

Patents

Highlights

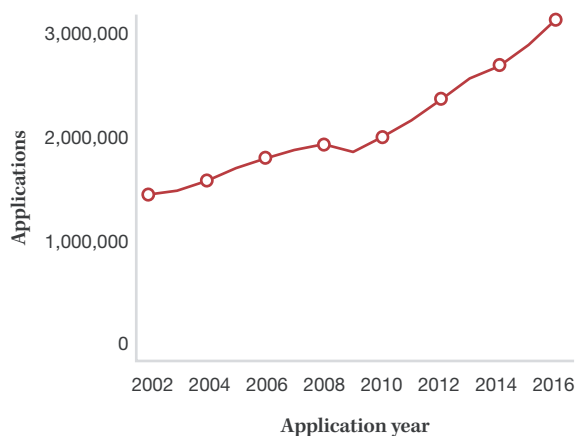
More than 3 million patent applications were filed worldwide in 2016 – a record number

For the first time, more than 3 million patent applications were filed worldwide in a single year, up 8.3% from 2015 (figure 1). Driving such strong growth was an exceptional number of filings in China, which received about 236,600 or 98% of the additional filings. The next largest contributor was the United States of America (U.S.) with around 16,200 additional filings. Following a modest increase of 4.5% in 2014, the growth rate picked up in both 2015 (+7.7%) and 2016 (+8.3%), aligning with the annual growth rates of between 8% and 9% observed between 2011 and 2013. But when patent applications in China are excluded, applications filed in the rest of the world grew by only 0.2% in 2016.

China received more applications than the combined total for the EPO, Japan, the Republic of Korea and the U.S.

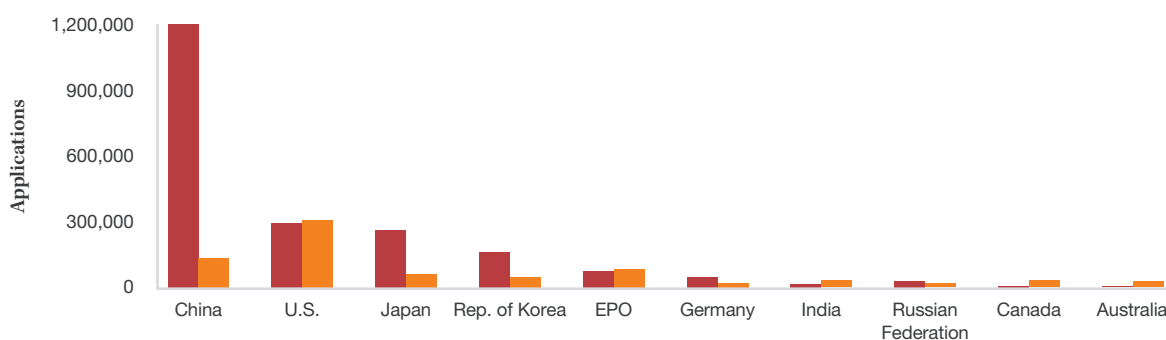
The State Intellectual Property Office of the People's Republic of China (SIPO) received 1.3 million patent applications in 2016 – more than the combined total for the United States Patent and Trademark Office (USPTO; 605,571), the Japan Patent Office (JPO; 318,381), the Korean Intellectual Property Office (KIPO; 208,830) and the European Patent Office (EPO; 159,358). Together, these top five offices accounted for 84% of the world total in 2016, which is nine percentage points higher than their combined share 10 years earlier. The list of top 10 offices in 2016 is almost the same as for 2015, except that Brazil was replaced by Australia as the tenth highest ranked office in 2016 (figure 2). Brazil moved down one position as a result of a 7.3% annual decline in filings.

Figure 1
Patent applications worldwide



Source: Standard figure A1.

Figure 2
Patent applications at the top 10 offices, 2016



■ RESIDENT ■ NON-RESIDENT

Source: Standard figure A8.

Of the top 20 patent offices, 12 were located in high-income countries, six in upper middle-income countries and two in lower middle-income countries. In terms of geographical distribution, eight offices were located in Asia, six in Europe, two in North America, two in Latin America and the Caribbean (LAC), and one each in Africa and Oceania.

Eight of the top 20 offices received more applications in 2016 than in 2015, while 12 received fewer. South Africa (+29.5%), China (+21.5%) and China Hong Kong (SAR; +15.4%) all exhibited double-digit growth. The strong growth in filings in China Hong Kong (SAR) and South Africa followed small declines at those offices the previous year, while China has had double-digit growth each year since 2010. The increases in applications filed in China and South Africa were both driven mainly by growth in resident applications, whereas growth in China Hong Kong (SAR) came primarily from an increase in non-resident applications. Another office that showed notable growth in 2016 was that of the Islamic Republic of Iran (+9.5%).

Of the 12 offices among the top 20 that received fewer applications in 2016 than in 2015, the Russian Federation (-8.6%), Brazil (-7.3%), Indonesia (-6.7%), and Canada (-6%) reported the most substantial declines. Applications in Brazil fell for a third consecutive year. Following strong growth in applications received in 2015, Canada, Indonesia and the Russian

Federation all saw decreases in 2016. A decline in resident applications was the primary reason for the decrease in total applications for the Russian Federation, whereas a decline in non-resident applications was the main driver for Canada and Brazil.

Among the top five offices, the JPO (-0.1%) saw a small drop in applications, continuing a trend that started in 2006 and mainly reflects a persistent fall in resident applications. The number of resident applications filed at the JPO has declined from around 347,000 in 2006 to around 260,200 in 2016. Following two consecutive years of growth, the EPO's filings declined by 0.4% in 2016 due to a drop in non-resident applications. KIPO has enjoyed solid growth in applications received each year since 2010, but filings there declined by 2.4% in 2016 primarily due to a decline in resident applications. SIPO, however, continues to experience very strong growth in applications received and retains top spot. The USPTO has seen seven consecutive years of growth.

Among offices of low- and middle-income countries, Morocco (+27.6%), the Republic of Moldova (+25%), Sri Lanka (+19.1%) and Turkey (+17.2%) recorded particularly rapid growth in 2016. Growth in resident applications was the main driver of total growth in the Republic of Moldova, Sri Lanka and Turkey, while non-resident applications were the main driver in

Morocco. The three regional offices – the African Intellectual Property Organization (OAPI), the African Regional Intellectual Property Organization (ARIPO) and the Eurasian Patent Organization (EAPO) – have seen applications fall for two successive years, mainly due to a drop in resident applications. At most offices of low- and middle-income countries, the bulk of applications is filed by non-residents. As a result, overall increases or decreases in applications received by these offices are determined mainly by the filing behavior of non-resident applicants.

Asia became the first region to receive 2 million applications in a single year

Offices located in Asia received just over 2 million applications in 2016, representing a 13% increase on 2015. Asia's share of all applications filed worldwide increased from 49.7% in 2006 to 64.6% in 2016, primarily driven by strong growth in filings in China (figure 3), which accounted for around two-thirds of all applications filed in the region. Excluding China, the share of the rest of Asia in the world total actually decreased from around 37.9% to 21.8% over the same period, mainly due to a decrease in applications filed in Japan.

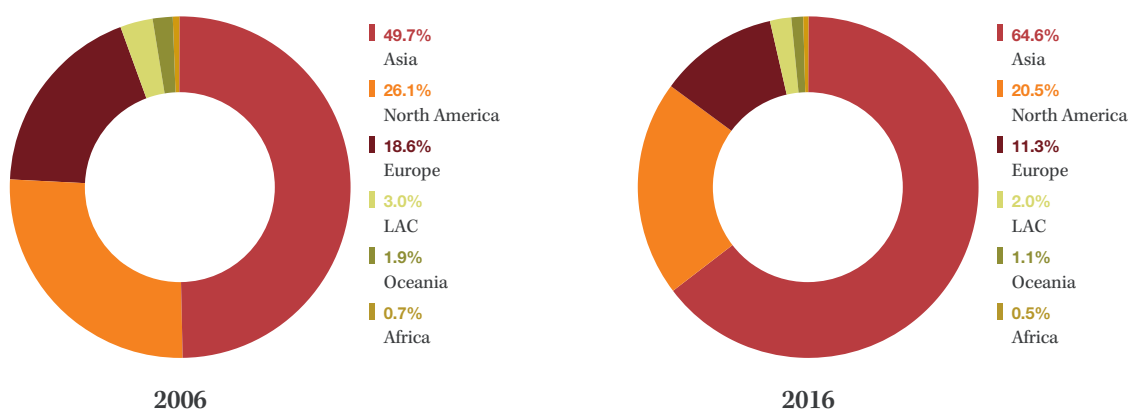
Offices in North America accounted for one-fifth of the 2016 world total, while those in Europe accounted

for just over one-tenth. The combined share for Africa, Latin America and the Caribbean (LAC) and Oceania was 3.6%. The shares of all world regions except Asia have gradually declined over the past decade due to the rapid growth in applications filed in China.

Offices of high-income countries received almost half of all applications filed worldwide in 2016 – considerably lower than their 78.3% share in 2006 – while the share for offices of upper middle-income countries rose from 18.3% in 2006 to 47.6% in 2016 (figure 4). This shift in distribution of applications toward the upper middle-income group is largely explained by the strong growth in filings in China and the decline in Japan. Applications filed in China increased from just over 210,000 in 2006 to around 1.3 million in 2016, whereas those filed in Japan decreased from around 408,000 to around 318,000 over the same period. China accounted for 90% of the upper middle-income group total in 2016; excluding China, the remaining upper middle-income countries received just 4.8% of total worldwide filings.

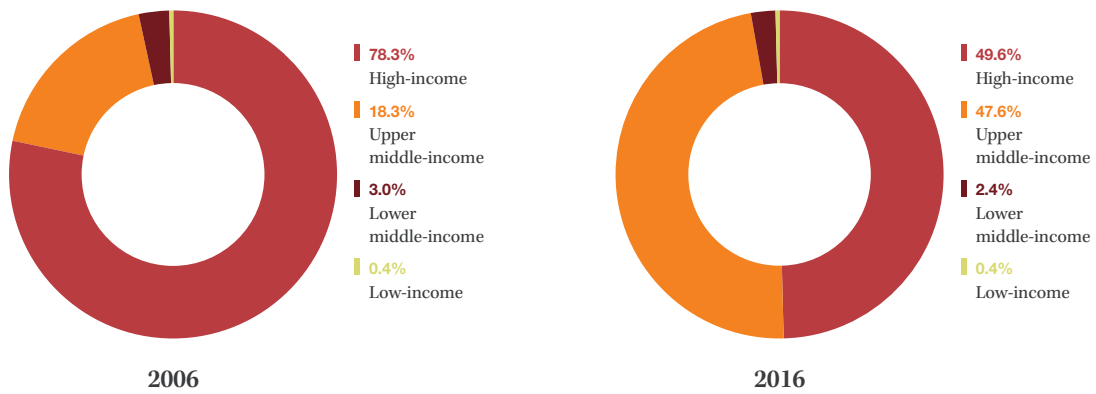
The combined share of the low- and lower middle-income groups was 2.8% in 2016, which is slightly below the 3.4% observed in 2006. However, the number of applications received by offices of these two income groups rose from 61,200 to 86,000 during the same period.

Figure 3
Patent applications by region



Source: Standard figure A6.

Figure 4
Patent applications by income group

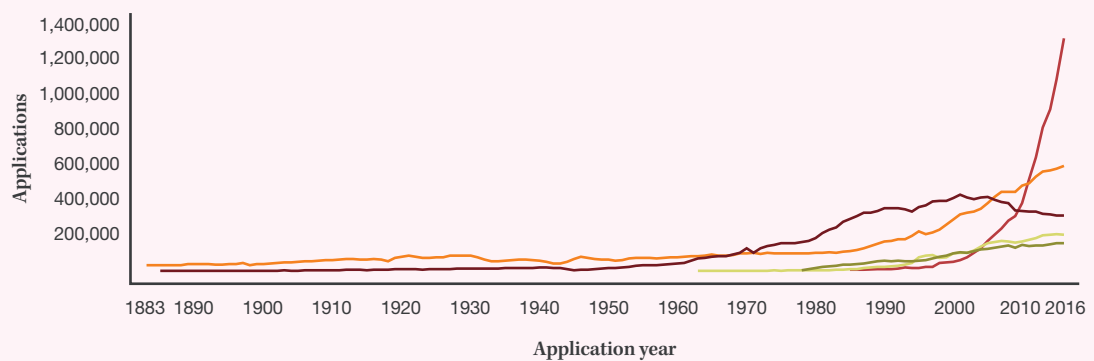


Source: Standard figure A5.

Patent filings since 1883

From 1883 to 1963, the patent office of the U.S. was the leading office for world filings. Application numbers in Japan and the U.S. were stable until the early 1970s, when Japan began to see rapid growth, a pattern also observed for the U.S. from the 1980s onward. Among the top five offices, Japan surpassed the U.S. in 1968 and maintained the top position until 2005. Since the early 2000s, however, the number of applications filed in Japan has trended downward. Both the EPO and the Republic of Korea have seen increases each year since the early 1980s, as has China since 1995. China surpassed the EPO and the Republic of Korea in 2005, Japan in 2010 and the U.S. in 2011 – and it now receives the largest number of applications worldwide. There has been a gradual upward trend in the combined share of the top five offices in the world total – from 74% in 2006 to 84% in 2016.

Trend in patent applications for the top five offices



■ CHINA ■ U.S. ■ JAPAN ■ REP. OF KOREA ■ EPO

Note: The IP office of the Soviet Union, not represented in this figure, was the leading office in the world in terms of filings from 1964 to 1969. Like Japan and the U.S., the office of the Soviet Union saw stable application numbers until the early 1960s, after which it recorded rapid growth in applications filed.

Source: Standard figure A7.

Equivalent application class count

Applications at regional intellectual property (IP) offices are equivalent to multiple applications in the countries that are members of the organizations establishing those offices. In particular, to calculate the number of equivalent applications for the African Intellectual Property Organization (OAPI), the Eurasian Patent Organization (EAPO) and the Patent Office of the Cooperation Council for the Arab States of the Gulf (GCC Patent Office), each application is multiplied by the corresponding number of member states. For African Regional Intellectual Property Organization (ARIPO) and the European Patent Office (EPO) data, each application is counted as one application abroad if the applicant does not reside in a member state or as one resident application and one application abroad if the applicant resides in a member state. The equivalent application concept is used for reporting data by origin.

Residents of the U.S. filed more than four times as many patent applications abroad as Chinese residents

Applications received by offices from resident and non-resident applicants are referred to as office data, whereas applications filed by applicants at a national/regional office (resident applications) or at foreign offices (applications abroad) are referred to as origin data. Here, patent statistics based on the origin of residence of the first named applicant are reported in order to complement the picture of patent activity worldwide.

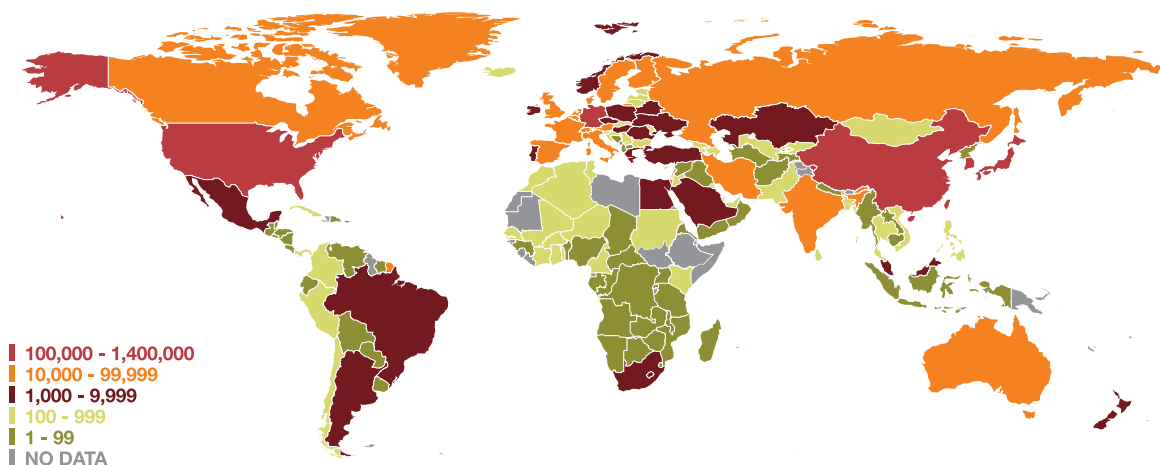
Applicants from China filed around 1.26 million equivalent patent applications in 2016 – more than the combined total for applicants from the U.S. (520,877), Japan (453,640) and the Republic of Korea (233,625)

(map 1). China has been the largest origin of patent applications since 2012, when it surpassed Japan. However, it should be noted that around 96% of all applications from China are filed in China and only 4% filed abroad. In contrast, filings abroad constitute around 43% of total applications from Japan and the U.S.

Twelve of the top 20 origins are located in Europe. Their combined total equivalent patent applications (523,605) is slightly higher than that from U.S.-based applicants. All top 20 origins, with the exception of China, India, the Islamic Republic of Iran and the Russian Federation, are high-income countries.

Among the top 20 origins, China (+24.4%), India (+7.7%), Belgium (+4.7%) and Israel (+4.3%) recorded the fastest growth in 2016. Almost all the growth in

Map 1 Equivalent patent applications by origin, 2016



Source: Standard map A17.

filings from applicants from China was driven by increases in resident filings – of 246,700 additional filings by Chinese applicants, 236,700 were filed in China and only 10,000 abroad. For both India and Israel, growth in applications abroad (mainly in the U.S.) was the main source of overall growth.

A number of origins not among the top 20, such as South Africa (+96.9%), the United Arab Emirates (+38.8%), Colombia (+34.6%), Saudi Arabia (+33.8%) and Argentina (+28.5%), recorded double-digit growth. The overall growth in Argentina, Colombia, Saudi Arabia and South Africa was due to increases in resident applications, while growth in equivalent applications abroad drove overall growth in the United Arab Emirates.

Filing abroad reflects the globalization of intellectual property (IP) protection and a desire to commercialize technology in foreign markets. The costs of filing abroad can be substantial, so the patents for which applicants seek international protection are likely to confer higher values. Among the top 20 origins, applications filed abroad made up a large share of the totals for Canada, Israel and Switzerland. However, in absolute numbers, the U.S. had the most with 215,918, followed by Japan (191,819) and Germany (75,378). Germany saw growth in applications abroad, whereas these decreased for both Japan and the U.S.

Applicants residing in China, while ranking first in terms of resident applications, filed considerably fewer applications abroad (51,522). However, applications filed abroad from China have increased markedly in recent years – from around 7,000 in 2006 to the 51,522 filed in 2016. Among large middle-income origins, India (47.5%), Mexico (45.2%), Malaysia (42.5%), South Africa (28.9%) and Brazil (27.3%) have a high proportion of applications abroad as a share of total applications. The bulk of filings abroad from these origins were destined for the USPTO.

Among other factors, technological specialization, proximity and market size influence cross-border applications. U.S. applicants accounted for more than half of all non-resident applications filed in Norway (72.4%), Turkey (57.4%), Canada (52.8%), Mexico (51.3%) and Australia (50.1%). At many offices, applicants from Germany, Japan or the U.S. accounted for the highest non-resident shares. For example, applicants from Germany had the highest share of non-resident filings in Italy (33.2%), Switzerland (31.4%) and France (26.3%). Japanese applicants accounted

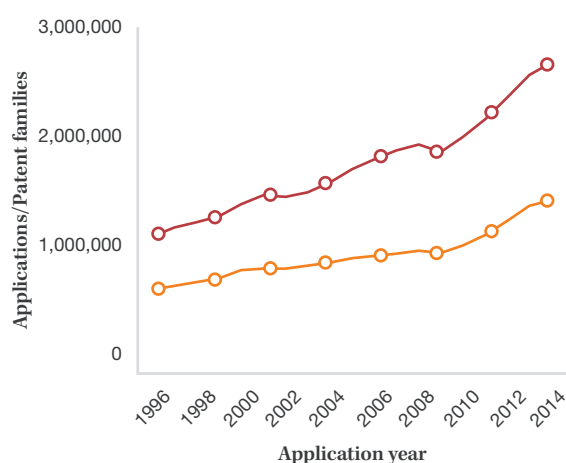
for a high share of the total in Germany (35.2%), the Republic of Korea (32.5%) and Indonesia (29.4%).

More than 1.4 million patent applications for unique inventions were filed worldwide in 2014

Patent applicants traditionally file at their national offices and then subsequently abroad. This means some inventions are recorded more than once. To take this into account, WIPO has developed indicators for patent families, and the trend in patent families mirrors that for patent applications. The total number of patent families worldwide increased from around 1 million in 2010 to just over 1.42 million in 2014. Applicants from China (47.3%), Japan (16.7%) and the U.S. (11.9%) accounted for three-quarters of all patent families in 2014.

Over the past 20 years, the ratio of families to applications has remained more or less stable at around 0.52. This means that just over half of all applications are initial filings and the others repetitive filings, mostly at foreign offices (figure 5). Belgium, Denmark, Norway, Switzerland and Turkey have low family-to-application ratios – around 0.17 for the period from 2012 to 2014 – indicating substantial multiplication due to high numbers of cross-border filings. Conversely, China and the Russian Federation have high ratios of around 0.8, indicating less duplication due to low numbers of cross-border filings.

Figure 5
Patent applications and patent families worldwide



■ APPLICATIONS ■ PATENT FAMILIES

Source: Standard figures A1 and A23.

Patent families

A patent family is a set of interrelated patent applications filed in one or more offices to protect the same invention. The patent applications in a family are interlinked by one or more of: priority claim, Patent Cooperation Treaty (PCT) national phase entry, continuation, continuation-in part, internal priority and addition or division. A special subset comprises foreign-oriented patent families, that is, those patent families that have at least one filing office different from the office of the applicant's country of origin. Some foreign-related patent families include only one filing office because applicants may choose to file only with a foreign office. For example, if a Canadian applicant files a patent application directly with the USPTO without having previously filed with the patent office of Canada, that patent family will constitute a foreign-oriented patent family with just one office.

The size of patent families (i.e., the number of offices) reflects their geographical coverage. Around 81% of patent families created worldwide between 2012 and 2014 were filed in a single office. There is considerable variation among top origins, however. For example, around one-third of all patent families originating from the Netherlands, Sweden and Switzerland cover a single office, whereas single-office patent families account for 97% of all families for China and the Russian Federation. Focusing exclusively on foreign-oriented patent families shows that on average such families cover three foreign offices. Among the top origins, applicants from Switzerland tend to cover four offices when filing abroad, whereas those from Canada cover two on average.

The top 10 patent applicants worldwide are Asia-based multinationals

Canon Inc. of Japan was the top applicant for the period from 2011 to 2014, with 30,476 patent families worldwide. It was followed by Samsung Electronics (26,609) of the Republic of Korea and Japanese companies Panasonic (22,899), Toshiba (22,627) and Toyota Jidosha (22,190). The top 10 applicants are all located in Asia. The highest-ranking non-Asian applicant was Robert Bosch of Germany (16,582) at number 12.

More than a quarter (26.9%) of Canon's patent families during this period related to optics technology, while computer technology accounted for the highest share of families belonging to Samsung Electronics (26%) and Toshiba (16.1%). For Panasonic, electrical machinery (22.7%) was the most important technology field. Transport (24.2%) saw the highest share of all patents for Toyota Jidosha.

Applicants from just nine origins make up the top 100 list for the period from 2011 to 2014. Japan (40) had the highest number of applicants in this list, followed by China (26), the Republic of Korea (15),

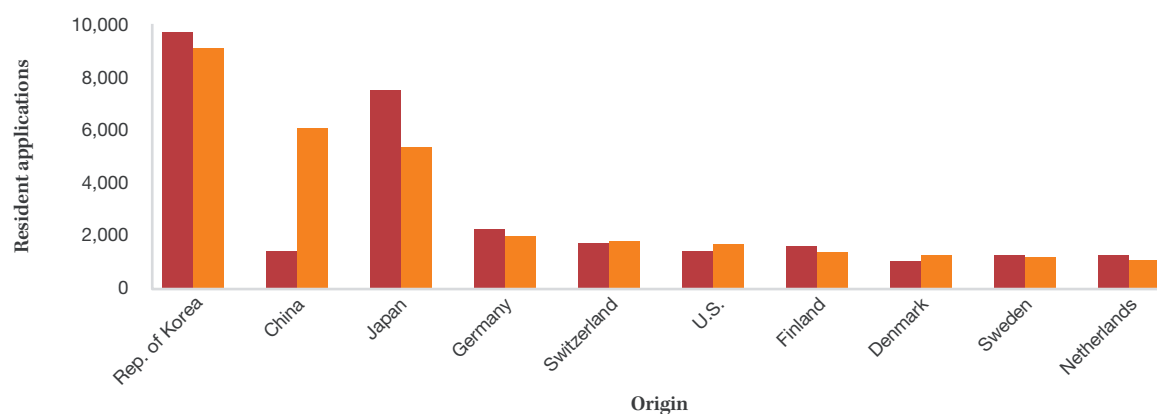
the U.S. (9), Germany (6) and one each from France, the Netherlands, Sweden and Taiwan, Province of China. The top 100 list mainly comprises multinational companies. However, 14 Chinese universities also feature. Combined, these 14 applicants accounted for 9% of all patent families held by the top 100 applicants.

The Republic of Korea filed the highest number of patents per unit of GDP

Variations in patenting activity across countries reflect differences in their levels of economic growth and development. It is therefore informative to examine resident patent activity with regard to population, R&D spending, GDP and other variables. These are commonly referred to as "patent activity intensity" indicators.

Since 2004, the Republic of Korea has had the highest number of patent applications per unit of USD 100 billion GDP. Its ratio of resident applications to GDP is considerably higher than those of China and Japan, ranked second and third, respectively (figure 6). For the first time since 2010, the top five ranking has changed. After surpassing Germany in 2010, China has moved ahead of Japan to rank second. The gap between China and the Republic of Korea has narrowed rapidly. Reflecting strong growth in resident applications, China's resident applications per unit of GDP increased from 1,455 in 2006 to 6,069 in 2016 – the fastest growth among the top origins. Germany and Switzerland are ranked fourth and fifth, respectively. Between 2006 and 2016, Germany's resident patent applications per GDP unit fell from 2,260 to 2,019, while those of Switzerland rose from 1,768 to 1,841.

The list of the top 20 origins is predominantly comprised of high-income countries. However, three middle-income countries – China, the Russian Federation and Ukraine – also feature. The rank of the top 20 origins has been stable for the past 10 years, with little movement in country rankings except that of China.

Figure 6**Resident patent applications per USD 100 billion GDP for the top 10 origins**

■ 2006 ■ 2016

Source: Standard figure A41.

Despite sizable increases in their resident patent application to GDP ratios between 2006 and 2016, large middle-income countries such as Brazil, India, Malaysia and Mexico exhibit low numbers of resident applications per unit of GDP. Brazil, with 406 resident applications per unit of GDP, is the highest-placed origin in Latin America and the Caribbean, while South Africa ranks highest in Africa with 179.

The profile of resident applications per million population is similar to that adjusted by GDP, but shows some subtle differences. The Republic of Korea retains its lead. However, Japan ranks second in this regard. China ranks much lower – sixth, after Germany – due to its high population. Small high-income countries of origin such as Finland, Luxembourg, Norway and Singapore rank high when resident patent applications are adjusted by population or GDP. Among the large middle-income countries of origin, India and Mexico each filed 10 resident applications per million population, despite India's number of resident applications being 10 times higher than that of Mexico. Similarly, Chile has a higher ratio of resident applications to population than Argentina, even though Argentina has twice as many resident applications as Chile.

Computer technology remains the most frequently featured technology field in applications

In 2015 – the latest year for which complete data are available due to the delay between application and publication – computer technology was the most frequently featured technology in published patent applications worldwide with around 187,000 published applications. It was followed by electrical machinery (176,400), measurement (124,000), digital communication (123,300) and medical technology (110,100). These five fields accounted for 28.6% of all published applications worldwide.

Among the top 20 technology fields, food chemistry (+10.9%), digital communication (+8.7%), materials metallurgy (+8.1%) and basic materials chemistry (+7.7%) witnessed the fastest average annual growth between 2005 and 2015. Food chemistry rose from around 22,400 published applications in 2005 to around 63,200 in 2015, while digital communication increased from 53,600 to 123,300 over the same period. In contrast, there was a slight decline in published patent applications for optics (-0.9%), audio-visual technology (-1.5%) and telecommunications (-1.8%).

