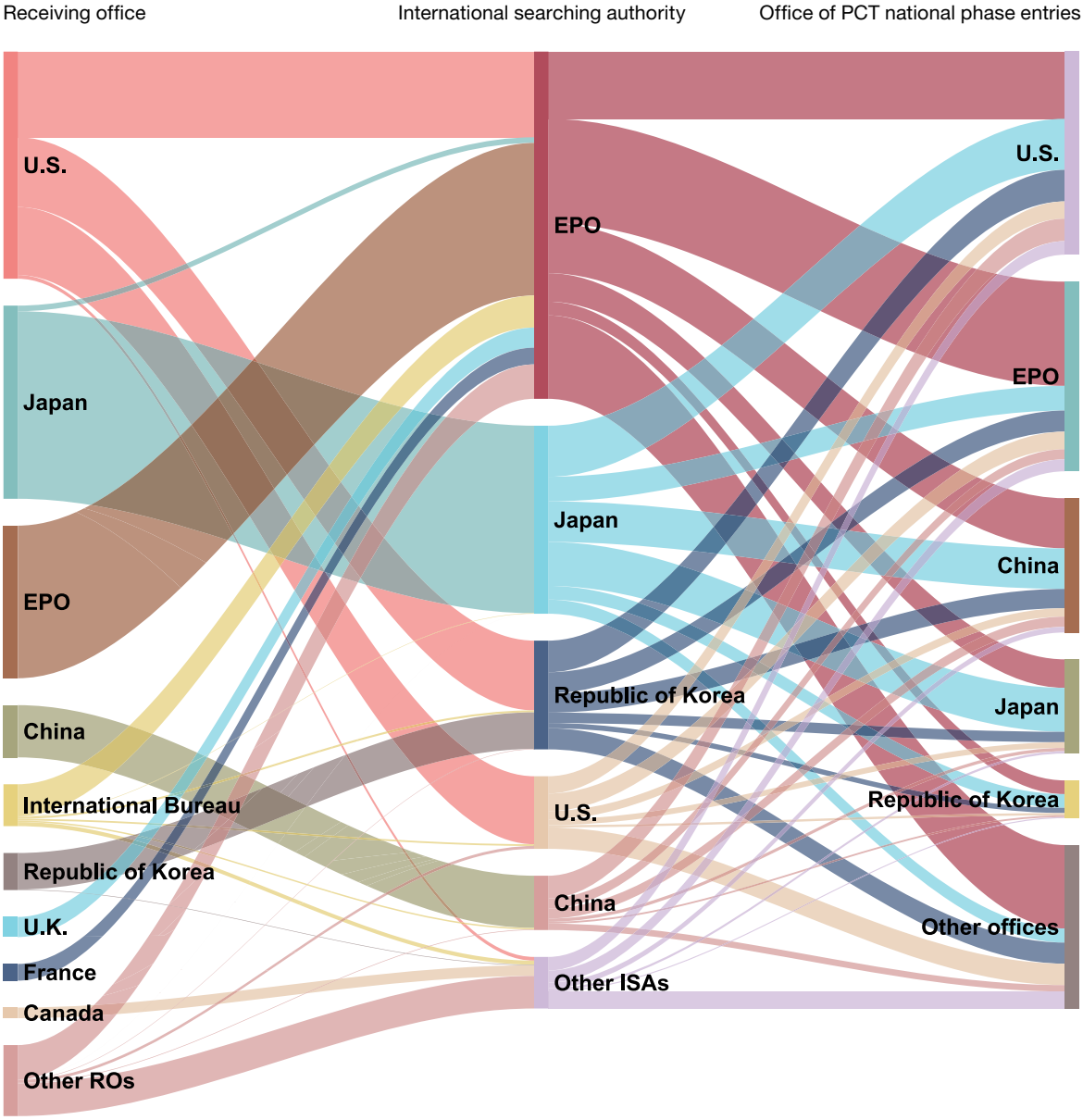
A1 (WITH ISR) | A2 (WITHOUT ISR)

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. Only one PCT application with an ISR established by the Visegrad Patent Institute – which started operation on July 1, 2017 – was published by the IB in 2017.

Source: WIPO Statistics Database, March 2018.

Of all PCT applications filed at the Japan Patent Office (JPO) from 2010 to 2012, a large proportion entered the national phase in the U.S. based on an international search report produced by the JPO.

C21. Flow of PCT applications transmitted from selected receiving offices to the top five international searching authorities and offices of PCT national phase entries, 2010–2012



Note: National phase entry (NPE) data may be incomplete. This figure shows the flow of PCT applications between selected ROs, 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.

Source: WIPO Statistics Database and EPO PATSTAT Database, March 2018.

