Patent Cooperation Treaty Yearly Review 2021

The International Patent System

WIPO
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Further information

Online resources

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

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

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

Contact information

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Email: *ipstats.mail@wipo.int*

Key numbers for 2020

675,200 (+4.3%)
PCT national phase entries

275,900 (+4%)
PCT applications filed

125 (–3)
Countries in which PCT applications were filed

56.7% (–0.2 percentage point)
Share of PCT national phase entries in worldwide non-resident patent application filings

16.5% (+0.8 percentage point)
Share of women among PCT inventors

Note: The latest available year for PCT national phase entry data is 2019.

Special theme: A first insight into the impact of the COVID-19 pandemic on PCT applications

At the end of 2019, scientists in China identified a new coronavirus (COVID-19) as the source of a cluster of pneumonia cases in the city of Wuhan. In March 2020, the World Health Organization (WHO) declared the COVID-19 outbreak a pandemic. From March to December 2020, a large number of countries undertook forceful countermeasures, such as hard "lockdowns" and border restrictions, to limit the spread of the virus.

These measures together with the pandemic itself led to immediate and substantial social and economic disruption globally, resulting in a drop in global gross domestic product (GDP) estimated to be 3.5% in 2020.[1] Despite this global economic recession, the number of PCT applications filed grew by 4% during that year. Since the PCT System began operating in 1978, the number of PCT applications filed has continued to grow almost every year with 2009 being the only exception, which was the year after the start of the global financial crisis, when the number of PCT applications fell by 4.8%.

This year's Special theme provides a first insight into the impact of the COVID-19 pandemic on PCT applications filed in 2020. At the onset of the pandemic – as in the global financial crisis – overall PCT filing activity slowed rapidly, with trends in filings varying markedly between countries. In addition, changes in the distribution of PCT filings by field of technology between March and July 2020 show the share of filings in the electrical engineering sector decreasing, mainly in favor of innovations in biosciences and chemistry.[2] This suggests that PCT applicants adapted quickly to the new context. Furthermore, results from a small-scale survey show that COVID-19 restrictions negatively affected the research and development (R&D) and intellectual property (IP) filing activities of the applicants interviewed, but only to a relatively modest degree.

As happened with the 2008 financial crisis, PCT filing activity slowed rapidly at the beginning of the pandemic

The two main global economic downturns experienced thus far in the 21st century have had fundamentally different causes. The crisis of 2008 was the result of banks taking excessive risks, which, combined with the bursting of a housing bubble in the United States of America (U.S.), damaged financial institutions globally; whereas the crisis of 2020 was the consequence of the worldwide spread of a highly contagious disease that placed national health care systems in jeopardy. Comparing PCT filing trends during the two crises does, however, reveals certain similarities.

During the financial crisis, PCT filing activity fell in the immediate aftermath of the bankruptcy of the Lehman Brothers bank on September 15, 2008 (see figure S1).[3] It then took six months to plateau and a further eight months before filing activity improved. In 2009, the total number of PCT applications filed fell by almost 5%. That same year, PCT applications filed in China grew by 29.1%, but had only a moderate impact on PCT filing overall, as China then accounted for no more than 5.1% of PCT filings.

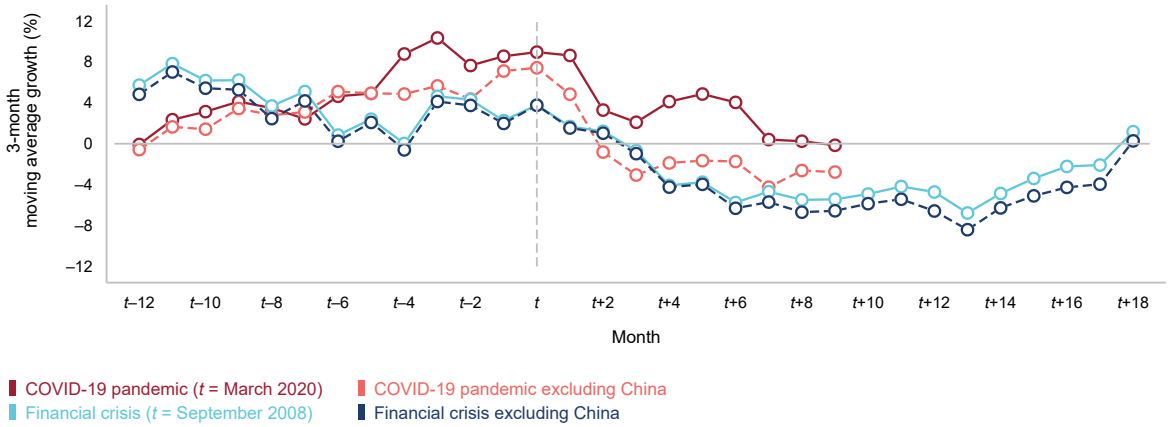
In 2020, PCT application filing activity likewise slowed down soon after the pandemic began. Throughout the four months prior to the WHO declaring COVID-19 a

1 See *World Economic Outlook*, International Monetary Fund (January 2021).

2 At the time of drafting this analysis, in March 2021, general trends in PCT filings are available for the whole of 2020, but due to confidentiality requirements, data relating to the technology fields are partly missing.

3 To smooth fluctuations in filings due to seasonality, monthly growth rates were calculated using the moving average of three-month periods with those of a year earlier.

S1. Three-month moving average growth in PCT applications filed during the 2008–2009 financial crisis and the COVID-19 pandemic



Source: WIPO Statistics Database, March 2021.

pandemic, monthly growth rates were strong, varying between 7.6% and 10.3%. Growth then slowed from 9% in March down to 2.1% in June. From July to September, filing activity rebounded, with growth varying between 4% and 5% per month, coinciding with the temporary lifting of containment measures in many high-income economies. In the last quarter of 2020, when stronger measures to fight the virus returned, PCT filing activity fell, from a 0.4% growth in October to a 0.2% decline in December.

The geographical distribution of PCT filings has changed significantly since the last economic crisis. This is due to China having undergone a strong growth in PCT filings since 2008 and by 2020 accounting for approximately one quarter of all applications. A much steeper decline in filing is seen when China is removed from the total count, with filing activity dropping sharply from March onward. Between May and December 2020, the number of applications filed decreased month on month compared to the previous year, October seeing the steepest fall (–4.3%). From November, the gap between the overall filing trend and the trend excluding China narrowed, reflecting a slower rate of growth in PCT applications filed in China, though remaining faster than in the rest of the world.

At the beginning of these two crises, the number of PCT applications filed slowed rapidly and dramatically in Germany, the Republic of Korea and the U.S. (see figure S2). Germany had a short lag during the financial crisis before filings declined, but then saw filing activity fall particularly steeply during both crises – in June 2020, filings in Germany dropped by nearly 13%.

During the seven months that followed the Lehman Brothers bankruptcy, Japan maintained double-digit growth rates in PCT filings. However, in 2020, its filing activity fell sharply, from a growth of 8% in February to a decline of 6.7% in May. Filings from Japan decreased every month between March and December, with the sharpest fall coming in October (–11%). Of the top five origins, Germany and Japan saw the steepest declines in PCT filings following the onset of the pandemic.

Although China maintained high growth rates during the first months of the pandemic, these slowed progressively from August (+28.4%) to December (+7%). By comparison, during the global financial downturn of 2008–2009, PCT applications filed in China grew extremely rapidly just five months after the crisis began.

Countries outside the top five, combined, saw filing activity fall abruptly during most of the 12 months that followed the beginning of the financial crisis. This time, since the pandemic began, they have seen filing activity slow and fluctuate, but not plunge as steeply as it did during the financial crisis.

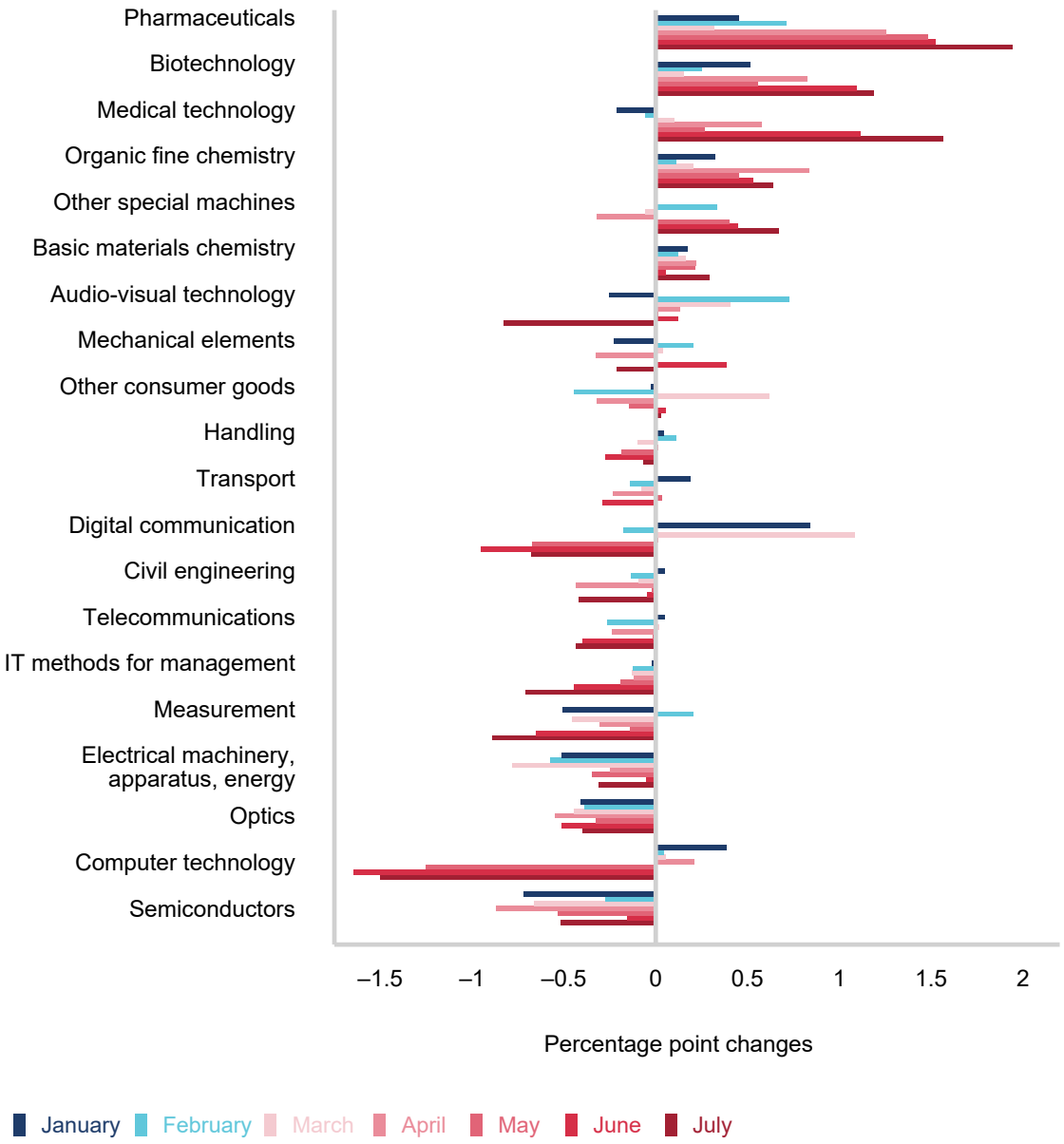
PCT applications filed in technical fields relating to health performed well

Information relating to technical fields is usually available within several months of the filing of a PCT application. At the time of drafting of this review, about 72% of applications filed between January and July 2020 had technical field data available, which precludes analyzing growth rates but not distribution. Comparing the distribution by field of technology for PCT appli-

S2. Three-month moving average growth in PCT applications filed during the 2008–2009 financial crisis and the COVID-19 pandemic for the top five origins

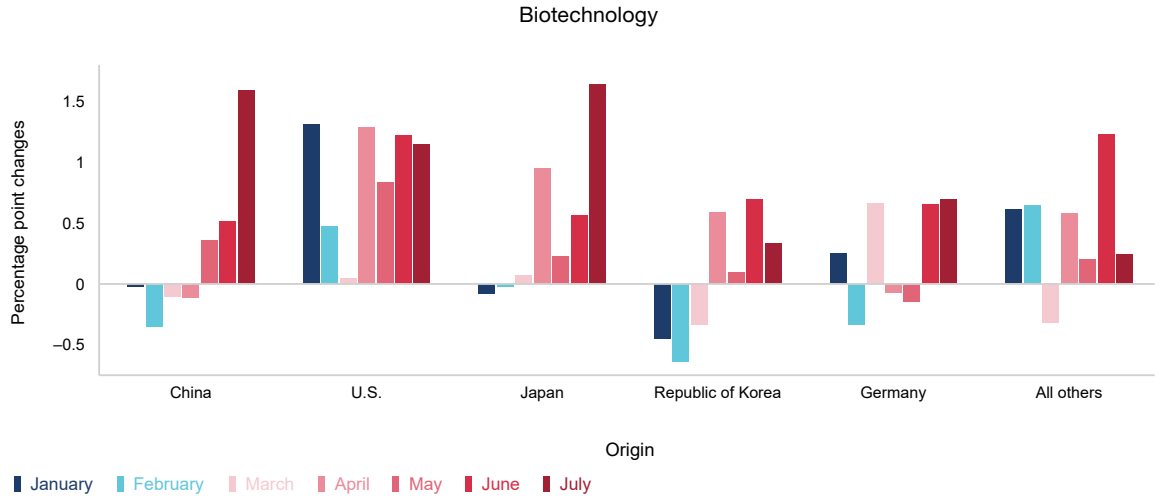
Source: WIPO Statistics Database, March 2021.

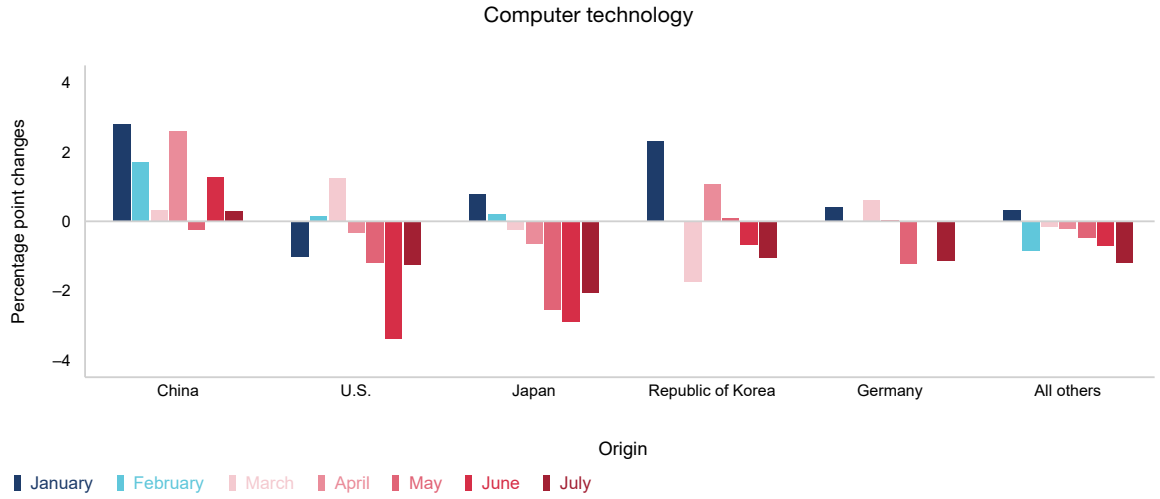
S3. Percentage point changes in share of PCT applications filed for the top 20 fields of technology, January–July, 2020



Source: WIPO Statistics Database, March 2021.

S4. Percentage point changes in share of PCT applications filed for the top five origins and selected fields of technology, January–July, 2020





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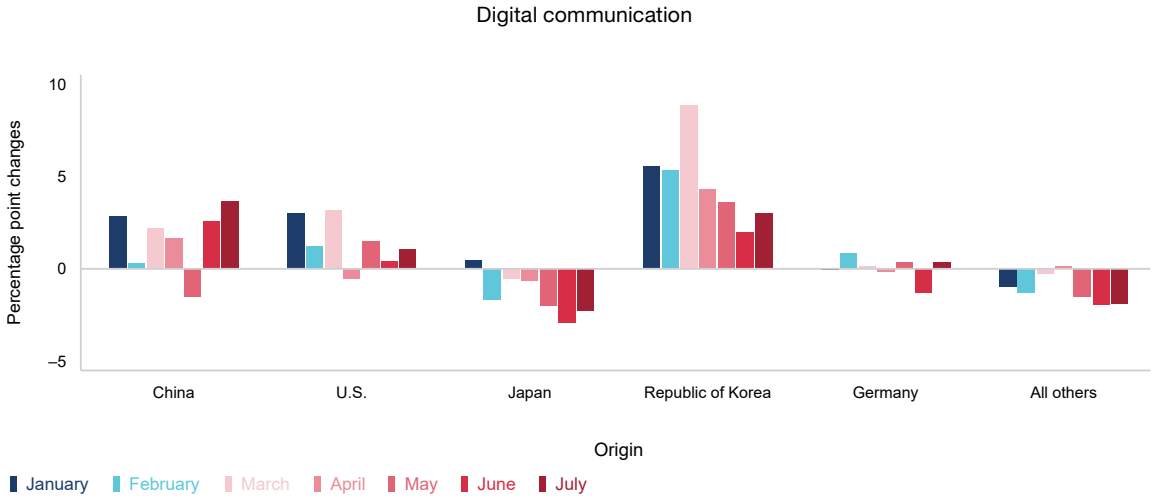
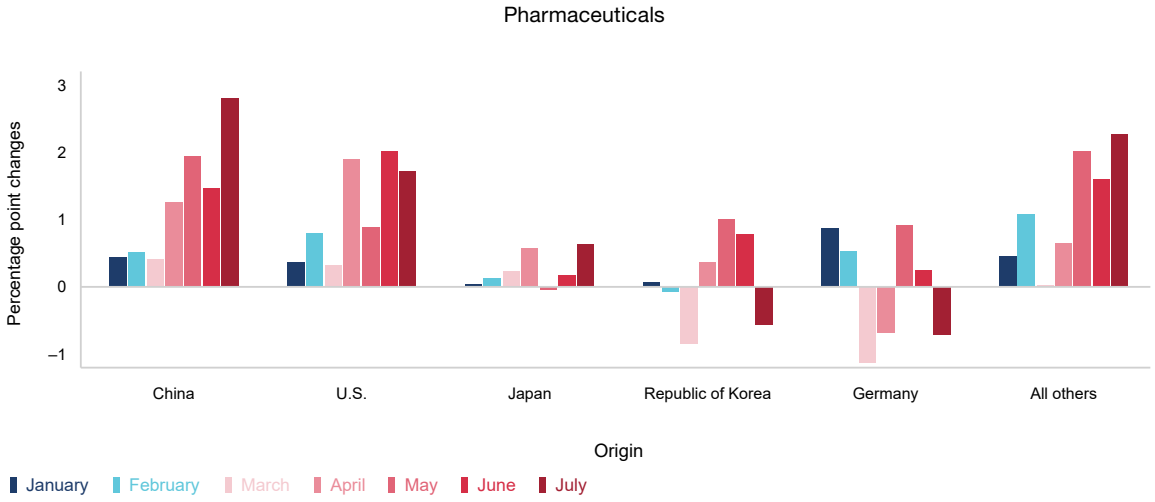




Source: WIPO Statistics Database, March 2021.

S5. PCT applicants' feedback on the impact of the COVID-19 pandemic on R&D and IP filing in 2020 and 2021

Survey results	China	Germany	Japan	Republic of Korea	U.S.	Total
Total number of responses	2	2	13	4	7	28
No to small impact on R&D activity	2	2	7	0	3	14
Moderate impact on R&D activity	0	0	6	0	4	10
Fairly severe to severe impact on R&D activity	0	0	0	4	0	4
No to small impact on IP filings	2	2	7	1	4	16
Moderate impact on IP filings	0	0	6	2	2	10
Fairly severe to severe impact on IP filings	0	0	0	1	1	2
Average impact score on R&D activity (0=no impact; 5=severe impact)	**0.5**	**1.0**	**1.5**	**4.0**	**1.7**	**1.8**
Average impact score on IP filings (0=no impact; 5=severe impact)	**0.0**	**1.0**	**1.4**	**2.3**	**1.6**	**1.4**

Source: WIPO Patents and Technology Sector, March 2021.

cations filed between January and July 2020 with that for applications filed during the same months of 2019 provides some first insights into the latest filing trends by technical field.

PCT applications filed in the field of digital communication accounted for 8.9% of total filings in January 2019 and for 9.7% in January 2020, representing an on-year 0.8 percentage points increase (see figure S3). Among all technical fields, digital communication was the one to see the most pronounced increase in share in January and in March 2020.

Since the pandemic began, all fields in the chemistry sector – such as biotechnology and pharmaceuticals – have seen an increase in their share of total filings; conversely, all those from the electrical engineering sector – such as computer technology and digital communication – have seen their respective shares decrease.

The proportion of applications filed between April and July 2020 increased sharply for biotechnology, medical technology, organic fine chemistry and pharmaceuticals. This was most pronounced in the pharmaceuticals field, whose share rose by between 1.3 to 1.9 percentage points in the four months between April and July.

In contrast, a decrease in shares of applications filed was most pronounced in computer technology, digital communication and semiconductors. Among the 35 technical fields, computer technology experienced the largest drop in share, decreasing by between 1.3 to 1.6 percentage points between May and July.

These changes in shares may suggest that applicants quickly adjusted their filing strategy to the context of the pandemic. The increase in share for fields relating to health may be due to a global race to produce innovations connected to the new coronavirus. The drop in shares for technical fields in the electrical engineering sector suggests this may be a main source of the slowdown in overall PCT filings (see figure S1).

In the top five countries of origin, the share of applications filed in biotechnology increased almost every month between April and July 2020 (see figure S4). During the same period, the share of applications filed in pharmaceuticals by applicants from China, the U.S. and countries outside the top five combined (i.e., all others) increased sharply.

Between April and July, the proportion of applications filed in computer technology fell steeply in Japan, the U.S. and for countries outside the top five combined; conversely, it grew in China.

Between February and July 2020, Japan saw a steady decline in share of applications filed in digital communication, whereas it constantly – or almost constantly – grew in China, the U.S. and the Republic of Korea.

The finding of a relatively strong PCT filing performance in health-related technology fields – especially in biotechnology, medical technology and pharmaceuticals – may at first appear to be a logical response to the innovation needs created by the pandemic. However, it is important to point out that the vast majority of those PCT applications filed since the pandemic began relate to inventions made prior to its start. The strong PCT performance of health-related technology fields may therefore reflect a shift in the commercialization strategy for technologies already under development or a drop in filings of applications not relating to health. A fuller assessment of this trend will need to wait until complete information on the technological classification of PCT applications filed in 2020 is available.

A survey shows that pandemic-related measures affected some R&D activities

In March 2021, a total of 28 large PCT applicants from the top five countries of origin provided general feedback on how the COVID-19 pandemic was affecting their R&D and IP filing activities (see table S5). Applicants rated the impact of the pandemic on these two activities, ranging from not impacted (0) to severely impacted (5). In addition, several respondents provided more detailed observations.

With an overall average score of 1.8 points out of 5, the applicants interviewed considered the pandemic to have had a relatively low impact on their R&D.

Several respondents pointed to the negative impact of teleworking on R&D, which generally requires a minimum amount of work in a laboratory. Social distancing also delayed R&D activities due to less collaborative work being undertaken on-site with other companies. One large pharmaceutical company mentioned that the pandemic had caused delays to research and changes in procedures at the beginning. In contrast, a health care-related company noted that the pandemic created new R&D opportunities, for example, in remote medical services.

With an average score of 1.4, interviewed applicants expressed the belief that the COVID-19 pandemic had had a relatively low impact on the level of IP filings. Sixteen of the 28 applicants believed it had little or no impact on IP filing. Only one company in the Republic of Korea and one in the U.S. reported a quite severe impact on filings.

An applicant from the Republic of Korea noted that communication between its R&D and IP departments became less efficient with the introduction of virtual meetings. A Japanese company indicated that any dramatic fall in customer demand may affect the budget it allocates to IP filings, at least to a certain extent. Finally, a U.S. company noted the pandemic indirectly causing significant delays in legalizing documents with the relevant national authorities.

Conclusion

Just as during the financial crisis of 2008–2009, PCT filing activity slowed down rapidly and significantly at the start of the COVID-19 pandemic, plunging from a 9% growth in March down to a 0.2% decline in December 2020. Filing activity only rebounded from July to September, when most high-income economies lifted containment measures. The sustained growth in filings seen from China during most of 2020 had a substantial positive impact on overall PCT filings.

Among the top five countries, growth in applications from China remained high during the first months of the pandemic, but slowed progressively from August to the end of the year. Germany, Japan, the Republic of Korea and the U.S. all saw PCT application filing activity drop from March 2020 onwards. Of the top five origins, Germany and Japan experienced the steepest decline in filings.

Among technical fields, between March and July 2020, the largest decreases in shares of overall filings were for computer technology, digital communication and semiconductors. During the same period, shares increased the most for biotechnology, medical technology, organic fine chemistry and pharmaceuticals. The share of applications filed in biotechnology increased for almost every month in each of the top five countries of origin, while that in pharmaceuticals increased sharply in China and the U.S.

The vast majority of PCT applications filed since the pandemic began relate to innovations made prior to its start. The increase in the share of applications in health-related technology fields may therefore suggest a change in applicants' strategies as they adapted to the context of the pandemic by commercializing technologies already under development or reducing filings unrelated to health. A fuller assessment of this trend will be possible once complete technical field data for 2020 are available.

A small survey of large PCT user companies in the top five origins undertaken a year after the pandemic began showed it to have affected R&D and IP filing, although this was rated as being only to a relatively modest degree, on average.

Section A
Statistics on the international phase: PCT applications

Highlights

Despite the COVID-19 pandemic, a record number of PCT applications was filed in 2020

An estimated 275,900 international patent applications (PCT applications) were filed under WIPO's Patent Cooperation Treaty (PCT) in 2020 (see figure A1). This represents a 4% increase on 2019 and an eleventh consecutive year of growth. Despite the COVID-19 pandemic adversely affecting economies worldwide in 2020, there was an increase in the number of PCT applications filed, mostly due to intense filing activity in China (see Special theme).

Since the PCT System became operational in 1978, about 4.26 million PCT applications have been filed. Overall, PCT filings have grown every year, except for 2009, when the global financial crisis led to an economic downturn.

Applicants from 125 countries filed PCT applications in 2020

In 2020, 153 states were members of the PCT and applicants from 125 countries filed PCT applications at 84 receiving offices (ROs). Despite this broad geographical spread, most filing activity is concentrated in a small number of economies.

Combined, the top 10 ROs accounted for 94.2% of applications filed in 2020. With 72,349 filings, the China National Intellectual Property Administration (CNIPA) received the highest number of PCT applications. It was followed by the United States Patent and Trademark Office (USPTO), the Japan Patent Office (JPO), the European Patent Office (EPO), the Korean Intellectual Property Office (KIPO) and the International Bureau (IB) of WIPO (see figure A4).

Applicants from China cemented their position as the largest users of the PCT System

With 68,720 PCT applications, applicants residing in China filed the most applications in 2020. They were followed by applicants from the United States of America (U.S.) (59,230) and Japan (50,520) (see figure A7). Combined with applicants from Germany and the Republic of Korea, the top five countries accounted for 78.7% of all PCT applications filed in 2020. Driven mainly by a rapid increase in filings by applicants from China and Japan, the combined share of the top five users of the PCT System has increased every year for the past decade.

The top 20 origins included 17 high-income countries – mostly European – and three middle-income economies, namely, China, India and Turkey (see figure A8). Outside the top 20 origins, other large middle-income economies with notable numbers of PCT applications were Brazil, the Islamic Republic of Iran, the Russian Federation and Malaysia, whose filings ranged between 283 and 1,073. Applicants from Sudan accounted for half of the 12 applications filed by applicants residing in low-income countries (see table A30).

Compared to 2019, 12 of the top 20 origins filed more PCT applications in 2020. The main growth came from China (+16.1%), Denmark (+7.5%), Austria (+6%), Switzerland (+5.5%) and the Republic of Korea (+5.2%). In contrast, the countries which experienced the sharpest falls were India (–6.5%), Japan (–4.1%) and Canada (–4%).

Among the large middle-income economies not to feature among the top 20 origins, Malaysia (+26.2%), the Islamic Republic of Iran (+25.8%) and Thailand (+24.5%)

underwent a sharp growth in PCT filings. In contrast, the Russian Federation (–9.5%), Mexico (–9.3%) and South Africa (–8.7%) saw a marked contraction.

The majority of PCT filings originated from Asia in 2020

Countries located in Asia accounted for 53.7% of all PCT applications filed in 2020. Asia's share grew from 35.7% in 2010 to 53.7% in 2020, primarily due to increases in filings from China, Japan and the Republic of Korea (see figure A3).

North America (22.4%) became the second region in terms of PCT applications, followed very closely by Europe (22.3%). The combined share for Africa, Latin America and the Caribbean (LAC) and Oceania amounted to 1.4% of total PCT filings.

The business sector accounted for about 87% of all PCT applications

In 2020, the IB published 264,584 PCT applications, representing a 7.3% rise in published applications compared to 2019. The business sector accounted for 86.7% of all published PCT applications, followed by the university sector (5.8%), individuals (5.5%) and the government and public research organization (PRO) sector (1.9%) (see figure A11).

The business sector accounted for the majority of published applications received from each of the top 20 origins in the high-income group. This sector's share was especially high for Sweden (97.7%) and Japan (96.2%). Of the top 20 origins from the middle-income category, the business sector accounted for a majority of the published applications in six, while individual applicants filed most applications in eight. Individual applicants accounted for over 80% of applications from Egypt, the Islamic Republic of Iran, Ukraine and Viet Nam (see figure A12).

The university sector was responsible for a particularly large proportion of applications originating from Morocco (47.1%), Colombia (21.9%) and Peru (18.2%). It also accounted for relatively high shares among several high-income economies, such as Singapore (13.7%) and Spain (13.2%). Governments and PROs were responsible for a relatively large proportion of applications originating from Malaysia (32%), Argentina[4] (21.9%) and Singapore (12.3%).

Huawei remained the top PCT applicant in 2020

For a fourth consecutive year, China-based telecoms giant Huawei Technologies topped the ranking of PCT applicants, with 5,464 PCT applications published in 2020 (see table A15). With 3,093 applications, Samsung Electronics of the Republic of Korea ranked in second position, followed by Mitsubishi Electric Corp. of Japan, LG Electronics Inc. of the Republic of Korea and Qualcomm Inc. of the U.S.

Among the top 10 PCT applicants, three companies registered particularly sharp growth. With 1,053 more published PCT applications in 2020, Huawei Technologies set a new record in the number of applications published by a company within a single year. Samsung Electronics moved up to the second position in 2020 thanks to 759 additional applications published for the year. LG Electronics recorded the fastest increase in published applications in 2020, moving up from 10th position in 2019 to fourth. Within the top 50 list, other notable increases in applications came from the Japanese Nippon Telegraph and Telephone Corp. (+669 applications) and the Chinese Beijing Bytedance Network Technology Corp. (+649).

The top 50 applicants list for 2020 is composed of companies from only eight origins. Japan had 16 of the top applicants, followed by China (13), the U.S. (11), Germany (4) and the Republic of Korea (3). Finland, the Netherlands and Sweden each had one listed applicant.