Among the top 10 origins in the period from 2013 to 2015, China, Japan and the Republic of Korea filed most heavily in electrical machinery; France and Germany in transport; Switzerland and the United Kingdom (U.K.) in pharmaceuticals; the Netherlands in medical technology; the Russian Federation in food chemistry; and the U.S. in computer technology. The combined share of the top three technologies for the top 10 origins ranged from 15.4% for the U.K. to 27.2% for the U.S.

Among the large middle-income countries in the period from 2013 to 2015, applicants residing in India filed most heavily in computer technology (17.4% of total published applications); Turkey (12.7%) and Mexico (11%) in pharmaceuticals; and South Africa in civil engineering (8.3%).

The top technology field – computer technology – accounted for a high share of published patent applications originating from Barbados (16.2%), Bermuda (14.5%), Israel (13%), China Hong Kong SAR (10.8%) and Singapore (10.7%) for the period from 2013 to 2015.

Patents granted by the EPO grew by 40% in 2016 – the fastest growth since 1983

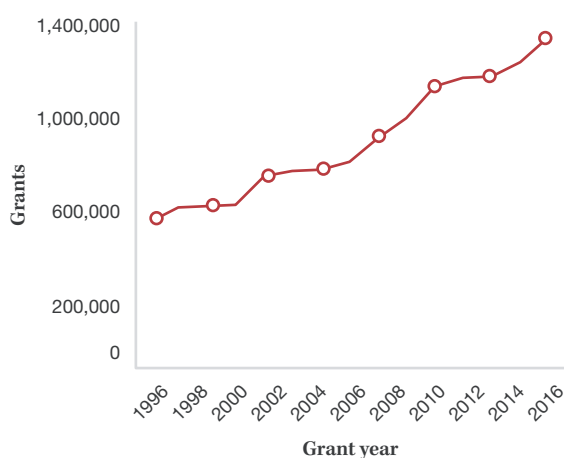
Offices carry out a formal and substantive examination to decide whether or not to issue a patent. The procedure for granting a patent varies across offices, and differences in the numbers of granted patents among offices depend on factors such as examination capacity and procedural delays. For this reason, application data for a given year should not be compared with grant data from the same year.

In 2016, an estimated 1.35 million patents were granted worldwide, up 8.9% on 2015 (figure 7). Growth in 2016 was the fastest since 2012. This was due mainly to the increase at both the EPO and SIPO. The EPO granted 27,500 more patents in 2016 than in 2015, while SIPO issued 48,900 additional patents.

SIPO granted 404,208 patents in 2016, followed by the USPTO (303,049), the JPO (203,087), KIPO (108,875)

and the EPO (95,956). These five offices issued more than 1.1 million patents between them – 83% of the world total. Patents granted by the EPO grew by 40.2% in 2016 – the fastest growth since 1983. SIPO (+12.5%), the JPO (+7.3%), KIPO (+6.9%) and the USPTO (+1.6%) also issued more patents in 2016 than in 2015.

Figure 7
Patent grants worldwide



Source: Standard figure A3.

Among the top 20 offices, the Philippines saw the fastest growth (+82.1%), with grants increasing from 2,200 in 2015 to 4,006 in 2016. This reflected a substantial increase in the number of non-resident grants. India (+37%), Brazil (+23%) and Canada (+19%) were the other top 20 offices to exhibit double-digit growth in 2016. Again, growth in non-resident grants drove overall growth for these offices.

Beyond the top 20 list, Indonesia granted 3,674 patents in 2016, almost double the number for the previous year. The Islamic Republic of Iran and Malaysia each issued around 3,300 patents, while around 1,800 patents each were granted by Argentina and Turkey. All these offices saw strong annual growth in patent grants.

Asia's share of worldwide patent grants was 57% in 2016 – considerably below its share of applications (64.6%). However, its share of grants has increased

from 48.8% in 2006 to 57% in 2016. Offices located in North America accounted for a quarter of patent grants worldwide in 2016, which is similar to the region's 2006 share. Offices in Europe accounted for 14.5% of the 2016 world total, while the combined share for Africa, Latin America and the Caribbean and Oceania was 4.1%.

Around 2.8 million patents are in force in the U.S.

Patent rights generally last for up to 20 years from the date the application was filed. The estimated number of patents in force worldwide rose from 7.8 million in 2009 to 11.8 million in 2016.

The USPTO recorded the most, with 2.8 million patents in force in 2016, followed by the JPO (2 million), SIPO (1.8 million) and KIPO (1 million). Just these four jurisdictions cover around 63% of all patents in force worldwide. The top 20 list includes 16 offices from high-income countries and four from upper middle-income countries, namely China, Mexico, the Russian Federation and South Africa. Offices of other large middle-income countries with substantial numbers of patents in force are Turkey (63,500), India (50,000), Malaysia (25,000) and Brazil (24,000). Denmark (55,700), Singapore (48,600) and Finland (48,600) – three small high-income countries – had large numbers of patents in force in their jurisdictions.

Holders must pay maintenance/renewal fees to maintain the validity of their patents, and may opt to let a patent lapse before the end of its full term. For the 72 offices that reported their in-force data broken down by year of filing, between 40% and 43% of patents granted remained in force for at least 6 to 10 years after the filing date, and about one-fifth lasted the full 20 years.

Although patents can be maintained for 20 years, the average age of patents varied across offices. For example, the average age of all patents in force 2016 in India was 12.8 years, while in China it was 7.2 years. Along with India, Germany (11.6 years), Canada (11)

and Denmark (10.9) also have high average ages of patents in force.

The top four offices had fewer potentially pending applications in 2016 than in 2015

Patent offices must assess whether the claims in applications meet the standards of novelty, non-obviousness and industrial applicability defined in national laws. Processing patents therefore consumes time and resources.

The number of applications that were potentially pending globally fell from 5.6 million in 2009 to 5 million in 2016. This estimate is based on data from 108 offices. However, the figure would be higher if data from SIPO were available. The decline in applications pending worldwide was driven mainly by Japan, which saw potentially pending applications decline from around 1.6 million in 2009 to 0.8 million in 2016.

The USPTO had the most potentially pending applications in 2016 with 1.1 million, followed by the JPO (around 847,000) and the EPO (668,000). However, the USPTO has seen eight successive years of reduction in the number of potentially pending applications, while the JPO has reported declines each year since 2005. The EPO saw 2.3% fewer potentially pending applications, representing the first decrease since at least 2004. This was partly due to a substantial increase in the number of patent applications processed and granted in 2016. A large share of the EPO's (70%) and the JPO's (79%) potentially pending applications was awaiting request for examination. In such cases, even if these offices have resources to process and reduce the number of pending applications, they will be unable to do so until they receive a request for examination from applicants.

Among middle-income countries, Brazil had the largest number of potentially pending applications: they almost doubled, from around 123,200 in 2006 to around 243,800 in 2016. India saw a 6.1% increase in its potentially pending applications in 2016. However, 80% of the total (242,800) were awaiting request for examination.

Potentially pending applications

Potentially pending applications include all patent applications, at any stage in the process, awaiting a final decision by a patent office, including those applications for which applicants have not filed a request for examination (where applicable).

A record number of international patent applications were filed through the PCT System in 2016

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

The number of PCT applications grew by 7.2% in 2016 – the fastest increase since 2011 and the seventh consecutive year of growth. Around 233,000 PCT applications were filed in 2016. Applicants based in the U.S. filed the largest number of PCT applications with 56,590, followed by applicants from Japan (45,214), China (43,094), Germany (18,305) and the Republic of Korea (15,552).

Fourteen of the top 20 origins filed more PCT applications in 2016 than in 2015. China recorded extraordinary growth (+44.4%), while Italy (+9.4%), Israel (+9.1%), India (+8.2%) and the Netherlands (+7.9%) also saw strong increases. In contrast, for the second successive year Canada (-17.3%) saw a substantial decline in filings, linked to a declining number of applications filed by Research in Motion and Nortel.

Utility model applications worldwide increased by 28.9%

A utility model is a special form of patent right granted by a state or jurisdiction to an inventor or the inventor’s assignee for a fixed period of time. The terms and conditions for granting a utility model are slightly different from those for normal patents, including a shorter term of protection and less stringent patentability requirements.

In 2016, utility model applications increased by 28.9%, amounting to 1.55 million applications. This strong growth was primarily due to a 30.9% increase in applications filed at SIPO. In 2016, SIPO received nearly 95% of all utility model applications filed in the world – the remaining 73 offices accounted for just 5% of the world total. China (1.48 million) was followed by Germany (14,030) and the Russian Federation (11,112). Ukraine (9,584) exhibited rapid growth and surpassed

the Republic of Korea (7,764) as the fourth highest office for utility model applications.

Among the top 20 offices, the Philippines (+42.3%), Kazakhstan (+35.1%) and Indonesia (+32.2%) witnessed sharp growth in 2016 – albeit from a low base. The numbers of applications filed in Japan and the Republic of Korea have declined drastically over the past 10 years. Applications filed in Japan fell from 10,965 in 2006 to 6,480 in 2016, while those in the Republic of Korea declined from 32,908 to 7,767.

Utility model applications are rarely filed abroad: resident applications made up about 99% of all applications filed worldwide in 2016. Among the top 10 offices, resident shares varied between 95% and 99%, except in Germany (72%) and Japan (76%), which had lower resident shares.

Women’s participation rate in patent applications tends to be high in technology fields related to life sciences

The share of PCT applications with women inventors increased from 21.7% in 2002 to 29.7% in 2016. The 2016 figure is one percentage point higher than that for 2015. The total number of PCT applications with women inventors almost tripled, from around 22,600 to around 62,400, over the same period. Women’s participation rate varied across countries. Among the top 20 origins, the Republic of Korea (46.9%) and China (46.8%) were the most gender-equal. Spain (36%), the U.S. (31.5%) and France (31.5%) also had relatively high shares of PCT applications with women inventors.

Technology fields related to the life sciences have relatively high shares of women inventors in PCT applications. Biotechnology (58.3%) had the highest share, followed by pharmaceuticals (56.4%), organic fine chemistry (54.7%) and food chemistry (51%).

The women’s participation rate based on national/regional patent office application data is lower than that based on PCT application data. Among offices for which data were available, the share of resident patent applications with women inventors ranged from 11.1% at the German patent office to 38.7% at the Russian patent office in 2014. That Germany has the largest gender gap could be due in part to the fact it has a high number of patent filings in fields of technology, such as transport and mechanical engineering, for which the participation rates for women are low.

Standard figures and tables

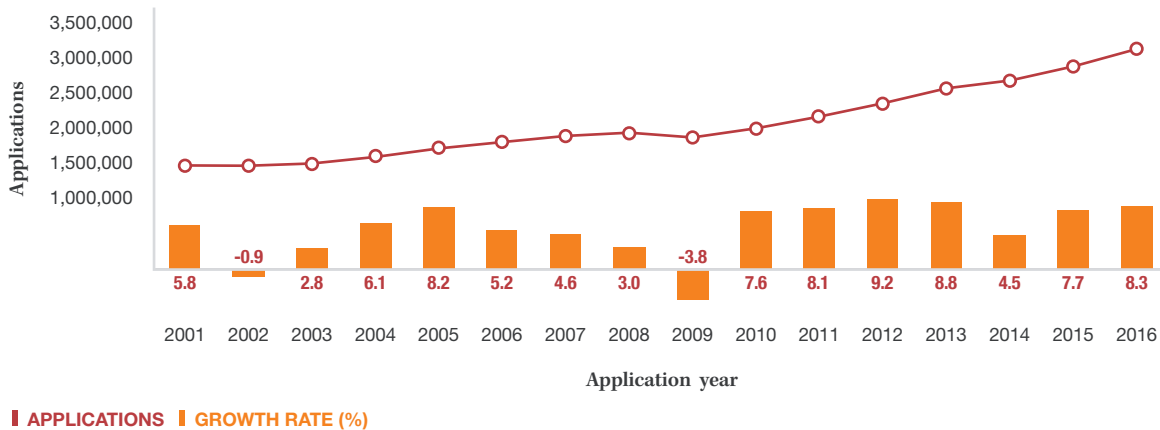
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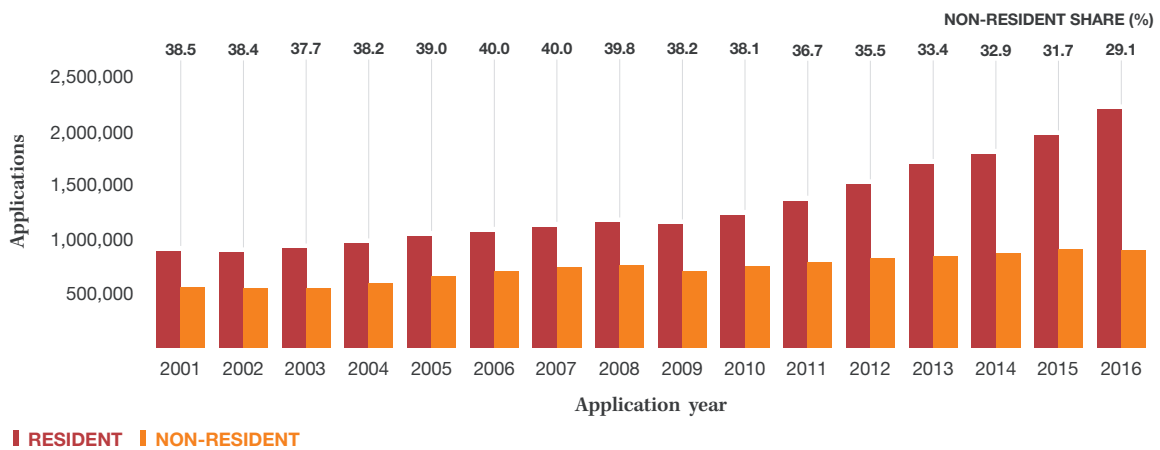
Patent applications and grants worldwide

Figure A1
Trend in patent applications worldwide



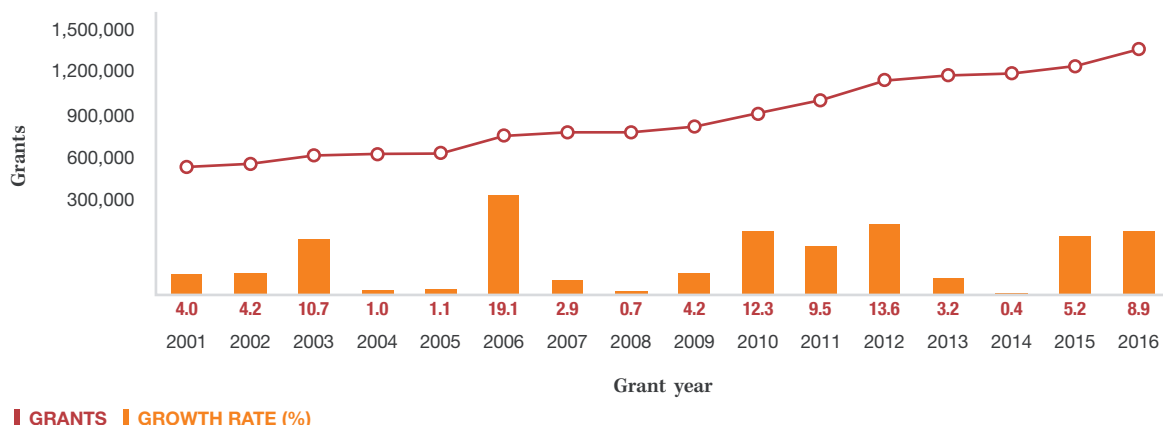
Note: World totals are WIPO estimates using data covering 154 patent offices. These totals include applications filed directly with national and regional offices and applications entering offices through the Patent Cooperation Treaty national phase (where applicable).
Source: WIPO Statistics Database, September 2017.

Figure A2
Resident and non-resident patent applications worldwide



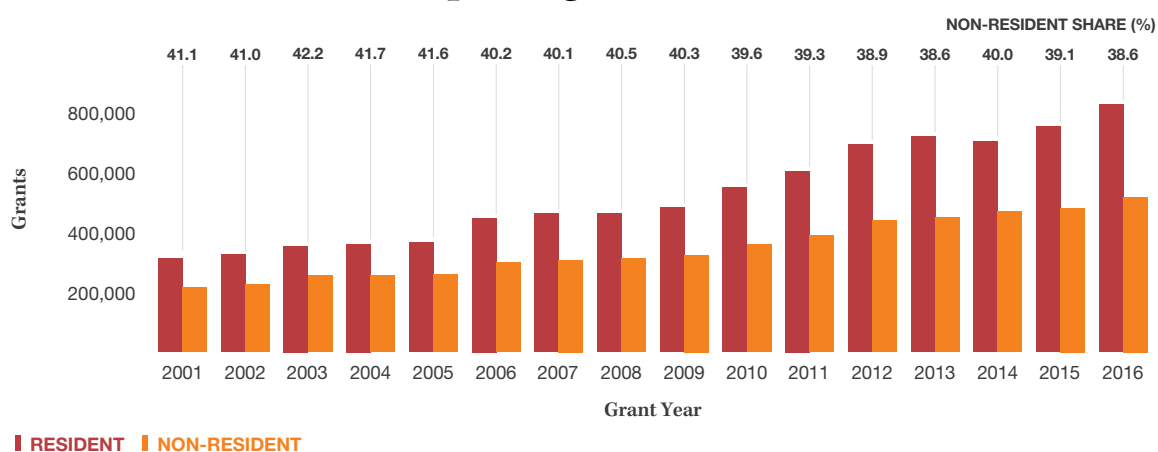
Note: World totals are WIPO estimates using data covering 154 patent offices. These totals include applications filed directly with national and regional offices and applications entering offices through the Patent Cooperation Treaty national phase (where applicable). See the glossary for definitions of resident and non-resident.
Source: WIPO Statistics Database, September 2017.

Figure A3
Trend in patent grants worldwide



Note: World totals are WIPO estimates using data covering 148 patent offices. These totals include patent grants based on applications filed directly with national and regional offices and patents granted by offices on the basis of the Patent Cooperation Treaty national phase (where applicable).
Source: WIPO Statistics Database, September 2017.

Figure A4
Resident and non-resident patent grants worldwide



Note: World totals are WIPO estimates using data covering 148 patent offices. These totals include patent grants based on applications filed directly with national and regional offices and patents granted by offices on the basis of the Patent Cooperation Treaty national phase (where applicable). See the glossary for definitions of resident and non-resident.
Source: WIPO Statistics Database, September 2017.

Patent applications and grants by office

Figure A5
Patent applications by income group

Income group	Number of applications		Resident share (%)		Share of world total (%)		Average growth (%)
	2006	2016	2006	2016	2006	2016	2006-16
High-income	1,402,100	1,552,800	63.3	59.1	78.3	49.6	1.0
Upper middle-income	327,700	1,489,100	51.8	85.3	18.3	47.6	16.3
Lower middle-income	53,800	76,000	21.7	26.7	3.0	2.4	3.5
Low-income	7,400	10,000	86.5	86.0	0.4	0.4	3.1
World	1,791,000	3,127,900	60.0	70.9	100.0	100.0	5.7

Note: Totals by income group are WIPO estimates using data covering 154 offices. Each category includes the following number of offices: high-income countries/economies (58), upper middle-income (43), lower middle-income (37) and low-income (16). European Patent Office data are allocated to the high-income group because most of its member states are high-income countries. For similar reasons, data for the African Regional Intellectual Property Organization and the African Intellectual Property Organization are allocated to the low-income group, while those for the Eurasian Patent Organization are allocated to the lower middle-income group. For information on income group classification, see the Data description section.

Source: WIPO Statistics Database, September 2017.

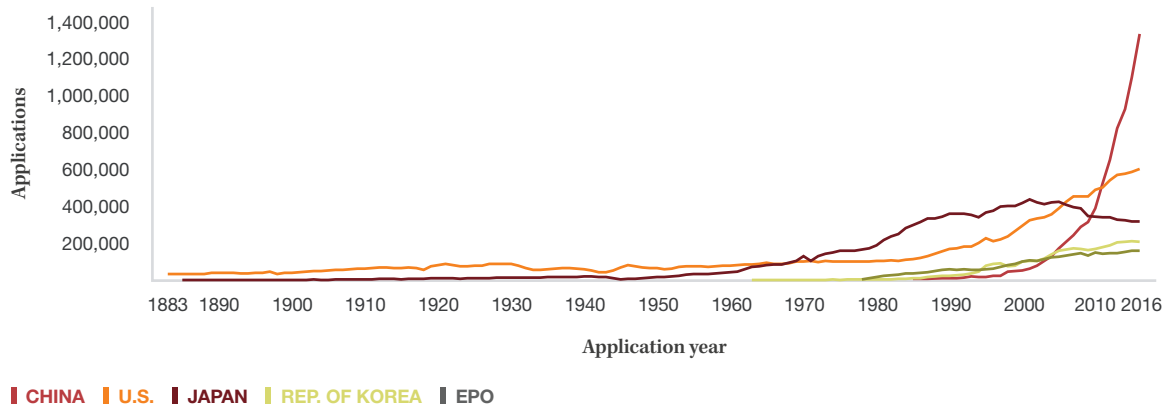
Figure A6
Patent applications by region

Region	Number of applications		Resident share (%)		Share of world total (%)		Average growth (%)
	2006	2016	2006	2016	2006	2016	2006-16
Africa	12,700	17,500	11.0	28.0	0.7	0.5	3.3
Asia	889,800	2,019,100	69.9	83.3	49.7	64.6	8.5
Europe	333,100	354,900	63.9	61.3	18.6	11.3	0.6
Latin America & the Caribbean	54,000	61,300	11.9	14.2	3.0	2.0	1.3
North America	468,000	640,300	48.6	46.8	26.1	20.5	3.2
Oceania	33,400	34,800	15.0	10.6	1.9	1.1	0.4
World	1,791,000	3,127,900	60.0	70.9	100.0	100.0	5.7

Note: Totals by geographic region are WIPO estimates using data covering 154 offices. Each region includes the following number of offices: Africa (29), Asia (43), Europe (45), Latin America & the Caribbean (30), North America (2) and Oceania (5).

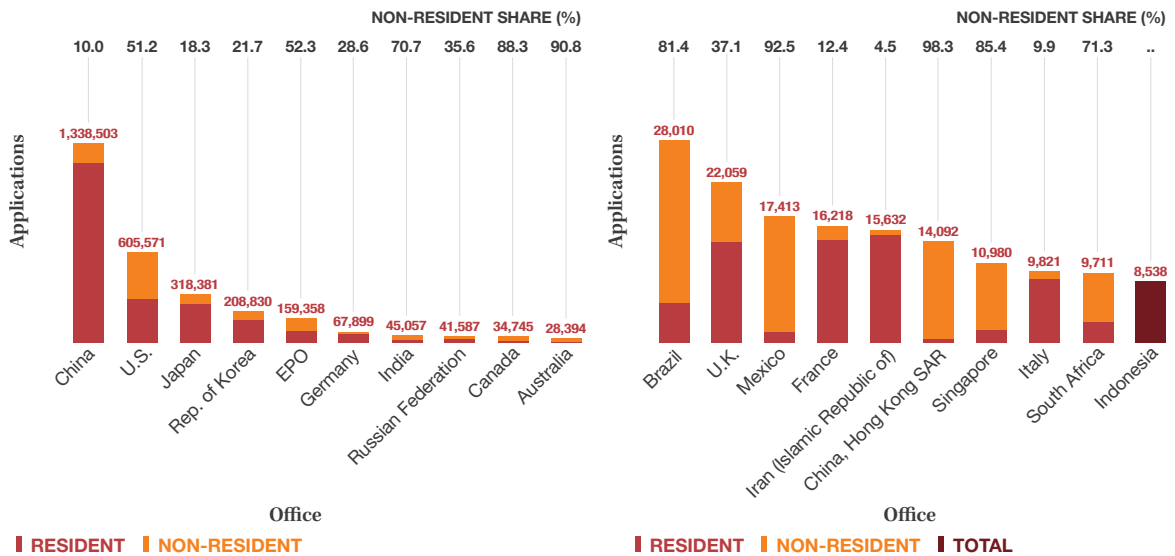
Source: WIPO Statistics Database, September 2017.

Figure A7
Trend in patent applications for the top five offices



Note: EPO is the European Patent Office. The top five offices were selected based on their 2016 totals.
Source: WIPO Statistics Database, September 2017.

Figure A8
Patent applications at the top 20 offices, 2016

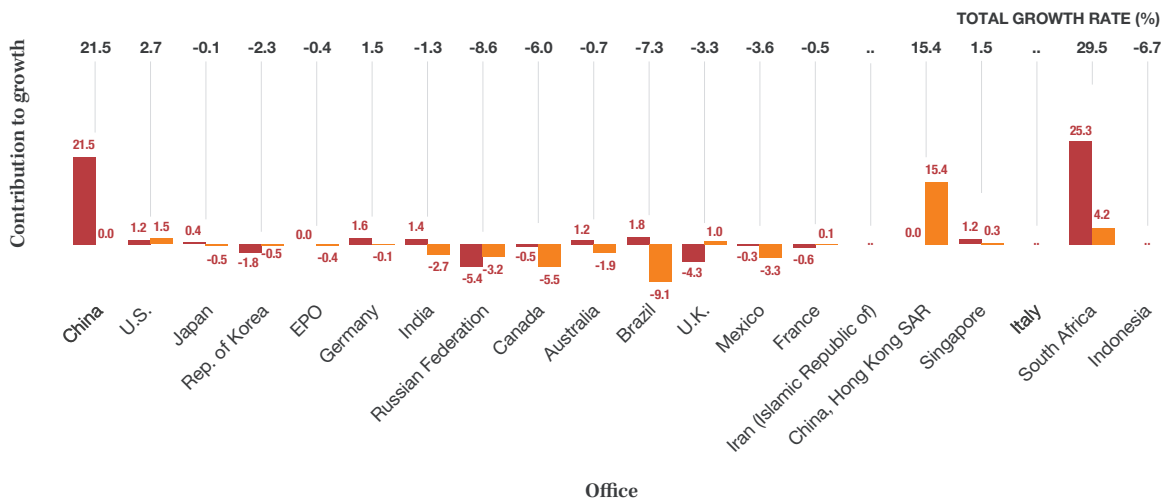


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Note: EPO is the European Patent Office. In general, national offices of European Patent Office (EPO) member states receive lower volumes of applications because applicants may apply via the EPO to seek protection within any EPO member state. The number of applications broken down by resident and non-resident is not available for Indonesia.

Source: WIPO Statistics Database, September 2017.

Figure A9
Contribution of resident and non-resident applications to total growth for the top 20 offices, 2015-16



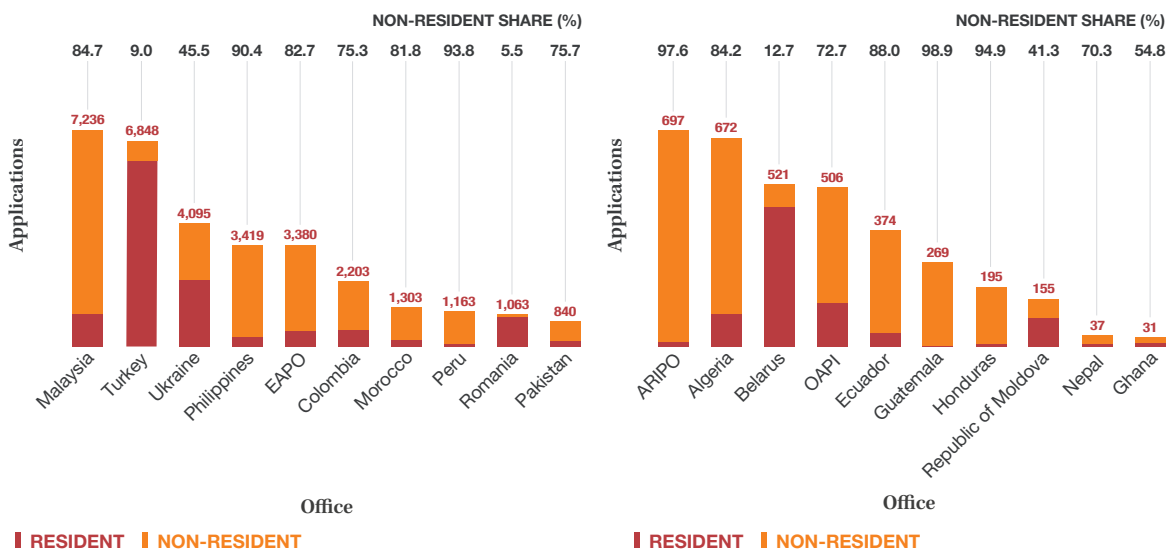
■ CONTRIBUTION OF RESIDENT APPLICATIONS ■ CONTRIBUTION OF NON-RESIDENT APPLICATIONS

.. indicates not available.