Supplementary international searching authorities

The number of supplementary international search reports issued in 2017 remained almost stable compared with 2016.

C22. Distribution of supplementary international search reports by supplementary international searching authority, 2012–2017

Supplementary international searching authority	Year					
	2012	2013	2014	2015	2016	2017
Austria	2	2	2	2		1
European Patent Office	21	30	61	40	44	40
Finland	1					
Nordic Patent Institute	3					
Russian Federation	19	32	46	22	3	6
Singapore					1	
Sweden		3				
Ukraine						2
Total	**46**	**67**	**109**	**64**	**48**	**49**

Note: The data for 2017 may be incomplete.

Source: WIPO Statistics Database, March 2018.

International preliminary examining authorities

The EPO issued nearly two-thirds of all international preliminary reports on patentability in 2017.

C23. Distribution of international preliminary reports on patentability by international preliminary examining authority, 2015–2017

International preliminary examining authority	Year			2017 share (%)	Change from 2016 (%)
	2015	2016	2017		
Australia	617	599	549	4.1	–8.3
Austria	6	5	8	0.1	60.0
Brazil	43	47	50	0.4	6.4
Canada	290	231	215	1.6	–6.9
Chile		5	8	0.1	60.0
China	419	381	318	2.4	–16.5
Egypt	4		1	0.0	n.a.
European Patent Office	9,055	9,077	8,384	63.1	–7.6
Finland	104	60	76	0.6	26.7
India	6	25	28	0.2	12.0
Israel	79	80	96	0.7	20.0
Japan	2,478	2,019	1,945	14.6	–3.7
Nordic Patent Institute	45	32	33	0.2	3.1
Republic of Korea	239	209	163	1.2	–22.0
Russian Federation	68	71	51	0.4	–28.2
Singapore		26	106	0.8	307.7
Spain	66	60	46	0.3	–23.3
Sweden	295	206	134	1.0	–35.0
Ukraine			4	0.0	n.a.
United States of America	1,814	1,229	1,068	8.0	–13.1
Visegrad Patent Institute			3	0.0	n.a.
Total	**15,628**	**14,362**	**13,286**	**100.0**	**–7.5**

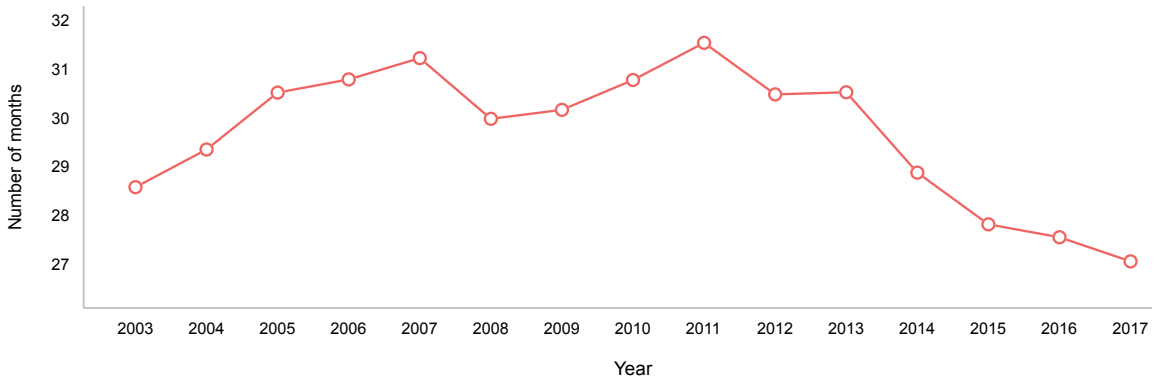
n.a. indicates not applicable.

Note: The data for 2017 may be incomplete.

Source: WIPO Statistics Database, March 2018.