4 Argentina is not a PCT Contracting State but, in accordance with PCT Rule 18.3, the right to file a PCT application exists if one of the multiple applicants named in the application has the right to file by reason of nationality or residence in a PCT Contracting State.

Companies active in digital communication headed the list of top 50 PCT filers in 2020. Of the top 10 applicants, six filed mainly in digital communication, namely, Ericsson, Huawei Technologies, Oppo Mobile, LG Electronics, Qualcomm Inc. and Samsung Electronics (see table A16).

Half of the top 10 universities were in China

Among educational institutions, the University of California remained the largest user of the PCT System in 2020, with 559 published PCT applications (see table A17). It was followed by the Massachusetts Institute of Technology (MIT) of the U.S. and the Shenzhen University of China.

Of the top 50 universities, 18 were located in the U.S., 16 in China, five in the Republic of Korea, four in Japan, two in the United Kingdom (U.K) and one each in India, Israel, Saudi Arabia, Singapore and Switzerland.

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

With 428 published applications, the German-based Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung headed the list of top 30 government and PRO applicants in 2020. It was followed by the Shenzhen Institute of Advanced Technology of China, the China Academy of Telecommunications Technology, the Commissariat à l'Énergie Atomique et aux Énergies Alternatives and the Institut National de la Santé et de la Recherche Médicale, both of France (see table A18).

Applicants from 12 countries are in the top 30 list for 2020. The Republic of Korea (6) had the highest number of top applicants, followed by China (5), the U.S. (5), France (3) and Japan (3).

Computer technology remained the main technology field in PCT applications

Computer technology (24,334) remained in top position in 2020. It was followed by digital communication (22,068), medical technology (17,497), electrical machinery, apparatus, energy (17,363) and measurement (12,699) (see table A20). These top five fields of technology, combined, accounted for 35.5% of all PCT applications published in 2020.

Compared to 2019, the number of published PCT applications decreased for engines, pumps, turbines (–4.5%) and mechanical elements (–1.8%). Over the same period, audio-visual technology (+29.6%), micro-structural and nano-technology (+16.9%), and digital communication (+15.8%) all saw double-digit growth.

The share of women listed as inventors grew faster in 2020 than the year before, but remained low

In 2020, women accounted for 16.5% of all inventors listed in PCT applications and men the remaining 83.5% (see figure A22). The share of women inventors increased by 0.7 percentage points in 2020 as compared to 2019. Since 2006, this share has almost continuously increased; only 2011 saw a very slight drop.

The share of women inventors has grown in each of the world's geographical regions over the past 10 years. In 2020, the LAC region (19.2%) had the highest share of women among PCT inventors, followed by Asia (17.4%), North America (16.5%), Oceania (14.9%), Europe (14.2%) and Africa (12.1%) (see figure A24).

About 96% of PCT applications named at least one man as inventor in 2020, and 34% named at least one woman as inventor (see figure A23). The share of PCT applications with at least one woman as inventor has risen from 22% in 2006 to 33.7% in 2020, while the proportion of PCT applications with at least one man as inventor has decreased within the same period from 97.3% to 95.9%.

The gender gap among PCT inventors varies considerably between countries. Of the top 20 origins, Spain, China and the Republic of Korea had the largest proportion of inventors who were women in 2020 (see figure A25). They were the only origins among the top 20 where at least one-fifth of inventors were women. In contrast,

Austria, Germany and Japan had around one-tenth or less of female inventors in applications published in 2020.

Those technology fields relating to the life sciences had comparatively higher proportions of women among inventors listed in PCT applications published between 2018 and 2020 (see table A26). Overall, women represented more than one-quarter of inventors in the fields of analysis of biological materials, biotechnology, food chemistry and pharmaceuticals. Biotechnology was the technical field with the largest proportion of women listed as inventors in four out of the six geographical regions. Food chemistry had a slightly larger proportion of women as inventors in Asia. Women listed in PCT applications filed by applicants residing in the LAC region accounted for more than one-third of inventors in six technical fields, with organic fine chemistry almost reaching gender parity (49.5%).

The top 50 PCT geographical clusters accounted for the majority of PCT filing activity

Combined, the top 50 PCT clusters represented 58.5% of PCT applications published between 2015 and 2019 (see table A28). Over this period, Tokyo–Yokohama was by far the largest PCT cluster, with its 116,794 PCT applications accounting for 10.8% of all applications. Tokyo–Yokohama was followed by Shenzhen–Hong Kong–Guangzhou and Seoul. San Jose–San Francisco (fourth position) and Paris (11th position) were the highest ranked clusters in North America and Europe, respectively.

Compared to 2014–2018, two-thirds of the top 50 PCT clusters grew during 2015–2019, of which 10 saw double-digit increases. The three clusters with the sharpest growth were Qingdao (+46.8%), Suzhou (+35.2%) and Hangzhou (+34.7%), all in China.

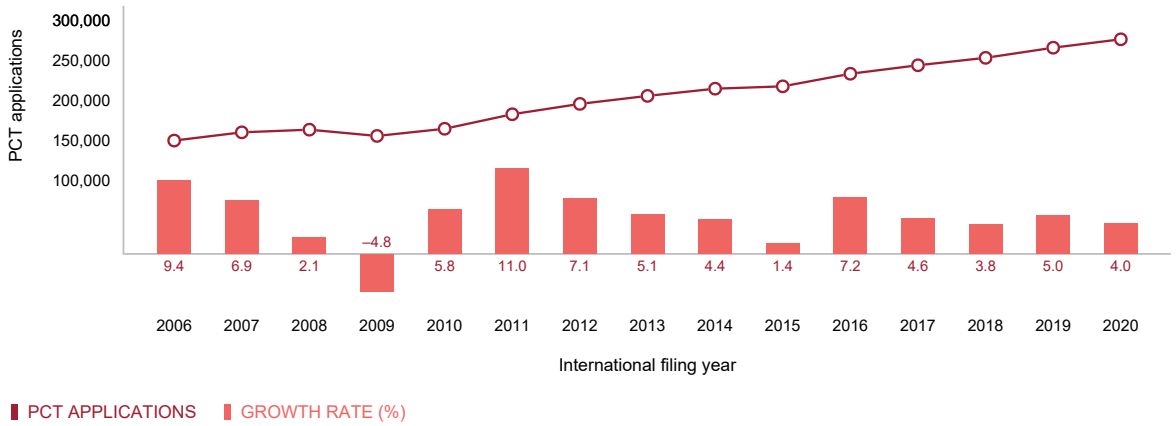
Within the top 50, the highest number of clusters were in the U.S. (15), Germany (7), China (6) and Japan (5). China, India and Turkey were the only three middle-income countries that had clusters among the top 50 in the 2015–2019 period.

Digital communication accounted for more than 10% of published applications in eight of the top 20 PCT clusters, with 33.5% in San Diego, 28.5% in Shenzhen–Hong Kong–Guangzhou and 21.1% in Beijing (see table A29). Computer technology represented over one-tenth of applications in seven of the top 20 clusters and was by far the main technology field for Seattle (40.1%) and San Jose–San Francisco (22.8%).

Global trends in PCT applications

The total number of PCT applications grew by 4% to 275,900 in 2020.

A1. Trend in filings of PCT applications, 2006–2020

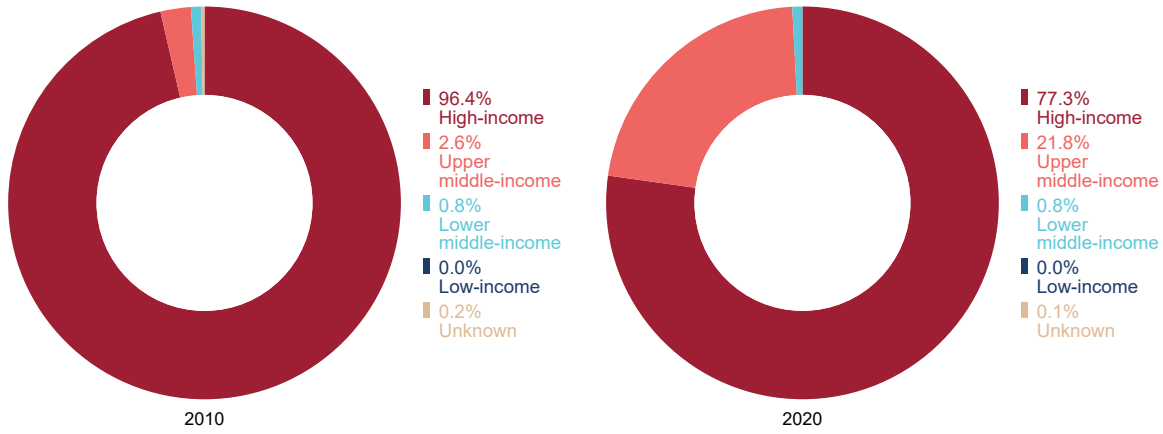


Note: Data for 2020 are WIPO estimates.

Source: WIPO Statistics Database, March 2021.

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

A2. Distribution of PCT applications by income group, 2010 and 2020

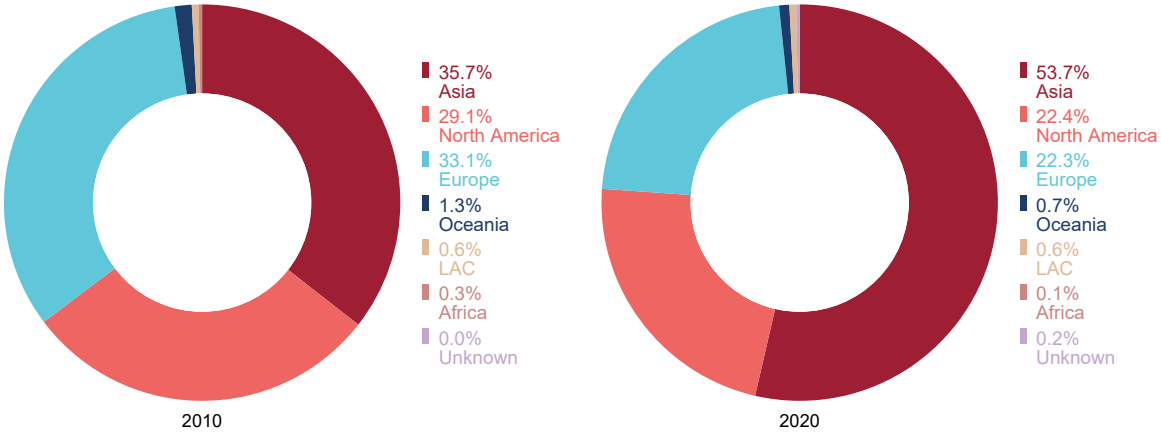


Note: Data for 2020 are WIPO estimates. Each income group includes the following number of origins: high-income (61), upper middle-income (35), lower middle-income (24) and low-income (5). For information on income group classification, see annex, Data description.

Source: WIPO Statistics Database, March 2021.

Asia accounted for the majority of PCT applications filed in 2020.

A3. Distribution of PCT applications by region, 2010 and 2020



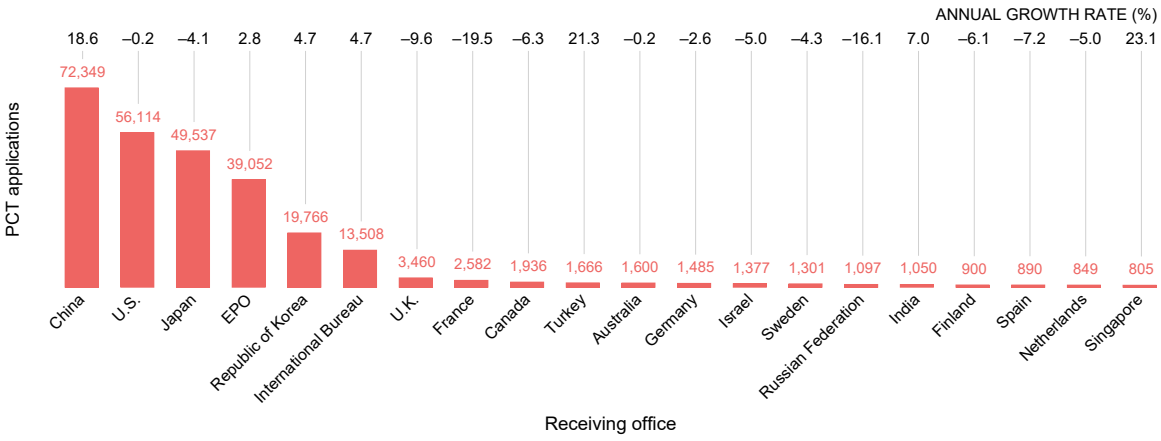
Note: Data for 2020 are WIPO estimates. Each region includes the following number of origins: Africa (22), Asia (32), Europe (42), Latin America and the Caribbean (LAC) (21), North America (3) and Oceania (4).

Source: WIPO Statistics Database, March 2021.

PCT applications by receiving office

The CNIPA received more than 72,300 PCT applications in 2020.

A4. PCT applications for the top 20 receiving offices, 2020

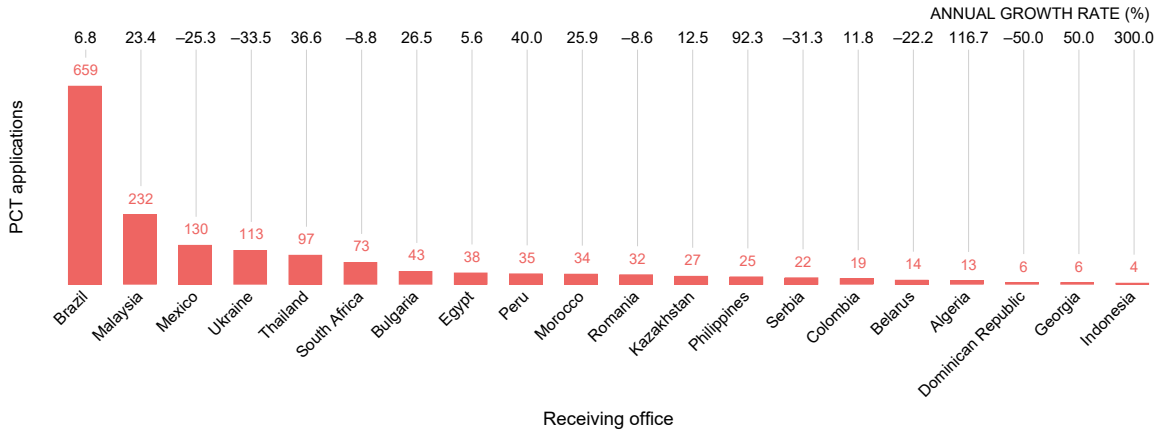


Note: Data for 2020 are WIPO estimates. CNIPA is the China National Intellectual Property Administration and EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2021.

The office of Brazil received 659 PCT applications in 2020.

A5. PCT applications for selected receiving offices of low- and middle-income countries, 2020



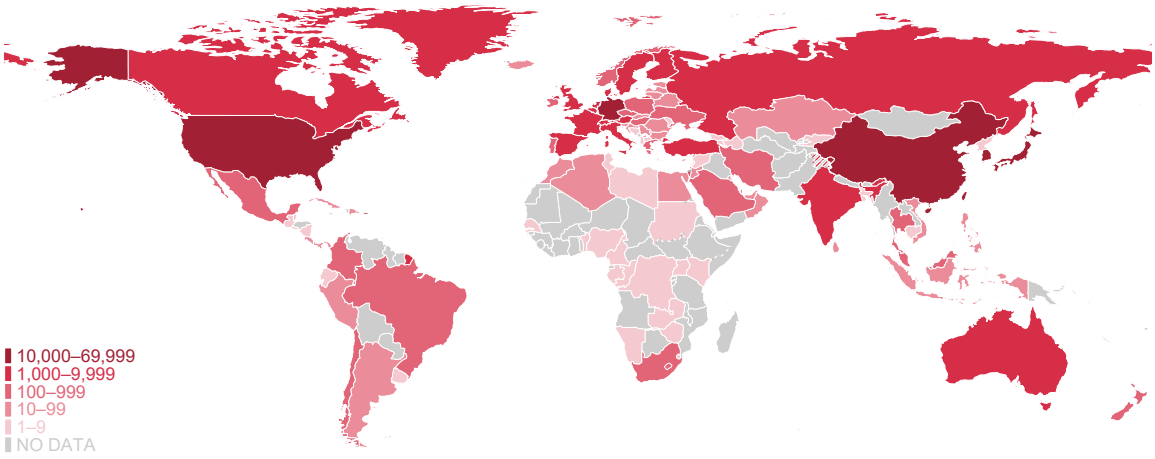
Note: Data for 2020 are WIPO estimates. The selected offices are from different world regions and income groups (low-income, lower middle-income and upper middle-income). Where available, data for all offices are presented in statistical table A30.

Source: WIPO Statistics Database, March 2021.

PCT applications by origin

PCT applications are highly concentrated in a few origins.

A6. PCT applications by origin, 2020

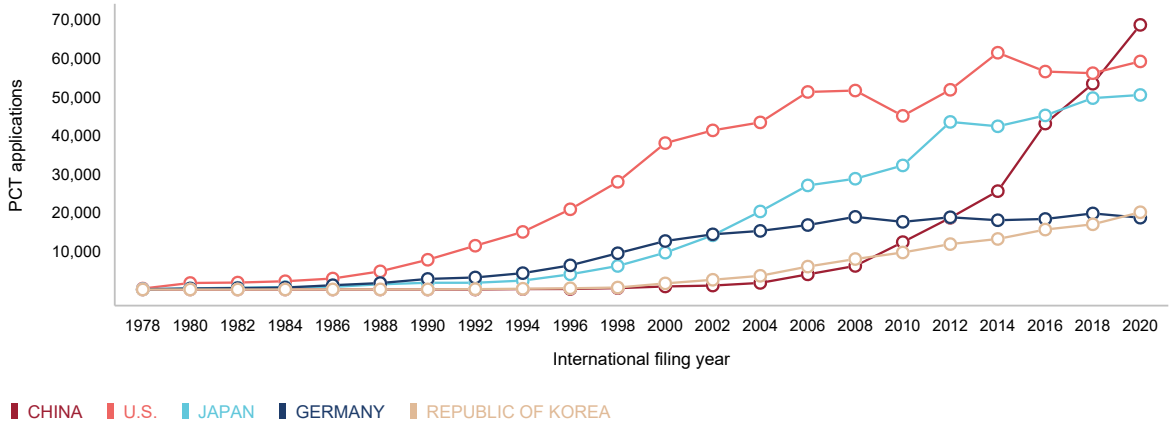


Note: Data for 2020 are WIPO estimates.

Source: WIPO Statistics Database, March 2021.

Up until 2019, U.S.-based applicants had filed the most PCT applications for every year.

A7. Trend in PCT applications for the top five origins, 1978–2020

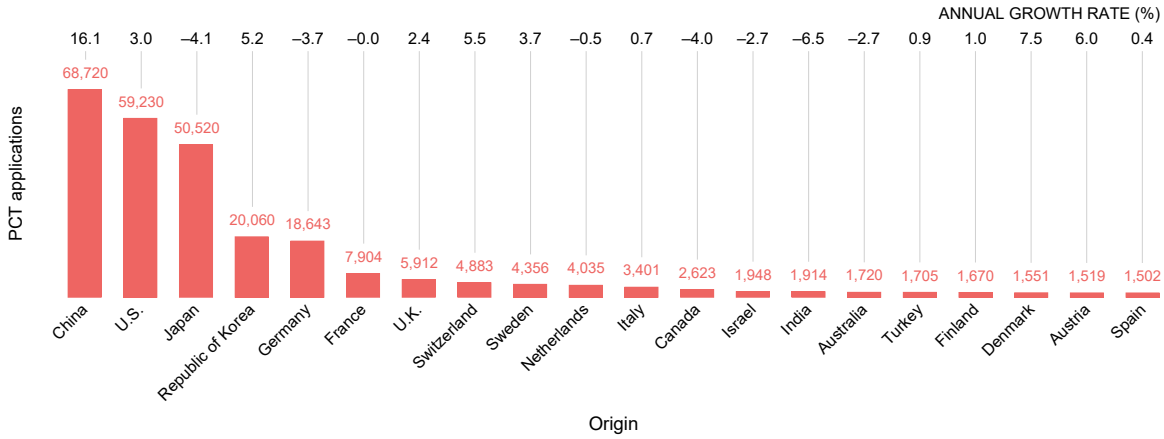


Note: Data for 2020 are WIPO estimates.

Source: WIPO Statistics Database, March 2021.

Among the top 20 origins, only China recorded double-digit growth in 2020.

A8. PCT applications for the top 20 origins, 2020



Note: Data for 2020 are WIPO estimates.

Source: WIPO Statistics Database, March 2021.

Asia and Latin America and the Caribbean are the geographical regions to have undergone the sharpest growth in filings in 2020.

A9. PCT applications for the top countries by region, 2018–2020

Region	Origin	2018	2019	2020	Regional share 2020 (%)	Change from 2019 (%)
Africa	South Africa	275	275	251	60.9	–8.7
	Egypt	44	44	46	11.2	4.5
	Morocco	49	33	42	10.2	27.3
	Algeria	16	9	14	3.4	55.6
	Mauritius	4	12	14	3.4	16.7
	Others	45	43	45	10.9	4.7
	Total*	**433**	**416**	**412**	**0.1**	**–1.0**
Asia	China	53,445	59,193	68,720	46.4	16.1
	Japan	49,703	52,693	50,520	34.1	–4.1
	Republic of Korea	16,919	19,073	20,060	13.5	5.2
	Israel	1,896	2,003	1,948	1.3	–2.7
	India	2,009	2,047	1,914	1.3	–6.5
	Turkey	1,398	1,689	1,705	1.2	0.9
	Singapore	904	1,112	1,278	0.9	14.9
	Saudi Arabia	662	552	956	0.6	73.2
	Iran (Islamic Republic of)	176	225	283	0.2	25.8
	Malaysia	143	202	255	0.2	26.2
	Others	419	504	540	0.4	7.1
	Total*	**127,674**	**139,293**	**148,179**	**53.7**	**6.4**
Europe	Germany	19,754	19,358	18,643	30.3	–3.7
	France	7,922	7,906	7,904	12.8	0.0
	U.K.	5,637	5,773	5,912	9.6	2.4
	Switzerland	4,596	4,627	4,883	7.9	5.5
	Sweden	4,175	4,202	4,356	7.1	3.7
	Netherlands	4,132	4,055	4,035	6.5	–0.5
	Italy	3,328	3,379	3,401	5.5	0.7
	Finland	1,833	1,654	1,670	2.7	1.0
	Denmark	1,445	1,443	1,551	2.5	7.5
	Austria	1,485	1,433	1,519	2.5	6.0
	Others	7,565	7,817	7,751	12.6	–0.8
	Total*	**61,872**	**61,647**	**61,625**	**22.3**	**0.0**
Latin America and the Caribbean	Brazil	615	643	697	44.8	8.4
	Chile	241	224	262	16.8	17.0
	Mexico	273	216	196	12.6	–9.3
	Colombia	159	128	132	8.5	3.1
	Antigua and Barbuda	96	47	68	4.4	44.7
	Argentina	42	35	42	2.7	20.0
	Barbados	83	65	40	2.6	–38.5
	Peru	37	26	37	2.4	42.3
	Panama	186	17	21	1.4	23.5
	Cuba	7	9	12	0.8	33.3
	Others	74	68	48	3.1	–29.4
	Total*	**1,813**	**1,478**	**1,555**	**0.6**	**5.2**
North America	U.S.	56,172	57,499	59,230	95.7	3.0
	Canada	2,416	2,731	2,623	4.2	–4.0
	Bermuda	28	22	10	0.0	–54.5
	Total*	**58,616**	**60,252**	**61,863**	**22.4**	**2.7**
Oceania	Australia	1,827	1,767	1,720	84.5	–2.7
	New Zealand	275	249	311	15.3	24.9
	Others	2	3	5	0.2	66.7
	Total*	**2,104**	**2,019**	**2,036**	**0.7**	**0.8**
Unknown		267	276	230	0.1	–16.7
Total		**252,779**	**265,381**	**275,900**	**n.a.**	**4.0**

Note: Data for 2020 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 10 PCT applications in 2020. Data for all origins are reported in statistical table A30.

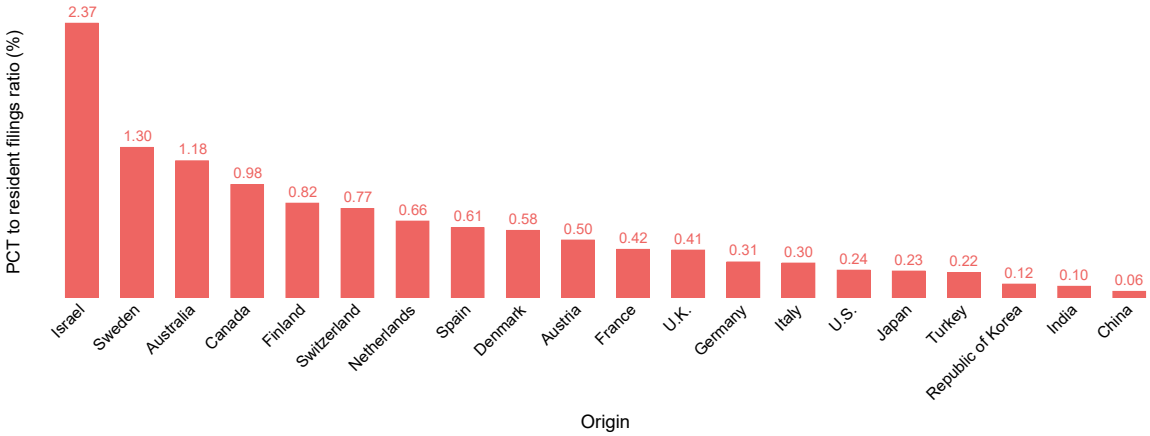
* indicates share of world total.

n.a. indicates not applicable.

Source: WIPO Statistics Database, March 2021.

Israel had a high conversion rate of resident patent application to PCT application compared to other Asian origins.

A10. Conversion ratio of direct resident patent applications to PCT applications for the top 20 origins, 2020



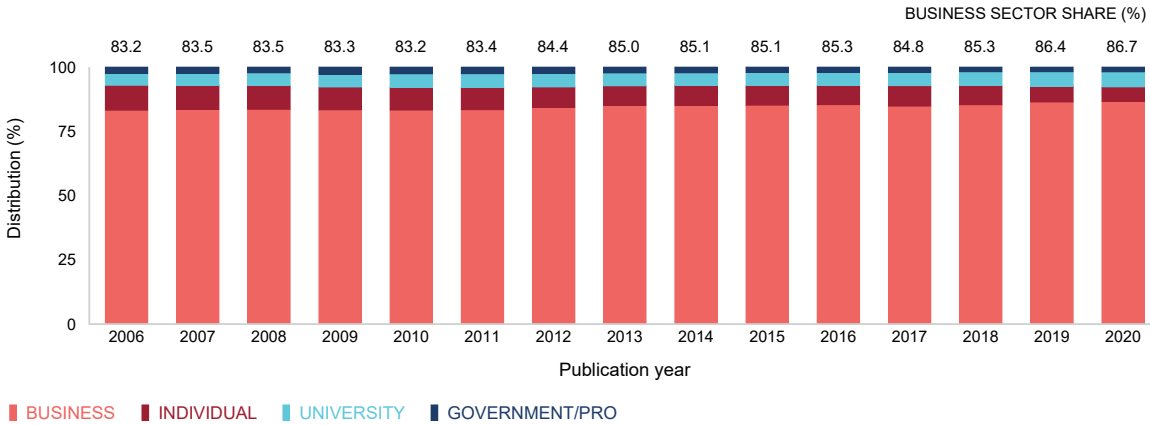
Note: Data for 2020 are WIPO estimates. This hypothetical "conversion ratio" reflects the proportion of direct resident patent applications converted into PCT applications. The ratio is defined for the top 20 origins in terms of PCT applications filed in 2020 divided by resident patent applications (including regional applications and excluding PCT national phase entries) filed in 2019. In theory, the conversion ratio ought to 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 instead opt to file a first application at the USPTO, then convert that prior filing into a PCT application.

Source: WIPO Statistics Database, March 2021.

PCT applications by applicant type

The business sector accounted for 86.7% of all PCT applications filed in 2020.

A11. Distribution of PCT applications by applicant type, 2006–2020

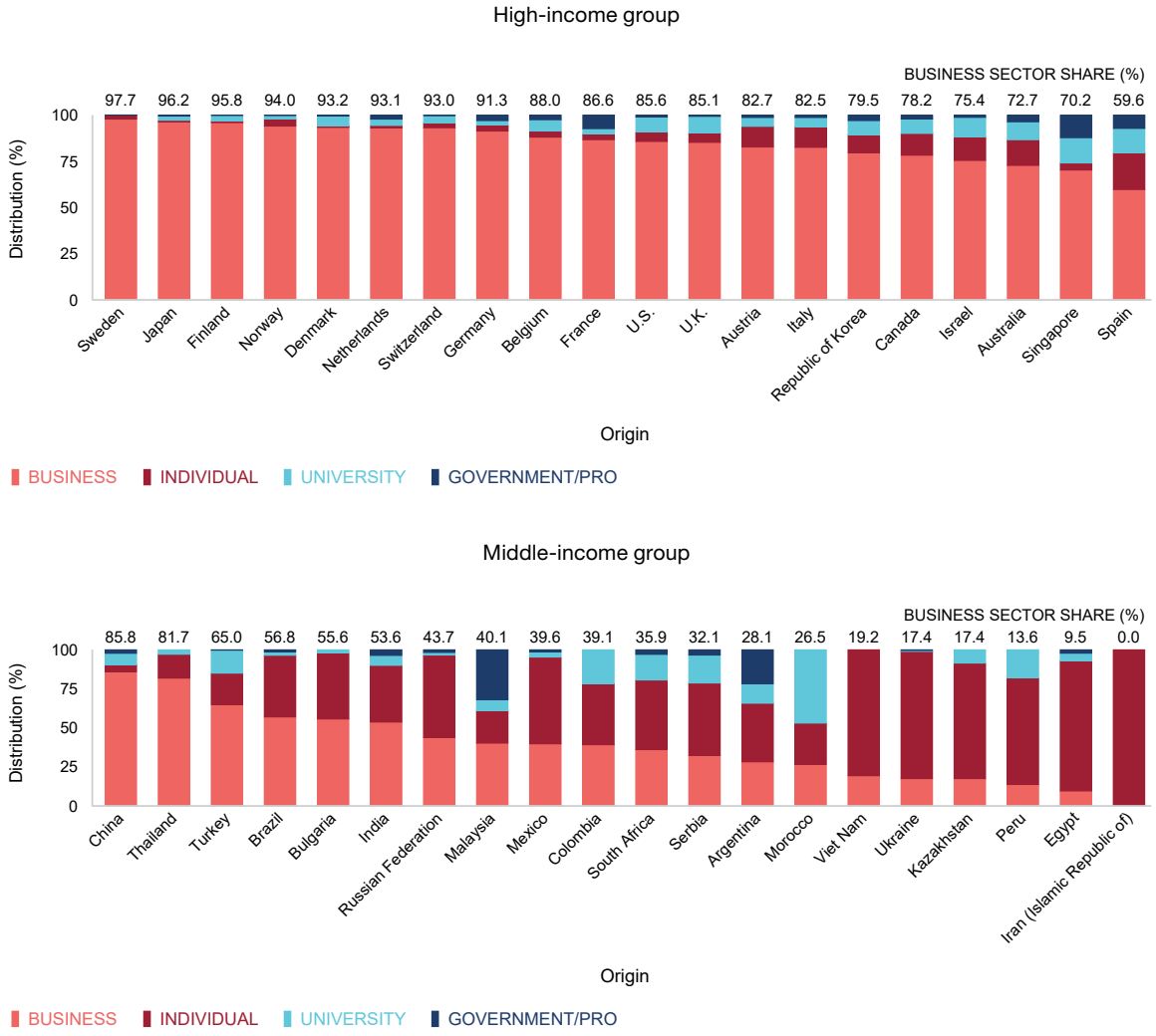


Note: The government and public research organization (PRO) sector includes private non-profit organizations and hospitals. The university sector includes all educational institutions. For confidentiality reasons, data are based on the publication date.