Note: EPO is the European Patent Office. This figure shows total growth or decrease in applications at each office broken down by the respective contributions of resident and non-resident applications. For example, applications filed in the U.S. grew by 2.7%. Growth in resident applications accounted for 1.2 percentage points of this increase, whereas the remaining 1.5 percentage points reflected growth in non-resident applications. Resident and non-resident contributions are not available for Indonesia, the Islamic Republic of Iran and Italy.

Source: WIPO Statistics Database, September 2017.

Figure A10
Patent applications at offices of selected low- and middle-income countries, 2016



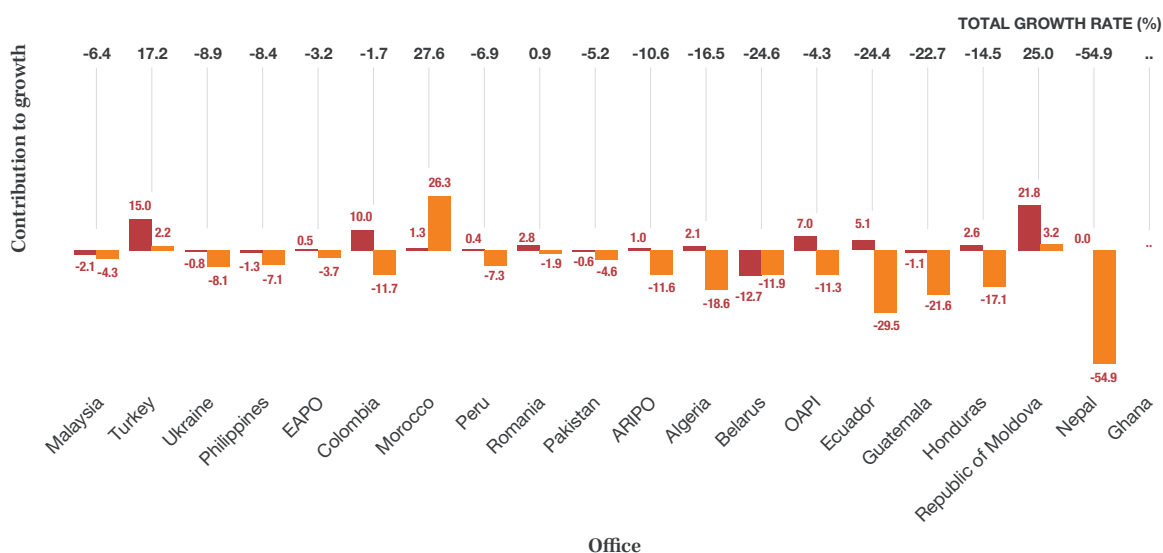
■ RESIDENT ■ NON-RESIDENT

■ RESIDENT ■ NON-RESIDENT

Note: ARIPO is the African Regional Intellectual Property Organization, EAPO is the Eurasian Patent Organization and OAPI is the African Intellectual Property Organization. The selected offices are from different world regions and income groups (low-income, lower middle-income and upper middle-income). Where available, data for all offices are presented in the statistical table at the end of this section.

Source: WIPO Statistics Database, September 2017.

Figure A11
Contribution of resident and non-resident applications to total growth for offices of selected low- and middle-income countries, 2015-16



.. indicates not available.

Note: ARIPO is the African Regional Intellectual Property Organization, EAPO is the Eurasian Patent Organization and OAPI is the African Intellectual Property Organization. The selected offices are from different world regions and income groups (low-income, lower middle-income and upper middle-income). Data for all available offices are presented in the statistical table at the end of this section. This figure shows total growth or decrease in applications at each office broken down by the respective contributions of resident and non-resident applications. For example, applications filed in Turkey grew by 17.2%. Growth in resident applications accounted for 15 percentage points of this increase, whereas the remaining 2.2 percentage points came from growth in non-resident applications.

Source: WIPO Statistics Database, September 2017.

Figure A12
Patent grants by income group

Income group	Number of grants		Resident share (%)		Share of world total (%)		Average growth (%)
	2006	2016	2006	2016	2006	2016	
High-income	614,900	847,600	63.0	57.4	81.4	62.7	3.3
Upper middle-income	116,500	474,400	46.2	70.2	15.4	35.1	15.1
Lower middle-income	19,000	22,100	32.1	16.7	2.5	1.6	1.5
Low-income	4,800	7,500	87.5	88.0	0.6	0.6	4.6
World	755,200	1,351,600	59.8	61.4	100.0	100.0	6.0

Note: Totals by income group are WIPO estimates using data covering 148 offices. Each category includes the following number of offices: high-income countries/economies (56), upper middle-income (42), lower middle-income (35) and low-income (15). European Patent Office data are allocated to the high-income group because most of its member states are high-income countries. For similar reasons, data for the African Regional Intellectual Property Organization and the African Intellectual Property Organization are allocated to the low-income group, while those for the Eurasian Patent Organization are allocated to the lower middle-income group. For information on income group classification, see the Data description section.

Source: WIPO Statistics Database, September 2017.

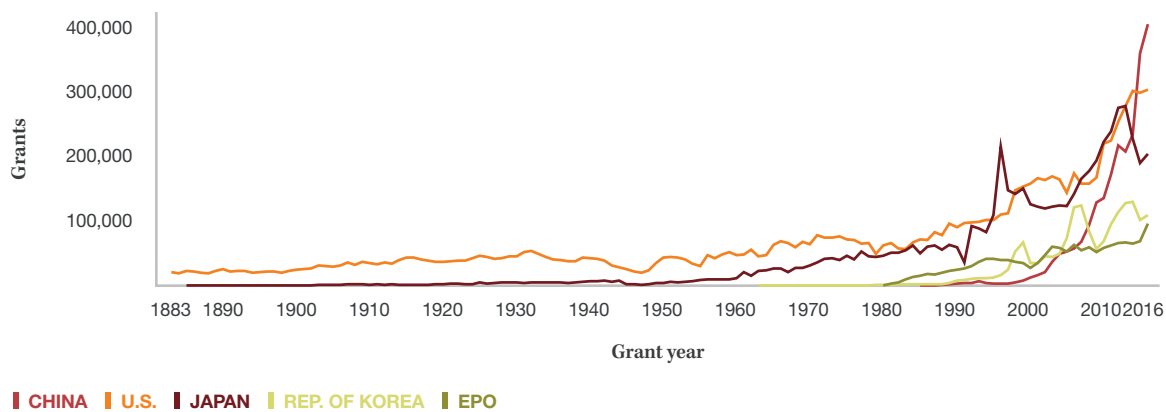
Figure A13
Patent grants by region

Region	Number of grants		Resident share (%)		Share of world total (%)		Average growth (%)
	2006	2016	2006	2016	2006	2016	2006-16
Africa	4,500	7,800	31.1	14.1	0.6	0.6	5.7
Asia	368,500	771,000	69.3	72.8	48.8	57.0	7.7
Europe	163,100	195,900	62.0	59.6	21.6	14.5	1.8
Latin America & the Caribbean	17,600	19,600	6.3	7.7	2.3	1.5	1.1
North America	188,700	329,500	48.4	44.6	25.0	24.4	5.7
Oceania	12,800	27,800	10.2	6.1	1.7	2.1	8.1
World	755,200	1,351,600	59.8	61.4	100.0	100.0	6.0

Note: Totals by geographic region are WIPO estimates using data covering 148 offices. Each region includes the following number of offices: Africa (28), Asia (41), Europe (44), Latin America & the Caribbean (29), North America (2) and Oceania (4).

Source: WIPO Statistics Database, September 2017.

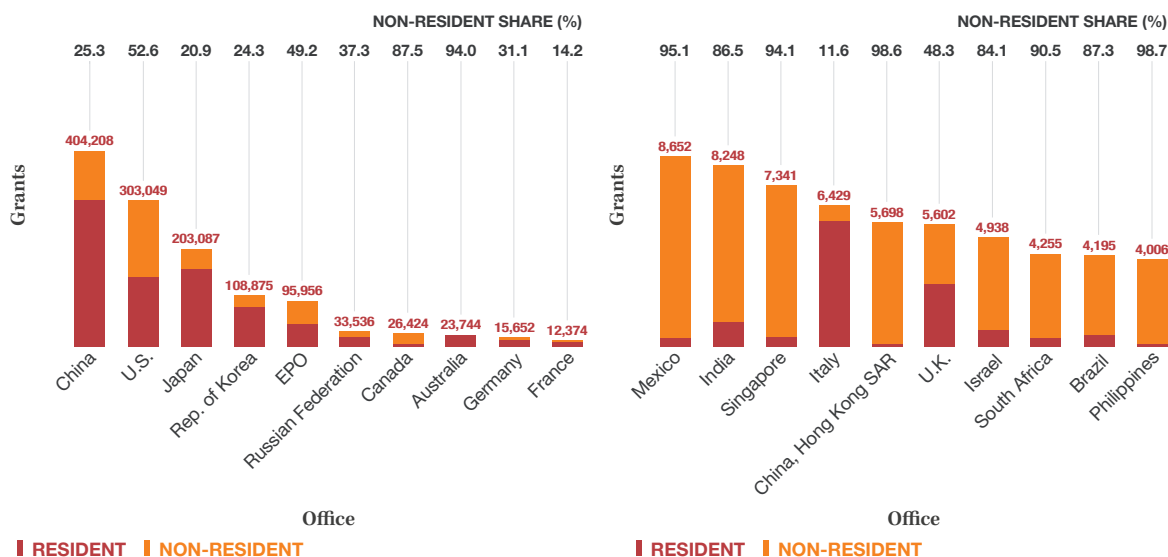
Figure A14
Trend in patent grants for the top five offices



Note: EPO is the European Patent Office. The top five offices were selected based on their 2016 totals.

Source: WIPO Statistics Database, September 2017.

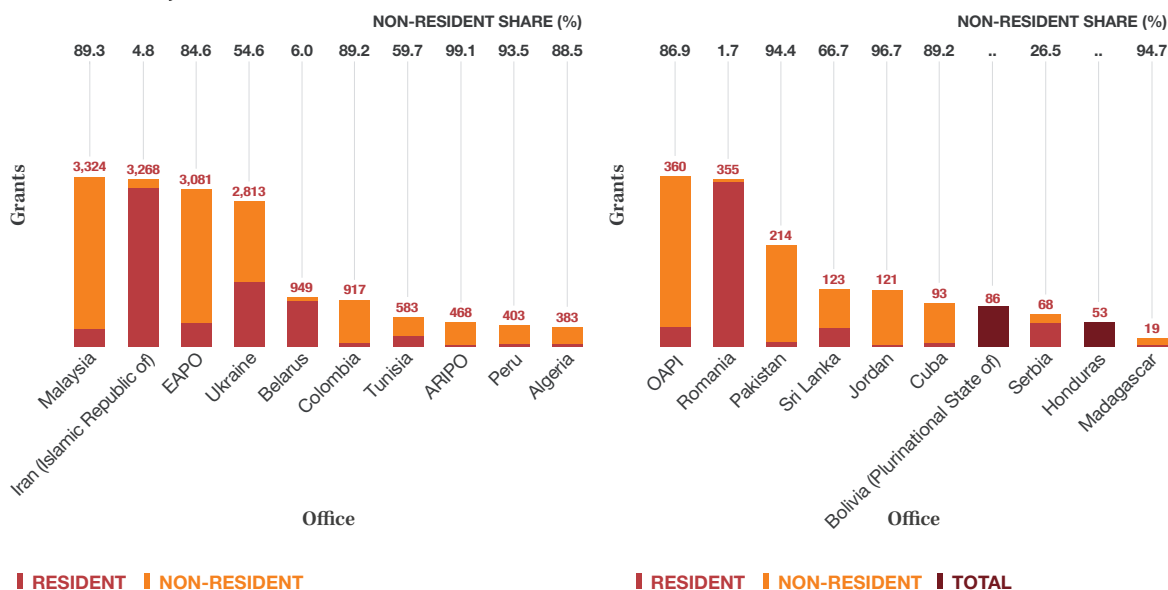
Figure A15
Patent grants for the top 20 offices, 2016



Note: EPO is the European Patent Office. The procedure for issuing patents varies across offices, and differences in the numbers of patents granted among offices depend on factors such as examination capacity and procedural delays. The examination process can also be lengthy, so there is a time lag between application and grant dates. For this reason, data on applications for a given year should not be compared with data on grants for the same year.

Source: WIPO Statistics Database, September 2017.

Figure A16
Patent grants for offices of selected low- and middle-income countries, 2016



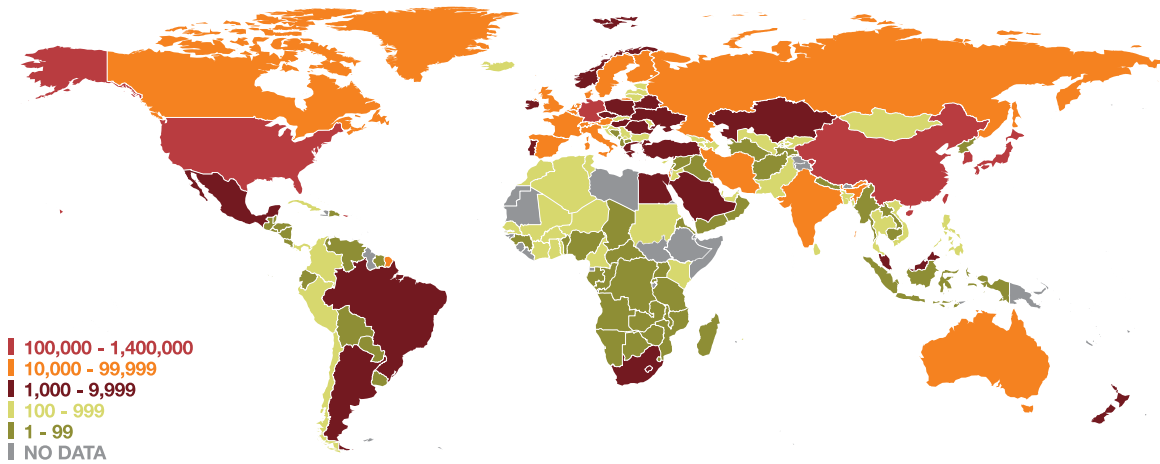
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Note: ARIPO is the African Regional Intellectual Property Organization, EAPO is the Eurasian Patent Organization and OAPI is the African Intellectual Property Organization. The selected offices are from different world regions and income groups (low-income, lower middle-income and upper middle-income). Where available, data for all offices are presented in the statistical table at the end of this section.

Source: WIPO Statistics Database, September 2017.

Patent applications and grants by origin

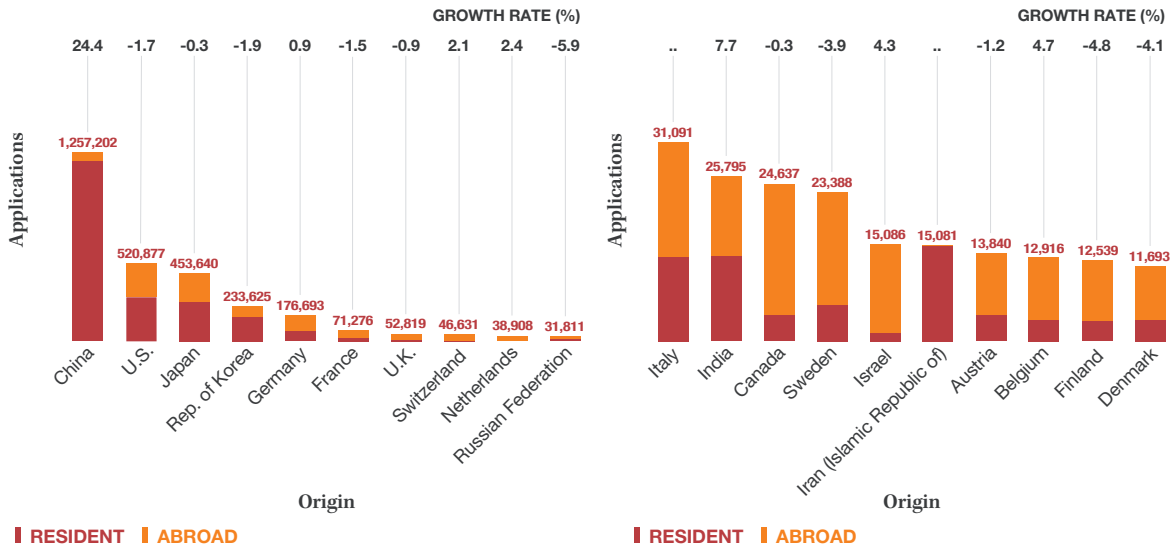
Figure A17
Equivalent patent applications by origin, 2016



Note: Patent filing activity by origin includes resident applications and applications filed abroad. The origin of a patent application is determined by the residence of the first named applicant. Applications filed at regional offices are considered equivalent to multiple applications in the relevant member states. See the glossary for the definition of equivalent application.

Source: WIPO Statistics Database, September 2017.

Figure A18
Equivalent patent applications for the top 20 origins, 2016



.. indicates not available.

Note: Patent activity by origin includes resident applications and applications filed abroad. The origin of a patent application is determined by the residence of the first named applicant. Applications filed at regional offices are considered equivalent to multiple applications in the relevant member states. See the glossary for the definition of equivalent application.

Source: WIPO Statistics Database, September 2017.

Figure A19

Patent applications for the top 25 offices and origins, 2016

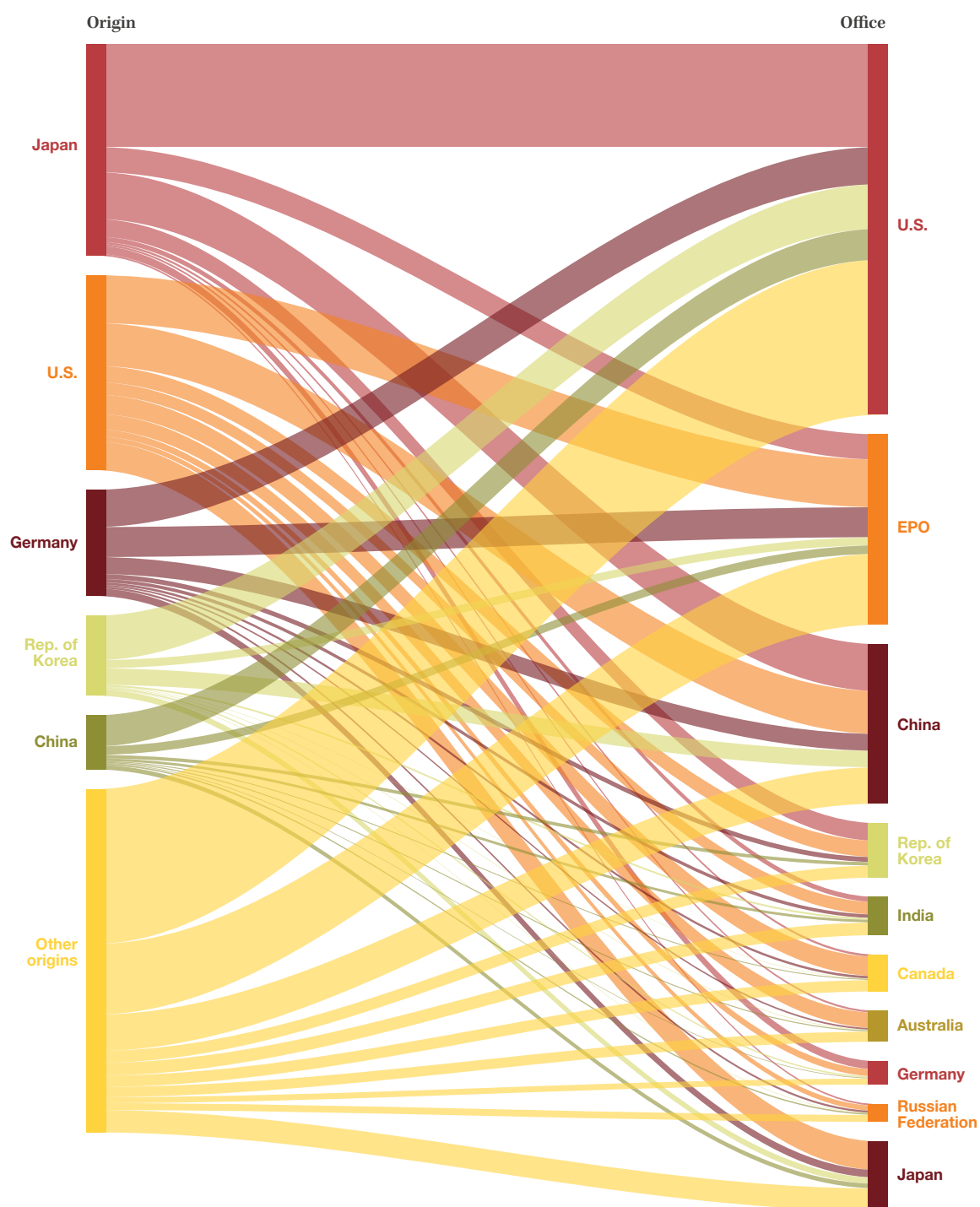
Origin	Office											
	Australia	Brazil	Canada	China	China, Hong Kong SAR	EPO	France	Germany	India	Indonesia	Iran (Islamic Republic of)	Israel
Australia	2,620	160	430	624	189	776	2	25	248	99	8	68
Austria	204	219	249	946	34	2,039	12	976	273	54	24	33
Belgium	254	318	305	700	109	2,186	103	54	281	58	21	81
Brazil	57	5,200	54	134	10	207		17	59	16	1	5
Canada	545	208	4,078	985	275	1,576	8	91	312	60	14	106
China	893	799	777	1,204,981	804	7,152	151	552	2,171	519	41	65
Denmark	206	200	260	858	71	1,870	2	26	313	63	19	44
Finland	179	178	296	1,007	143	1,818	9	77	248	112	5	15
France	808	1,452	1,695	4,631	422	10,508	14,206	270	1,138	280	71	263
Germany	1,394	2,219	2,023	14,158	864	25,094	530	48,480	2,871	446	101	363
India	207	159	159	288	45	759	6	29	13,199	91	4	52
Iran (Islamic Republic of)			3	1		4	2	4	3		14,930	
Israel	394	185	393	800	181	1,211		31	304	20		1,300
Italy	343	640	567	1,610	200	4,171	66	170	560	108	54	109
Japan	1,607	1,829	1,864	39,207	1,379	21,006	160	6,839	4,228	2,508	30	215
Netherlands	608	965	555	3,155	173	6,838	30	209	1,400	310	37	149
Rep. of Korea	468	290	330	13,764	170	6,824	36	1,204	1,533	367	56	46
Russian Federation	34	44	69	135	20	173	3	15	80	39	6	15
Singapore	121	46	95	769	67	433	2	132	131	65	2	20
Spain	141	200	189	393	73	1,562	87	26	171	39	12	57
Sweden	491	604	403	1,919	139	3,555	20	517	780	131	13	72
Switzerland	1,151	1,347	1,249	3,453	940	7,267	251	951	1,466	426	51	365
Turkey	19	30	18	80	6	510	4	11	27	14	8	17
U.K.	1,176	697	1,141	2,372	512	5,133	49	225	1,014	248	9	173
U.S.	12,909	9,100	16,191	35,895	5,856	40,046	315	5,859	10,441	2,096	47	2,486
Others/Unknown	1,565	921	1,352	5,638	1,410	6,640	164	1,109	1,806	369	68	300
Total	28,394	28,010	34,745	1,338,503	14,092	159,358	16,218	67,899	45,057	8,538	15,632	6,419

Origin	Office												
	Italy	Japan	Malaysia	Mexico	New Zealand	Rep. of Korea	Russian Federation	Singapore	South Africa	Turkey	U.K.	U.S.	Viet Nam
Australia	3	415	103	118	594	204	76	181	189	1	111	3,666	40
Austria	14	403	47	135	30	306	193	70	101	2	41	2,596	20
Belgium	8	433	52	130	59	274	132	79	84	1	163	2,644	30
Brazil	2	70	6	71	2	34	26	6	39	3	7	931	1
Canada	2	545	44	224	117	342	126	108	119	2	159	13,493	31
China	29	3,810	333	558	124	2,829	1,171	343	389	35	659	26,026	492
Denmark		380	60	128	58	166	170	54	68		45	2,202	24
Finland	2	407	34	85	28	283	148	40	121	2	117	3,085	66
France	33	3,237	192	594	183	1,766	896	338	379	3	150	12,863	94
Germany	323	6,388	427	1,153	275	4,111	1,726	593	669	49	499	31,201	238
India	3	227	79	112	58	121	46	66	137	5	60	8,739	39
Iran (Islamic Republic of)						1				1		129	
Israel	3	528	14	114	55	238	118	121	79	4	98	8,253	14
Italy	8,848	802	65	301	74	467	448	101	136	9	57	5,209	60
Japan	101	260,244	1,481	1,181	195	14,773	1,416	1,719	268	58	562	86,021	1,334
Netherlands	19	2,272	165	447	142	913	794	189	204	2	278	5,456	124
Rep. of Korea	7	5,216	208	222	42	163,424	394	162	72	22	78	37,341	576
Russian Federation		115	22	19	2	55	26,795	13	28	4	8	1,219	25
Singapore	1	488	96	34	19	146	50	1,601	26	1	99	1,988	49
Spain	17	260	32	204	41	138	121	44	66	2	42	1,790	12
Sweden	19	817	105	229	64	591	325	82	177	5	157	5,206	50
Switzerland	116	2,539	411	968	388	1,411	877	497	508	19	296	5,225	233
Turkey	2	38	4	10	2	23	28	3	10	6,230	15	373	2
U.K.	39	1,718	209	319	249	902	451	318	424	3	13,876	14,074	45
U.S.	126	23,979	1,607	8,262	2,251	13,643	4,323	3,707	2,248	355	2,864	295,327	786
Others/ Unknown	104	3,050	1,440	1,795	1,334	1,669	737	545	3,170	30	1,618	30,514	843
Total	9,821	318,381	7,236	17,413	6,386	208,830	41,587	10,980	9,711	6,848	22,059	605,571	5,228

Note: EPO is the European Patent Office. Origin data are based on absolute counts, not equivalent counts. The top 25 offices and origins are selected based on the available 2016 data broken down by country of origin.

Source: WIPO Statistics Database, September 2017.

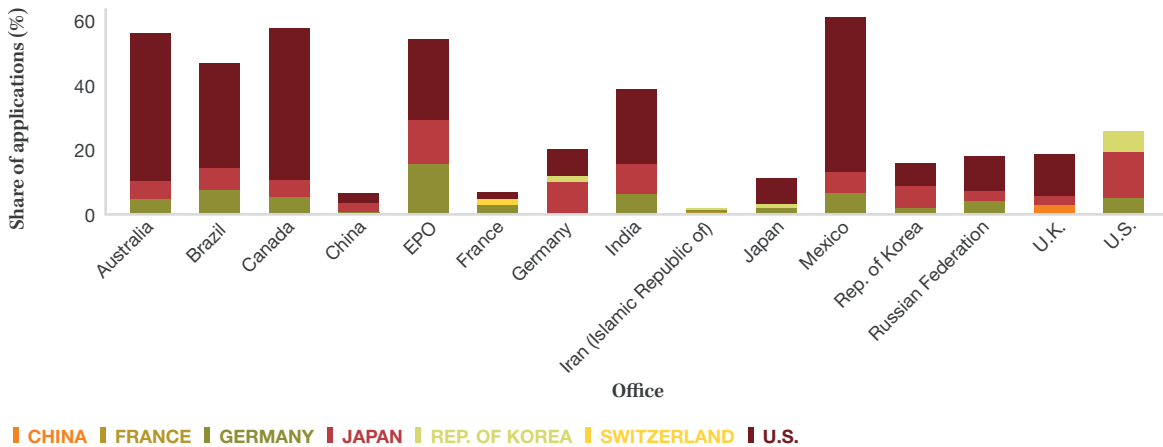
Figure A20
Flow of non-resident patent applications between the top five origins and the top 10 offices, 2016



Note: EPO is the European Patent Office. Origin data are based on absolute counts, not equivalent counts.