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, 2003–2017

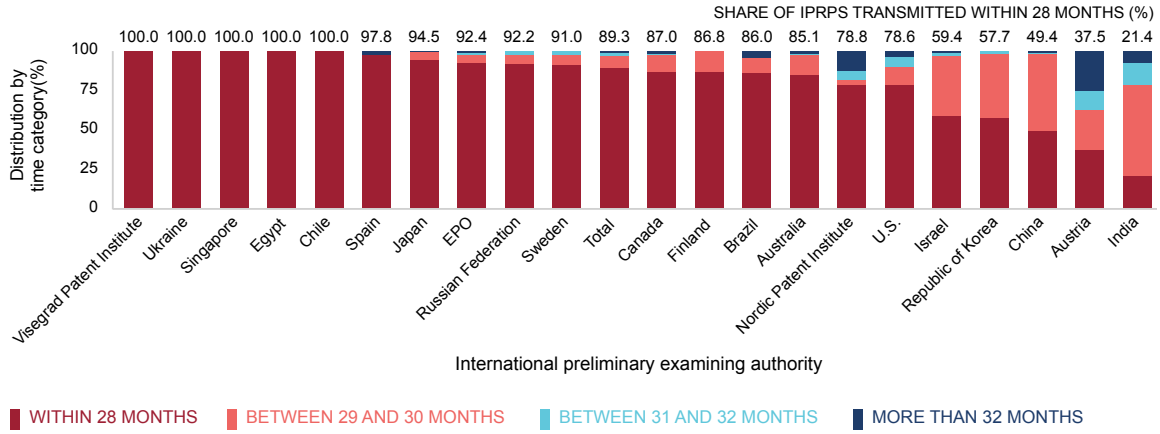


Note: Timeliness is calculated as the time elapsed between the priority date and the date on which the IB received the international preliminary report on patentability (IPRP) from the international preliminary examining authority.

Source: WIPO Statistics Database, March 2018.

Five offices 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, 2017



Note: This figure presents the same timeliness information for 2017 as that presented in the previous figure, but breaks it down by international preliminary examining authority. Timeliness is calculated as the time elapsed between the priority date and the date when the IB received the IPRP from the international preliminary examining authority.

Source: WIPO Statistics Database, March 2018.

PCT-Patent Prosecution Highway pilots

The EPO received a total of 1,811 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, 2017

	Office of Earlier Examination									
Office of later examination	Japan	European Patent Office	United States of America	Republic of Korea	China	Canada	Israel	Sweden	Others	Total
Japan	1,273	733	51	70	91	3	3	9	20	2,253
European Patent Office	1,512	0	81	55	104	26	22	0	11	1,811
China	593	599	78	107	0	0	12	17	14	1,420
Republic of Korea	236	247	73	69	35	1	4	13	30	708
Canada	71	153	63	52	0	136	5	3	16	499
Russian Federation	94	62	3	41	22	2	8	4	12	248
Australia	31	92	46	36	0	10	3	3	8	229
Israel	2	114	7	5	9	0	32	0	1	170
Mexico	62	39	3	0	0	1	0	0	10	115
Singapore	42	8	2	1	1	0	0	0	7	61
Colombia	1	9	43	0	0	0	0	0	4	57
Philippines	42	0	11	1	0	0	0	0	0	54
Malaysia	42	0	0	0	0	0	0	0	0	42
United Kingdom	1	0	3	1	8	0	0	0	0	13
Eurasian Patent Organization	7	3	0	0	0	0	0	0	0	10
New Zealand	0	4	2	0	0	0	1	0	3	10
Others	5	0	13	0	0	2	0	1	1	22
Total	**4,014**	**2,063**	**479**	**438**	**270**	**181**	**90**	**50**	**137**	**7,722**

Note: Data for several offices of later examination, such as Germany, Indonesia and the USPTO, are missing.

Source: WIPO, based on data from the JPO, March 2018.

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 2017, it comprised 152 Contracting States, as shown on the map below. A table listing all PCT Contracting States is provided on page 96.

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.

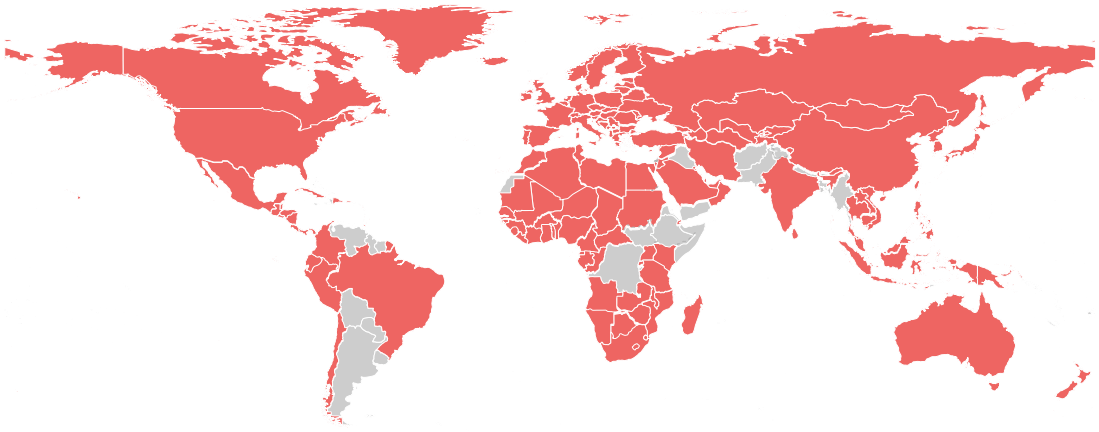
Compared with the Paris Convention route, applicants can delay examination procedures at national patent offices as well as the payment of associated legal fees and translation costs. By deferring national and regional procedures, applicants gain time to make decisions on the potential commercialization 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 search 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) undertaken of this application by an international preliminary examining authority (IPEA) or take no further action. The applicant generally

Contracting States in 2017



Source: WIPO, December 2017

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 search 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), they file an international application under the PCT with an RO – the respective national or regional patent office, or the IB – thus beginning the international phase. Only a national or resident of a PCT Contracting State can file a PCT application. If there are several applicants named in the PCT application, only one of them 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 one 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 an 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 resulting 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.