Source: WIPO Statistics Database, March 2021.

Nearly 98% of PCT applications originating in Sweden were filed by businesses.

A12. Distribution of PCT applications by applicant type for the top 20 origins by income group, 2020

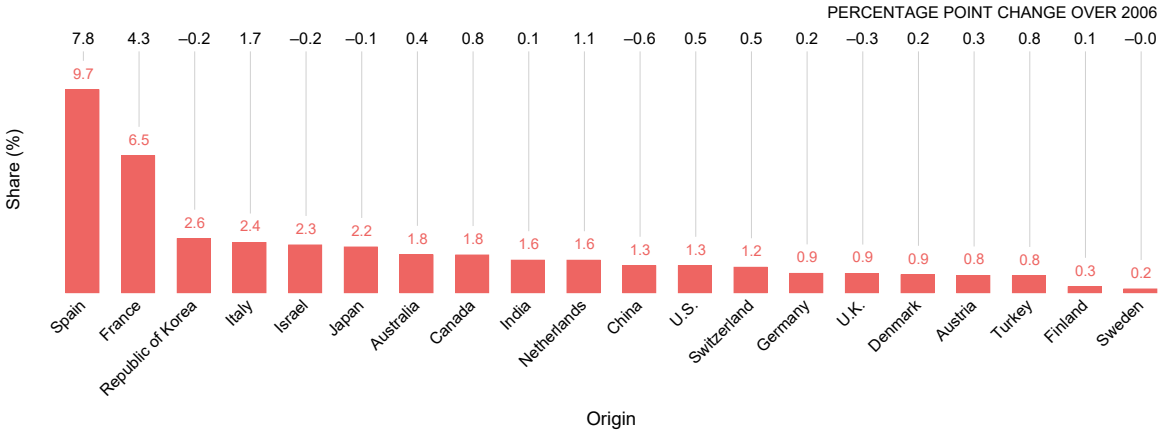


Note: The government and PRO sector includes private non-profit organizations and hospitals. The university sector includes all educational institutions. For confidentiality reasons, data are based on published applications and on the publication date.

Source: WIPO Statistics Database, March 2021.

France and Spain exhibited a comparatively high level of collaboration between the business and public sectors.

A13. Share of PCT applications with business and public sector co-applicants for the top 20 origins, 2020

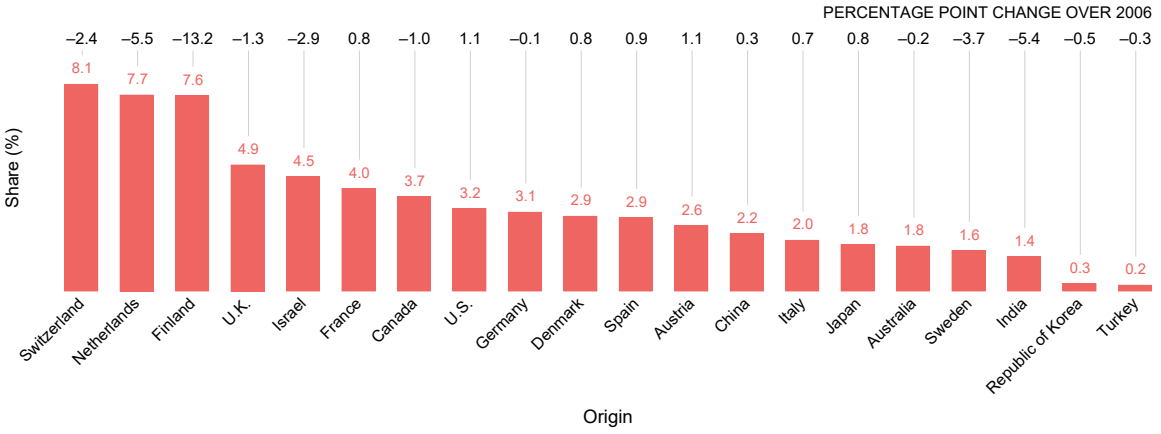


Note: The public sector comprises the university sector and the government and PRO sector. The government and PRO sector includes private non-profit organizations and hospitals. The university sector includes all educational institutions. For confidentiality reasons, data are based on published applications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

Source: WIPO Statistics Database, March 2021.

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

A14. Share of PCT applications with foreign co-applicants for the top 20 origins, 2020



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

Source: WIPO Statistics Database, March 2021.

Top PCT applicants

Huawei Technologies stayed as top PCT applicant in 2020.

A15. Top 50 business PCT applicants, 2018–2020

Overall ranking	Change in position from 2019	Applicant	Origin	Published PCT applications		
				2018	2019	2020
1	0	HUAWEI TECHNOLOGIES CO., LTD.	China	5,405	4,411	5,464
2	1	SAMSUNG ELECTRONICS CO., LTD.	Republic of Korea	1,997	2,334	3,093
3	–1	MITSUBISHI ELECTRIC CORPORATION	Japan	2,812	2,661	2,810
4	6	LG ELECTRONICS INC.	Republic of Korea	1,697	1,646	2,759
5	–1	QUALCOMM INCORPORATED	U.S.	2,405	2,127	2,173
6	1	TELEFONAKTIEBOLAGET LM ERICSSON (PUBL)	Sweden	1,645	1,698	1,989
7	–1	BOE TECHNOLOGY GROUP CO.,LTD	China	1,813	1,864	1,892
8	–3	GUANG DONG OPPO MOBILE TELECOMMUNICATIONS CORP., LTD	China	1,042	1,927	1,801
9	4	SONY CORPORATION	Japan	1,342	1,566	1,793
10	2	PANASONIC INTELLECTUAL PROPERTY MANAGEMENT CO., LTD.	Japan	1,465	1,567	1,611
11	3	HEWLETT–PACKARD DEVELOPMENT COMPANY, L. P.	U.S.	1,170	1,510	1,595
12	3	MICROSOFT TECHNOLOGY LICENSING, LLC	U.S.	1,476	1,370	1,529
13	–4	ROBERT BOSCH CORPORATION	Germany	1,525	1,687	1,375
14	–3	LG CHEM, LTD.	Republic of Korea	969	1,624	1,374
15	12	NIPPON TELEGRAPH AND TELEPHONE CORPORATION	Japan	138	703	1,372
16	2	ZTE CORPORATION	China	2,080	1,085	1,316
17	–9	PING AN TECHNOLOGY (SHENZHEN) CO., LTD.	China	336	1,691	1,304
18	–1	SIEMENS AKTIENGESELLSCHAFT	Germany	1,211	1,153	1,202
19	–3	FUJIFILM CORPORATION	Japan	962	1,158	1,128
20	0	NEC CORPORATION	Japan	947	1,024	1,121
21	2	SZ DJI TECHNOLOGY CO., LTD	China	766	875	1,073
22	–3	DENSO CORPORATION	Japan	998	1,026	1,062
23	11	VIVO MOBILE COMMUNICATION CO., LTD.	China	179	603	955
24	7	SHENZHEN CHINA STAR OPTOELECTRONICS SEMICONDUCTOR DISPLAY TECHNOLOGY CO., LTD.	China	567	654	872
24	17	WUHAN CHINA STAR OPTOELECTRONICS SEMICONDUCTOR DISPLAY TECHNOLOGY CO., LTD.	China	10	506	872
26	–5	KONINKLIJKE PHILIPS ELECTRONICS N.V.	Netherlands	1,033	982	846
27	3	3M INNOVATIVE PROPERTIES COMPANY	U.S.	648	662	789
28	–2	GOOGLE INC.	U.S.	836	777	781
29	–4	ALIBABA GROUP HOLDING LIMITED	China	496	1,029	770
30	2	NTT DOCOMO, INC.	Japan	450	624	767
31	–9	SHARP KABUSHIKI KAISHA	Japan	1,132	928	745
32	362	BEIJING BYTEDANCE NETWORK TECHNOLOGY CO., LTD.	China	0	70	719
33	6	SONY SEMICONDUCTOR SOLUTIONS CORPORATION	Japan	467	517	703
34	–6	MURATA MANUFACTURING CO., LTD.	Japan	889	701	697
35	12	HKC CORPORATION LIMITED	China	319	468	672
36	11	APPLIED MATERIALS, INC.	U.S.	407	467	635
37	16	KYOCERA CORPORATION	Japan	413	432	626
37	–13	INTEL CORPORATION	U.S.	1,835	849	626
39	–3	NOKIA TECHNOLOGIES OY	Finland	551	579	618
40	41	APPLE INC.	U.S.	390	307	615
41	9	OMRON CORPORATION	Japan	346	442	596
41	–8	HITACHI AUTOMOTIVE SYSTEMS, LTD.	Japan	582	612	596
43	109	GREE ELECTRIC APPLIANCES INC. OF ZHUHAI	China	177	175	562
44	–15	HONDA MOTOR CO., LTD.	Japan	504	692	559
46	17	HALLIBURTON ENERGY SERVICES, INC.	U.S.	637	372	558
47	–10	BASF SE	Germany	557	573	542
48	2	SCHAEFFLER TECHNOLOGIES AG & CO. KG	Germany	613	442	529
49	–7	CORNING INCORPORATED	U.S.	336	502	527
50	–1	MICRON TECHNOLOGY, INC.	U.S.	184	451	524
51	–16	OLYMPUS CORPORATION	Japan	750	586	499

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

Source: WIPO Statistics Database, March 2021.

Digital communication technologies accounted for the majority of published PCT applications for most of the top 10 applicants.

A16. Share of technology fields for the top 10 business applicants, 2020

Field of technology	Applicant									
	Huawei Tech.	Samsung Electr.	Mitsubishi Electr.	LG Electr.	Qualcomm	LM Ericsson	BOE Tech. Group	OPPO Mobile Tel. Corp	Sony Corp.	Panasonic
Electrical machinery, apparatus, energy	2.5	3.9	17.6	3.6	0.5	0.3	1.1	4.1	1.3	28.5
Audio-visual technology	9.3	10.6	2.7	16.2	7.1	3.0	23.8	12.5	18.5	6.9
Telecommunications	11.0	13.2	4.0	8.4	12.6	12.3	1.3	13.8	5.0	1.9
Digital communication	52.1	28.1	4.0	37.2	68.4	72.1	1.5	50.9	19.3	1.1
Basic communication processes	1.6	0.7	1.9	0.3	1.5	1.4	0.5	0.1	0.7	0.7
Computer technology	16.1	24.7	7.8	5.1	5.0	6.8	16.2	13.3	21.6	5.0
IT methods for management	0.2	1.8	2.1	0.8	0.0	1.2	1.1	0.2	2.6	3.1
Semiconductors	1.4	2.1	4.4	2.7	1.2	0.1	31.2	0.3	1.6	3.8
Optics	2.0	2.5	2.7	1.3	0.1	0.7	13.8	1.5	7.5	5.5
Measurement	1.7	2.1	7.3	1.2	2.3	1.3	2.7	1.6	4.6	7.9
Analysis of biological materials	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.3	0.2
Control	0.7	0.5	6.4	1.8	0.8	0.5	0.5	0.2	3.9	4.1
Medical technology	0.3	1.2	0.6	0.8	0.0	0.0	1.0	0.2	4.5	2.5
Organic fine chemistry	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2
Biotechnology	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.2	0.2
Pharmaceuticals	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0
Macromolecular chemistry, polymers	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.7
Food chemistry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Basic materials chemistry	0.0	0.2	0.0	0.0	0.0	0.0	0.3	0.0	0.1	0.5
Materials, metallurgy	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.1	2.7
Surface technology, coating	0.1	0.2	0.1	0.2	0.0	0.0	1.0	0.1	0.1	2.0
Micro-structural and nano-technology	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.1
Chemical engineering	0.1	0.2	0.4	0.1	0.0	0.0	1.4	0.0	0.1	1.2
Environmental technology	0.0	0.1	0.5	0.1	0.0	0.0	0.2	0.0	0.0	1.2
Handling	0.0	1.0	7.4	4.2	0.0	0.2	0.2	0.1	2.5	0.7
Machine tools	0.0	0.0	1.9	0.0	0.0	0.0	0.1	0.0	0.1	2.6
Engines, pumps, turbines	0.1	0.2	3.3	0.4	0.0	0.0	0.0	0.0	0.1	1.5
Textile and paper machines	0.0	0.0	0.3	0.0	0.0	0.0	0.1	0.0	0.3	0.2
Other special machines	0.0	0.0	0.4	0.5	0.0	0.0	0.1	0.1	0.2	0.9
Thermal processes and apparatus	0.1	1.4	16.0	3.1	0.0	0.1	0.0	0.0	0.1	3.8
Mechanical elements	0.1	0.3	0.8	0.5	0.0	0.1	0.1	0.1	0.2	0.8
Transport	0.3	0.4	4.5	3.0	0.2	0.2	0.3	0.0	1.5	3.1
Furniture, games	0.1	1.4	0.4	2.4	0.1	0.1	0.3	0.2	1.3	2.0
Other consumer goods	0.1	2.8	1.7	5.7	0.0	0.0	0.1	0.8	1.2	1.9
Civil engineering	0.0	0.1	0.4	0.1	0.0	0.0	0.1	0.0	0.1	2.4

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

Source: WIPO Statistics Database, March 2021.

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

A17. Top 50 university PCT applicants, 2018–2020

Overall ranking	Change in position from 2019	Applicant	Origin	Published PCT applications		
				2018	2019	2020
44	2	UNIVERSITY OF CALIFORNIA	U.S.	501	470	559
99	8	MASSACHUSETTS INSTITUTE OF TECHNOLOGY	U.S.	216	230	269
107	–3	SHENZHEN UNIVERSITY	China	201	247	252
118	–25	TSINGHUA UNIVERSITY	China	137	265	231
136	266	ZHEJIANG UNIVERSITY	China	41	69	209
154	15	BOARD OF REGENTS OF THE UNIVERSITY OF TEXAS SYSTEM	U.S.	159	161	184
177	12	DALIAN UNIVERSITY OF TECHNOLOGY	China	53	141	159
183	–20	SOUTH CHINA UNIVERSITY OF TECHNOLOGY	China	170	165	157
190	19	LELAND STANFORD JUNIOR UNIVERSITY	U.S.	121	132	154
202	33	UNIVERSITY OF TOKYO	Japan	92	119	149
204	75	CHINA UNIVERSITY OF MINING AND TECHNOLOGY	China	114	100	148
206	–5	SEOUL NATIONAL UNIVERSITY	Republic of Korea	113	136	146
223	183	NORTHEASTERN UNIVERSITY	China	51	83	132
225	15	JIANGNAN UNIVERSITY	China	74	118	131
232	40	OSAKA UNIVERSITY	Japan	105	105	128
239	79	SOUTHEAST UNIVERSITY	China	47	89	125
240	15	HANYANG UNIVERSITY	Republic of Korea	89	113	124
246	80	JOHNS HOPKINS UNIVERSITY	U.S.	99	87	121
248	–56	HARVARD UNIVERSITY	U.S.	169	140	118
248	57	KOREA UNIVERSITY	Republic of Korea	72	93	118
260	169	SHANDONG UNIVERSITY OF SCIENCE AND TECHNOLOGY	China	13	64	111
270	291	YONSEI UNIVERSITY	Republic of Korea	65	48	108
270	17	NORTHWESTERN UNIVERSITY	U.S.	71	98	108
280	307	TIANJIN UNIVERSITY	China	23	46	104
280	56	COLUMBIA UNIVERSITY	U.S.	59	84	104
302	–75	KING ABDULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY	Saudi Arabia	78	123	97
308	48	NATIONAL UNIVERSITY OF SINGAPORE	Singapore	70	79	96
308	–40	UNIVERSITY OF MICHIGAN	U.S.	81	107	96
318	–23	OXFORD UNIVERSITY INNOVATION LIMITED	U.K.	79	96	93
326	45	PEKING UNIVERSITY	China	74	75	90
334	–35	UNIVERSITY OF FLORIDA	U.S.	79	94	86
340	10	UNIVERSITY OF ARIZONA	U.S.	79	80	85
344	–53	KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY	Republic of Korea	94	97	84
361	32	SHANDONG UNIVERSITY	China	49	71	80
367	–28	CORNELL UNIVERSITY	U.S.	76	83	79
372	98	INDIAN INSTITUTE OF TECHNOLOGY	India	48	58	78
380	–48	UNIVERSITY OF COLORADO	U.S.	44	85	77
384	–17	KYOTO UNIVERSITY	Japan	86	76	76
384	45	UNIVERSITY OF PENNSYLVANIA	U.S.	56	64	76
398	26	CALIFORNIA INSTITUTE OF TECHNOLOGY	U.S.	66	65	74
414	147	UNIVERSITY OF WASHINGTON	U.S.	36	48	72
423	–4	TOHOKU UNIVERSITY	Japan	87	66	70
431	1352	QINGDAO TECHNOLOGICAL UNIVERSITY	China	8	14	69
442	7	ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE	Switzerland	58	62	67
452	–14	IMPERIAL INNOVATIONS LTD.	U.K.	44	63	65
452	1118	WUYI UNIVERSITY	China	0	16	65
461	4	YALE UNIVERSITY	U.S.	46	59	64
484	–65	UNIVERSITY OF PITTSBURGH	U.S.	70	66	61
484	–78	ISRAEL INSTITUTE OF TECHNOLOGY	Israel	47	68	61
503	–50	JIANGSU UNIVERSITY	China	64	61	59

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

Source: WIPO Statistics Database, March 2021.

Fraunhofer-Gesellschaft stayed as top PCT applicant for the government and PRO sector in 2020.

A18. Top 30 government and PRO PCT applicants, 2018–2020

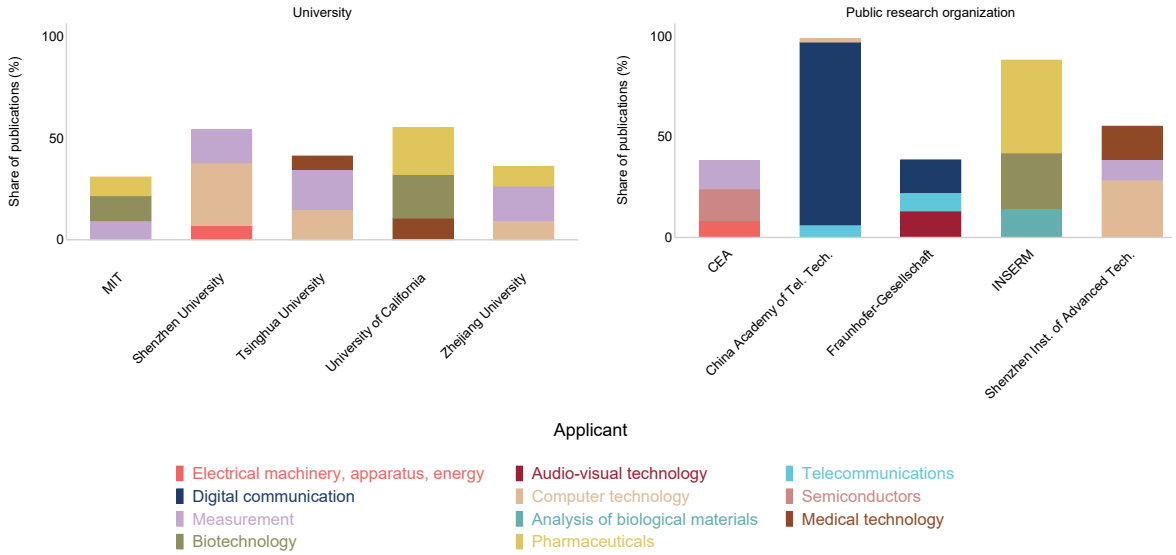
Overall ranking	Change in position from 2019	Applicant	Origin	Published PCT applications		
				2018	2019	2020
61	13	FRAUNHOFER-GESELLSCHAFT ZUR FÖRDERUNG DER ANGEWANDTEN FORSCHUNG E.V.	Germany	345	331	428
70	110	SHENZHEN INSTITUTE OF ADVANCED TECHNOLOGY	China	128	152	362
80	9	CHINA ACADEMY OF TELECOMMUNICATIONS TECHNOLOGY	China	304	276	321
137	–28	COMMISSARIAT À L'ÉNERGIE ATOMIQUE ET AUX ÉNERGIES ALTERNATIVES	France	289	229	208
170	60	INSTITUT NATIONAL DE LA SANTÉ ET DE LA RECHERCHE MÉDICALE (INSERM)	France	149	122	167
211	–8	AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH	Singapore	130	135	142
246	–33	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE (CNRS)	France	139	130	121
300	–69	NATIONAL INSTITUTE OF ADVANCED INDUSTRIAL SCIENCE AND TECHNOLOGY	Japan	139	121	98
348	46	KOREA ELECTRONICS TECHNOLOGY INSTITUTE	Republic of Korea	65	70	83
367	149	ELECTRONICS AND TELECOMMUNICATIONS RESEARCH INSTITUTE OF KOREA	Republic of Korea	56	53	79
384	10	NEDERLANDSE ORGANISATIE VOOR TOEGEPAST-NATUURWETENSCHAPPELIJK ONDERZOEK TNO	Netherlands	48	70	76
404	–82	MAYO FOUNDATION FOR MEDICAL EDUCATION AND RESEARCH	U.S.	71	88	73
448	34	CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS (CSIC)	Spain	44	56	66
474	1204	MIMOS BERHAD	Malaysia	1	15	62
515	–14	KOREA RESEARCH INSTITUTE OF CHEMICAL TECHNOLOGY	Republic of Korea	51	54	58
532	47	MAX-PLANCK-GESELLSCHAFT ZUR FÖRDERUNG DER WISSENSCHAFTEN E.V.	Germany	41	47	55
538	–79	SLOAN-KETTERING INSTITUTE FOR CANCER RESEARCH	U.S.	56	60	54
548	336	BATTELLE MEMORIAL INSTITUTE	U.S.	27	30	52
584	–309	U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES	U.S.	99	103	48
605	–1	COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH	India	48	45	46
690	–86	KOREA INSTITUTE OF INDUSTRIAL TECHNOLOGY	Republic of Korea	54	45	40
690	–70	DALIAN INSTITUTE OF CHEMICAL PHYSICS, CHINESE ACADEMY OF SCIENCES	China	39	44	40
702	–123	RIKEN (THE INSTITUTE OF PHYSICAL AND CHEMICAL RESEARCH)	Japan	57	47	39
702	26	NATIONAL INSTITUTE FOR MATERIALS SCIENCE	Japan	29	37	39
702	240	COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION	Australia	49	28	39
721	–25	KOREA INSTITUTE OF MACHINERY & MATERIALS	Republic of Korea	30	39	38
774	168	NANTONG TEXTILE & SILK INDUSTRIAL TECHNOLOGY RESEARCH INSTITUTE	China	6	28	36
794	–49	KOREA INSTITUTE OF SCIENCE AND TECHNOLOGY	Republic of Korea	31	36	35
811	–207	UNITED STATES OF AMERICA AS REPRESENTED BY THE SECRETARY OF THE NAVY	U.S.	51	45	34
840	730	INSTITUTE OF MICROELECTRONICS OF THE CHINESE ACADEMY OF SCIENCES	China	18	16	33

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

Source: WIPO Statistics Database, March 2021.

Measurement accounted for the highest share of PCT applications from six out of 10 selected applicants.

A19. Share of the top three technology fields for the top five universities and PROs, 2020



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

Source: WIPO Statistics Database, March 2021.

PCT applications by field of technology

Computer technology remained the technical field with the most PCT applications published in 2020.

A20. PCT applications by field of technology, 2016–2020

	Technical field	Publication year					2020 share (%)	Change from 2019 (%)
		2016	2017	2018	2019	2020		
I	**Electrical engineering**							
1	Electrical machinery, apparatus, energy	14,448	15,233	16,556	17,194	17,363	6.6	1.0
2	Audio-visual technology	7,045	7,530	8,187	8,900	11,531	4.4	29.6
3	Telecommunications	5,236	5,647	6,132	5,861	6,442	2.4	9.9
4	Digital communication	17,712	18,364	20,233	19,050	22,068	8.3	15.8
5	Basic communication processes	1,377	1,323	1,712	1,554	1,610	0.6	3.6
6	Computer technology	17,168	19,146	19,181	21,496	24,334	9.2	13.2
7	IT methods for management	4,307	4,702	4,803	5,747	5,889	2.2	2.5
8	Semiconductors	6,533	6,519	7,183	8,048	8,861	3.4	10.1
II	**Instruments**							
9	Optics	6,611	7,156	7,610	8,018	8,369	3.2	4.4
10	Measurement	9,333	10,052	10,775	11,451	12,699	4.8	10.9
11	Analysis of biological materials	1,766	1,912	1,940	1,917	2,058	0.8	7.4
12	Control	3,687	4,292	5,212	5,363	5,457	2.1	1.8
13	Medical technology	14,278	15,028	15,798	16,916	17,497	6.6	3.4
III	**Chemistry**							
14	Organic fine chemistry	5,708	5,689	5,787	5,887	6,351	2.4	7.9
15	Biotechnology	5,983	6,574	6,640	7,404	7,990	3.0	7.9
16	Pharmaceuticals	8,246	8,761	9,130	9,785	10,767	4.1	10.0
17	Macromolecular chemistry, polymers	3,811	3,932	4,249	4,425	4,655	1.8	5.2
18	Food chemistry	1,887	1,913	2,104	2,214	2,381	0.9	7.5
19	Basic materials chemistry	5,472	5,639	5,573	5,589	5,712	2.2	2.2
20	Materials, metallurgy	3,893	4,023	4,334	4,416	4,682	1.8	6.0
21	Surface technology, coating	3,272	3,579	3,680	3,851	4,015	1.5	4.3
22	Micro-structural and nano-technology	387	423	395	390	456	0.2	16.9
23	Chemical engineering	4,375	4,685	4,886	5,074	5,278	2.0	4.0
24	Environmental technology	2,580	2,648	2,732	2,705	3,011	1.1	11.3
IV	**Mechanical engineering**							
25	Handling	5,062	5,521	5,889	5,954	6,408	2.4	7.6
26	Machine tools	3,631	3,588	4,077	4,299	4,311	1.6	0.3
27	Engines, pumps, turbines	5,607	5,630	5,656	5,366	5,123	1.9	–4.5
28	Textile and paper machines	2,521	2,594	2,757	2,769	2,952	1.1	6.6
29	Other special machines	5,758	6,395	6,959	7,235	7,476	2.8	3.3
30	Thermal processes and apparatus	3,153	3,635	3,866	4,085	4,305	1.6	5.4
31	Mechanical elements	5,781	6,115	6,187	5,952	5,843	2.2	–1.8
32	Transport	8,754	9,794	10,941	11,226	11,290	4.3	0.6
V	**Other fields**							
33	Furniture, games	4,050	4,411	4,669	4,625	4,715	1.8	1.9
34	Other consumer goods	4,749	4,990	5,403	5,444	6,046	2.3	11.1
35	Civil engineering	6,260	6,115	6,121	6,386	6,496	2.5	1.7

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

Source: WIPO Statistics Database, March 2021.

A large proportion of PCT filings from Thailand related to optics, while many of those from Saudi Arabia related to measurement.

A21. Relative specialization index for published PCT applications by selected fields of technology, 2020

(Continued)

(A21 continued)

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

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

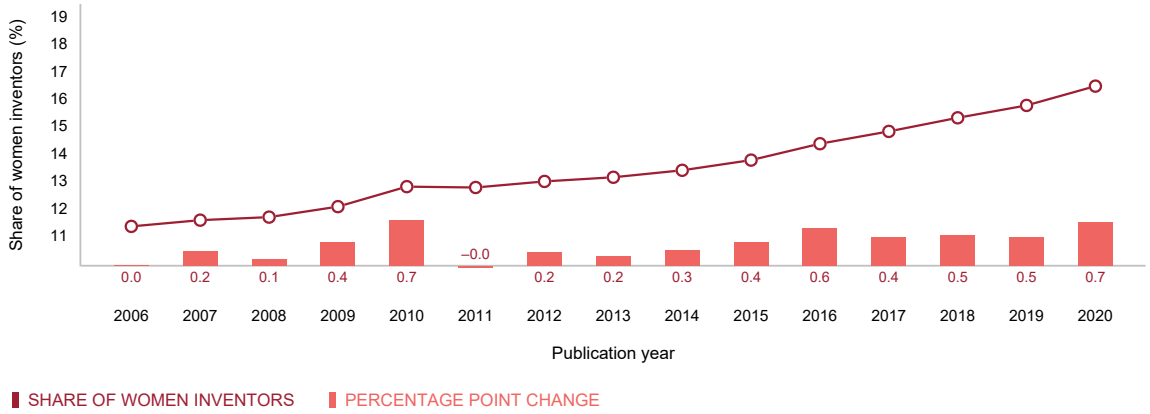
where F_c and F_r denote applications from country C and in a field of technology R. A positive value for a technology indicates that a country has a relatively high share of PCT filings related to that field of technology. For confidentiality reasons, data are based on published applications and on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

Source: WIPO Statistics Database, March 2021.

Participation of women inventors in PCT applications

In 2020, 16.5% of all inventors listed in PCT applications were women; this is 0.7 percentage points higher than for 2019.

A22. Share of women among listed inventors in PCT applications, 2006–2020

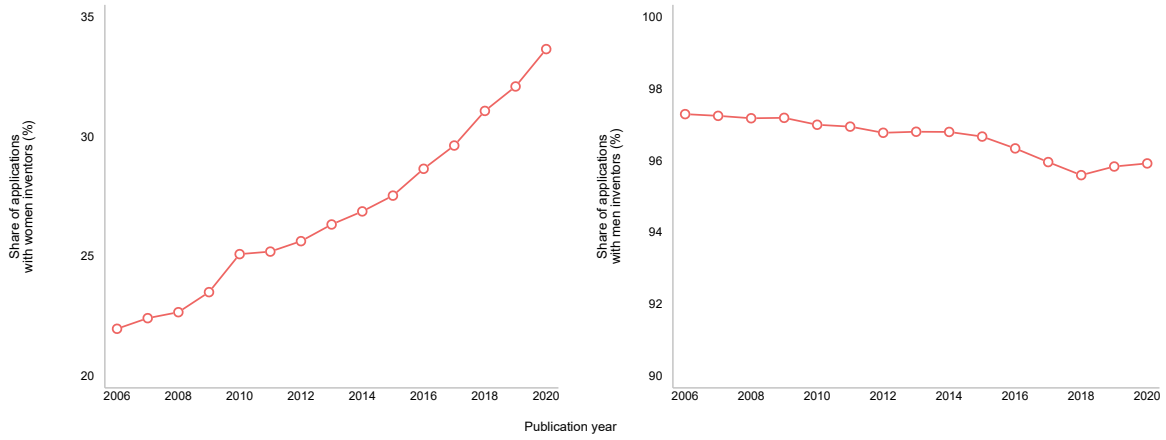


Note: For further details on methodology, refer to Martínez, G.L., Raffo, J. and Saito, K. (2016). Identifying the Gender of PCT Inventors. *Economic Research Working Paper No. 33*. Geneva: WIPO. Available at: *www.wipo.int/publications/en/details.jsp?id=4125*.