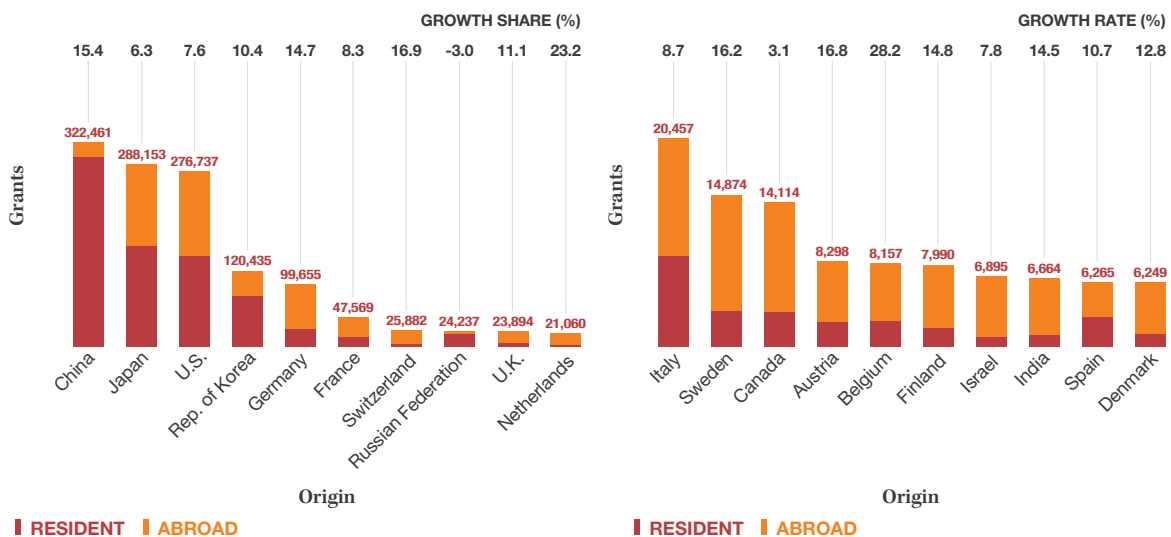
Source: WIPO Statistics Database, September 2017.

Figure A21
Distribution of patent applications for the top 15 offices and selected origins, 2016



Note: EPO is the European Patent Office. Origin data are based on absolute counts, not equivalent counts.
 Source: WIPO Statistics Database, September 2017.

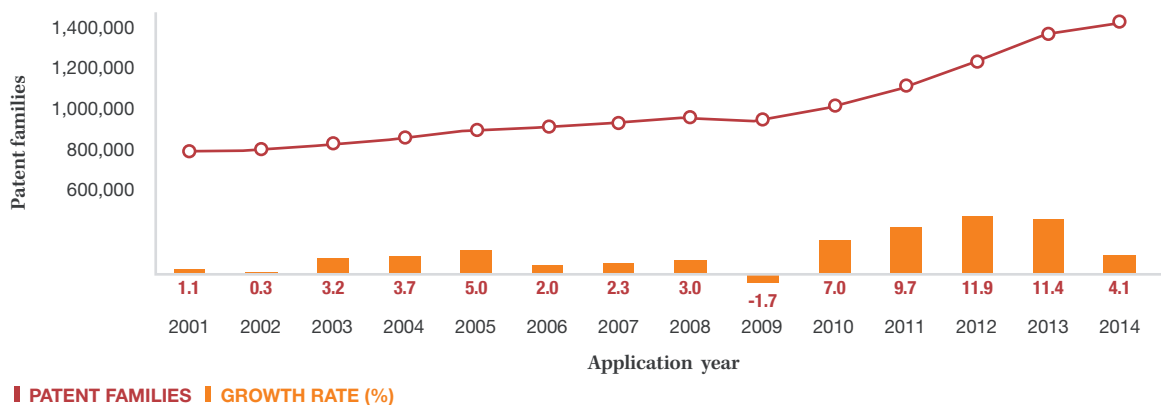
Figure A22
Equivalent patent grants for the top 20 origins, 2016



Note: See the glossary for the definition of equivalent grants.
 Source: WIPO Statistics Database, September 2017.

Patent families

Figure A23
Trend in patent families worldwide



■ PATENT FAMILIES ■ GROWTH RATE (%)

Note: Applicants often file patent applications in multiple jurisdictions, so some inventions are recorded more than once. To take this into account, WIPO has indicators related to patent families, defined as patent applications interlinked by one or more of: priority claim, Patent Cooperation Treaty national phase entry, continuation, continuation-in-part, internal priority and addition or division. Patent families here include only those associated with patent applications for inventions and exclude patent families associated with utility model applications.

Sources: WIPO Statistics Database and EPO PATSTAT database, October 2017.

Figure A24
Trend in foreign-oriented patent families worldwide

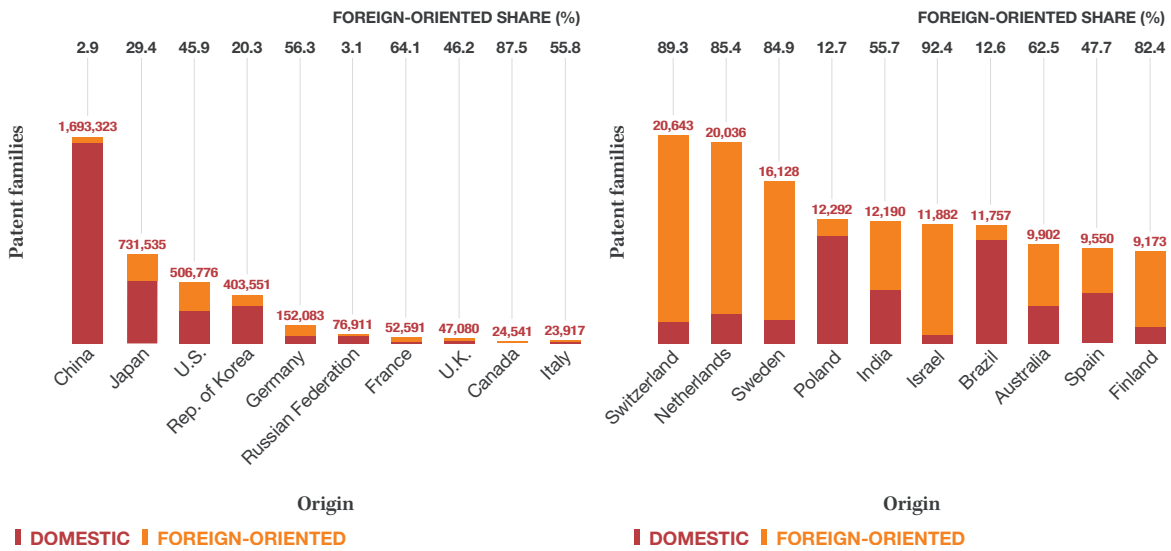


■ FOREIGN-ORIENTED PATENT FAMILIES ■ GROWTH RATE (%)

Note: A special subset of patent families comprises foreign-oriented patent families: this includes only patent families that have at least one filing office different from the office of the applicant's country of origin. Some foreign-oriented patent families include only one filing office, because applicants may choose to file directly with a foreign office. For example, if a Canadian applicant files a patent application directly with the USPTO without previously filing with the patent office of Canada, that application and applications filed subsequently with the USPTO will form a foreign-oriented patent family. The sharp drop in foreign-oriented patent families in 2014 shown here may partly reflect incomplete data.

Sources: WIPO Statistics Database and EPO PATSTAT database, October 2017.

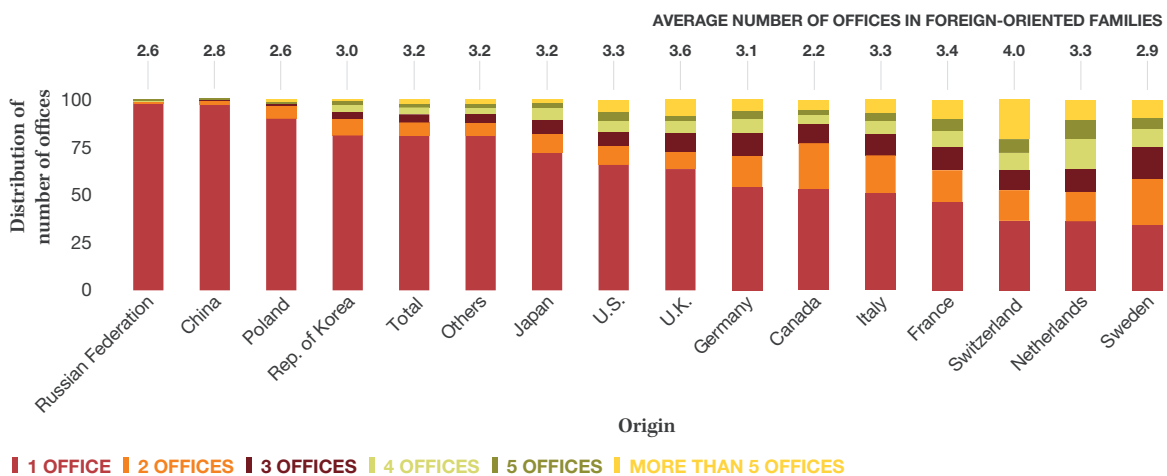
Figure A25
Domestic and foreign-oriented patent families for the top 20 origins, 2012-14



Note: A patent family is defined as patent applications interlinked by one or more of: priority claim, Patent Cooperation Treaty national phase entry, continuation, continuation-in-part, internal priority and addition or division. Patent families here include only those associated with patent applications for inventions and exclude patent families associated with utility model applications.

Sources: WIPO Statistics Database and EPO PATSTAT database, October 2017.

Figure A26
Distribution of patent families by number of offices for the top 20 origins, 2012-14



Note: A patent family is defined as patent applications interlinked by one or more of: priority claim, Patent Cooperation Treaty national phase entry, continuation, continuation-in-part, internal priority and addition or division. Patent families here include only those associated with patent applications for inventions and exclude patent families associated with utility model applications.

Sources: WIPO Statistics Database and EPO PATSTAT database, October 2017.

Figure A27
Top 100 patent applicants worldwide, based on total number of patent families

Applicant	Origin	2011	2012	2013	2014	Total number of patent families 2011-14
CANON INC	Japan	6,871	7,473	7,829	8,303	30,476
SAMSUNG ELECTRONICS CO., LTD.	Rep. of Korea	5,139	6,254	7,635	7,581	26,609
PANASONIC CORPORATION	Japan	10,284	7,904	4,282	429	22,899
TOSHIBA KK	Japan	6,165	6,105	5,543	4,814	22,627
TOYOTA JIDOSHA KABUSHIKI KAISHA	Japan	6,980	5,487	4,824	4,899	22,190
MITSUBISHI ELECTRIC CORP	Japan	5,327	5,796	5,416	5,089	21,628
HUAWEI TECHNOLOGIES CO., LTD.	China	3,339	4,717	5,377	4,744	18,177
LG ELECTRONICS INC	Rep. of Korea	4,235	4,095	4,313	4,971	17,614
STATE GRID CORPORATION OF CHINA	China	193	671	6,875	9,494	17,233
SEIKO EPSON CORP	Japan	5,303	3,843	3,742	4,080	16,968
SHARP CORP	Japan	4,766	5,835	3,054	3,165	16,820
ROBERT BOSCH GMBH	Germany	3,658	4,335	4,433	4,156	16,582
RICOH CO LTD	Japan	4,130	3,981	4,550	3,652	16,313
CHINA PETROLEUM & CHEMICAL CORPORATION	China	3,076	3,318	3,721	4,044	14,159
FUJITSU LTD	Japan	3,508	3,513	3,520	3,282	13,823
ZTE CORPORATION	China	4,536	3,594	2,231	3,422	13,783
DENSO CORP	Japan	2,993	3,054	3,341	3,366	12,754
INTERNATIONAL BUSINESS MACHINES CORPORATION	U.S.	528	1,907	4,621	4,492	11,548
SIEMENS AG	Germany	3,001	2,899	2,731	2,886	11,517
HONDA MOTOR CO LTD	Japan	2,748	2,711	2,945	2,537	10,941
SONY CORP	Japan	3,273	2,760	2,363	2,491	10,887
HYUNDAI MOTOR CO LTD	Rep. of Korea	2,512	2,449	2,641	3,134	10,736
HITACHI LTD	Japan	2,720	2,844	2,591	2,486	10,641
ZHEJIANG UNIVERSITY	China	2,147	2,301	2,674	2,629	9,751
NEC CORP	Japan	2,444	2,603	2,218	2,073	9,338
QUALCOMM INCORPORATED	U.S.	1,324	2,097	2,971	2,891	9,283
FUJIFILM CORP	Japan	3,139	2,234	1,938	1,953	9,264
DAINIPPON PRINTING CO LTD	Japan	2,076	2,340	2,194	2,178	8,788
DAIMLER AG	Germany	2,112	2,139	2,032	1,967	8,250
NIPPON TELEGRAPH & TELEPHONE	Japan	1,993	2,022	2,158	1,843	8,016
SAMSUNG DISPLAY CO LTD	Rep. of Korea	904	1,653	2,749	2,563	7,869
LG DISPLAY CO LTD	Rep. of Korea	1,860	1,804	1,869	2,020	7,553
SCHAEFFLER TECHNOLOGIES GMBH & CO KG	Germany	1,538	1,602	1,832	2,486	7,458
TSINGHUA UNIVERSITY	China	1,582	1,876	1,785	1,831	7,074
HONGFUJIN PRECISION INDUSTRY (SHENZHEN) CO., LTD.	China	2,681	2,312	1,714	313	7,020
PANASONIC IP MAN CORP	Japan	55	155	2,023	4,748	6,981
KONICA CORP	Japan	246	2,381	2,212	2,136	6,975
OCEAN'S KING LIGHTING SCIENCE & TECHNOLOGY CO., LTD.	China	1,148	2,032	3,609	185	6,974
KOREA ELECTRONICS TELECOMM	Rep. of Korea	1,502	2,094	1,637	1,734	6,967
POSCO	Rep. of Korea	1,661	1,896	1,769	1,629	6,955
HARBIN INSTITUTE OF TECHNOLOGY	China	1,123	1,547	2,036	2,230	6,936
BROTHER IND LTD	Japan	1,960	1,734	1,694	1,461	6,849
LG CHEMICAL LTD	Rep. of Korea	897	1,547	2,029	2,318	6,791
SAMSUNG ELECTRO MECH	Rep. of Korea	1,767	1,922	1,649	1,364	6,702
SOUTHEAST UNIVERSITY	China	1,255	1,374	1,873	2,109	6,611
KYOCERA CORP	Japan	1,953	1,875	1,542	1,234	6,604
LENOVO (BEIJING) CO., LTD.	China	614	1,856	1,798	2,316	6,584
MITSUBISHI HEAVY IND LTD	Japan	1,825	2,019	1,628	1,085	6,557
KONINKLIJKE PHILIPS ELECTRONICS N.V.	Netherlands	1,586	1,577	1,633	1,597	6,393
TENCENT TECHNOLOGY (SHENZHEN) CO., LTD.	China	830	1,888	1,905	1,700	6,323
LG INNOTEK CO LTD	Rep. of Korea	2,548	1,490	949	1,218	6,205

Applicant	Origin	2011	2012	2013	2014	Total number of patent families 2011-14
HYUN DAI HEAVY IND CO LTD	Rep. of Korea	1,391	1,953	1,438	1,325	6,107
TELEFONAKTIEBOLAGET LM ERICSSON (PUBL)	Sweden	1,369	1,552	1,531	1,655	6,107
SHANGHAI JIAO TONG UNIVERSITY	China	1,250	1,478	1,673	1,631	6,032
SANKYO CO	Japan	774	1,549	1,874	1,822	6,019
FUJI XEROX CO LTD	Japan	1,406	1,671	1,510	1,378	5,965
KYOCERA DOCUMENT SOLUTIONS INC	Japan	1,093	1,215	1,653	1,899	5,860
NISSAN MOTOR	Japan	1,226	1,814	1,505	1,280	5,825
INTEL CORP	U.S.	1,243	1,181	1,703	1,636	5,763
GEN ELECTRIC	U.S.	399	1,151	2,044	1,859	5,453
GOOGLE INC	U.S.	438	1,257	2,156	1,482	5,333
BOE TECHNOLOGY GROUP CO., LTD.	China	472	1,211	1,552	2,066	5,301
TIANJIN UNIVERSITY	China	990	1,271	1,503	1,497	5,261
SUMITOMO ELECTRIC INDUSTRIES	Japan	1,631	1,368	1,146	1,109	5,254
NIPPON KOGAKU KK	Japan	1,678	1,682	1,248	580	5,188
HONGHAI PRECISION INDUSTRY CO., LTD.	Taiwan, Province of China	1,386	1,221	1,758	695	5,060
SOUTH CHINA UNIVERSITY OF TECHNOLOGY	China	914	1,116	1,369	1,630	5,029
TOPPAN PRINTING CO LTD	Japan	1,307	1,268	1,246	1,194	5,015
HEWLETT PACKARD DEVELOPMENT CO	U.S.	694	924	1,562	1,754	4,934
SAMSUNG HEAVY IND	Rep. of Korea	1,051	1,313	1,119	1,279	4,762
JFE STEEL KK	Japan	1,534	1,205	986	1,011	4,736
JIANGNAN UNIVERSITY	China	962	1,234	1,164	1,349	4,709
BEIHANG UNIVERSITY	China	1,080	1,098	1,220	1,184	4,582
GM GLOBAL TECH OPERATIONS INC	U.S.	919	1,080	1,381	1,162	4,542
OLYMPUS CORP	Japan	1,160	921	954	1,470	4,505
MURATA MANUFACTURING CO	Japan	1,058	1,042	1,242	1,148	4,490
BASF SE	Germany	1,098	1,385	1,035	934	4,452
FORD GLOBAL TECH LLC	U.S.	214	446	1,607	2,039	4,306
APPLE INC	U.S.	280	1,091	1,251	1,543	4,165
YAZAKI CORP	Japan	1,080	1,035	1,128	906	4,149
BAYERISCHE MOTOREN WERKE AG	Germany	651	823	1,173	1,477	4,124
UNIVERSITY OF ELECTRONIC SCIENCE AND TECHNOLOGY OF CHINA	China	687	843	1,187	1,390	4,107
PEUGEOT CITROEN AUTOMOBILES SA	France	1,209	1,141	953	789	4,092
BEIJING UNIVERSITY OF TECHNOLOGY	China	597	732	1,249	1,468	4,046
KYORAKU SANGYO KK	Japan	865	740	1,074	1,367	4,046
HYUNDAI MOBIS CO LTD	Rep. of Korea	838	1,221	864	1,098	4,021
TOYOTA IND CORP	Japan	703	1,228	984	1,082	3,997
PETROCHINA COMPANY LIMITED	China	598	801	1,196	1,385	3,980
PEKING UNIVERSITY	China	888	887	1,154	1,022	3,951
SUMITOMO CHEMICAL CO	Japan	1,569	1,170	601	605	3,945
SEMICONDUCTOR MANUFACTURING INTERNATIONAL (SHANGHAI) CO., LTD.	China	645	834	1,054	1,398	3,931
JIANGSU UNIVERSITY	China	488	914	1,455	1,051	3,908
XI'AN JIAOTONG UNIVERSITY	China	813	865	1,064	1,162	3,904
DAIKIN IND LTD	Japan	1,033	1,158	874	832	3,897
BRIDGESTONE CORP	Japan	1,375	912	868	723	3,878
SK HYNIX INC	Rep. of Korea	1,053	1,176	789	846	3,864
NSK LTD	Japan	989	923	780	1,071	3,763
DAEWOO SHIPBUILDING & MARINE	Rep. of Korea	590	903	1,015	1,189	3,697
SANYO PRODUCT CO LTD	Japan	631	875	947	1,242	3,695
ZHUHAI GREE ELECTRIC APPLIANCES INC.	China	325	951	1,106	1,284	3,666

Note: A patent family is defined as patent applications interlinked by one or more of: priority claim, Patent Cooperation Treaty national phase entry, continuation, continuation-in-part, internal priority and addition or division. Patent families here include only those associated with patent applications for inventions and exclude patent families associated with utility model applications.

Sources: WIPO Statistics Database and EPO PATSTAT database, September 2017.

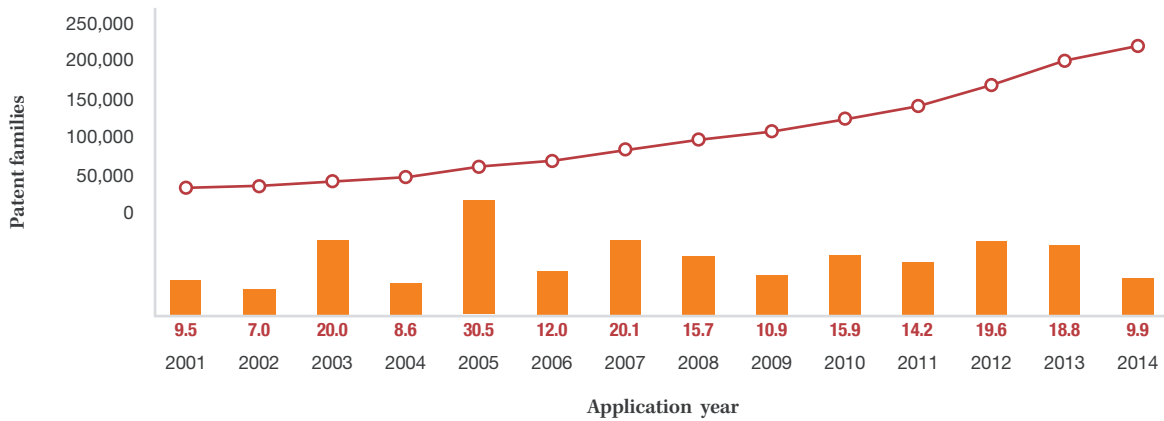
Figure A28
Distribution of technology fields for each top 10 applicant based on patent families, 2011-14

Field of technology	Applicant									
	Canon Inc	Samsung Electronics	Panasonic Corp	Toshiba KK	Toyota Jidosha KK	Mitsubishi Electric Corp	Huawei Technologies	LG Electronics Inc	State Grid Corp of China	Seiko Epson Corp
Electrical machinery, apparatus, energy	3.1	4.6	22.7	11.0	23.1	19.8	3.2	4.5	31.5	3.5
Audio-visual technology	16.4	10.8	10.3	9.4	0.8	6.0	4.2	7.8	1.6	7.8
Telecommunications	6.4	8.1	4.5	3.3	0.2	4.5	10.4	19.7	2.2	2.3
Digital communication	2.4	14.5	2.9	3.5	0.5	4.3	57.9	29.8	4.1	0.6
Basic communication processes	0.4	1.7	1.4	2.0	0.2	1.8	1.4	0.3	0.3	3.5
Computer technology	14.9	26.0	5.1	16.1	1.8	6.7	18.2	10.1	7.8	6.2
IT methods for management	0.5	1.4	0.6	1.8	0.3	0.8	0.6	0.7	7.2	0.7
Semiconductors	3.3	12.3	7.5	14.4	3.1	8.0	0.4	3.4	0.3	5.8
Optics	26.9	4.0	3.5	2.9	0.1	3.1	1.2	1.9	0.6	11.7
Measurement	3.1	2.9	4.3	4.8	3.8	6.6	0.9	1.1	21.1	8.7
Analysis of biological materials	0.0	0.3	0.2	0.1	0.0	0.0	0.0	0.1	0.3	0.1
Control	0.4	0.8	1.6	3.1	2.6	4.3	0.4	0.7	5.6	1.2
Medical technology	4.1	2.6	2.7	7.4	0.5	0.6	0.1	0.4	0.1	3.2
Organic fine chemistry	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Biotechnology	0.0	0.7	0.3	0.1	0.2	0.0	0.0	0.1	0.0	0.3
Pharmaceuticals	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1
Macromolecular chemistry, polymers	0.4	0.2	0.5	0.1	0.1	0.1	0.0	0.0	0.3	0.3
Food chemistry	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Basic materials chemistry	0.7	0.4	0.4	0.3	0.3	0.2	0.0	0.1	0.4	1.7
Materials, metallurgy	0.2	0.3	0.9	0.9	1.8	0.2	0.1	0.2	0.4	0.5
Surface technology, coating	0.5	0.5	1.2	0.9	1.2	0.5	0.0	0.2	0.4	1.5
Micro-structural and nano-technology	0.1	0.2	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.9
Chemical engineering	0.2	0.6	1.2	1.2	1.1	0.5	0.0	1.1	1.0	0.7
Environmental technology	0.6	0.3	0.9	1.8	3.7	0.6	0.0	0.3	0.5	0.0
Handling	3.3	0.5	0.6	1.0	1.0	5.2	0.0	0.4	2.2	6.3
Machine tools	0.2	0.2	1.2	0.7	2.1	1.6	0.0	0.1	2.3	0.7
Engines, pumps, turbines	0.2	0.2	2.6	4.0	17.2	3.4	0.1	1.5	0.8	0.4
Textile and paper machines	9.5	0.2	0.5	0.9	0.0	0.3	0.0	0.2	0.1	28.6
Other special machines	0.8	0.4	1.2	0.5	0.9	0.5	0.0	0.3	0.8	1.0
Thermal processes and apparatus	0.0	1.1	6.5	1.2	0.4	11.6	0.2	6.0	0.8	0.0
Mechanical elements	0.5	0.3	0.7	0.6	8.0	1.0	0.1	0.3	1.1	0.4
Transport	0.0	0.1	1.9	1.2	24.2	3.5	0.1	0.9	1.0	0.1
Furniture, games	0.0	0.8	3.8	1.0	0.2	2.1	0.0	1.6	0.3	0.6
Other consumer goods	0.1	2.0	5.2	3.1	0.1	1.4	0.2	5.3	0.8	0.3
Civil engineering	0.0	0.1	2.9	0.3	0.3	0.5	0.1	0.2	3.9	0.0

Note: WIPO's IPC technology concordance table was used to convert IPC symbols into 35 corresponding fields of technology (see Annex A for details).

Sources: WIPO Statistics Database and EPO PATSTAT database, September 2017.

Figure A29
Trend in university and PRO patent families worldwide



■ UNIVERSITY AND PRO ■ GROWTH RATE (%)

Note: PRO means public research organization. A patent family is defined as patent applications interlinked by one or more of: priority claim, Patent Cooperation Treaty national phase entry, continuation, continuation-in-part, internal priority and addition or division. Patent families here include only those associated with patent applications for inventions and exclude patent families associated with utility model applications.

Sources: WIPO Statistics Database and EPO PATSTAT database, October 2017.

Figure A30**Top five university and PRO patent applicants worldwide for selected origins, based on patent families**

Origin	Applicant	2011	2012	2013	2014
China	ZHEJIANG UNIVERSITY	2,147	2,301	2,674	2,629
	TSINGHUA UNIVERSITY	1,582	1,876	1,785	1,831
	HARBIN INSTITUTE OF TECHNOLOGY	1,123	1,547	2,036	2,230
	SOUTHEAST UNIVERSITY	1,255	1,374	1,873	2,109
	SHANGHAI JIAO TONG UNIVERSITY	1,250	1,478	1,673	1,631
Germany	FRAUNHOFER GES FORSCHUNG	447	474	552	510
	DEUTSCH ZENTR LUFT & RAUMFAHRT	208	215	235	174
	TECH UNIVERSITY DRESDEN	59	56	71	91
	KARLSRUHER INST TECHNOLOGIE	50	63	50	49
	MAX PLANCK GESELLSCHAFT	70	61	32	40
France	COMMISSARIAT A L'ÉNERGIE ATOMIQUE ET AUX ÉNERGIES ALTERNATIVES	599	644	688	682
	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE (CNRS)	229	205	161	178
	IFP ENERGIES NOUVELLES	169	172	161	168
	INSTITUT NATIONAL DE LA SANTE ET DE LA RECHERCHE MEDICALE	179	145	158	151
	CENTRE NATIONAL D'ÉTUDES SPATIALES	35	29	22	21
Japan	NAT INST OF ADV IND & TECHNOL	408	505	465	435
	TOKYO UNIVERSITY	196	197	293	252
	RAILWAY TECHNICAL RES INST	193	171	183	173
	TOHOKU UNIVERSITY	162	161	159	165
	KYOTO UNIVERSITY	132	137	141	164
Rep. of Korea	KOREA ELECTRONICS TELECOMM	1,502	2,094	1,637	1,734
	KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY	908	1,040	745	766
	KOREA ELECTRONICS TECHNOLOGY	512	711	632	635
	YONSEI UNIVERSITY INDUSTRY ACADEMIC COOPERATION FOUNDATION	473	518	484	724
	SEOUL NAT UNIV IND FOUNDATION	469	513	484	541
U.S.	UNIVERSITY OF CALIFORNIA	585	638	732	666
	MASSACHUSETTS INSTITUTE TECHNOLOGY	218	294	386	327
	THE JOHNS HOPKINS UNIVERSITY	222	219	229	275
	STANFORD UNIVERSITY	186	202	287	198
	THE UNIVERSITY OF TEXAS SYSTEM	167	176	258	251

Note: PRO means public research organization. A patent family is defined as patent applications interlinked by one or more of: priority claim, Patent Cooperation Treaty national phase entry, continuation, continuation-in-part, internal priority and addition or division. Patent families include only those associated with patent applications for inventions and exclude patent families associated with utility model applications.