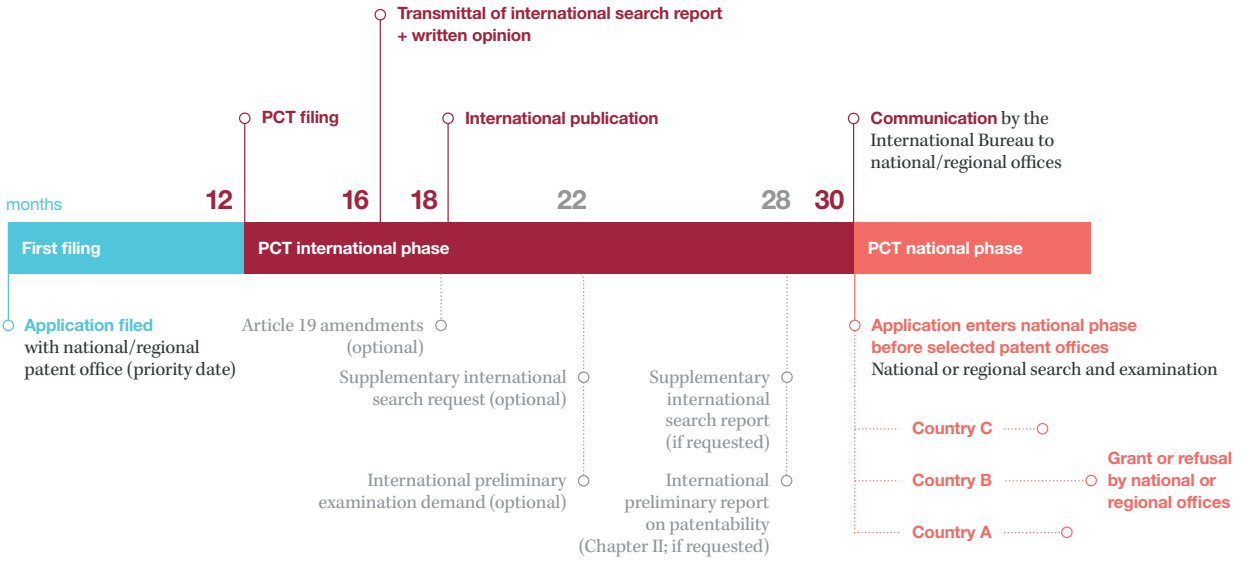
National phase

Applicants have at least 18 months from the filing date of their applications before entering the national phase at individual patent offices. This delay affords additional time – compared with 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, each patent office is responsible for processing the application in accordance with its national patent laws, and for deciding whether to grant patent protection, while certain PCT protections continue to apply. The time required for this 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 a fast-track examination procedure. Under these agreements, an applicant receiving a written opinion or an IPRP indicating that at least one claim in the PCT application has

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 2018

novelty, an inventive step and industrial applicability may request that the other patent offices fast-track the examination of corresponding claims in corresponding applications. 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 2017 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 2016. 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 2016 data supplied to WIPO corresponding to 99.2% 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[2] and groupings by region are based on the United Nations (UN) definition of regions.[3]

The figures in this review are subject to change.[4]

2 Available at: *https://datahelpdesk.worldbank.org/knowledgebase/articles/906519*

3 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 subregions remains identical.

4 Regular updates are available at: *www.wipo.int/ipstats*

List of acronyms and abbreviations

ARIPO	African Regional Intellectual Property Organization
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
SIPO	State Intellectual Property Office of the People's Republic of China
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 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 formality 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 "A brief presentation of the Patent Cooperation Treaty".

International preliminary examining authority (IPEA): A national or regional patent office or intergovernmental organization appointed by the PCT Assembly to carry out international preliminary examinations. 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.

International 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-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.

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

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.

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

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 that carries out the main international search. The SISR primarily focuses on the patent documentation in the language in which the SISA specializes.

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 IP system. Established in 1967, WIPO's mandate is to promote the protection of IP throughout the world 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.