Source: WIPO Statistics Database, March 2021.

In 2020, about 96% of PCT applications listed at least one man as inventor and 34% of all PCT applications listed at least one woman as inventor.

A23. Share of PCT applications with at least one woman as inventor and with at least one man as inventor, 2006–2020

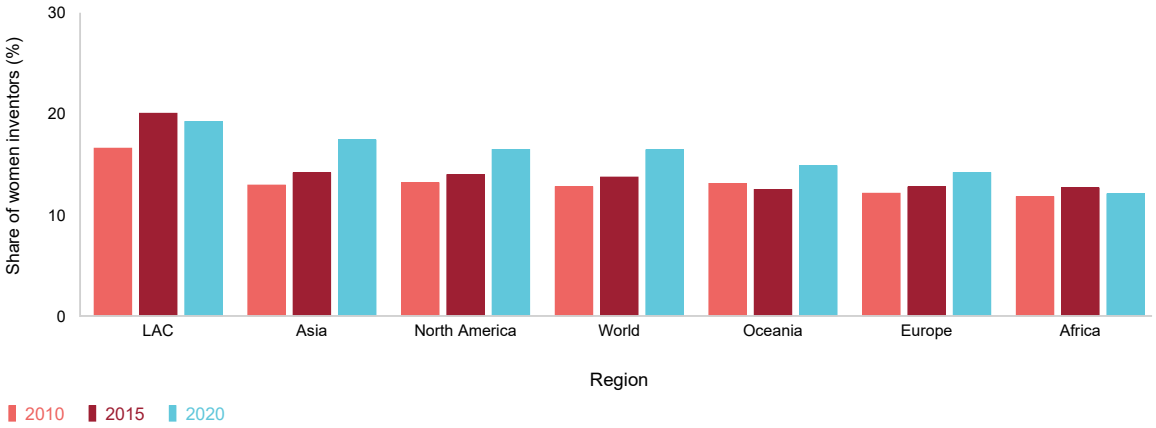


Note: For further details on methodology, refer to Martínez, G.L., Raffo, J. and Saito, K. (2016). Identifying the Gender of PCT Inventors. *Economic Research Working Paper No. 33*. Geneva: WIPO. Available at: *www.wipo.int/publications/en/details.jsp?id=4125*.

Source: WIPO Statistics Database, March 2021.

The proportion of PCT applications with women as inventors grew in each of the world's geographical regions between 2010 and 2020.

A24. Share of women among listed inventors in PCT applications by geographical region, 2010, 2015 and 2020

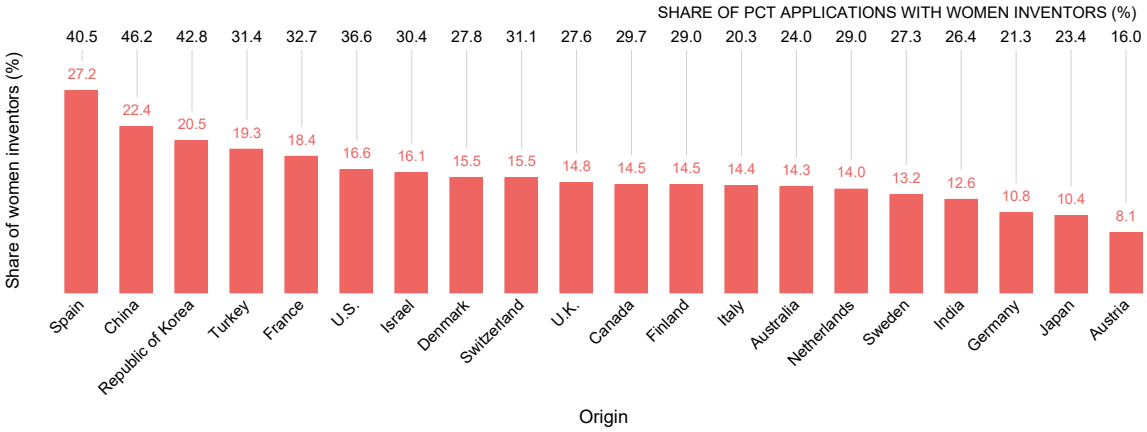


Note: LAC is Latin America and the Caribbean. For further details on methodology, refer to Martínez, G.L., Raffo, J. and Saito, K. (2016). Identifying the Gender of PCT Inventors. *Economic Research Working Paper No. 33*. Geneva: WIPO. Available at: *www.wipo.int/publications/en/details.jsp?id=4125*.

Source: WIPO Statistics Database, March 2021.

Women accounted for over one-quarter of inventors listed in PCT applications from Spain.

A25. Share of women among listed inventors and share of PCT applications with at least one woman as inventor for the top 20 origins, 2020



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

Source: WIPO Statistics Database, March 2021.

Gender parity was almost achieved for inventors listed in PCT applications filed by applicants from the LAC region in the field of organic fine chemistry during the period 2018–2020.

A26. Share of women among listed inventors in PCT applications by geographical region and field of technology, 2018–2020

	Field of technology	Africa (%)	Asia (%)	Europe (%)	LAC (%)	North America (%)	Oceania (%)	Total (%)
I	**Electrical engineering**							
1	Electrical machinery, apparatus, energy	4.8	13.2	7.6	8.9	11.8	11.6	11.7
2	Audio-visual technology	4.3	15.6	7.9	17.3	14.5	9.2	14.6
3	Telecommunications	7.5	16.2	7.6	12.0	12.7	8.3	13.9
4	Digital communication	3.1	19.7	11.6	23.3	14.3	6.4	16.8
5	Basic communication processes	0.0	10.2	7.1	25.0	12.4	6.3	10.2
6	Computer technology	7.5	17.4	10.2	14.6	13.0	10.9	14.8
7	IT methods for management	5.5	18.4	10.3	18.0	14.4	9.1	15.8
8	Semiconductors	16.7	14.4	13.0	18.5	14.1	21.4	14.2
II	**Instruments**							
9	Optics	0.0	14.2	10.5	15.2	12.6	17.3	13.3
10	Measurement	7.4	14.3	8.7	14.3	12.2	12.2	12.3
11	Analysis of biological materials	22.4	24.8	26.9	34.5	25.4	28.6	25.7
12	Control	5.5	13.1	7.5	15.1	11.2	12.1	11.4
13	Medical technology	14.9	17.3	13.7	22.2	15.1	13.9	15.6
III	**Chemistry**							
14	Organic fine chemistry	25.0	23.2	27.0	49.5	23.3	23.0	24.5
15	Biotechnology	39.0	27.5	32.8	37.6	27.9	31.9	29.1
16	Pharmaceuticals	36.9	26.6	32.2	39.1	26.3	27.2	28.0
17	Macromolecular chemistry, polymers	31.4	17.8	22.4	33.4	20.5	20.5	19.6
18	Food chemistry	25.0	28.0	30.6	32.4	26.8	23.0	28.5
19	Basic materials chemistry	21.2	18.4	23.6	25.7	20.8	17.0	20.6
20	Materials, metallurgy	15.5	13.9	15.3	18.9	16.6	14.3	14.8
21	Surface technology, coating	25.0	13.5	13.3	20.8	16.4	16.0	14.1
22	Micro-structural and nano-technology	n.a.	15.8	18.5	36.5	18.5	23.6	17.9
23	Chemical engineering	14.5	16.8	13.5	18.6	14.3	11.0	15.1
24	Environmental technology	19.5	15.6	12.2	17.0	12.1	9.4	13.8
IV	**Mechanical engineering**							
25	Handling	3.9	13.0	6.5	12.1	10.5	5.9	10.3
26	Machine tools	10.6	11.2	5.6	15.9	9.8	7.7	9.2
27	Engines, pumps, turbines	3.3	10.1	5.1	4.6	6.9	6.1	7.6
28	Textile and paper machines	26.3	16.2	14.5	28.9	15.3	12.9	15.5
29	Other special machines	10.1	15.3	10.6	20.1	12.6	12.1	13.1
30	Thermal processes and apparatus	6.1	13.0	7.1	9.6	8.9	8.0	11.3
31	Mechanical elements	6.2	10.4	4.6	11.8	6.5	5.6	7.4
32	Transport	4.8	11.8	6.2	9.9	7.7	6.8	9.1
V	**Other fields**							
33	Furniture, games	14.5	16.7	8.8	25.4	11.8	12.4	13.5
34	Other consumer goods	10.3	17.0	13.5	25.0	17.5	19.0	16.2
35	Civil engineering	1.9	14.0	6.1	11.2	8.5	5.4	9.8
	Total	**13.1**	**16.5**	**14.1**	**22.4**	**16.0**	**14.7**	**15.9**

Note: This table shows the share of women inventors for each region and each technical field in which at least 10 inventors are listed. LAC is Latin America and the Caribbean. For further details on methodology, refer to Martínez, G.L., Raffo, J. and Saito, K. (2016). Identifying the Gender of PCT Inventors. *Economic Research Working Paper No. 33*. Geneva: WIPO. Available at: *www.wipo.int/publications/en/details.jsp?id=4125*. WIPO's IPC technology concordance table (available at: *www.wipo.int/ipstats*) was used to convert IPC symbols into 35 corresponding fields of technology.

n.a. indicates not applicable.

Source: WIPO Statistics Database, March 2021.

Women accounted for 41.4% of all inventors listed in PCT applications filed by applicants from France in the field of pharmaceuticals and published in 2020.

A27. Share of women among listed inventors in PCT applications for the top 10 origins by field of technology, 2020

	Origin									
Field of technology	U.S.	China	Japan	Germany	Republic of Korea	France	U.K.	Switzerland	Sweden	Netherlands
Electrical machinery, apparatus, energy	12.0	19.3	8.8	6.1	18.4	11.8	8.0	8.1	3.9	8.5
Audio-visual technology	15.2	24.4	9.0	6.9	19.7	7.1	8.7	9.0	14.4	6.9
Telecommunications	14.4	21.0	8.7	4.5	15.2	9.1	9.8	4.9	10.9	7.0
Digital communication	15.9	23.8	13.8	7.0	15.5	10.3	9.5	7.5	15.5	10.1
Basic communication processes	10.8	15.7	4.3	1.9	12.2	6.8	11.1	11.3	5.2	7.4
Computer technology	13.4	20.9	10.9	9.5	17.7	11.5	10.2	10.9	12.1	12.2
IT methods for management	15.8	22.9	12.7	12.4	21.0	13.0	13.1	13.3	9.3	9.9
Semiconductors	13.6	21.2	8.9	14.0	20.9	16.8	13.1	11.0	9.8	10.5
Optics	13.1	21.2	9.2	7.3	20.3	17.9	10.4	8.3	7.6	10.2
Measurement	13.1	22.2	8.2	6.8	17.5	13.1	10.1	7.9	8.6	8.0
Analysis of biological materials	25.8	29.9	17.5	22.1	29.7	35.3	29.7	20.2	22.1	14.8
Control	12.4	19.2	9.2	7.3	16.5	10.1	8.2	7.7	6.4	8.2
Medical technology	15.8	22.9	14.0	12.8	21.1	16.2	11.8	12.4	21.6	13.5
Organic fine chemistry	23.6	25.4	18.6	26.6	31.1	39.0	23.8	23.0	20.9	20.4
Biotechnology	28.4	31.5	17.9	28.0	33.3	40.7	30.7	28.8	26.7	25.5
Pharmaceuticals	26.8	28.5	18.2	27.9	33.7	41.4	30.9	27.1	34.3	30.9
Macromolecular chemistry, polymers	20.4	26.7	13.3	20.8	23.7	27.5	21.4	14.3	27.4	18.4
Food chemistry	28.9	30.7	20.9	23.0	34.9	38.2	27.4	32.5	27.9	33.0
Basic materials chemistry	21.1	25.7	15.4	25.0	25.4	29.0	20.8	23.8	18.9	15.9
Materials, metallurgy	18.9	23.1	8.9	13.1	17.4	22.3	15.9	20.3	16.5	10.9
Surface technology, coating	16.8	22.6	10.7	12.6	22.8	16.8	7.3	13.1	13.3	15.0
Micro-structural and nano-technology	18.0	24.1	10.2	10.2	20.7	27.7	13.5	26.1	27.8	18.8
Chemical engineering	14.6	22.2	11.9	11.3	20.0	19.6	12.5	14.9	11.7	11.9
Environmental technology	11.4	20.8	9.5	9.4	18.9	22.3	11.3	7.3	8.0	10.5
Handling	10.3	18.5	8.6	6.2	14.2	5.0	12.0	8.7	9.4	5.2
Machine tools	10.8	19.4	6.6	5.0	14.9	15.1	8.6	5.4	6.2	7.6
Engines, pumps, turbines	7.9	20.8	5.4	4.6	15.7	7.7	5.3	6.1	3.4	4.0
Textile and paper machines	14.5	27.8	11.5	12.4	21.6	23.2	11.0	8.3	15.3	7.7
Other special machines	12.7	22.2	10.1	10.2	21.7	14.1	10.0	10.8	5.2	13.3
Thermal processes and apparatus	9.0	19.5	7.8	8.1	12.5	8.7	4.0	7.6	6.1	10.1
Mechanical elements	7.2	20.5	5.6	4.1	15.5	4.5	6.9	2.2	4.1	5.8
Transport	9.1	20.7	7.3	5.5	14.7	8.9	5.9	4.5	4.5	8.6
Furniture, games	12.4	19.6	12.2	8.3	19.3	10.4	7.9	6.7	7.9	12.9
Other consumer goods	18.2	17.1	13.6	11.1	18.4	17.2	15.2	13.3	15.2	6.5
Civil engineering	8.9	18.8	7.9	5.5	17.9	9.3	5.5	5.5	3.5	9.6

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

Source: WIPO Statistics Database, March 2021.

Top clusters of inventors in PCT applications

Tokyo-Yokohama accounted for nearly 11% of all PCT applications published during the period 2015–2019.

A28. Top 50 PCT clusters, 2015–2019

Ranking	Change in position from 2014–2018	Cluster	Origin	PCT applications	Share of total PCT applications (%)	Change from 2014–2018 (%)
1	0	Tokyo–Yokohama	Japan	116,794	10.8	3.1
2	0	Shenzhen–Hong Kong–Guangzhou	China / China, Hong Kong SAR	84,326	7.8	16.7
3	0	Seoul	Republic of Korea	42,564	3.9	4.3
4	0	San Jose–San Francisco, CA	U.S.	39,999	3.7	0.6
5	0	Osaka–Kobe–Kyoto	Japan	31,227	2.9	6.0
6	0	Beijing	China	28,341	2.6	13.0
7	0	San Diego, CA	U.S.	19,162	1.8	–2.6
8	0	Nagoya	Japan	18,859	1.7	–2.4
9	0	Boston–Cambridge, MA	U.S.	15,633	1.4	1.1
10	1	Shanghai	China	14,696	1.4	10.1
11	–1	Paris	France	13,639	1.3	0.6
12	0	New York City, NY	U.S.	12,056	1.1	–2.0
13	0	Seattle, WA	U.S.	11,339	1.1	–1.9
14	0	Houston, TX	U.S.	10,349	1.0	–4.6
15	0	Los Angeles, CA	U.S.	9,603	0.9	–1.6
16	1	Daejeon	Republic of Korea	9,430	0.9	13.5
17	–1	Stuttgart	Germany	8,923	0.8	7.0
18	0	Eindhoven	Belgium / Netherlands	8,207	0.8	–0.2
19	1	Munich	Germany	7,992	0.7	6.1
20	–1	Cologne	Germany	7,921	0.7	1.2
21	0	Tel Aviv–Jerusalem	Israel	7,101	0.7	0.4
22	5	Hangzhou	China	6,510	0.6	34.7
23	–1	Minneapolis, MN	U.S.	6,259	0.6	–2.9
24	–1	Portland, OR	U.S.	6,257	0.6	–0.2
25	0	Stockholm	Sweden	5,797	0.5	1.1
26	–2	Chicago, IL	U.S.	5,378	0.5	–12.8
27	–1	Frankfurt Am Main	Germany	5,131	0.5	–0.7
28	0	Washington, DC–Baltimore, MD	U.S.	4,632	0.4	0.9
29	1	London	U.K.	4,550	0.4	6.3
30	–1	Amsterdam–Rotterdam	Netherlands	4,321	0.4	–2.0
31	0	Singapore	Singapore	4,157	0.4	3.4
32	1	Cincinnati, OH	U.S.	4,012	0.4	2.9
33	–1	Heidelberg–Mannheim	Germany	3,892	0.4	–0.5
34	0	Nuremberg–Erlangen	Germany	3,616	0.3	–3.0
35	0	Hamamatsu	Japan	3,603	0.3	5.7
36	13	Suzhou	China	3,550	0.3	35.2
37	0	Bengaluru	India	3,480	0.3	5.8
38	4	Kanazawa	Japan	3,454	0.3	15.6
39	–3	Berlin	Germany	3,388	0.3	1.7
40	–2	Philadelphia, PA	U.S.	3,309	0.3	4.3
41	–2	Brussels	Belgium	3,199	0.3	0.9
42	–2	Dallas, TX	U.S.	3,133	0.3	–0.7
43	–2	Zürich	Switzerland / Germany	3,128	0.3	0.4
44	3	Taipei–Hsinchu	Taiwan, Province of China	3,090	0.3	13.6
45	14	Qingdao	China	3,045	0.3	46.8
46	–3	Copenhagen	Denmark	3,040	0.3	2.8
47	1	Istanbul	Turkey	3,003	0.3	12.2
48	–4	Raleigh, NC	U.S.	2,873	0.3	–2.6
49	1	Cambridge	U.K.	2,850	0.3	8.6
50	–5	Helsinki	Finland	2,677	0.3	–4.0

Note: For further details on methodology, refer to the Special theme of the 2020 edition of the *PCT Yearly Review*.

Source: WIPO Statistics Database, March 2021.

Seattle was highly concentrated in computer technology in 2015–2019

A29 Top 15 technology fields for the top 20 PCT clusters, 2015–2019

		Field of technology															
Rank	Cluster	Digital communication	Computer technology	Electrical machinery, apparatus, energy	Medical technology	Measurement	Audio-visual technology	Optics	Pharmaceuticals	Transport	Semiconductors	Telecommunications	Biotechnology	IT methods for management	Organic fine chemistry	Basic materials chemistry	All other fields
1	Tokyo–Yokohama	4.3	7.9	9.4	5.8	4.9	5.0	5.8	1.4	5.1	4.7	2.2	1.6	2.3	1.7	2.7	35.2
2	Shenzhen–Hong Kong–Guangzhou	28.5	16.6	5.9	2.5	2.7	6.2	4.1	0.9	2.5	2.1	6.1	0.9	2.8	0.5	0.5	17.3
3	Seoul	17.2	9.7	6.5	5.6	2.7	6.2	3.1	3.4	2.2	3.9	6.0	2.4	3.4	2.0	1.5	24.0
4	San Jose–San Francisco, CA	11.2	22.8	4.2	8.1	4.3	4.2	3.4	4.7	1.4	6.9	2.8	5.1	5.4	1.8	0.8	13.0
5	Osaka–Kobe–Kyoto	2.4	3.1	13.2	5.5	6.4	4.1	4.5	2.8	2.6	5.8	3.1	2.2	0.7	2.0	3.2	38.5
6	Beijing	21.1	18.3	4.0	2.5	3.6	8.8	8.2	2.0	1.6	8.5	3.0	1.9	1.8	1.0	0.9	12.5
7	San Diego, CA	33.5	12.7	2.5	4.3	3.8	5.5	1.4	5.4	1.0	2.8	6.4	4.7	1.0	2.4	0.9	11.9
8	Nagoya	0.8	2.3	18.5	2.1	6.3	6.4	1.8	0.4	14.2	3.4	1.0	0.7	0.4	0.6	1.3	39.9
9	Boston–Cambridge, MA	2.7	7.6	3.8	11.8	5.0	2.3	1.9	17.1	0.9	2.2	1.8	13.8	1.5	5.7	1.5	20.6
10	Shanghai	19.2	12.5	7.0	4.1	3.2	2.9	2.2	6.0	3.1	2.0	3.6	3.1	2.2	5.8	2.4	20.8
11	Paris	5.7	5.7	5.8	4.1	6.1	1.7	3.0	4.2	11.3	1.1	1.7	3.5	1.5	5.7	1.6	37.2
12	New York City, NY	5.9	9.1	2.0	8.6	3.7	1.3	1.5	14.5	0.9	0.8	2.3	6.6	5.6	9.7	3.1	24.3
13	Seattle, WA	13.2	40.1	2.4	3.4	2.6	4.6	3.0	3.1	1.1	0.6	3.0	3.3	8.0	0.7	0.3	10.7
14	Houston, TX	1.3	7.9	2.2	2.0	11.1	1.3	0.9	2.5	1.1	0.4	0.7	2.0	0.7	3.1	8.8	53.9
15	Los Angeles, CA	4.3	9.1	4.2	20.0	3.8	3.2	3.9	7.5	3.4	1.6	2.3	4.7	3.1	2.2	1.2	25.5
16	Daejeon	2.2	3.0	22.4	2.5	4.7	2.2	4.1	3.2	2.6	5.1	1.2	2.8	1.0	5.3	4.1	33.6
17	Stuttgart	2.9	3.0	11.9	2.6	11.2	1.7	1.6	0.9	12.4	1.5	1.5	1.3	0.5	0.2	0.4	46.3
18	Eindhoven	2.8	11.0	14.7	27.7	7.7	1.7	9.4	0.2	0.6	2.3	1.5	0.4	1.0	0.2	0.4	18.5
19	Munich	12.6	8.6	7.7	4.2	6.1	2.1	1.6	2.0	12.8	1.5	3.5	2.5	1.4	1.3	0.8	31.3
20	Cologne	1.7	1.3	5.3	3.2	3.7	0.6	0.6	3.0	6.1	0.5	0.4	2.7	0.7	7.8	9.2	53.2

Note: For further details on methodology, refer to the Special theme of the 2020 edition of the *PCT Yearly Review*. 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 2021.

Statistical table

A30. PCT applications by office and origin, 2019–2020

Name	PCT applications filed in 2020 (international phase)		PCT applications filed in 2019 (international phase)	
	At receiving office	By country of origin	At receiving office	By country of origin
African Intellectual Property Organization	0	n.a.	2	n.a.
African Regional Intellectual Property Organization	1	n.a.	1	n.a.
Albania	0	1	1	3
Algeria	13	14	6	9
Andorra	n.a.	1	n.a.	4
Angola (c)	0	0	0	0
Antigua and Barbuda	0	68	0	47
Argentina	n.a.	42	n.a.	35
Armenia	0	4	0	3
Australia	1,600	1,720	1,603	1,767
Austria	458	1,519	499	1,433
Azerbaijan	5	7	10	12
Bahamas	n.a.	6	n.a.	2
Bahrain	0	2	0	2
Bangladesh	n.a.	1	n.a.	2
Barbados (c)	0	40	0	65
Belarus	14	14	18	16
Belgium	0	1,331	0	1,355
Belize	0	4	0	0
Benin (d)	0	1	0	1
Bermuda	n.a.	10	n.a.	22
Bosnia and Herzegovina	7	7	2	2
Botswana	0	0	0	0
Brazil	659	697	617	643
Brunei Darussalam	0	1	1	2
Bulgaria	43	53	34	49
Burkina Faso (d)	0	0	0	1
Cambodia	0	1	0	0
Cameroon (d)	0	2	0	1
Canada	1,936	2,623	2,067	2,731
Central African Republic (d)	0	0	0	0
Chad (d)	0	0	0	0
Chile	210	262	194	224
China	72,349	68,720	60,997	59,193
Colombia	19	132	17	128
Comoros (d)	0	0	0	0
Congo (d)	0	1	0	1
Costa Rica	6	10	3	12
Côte d'Ivoire (d)	0	0	0	1
Croatia	8	21	31	41
Cuba	11	12	9	9
Cyprus	3	42	1	40
Czech Republic	157	219	123	185
Democratic People's Republic of Korea	2	2	1	1
Democratic Republic of the Congo	n.a.	1	n.a.	0
Denmark	425	1,551	445	1,443
Djibouti	0	0	0	0
Dominica	0	0	0	0
Dominican Republic	6	10	12	13
Ecuador	1	4	0	18
Egypt	38	46	36	44
El Salvador	1	1	1	2
Equatorial Guinea (d)	0	0	0	0
Estonia	2	55	1	37
Eswatini (a)	0	1	0	0
Ethiopia	n.a.	0	n.a.	1
Eurasian Patent Organization	10	n.a.	8	n.a.
European Patent Office	39,052	n.a.	37,998	n.a.
Fiji	n.a.	0	n.a.	1
Finland	900	1,670	958	1,654

(Continued)

(A30 continued)

Name	PCT applications filed in 2020 (international phase)		PCT applications filed in 2019 (international phase)	
	At receiving office	By country of origin	At receiving office	By country of origin
France	2,582	7,904	3,206	7,906
Gabon (d)	0	1	0	0
Gambia (a)	0	0	0	0
Georgia	6	6	4	6
Germany	1,485	18,643	1,524	19,358
Ghana	0	0	0	0
Greece	65	103	91	123
Grenada	0	0	0	0
Guatemala	0	2	0	0
Guinea (d)	0	0	0	0
Guinea-Bissau (d)	0	0	0	0
Honduras	0	0	0	0
Hungary	105	139	104	153
Iceland	25	51	19	41
India	1,050	1,914	981	2,047
Indonesia	4	16	1	7
International Bureau	13,508	n.a.	12,898	n.a.
Iran (Islamic Republic of)	48	283	33	225
Iraq	n.a.	0	n.a.	2
Ireland	8	793	10	636
Israel	1,377	1,948	1,449	2,003
Italy	420	3,401	404	3,379
Jamaica	n.a.	0	n.a.	1
Japan	49,537	50,520	51,652	52,693
Jordan	11	20	12	19
Kazakhstan	27	30	24	27
Kenya	6	7	3	8
Kuwait	0	13	0	5
Kyrgyzstan	2	4	1	2
Lao People's Democratic Republic (c)	0	0	0	0
Latvia	6	30	1	36
Lebanon	n.a.	2	n.a.	3
Lesotho	0	0	0	0
Liberia	0	0	0	0
Libya	0	3	0	0
Liechtenstein (b)	0	250	0	279
Lithuania	0	41	1	33
Luxembourg	0	318	0	339
Madagascar (c)	0	0	0	0
Malawi	0	0	0	0
Malaysia	232	255	188	202
Mali (d)	0	0	0	0
Malta	0	42	0	37
Mauritania (d)	0	0	0	0
Mauritius	n.a.	14	n.a.	12
Mexico	130	196	174	216
Monaco	0	20	0	11
Mongolia	0	0	0	0
Montenegro (c)	0	0	1	1
Morocco	34	42	27	33
Mozambique (a)	0	0	0	1
Namibia (a)	0	5	0	3
Nauru	n.a.	1	n.a.	0
Netherlands	849	4,035	894	4,055
New Zealand	181	311	164	249
Nicaragua	2	2	0	0
Niger (d)	0	0	0	0
Nigeria (c)	0	4	0	1
North Macedonia	3	6	5	5
Norway	324	702	314	787
Oman	10	11	9	9
Pakistan	n.a.	0	n.a.	1

(Continued)

(A30 continued)

Name	PCT applications filed in 2020 (international phase)		PCT applications filed in 2019 (international phase)	
	At receiving office	By country of origin	At receiving office	By country of origin
Panama	5	21	0	17
Papua New Guinea	0	0	0	0
Peru	35	37	25	26
Philippines	25	32	13	21
Poland	196	363	202	365
Portugal	62	269	54	196
Qatar	15	23	15	25
Republic of Korea	19,766	20,060	18,885	19,073
Republic of Moldova	5	5	6	7
Romania	32	41	35	39
Russian Federation	1,097	1,073	1,307	1,185
Rwanda	0	0	0	0
Saint Kitts and Nevis	0	1	0	5
Saint Lucia (c)	0	0	0	0
Saint Vincent and the Grenadines (c)	0	0	0	0
Samoa	0	4	0	2
San Marino	0	7	1	5
Sao Tome and Principe (c)	0	0	0	0
Saudi Arabia	22	956	30	552
Senegal (d)	0	2	0	4
Serbia	22	25	32	38
Seychelles	0	3	0	1
Sierra Leone (a)	0	0	0	0
Singapore	805	1,278	654	1,112
Slovakia	30	50	22	41
Slovenia	37	86	35	90
South Africa	73	251	80	275
Spain	890	1,502	959	1,496
Sri Lanka (c)	0	23	0	17
Sudan	4	6	3	3
Sweden	1,301	4,356	1,359	4,202
Switzerland	33	4,883	64	4,627
Syrian Arab Republic	0	2	3	3
Tajikistan	0	0	0	0
Thailand	97	188	71	151
Togo (d)	0	0	0	0
Trinidad and Tobago	0	1	0	3
Tunisia	3	4	10	11
Turkey	1,666	1,705	1,374	1,689
Turkmenistan	0	0	0	1
Uganda	0	1	0	1
Ukraine	113	133	170	182
United Arab Emirates (c)	0	86	0	108
United Kingdom	3,460	5,912	3,827	5,773
United Republic of Tanzania (a)	0	0	0	0
United States of America	56,114	59,230	56,232	57,499
Uruguay	n.a.	7	n.a.	11
Uzbekistan	0	0	0	1
Venezuela (Bolivarian Republic of)	n.a.	0	n.a.	1
Viet Nam	18	24	23	34
Zambia	1	1	0	2
Zimbabwe	0	2	0	2
Others	0	230	0	276
Total	**275,900**	**275,900**	**265,381**	**265,381**

Note: Data for 2020 are WIPO estimates.
(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 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, or the office does not act as PCT receiving office.
Source: WIPO Statistics Database, March 2021.

Section B
Statistics on PCT national phase entries

Highlights

PCT national phase entries grew by 4.3% in 2019

An estimated 675,200 PCT national phase entries (NPEs) were initiated worldwide in 2019 – the latest year for which data are available. This represents an increase of 4.3% on 2018 (see figure B1). Over the past 15 years, the number of NPEs initiated worldwide has almost doubled; half of this increase originating from Japan and the U.S.

NPEs initiated by non-resident applicants represented 83.5% of all NPEs in 2019. This share has tended to decrease slightly over the past decade, mainly due to a growth in resident NPEs initiated at the Japan Patent Office (JPO) and at the United States Patent and Trademark Office (USPTO). In 2019, NPEs initiated by resident applicants at these two offices accounted for 39.5% and 22.4% of total NPEs, respectively. This is about 10 percentage points more than their respective 2005 shares (see figure B12).

Asia has become the region from which the most PCT NPEs are initiated worldwide

For the first time, applicants from Asia initiated the largest proportion of NPEs in the world, accounting for 35.6% of all NPEs in 2019. Asia's share has increased sharply since 2009, when it was of 23.6% (see figure B3). Europe (31.7%), which had initiated the most NPEs ever since the late 1990s, moved down to second position in 2019, closely followed by North America (29.4%). The combined share of applicants located in Africa, Latin America and the Caribbean (LAC) and Oceania amounted to 2%.

Of the top 20 offices, eighteen received more NPEs in 2019 than in the previous year, among which the offices of Viet Nam (+28.3%) and Singapore (+15.2%) both saw double-digit growth (see figure B11). In contrast, the offices of Mexico and the Russian Federation experienced a slight drop in the number of NPEs.