Sources: WIPO Statistics Database and EPO PATSTAT database, September 2017.

Figure A31
Distribution of technology fields for selected universities and PROs
based on patent families, 2011-14

Field of technology	Applicant												
	Zhejiang Univ	Tsinghua Univ	Commissariat Energie Atomique	Centre national de la recherche scientifique (CNRS)	Fraunhofer Ges Forschung	Deutsch Zentr Luft & Raumfahrt	Nat Inst of Adv Ind & Tech	Tokyo Univ	Korea Electronics Telecomm	Korea Advanced Inst Sci & Tech	Univ of California	Massachusetts Inst Tech	
Electrical machinery, apparatus, energy	6.7	8.0	12.3	4.9	6.4	5.4	9.6	10.2	2.8	9.7	3.6	6.9	
Audio-visual technology	1.3	2.3	2.1	1.1	6.2	0.8	1.3	1.7	9.1	3.4	1.0	1.7	
Telecommunications	1.2	2.2	2.0	1.5	2.8	3.5	0.6	1.3	11.7	4.9	0.8	1.9	
Digital communication	2.9	7.8	1.9	0.2	2.5	3.2	0.6	1.2	28.8	6.9	0.8	2.3	
Basic communication processes	0.7	1.5	1.8	1.7	2.1	4.2	0.4	0.3	2.2	2.4	0.9	1.3	
Computer technology	10.0	13.3	7.1	2.4	8.7	2.7	2.7	4.6	21.5	15.9	5.1	5.7	
IT methods for management	0.8	1.2	0.2	0.0	0.2	0.3	0.4	0.8	4.2	2.7	0.6	0.5	
Semiconductors	1.7	5.9	17.5	4.7	7.4	0.9	14.8	3.5	3.7	6.9	4.7	5.7	
Optics	2.1	3.4	3.9	3.8	5.3	1.6	4.0	3.0	3.2	3.0	2.1	3.8	
Measurement	13.4	13.7	12.1	10.6	12.1	16.5	11.9	10.7	4.1	6.4	6.1	6.9	
Analysis of biological materials	0.8	0.3	1.2	5.4	1.2	0.2	2.3	4.5	0.3	1.3	6.5	3.3	
Control	3.1	2.5	0.7	0.5	0.8	6.3	0.8	1.0	2.6	1.5	0.4	1.1	
Medical technology	2.6	2.4	2.1	2.7	3.4	2.6	2.2	4.8	1.2	3.3	11.4	8.0	
Organic fine chemistry	4.5	1.4	0.9	8.8	0.9	0.0	3.7	5.4	0.0	0.7	5.9	3.6	
Biotechnology	5.7	2.4	1.1	12.1	2.8	0.2	7.7	11.8	0.2	4.2	17.4	12.4	
Pharmaceuticals	3.2	0.7	0.8	11.7	1.2	0.0	1.5	7.3	0.0	1.1	16.2	9.9	
Macromolecular chemistry, polymers	2.4	0.6	0.8	2.1	2.4	0.2	2.9	4.1	0.1	0.6	1.4	1.3	
Food chemistry	3.5	0.2	0.1	0.4	0.4	0.0	0.5	1.1	0.0	0.1	1.0	0.6	
Basic materials chemistry	2.6	1.6	1.7	3.2	2.8	0.7	3.4	2.1	0.1	1.3	2.1	1.9	
Materials, metallurgy	4.7	3.6	3.2	3.4	3.4	1.3	7.9	3.6	0.1	2.6	1.2	2.0	
Surface technology, coating	1.7	1.6	4.0	2.1	4.3	1.1	3.8	1.1	0.3	1.4	1.8	3.1	
Micro-structural and nano-technology	1.0	1.8	3.4	2.5	1.3	0.0	1.6	1.1	0.2	2.6	1.3	1.9	
Chemical engineering	3.8	3.4	3.2	5.7	2.4	0.3	5.4	2.8	0.3	2.5	2.8	4.5	
Environmental technology	3.3	3.3	2.3	1.8	0.7	0.9	2.2	1.0	0.0	1.0	0.7	1.7	
Handling	1.0	1.3	1.1	0.6	1.1	4.8	0.7	0.3	0.3	1.6	0.2	0.8	
Machine tools	1.5	2.1	1.4	0.9	4.5	0.4	1.0	0.8	0.0	0.6	0.2	0.3	
Engines, pumps, turbines	2.1	3.3	3.6	1.0	1.3	6.5	1.1	1.2	0.1	1.4	0.7	1.0	
Textile and paper machines	0.6	0.5	0.2	0.2	0.6	1.4	0.7	1.0	0.1	0.4	0.2	0.5	
Other special machines	3.4	0.6	1.3	1.6	3.4	8.4	2.0	2.7	0.4	1.4	1.1	2.3	
Thermal processes and apparatus	1.8	1.8	3.0	0.7	1.4	4.8	0.7	1.4	0.1	0.6	0.5	1.0	
Mechanical elements	2.0	1.1	1.0	0.6	1.5	4.5	0.4	0.4	0.0	1.4	0.4	0.9	
Transport	1.6	2.0	1.2	0.3	1.5	15.4	0.4	2.0	1.2	3.3	0.3	0.7	
Furniture, games	0.4	0.1	0.2	0.1	0.7	0.2	0.3	0.2	0.3	0.9	0.3	0.2	
Other consumer goods	0.3	0.2	0.3	0.5	1.1	0.4	0.1	0.4	0.2	0.5	0.3	0.3	
Civil engineering	1.7	2.0	0.4	0.2	0.8	0.1	0.3	0.8	0.1	1.4	0.3	0.2	

Note: PRO means public research organization. A patent family is defined as patent applications interlinked by one or more of: priority claim, Patent Cooperation Treaty national phase entry, continuation, continuation-in-part, internal priority and addition or division. Patent families here include only those associated with patent applications for inventions and exclude patent families associated with utility model applications. WIPO's IPC technology concordance table was used to convert IPC symbols into 35 corresponding fields of technology (see Annex A for details).

Sources: WIPO Statistics Database and EPO PATSTAT database, October 2017.

Published patent applications by field of technology

Figure A32

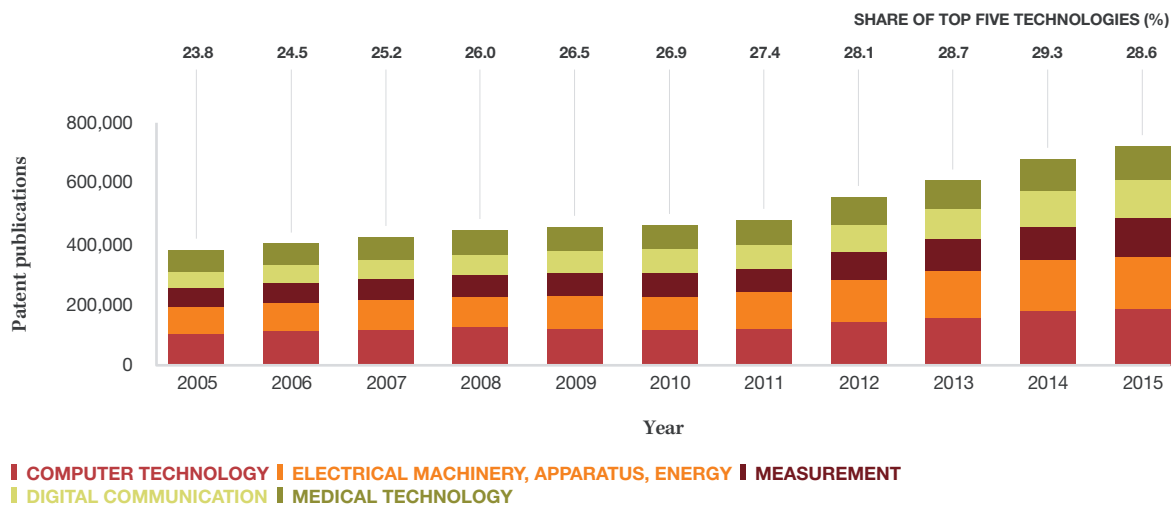
Published patent applications worldwide by field of technology

Field of technology	2005	2010	2015	Share (%) of 2015	Average growth (%) 2005-15
Electrical Engineering					
Electrical machinery, apparatus, energy	89,962	110,667	176,457	7.0	7.0
Audio-visual technology	87,442	72,811	75,133	3.0	-1.5
Telecommunications	60,638	54,162	50,786	2.0	-1.8
Digital communication	53,654	75,728	123,258	4.9	8.7
Basic communication processes	17,632	15,471	15,661	0.6	-1.2
Computer technology	105,158	121,224	187,007	7.4	5.9
IT methods for management	18,125	22,829	42,270	1.7	8.8
Semiconductors	67,453	71,547	77,542	3.1	1.4
Instruments					
Optics	69,650	60,613	63,590	2.5	-0.9
Measurement	61,548	75,815	123,986	4.9	7.3
Analysis of biological materials	12,524	11,422	15,200	0.6	2.0
Control	26,676	28,099	49,593	2.0	6.4
Medical technology	69,527	77,944	110,109	4.4	4.7
Chemistry					
Organic fine chemistry	57,323	54,253	63,603	2.5	1.0
Biotechnology	38,296	39,068	55,499	2.2	3.8
Pharmaceuticals	73,701	71,276	102,790	4.1	3.4
Macromolecular chemistry, polymers	27,965	28,531	45,576	1.8	5.0
Food chemistry	22,391	27,659	63,150	2.5	10.9
Basic materials chemistry	39,075	44,451	82,202	3.3	7.7
Materials, metallurgy	29,406	37,377	63,835	2.5	8.1
Surface technology, coating	27,962	32,222	42,671	1.7	4.3
Micro-structural and nano-technology	2,145	3,366	4,725	0.2	8.2
Chemical engineering	33,619	36,887	60,479	2.4	6.0
Environmental technology	20,880	25,776	42,979	1.7	7.5
Mechanical Engineering					
Handling	43,339	42,382	68,535	2.7	4.7
Machine tools	36,024	42,237	76,060	3.0	7.8
Engines, pumps, turbines	41,418	48,133	65,336	2.6	4.7
Textile and paper machines	38,280	30,643	38,380	1.5	0.0
Other special machines	46,948	49,107	89,750	3.6	6.7
Thermal processes and apparatus	24,238	29,092	42,876	1.7	5.9
Mechanical elements	42,620	45,746	69,589	2.8	5.0
Transport	65,748	66,359	105,294	4.2	4.8
Other fields					
Furniture, games	42,116	41,695	61,930	2.5	3.9
Other consumer goods	33,450	31,915	50,882	2.0	4.3
Civil engineering	51,225	56,268	90,185	3.6	5.8
Unknown	20,298	29,537	20,305	0.8	0.0
Total	1,598,456	1,712,312	2,517,223	100.0	4.6

Note: Data refer to published patent applications. There is a minimum delay of 18 months between the application date and the publication date. WIPO's IPC technology concordance table was used to convert IPC symbols into 35 corresponding fields of technology (see Annex A for details).

Sources: WIPO Statistics Database and EPO PATSTAT database, October 2017.

Figure A33
Trend in published patent applications for the top five technology fields



Note: Data refer to published patent applications. There is a minimum delay of 18 months between the application date and the publication date. WIPO's IPC technology concordance table was used to convert IPC symbols into 35 corresponding fields of technology (see Annex A for details). The top five fields were selected based on their 2015 totals.

Sources: WIPO Statistics Database and EPO PATSTAT database, October 2017.

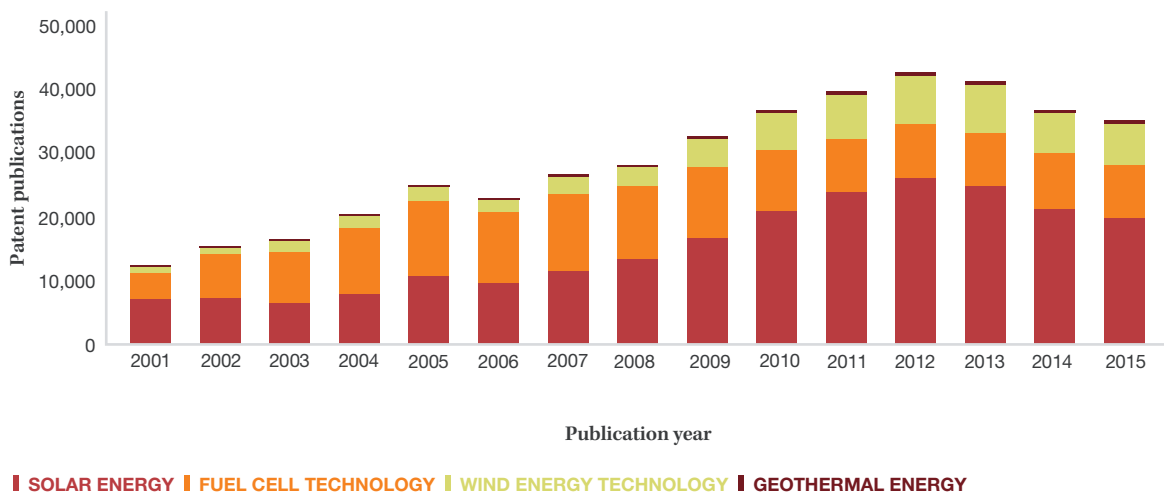
Figure A34
Distribution of published patent applications by technology field for the top 10 origins, 2013-15

Field of technology	Origin									
	China	France	Germany	Japan	Netherlands	Rep. of Korea	Russian Federation	Switzerland	U.K.	U.S.
Electrical machinery, apparatus, energy	6.8	6.3	9.2	10.9	7.5	9.3	3.6	4.3	5.8	4.6
Audio-visual technology	2.0	2.5	1.5	5.4	3.0	5.7	0.7	1.0	1.8	3.0
Telecommunications	1.8	2.4	0.9	2.6	1.3	3.4	1.2	0.6	2.0	2.5
Digital communication	5.4	5.9	1.5	2.9	2.4	5.9	0.6	1.2	3.6	6.6
Basic communication processes	0.4	0.6	0.6	0.9	0.8	0.6	0.8	0.5	0.6	0.9
Computer technology	6.7	5.7	3.1	6.5	5.7	9.1	2.5	2.4	6.3	12.6
IT methods for management	1.0	0.9	0.4	1.1	0.7	3.4	0.4	0.7	1.5	3.4
Semiconductors	1.8	2.5	2.8	6.4	3.5	6.9	0.9	0.7	1.3	3.2
Optics	1.5	1.7	1.6	6.6	4.0	3.4	0.8	1.0	1.6	1.8
Measurement	6.3	5.3	5.6	4.3	5.1	3.5	7.5	7.8	5.2	3.9
Analysis of biological materials	0.4	0.9	0.6	0.3	0.8	0.4	2.1	1.5	1.4	0.9
Control	2.4	1.3	1.7	1.7	1.0	1.4	1.6	1.3	1.8	1.8
Medical technology	2.1	3.8	4.9	3.2	10.3	2.7	6.4	7.0	6.4	8.4
Organic fine chemistry	2.3	5.2	3.5	1.6	3.6	1.3	1.6	8.0	4.7	3.1
Biotechnology	1.8	2.9	1.7	0.9	3.8	1.4	1.8	5.7	3.9	3.5
Pharmaceuticals	4.3	4.4	2.7	1.2	3.4	1.9	4.3	11.5	6.4	5.6
Macromolecular chemistry, polymers	2.1	1.5	2.1	2.1	3.3	1.1	0.9	1.9	0.8	1.4
Food chemistry	4.5	0.9	0.5	0.8	3.5	1.7	13.2	4.0	1.3	1.2
Basic materials chemistry	4.4	2.1	3.5	2.1	4.9	1.5	3.6	3.5	3.4	2.9
Materials, metallurgy	4.0	2.2	1.9	2.3	1.0	2.0	5.6	1.5	1.4	1.1
Surface technology, coating	1.8	1.6	1.8	2.3	1.2	1.6	1.9	1.4	1.2	1.4
Micro-structural and nano-technology	0.2	0.3	0.2	0.1	0.2	0.2	0.8	0.2	0.1	0.2
Chemical engineering	3.0	2.4	2.7	1.4	2.8	2.0	3.2	2.5	3.0	2.0
Environmental technology	2.3	1.6	1.6	1.3	1.8	1.6	2.1	1.4	1.8	1.1
Handling	2.9	2.3	3.2	2.8	3.0	1.9	1.0	5.7	2.6	2.0
Machine tools	4.7	1.6	3.8	2.3	0.9	2.2	3.0	1.7	1.3	1.6
Engines, pumps, turbines	1.6	4.9	6.4	3.2	1.0	1.9	4.7	2.8	3.7	2.7
Textile and paper machines	1.8	0.7	1.5	2.5	1.3	0.9	0.4	2.3	0.8	1.0
Other special machines	4.3	3.4	3.4	2.7	4.6	2.7	5.5	2.5	2.6	2.5
Thermal processes and apparatus	2.1	1.6	1.8	1.8	1.0	2.0	1.7	1.4	1.4	0.9
Mechanical elements	2.4	3.7	7.0	2.9	1.6	2.0	3.0	1.9	3.1	2.0
Transport	2.5	9.6	9.6	5.4	2.5	5.2	4.3	1.6	4.8	2.9
Furniture, games	2.0	1.7	1.5	3.6	2.4	2.5	1.1	3.0	3.5	2.3
Other consumer goods	2.1	2.1	1.9	1.5	1.6	2.7	0.9	3.5	3.8	1.7
Civil engineering	4.0	3.3	3.2	2.2	4.3	4.0	6.3	2.0	5.1	3.1

Note: Data refer to published patent applications. There is a minimum delay of 18 months between the application date and the publication date. WIPO's IPC technology concordance table was used to convert IPC symbols into 35 corresponding fields of technology (see Annex A for details). The top 10 origins were selected based on their 2013-15 total published applications.

Sources: WIPO Statistics Database and EPO PATSTAT database, October 2017.

Figure A35
Trend in patent applications in energy-related technologies



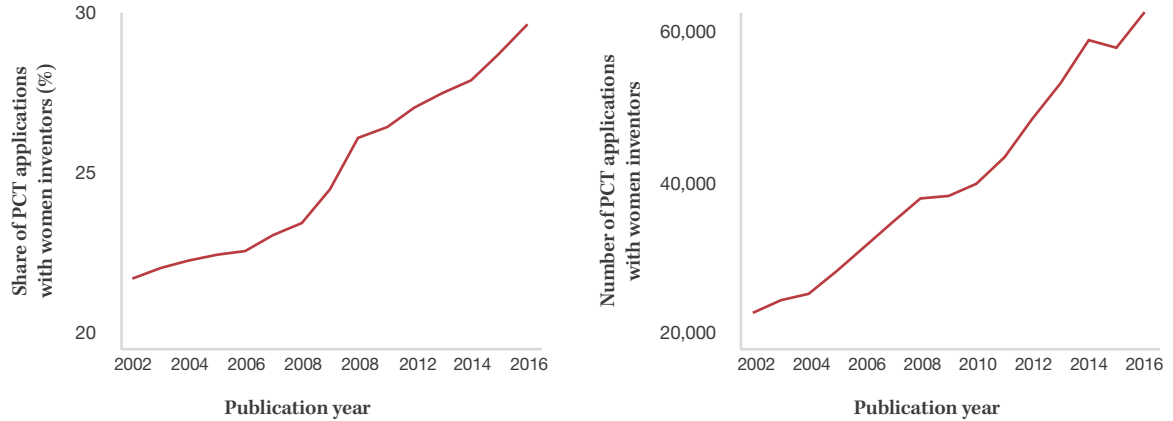
■ SOLAR ENERGY ■ FUEL CELL TECHNOLOGY ■ WIND ENERGY TECHNOLOGY ■ GEOTHERMAL ENERGY

Note: For definitions of the technologies – fuel cells, geothermal, solar and wind energy – see Annex B. The correspondence between IPC symbols and technology fields is not always clear (there is no one-to-one relationship). It is thus difficult to capture all patents in a specific technology field. Even so, the IPC-based definitions are likely to capture the vast majority of patent applications in these areas. Data refer to published patent applications.

Sources: WIPO Statistics Database and EPO PATSTAT database, October 2017.

Patent applications by gender

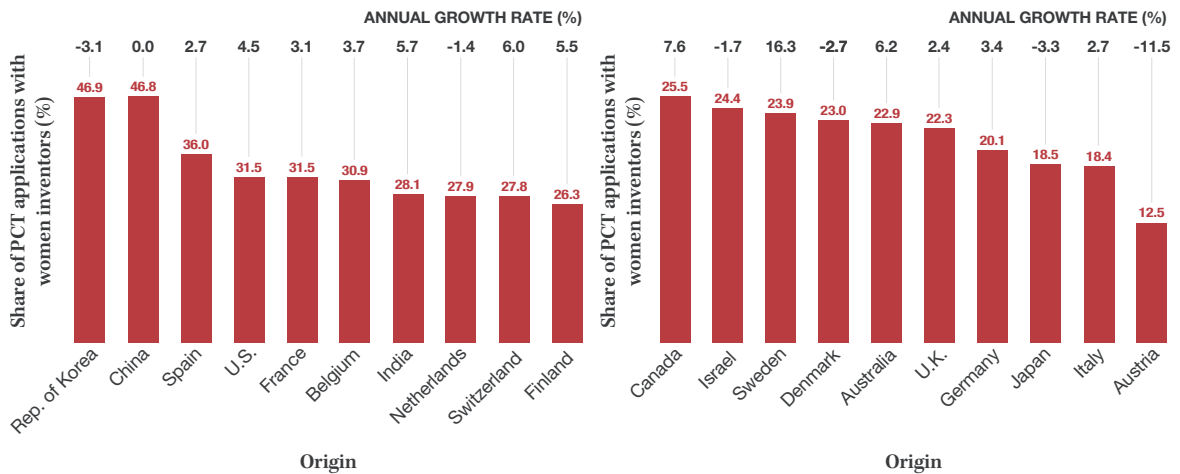
Figure A36
Women inventors in PCT applications



Note: In order to attribute gender to inventors' names recorded in PCT applications, WIPO produced a world gender-name dictionary based on information from 13 different public sources. Gender is attributed to a given name on a country-by-country basis because certain names can be considered male in one country but female in another.

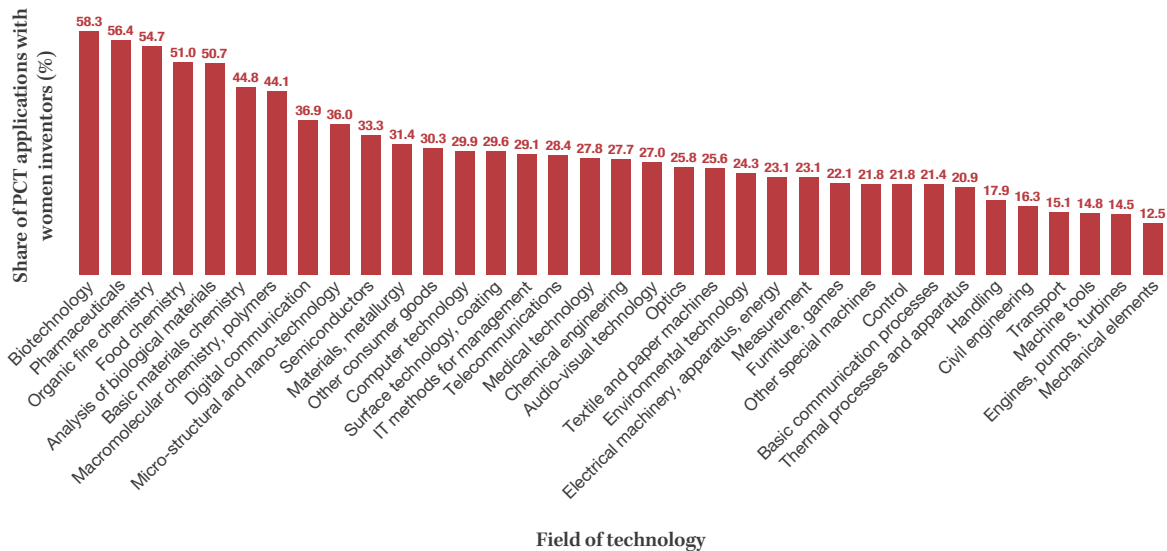
Sources: WIPO Statistics Database, September 2017.

Figure A37
Share of PCT applications with women inventors for the top 20 origins, 2016



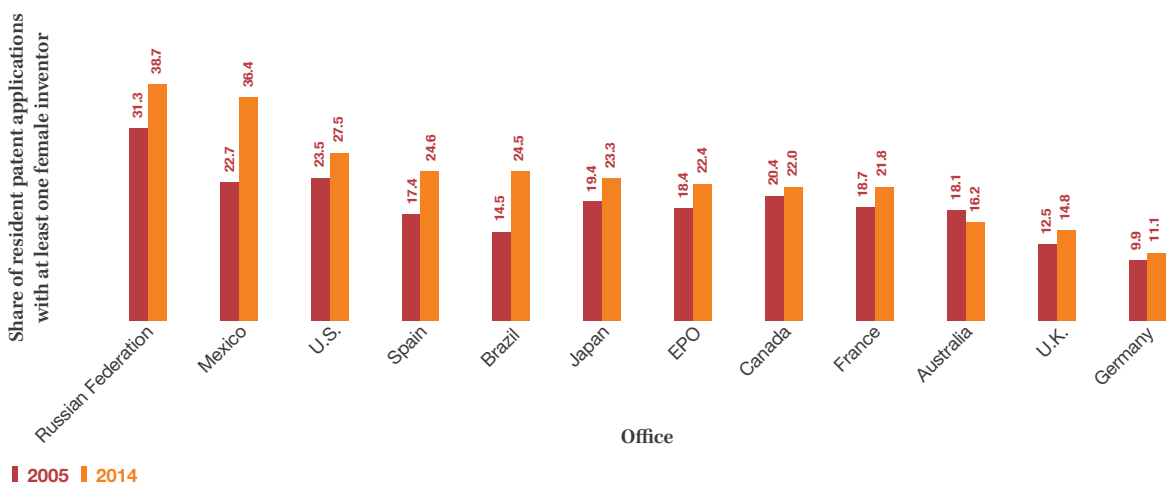
Note: In order to attribute gender to inventors' names recorded in PCT applications, WIPO produced a gender-name dictionary based on information from 13 different public sources. Gender is attributed to a given name on a country-by-country basis because certain names can be considered male in one country but female in another.

Sources: WIPO Statistics Database, September 2017.

Figure A38**Share of PCT international patent applications with women inventors by field of technology, 2016**

Note: In order to attribute gender to inventors' names recorded in PCT applications, WIPO produced a gender-name dictionary based on information from 13 different public sources. Gender is attributed to a given name on a country-by-country basis because certain names can be considered male in one country but female in another.

Sources: WIPO Statistics Database, September 2017.

Figure A39**Share of patent applications with women inventors for selected patent offices**

Sources: WIPO Statistics Database and EPO PATSTAT database, September 2017.