IPC technology concordance table

Field of technology	IPC code(s)
Electrical engineering	
Electrical machinery, apparatus, energy	F21H%, F21K%, F21L%, F21S%, F21V%, F21W%, F21Y%, H01B%, H01C%, H01F%, H01G%, H01H%, H01J%, H01K%, H01M%, H01R%, H01T%, H02B%, H02G%, H02H%, H02J%, H02K%, H02M%, H02N%, H02P%, H02S%, H05B%, H05C%, H05F%, H99Z%
Audio-visual technology	G09F%, G09G%, G11B%, H04N 3%, H04N 5%, H04N 7%, H04N 9%, H04N 11%, H04N 13%, H04N15%, H04N 17%, H04N 19%, H04N 101%, H04R%, H04S%, H05K%
Telecommunications	G08C%, H01P%, H01Q%, H04B%, H04H%, H04J%, H04K%, H04M%, H04N 1%, H04Q%
Digital communication	H04L%, H04N 21%, H04W%
Basic communication processes	H03B%, H03C%, H03D%, H03F%, H03G%, H03H%, H03J%, H03K%, H03L%, H03M%
Computer technology	G06C%, G06D%, G06E%, G06F%, G06G%, G06J%, G06K%, G06M%, G06N%, G06T%, G10L%, G11C%
IT methods for management	G06Q%
Semiconductors	H01L%
Instruments	
Optics	G02B%, G02C%, G02F%, G03B%, G03C%, G03D%, G03F%, G03G%, G03H%, H01S%
Measurement	G01B%, G01C%, G01D%, G01F%, G01G%, G01H%, G01J%, G01K%, G01L%, G01M%, G01N 1%, G01N3%, G01N 5%, G01N 7%, G01N 9%, G01N 11%, G01N 13%, G01N 15%, G01N 17%, G01N 19%, G01N21%, G01N 22%, G01N 23%, G01N 24%, G01N 25%, G01N 27%, G01N 29%, G01N 30%, G01N 31%, G01N 35%, G01N 37%, G01P%, G01Q%, G01R%, G01S%, G01V%, G01W%, G04B%, G04C%, G04D%, G04F%, G04G%, G04R%, G12B%, G99Z%
Analysis of biological materials	G01N 33%
Control	G05B%, G05D%, G05F%, G07B%, G07C%, G07D%, G07F%, G07G%, G08B%, G08G%, G09B%, G09C%, G09D%
Medical technology	A61B%, A61C%, A61D%, A61F%, A61G%, A61H%, A61J%, A61L%, A61M%, A61N%, H05G%
Chemistry	
Organic fine chemistry	A61K 8%, A61Q%, C07B%, C07C%, C07D%, C07F%, C07H%, C07J%, C40B%
Biotechnology	C07G%, C07K%, C12M%, C12N%, C12P%, C12Q%, C12R%, C12S%
Pharmaceuticals	A61K 6%, A61K 9%, A61K 31%, A61K 33%, A61K 35%, A61K 36%, A61K 38%, A61K 39%, A61K 41%, A61K 45%, A61K 47%, A61K 48%, A61K 49%, A61K 50%, A61K 51%, A61K 101%, A61K 103%, A61K125%, A61K 127%, A61K 129%, A61K 131%, A61K 133%, A61K 135%, A61P%
Macromolecular chemistry, polymers	C08B%, C08C%, C08F%, C08G%, C08H%, C08K%, C08L%
Food chemistry	A01H%, A21D%, A23B%, A23C%, A23D%, A23F%, A23G%, A23J%, A23K%, A23L%, C12C%, C12F%, C12G%, C12H%, C12J%, C13B 10%, C13B 20%, C13B 30%, C13B 35%, C13B 40%, C13B 50%, C13B99%, C13D%, C13F%, C13J%, C13K%
Basic materials chemistry	A01N%, A01P%, C05B%, C05C%, C05D%, C05F%, C05G%, C06B%, C06C%, C06D%, C06F%, C09B%, C09C%, C09D%, C09F%, C09G%, C09H%, C09J%, C09K%, C10B%, C10C%, C10F%, C10G%, C10H%, C10J%, C10K%, C10L%, C10M%, C10N%, C11B%, C11C%, C11D%, C99Z%
Materials, metallurgy	B22C%, B22D%, B22F%, C01B%, C01C%, C01D%, C01F%, C01G%, C03C%, C04B%, C21B%, C21C%, C21D%, C22B%, C22C%, C22F%
Surface technology, coating	B05C%, B05D%, B32B%, C23C%, C23D%, C23F%, C23G%, C25B%, C25C%, C25D%, C25F%, C30B%
Micro-structural and nano-technology	B81B%, B81C%, B82B%, B82Y%
Chemical engineering	B01B%, B01D 1%, B01D 3%, B01D 5%, B01D 7%, B01D 8%, B01D 9%, B01D 11%, B01D 12%, B01D15%, B01D 17%, B01D 19%, B01D 21%, B01D 24%, B01D 25%, B01D 27%, B01D 29%, B01D 33%, B01D35%, B01D 36%, B01D 37%, B01D 39%, B01D 41%, B01D 43%, B01D 57%, B01D 59%, B01D 61%, B01D63%, B01D 65%, B01D 67%, B01D 69%, B01D 71%, B01F%, B01J%, B01L%, B02C%, B03B%, B03C%, B03D%, B04B%, B04C%, B05B%, B06B%, B07B%, B07C%, B08B%, C14C%, D06B%, D06C%, D06L%, F25J%, F26B%, H05H%
Environmental technology	A62C%, B01D 45%, B01D 46%, B01D 47%, B01D 49%, B01D 50%, B01D 51%, B01D 52%, B01D 53%, B09B%, B09C%, B65F%, C02F%, E01F 8%, F01N%, F23G%, F23J%, G01T%