Applicants based in the U.S. initiated the most PCT NPEs worldwide

In 2019, applicants residing in the U.S. initiated 188,806 NPEs. They were followed by applicants from Japan (137,808), Germany (59,457), China (49,664) and the Republic of Korea (33,186) (see table B7). The U.S. and Japan combined accounted for nearly half of all NPEs initiated worldwide, with 28% and 20.4% of total NPEs, respectively. Aside from the high concentration of NPEs among just a few origins, applicants from approximately 130 countries initiated NPEs in 2019.

Six of the top 10 origins recorded growth, among which applicants from China (+38%), the Republic of Korea (+15.5%) and Sweden (+10.1%) reported the highest annual increases in NPEs. In contrast, the sharpest falls originated from the U.K. (–7.5%), Switzerland (–5.4%) and the Netherlands (–4.4%) (see figure B6). A majority of the top origins in Africa, Europe and LAC listed in table B7 saw decreases in the number of NPEs they initiated in 2019 as compared to 2018.

Of the 164,221 NPEs received at the USPTO, the largest proportions were initiated by applicants from the U.S. (22.4% of the total), Japan (21%) and China (9.9%) (see figure B12). Combined, these three origins also accounted for the majority of NPEs initiated at the JPO. Applicants from the U.S. accounted for the highest shares of

NPEs at 14 of the top 20 offices, while applicants residing in Japan accounted for the highest shares at the other six offices. More specifically, U.S.-based applicants accounted for over 45% of all NPEs initiated at the offices of Canada, Israel and Mexico, while Japan-based applicants initiated a large proportion of NPEs at the offices of Germany (53%), Thailand (44.9%) and Japan (39.5%).

The PCT System accounted for 56.7% of all non-resident patent applications in 2019

An estimated 563,500 non-resident NPEs were initiated worldwide in 2019 via the PCT route. By comparison, non-resident applicants filed about 429,500 patent applications directly with offices (i.e., via the Paris route). This means that 56.7% of all non-resident patent applications were filed via the PCT route in 2019 (see figure B13). This is 0.2 percentage points lower than in the previous year but nearly 10 percentage points higher than in 2005. Long-term data show that the number of patent applications filed via both routes has trended upward, although the PCT route has grown at a faster pace, with an average annual growth rate of 4.3% between 2005 and 2019, as compared to 1.5% for the Paris route. However, for the past two years, non-resident patent applications filed directly with offices have grown faster than non-resident NPEs.

Of the top 20 offices in terms of non-resident patent applications, 17 received a majority of their non-resident filings via the PCT route, with the offices of Brazil and Israel having shares above 90%, and those of Germany, the U.K. and the U.S. between 28% and 38% (see figure B15).

Of the top 20 origins for filing applications abroad, applicants from Australia, Denmark, the Netherlands, Sweden and the U.S. relied on the PCT route for over two-thirds of their filings abroad. In contrast, applicants from Canada, India, Israel and the Republic of Korea filed the majority of their patent applications abroad directly with foreign offices via the Paris route (see figure B14).

Applicants residing in Belgium and Switzerland initiated a high number of NPEs for each PCT international application filed, averaging 4.8 and 4.6 NPEs per PCT application, respectively. In contrast, applicants from China averaged just one NPE per PCT application (see figure B8).

Samsung Electronics created the most foreign-oriented patent families using the PCT route

Samsung Electronics of the Republic of Korea created the highest number of foreign-oriented patent families (for a definition, see the Glossary in the annex) using the PCT route, with 4,718 such families created between 2015 and 2017 (see figure B17). It was followed by the BOE Technology Group, Huawei Technologies and Sony Corp., which had between 4,200 and 4,700 such families each.

Of the top 50 applicants in terms of foreign-oriented patent families between 2015 and 2017, 21 relied primarily on the PCT System to protect innovations abroad (see table B18). Out of the 21, Shenzhen China Star Optoelectronics Technology Co. used the PCT route for almost the entirety of its foreign-oriented patent families. It was followed, in descending order, by Qualcomm Inc., Microsoft Technology Licensing, Huawei Technologies and Koninklijke Philips, which each used the PCT System for between 94% and 99% of all their foreign-oriented patent families. In contrast, several other applicants with a high number of foreign-oriented patent families relied on the PCT System hardly at all, for instance, Ford Global Tech and Samsung Display Co.

Global trends in PCT national phase entries

National phase entries by origin

National phase entries by office

Patent applications by filing route

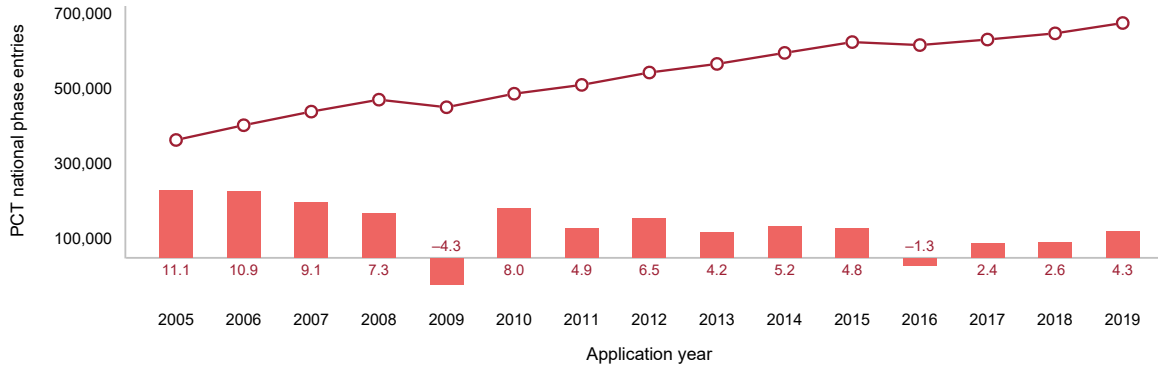
Top applicants in foreign-oriented patent families

Statistical table

Global trends in PCT national phase entries

In 2019, 675,200 PCT national phase entries were initiated, an increase of 4.3% on 2018.

B1. Trend in PCT national phase entries, 2005–2019

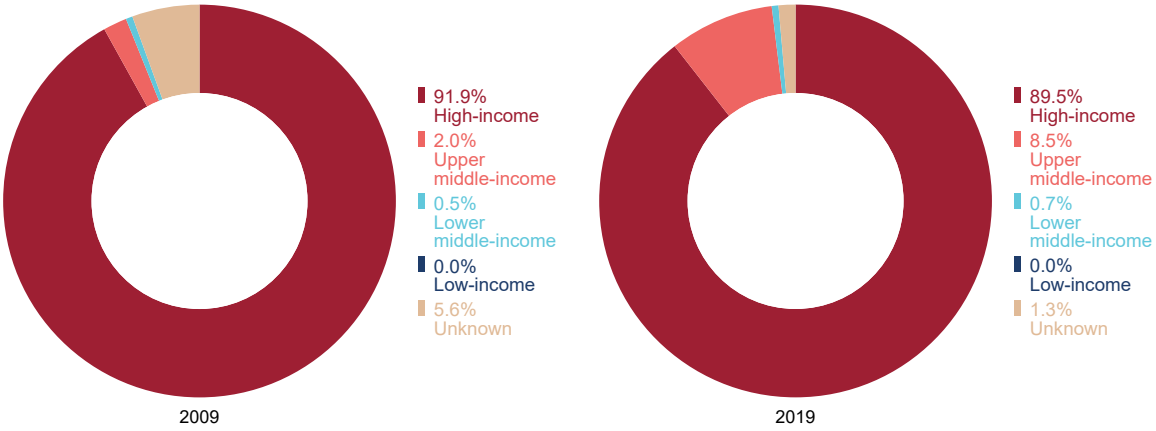


Note: These are WIPO estimates. National phase data from patent offices are available only up to 2019.

Source: WIPO Statistics Database, March 2021.

Applicants from high-income economies initiated almost 90% of PCT national phase entries in 2019.

B2. PCT national phase entries by income group, 2009 and 2019

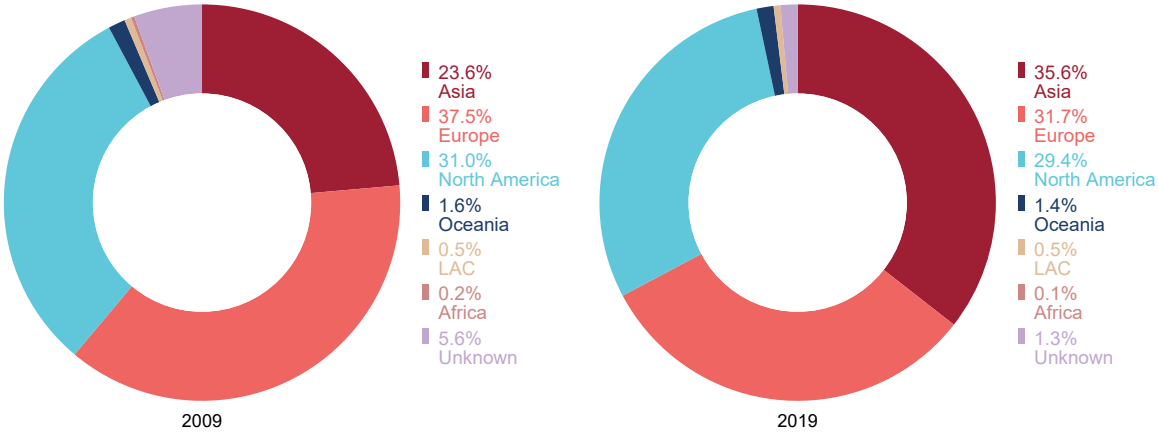


Note: Each category includes the following number of origins: high-income (66), upper middle-income (39), lower middle-income (24) and low-income (6). For information on income group classification, see annex, Data description.

Source: WIPO Statistics Database, March 2021.

Asia accounted for the largest proportion of PCT national phase entries in 2019.

B3. PCT national phase entries by region, 2009 and 2019



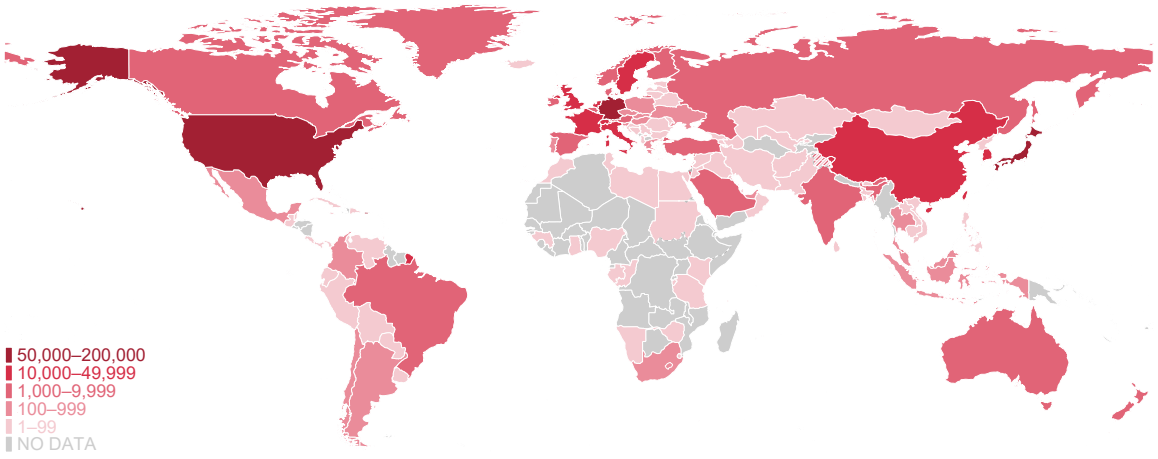
Note: Each region includes the following number of origins: Africa (19), Asia (41), Europe (42), Latin America and the Caribbean (LAC) (27), North America (3) and Oceania (3).

Source: WIPO Statistics Database, March 2021.

National phase entries by origin

Applicants from more than 130 countries initiated PCT national phase entries in 2019.

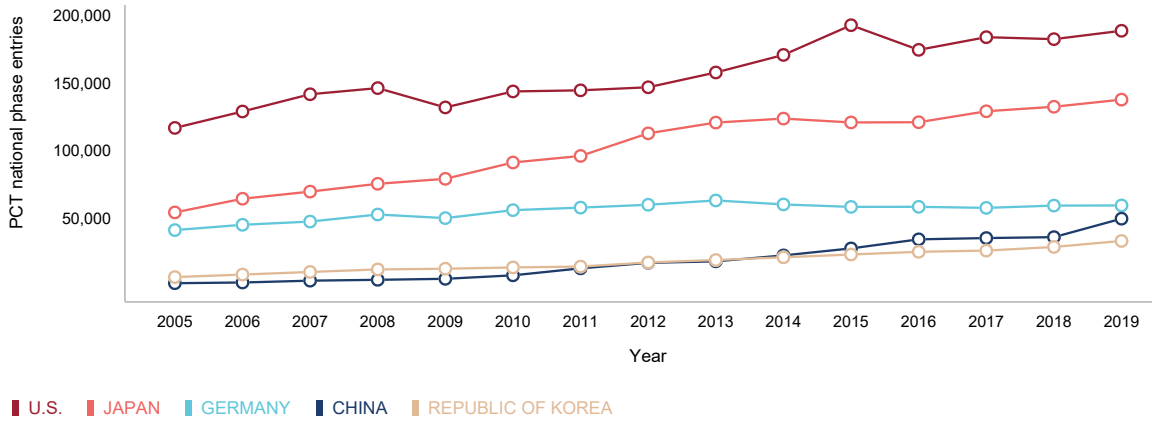
B4. PCT national phase entries by origin, 2019



Source: WIPO Statistics Database, March 2021.

Since the PCT System began, applicants from the U.S. have initiated year-on-year the highest number of PCT national phase entries worldwide.

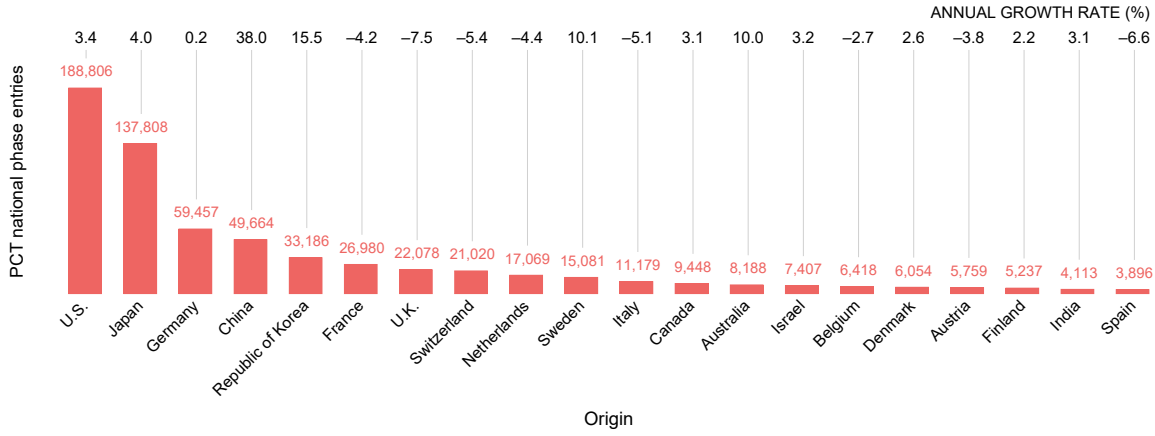
B5. Trends in PCT national phase entries for the top five origins, 2005–2019



Source: WIPO Statistics Database, March 2021.

In 2019, China and the Republic of Korea experienced the sharpest growth in PCT national phase entries among the top 20 origins.

B6. PCT national phase entries for the top 20 origins, 2019



Source: WIPO Statistics Database, March 2021.

PCT national phase entries from applicants in Asia increased by 11.5% in 2019.

B7. PCT national phase entries for the top origins by region, 2017–2019

Region	Origin	2017	2018	2019	Regional share 2019 (%)	Change from 2018 (%)
Africa	South Africa	1,020	879	743	77.9	–15.5
	Egypt	38	47	53	5.6	12.8
	Morocco	23	43	48	5.0	11.6
	Eswatini	2	93	29	3.0	–68.8
	Mauritius	16	42	14	1.5	–66.7
	Others	102	109	67	7.0	–38.5
	Total*	**1,201**	**1,213**	**954**	**0.1**	**–21.4**
Asia	Japan	129,202	132,527	137,808	57.3	4.0
	China	35,332	35,993	49,664	20.7	38.0
	Republic of Korea	26,028	28,731	33,186	13.8	15.5
	Israel	7,027	7,176	7,407	3.1	3.2
	India	4,059	3,989	4,113	1.7	3.1
	Singapore	2,941	2,830	2,915	1.2	3.0
	Saudi Arabia	692	1,104	1,641	0.7	48.6
	Turkey	1,248	1,015	1,168	0.5	15.1
	Thailand	436	492	622	0.3	26.4
	China, Hong Kong SAR	408	511	500	0.2	–2.2
	Others	1,237	1,243	1,371	0.6	10.3
	Total*	**208,610**	**215,611**	**240,395**	**35.6**	**11.5**
Europe	Germany	57,683	59,356	59,457	27.8	0.2
	France	29,613	28,173	26,980	12.6	–4.2
	U.K.	22,348	23,856	22,078	10.3	–7.5
	Switzerland	20,685	22,230	21,020	9.8	–5.4
	Netherlands	18,421	17,847	17,069	8.0	–4.4
	Sweden	12,276	13,703	15,081	7.0	10.1
	Italy	11,010	11,780	11,179	5.2	–5.1
	Belgium	6,120	6,599	6,418	3.0	–2.7
	Denmark	5,875	5,900	6,054	2.8	2.6
	Austria	5,562	5,985	5,759	2.7	–3.8
	Others	22,113	23,008	22,894	10.7	–0.5
	Total*	**211,706**	**218,437**	**213,989**	**31.7**	**–2.0**
Latin America and the Caribbean	Brazil	1,159	1,074	1,224	36.3	14.0
	Mexico	555	620	749	22.2	20.8
	Chile	381	392	407	12.1	3.8
	Antigua and Barbuda	11	400	266	7.9	–33.5
	Barbados	337	342	182	5.4	–46.8
	Argentina	165	111	126	3.7	13.5
	Colombia	143	162	119	3.5	–26.5
	Cuba	18	90	61	1.8	–32.2
	Uruguay	11	79	44	1.3	–44.3
	Peru	40	43	39	1.2	–9.3
	Others	171	136	158	4.7	16.2
	Total*	**2,991**	**3,449**	**3,375**	**0.5**	**–2.1**
North America	U.S.	184,048	182,601	188,806	95.2	3.4
	Canada	8,884	9,161	9,448	4.8	3.1
	Bermuda	41	27	69	0.0	155.6
	Total*	**192,973**	**191,789**	**198,323**	**29.4**	**3.4**
Oceania	Australia	7,131	7,447	8,188	86.6	10.0
	New Zealand	1,580	1,397	1,255	13.3	–10.2
	Samoa	35	2	17	0.2	750.0
	Others	3	11	0	0.0	–100.0
	Total*	**8,749**	**8,857**	**9,460**	**1.4**	**6.8**
Unknown*		4,770	8,144	8,702	1.3	6.9
World		**631,000**	**647,500**	**675,200**	**n.a.**	**4.3**

Note: World totals are WIPO estimates. This table shows the top countries in each region (with a maximum of 10 countries per region) whose applicants filed more than 10 PCT national phase entries in 2019. Data for all origins are reported in statistical table B19.

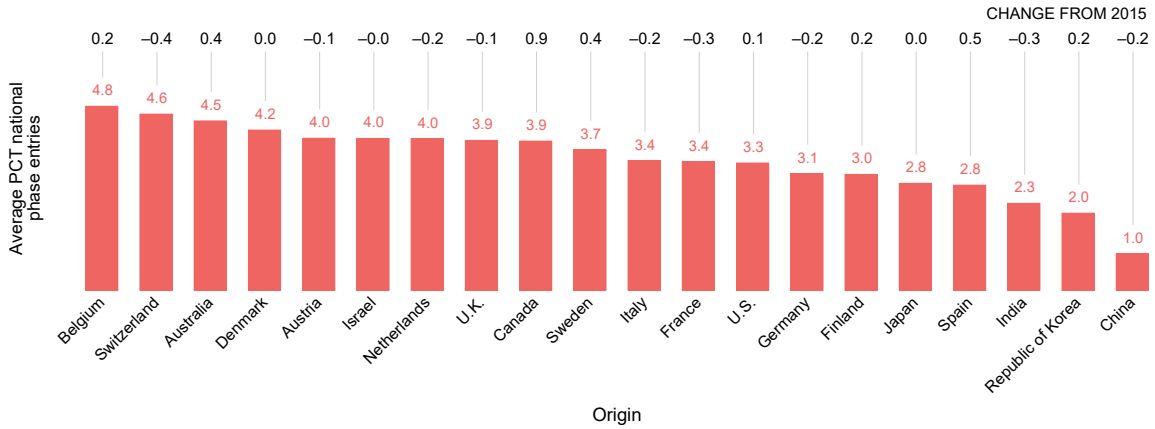
* indicates share of world total.

n.a. indicates not applicable.

Source: WIPO Statistics Database, March 2021.

Applicants residing in Belgium initiated nearly five NPEs per PCT application, on average.

B8. Average number of national phase entries per PCT application for selected origins, 2019



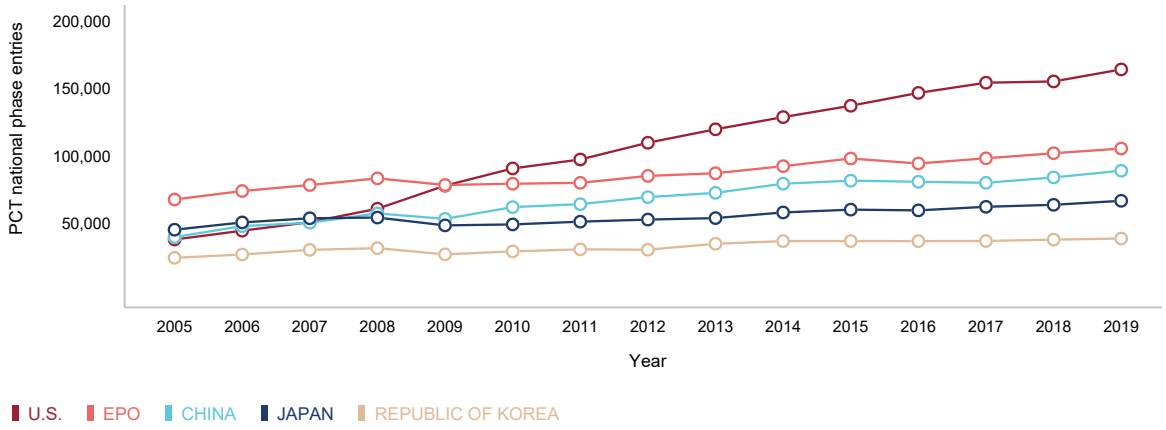
Note: The average is defined as the number of national phase entries initiated in 2019 divided by the average number of PCT applications filed in the two preceding years.

Source: WIPO Statistics Database, March 2021.

National phase entries by office

Since 2010, the U.S. has attracted the most PCT national phase entries.

B9. Trends in PCT national phase entries for the top five offices, 2005–2019

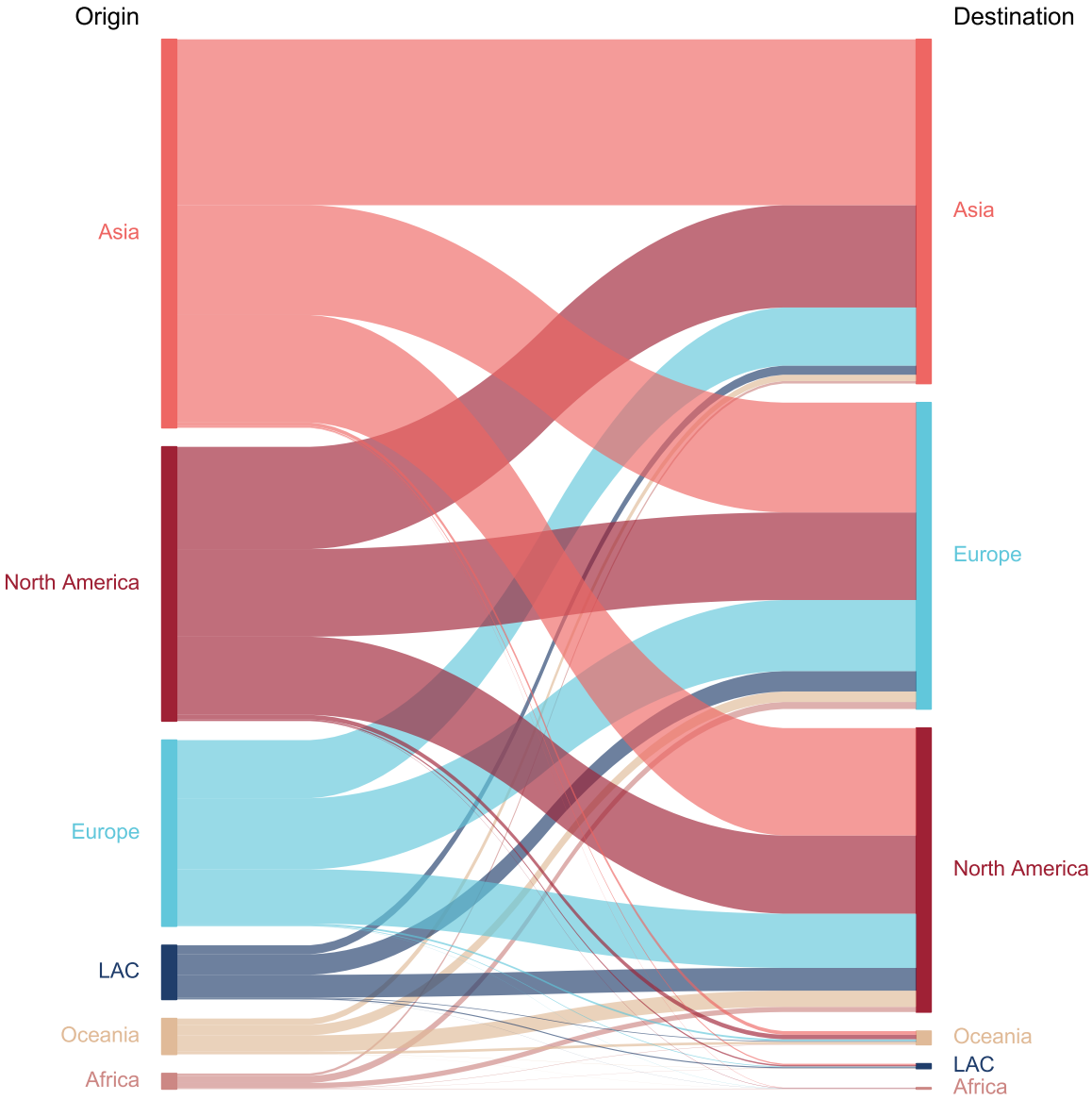


Note: EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2021.

Applicants residing in Asia initiated most of their national phase entries in their home region.

B10. Flow of national phase entries between regions of origin and regions of destination, 2019

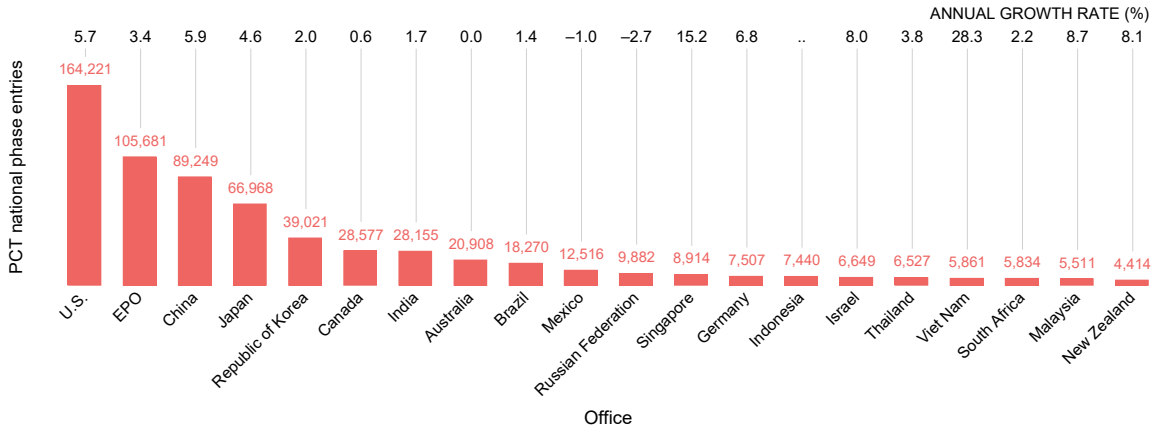


Note: LAC is Latin America and the Caribbean.

Source: WIPO Statistics Database, March 2021.

Of the top 20 offices, Singapore and Viet Nam were the two that experienced double-digit growth in PCT national phase entries.

B11. PCT national phase entries for the top 20 offices, 2019



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

.. indicates data are unknown.

Source: WIPO Statistics Database, March 2021.

Applicants residing in Japan accounted for the highest share of PCT national phase entries initiated at the Japan Patent Office, with 39.5% of the total.

B12. Flow of national phase entries for the top 20 offices and the top 10 origins as a percentage of total national phase entries at respective offices, 2019

	Origin										
Office	U.S.	Japan	Germany	China	Republic of Korea	France	U.K.	Switzerland	Netherlands	Sweden	Other origins
U.S.	22.4	21.0	9.2	9.9	6.8	4.4	4.4	1.8	2.0	2.3	15.7
EPO	28.4	14.8	11.5	9.1	4.8	5.2	3.4	3.1	2.9	2.7	14.1
China	27.0	29.2	11.2	0.8	6.8	3.8	2.3	3.1	3.0	2.3	10.5
Japan	21.6	39.5	6.8	7.4	5.2	3.0	2.1	2.7	2.5	1.3	7.9
Republic of Korea	29.7	27.5	9.0	8.1	3.2	3.6	2.5	3.0	2.3	1.9	9.3
Canada	47.0	5.4	6.3	4.3	1.4	4.5	3.8	3.8	1.6	1.7	20.2
India	30.6	13.6	7.6	12.1	6.0	3.5	3.1	2.9	3.9	3.4	13.3
Australia	43.0	6.1	5.4	7.1	2.8	2.8	4.4	4.1	1.8	2.4	20.2
Brazil	37.2	7.7	8.9	6.5	1.9	5.5	3.2	5.3	3.9	2.9	17.1
Mexico	45.9	8.3	7.2	4.2	2.2	3.7	2.6	5.4	2.4	2.7	15.4
Russian Federation	22.6	9.8	11.7	10.0	3.0	5.9	3.4	7.1	4.6	4.3	17.5
Singapore	36.1	16.0	4.5	10.7	2.7	3.0	3.2	3.9	1.4	1.1	17.4
Germany	20.4	53.0	14.7	2.7	1.4	0.7	1.7	0.4	0.5	0.5	4.1
Indonesia	21.5	28.1	4.8	10.3	5.2	3.2	1.9	4.5	4.1	2.2	14.3
Israel	46.4	3.5	5.6	4.7	1.0	4.1	3.4	6.4	2.2	1.5	21.3
Thailand	16.3	44.9	5.3	6.3	3.8	3.1	1.0	4.1	2.7	1.4	11.1
South Africa	32.3	3.3	7.8	9.4	1.5	3.6	6.5	5.2	1.8	4.6	24.0
Viet Nam	16.3	27.1	4.4	19.9	12.2	1.5	1.2	3.0	2.4	1.3	10.8
Malaysia	23.3	24.0	6.2	11.5	4.5	2.7	3.8	5.7	1.9	2.1	14.2
New Zealand	44.6	4.5	5.3	3.4	1.2	2.4	4.9	4.4	1.9	2.3	25.0

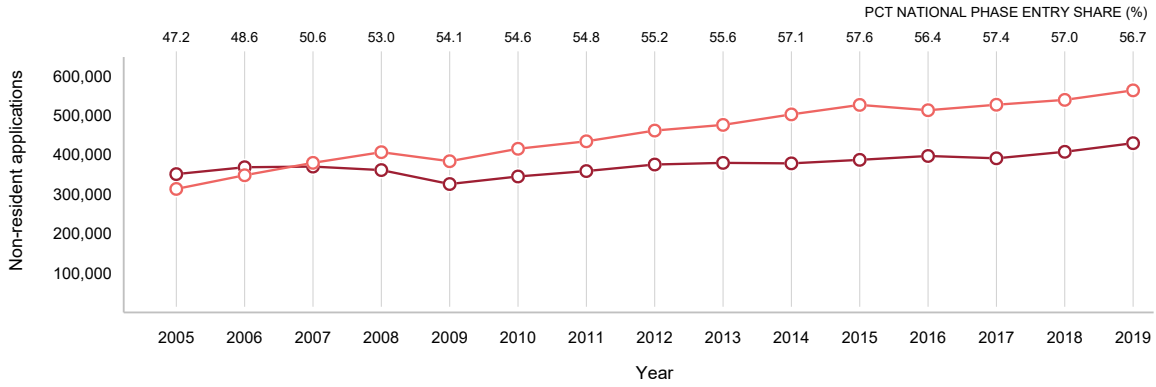
Note: This table shows the top 10 origins for which national phase entry office data are available. EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2021.