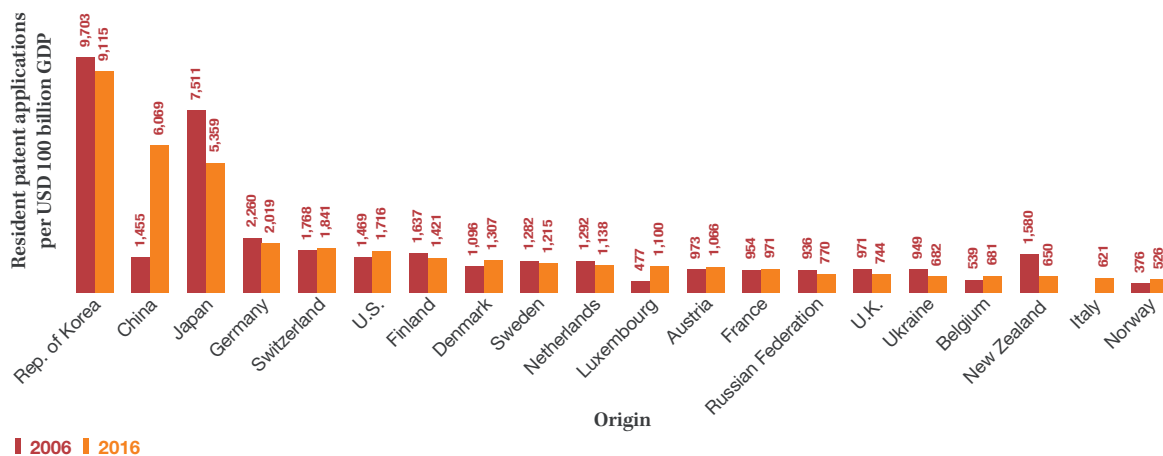
Figure A40**Share of patent applications with women inventors for selected patent offices by field of technology, 2014**

Field of technology	Office											
	Australia	Brazil	Canada	EPO	France	Germany	Japan	Mexico	Russian Federation	Spain	U.K.	U.S.
Electrical machinery, apparatus, energy	9.7	17.5	22.1	16.1	18.1	9.5	21.7	14.3	25.2	27.9	12.1	21.3
Audio-visual technology	7.8	7.4	20.8	14.8	17.2	9.9	20.7	23.1	24.8	12.4	8.4	25.5
Telecommunications	10.4	27.5	14.6	18.0	17.8	7.6	20.2	26.3	19.5	15.9	11.1	24.8
Digital communication	10.3	12.9	20.1	21.4	17.6	7.3	22.0	25.0	16.0	21.7	15.8	28.2
Basic communication processes	9.1	0.0	5.7	12.6	14.5	6.0	14.9	25.0	18.1	21.4	6.5	23.8
Computer technology	18.4	17.4	20.8	19.2	21.3	11.4	23.4	26.1	23.5	30.7	11.2	27.5
IT methods for management	14.9	17.0	23.1	18.5	19.6	10.1	28.1	20.9	14.3	27.3	13.5	27.0
Semiconductors	40.9	54.5	44.8	26.1	30.9	18.5	24.8	22.2	41.1	43.3	27.7	37.6
Optics	18.9	23.2	19.2	21.6	24.8	13.0	23.4	12.5	29.4	35.6	15.0	25.6
Measurement	13.8	24.9	20.9	15.6	20.7	11.3	22.1	32.4	26.3	39.5	12.9	23.6
Analysis of biological materials	46.8	71.1	48.6	48.6	50.8	27.7	42.4	65.0	81.1	69.3	32.3	46.4
Control	8.4	16.0	20.8	12.3	17.9	10.5	22.8	29.4	31.9	15.5	7.8	21.2
Medical technology	27.7	25.4	31.8	22.5	20.7	16.5	27.2	41.8	56.0	30.6	21.1	26.4
Organic fine chemistry	42.0	70.4	53.5	59.8	63.8	58.4	43.6	73.6	70.2	74.2	52.6	50.7
Biotechnology	50.6	82.8	47.9	60.5	60.2	40.5	44.9	74.7	77.9	81.9	46.4	50.2
Pharmaceuticals	43.4	78.7	51.9	61.9	58.4	39.0	48.8	64.7	71.8	74.3	47.6	48.4
Macromolecular chemistry, polymers	18.4	50.0	35.7	48.3	51.3	36.1	32.3	60.0	73.2	53.8	41.3	43.4
Food chemistry	34.0	56.9	31.1	49.7	40.8	14.7	43.5	41.9	58.7	44.2	22.0	37.4
Basic materials chemistry	19.8	56.4	28.1	49.2	49.5	35.4	37.0	39.7	52.7	49.2	30.1	42.2
Materials, metallurgy	20.2	40.3	27.7	29.9	48.5	19.1	27.0	39.7	54.8	50	25.2	31.1
Surface technology, coating	21.9	32.6	21.9	25.0	35.8	16.7	26.8	38.2	42.9	28.8	16.6	31.2
Micro-structural and nano-technology	60.9	80.0	34.9	35.5	34.7	17.5	28.1	63.6	53.2	70.2	32.5	36.0
Chemical engineering	15.9	30.9	24.8	22.0	33.4	15.8	25.5	43.9	46.3	34.6	16.7	26.5
Environmental technology	14.9	34.5	15.7	19.9	25.5	12.7	24.4	42.9	32.4	26.9	13.1	21.8
Handling	2.6	15.3	12.2	10.0	12.9	7.0	20.1	23.7	19.8	15.5	8.9	18.1
Machine tools	4.6	17.7	14.3	8.4	11.0	7.2	20.5	27.3	27.5	18.5	5.2	16.6
Engines, pumps, turbines	1.2	8.9	16.8	11.4	20.0	9.6	19.0	19.2	15.6	14.1	5.6	14.0
Textile and paper machines	20.6	31.4	14.0	22.6	29.7	15.1	23.6	26.3	58.4	20.7	17.9	29.1
Other special machines	8.6	13.7	20.0	15.1	18.2	9.5	24.3	23.2	30.4	17.0	9.7	20.6
Thermal processes and apparatus	9.6	14.3	5.0	12.8	18.1	9.5	22.9	21.4	25.6	23.5	4.7	15.4
Mechanical elements	1.6	12.6	11.6	8.9	13.6	7.0	18.0	21.7	23.0	18.8	5.4	11.4
Transport	5.2	12.0	12.6	10.5	15.3	8.5	18.1	18.2	19.1	14.7	9.2	14.3
Furniture, games	17.0	12.7	15.9	13.1	17.4	12.8	20.0	17.5	14.2	16.2	12.8	20.0
Other consumer goods	20.3	18.7	31.3	22.6	28.6	20.1	26.3	23.7	39.8	24.8	23.8	28.6
Civil engineering	5.9	12.0	13.9	9.3	10.9	6.5	20.8	14.0	20.0	13.1	5.3	15.6

Sources: WIPO Statistics Database and EPO PATSTAT database, September 2017.

Patent applications in relation to GDP and population

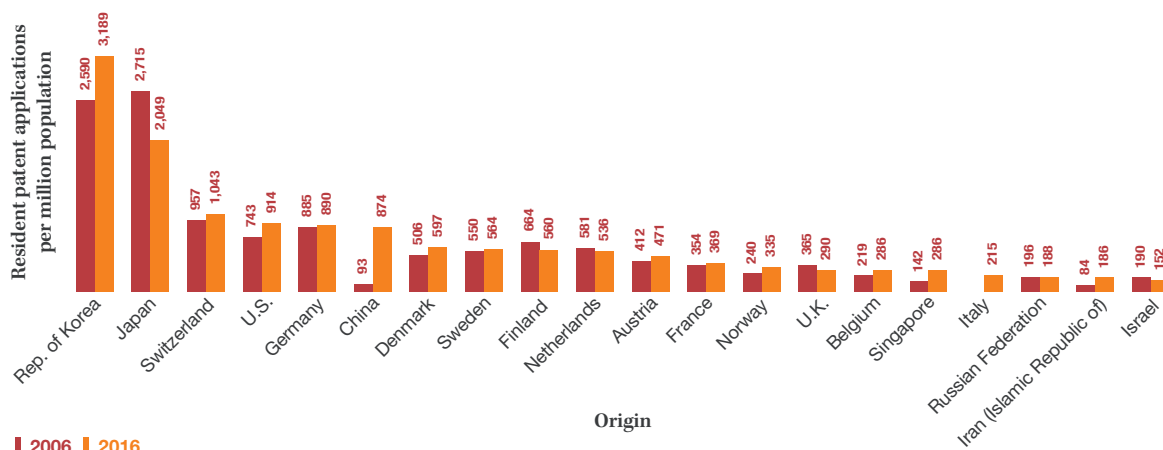
Figure A41
Resident patent applications per USD 100 billion GDP for the top 20 origins



Note: GDP data are in 2011 US PPP dollars. The top 20 origins were included if they had a GDP greater than USD 25 billion PPP and more than 100 resident patent applications. Due to space constraints, only the top 20 origins that fulfil these criteria are presented.

Sources: WIPO Statistics Database and World Bank, September 2017.

Figure A42
Resident patent applications per million population for the top 20 origins

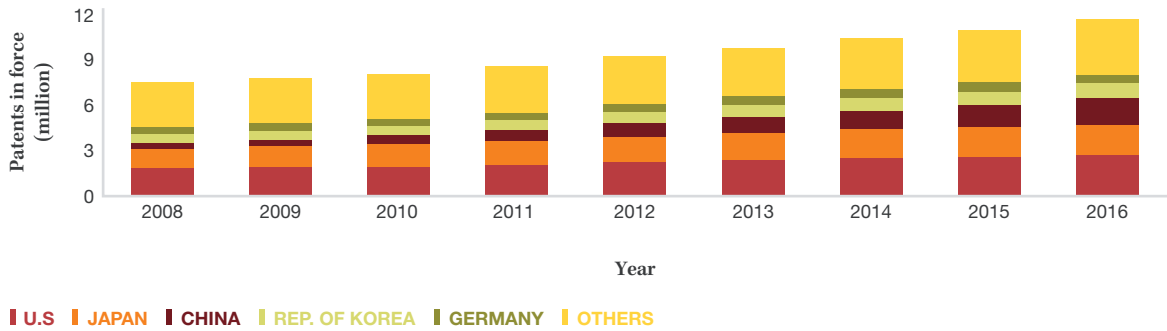


Note: The top 20 origins were included if they had a population greater than 5 million and if they had more than 100 resident patent applications. Due to space constraints, only the top 20 origins that fulfil these criteria are presented.

Sources: WIPO Statistics Database and World Bank, September 2017.

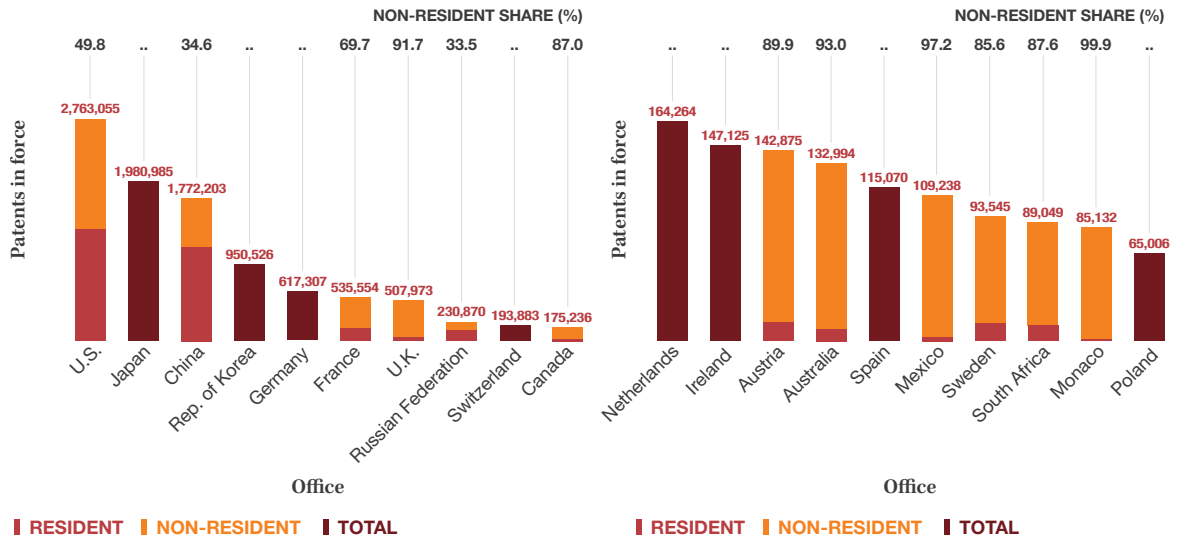
Patents in force

Figure A43
Trend in patents in force worldwide



Note: World totals are WIPO estimates using data covering 107 offices.
Sources: WIPO Statistics Database, September 2017.

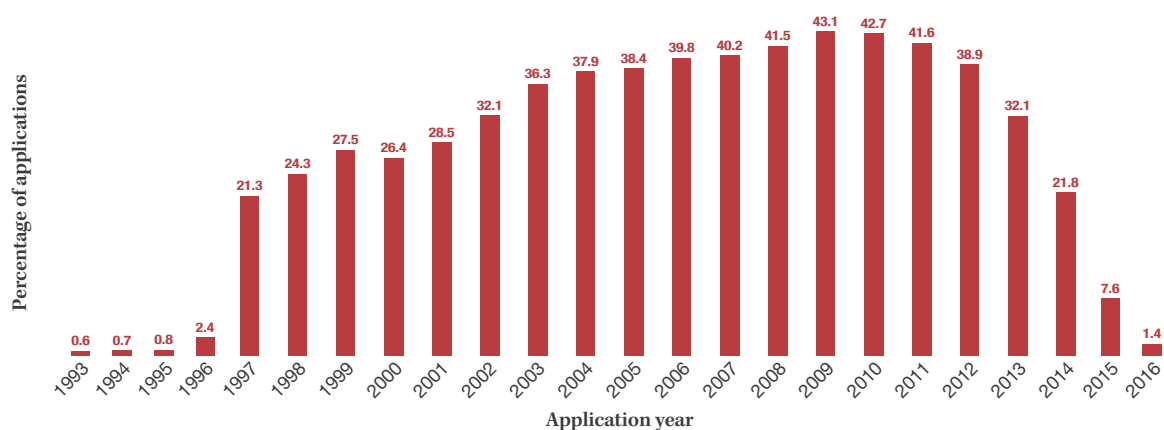
Figure A44
Patents in force at the top 20 offices, 2016



.. indicates not available.

Sources: WIPO Statistics Database, September 2017.

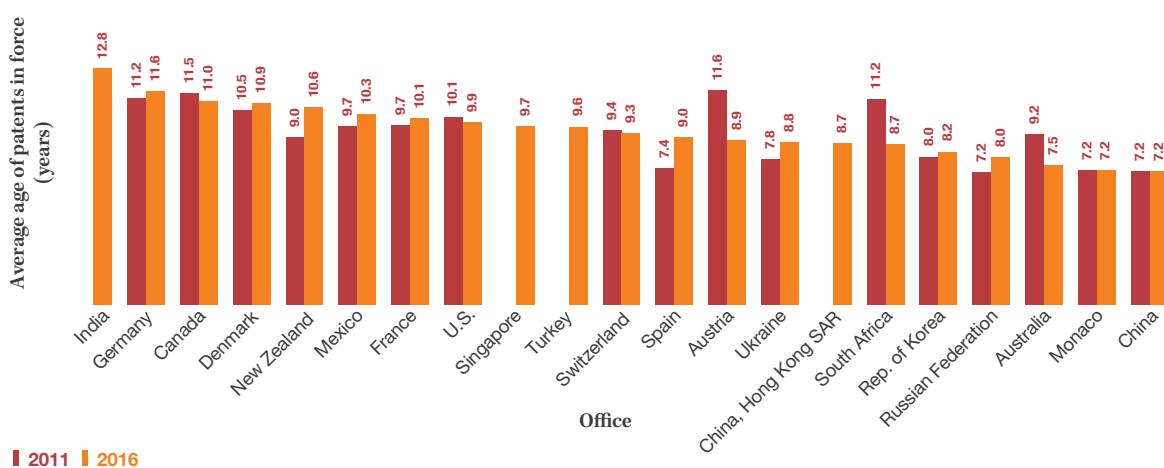
Figure A45
Patents in force in 2016 as a percentage of total applications



Note: Percentages are calculated as the number of patent applications filed in year t and in force in 2016, divided by the total number of patent applications filed in year t . Patent holders must pay maintenance fees to maintain the validity of their patents. Depending on technological and commercial considerations, patent holders may opt to let a patent lapse before the end of the full protection term. This figure shows the distribution of patents in force in 2016 as a percentage of total applications in the year of filing. But not all offices provide these data. Data for 72 offices show that 40-43% of the applications for which patents were eventually granted remained in force for at least 6 to 10 years after the application date. About 21% of these patents lasted the full 20-year patent term.

Sources: WIPO Statistics Database, September 2017.

Figure A46
Average age of patents in force at selected offices

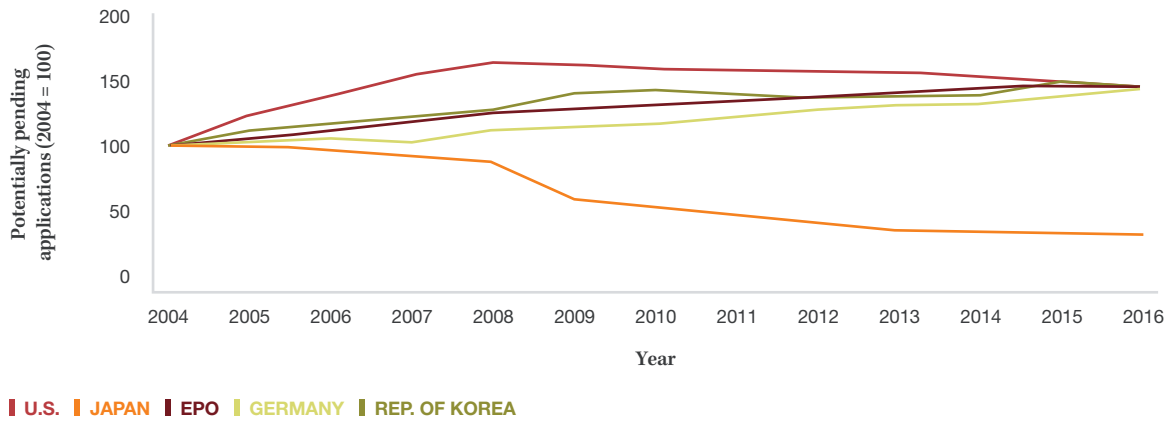


■ 2011 ■ 2016

Sources: WIPO Statistics Database, September 2017.

Pending patent applications

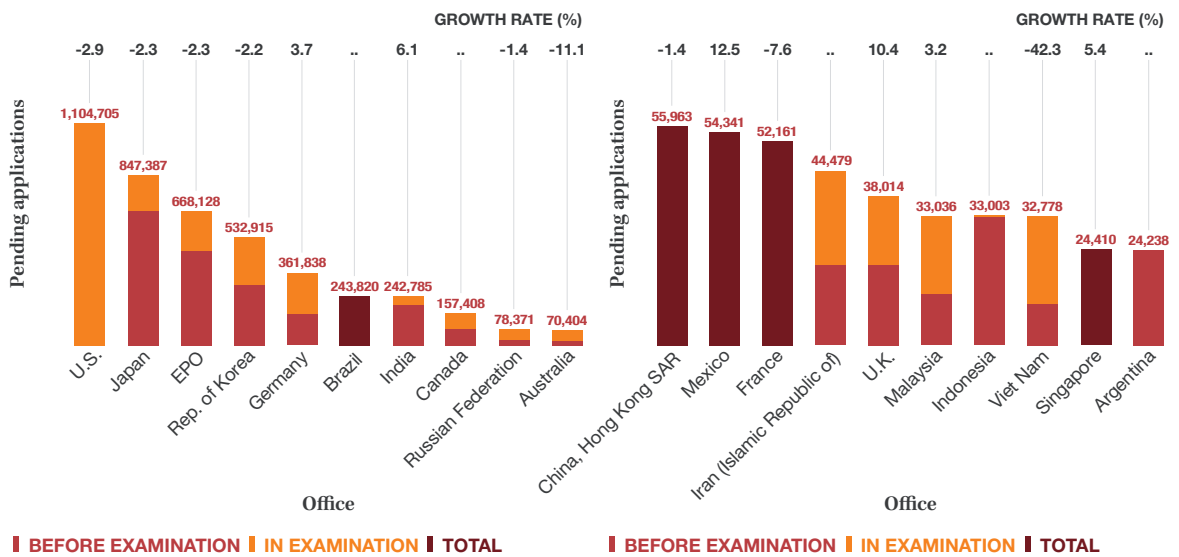
Figure A47
Potentially pending applications at the top offices



Note: EPO is the European Patent Office. Application processing varies across offices, making it difficult to measure pending applications. In some offices patent applications automatically proceed to the examination stage unless applicants withdraw them; in others, applications do not proceed to examination unless applicants file a separate request for examination. To take account of procedural differences, pending application data are separated between (a) all patent applications, at any stage in the process, that are awaiting a final decision by a patent office, including those for which applicants have not filed a request for examination (where applicable) and (b) patent applications undergoing examination for which the applicant has requested examination (where such separate requests are necessary). Data for the State Intellectual Property Office of the People's Republic of China (SIPO), the office that receives the most applications, were unavailable.

Sources: WIPO Statistics Database, September 2017.

Figure A48
Potentially pending applications at the top 20 offices, 2016



.. indicates not available.

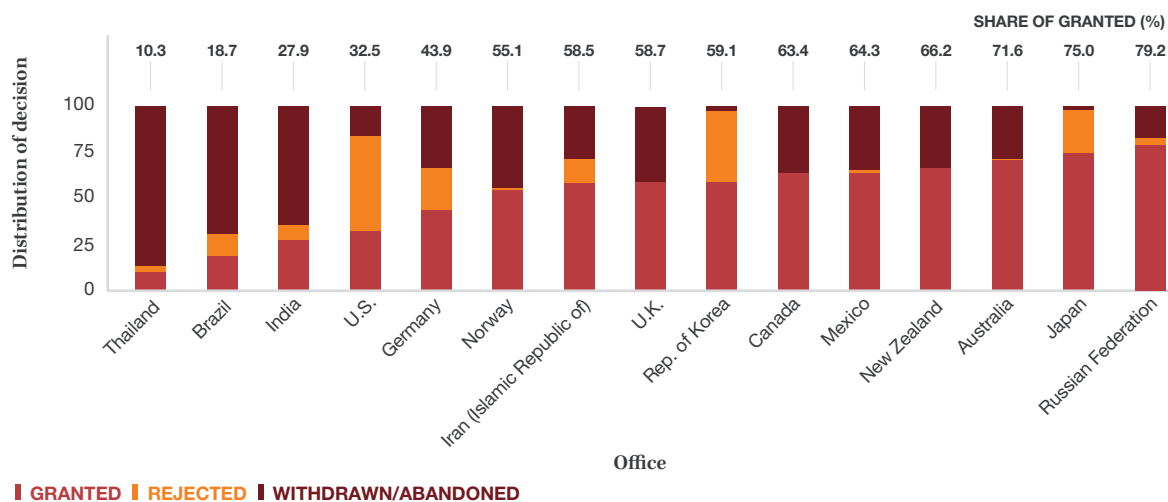
Note: EPO is the European Patent Office. Potentially pending applications include all patent applications, at any stage in the process, awaiting a final decision by a patent office, including those for which applicants have not filed a request for examination (where applicable). Data for Brazil include both pending patent and utility model applications, and so are not comparable with other offices.

Sources: WIPO Statistics Database, September 2017.

Patent examination process

Figure A49

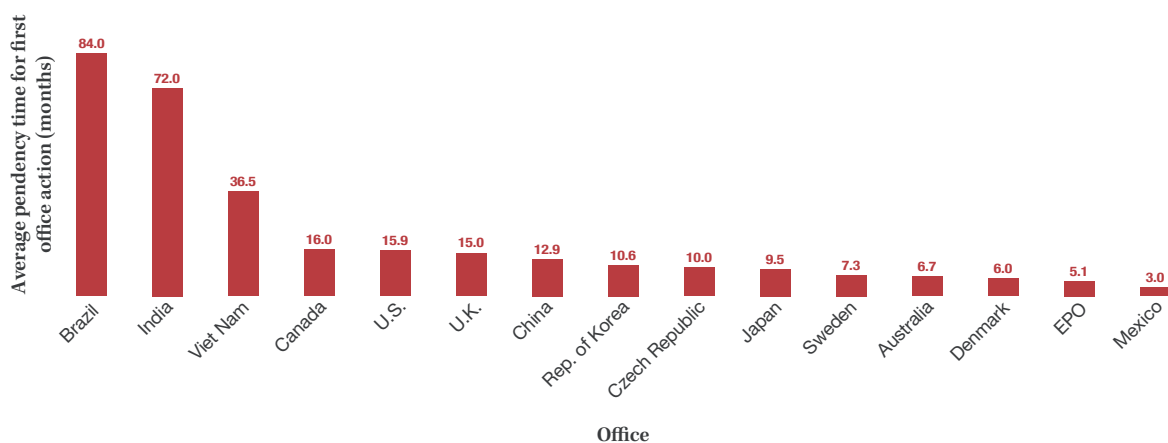
Distribution of patent examination decisions for selected offices, 2016



Note: WIPO collects data from IP offices using a common questionnaire and methodology. However, due to differences in patent procedures between offices, data cannot be fully harmonized. Therefore, one should exercise caution when making comparisons across offices.
Sources: WIPO Statistics Database, September 2017.

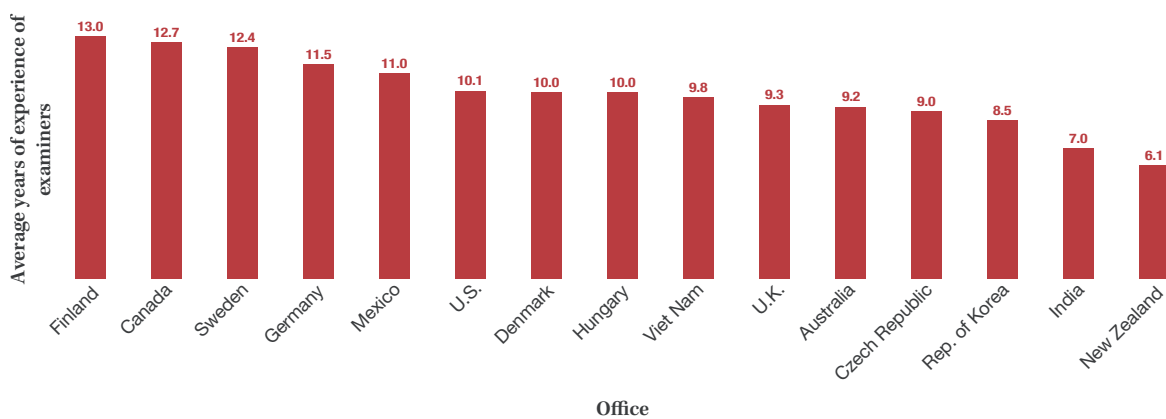
Figure A50

Average pendency time for first office action for selected offices, 2016



Note: WIPO collects data from IP offices using a common questionnaire and methodology. However, due to differences in patent procedures between offices, data cannot be fully harmonized. Therefore, one should exercise caution when making comparisons across offices.
Sources: WIPO Statistics Database, September 2017.

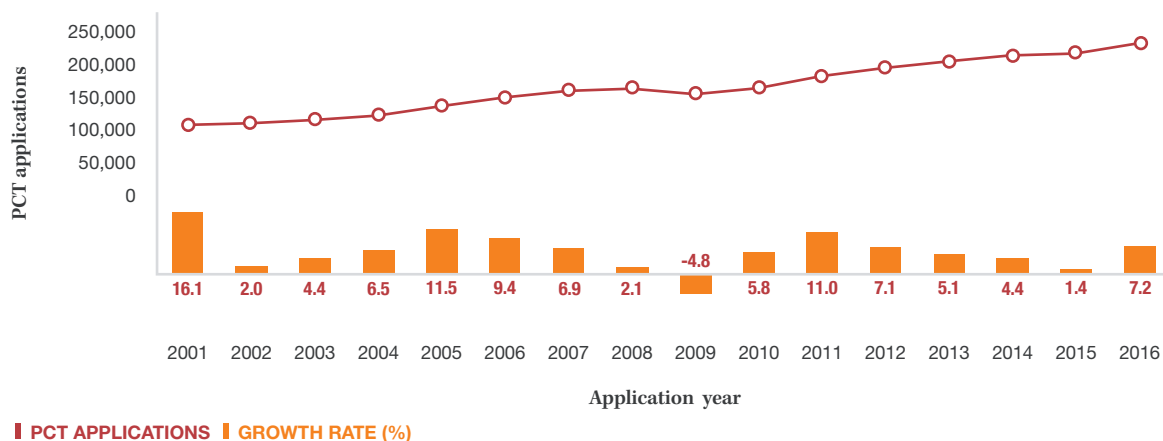
Figure A51
Average years of experience of patent examiners for selected offices, 2016



Sources: WIPO Statistics Database, September 2017.