(Continued)

(Continued)

Field of technology	IPC code(s)
Mechanical engineering	
Handling	B25J%, B65B%, B65C%, B65D%, B65G%, B65H%, B66B%, B66C%, B66D%, B66F%, B67B%, B67C%, B67D%
Machine tools	A62D%, B21B%, B21C%, B21D%, B21F%, B21G%, B21H%, B21J%, B21K%, B21L%, B23B%, B23C%, B23D%, B23F%, B23G%, B23H%, B23K%, B23P%, B23Q%, B24B%, B24C%, B24D%, B25B%, B25C%, B25D%, B25F%, B25G%, B25H%, B26B%, B26D%, B26F%, B27B%, B27C%, B27D%, B27F%, B27G%, B27H%, B27J%, B27K%, B27L%, B27M%, B27N%, B30B%
Engines, pumps, turbines	F01B%, F01C%, F01D%, F01K%, F01L%, F01M%, F01P%, F02B%, F02C%, F02D%, F02F%, F02G%, F02K%, F02M%, F02N%, F02P%, F03B%, F03C%, F03D%, F03G%, F03H%, F04B%, F04C%, F04D%, F04F%, F23R%, F99Z%, G21B%, G21C%, G21D%, G21F%, G21G%, G21H%, G21J%, G21K%
Textile and paper machines	A41H%, A43D%, A46D%, B31B%, B31C%, B31D%, B31F%, B41B%, B41C%, B41D%, B41F%, B41G%, B41J%, B41K%, B41L%, B41M%, B41N%, C14B%, D01B%, D01C%, D01D%, D01F%, D01G%, D01H%, D02G%, D02H%, D02J%, D03C%, D03D%, D03J%, D04B%, D04C%, D04G%, D04H%, D05B%, D05C%, D06G%, D06H%, D06J%, D06M%, D06P%, D06Q%, D21B%, D21C%, D21D%, D21F%, D21G%, D21H%, D21J%, D99Z%
Other special machines	A01B%, A01C%, A01D%, A01F%, A01G%, A01J%, A01K%, A01L%, A01M%, A21B%, A21C%, A22B%, A22C%, A23N%, A23P%, B02B%, B28B%, B28C%, B28D%, B29B%, B29C%, B29D%, B29K%, B29L%, B33Y%, B99Z%, C03B%, C08J%, C12L%, C13B 5%, C13B 15%, C13B 25%, C13B 45%, C13C%, C13G%, C13H%, F41A%, F41B%, F41C%, F41F%, F41G%, F41H%, F41J%, F42B%, F42C%, F42D%
Thermal processes and apparatus	F22B%, F22D%, F22G%, F23B%, F23C%, F23D%, F23H%, F23K%, F23L%, F23M%, F23N%, F23Q%, F24B%, F24C%, F24D%, F24F%, F24H%, F24J%, F25B%, F25C%, F27B%, F27D%, F28B%, F28C%, F28D%, F28F%, F28G%
Mechanical elements	F15B%, F15C%, F15D%, F16B%, F16C%, F16D%, F16F%, F16G%, F16H%, F16J%, F16K%, F16L%, F16M%, F16N%, F16P%, F16S%, F16T%, F17B%, F17C%, F17D%, G05G%
Transport	B60B%, B60C%, B60D%, B60F%, B60G%, B60H%, B60J%, B60K%, B60L%, B60M%, B60N%, B60P%, B60Q%, B60R%, B60S%, B60T%, B60V%, B60W%, B61B%, B61C%, B61D%, B61F%, B61G%, B61H%, B61J%, B61K%, B61L%, B62B%, B62C%, B62D%, B62H%, B62J%, B62K%, B62L%, B62M%, B63B%, B63C%, B63G%, B63H%, B63J%, B64B%, B64C%, B64D%, B64F%, B64G%
Other fields	
Furniture, games	A47B%, A47C%, A47D%, A47F%, A47G%, A47H%, A47J%, A47K%, A47L%, A63B%, A63C%, A63D%, A63F%, A63G%, A63H%, A63J%, A63K%
Other consumer goods	A24B%, A24C%, A24D%, A24F%, A41B%, A41C%, A41D%, A41F%, A41G%, A42B%, A42C%, A43B%, A43C%, A44B%, A44C%, A45B%, A45C%, A45D%, A45F%, A46B%, A62B%, A99Z%, B42B%, B42C%, B42D%, B42F%, B43K%, B43L%, B43M%, B44B%, B44C%, B44D%, B44F%, B68B%, B68C%, B68F%, B68G%, D04D%, D06F%, D06N%, D07B%, F25D%, G10B%, G10C%, G10D%, G10F%, G10G%, G10H%, G10K%
Civil engineering	E01B%, E01C%, E01D%, E01F 1%, E01F 3%, E01F 5%, E01F 7%, E01F 9%, E01F 11%, E01F 13%, E01F 15%, E01H%, E02B%, E02C%, E02D%, E02F%, E03B%, E03C%, E03D%, E03F%, E04B%, E04C%, E04D%, E04F%, E04G%, E04H%, E05B%, E05C%, E05D%, E05F%, E05G%, E06B%, E06C%, E21B%, E21C%, E21D%, E21F%, E99Z%