Patent applications by filing route

In 2019, PCT national phase entries accounted for 56.7% of all non-resident patent applications filed worldwide.

B13. Trend in non-resident patent applications by filing route, 2005–2019

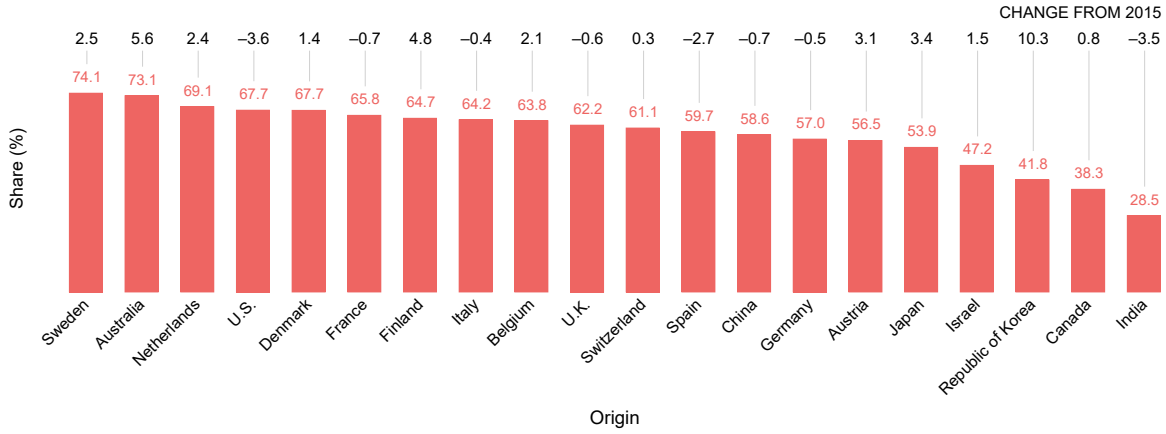


Note: These data are WIPO estimates.

Source: WIPO Statistics Database, March 2021.

Applicants from Sweden filed 74.1% of applications abroad using the PCT route.

B14. Share of PCT national phase entries in total filings abroad for the top 20 origins, 2019

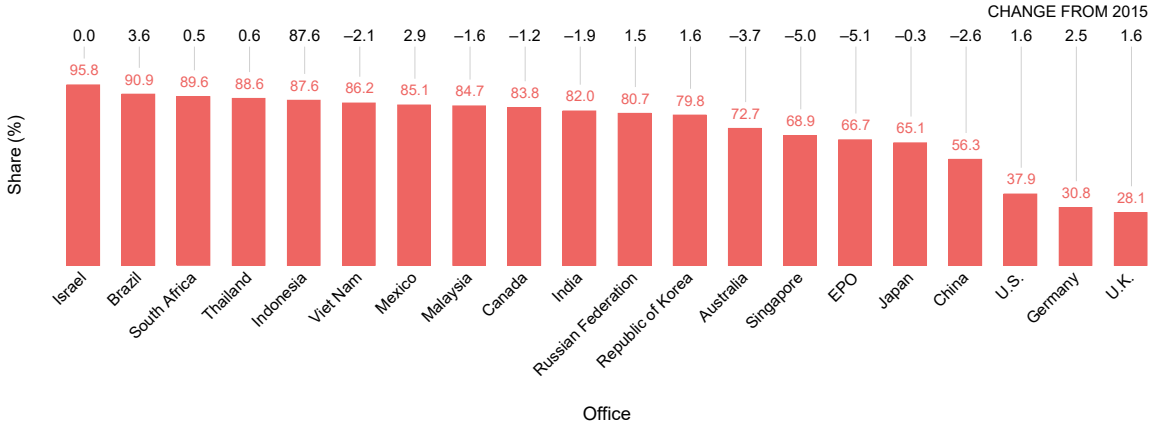


Note: The share is defined as the number of PCT national phase entries initiated abroad divided by the total number of patent applications filed abroad. It includes data from the 20 origins that filed the most applications abroad in 2019.

Source: WIPO Statistics Database, March 2021.

Brazil and Israel received more than 90% of non-resident patent applications via the PCT System.

B15. Share of PCT national phase entries in total non-resident filings for the top 20 offices, 2019



Note: The share is defined as non-resident PCT national phase entries initiated divided by the total number of non-resident patent applications filed. It includes data from the 20 offices to receive the most non-resident filings in 2019; that is, data from countries that are members of the PCT System and provided data broken down by filing route. EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2021.

Applicants from China used the PCT route for 97.5% of patent filings at the office of Brazil.

B16. Share of PCT national phase entries in total non-resident filings for the top 10 origins and the top 20 offices, 2019

Office	Origin: U.S.	Japan	Germany	China	Republic of Korea	France	U.K.	Switzerland	Netherlands	Sweden
U.S.		40.5	49.7	41.2	30.5	61.9	50.9	55.0	68.8	71.5
China	61.0	53.2	60.6		37.8	69.6	70.3	71.7	80.9	77.2
EPO	64.6	70.1		78.0	60.4					
Japan	62.6		72.7	61.5	61.3	77.9	72.7	68.4	83.1	74.0
Republic of Korea	87.4	70.7	82.5	83.6		89.0	90.3	87.5	89.7	90.6
India	82.9	78.6	77.7	90.6	63.4	81.5	92.1	71.4	94.1	93.8
Canada	79.6	92.9	87.4	81.5	95.5	81.7	86.6	93.4	92.2	95.6
Australia	67.7	79.8	85.0	79.5	78.3	77.4	80.0	82.9	82.9	88.1
Germany	24.5	49.8		45.2	8.3	10.9	37.5	3.5	23.5	10.3
Brazil	88.9	87.3	91.9	97.5	94.1	87.2	90.3	97.7	99.3	97.6
China, Hong Kong SAR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mexico	81.6	89.0	89.6	93.7	87.3	89.2	89.9	90.5	90.4	93.4
Singapore	67.2	64.3	68.4	82.4	52.5	75.7	65.6	77.0	78.2	88.2
Russian Federation	76.9	74.1	83.9	91.4	74.8	83.5	78.2	88.5	87.5	94.4
Indonesia	97.5	79.1	91.9	96.3	74.1	97.9	97.9	95.3	99.3	99.4
Thailand	95.5	83.0	93.7	91.8	93.9	99.5	100.0	94.7	98.2	100.0
U.K.	56.4	38.0	5.5	20.7	12.2	17.6		1.9	14.5	1.3
Viet Nam	93.3	89.0	89.2	95.3	71.0	95.4	97.0	93.4	100.0	100.0
Malaysia	84.4	80.2	81.2	93.3	88.0	92.3	88.1	93.7	81.0	97.3
Israel	96.2	98.7	92.2	97.8	100.0	90.5	94.8	99.1	99.3	99.0

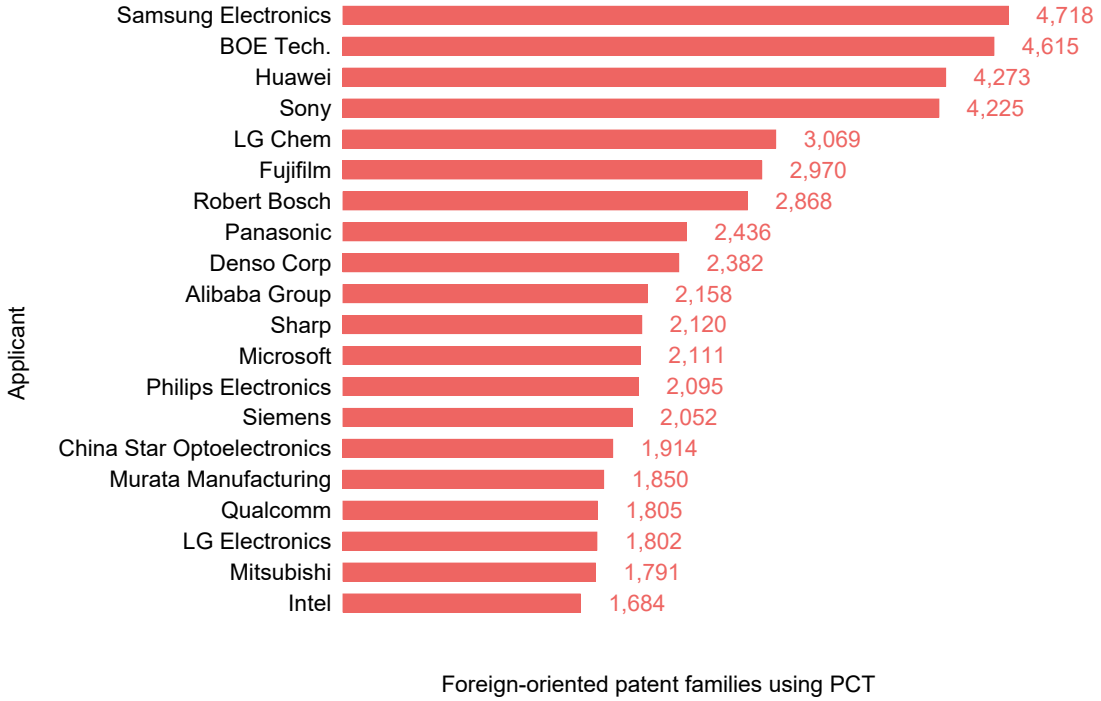
Note: This figure includes data from the 20 offices to receive the most non-resident filings in 2019; that is, data from countries that are members of the PCT System and provided data broken down by filing route. In general, the national offices of European Patent Office (EPO) member states receive a relatively small proportion of national phase entries, because applicants may apply via the EPO to seek protection within any EPO member state.

Source: WIPO Statistics Database, March 2021.

Top applicants in foreign-oriented patent families

Samsung Electronics had the highest number of foreign-oriented patent families using the PCT route between 2015 and 2017.

B17. Top 20 applicants in foreign-oriented patent families using the PCT System, 2015–2017



Note: The number of patent applications in foreign-oriented patent families as reported in the autumn 2020 edition of PATSTAT may be incomplete for most recent years. A patent family is a set of interrelated patent applications filed at one or more offices to protect the same invention. 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 at an office other than the applicant's home office.

Source: WIPO Statistics Database and EPO PATSTAT Database, March 2021.

Of the top 50 applicants with foreign-oriented patent families between 2015 and 2017, 21 relied primarily on the PCT System to protect their innovations abroad.

B18. Top 50 applicants in foreign-oriented patent families, 2012–2014 and 2015–2017

		Foreign-oriented patent families		Foreign-oriented patent families using the PCT route (%)	
Rank	Applicant	2012–2014	2015–2017	2012–2014	2015–2017
1	SAMSUNG ELECTRONICS CO LTD	16,397	13,518	22.5	34.9
2	CANON KK	10,641	9,496	10.2	9.7
3	ALIBABA GROUP HOLDING LTD	1,635	7,455	35.7	28.9
4	FORD GLOBAL TECH LLC	3,994	7,121	0.8	0.1
5	BOE TECHNOLOGY GROUP CO LTD	3,345	7,016	69.9	65.8
6	BOSCH GMBH ROBERT	6,515	6,167	43	46.5
7	TOYOTA MOTOR CORP	4,019	6,021	45.6	5.7
8	SAMSUNG DISPLAY CO LTD	6,304	5,311	0.2	0.1
9	HYUNDAI MOTOR CO LTD	4,092	4,954	0.5	0.3
10	SEIKO EPSON CORP	4,923	4,637	9.8	8.7
11	SONY CORP	5,792	4,531	56	93.2
12	HUAWEI TECH CO LTD	2,755	4,505	85.5	94.9
13	HONDA MOTOR CO LTD	3,746	4,386	23.5	20
14	FUJITSU LTD	4,226	4,245	3.3	3.7
15	DENSO CORP	4,177	4,068	38.8	58.6
16	BAYERISCHE MOTOREN WERKE AG	3,135	3,957	26.6	27.7
17	SIEMENS AG	5,504	3,835	41.8	53.5
18	FUJIFILM CORP	3,779	3,707	71.3	80.1
19	GEN ELECTRIC	3,514	3,651	22.4	24.5
20	PANASONIC IP MAN CO LTD	2,132	3,553	65.6	68.6
21	LG CHEMICAL LTD	2,362	3,538	79.6	86.7
22	LG ELECTRONICS INC	3,260	3,515	29.4	51.3
23	RICOH CO LTD	3,159	3,136	12.4	13.2
24	TOSHIBA CORP	6,195	2,981	15.1	9.7
25	PANASONIC IP MAN CORP	1,373	2,980	34.5	33.1
26	SHARP KK	3,208	2,688	86.8	78.9
27	MITSUBISHI ELECTRIC CORP	3,278	2,618	54.7	68.4
28	MURATA MANUFACTURING CO	1,836	2,612	77.8	70.8
29	INTEL CORP	2,417	2,576	73.4	65.4
30	SK HYNIX INC	2,225	2,455	0	0.1
31	FUJI XEROX CO LTD	1,815	2,336	3.8	1.9
32	KONICA MINOLTA INC	1,965	2,256	36.7	26.3
33	KONINKLIJKE PHILIPS NV	1,816	2,208	97.9	94.9
34	MICROSOFT TECHNOLOGY LICENSING LLC	1,676	2,186	95.2	96.6
35	LG DISPLAY CO LTD	1,723	2,184	4.9	0.7
36	KYOCERA DOCUMENT SOLUTIONS INC	2,016	2,139	8.2	9.7
37	SUMITOMO ELECTRIC INDUSTRIES	1,474	2,037	67	78.8
38	KIA MOTORS CORP	1,056	2,010	0.5	0.3
39	SHENZHEN CHINA STAR OPTOELECT	1,156	1,918	99.3	99.8
40	NEC CORP	2,525	1,905	88.4	85.9
41	BROTHER IND LTD	2,243	1,875	3.3	9.2
42	QUALCOMM INC	1,943	1,827	97.7	98.8
43	ELECTRONICS & TELECOMMUNICATIONS RES INST	956	1,790	6.2	17.1
44	FANUC LTD	868	1,735	0	0
45	BASF SE	2,172	1,726	88.8	91.9
46	COMMISSARIAT ENERGIE ATOMIQUE	1,753	1,722	65.1	47.2
47	WARE PAUL	259	1,714	0	0
48	BOEING CO	1,465	1,701	15.1	0.2
49	IBM	4,595	1,667	20.7	51.9
50	HITACHI LTD	1,924	1,648	22.1	37.4

Note: The number of patent applications in foreign-oriented patent families as reported in the autumn 2020 edition of PATSTAT may be incomplete for most recent years. A patent family is a set of interrelated patent applications filed at one or more offices to protect the same invention. 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 at an office other than applicant's home office.

Source: WIPO Statistics Database and EPO PATSTAT Database, March 2021.

Statistical table

B19. PCT national phase entries by office and origin, 2018–2019

Name	PCT national phase entries in 2019		PCT national phase entries in 2018	
	At designated office	By country of origin	At designated office	By country of origin
Afghanistan	n.a.	1	n.a.	1
African Intellectual Property Organization	408	n.a.	398	n.a.
African Regional Intellectual Property Organization	816	n.a.	772	n.a.
Albania	..	3	3	0
Algeria	503	0	497	4
Andorra	n.a.	40	n.a.	13
Angola	108	0	114	7
Antigua and Barbuda	..	266	5	400
Argentina	n.a.	126	n.a.	111
Armenia	1	20	3	15
Aruba	n.a.	5	n.a.	0
Australia	20,908	8,188	20,900	7,447
Austria	429	5,759	427	5,985
Azerbaijan	16	5	15	13
Bahamas	n.a.	7	n.a.	22
Bahrain	316	43	213	3
Bangladesh	n.a.	4	n.a.	1
Barbados	31	182	..	342
Belarus	64	26	60	33
Belgium (c)	..	6,418	..	6,599
Belize	32	12	24	3
Benin (d)	..	0	..	0
Bermuda	n.a.	69	n.a.	27
Bhutan	n.a.	1	n.a.	3
Bolivia (Plurinational State of)	n.a.	6	n.a.	3
Bosnia and Herzegovina	5	8	7	2
Botswana	..	0	..	1
Brazil	18,270	1,224	18,011	1,074
Brunei Darussalam	129	9	90	1
Bulgaria	4	74	4	99
Burkina Faso (d)	..	0	..	0
Burundi	n.a.	6	n.a.	6
Cambodia	..	1	26	9
Cameroon (d)	..	0	..	7
Canada	28,577	9,448	28,396	9,161
Central African Republic (d)	..	0	..	0
Chad (d)	..	0	..	0
Chile	2,739	407	2,578	392
China	89,249	49,664	84,297	35,993
China, Hong Kong SAR	n.a.	500	n.a.	511
China, Macao SAR	n.a.	62	n.a.	28
Colombia	1,665	119	1,707	162
Comoros (d)	..	0	..	0
Congo (d)	..	1	..	0
Costa Rica	474	20	484	42
Côte d'Ivoire (d)	..	0	..	2
Croatia	5	73	2	46
Cuba	85	61	120	90
Curaçao	n.a.	11	n.a.	1
Cyprus (c)	..	141	..	184
Czech Republic	18	505	24	551
Democratic People's Republic of Korea	..	12	..	40
Denmark	86	6,054	93	5,900
Djibouti	..	0	..	0
Dominica	..	0	4	0
Dominican Republic	220	14	208	8
Ecuador	401	11	364	14

(Continued)

(B19 continued)

Name	PCT national phase entries in 2019		PCT national phase entries in 2018	
	At designated office	By country of origin	At designated office	By country of origin
Egypt	1,123	53	1,226	47
El Salvador	145	0	128	2
Equatorial Guinea (d)	..	0	..	0
Estonia	..	62	4	86
Eswatini (a)	..	29	..	93
Eurasian Patent Organization	2,581	n.a.	2,643	n.a.
European Patent Office	105,681	n.a.	102,196	n.a.
Finland	22	5,237	24	5,126
France (c)	..	26,980	..	28,173
Gabon (d)	..	3	..	0
Gambia	16	0	..	1
Georgia	110	1	151	11
Germany	7,507	59,457	7,027	59,356
Ghana	..	4	26	0
Greece (c)	..	404	..	300
Grenada	..	0	..	0
Guatemala	222	1	220	3
Guinea (d)	..	3	..	0
Guinea-Bissau (d)	..	0	..	0
Honduras	179	0	144	0
Hungary	13	567	11	522
Iceland	8	83	7	107
India	28,155	4,113	27,688	3,989
Indonesia	7,440	105	7,127	21
Iran (Islamic Republic of)	..	27	..	21
Iraq	n.a.	3	n.a.	2
Ireland (c)	..	2,231	..	2,295
Israel	6,649	7,407	6,158	7,176
Italy (c)	..	11,179	..	11,780
Jamaica	n.a.	5	n.a.	5
Japan	66,968	137,808	64,013	132,527
Jordan	254	11	16	7
Kazakhstan	..	28	..	26
Kenya	36	6	38	10
Kuwait	..	1	256	5
Kyrgyzstan	..	0	..	0
Lao People's Democratic Republic	..	1	40	0
Latvia (c)	..	36	..	38
Lebanon	n.a.	10	n.a.	28
Lesotho	..	0	..	0
Liberia	..	0	..	0
Libya	..	6	..	0
Liechtenstein (b)	..	640	..	567
Lithuania (c)	..	73	..	58
Luxembourg	..	1,506	..	1,812
Madagascar	28	0	37	0
Malawi	..	0	..	1
Malaysia	5,511	437	5,072	437
Mali (d)	..	0	..	2
Malta (c)	..	153	..	176
Marshall Islands	n.a.	0	n.a.	1
Mauritania (d)	..	0	..	0
Mauritius	n.a.	14	n.a.	42
Mexico	12,516	749	12,637	620
Monaco (c)	..	52	..	33
Mongolia	80	4	69	0
Montenegro	..	0	..	8
Morocco	2,178	48	1,963	43

(Continued)

(B19 continued)

Name	PCT national phase entries in 2019		PCT national phase entries in 2018	
	At designated office	By country of origin	At designated office	By country of origin
Mozambique	23	0	13	0
Namibia	8	9	7	2
Netherlands (c)	..	17,069	..	17,847
Netherlands Antilles	n.a.	2	n.a.	1
New Zealand	4,414	1,255	4,084	1,397
Nicaragua	..	0	..	0
Niger (d)	..	0	..	1
Nigeria	..	2	148	9
North Macedonia	..	0	..	0
Norway	562	3,141	544	3,300
Oman	468	6	400	0
Pakistan	n.a.	7	n.a.	8
Panama	324	23	347	10
Papua New Guinea	..	0	..	0
Paraguay	n.a.	2	n.a.	5
Peru	1,074	39	1,065	43
Philippines	3,495	37	3,182	57
Poland	53	784	53	927
Portugal	11	706	10	485
Qatar	814	53	..	56
Republic of Korea	39,021	33,186	38,239	28,731
Republic of Moldova	7	14	20	7
Romania	19	64	20	109
Russian Federation	9,882	1,944	10,159	1,603
Rwanda	..	0	..	0
Saint Kitts and Nevis	..	27	4	8
Saint Lucia	..	2	..	0
Saint Vincent and the Grenadines	3	0	4	0
Samoa	n.a.	17	n.a.	2
San Marino	1	19	..	23
Sao Tome and Principe	..	0	408	1
Saudi Arabia	2,691	1,641	2,464	1,104
Senegal (d)	..	0	..	0
Serbia	7	37	7	66
Seychelles	6	9	16	34
Sierra Leone	..	0	..	0
Singapore	8,914	2,915	7,740	2,830
Slovakia	5	207	3	134
Slovenia (c)	..	192	..	163
South Africa	5,834	743	5,706	879
Spain	89	3,896	96	4,172
Sri Lanka	241	40	234	18
Sudan	4	9	..	0
Sweden	70	15,081	73	13,703
Switzerland	73	21,020	82	22,230
Syrian Arab Republic	32	1	..	7
Tajikistan	1	0	..	0
Thailand	6,527	622	6,290	492
Togo (d)	..	0	..	0
Trinidad and Tobago	112	4	134	1
Tunisia	..	6	271	8
Turkey	274	1,168	215	1,015
Turkmenistan	..	0	..	1
Uganda	..	0	..	0
Ukraine	1,554	116	1,613	143
United Arab Emirates	1,797	234	1,664	202
United Kingdom	2,291	22,078	2,573	23,856
United Republic of Tanzania	..	1	9	9
United States of America	164,221	188,806	155,322	182,601

(Continued)

(B19 continued)

Name	PCT national phase entries in 2019		PCT national phase entries in 2018	
	At designated office	By country of origin	At designated office	By country of origin
Uruguay	n.a.	44	n.a.	79
Uzbekistan	153	30	157	4
Vanuatu	n.a.	0	n.a.	10
Venezuela (Bolivarian Republic of)	n.a.	6	n.a.	8
Viet Nam	5,861	36	4,567	34
Zambia	21	0	13	1
Zimbabwe	..	2	..	2
Others	1,262	9,457	777	8,877
Total	**675,200**	**675,200**	**647,500**	**647,500**

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

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

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

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

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

.. indicates data are unknown.

n.a. indicates not applicable.

Source: WIPO Statistics Database, March 2021.

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 relating to the international phase of the PCT System, including examining formalities; translating abstracts, titles and patentability reports; and publishing PCT applications.

About 44% of all PCT applications were published in English in 2020

In 2020, about 44% of all PCT applications were published in English, while Chinese (20.3%) overtook Japanese (19.2%) to become the second most used language of publication (see figure C1). The seven remaining languages of publication, combined, accounted for 16.1% of the total. Whereas the combined share of the top three languages has remained relatively stable over the past 15 years, the contribution made by each has altered drastically from when English accounted for nearly the two-thirds of publications in 2006 and Chinese for only 1.7%. Overall, the vast majority of PCT applications are published in the language in which they were filed.

More than 98% of PCT applications were filed electronically

Applicants filed 98.4% of PCT applications electronically and the remaining 1.6% on paper in 2020 (see figure C2). Since electronic filing means were first made available to applicants, their use has continuously increased.

Over 16% of PCT applications were filed using ePCT in 2020

In 2020, 71 ROs accepted ePCT-filings and applicants filed 44,514 PCT applications using this online service. This represents an increase of 29.4% on the previous year and corresponds to 16.1% of all PCT applications filed in 2020 (see figure C3). Applicants from the U.S. (10,868) filed by far the most applications using ePCT, followed by those from the Republic of Korea (5,104), Italy (1,966), India (1,904) and Canada (1,832). Among the 20 origins filing the most via ePCT, the Republic of Korea (+387%), China (+87%) and the U.S. (+56.7%) recorded the sharpest increases compared to 2019 (see figure C4).

The IB examined nearly 99% of all PCT applications within three weeks of receipt

In 2020, the IB performed the PCT-required formalities examination of 77.8% of PCT applications within one week of receipt of the application and 98.6% within three weeks (see figure C5).

Almost 81% of publications occurred during the week following the expiration of the 18-month period from the priority date, and 99.5% of publications occurred within two weeks of that period (see figure C6). When an international search report (ISR) is unavailable at the time of publication, an application is republished together with its ISR once it is available. The proportion of applications republished within two months of receipt of the ISR was 92.7%. Almost all republications occurred within three months of receipt of the ISR at the IB (see figure C7).

The receiving offices

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

Eighteen of the top 20 ROs received more than 90% of applications electronically in 2020

Of the top 20 ROs, Israel, Singapore, Turkey and the U.S. received nearly all PCT applications electronically in 2020. The share of electronic filings exceeded 99% at seven offices and 90% at every top 20 office, except for that of Germany (80.6%) and the Russian Federation (40.6%) (see figure C12).

Finland transmitted all its PCT applications to the IB within four weeks

In 2020, on average, ROs transmitted PCT applications to the IB within 2.6 weeks of the international filing date (see figure C14). Finland transmitted all its applications to the IB within four weeks of the filing date. Among the top 20 ROs, 11 transmitted more than 98% of PCT applications within this timeframe. In contrast, the offices of Turkey and the Russian Federation transmitted a large proportion of applications to the IB more than eight weeks after the international filing date (see figure C15).

The proportion of PCT applications transmitted by ROs to the ISAs within four weeks varied slightly from that transmitted to the IB. It was above 98% at the Japan Patent Office (JPO) and above 80% for half of the top 20 ROs (see figure C16).

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 CNIPA issued about 23% more ISRs in 2020

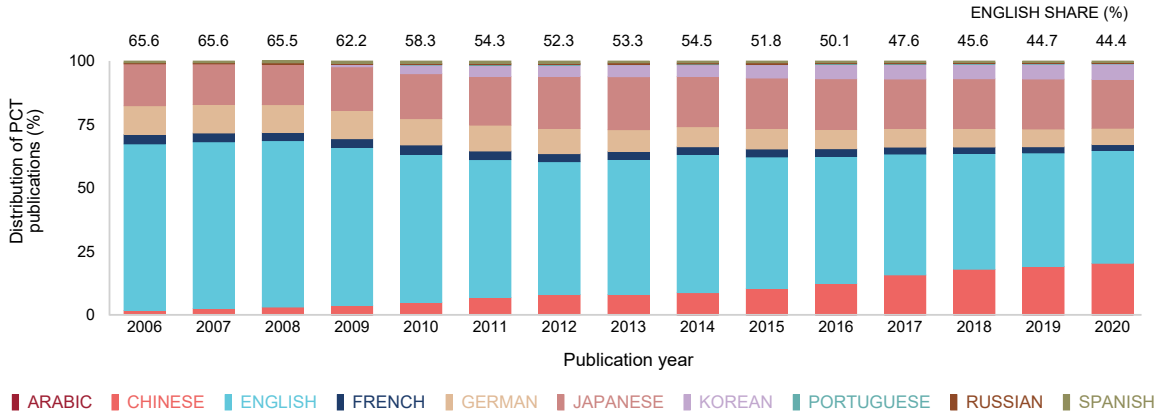
In 2020, 266,722 ISRs were issued by the 23 existing ISAs. The EPO issued 83,130 ISRs and was followed by the China National Intellectual Property Administration (CNIPA) and the JPO. Together, these three ISAs accounted for nearly three-quarters of all ISRs issued (see figure C17). Of the top 10 ISAs, Turkey (+77.2%), the CNIPA (+22.9%) and India (+5.8%) experienced the sharpest growth. Of the 23 ISAs, 14 issued fewer ISRs in 2020 than in the previous year.

Of all the ISRs that are required to be transmitted to the IB within three months of the date of receipt of the application, 86.1% were transmitted within this timeframe in 2020 (see figure C20). At 16 ISAs, more than 80% of ISRs that ought to have been transmitted to the IB within three months from the date of receipt of the search copy met this deadline. As for those required to be transmitted within 9 months of the priority date, 79.1% met this timeframe in 2020 (see figure C21). Four ISAs transmitted all such ISRs within the required 9 months, and all 23 ISAs transmitted at least half within this timeframe.

PCT applications by publication language and filing medium

More than 44% of PCT applications were published in English in 2020.

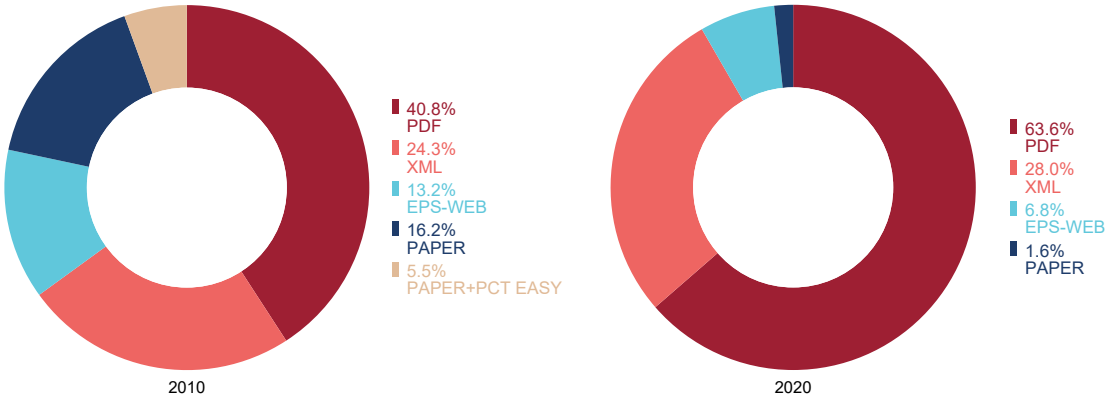
C1. Distribution of PCT applications by language of publication, 2006–2020



Source: WIPO Statistics Database, March 2021.