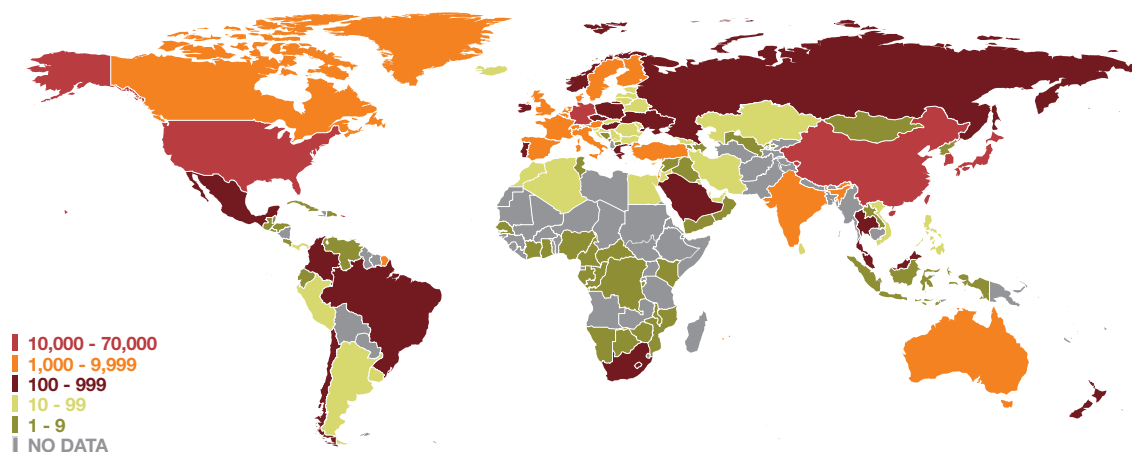
Patent applications filed through the Patent Cooperation Treaty (PCT) System

Figure A52
Trend in PCT applications



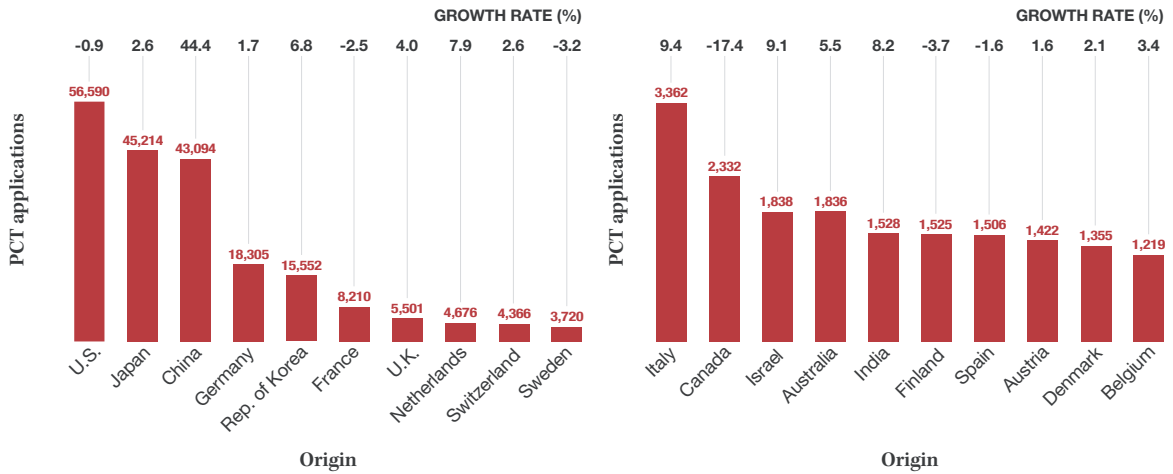
Note: Data refer to the international phase of the Patent Cooperation Treaty System. Counts are based on the international application date.
Source: WIPO Statistics Database, September 2017.

Figure A53
PCT applications by origin, 2016



Note: Data refer to the international phase of the Patent Cooperation Treaty System. Counts are based on the residency of the first named applicant and the international application date.
Source: WIPO Statistics Database, September 2017.

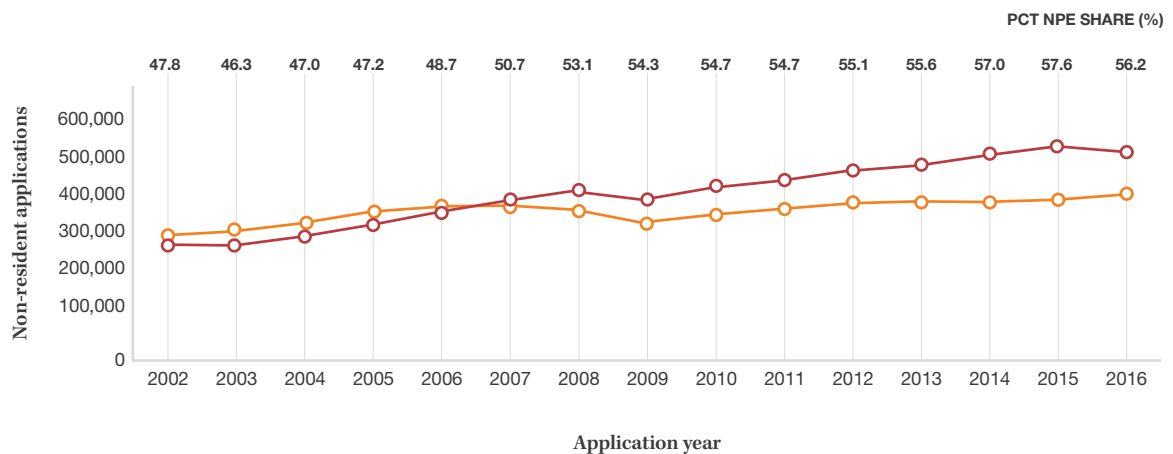
Figure A54
PCT applications for the top 20 origins, 2016



Note: Data refer to the international phase of the Patent Cooperation Treaty System. Counts are based on the residency of the first named applicant and the international application date.

Source: WIPO Statistics Database, September 2017.

Figure A55
Trend in non-resident applications by filing route

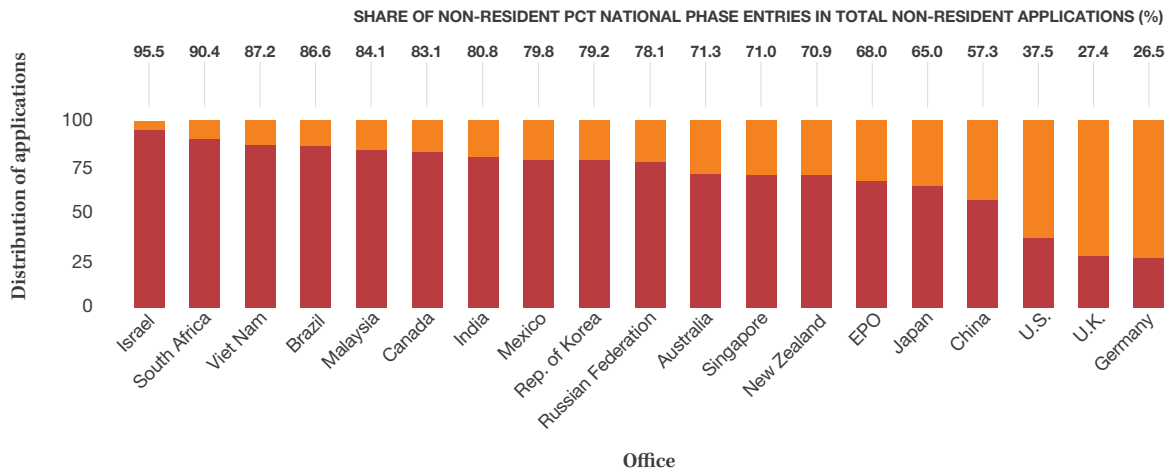


█ PCT NATIONAL PHASE ENTRIES █ DIRECT APPLICATIONS

Note: A patent office may receive patent applications filed either directly with the office (known as the “Paris route”) or through the Patent Cooperation Treaty System (Patent Cooperation Treaty national phase entries).

Source: WIPO Statistics Database, September 2017.

Figure A56
Non-resident applications by filing route for selected offices, 2016



■ NON-RESIDENT PCT NATIONAL PHASE ENTRIES ■ NON-RESIDENT DIRECT APPLICATIONS

Note: EPO is the European Patent Office. A patent office may receive patent applications filed either directly with the office (known as the "Paris route") or through the Patent Cooperation Treaty System (Patent Cooperation Treaty national phase entries).

Source: WIPO Statistics Database, September 2017.

Patent Prosecution Highway (PPH)

Figure A57

PPH requests by office of first filing and offices of later examination, 2016

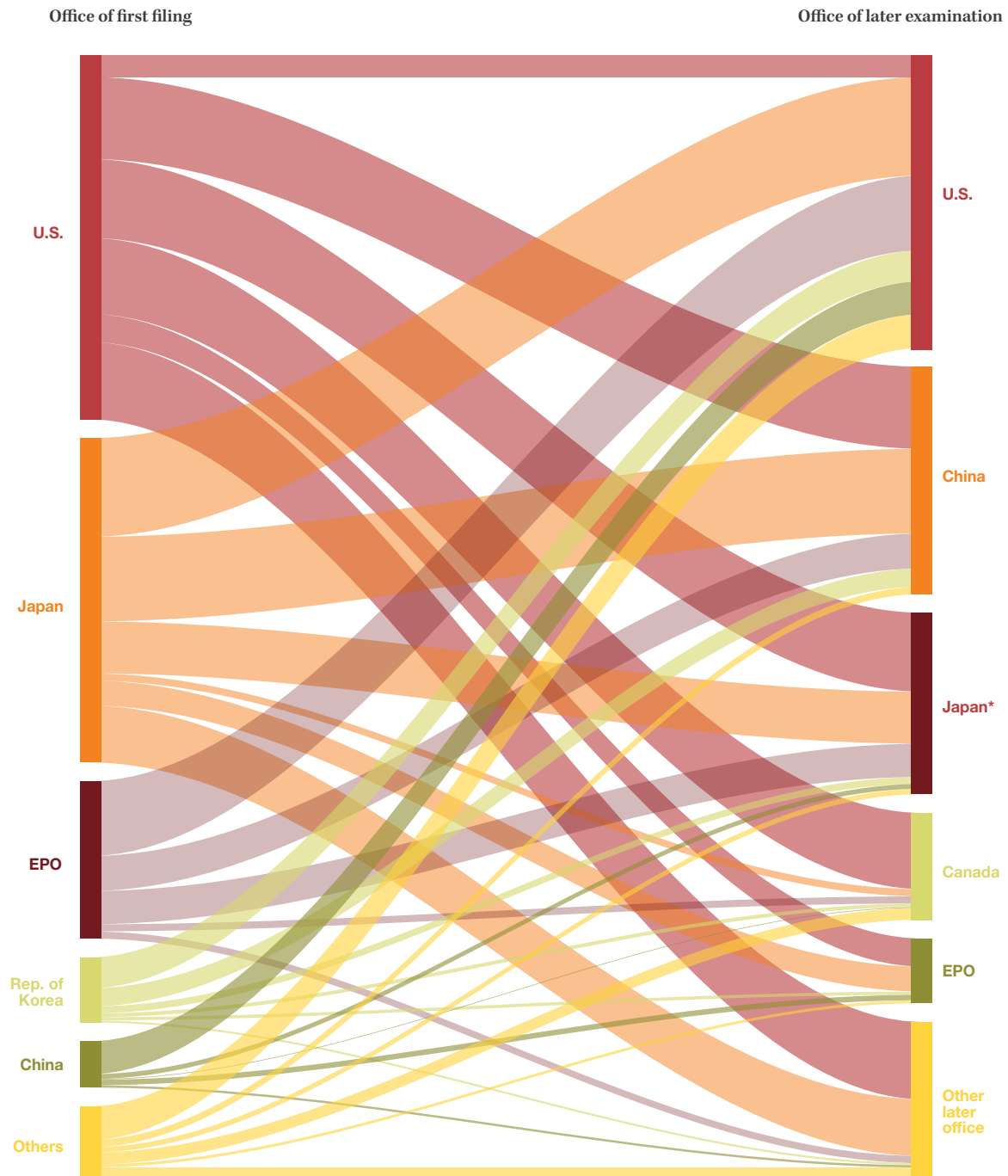
Office of later examination	Office of first filing																Total	
	Australia	Austria	Canada	China	Denmark	EPO	Finland	Germany	Israel	Japan	Rep. of Korea	Russian Federation	Sweden	U.K.	U.S.	Others/Unknown		
Australia	9	2	1	11	2	26	1	7	5	102	5		17	39	864	40	1,131	
Azerbaijan								2								7	14	23
Brazil															34			34
Canada	86	2	111	16	1	164	12	5	8	167	86	11	2	25	1,768	13	2,477	
Chile																	1	1
China			7		13	813	3	53	9	1,965	424	22	23	34	1,904	4	5,274	
Colombia										13					60	2	75	
EAPO										2							2	
EPO	13		33	127					18	580	74				650	2	1,497	
Finland							1			1			1			1	4	
Germany	1	9		14	2					505	16	1		16	172		736	
Indonesia										38							1	39
Israel	24		5	5		110			36	21	18		1	8	273	1	502	
Japan*	16		14	113	12	773	5	15	7	1,205	161	9	5	39	1,832	3	4,209	
Mexico	1	1	1	4		24		3		111	2			2	249	24	422	
Norway										2				2	10	2	16	
Singapore		2		3	1	4		1		21					6		38	
Spain															2		2	
Thailand										390							390	
U.K.	2			15	1		1	2		14	6				117		158	
U.S.	100	16	157	765	20	1,736	34	57	76	2,289	719	57	88	142	504	34	6,794	
Viet Nam										100							100	
Total	252	32	329	1,073	52	3,650	57	145	159	7,526	1,511	100	137	307	8,453	141	23,924	

* indicates data based on office of earlier examination rather than office of first filing.

Note: EAPO is the Eurasian Patent Organization and EPO is the European Patent Office. A patent prosecution highway is a bilateral agreement between two offices that enables applicants to request a fast-track examination whereby patent examiners can use the work of the other office.

Source: WIPO Statistics Database, September 2017.

Figure A58
Flow of PPH requests between offices of first filing and offices of later examination, 2016



* indicates data based on office of earlier examination rather than office of first filing.

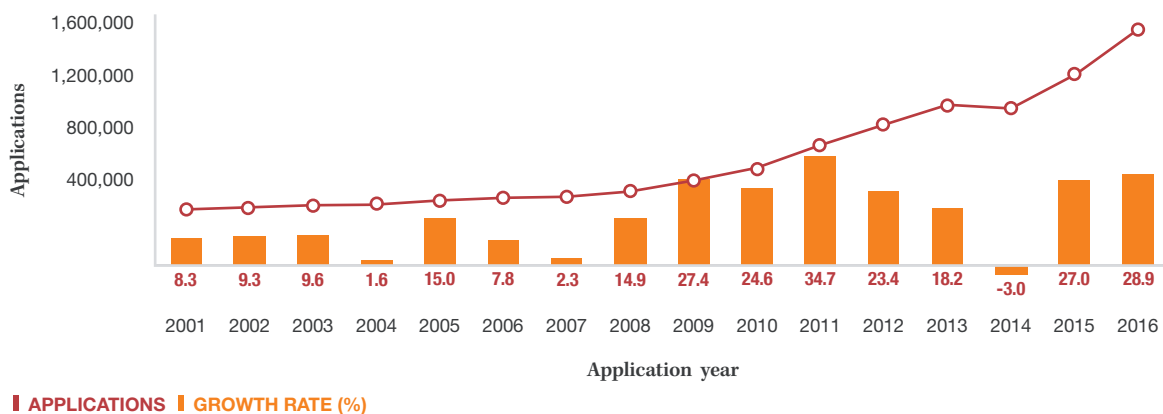
Note: EPO is the European Patent Office. Japan data refers to the office of earlier examination rather than the office of first filing. A patent prosecution highway is a bilateral agreement between two offices that enables applicants to request a fast-track examination whereby patent examiners can use the work of the other office. This graph shows the flows of PPH requests between offices of first filing and offices of later examination.

Source: WIPO Statistics Database, September 2017.

Utility model applications

Figure A59

Trend in utility model applications worldwide



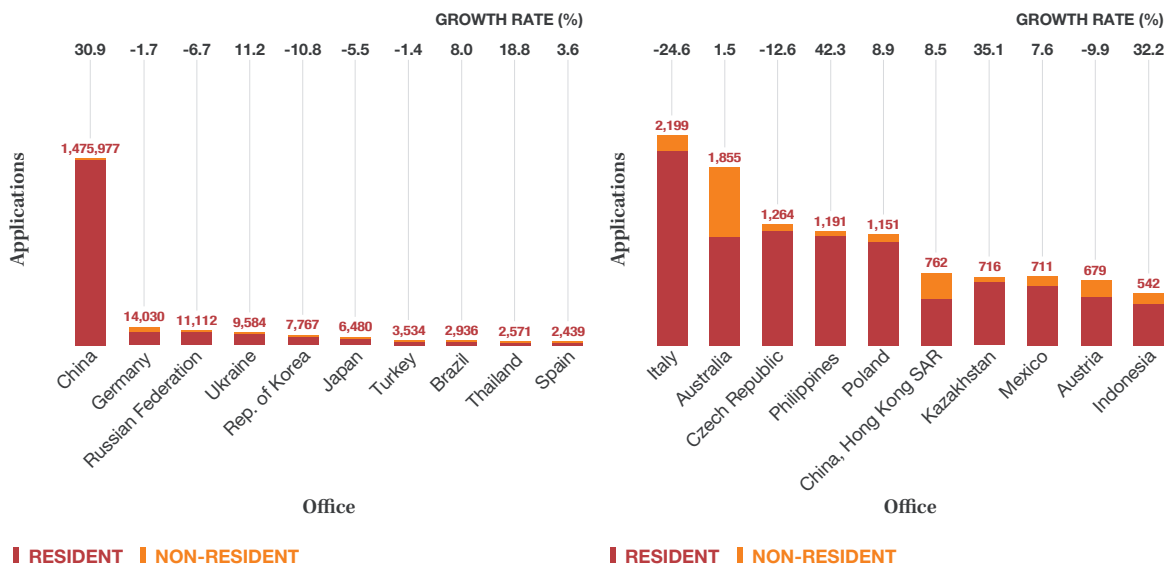
■ APPLICATIONS ■ GROWTH RATE (%)

Note: World totals are WIPO estimates using data covering 74 patent offices. These totals include applications filed directly with national and regional offices and applications entering offices through the Patent Cooperation Treaty national phase (where applicable).

Source: WIPO Statistics Database, September 2017.

Figure A60

Utility model applications for the top 20 offices, 2016

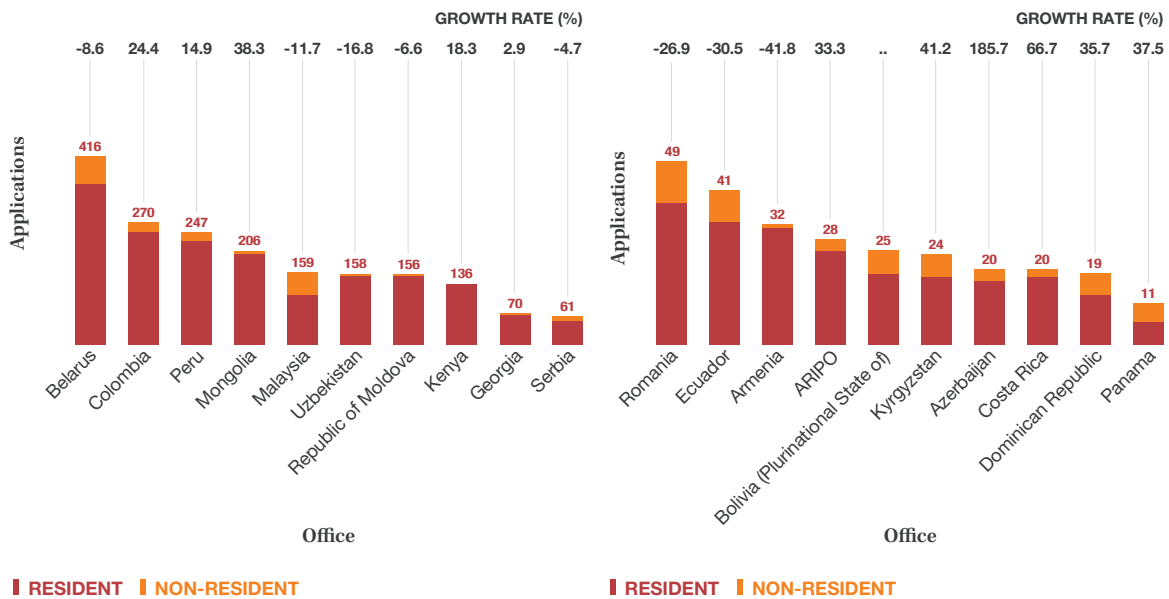


■ RESIDENT ■ NON-RESIDENT

■ RESIDENT ■ NON-RESIDENT

Source: WIPO Statistics Database, September 2017.

Figure A61
Utility model applications for offices of selected low- and middle-income countries, 2016



.. indicates not available.

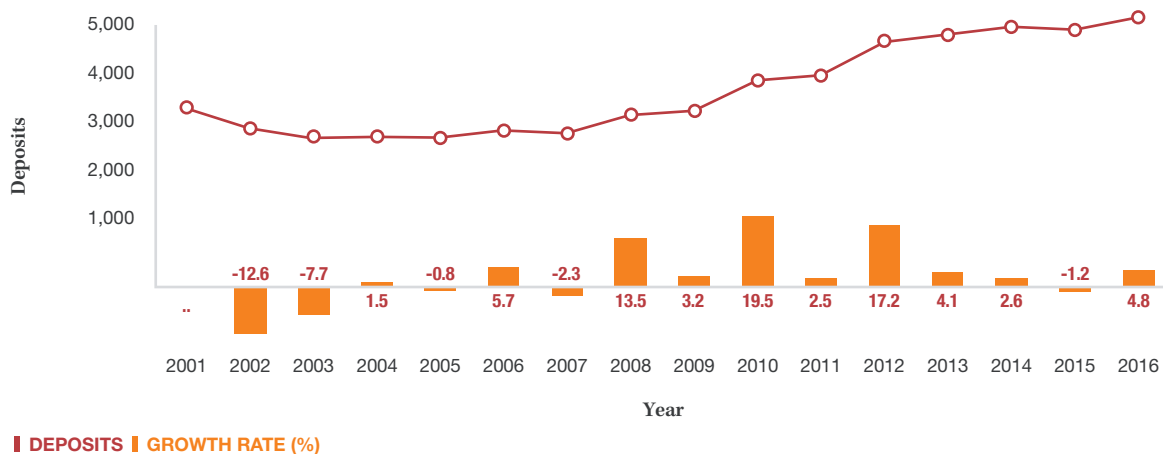
Note: ARIPO is the African Regional Intellectual Property Organization.

Source: WIPO Statistics Database, September 2017.

Microorganisms

Figure A62

Trend in microorganism deposits worldwide

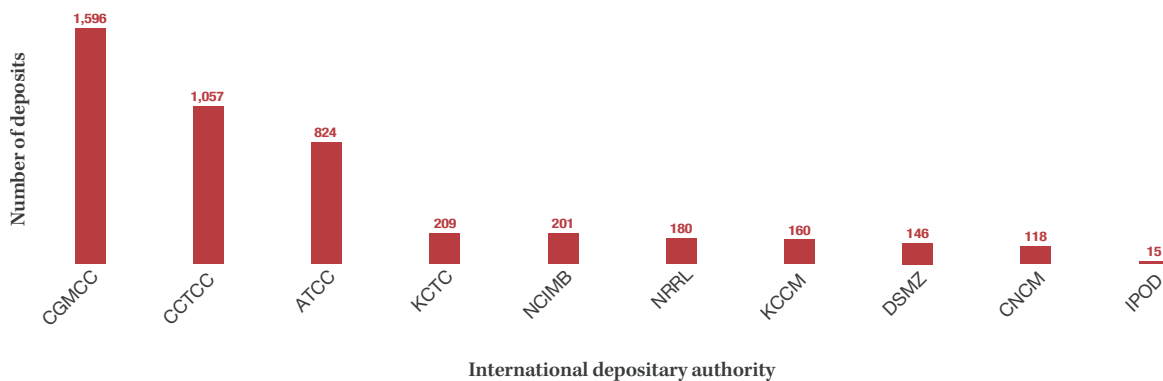


Note: Deposits of microorganisms for patent procedures are important for biotechnological inventions. Disclosing an invention is a requirement for receiving a patent.

Source: WIPO Statistics Database, September 2017.

Figure A63

Deposits at the top international depository authorities, 2016



Note: ATCC is the American Type Culture Collection (U.S.), CCTCC is the China Center for Type Culture Collection, CGMCC is the China General Microbiological Culture Collection Center, CNCM is the Collection Nationale de Cultures de Micro-organismes (France), DSMZ is the Leibniz-Institut DSMZ (Deutsche Sammlung von Mikroorganismen und Zellkulturen GmbH; Germany), IPOD is the International Patent Organism Depository (Japan), KCCM is the Korean Culture Center of Microorganisms (Rep. of Korea), KCTC is the Korean Collection for Type Cultures (Rep. of Korea), NCIMB is the National Collection of Industrial, Food and Marine Bacteria (U.K.) and NRRL is the Agriculture Research Services Culture Collection (U.S.).

Source: WIPO Statistics Database, September 2017.

Statistical tables

Figure A64
Patent applications by office and origin, 2016

Name	Applications by office			Equivalent applications by origin	Receiving office	PCT international applications		PCT national phase entry
	Total	Resident	Non-resident	Total (a)		Origin	Office	Origin
Afghanistan	..	..	..	8	n.a.	0	..	1
African Intellectual Property Organization	506	138	368	n.a.	2	n.a.	361	n.a.
African Regional Intellectual Property Organization	697	17	680	n.a.	0	n.a.	657	n.a.
Albania	25	21	4	53	0	0	2	16
Algeria	672	106	566	117	11	13	535	..
Andorra	3	0	3	15	n.a.	8	..	2
Angola (e)	..	..	..	3	n.a.	0	..	2
Antigua and Barbuda	12	0	12	84	0	0	12	..
Argentina	3,809	884	2,925	1,142	n.a.	46	..	84
Armenia	126	125	1	192	4	9	1	12
Aruba	..	..	..	3	n.a.	0	..	1
Australia	28,394	2,620	25,774	11,679	1,703	1,836	19,375	7,133
Austria	2,315	2,078	237	13,840	507	1,422	506	6,758
Azerbaijan	163	144	19	498	3	4	8	9
Bahamas	37	3	34	103	n.a.	5	..	37
Bahrain	177	6	171	33	0	6	170	4
Bangladesh	344	77	267	149	n.a.	0	..	13
Barbados (e)	41	0	41	357	n.a.	114	41	265
Belarus	521	455	66	1,473	8	14	44	46
Belgium	1,173	1,054	119	12,916	55	1,219	..	6,756
Belize	37	0	37	27	0	4	37	11
Benin (f,i)	n.a.	n.a.	n.a.	68	n.a.	0	n.a.	..
Bermuda	..	..	..	118	n.a.	0	..	46
Bolivia (Plurinational State of)	253	12	241	15	n.a.	0	..	3
Bosnia and Herzegovina	66	60	6	68	1	4	..	2
Botswana	7	1	6	11	0	1	..	1
Brazil	28,010	5,200	22,810	7,208	528	567	19,857	1,147
Brunei Darussalam	..	..	..	5	1	5	..	3
Bulgaria	241	230	11	428	29	58	5	82
Burkina Faso(f,i)	n.a.	n.a.	n.a.	155	n.a.	0	n.a.	1
Burundi	..	..	..	..	n.a.	2	..	..
Cabo Verde	..	..	..	3	n.a.	0	..	1
Cambodia (b,c)	65	0	65	4	0	0	..	2
Cameroon (f,i)	n.a.	n.a.	n.a.	816	n.a.	2	n.a.	..
Canada	34,745	4,078	30,667	24,637	1,855	2,332	27,021	9,512
Central African Republic (f,i)	n.a.	n.a.	n.a.	17	n.a.	0	n.a.	..
Chad (f,i)	n.a.	n.a.	n.a.	51	n.a.	0	n.a.	..