Note: For definitions of IPC symbols, see *www.wipo.int/classifications/ipc*. For an electronic version of the IPC technology concordance table, visit *www.wipo.int/ipstats*.

Source: WIPO, January 2018.

PCT Contracting States

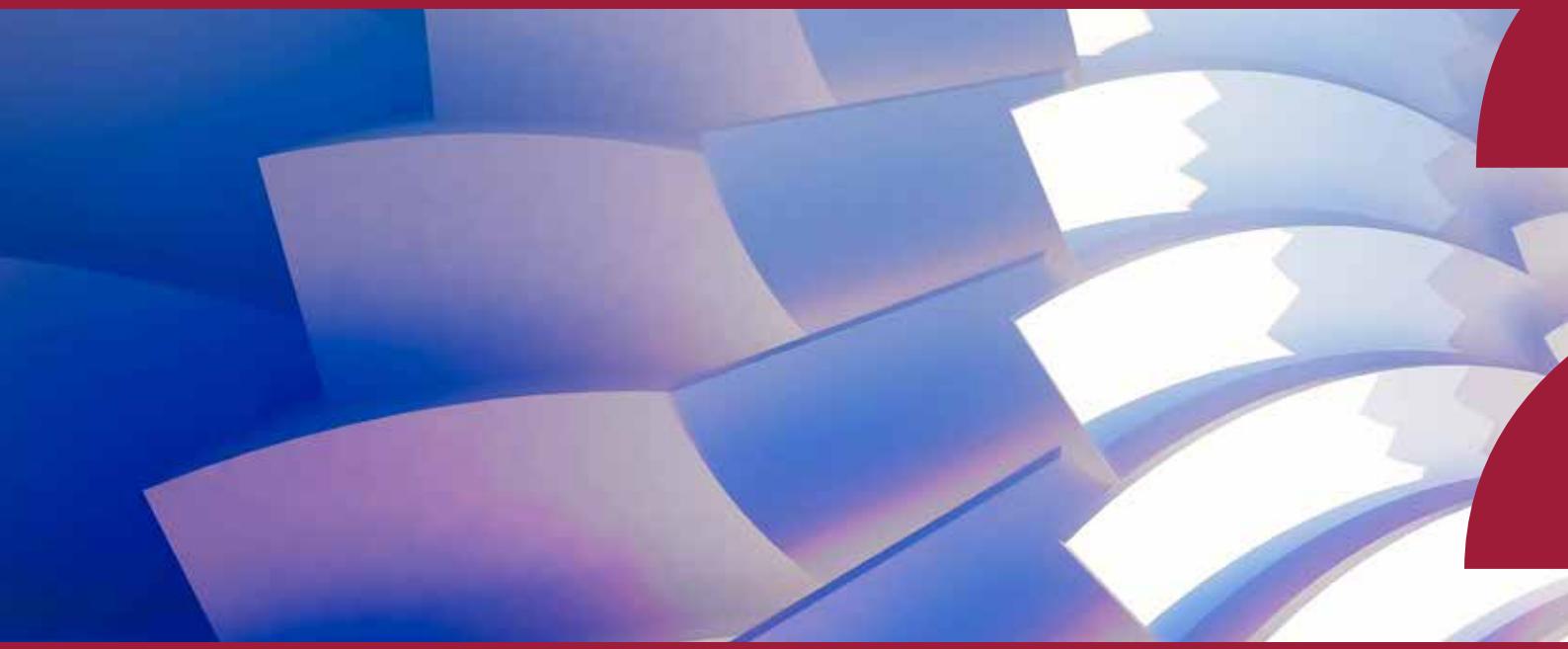
During 2017, one new Contracting State acceded to the PCT, namely Jordan (effective June 9, 2017), bringing the total number of Contracting States to 152.