Over 98% of all PCT applications were filed electronically in 2020.

C2. Distribution of PCT applications by filing medium, 2010 and 2020



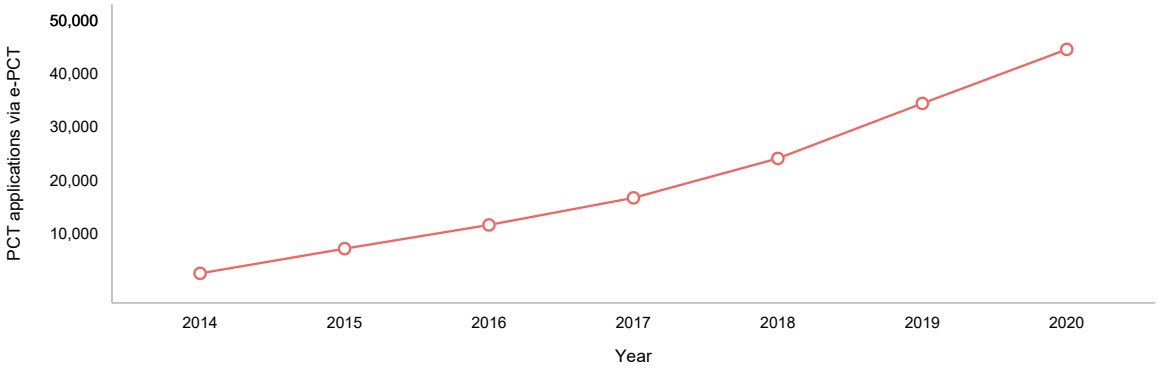
Note: PDF, EFS-WEB and XML are the three fully electronic filing mediums. Since mid-2015, PCT applications can no longer be filed using PCT-EASY.

Source: WIPO Statistics Database, March 2021.

PCT applications filed using ePCT

Applicants filed about 44,500 PCT applications using ePCT in 2020, an increase of 29.4% on 2019.

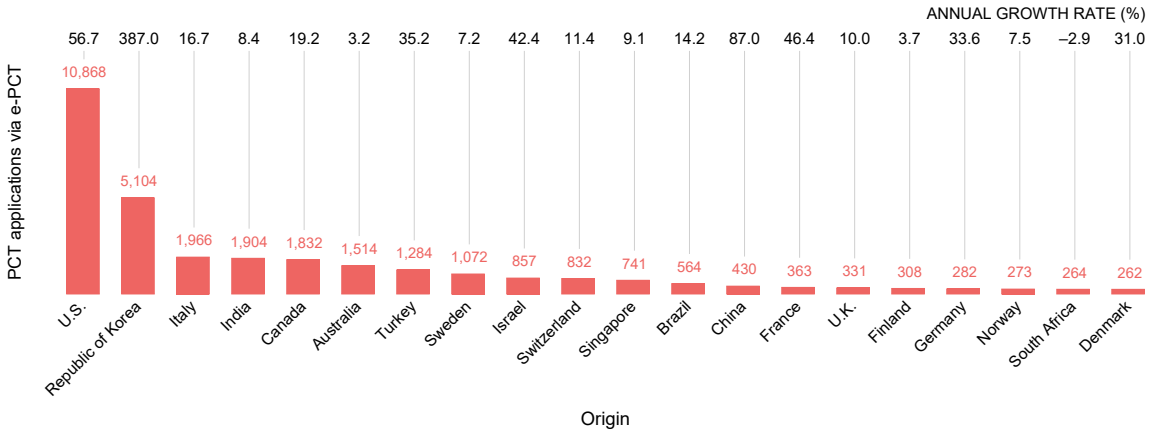
C3. Trend in PCT applications filed using ePCT, 2014–2020



Source: WIPO Statistics Database, March 2021.

Applicants residing in the U.S. filed nearly 10,900 applications using ePCT.

C4. PCT applications filed using ePCT for the top 20 origins, 2020

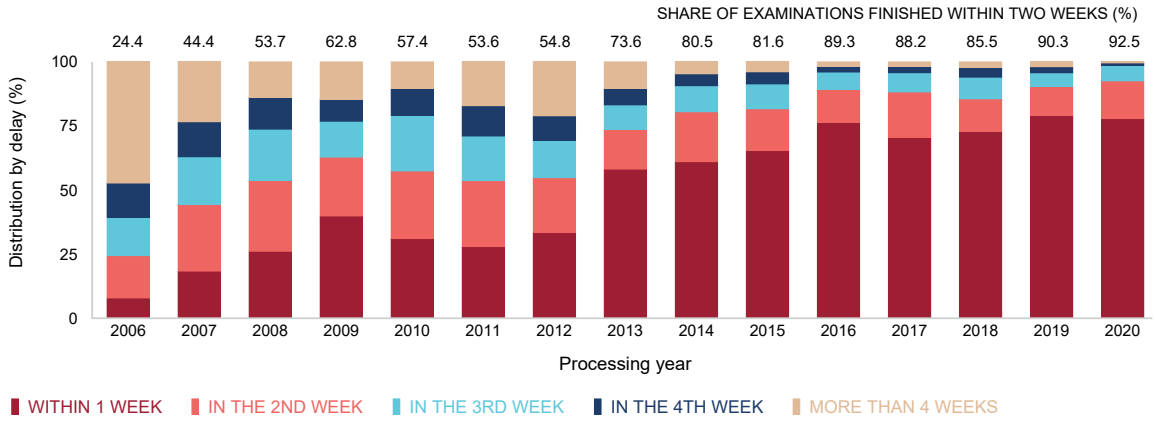


Source: WIPO Statistics Database, March 2021.

Timeliness in processing PCT applications by the International Bureau

The formalities examination was completed within two weeks for 92.5% of PCT applications processed in 2020.

C5. Timeliness of formalities examination, 2006–2020

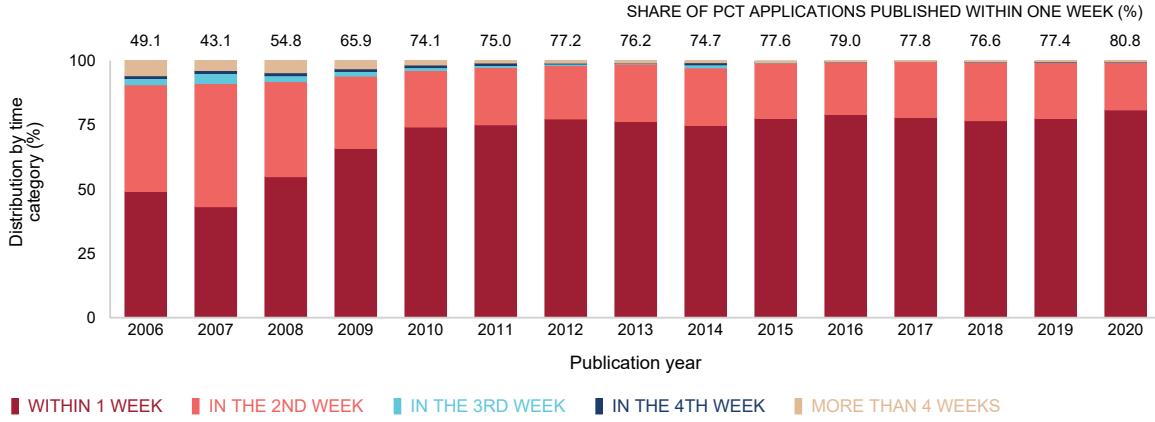


Note: The International Bureau (IB) performs a formality examination of PCT applications and related documents promptly after receipt. Once the formality examination of a PCT application is completed, the IB sends a form to the applicant acknowledging receipt of the application. Timeliness is calculated as the time 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 2021.

Since 2011, three-quarters or more of PCT applications have been published within one week of the expiration of the 18-month limit.

C6. Timeliness in publishing PCT applications, 2006–2020

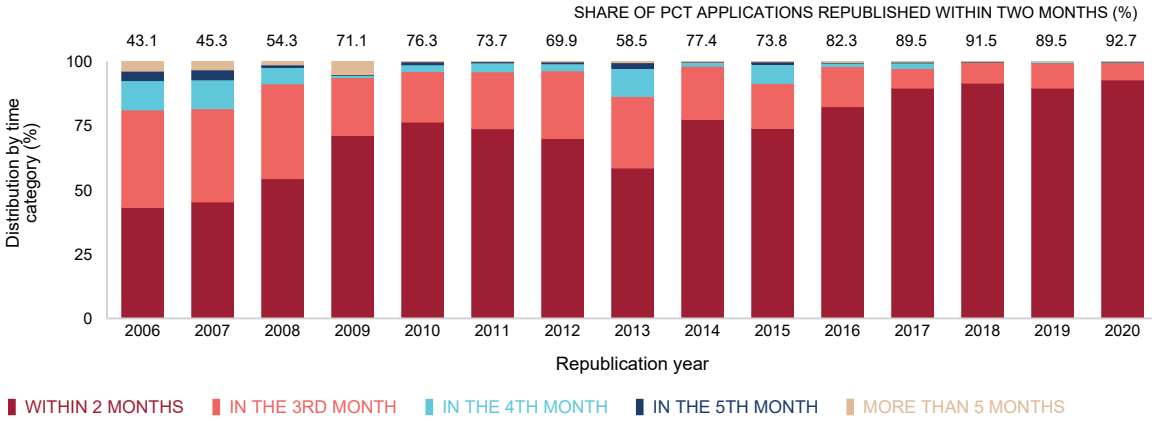


Note: PCT applications and related documents are to be published "promptly" after the expiration of 18 months from the priority date, unless the applicant requests early publication, or the application is withdrawn or considered withdrawn. Timeliness is calculated as the time between the time limit of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

Source: WIPO Statistics Database, March 2021.

In 2020, nearly 93% of republications occurred within two months of receipt of an ISR.

C7. Timeliness in republishing PCT applications with international search reports, 2006–2020



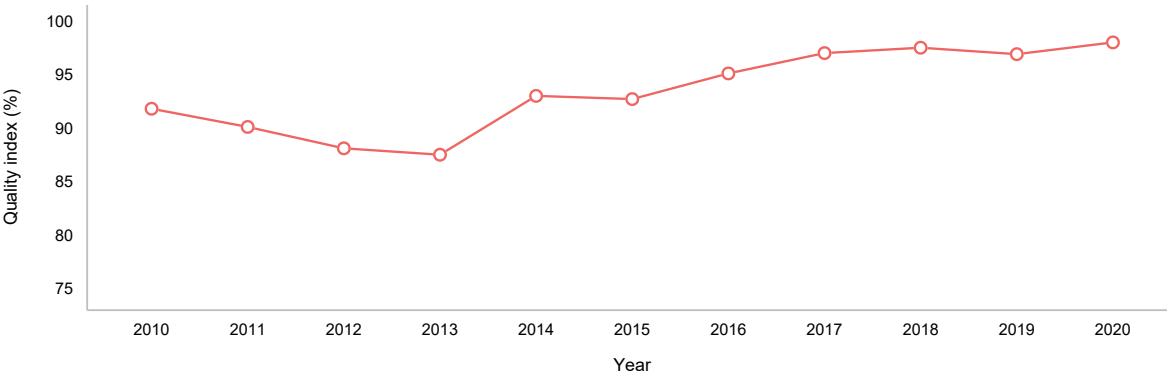
Note: The International Bureau (IB) is required to publish applications even in the absence of an international search report (ISR). In such cases, the application is republished along with an ISR after the report is received. Timeliness is calculated as the time elapsed between the date of receipt of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

Source: WIPO Statistics Database, March 2021.

Efficiency in processing PCT applications by the International Bureau

The overall quality of the formalities examination has continued to improve since 2013.

C8. Formalities examination quality index, 2010–2020

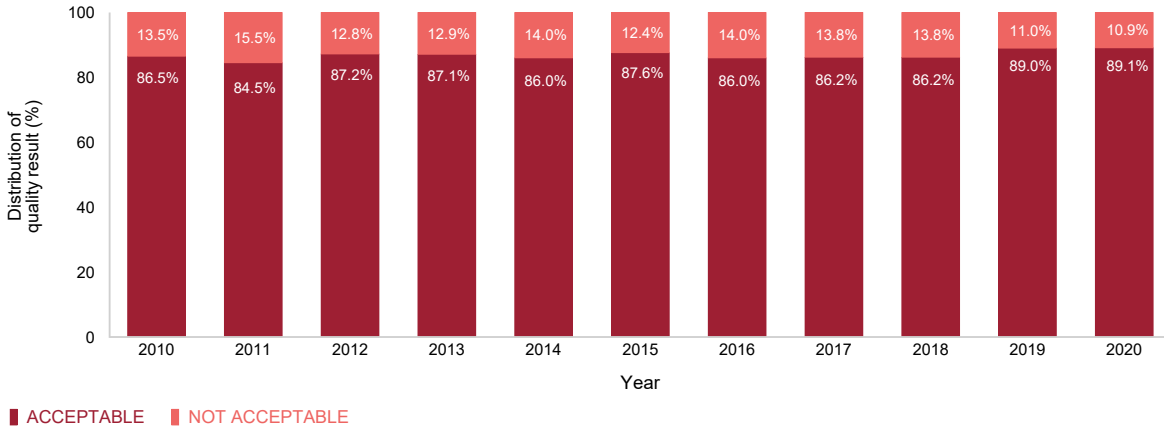


Note: In order to measure the quality of the formalities examination by the International Bureau (IB) in a simple and comprehensive manner, the IB has developed an aggregate quality index, calculated as the average of four lead quality indicators. Three of these are based on the timeliness of key transactions. The quality index is the simple average of: (i) the percentage of forms PCT/IB/301 (notification of receipt of a PCT application) sent within five weeks of the IB receiving a PCT application; (ii) the percentage of PCT applications published within six months and three weeks after the international filing date; (iii) the percentage of republications with an international search report (ISR) within two months of the IB receiving the ISR; and (iv) the percentage of corrections to bibliographic data in the published PCT application (from 2009 to 2011) and the PCT operation quality control error rate (from 2012 onwards).

Source: WIPO Statistics Database, March 2021.

Around 89% of translations were rated as of acceptable quality in 2020.

C9. Translation quality indicator, 2010–2020



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

Source: WIPO Statistics Database, March 2021.

Since 2010, over 95% of report translations have been outsourced.

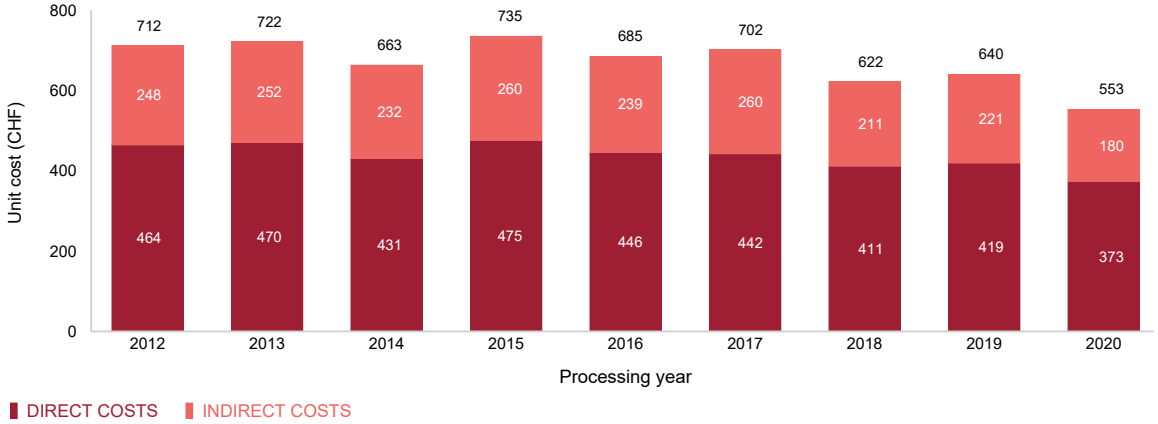
C10. Distribution of translation work, 2010–2020

Note: Translations by the International Bureau (IB) are intended to enhance the patent system's disclosure function by making the technological information in PCT applications accessible in languages other than the language 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 2021.

The average cost of processing a published PCT application was 553 Swiss francs (CHF) in 2020.

C11. Unit cost of processing a published PCT application, 2012–2020



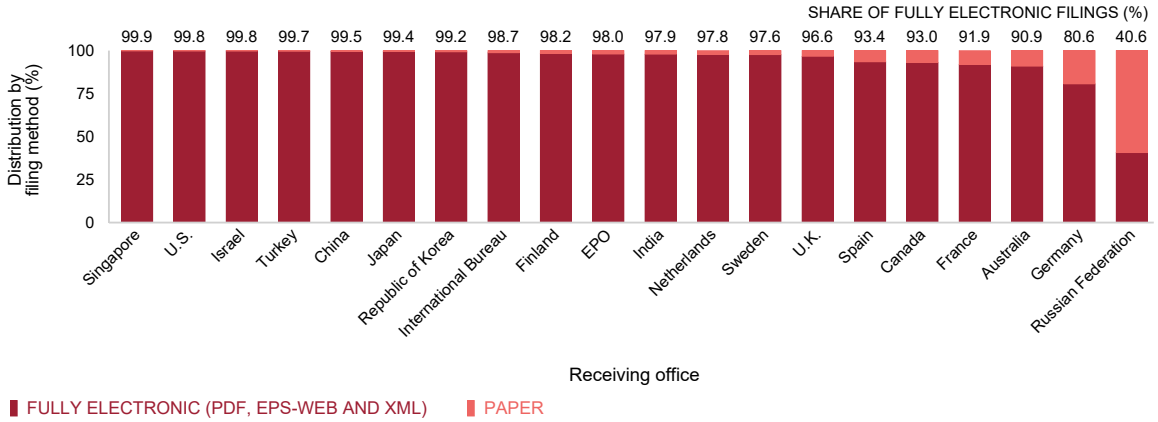
Note: The International Bureau (IB)'s efficiency in processing PCT applications can be measured by the unit cost of processing, defined as the average total cost of publishing a PCT application. Average total cost is determined by total PCT System expenditure, plus a proportion of expenditure on support and management activities. The unit cost includes the cost of all PCT activities, including translation, communication, management, and so on. 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 2021.

Receiving offices

The office of Singapore received nearly all PCT applications electronically.

C12. Distribution of PCT applications by filing medium, top 20 receiving offices, 2020

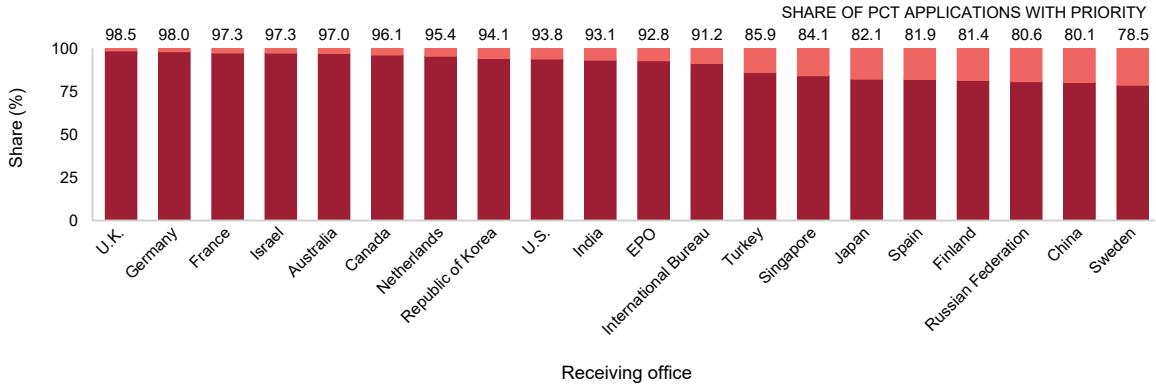


Note: EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2021.

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

C13. Share of PCT applications with priority filings, top 20 receiving offices, 2020

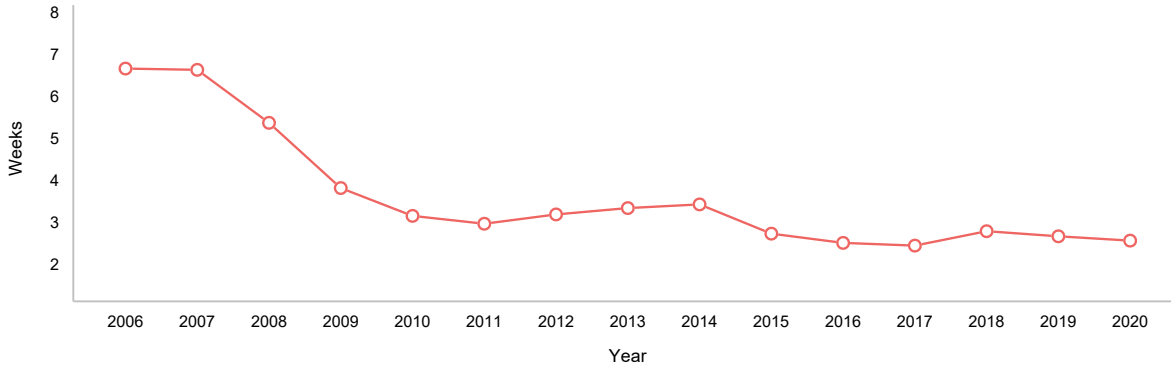


Note: EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2021.

On average, receiving offices transmitted PCT applications to the International Bureau within 2.6 weeks in 2020.

C14. Average timeliness in transmitting PCT applications to the International Bureau, 2006–2020

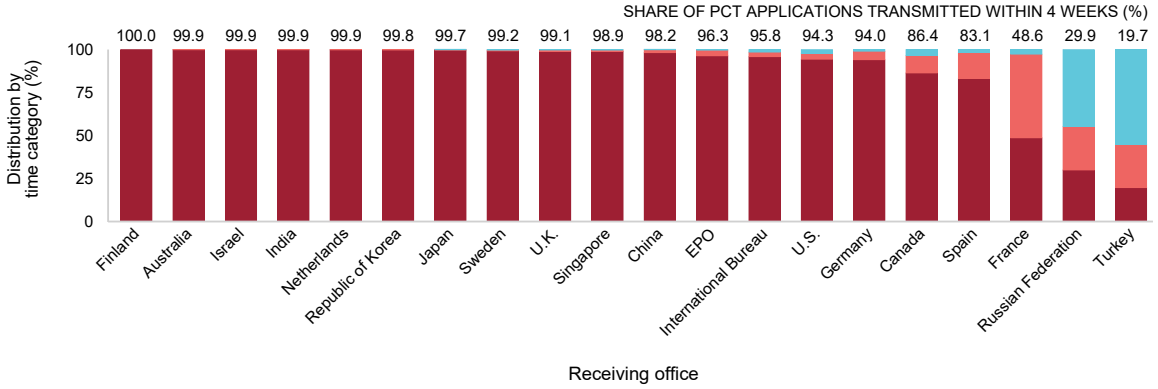


Note: The copy of the PCT application – known as the record copy – sent by the receiving office (RO) must reach the International Bureau (IB) before the expiration of the 13th month from the priority date. PCT applications are usually filed before the expiration of 12 months from the priority date. Where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

Source: WIPO Statistics Database, March 2021.

The office of Finland transmitted all its PCT applications to the International Bureau within four weeks.

C15. Timeliness in transmitting PCT applications to the International Bureau, top 20 receiving offices, 2020

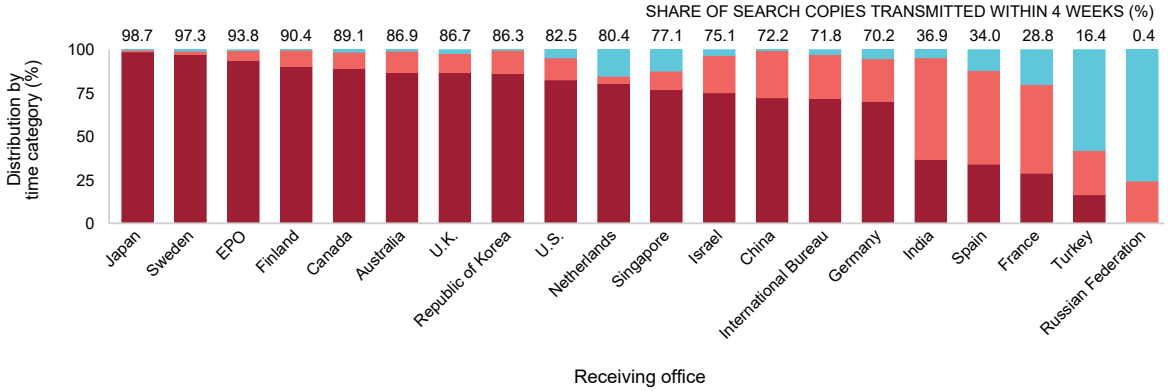


Note: The copy of the PCT application – known as the record copy – sent by the RO must reach the IB before the expiration of the 13th month from the priority date. PCT applications are usually filed before the expiration of 12 months from the priority date. Where this occurs, the IB should receive the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

Source: WIPO Statistics Database, March 2021.

The office of Japan transmitted almost 99% of its PCT applications to International Searching Authorities within four weeks.

C16. Timeliness in transmitting PCT applications to International Searching Authorities, top 20 receiving offices, 2020



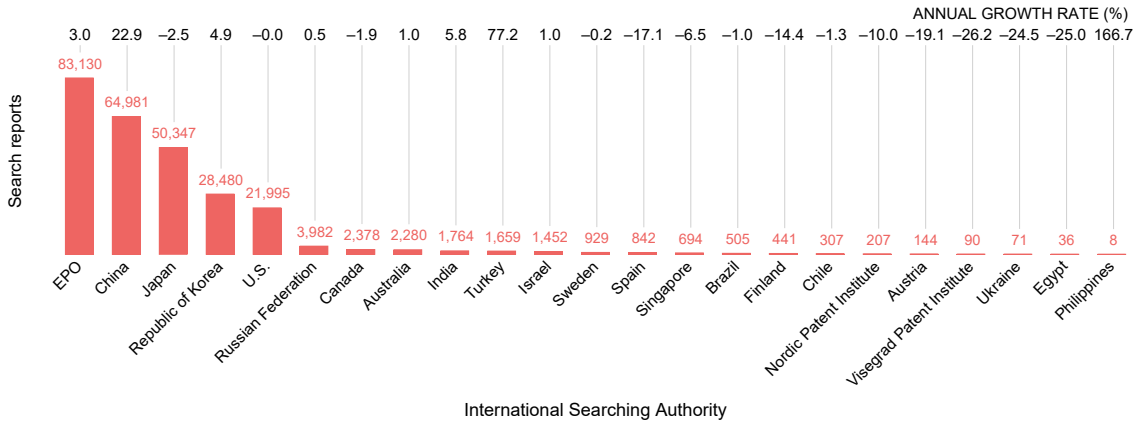
Note: Timeliness is calculated as the time elapsed between the international filing date and the date on which the International Searching Authority (ISA) received the PCT application – known as the search copy – from the receiving office. Dates of search fee payments are not used, due to the unavailability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

Source: WIPO Statistics Database, March 2021.

International Searching Authorities

The number of international search reports issued by the office of China grew by 22.9% in 2020.

C17. International search reports issued by International Searching Authority, 2020

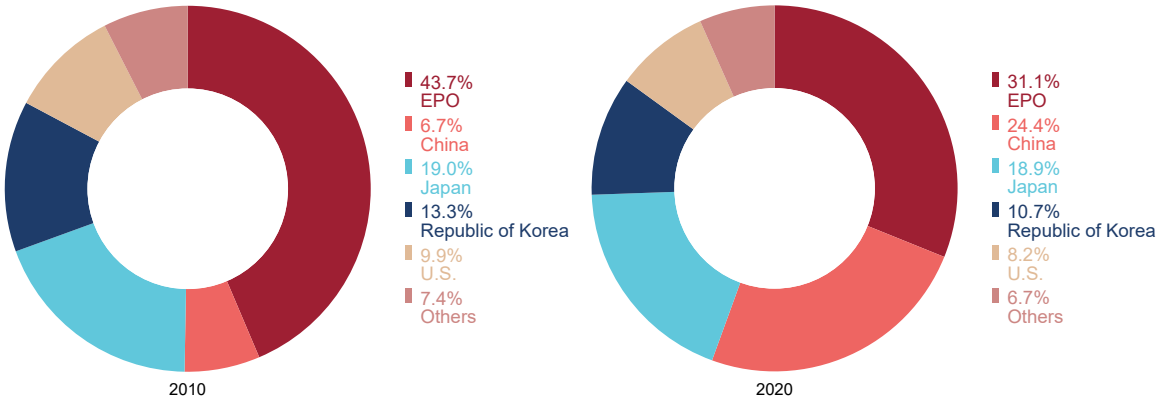


Note: EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2021.

China, the European Patent Office and Japan, combined, established almost three-quarters of all international search reports issued in 2020.

C18. Distribution of international search reports issued by International Searching Authority, 2010 and 2020

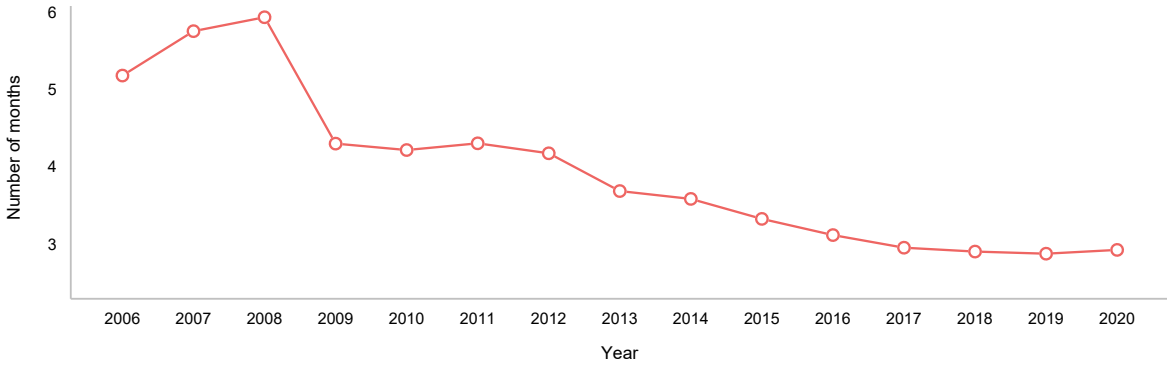


Note: EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2021.

Since 2018, the average timeliness in transmitting international search reports to the International Bureau has been 2.9 months.