Name	Applications by office			Equivalent applications by origin	Receiving office	PCT international applications		PCT national phase entry
	Total	Resident	Non-resident	Total (a)		Origin	Office	Origin
Chile	2,907	386	2,521	940	163	197	2,401	376
China	1,338,503	1,204,981	133,522	1,257,202	44,462	43,094	81,055	34,869
China, Hong Kong SAR	14,092	233	13,859	2,128	n.a.	0	..	338
China, Macao SAR	51	0	51	110	n.a.	0	..	5
Colombia	2,203	545	1,658	751	10	100	1,583	150
Congo (f,i)	n.a.	n.a.	n.a.	18	n.a.	1	n.a.	..
Costa Rica	505	9	496	58	1	4	477	12
Côte d'Ivoire (f,i)	n.a.	n.a.	n.a.	273	n.a.	2	n.a.	..
Croatia	188	175	13	255	27	39	6	50
Cuba	195	32	163	152	2	2	157	98
Curaçao	..	..	..	31	n.a.	0	..	7
Cyprus	4	3	1	335	2	37	..	152
Czech Republic	839	792	47	2,151	180	199	33	599
Democratic People's Republic of Korea	..	..	..	72	4	4	..	25
Democratic Republic of the Congo	..	..	..	4	n.a.	1	..	2
Denmark	1,850	1,552	298	11,693	524	1,354	106	6,452
Djibouti	..	..	..	..	1	0	..	..
Dominica	..	..	..	1	n.a.	0	..	..
Dominican Republic	273	16	257	27	5	6	234	1
Ecuador	374	45	329	51	2	9	284	2
Egypt	2,149	918	1,231	1,052	40	43	1,172	21
El Salvador	175	4	171	8	1	1	167	3
Eritrea	..	..	..	3	n.a.	0	..	3
Estonia	30	29	1	275	3	24	..	96
Eurasian Patent Organization	3,380	585	2,795	n.a.	3	n.a.	2,688	n.a.
European Patent Office	159,358	76,082	83,276	n.a.	35,288	n.a.	94,625	n.a.
Finland	1,368	1,260	108	12,539	969	1,525	27	7,120
France	16,218	14,206	2,012	71,276	3,606	8,210	..	37,793
Gabon (f,i)	n.a.	n.a.	n.a.	72	n.a.	1	n.a.	3
Gambia (h)	..	..	..	1	n.a.	0	..	1
Georgia	274	96	178	116	12	13	174	4
Germany	67,899	48,480	19,419	176,693	1,533	18,305	6,325	71,160
Ghana	31	14	17	117	0	2	17	11
Greece	646	606	40	1,226	68	111	..	384
Grenada	17	0	17	..	0	0	3	..
Guatemala	269	3	266	7	0	2	253	1
Guinea (f,i)	n.a.	n.a.	n.a.	19	n.a.	0	n.a.	..
Guyana	18	0	18	..	n.a.	0	..	..
Honduras	195	10	185	10	0	1	185	..
Hungary	665	616	49	1,533	148	178	17	663
Iceland	38	35	3	252	20	56	3	130

Name	Applications by office			Equivalent applications by origin	Receiving office	PCT international applications		PCT national phase entry
	Total	Resident	Non-resident	Total (a)		Origin	Office	Origin
India	45,057	13,199	31,858	25,795	738	1,528	25,896	4,405
Indonesia	8,538	0	8,538	52	7	8	7	18
International Bureau	..	..	..	n.a.	10,020	n.a.	..	n.a.
Iran (Islamic Republic of)	15,632	14,930	702	15,081	3	63	582	11
Iraq (b,c)	437	335	102	343	n.a.	1	..	1
Ireland	287	202	85	5,356	23	441	..	2,167
Israel	6,419	1,300	5,119	15,086	1,425	1,838	5,430	7,061
Italy	9,821	8,848	973	31,091	309	3,362	..	13,964
Jamaica	78	19	59	63	n.a.	0	..	1
Japan	318,381	260,244	58,137	453,640	44,495	45,214	59,893	119,612
Jordan	278	22	256	140	0	1	..	56
Kazakhstan	1,224	993	231	1,526	19	21	190	29
Kenya	203	144	59	202	2	4	56	32
Kuwait (b,d)	228	..	..	122	n.a.	3	..	1
Kyrgyzstan	89	84	5	138	0	0	..	..
Lao People's Democratic Republic (e)	..	..	..	5	n.a.	2	..	3
Latvia	113	95	18	255	3	24	..	134
Lebanon (b,c)	304	110	194	158	n.a.	6	..	16
Liechtenstein (g)	..	..	..	1,327	n.a.	249	..	844
Lithuania	153	95	58	219	2	28	..	63
Luxembourg	444	143	301	3,408	1	431	..	2,151
Madagascar (e)	36	6	30	8	n.a.	0	30	1
Malawi	4	3	1	3	0	1	..	..
Malaysia	7,236	1,109	6,127	1,929	180	189	5,178	312
Mali (f,i)	n.a.	n.a.	n.a.	199	n.a.	0	n.a.	1
Malta	4	3	1	496	0	87	4	284
Marshall Islands	..	..	..	2	n.a.	0	..	2
Mauritius	38	2	36	113	n.a.	4	..	72
Mexico	17,413	1,310	16,103	2,403	214	289	12,884	539
Micronesia (Federated States of)	..	..	..	..	n.a.	2	..	..
Monaco	14	7	7	220	0	13	..	119
Mongolia	219	112	107	114	0	1	101	..
Montenegro (e)	10	10	0	17	0	3	..	..
Morocco	1,303	237	1,066	263	31	35	883	11
Mozambique (h)	40	15	25	17	n.a.	1	17	..
Myanmar	..	..	..	2	n.a.	0	..	..
Namibia (h)	..	..	..	5	n.a.	2	..	1
Nepal	37	11	26	11	n.a.	0	..	..
Netherlands	2,604	2,290	314	38,908	950	4,676	..	22,704
New Zealand	6,386	1,075	5,311	3,062	210	308	3,826	1,418
Nicaragua	..	..	..	2	0	0	..	..

Name	Applications by office			Equivalent applications by origin	Receiving office	PCT international applications		PCT national phase entry
	Total	Resident	Non-resident	Total (a)		Origin	Office	Origin
Niger (f,i)	n.a.	n.a.	n.a.	121	n.a.	0	n.a.	1
Nigeria (e)	..	..	..	13	n.a.	4	..	3
Norway	2,060	1,227	833	5,899	300	653	745	3,184
Oman (e)	..	..	..	15	3	8	..	1
Pakistan	840	204	636	273	n.a.	0	..	3
Panama	417	68	349	112	4	60	330	31
Papua New Guinea (b,c)	47	1	46	4	0	0	41	1
Paraguay	..	..	..	3	n.a.	0	..	3
Patent Office of the Cooperation Council for the Arab States of the Gulf	1,949	286	1,663	n.a.	n.a.	n.a.	..	n.a.
Peru	1,163	72	1,091	153	25	24	1,025	71
Philippines	3,419	327	3,092	554	14	29	2,849	72
Poland	4,396	4,261	135	6,141	218	344	45	874
Portugal	751	724	27	1,675	46	184	8	671
Qatar	564	16	548	141	8	14	539	40
Republic of Korea	208,830	163,424	45,406	233,625	15,595	15,552	37,093	25,206
Republic of Moldova	155	91	64	101	7	10	64	2
Romania	1,063	1,005	58	1,254	27	44	6	102
Russian Federation	41,587	26,795	14,792	31,811	1,023	896	11,638	2,447
Rwanda	128	2	126	4	0	0	123	..
Saint Kitts and Nevis	..	..	..	14	n.a.	0	..	10
Saint Vincent and the Grenadines (b,c,e)	7	0	7	13	n.a.	0	7	13
Samoa (b,c)	4	1	3	25	n.a.	1	..	10
San Marino	458	4	454	47	6	8	..	22
Saudi Arabia	3,266	1,070	2,196	4,735	20	295	2,246	1,439
Senegal (f,i)	n.a.	n.a.	n.a.	392	n.a.	7	n.a.	..
Serbia	213	192	21	279	15	15	6	37
Seychelles	..	..	..	113	0	3	..	41
Singapore	10,980	1,601	9,379	6,684	646	864	7,040	2,894
Slovakia	235	220	15	458	19	55	6	105
Slovenia	..	..	..	513	29	69	..	322
South Africa	9,711	2,783	6,928	4,087	85	287	6,465	1,133
Spain	2,922	2,745	177	10,784	1,088	1,506	73	4,709
Sri Lanka (e)	573	280	293	315	n.a.	16	288	12
Sudan	285	284	1	291	0	0	..	..
Suriname	..	..	..	3	n.a.	0	..	..
Swaziland (b,c,h)	2	0	2	9	n.a.	0	..	3
Sweden	2,384	2,032	352	23,388	1,392	3,720	73	15,188
Switzerland	1,771	1,462	309	46,631	160	4,366	63	25,974
Syrian Arab Republic (c)	112	..	..	242	0	2	27	10
T F Y R of Macedonia	..	..	..	9	1	3	..	1

Name	Applications by office			Equivalent applications by origin	Receiving office	PCT international applications		PCT national phase entry
	Total	Resident	Non-resident	Total (a)		Origin	Office	Origin
Tajikistan (b,c)	1	0	1	16	0	0	..	..
Thailand	..	..	..	503	108	155	..	232
Togo (f,i)	n.a.	n.a.	n.a.	170	n.a.	0	n.a.	..
Tonga	..	..	..	2	n.a.	0	..	2
Trinidad and Tobago	136	3	133	19	0	38	133	9
Tunisia	583	235	348	270	5	6	336	17
Turkey	6,848	6,230	618	8,364	805	1,065	300	1,524
Turkmenistan	..	..	..	19	0	0	..	1
Uganda (h)	16	16	0	17	n.a.	0	..	..
Ukraine	4,095	2,233	1,862	2,737	153	162	1,673	200
United Arab Emirates (c,e)	1,574	..	..	520	n.a.	81	1,336	158
United Kingdom	22,059	13,876	8,183	52,819	4,007	5,501	2,535	24,833
United Republic of Tanzania (b,c,h)	2	1	1	4	n.a.	0	..	1
United States of America	605,571	295,327	310,244	520,877	56,675	56,590	146,867	179,595
Uruguay (b,c)	558	26	532	108	n.a.	14	..	49
Uzbekistan	555	353	202	385	1	2	194	24
Vanuatu	..	..	..	1	n.a.	0	..	1
Venezuela (Bolivarian Republic of)	..	..	..	44	n.a.	1	..	7
Viet Nam	5,228	560	4,668	632	6	10	4,072	20
Yemen	32	16	16	16	n.a.	1	..	..
Zambia	..	..	..	1	0	0	..	..
Zimbabwe	13	8	5	10	0	2	..	..
Others/Unknown	..	..	..	34,358	n.a.	210	..	5,034
Total (2016 estimates)	3,127,900	2,216,800	911,100	n.a.	232,904	232,904	615,400	n.a.

(a) Equivalent applications by origin data are incomplete because some offices do not report by origin.

(b) 2015 data are reported for applications by office.

(c) 2015 data are reported for equivalent applications by origin.

(d) The office did not report resident applications so the equivalent applications by origin data may be incomplete.

(e) The International Bureau acts as the receiving office for PCT applications.

(f) The African Intellectual Property Organization (OAPI) acts as the receiving office for PCT applications.

(g) The Swiss Federal Institute of Intellectual Property acts as the receiving office for PCT applications.

(h) The African Regional Intellectual Property Organization (ARIPO) acts as the receiving office for PCT applications.

(i) The African Intellectual Property Organization (OAPI) is the competent office for processing applications.

.. indicates not available

n.a. is not applicable

Source: WIPO Statistics Database, September 2017.

Figure A65
Patent grants by office and origin, and patents in force, 2016

Name	Total	Grants by office		Equivalent grants by origin	In force by office
		Resident	Non-resident	Total (a)	Total
Afghanistan	..	..	..	11	..
African Intellectual Property Organization	360	47	313	n.a.	2,220
African Regional Intellectual Property Organization	468	4	464	n.a.	3,421
Albania	5	5	0	6	..
Algeria	383	44	339	64	5,618
Andorra	..	..	..	15	..
Angola	..	..	..	1	..
Antigua and Barbuda	..	..	..	3	..
Argentina	1,879	201	1,678	377	..
Armenia	93	91	2	130	226
Aruba	..	..	..	1	..
Australia	23,744	1,433	22,311	6,176	132,994
Austria	1,135	984	151	8,298	142,875
Azerbaijan	131	117	14	466	345
Bahamas	47	0	47	212	1,077
Bahrain	..	..	..	11	..
Bangladesh	106	..	..	6	..
Barbados	26	0	26	366	..
Belarus	949	892	57	1,706	2,503
Belgium	1,620	1,368	252	8,157	..
Belize	4	0	4	7	132
Benin ^(a)	n.a.	n.a.	n.a.	51	..
Bermuda	..	..	..	169	..
Bolivia (Plurinational State of)	86	0	86	..	..
Bosnia and Herzegovina	12	0	12	3	375
Botswana	1	1	0	2	..
Brazil	4,195	533	3,662	1,472	24,153
Brunei Darussalam	..	..	..	10	..
Bulgaria	42	36	6	150	11,511
Burkina Faso (e)	n.a.	n.a.	n.a.	102	..
Cambodia (b,c)	1	0	1	1	..
Cameroon (e)	n.a.	n.a.	n.a.	206	..
Canada	26,424	3,295	23,129	14,114	175,236
Central African Republic (e)	n.a.	n.a.	n.a.	1	..
Chad(e)	n.a.	n.a.	n.a.	34	..
Chile	2,077	195	1,882	387	12,512
China	404,208	302,136	102,072	322,461	1,772,203

Name	Total	Grants by office		Equivalent grants by origin	In force by office
		Resident	Non-resident	Total (a)	Total
China, Hong Kong SAR	5,698	78	5,620	1,077	43,359
China, Macao SAR	57	1	56	31	467
Colombia	917	99	818	160	6,623
Congo (e)	n.a.	n.a.	n.a.	17	..
Costa Rica	67	3	64	19	678
Côte d'Ivoire (e)	n.a.	n.a.	n.a.	221	..
Croatia	35	11	24	80	6,606
Cuba	93	10	83	111	857
Curaçao	..	..	..	16	..
Cyprus	..	..	..	285	79
Czech Republic	781	637	144	1,311	37,889
Democratic People's Republic of Korea	..	..	..	13	..
Denmark	409	236	173	6,249	55,715
Dominica	..	..	..	1	..
Dominican Republic	21	1	20	5	265
Ecuador	10	2	8	8	..
Egypt	450	72	378	124	3,189
El Salvador	40	0	40	3	..
Estonia	27	19	8	117	8,924
Eurasian Patent Organization	3,081	474	2,607	n.a.	n.a.
European Patent Office	95,956	48,733	47,223	n.a.	n.a.
Finland	815	709	106	7,990	48,588
France	12,374	10,623	1,751	47,569	535,554
Gabon ^(e)	n.a.	n.a.	n.a.	17	..
Georgia	177	62	115	69	1,394
Germany	15,652	10,792	4,860	99,655	617,307
Ghana	25	3	22	3	25
Greece	271	264	7	500	26,479
Grenada	14	0	14	..	..
Guatemala	52	0	52	..	883
Guinea (e)	n.a.	n.a.	n.a.	17	..
Guyana	57	0	57	..	29
Holy See	..	..	..	1	..
Honduras	53	0	53	..	82
Hungary	271	89	182	690	23,782
Iceland	22	2	20	146	5,941
India	8,248	1,115	7,133	6,664	49,575
Indonesia	3,674	393	3,281	440	..
Iran (Islamic Republic of)	3,268	3,111	157	3,155	..
Iraq (b,c)	312	197	115	199	..

Name	Total	Grants by office		Equivalent grants by origin	In force by office
		Resident	Non-resident	Total (a)	Total
Ireland	164	77	87	2,906	147,125
Israel	4,938	787	4,151	6,895	30,922
Italy	6,429	5,682	747	20,457	..
Jamaica	5	1	4	16	328
Japan	203,087	160,643	42,444	288,153	1,980,985
Jordan	121	4	117	53	463
Kazakhstan (c)	1,011	..	..	1,534	3,218
Kenya	26	5	21	8	..
Kuwait	..	..	..	66	..
Kyrgyzstan	120	118	2	135	274
Latvia	68	66	2	152	7,419
Lebanon (b,c)	279	85	194	105	..
Liechtenstein	..	..	..	579	..
Lithuania	103	86	17	168	522
Luxembourg	184	85	99	1,843	19,960
Madagascar	19	1	18	1	386
Malawi	7	6	1	6	..
Malaysia	3,324	355	2,969	937	25,117
Mali ^(a)	n.a.	n.a.	n.a.	18	..
Malta	6	6	0	238	423
Marshall Islands	..	..	..	5	..
Mauritius	2	0	2	35	..
Mexico	8,652	423	8,229	950	109,238
Monaco	9	7	2	79	85,132
Mongolia	157	57	100	58	4,324
Montenegro (d)	8	8	0	9	2,372
Morocco	352	109	243	141	..
Mozambique	35	10	25	10	..
Namibia	..	..	..	2	..
Nepal (b,c)	2	2	0	3	..
Netherlands	1,914	1,624	290	21,060	164,264
New Zealand	3,910	304	3,606	1,275	38,906
Nicaragua	..	..	..	1	..
Nigeria	..	..	..	2	..
Norway	2,525	543	1,982	3,572	27,930
Oman	..	..	..	7	..
Pakistan	214	12	202	30	1,848
Panama	13	2	11	51	1,734
Papua New Guinea (b,c,d)	70	0	70	..	71
Paraguay	..	..	..	5	..

Name	Total	Grants by office		Equivalent grants by origin	In force by office
		Resident	Non-resident	Total (a)	Total
Patent Office of the Cooperation Council for the Arab States of the Gulf	673	65	608	n.a.	4,308
Peru	403	26	377	60	2,779
Philippines	4,006	52	3,954	141	..
Poland	3,548	3,370	178	4,337	65,006
Portugal	38	36	2	365	35,649
Qatar	..	..	..	49	..
Republic of Korea	108,875	82,400	26,475	120,435	950,526
Republic of Moldova	70	54	16	110	343
Romania	355	349	6	498	18,906
Russian Federation	33,536	21,020	12,516	24,237	230,870
Rwanda(d)	..	..	..	..	108
Saint Kitts and Nevis	..	..	..	4	..
Saint Vincent and the Grenadines	..	..	..	9	..
Samoa (b,c,d)	64	0	64	14	64
San Marino	462	6	456	26	..
Saudi Arabia	595	124	471	1,475	3,104
Senegal(e)	n.a.	n.a.	n.a.	119	..
Serbia	68	50	18	85	3,790
Seychelles	..	..	..	69	..
Singapore	7,341	432	6,909	3,066	48,603
Sint Maarten (Dutch Part)	..	..	..	1	..
Slovakia	122	81	41	195	16,363
Slovenia	..	..	..	411	..
South Africa	4,255	403	3,852	1,085	89,049
Spain	2,308	2,137	171	6,265	115,070
Sri Lanka	123	41	82	54	710
Sudan	164	163	1	164	164
Suriname	..	..	..	1	..
Swaziland ^(b,c)	2	0	2	45	..
Sweden	866	736	130	14,874	93,545
Switzerland	617	416	201	25,882	193,883
Syrian Arab Republic (c)	32	..	..	17	..
T F Y R of Macedonia	..	..	..	7	..
Tajikistan (d)	..	..	..	32	237
Thailand (b,c)	1,364	83	1,281	240	..
Trinidad and Tobago	60	1	59	5	..
Tunisia	583	235	348	243	..
Turkey	1,764	1,609	155	2,667	63,575
Uganda	..	..	..	..	19
Ukraine	2,813	1,277	1,536	1,636	24,760

Name	Total	Grants by office		Equivalent grants by origin	In force by office
		Resident	Non-resident	Total (a)	Total
United Arab Emirates (c)	222	..	..	106	673
United Kingdom	5,602	2,897	2,705	23,894	507,973
United Republic of Tanzania (b,c)	1	0	1	1	..
United States of America	303,049	143,723	159,326	276,737	2,763,055
Uruguay (b,c,d)	19	4	15	23	606
Uzbekistan	166	102	64	104	977
Vanuatu	..	..	..	1	..
Venezuela (Bolivarian Republic of)	..	..	..	20	..
Viet Nam	1,423	76	1,347	118	14,398
Yemen (b,c)	15	2	13	2	..
Zimbabwe	..	..	..	1	..
Others/Unknown	..	..	..	17,982	..
Total (2016 estimates)	1,351,600	829,600	522,000	n.a.	11,328,700

(a) Equivalent grants by origin data are incomplete because some offices do not report by origin.

(b) 2015 data are reported for grants by office.

(c) 2015 data are reported for equivalent grants by origin.

(d) 2015 data are reported for patents in force.

(e) The African Intellectual Property Organization (OAPI) is the competent office for issuing grants.

n.a. is not applicable

.. indicates not available

Source: WIPO Statistics Database, September 2017.

Figure A66
Utility model applications and grants by office and origin, 2016

Name	Applications by office			Equivalent applications by origin	Grants by office		
	Total	Resident	Non-resident	Total (a)	Total	Resident	Non-resident
Afghanistan	..	..	..	6	..	..	..
African Regional Intellectual Property Organization	28	25	3	n.a.	2	2	0
Albania (b,c,d)	4	3	1	5	1	0	1
Andorra	..	..	..	2	..	..	..
Argentina	205	184	21	205	42	34	8
Armenia	32	31	1	34	44	44	0
Australia	1,855	1,125	730	1,243	1,920	1,032	888
Austria	679	496	183	901	575	419	156
Azerbaijan	20	17	3	21	10	8	2
Bangladesh	..	..	..	1	..	..	..
Barbados	..	..	..	7	..	..	..
Belarus	416	353	63	456	328	265	63
Belgium	..	..	..	102	..	..	..
Belize	..	..	..	11	..	..	..
Bermuda	..	..	..	3	..	..	..
Bolivia (Plurinational State of)	25	19	6	19	6	2	4
Bosnia and Herzegovina	..	..	..	11	..	..	..
Botswana	4	3	1	10	1	1	0
Brazil	2,936	2,814	122	2,858	564	549	15
Brunei Darussalam	..	..	..	2	..	..	..
Bulgaria	462	450	12	467	217	208	9
Cambodia (b,c)	7	0	7	..	..	..	..
Canada	..	..	..	74	..	..	..
Chile	110	89	21	108	44	28	16
China	1,475,977	1,468,295	7,682	1,470,004	903,420	897,035	6,385
China, Hong Kong SAR	762	483	279	564	485	275	210
China, Macao SAR	15	1	14	33	11	1	10
Colombia	270	248	22	258	72	61	11
Costa Rica (b,c,d)	20	18	2	18	1	1	0
Croatia	83	77	6	77	70	68	2
Cuba	1	1	0	1	..	..	..
Cyprus	..	..	..	127	..	..	..
Czech Republic	1,264	1,199	65	1,373	1,187	1,124	63
Denmark	144	111	33	157	126	91	35
Dominican Republic	19	13	6	15	19	13	6
Ecuador	41	33	8	33	6	1	5
Egypt	..	..	..	4	..	..	..
El Salvador (b,c,d)	7	5	2	5	13	12	1
Equatorial Guinea	..	..	..	1	..	..	..
Estonia	61	55	6	70	52	38	14
Finland	450	419	31	574	402	374	28

Name	Applications by office			Equivalent applications by origin	Grants by office		
	Total	Resident	Non-resident	Total (a)	Total	Resident	Non-resident
France	472	208	264	616	..	..	..
Georgia	70	67	3	73	38	38	0
Germany	14,030	10,099	3,931	11,104	12,441	8,777	3,664
Ghana	2	2	0	2	..	..	..
Greece	23	20	3	35	19	17	2
Guatemala (b,c,d)	8	7	1	10	1	1	0
Honduras	7	6	1	6	6	1	5
Hungary	304	282	22	297	108	98	10
Iceland	..	..	..	1	..	..	..
India	..	..	..	24	..	..	..
Indonesia	542	427	115	430	90	84	6
Iran (Islamic Republic of)	..	..	..	9	..	..	..
Iraq	..	..	..	1	..	..	..
Ireland	..	..	..	21	..	..	..
Israel	..	..	..	83	..	..	..
Italy	2,199	2,033	166	2,437	1,849	1,690	159
Japan	6,480	4,928	1,552	7,358	6,297	4,756	1,541
Kazakhstan (b,c,d)	716	654	62	680	166	102	64
Kenya	136	136	0	136	22	22	0
Kyrgyzstan	24	18	6	20	26	20	6
Latvia	..	..	..	4	..	..	..
Lebanon	..	..	..	2	..	..	..
Liechtenstein	..	..	..	14	..	..	..
Lithuania	..	..	..	2	..	..	..
Luxembourg	..	..	..	47	..	..	..
Malaysia	159	110	49	147	29	18	11
Mali	..	..	..	2	..	..	..
Malta	..	..	..	7	..	..	..
Mauritius	..	..	..	2	..	..	..
Mexico	711	612	99	619	175	138	37
Monaco	..	..	..	2	..	..	..
Mongolia	206	204	2	204	129	129	0
Montenegro	..	..	..	2	..	..	..
Mozambique	8	7	1	7	7	6	1
Netherlands	..	..	..	230	..	..	..
New Zealand	..	..	..	43	..	..	..
Norway	..	..	..	15	..	..	..
Panama (b,c,d)	11	6	5	10	4	3	1
Peru	247	231	16	237	83	78	5
Philippines	1,191	1,141	50	1,147	1,674	1,587	87
Poland	1,151	1,084	67	1,125	674	638	36
Portugal	118	87	31	93	82	51	31
Republic of Korea	7,767	7,395	372	8,367	2,854	2,694	160

Name	Applications by office			Equivalent applications by origin	Grants by office		
	Total	Resident	Non-resident	Total (a)	Total	Resident	Non-resident
Republic of Moldova	156	154	2	160	122	121	1
Romania	49	38	11	42	41	34	7
Russian Federation	11,112	10,643	469	10,845	8,875	8,474	401
Rwanda	3	3	0	3	..	..	..
Samoa	..	..	..	19	..	..	..
San Marino	..	..	..	4	..	..	..
Saudi Arabia	..	..	..	4	..	..	..
Serbia	61	54	7	56	40	36	4
Seychelles	..	..	..	15	..	..	..
Singapore	..	..	..	280	..	..	..
Slovakia	359	300	59	352	363	322	41
Slovenia	..	..	..	4	..	..	..
South Africa	..	..	..	15	..	..	..
Spain	2,439	2,299	140	2,552	2,291	2,159	132
Sweden	..	..	..	156	..	..	..
Switzerland	..	..	..	660	..	..	..
Tajikistan (b,c,d)	93	90	3	90	83	81	2
Thailand	2,571	2,462	109	2,507	1,288	1,223	65
Turkey	3,534	3,457	77	3,517	2,441	2,346	95
Turkmenistan	..	..	..	1	..	..	..
Uganda (b,c,d)	..	..	..	..	1	1	0
Ukraine	9,584	9,470	114	9,610	9,044	8,931	113
United Arab Emirates	8	..	..	9	..	..	..
United Kingdom	..	..	..	256	..	..	..
United States of America	..	..	..	3,608	..	..	..
Uruguay (b,c,d)	54	41	13	43	15	12	3
Uzbekistan	158	153	5	154	103	98	5
Viet Nam	478	326	152	327	138	114	24
Yemen	1	1	0	1	1	1	0
Others/Unknown	..	..	..	2,286	..	..	..
Total (2016 estimates)	1,553,300	1,536,000	17,300	n.a.	..	..	..

(a) Equivalent applications by origin data are incomplete because some offices do not report by origin.

(b) 2015 data are reported for applications by office.

(c) 2015 data are reported for equivalent applications by origin.

(d) 2015 data are reported for grants by office.

n.a. is not applicable

.. indicates not available

Source: WIPO Statistics Database, September 2017.