Albania (EP)	Djibouti	Lesotho (AP)	Saint Kitts and Nevis
Algeria	Dominica	Liberia (AP)	Saint Lucia
Angola	Dominican Republic	Libya	Saint Vincent and the Grenadines
Antigua and Barbuda	Ecuador	Liechtenstein (EP)	San Marino (EP)
Armenia (EA)	Egypt	Lithuania (EP)	Sao Tome and Principe (AP)
Australia	El Salvador	Luxembourg (EP)	Saudi Arabia
Austria (EP)	Equatorial Guinea (OA)[2]	Madagascar	Senegal (OA)[2]
Azerbaijan (EA)	Estonia (EP)	Malawi (AP)	Serbia (EP)
Bahrain	Finland (EP)	Malaysia	Seychelles
Barbados	France (EP)[2]	Mali (OA)[2]	Sierra Leone (AP)
Belarus (EA)	Gabon (OA)[2]	Malta (EP)[2]	Singapore
Belgium (EP)[2]	Gambia (AP)	Mauritania (OA)[2]	Slovakia (EP)
Belize	Georgia	Mexico	Slovenia (EP)[2]
Benin (OA)[2]	Germany (EP)	Monaco (EP)[2]	South Africa
Bosnia and Herzegovina[1]	Ghana (AP)	Mongolia	Spain (EP)
Botswana (AP)	Greece (EP)[2]	Montenegro[1]	Sri Lanka
Brazil	Grenada	Morocco[3]	Sudan (AP)
Brunei Darussalam	Guatemala	Mozambique (AP)	Sweden (EP)
Bulgaria (EP)	Guinea (OA)[2]	Namibia (AP)	Switzerland (EP)
Burkina Faso (OA)[2]	Guinea-Bissau (OA)[2]	Netherlands (EP)[2]	Syrian Arab Republic
Cambodia	Honduras	New Zealand	Tajikistan (EA)
Cameroon (OA)[2]	Hungary (EP)	Nicaragua	Thailand
Canada	Iceland (EP)	Niger (OA)[2]	The former Yugoslav Republic of Macedonia (EP)
Central African Republic (OA)[2]	India	Nigeria	Togo (OA)[2]
Chad (OA)[2]	Indonesia	Norway (EP)	Trinidad and Tobago
Chile	Iran (Islamic Republic of)	Oman	Tunisia[5]
China	Ireland (EP)[2]	Panama	Turkey (EP)
Colombia	Israel	Papua New Guinea	Turkmenistan (EA)
Comoros (OA)[2]	Italy (EP)[2]	Peru	Uganda (AP)
Congo (OA)[2]	Japan	Philippines	Ukraine
Costa Rica	Jordan	Poland (EP)	United Arab Emirates
Côte d'Ivoire (OA)[2]	Kazakhstan (EA)	Portugal (EP)	United Kingdom (EP)
Croatia (EP)	Kenya (AP)	Qatar	United Republic of Tanzania (AP)
Cuba	Kingdom of Eswatini (AP)[2]	Republic of Korea	United States of America
Cyprus (EP)[2]	Kuwait	Republic of Moldova[4]	Uzbekistan
Czech Republic (EP)	Kyrgyzstan (EA)	Romania (EP)	Viet Nam
Democratic People's Republic of Korea	Lao People's Democratic Republic	Russian Federation (EA)	Zambia (AP)
Denmark (EP)	Latvia (EP)[2]	Rwanda (AP)	Zimbabwe (AP)

Notes:
1. Extension of European patent possible.
2. May only be designated for a regional patent (the national route via the PCT has been closed).
3. Validation of European patent possible.
4. Validation of European patent possible for international applications filed on or after November 1, 2015.
5. Validation of European patent will be possible for international applications filed on or after December 1, 2017.

Where a state can be designated for a regional patent, the two-letter code for the regional patent concerned is indicated in parentheses (AP = ARIPO patent, EA = Eurasian patent, EP = European patent, OA = OAPI patent).

Source: WIPO, January 2018.



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