C19. Average timeliness in transmitting international search reports to the International Bureau, measured from the date of receipt of the search copy, 2006–2020

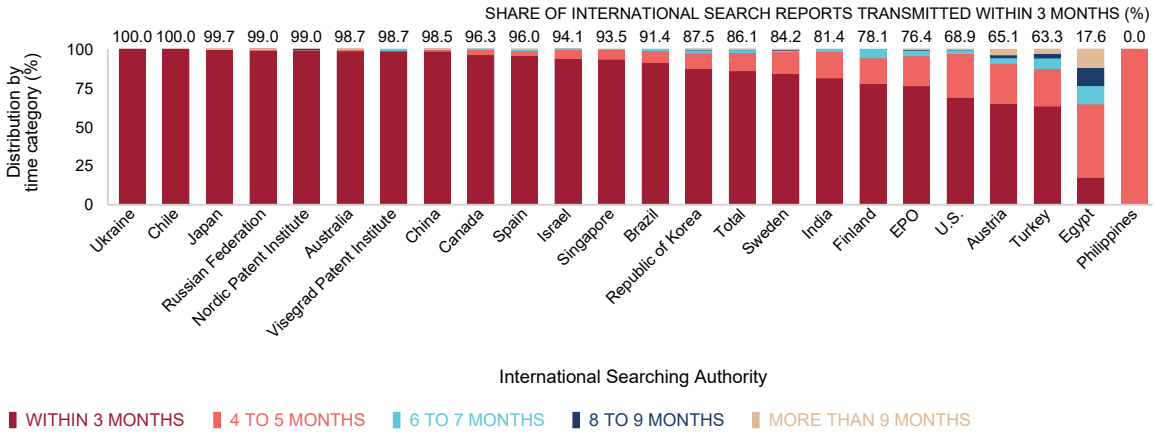


Note: The International Searching Authority (ISA) must establish the international search report (ISR) within three months of receiving a copy of the application – known as the search copy – or nine months from the priority date (or, if no priority is claimed, from the international filing date), whichever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

Source: WIPO Statistics Database, March 2021.

All international search reports that ought to be transmitted to the International Bureau within three months of the date of receipt of the search copy met this deadline at the offices of Chile and Ukraine.

C20. Timeliness in transmitting international search reports to the International Bureau, measured from date of receipt of the search copy by International Searching Authority, 2020

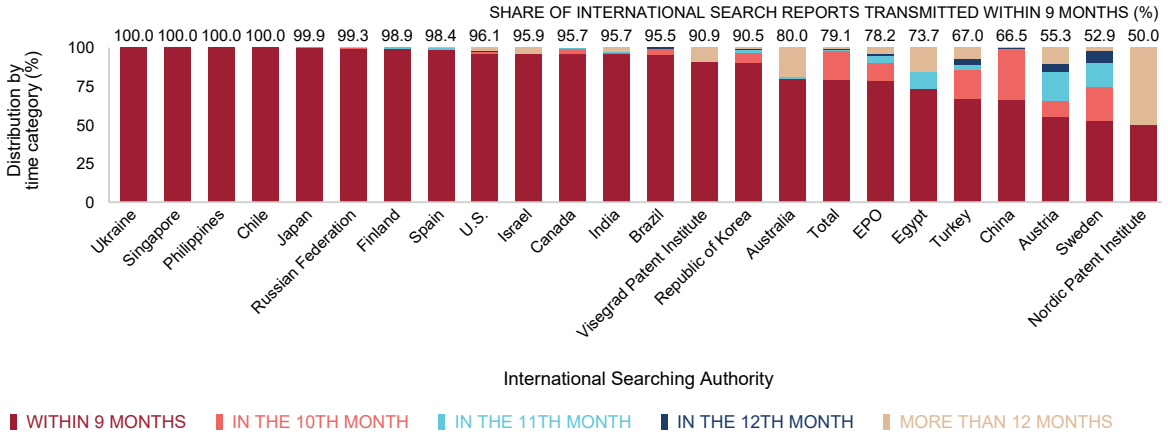


Note: The International Searching Authority (ISA) must establish the international search report (ISR) within three months of receiving a copy of the application – known as the search copy – or nine months from the priority date (or, if no priority is claimed, from the international filing date), whichever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

Source: WIPO Statistics Database, March 2021.

At the majority of International Searching Authorities, more than 90% of international search reports required to be transmitted to the International Bureau within nine months of the priority date met this deadline.

C21. Timeliness in transmitting international search reports to the International Bureau, measured from priority date by International Searching Authority, 2020



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

Source: WIPO Statistics Database, March 2021.

The International Bureau was able to publish more than 95% of PCT applications together with an international search report for 17 of the 23 International Searching Authorities.

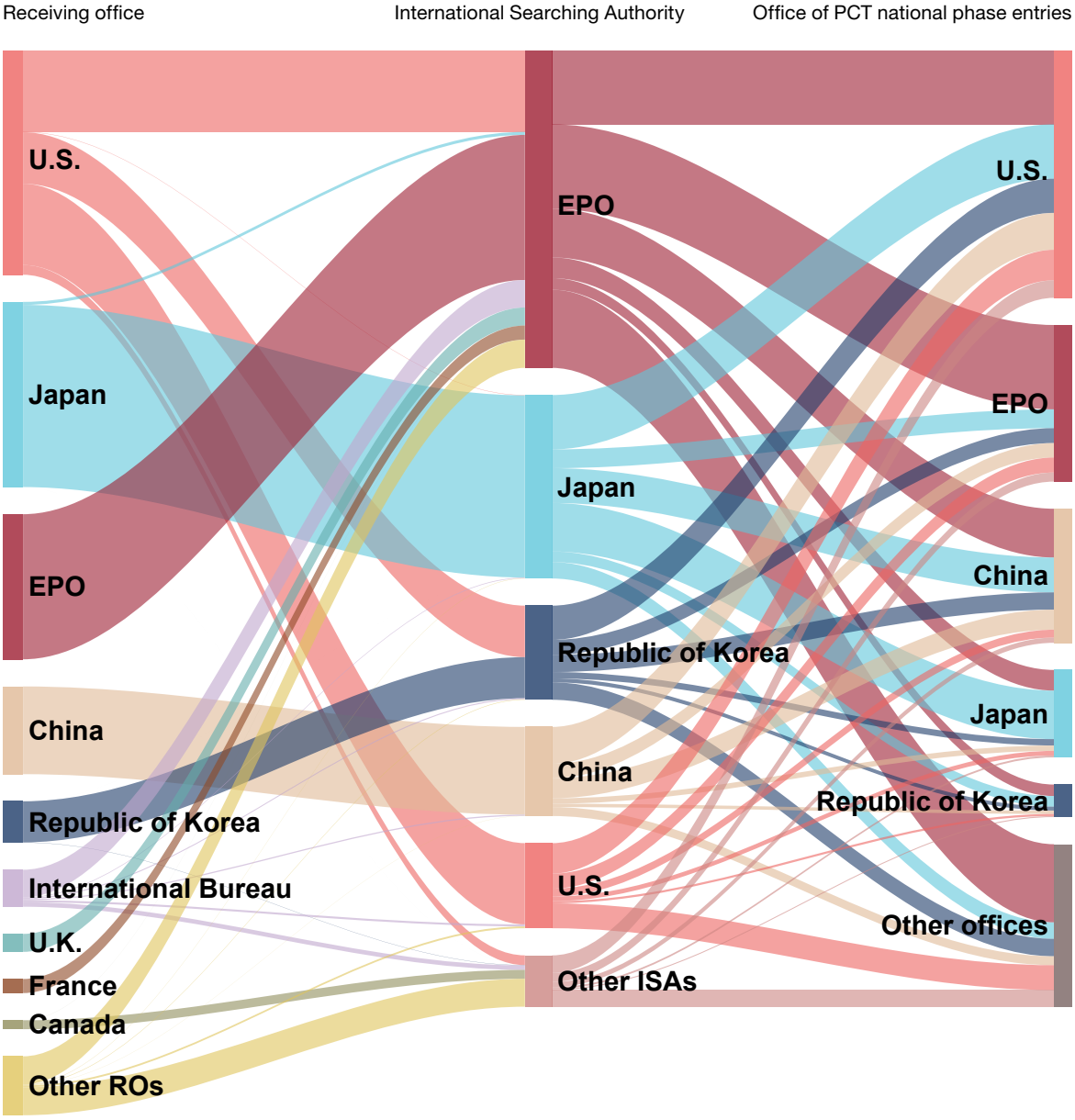
C22. Share of published PCT applications with or without an international search report by International Searching Authority, 2020

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

Source: WIPO Statistics Database, March 2021.

A large proportion of PCT applications filed at the office of the U.S had an international search report produced by the European Patent Office. This office also issued such reports for nearly half of national phase entries at offices other than the top five.

C23. Flow of PCT applications transmitted from selected receiving offices to the top five International Searching Authorities and the top five offices of PCT national phase entries, 2015–2017



Note: The 2015–2017 period refers to the years of PCT national phase entry and corresponds to the latest available data. National phase entry (NPE) data may be incomplete. This figure shows the flow of PCT applications between selected receiving offices (ROs), International Searching Authorities (ISAs) and offices of NPEs. Data for the offices of NPEs are based on fractional counts of PCT applications. Each RO may specify one or more ISA as competent for PCT applications filed with it. EPO is the European Patent Office.

Source: WIPO Statistics Database and EPO PATSTAT Database, March 2021.

Supplementary International Searching Authorities

The European Patent Office issued the vast majority of supplementary international search reports.

C24. Distribution of supplementary international search reports by Supplementary International Searching Authority, 2018–2020

Supplementary International Searching Authority	Year		
	2018	2019	2020
Austria	1	2	2
European Patent Office	54	94	50
Russian Federation		3	1
Sweden	3	1	1
Singapore	3	4	2
Turkey	1	2	1
Ukraine	1	4	1
Nordic Patent Institute		**2**	**1**
Visegrad Patent Institute		2	1
Total	**63**	**114**	**60**

Note: Data for 2020 may be incomplete.

Source: WIPO Statistics Database, March 2021.

International Preliminary Examining Authorities

The number of international preliminary reports on patentability issued in 2020 dropped by 7%.

C25. Distribution of international preliminary reports on patentability by International Preliminary Examining Authority, 2018–2020

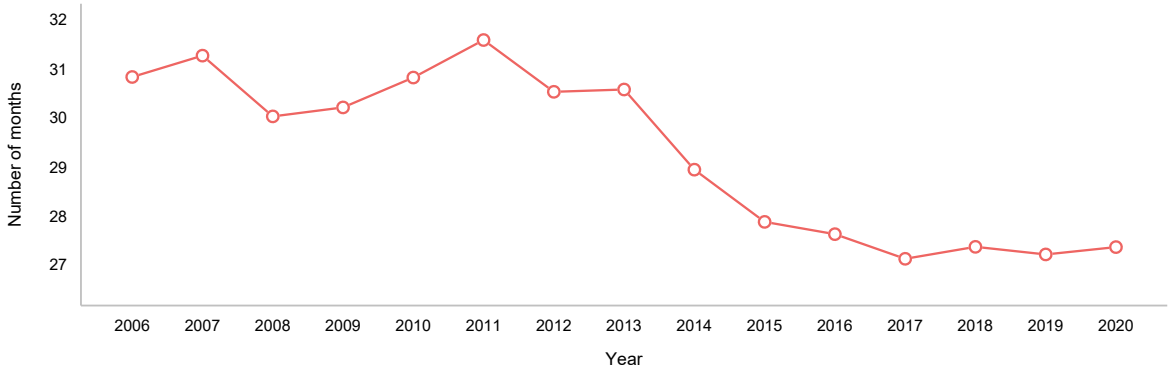
International Preliminary Examining Authority	Year			2020 share (%)	Change from 2019 (%)
	2018	2019	2020		
Australia	590	530	484	4.8	–8.7
Austria	3	7	8	0.1	14.3
Brazil	66	61	72	0.7	18.0
Canada	172	168	172	1.7	2.4
Chile	16	12	10	0.1	–16.7
China	397	471	419	4.1	–11.0
Egypt	2	3	6	0.1	100.0
European Patent Office	7,700	6,045	5,448	53.7	–9.9
Finland	66	55	63	0.6	14.5
India	41	89	67	0.7	–24.7
Israel	68	88	77	0.8	–12.5
Japan	2,128	1,945	1,817	17.9	–6.6
Nordic Patent Institute	36	27	37	0.4	37.0
Republic of Korea	135	130	106	1.0	–18.5
Russian Federation	50	57	36	0.4	–36.8
Singapore	111	93	91	0.9	–2.2
Spain	41	37	62	0.6	67.6
Sweden	127	88	77	0.8	–12.5
Turkey	4	18	44	0.4	144.4
Ukraine	7	7	8	0.1	14.3
U.S.	990	971	1,036	10.2	6.7
Visegrad Patent Institute	6	5	5	0.0	0.0
Total	**12,756**	**10,907**	**10,145**	**100.0**	**–7.0**

Note: Data for 2020 may be incomplete.

Source: WIPO Statistics Database, March 2021.

The average timeliness in transmitting international preliminary reports on patentability to the International Bureau was of 27.4 months in 2020.

C26. Average timeliness in transmitting international preliminary reports on patentability to the International Bureau, 2006–2020

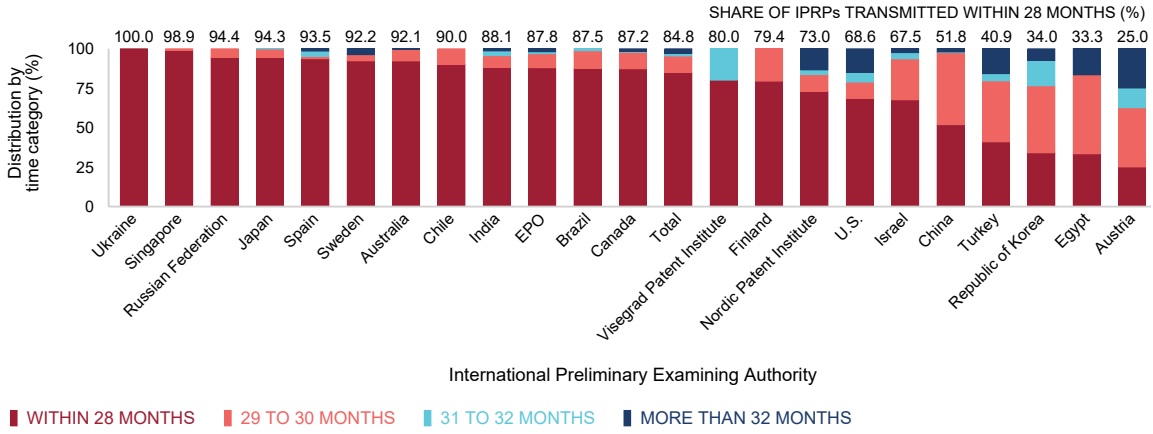


Note: Timeliness is calculated as the time elapsed between the priority date and the date on which the International Bureau received the international preliminary report on patentability (IPRP) from the International Preliminary Examining Authority (IPEA).

Source: WIPO Statistics Database, March 2021.

Eight offices transmitted 90% or more of international preliminary reports on patentability to the International Bureau within 28 months of the priority date.

C27. Timeliness in transmitting international preliminary reports on patentability to the International Bureau by International Preliminary Examining Authority, 2020



Note: This figure presents the same timeliness information for 2020 as that presented in figure C26, but breaks it down by International Preliminary Examining Authority (IPEA) and time category. Timeliness is calculated as the time elapsed between the priority date and the date when the International Bureau received the international preliminary report on patentability (IPRP) from the IPEA. EPO is the European Patent Office.

Source: WIPO Statistics Database, March 2021.

PCT-Patent Prosecution Highway pilots

The European Patent Office was the office of earlier examination for nearly half of the 1,404 PCT-Patent Prosecution Highway (PPH) requests received by China in 2020.

C28. Distribution of PCT-PPH requests by international authority and office of PCT national phase entry, 2020

	Office of earlier examination													
Office of later examination	Japan	EPO	U.S.	China	Republic of Korea	Canada	Israel	Australia	Sweden	Russian Federation	Singapore	Spain	Others	Total
Japan	1,336	418	103	87	36	10	4	8	6	5	4	0	3	2,020
China	435	692	136	0	73	19	16	0	16	9	5	0	3	1,404
Republic of Korea	207	183	83	35	31	5	3	3	1	1	1	0	10	563
EPO	208	0	148	90	29	32	13	4	0	5	2	0	0	531
Canada	50	153	96	48	21	109	9	6	2	5	1	1	3	504
Australia	30	121	121	0	16	8	6	0	0	2	4	0	1	309
Philippines	105	8	117	0	10	0	0	0	0	0	0	0	0	240
Russian Federation	35	90	21	50	11	0	0	0	3	2	0	0	0	212
Malaysia	161	26	0	23	0	0	0	0	0	0	0	0	0	210
Israel	13	78	39	4	7	1	36	0	2	0	0	0	0	180
Mexico	30	51	13	14	0	2	0	0	0	0	0	9	0	119
Colombia	2	19	44	0	0	1	2	5	2	1	0	0	0	76
U.K.	16	0	33	7	0	1	1	2	0	1	0	0	0	61
Singapore	2	8	6	26	2	1	0	0	0	0	0	0	0	45
Eurasian Patent Organization	6	21	0	0	0	0	0	0	0	0	0	0	0	27
New Zealand	2	0	6	0	0	1	0	11	1	0	2	0	1	24
Norway	3	0	6	0	0	1	0	1	0	0	0	0	1	12
Others	2	0	3	1	0	0	0	0	0	0	0	0	2	8
Total	**2,643**	**1,868**	**975**	**385**	**236**	**191**	**90**	**40**	**33**	**31**	**19**	**10**	**24**	**6,545**

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

Source: WIPO, based on data from the Japan Patent Office, March 2021.

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 first established, the PCT System comprised 18 members. By the end of 2020, it comprised 153 Contracting States, as shown on the map below. A table listing all PCT Contracting States is provided at the end of this review.

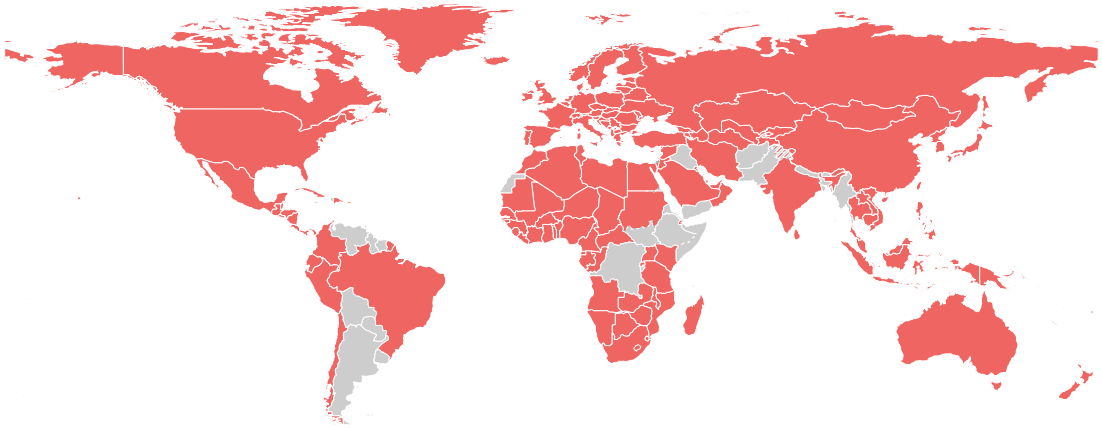
Advantages of the Patent Cooperation Treaty

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

Unlike the Paris Convention route, applicants can delay examination procedures at national patent offices, as well as the payment of associated legal fees and translation costs. By deferring national and regional procedures, applicants gain time to make decisions on the potential commercialization of their invention and the markets in which to seek patent protection. The reports produced by the international authorities that applicants receive during the international phase – about relevant prior art and the potential patentability of their inventions – help them make well-informed decisions.

In addition, the PCT System is intended to reduce unnecessary duplication among patent offices and to support work sharing between these offices. Under the PCT System, an applicant must file a patent application with a receiving office (RO) and choose an International Searching Authority (ISA) to provide an international search report (ISR) and a written opinion on the potential patentability of the invention. The International Bureau (IB) of WIPO then publishes the application in PATENTSCOPE, its online database. Following receipt of the ISR and a written opinion, the applicant can choose to request a supplementary international search (SIS) by a Supplementary International Searching Authority (SISA), have an international preliminary examination (IPE) of this application undertaken by an International Preliminary Examining Authority (IPEA) or take no further action. The applicant generally has a minimum 30 months from the earliest filing (priority)

Contracting States in 2020



Source: WIPO, March 2021.

date to decide whether to enter the national phase in the countries or regions in which protection is sought.

International phase

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

Filing applications

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

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

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

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

International search

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

Supplementary international search

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

International preliminary examination

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

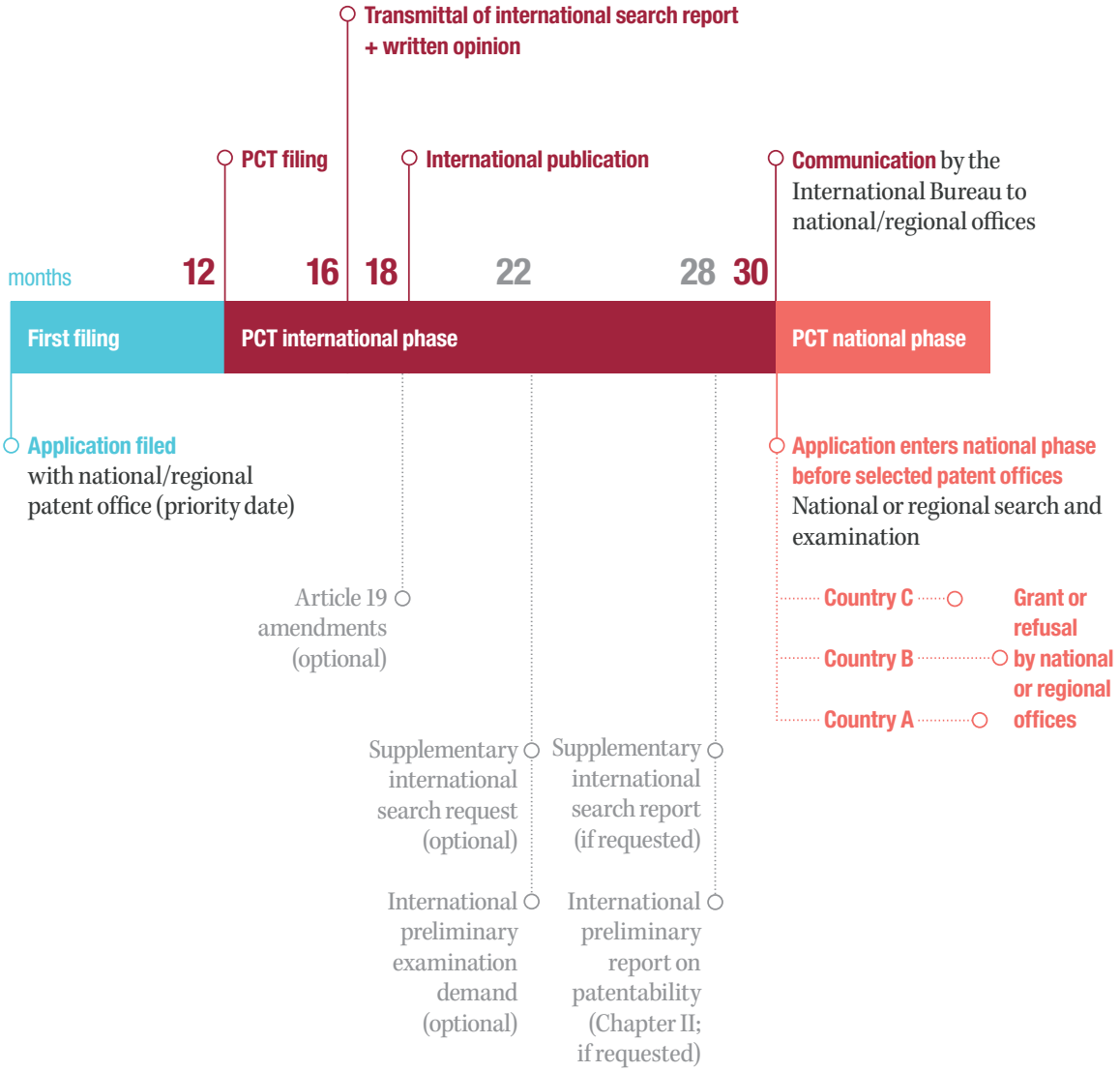
National phase

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

Patent Prosecution Highway

The PCT-Patent Prosecution Highway (PCT-PPH) pilots comprise bilateral agreements between patent offices that enable applicants to request accelerated processing of national phase applications. Under these agreements, an applicant receiving a written opinion or an IPRP indicating that at least one claim in the PCT application has novelty, an inventive step and industrial applicability, may request that other participating patent offices take up the processing of that application out of turn. An applicant may request the PCT-PPH procedure

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, March 2021.

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 request 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 the international phase of the PCT for 2020 are estimates. For top filing countries, estimates are made using several statistical and econometric models.

Publication of PCT applications usually takes place every Thursday. The years 2014 and 2020 each had 53 Thursdays instead of 52 as in other years, affecting slightly trends in statistics based on published PCT applications.

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 2019. Data may be missing for some offices and may be incomplete for some origins. Data are available for most of the larger offices, if not all. With the 2019 data supplied to WIPO corresponding to 99.8% of the world total, only a small proportion of the total is estimated. Missing data are usually estimated using linear extrapolation and averaging adjacent data points.

Due to its minor impact on data, 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[5] and groupings by region are based on the United Nations (UN) definition of regions.[6]

The figures in this review are subject to revision. Regular updates are available at WIPO's IP Statistics Data Center and Statistical Country Profiles at: *www.wipo.int/ipstats*.

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

6 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.

Acronyms

ARIPO	African Regional Intellectual Property Organization
CNIPA	China National Intellectual Property Administration
EPO	European Patent Office
GPPH	Global Patent Prosecution Highway
IB	International Bureau of WIPO
IP	intellectual property
IPC	International Patent Classification
IPE	international preliminary examination
IPEA	International Preliminary Examining Authority
IPRP	international preliminary report on patentability
ISA	International Searching Authority
ISR	international search report
JPO	Japan Patent Office
KIPO	Korean Intellectual Property Office
LAC	Latin America and the Caribbean
NPE	national phase entry
OAPI	African Intellectual Property Organization
PCT	Patent Cooperation Treaty
PCT-PPH	Patent Cooperation Treaty-Patent Prosecution Highway
PDF	portable document format
PRO	public research organization
RO	receiving office
SIS	supplementary international search
SISA	Supplementary International Searching Authority (authority specified for supplementary search)
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 regulating 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 regulating the optional international preliminary examination (IPE) procedure.

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

Designated state: A Contracting State in which protection for an 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 at an IP office of another state or jurisdiction. For example, an application filed by an applicant domiciled in Lithuania at the Japan Patent Office (JPO) is considered an application abroad from the perspective of Lithuania. 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 point of view of the JPO.

Foreign-oriented patent families: A patent family is a set of interrelated patent applications filed at 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 at an office other than 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 handles certain processing tasks for all PCT applications filed at all receiving offices worldwide. It also acts as a receiving office for PCT applications from all Contracting States.

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

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

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

1. Filing of a PCT application by an 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 a SISA;
5. Optional establishment of an IPRP by an IPEA.

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

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

International preliminary report on patentability (Chapter II of the PCT) (IPRP): A preliminary, non-binding opinion, established by an IPEA at the request of an 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 at 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 Senegal 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 an 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, enabling them to appropriate 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 during what is called the "national phase under the PCT."

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

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

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

PCT System: The PCT, an international treaty administered by WIPO, facilitates the acquisition of patent rights in a large number of jurisdictions. The PCT System simplifies the process of multiple national patent filings by reducing the requirement to file a separate application in each jurisdiction. However, the decision on whether to grant patent rights remains in the hands of national and regional patent offices, and patent rights remain limited to the jurisdiction of the patent-granting authority. The PCT application process starts with the international phase, during which an international search and, possibly, a preliminary examination, are performed, and concludes with the national phase, during which a national or regional patent office decides on the patentability of an invention according to national law.

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 of an International Searching Authority, the written opinion of an International Preliminary Examining Authority or the international preliminary report on patentability.

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

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

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

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

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

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

Supplementary International Searching Authority (SISA): See "Authority specified for supplementary international search."

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

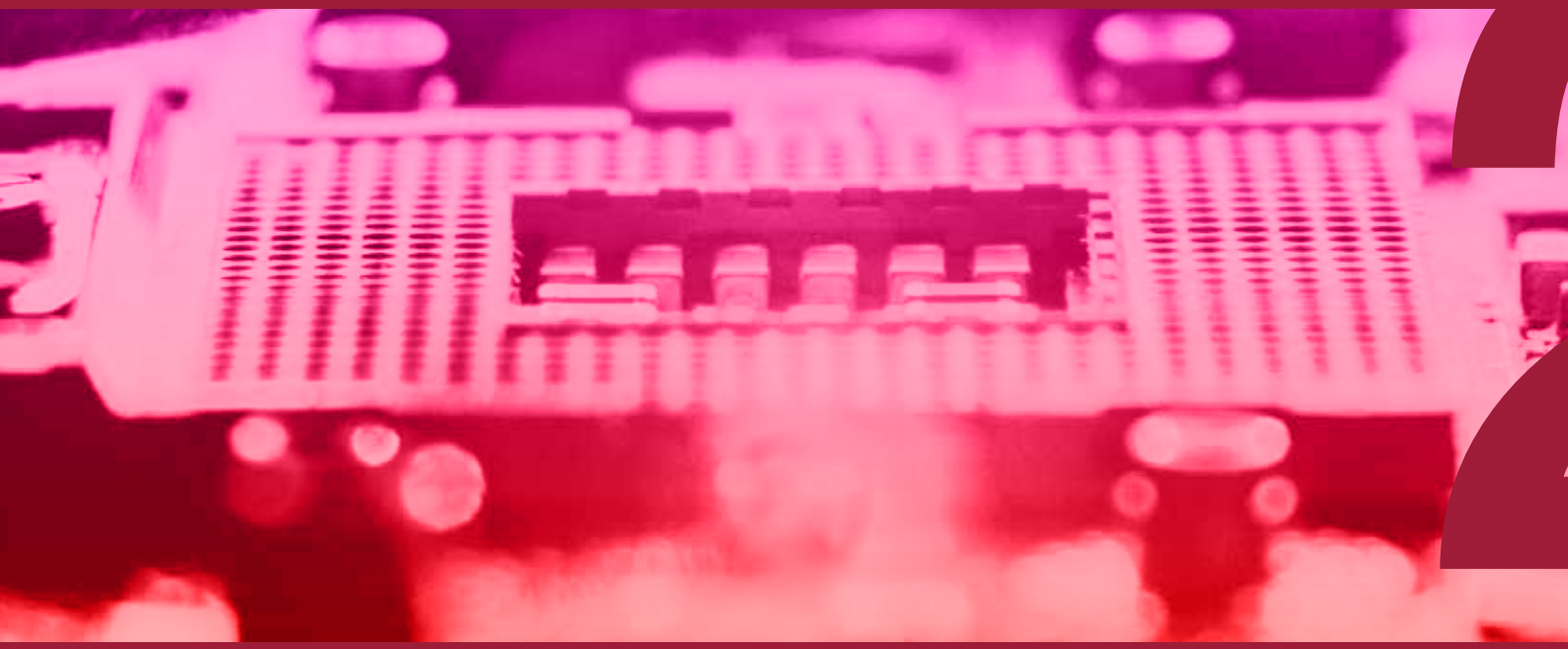
Written opinion of the ISA (WOSA): For every PCT application filed on or after January 1, 2004, an ISA establishes, at the same time that it establishes the ISR, a preliminary and non-binding written opinion on whether the claimed invention appears to be novel, to involve an inventive step and to be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

PCT Contracting States

In 2020, Samoa became bound by the PCT, bringing the total number of Contracting States to 153.

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

Source: WIPO, March 2021.



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