SECTION A
PATENTS, UTILITY MODELS AND MICROORGANISMS

Over the past two decades, the patent system has undergone important changes worldwide. As a result, patent legislation and patenting behavior have become prominent public policy themes. Similarly, use of the utility model (UM) system for protecting inventions has risen in certain countries.

This section provides an overview of patent and UM activity worldwide to enable users to analyze and monitor the latest trends. It presents a wide range of indicators that offer insights into the functioning and use of the patent and UM systems.

Disclosure of an invention is a generally recognized requirement for the granting of a patent. Where an invention involves microorganisms, national laws in most countries require that the applicant deposit a sample at a designated International Depositary Authority (IDA). This section also provides data on microorganisms.

The first subsection on patents describes the trend in patent activity worldwide and provides analysis of filings by office and origin, patent families, PCT international applications, international collaboration, filings by field of technology, intensity of patent activity, patents in force, oppositions to patents granted, pending patents, pendency times, and use of patent prosecution highways. The second subsection on UMs explores trends and activity at certain offices. The microorganism subsection focuses on global deposits, followed by a breakdown of these at each IDA, where data are available.

The Patent System

A patent confers, by law, a set of exclusive rights to applicants for inventions that meet the standards of novelty, non-obviousness and industrial applicability. It is valid for a limited period of time (generally 20 years), during which patent holders can commercially exploit their inventions on an exclusive basis. In return, applicants are obliged to disclose their inventions to the public so that others, skilled in the art, may replicate them. The patent system is designed to encourage innovation by providing innovators with time-limited exclusive legal rights, thus enabling them to appropriate the returns of their innovative activity.

The procedures for acquiring patent rights are governed by the rules and regulations of national and regional patent offices. These offices are responsible for issuing patents, and the rights are limited to the jurisdiction of the issuing authority. To obtain patent rights, applicants must file an application describing the invention with a national or regional office.

They can also file an “international application” through the Patent Cooperation Treaty (PCT), an international treaty administered by WIPO, that facilitates the acquisition of patent rights in multiple jurisdictions. The PCT system simplifies the process of multiple national patent filings by delaying the requirement to file a separate application in each jurisdiction in which protection is sought. However, the decision of whether or not to grant patents remains the prerogative of national or regional patent offices, and patent rights are limited to the jurisdiction of the patent granting authority.

The PCT international application process starts with the international phase, during which an international search and optional preliminary examination and supplementary international search are performed, and concludes with the national phase, during which national (or regional) patent offices decide on the patentability of an invention according to national law. For further details about the PCT system, refer to: *www.wipo.int/pct/en/.*

The Utility Model System

Like a patent, a UM confers a set of rights for an invention for a limited period of time, during which UM holders can commercially exploit their inventions on an exclusive basis. The terms and conditions for granting UMs are different from those for "traditional" patents. For example, UMs are issued for a shorter duration (7 to 10 years) and, at most offices, applications are granted without substantive examination. Like patents, the procedures for granting UM rights are governed by the rules and regulations of national intellectual property (IP) offices, and rights are limited to the jurisdiction of the issuing authority.

Around 60 countries provide protection for UMs. In this report, the UM terminology refers to UMs and other types of protection similar to UMs. For example, "innovation patents" in Australia and short-term patents in Ireland are considered equivalent to UMs.

Microorganisms under the Budapest Treaty

The Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure plays an important role in the field of biotechnological inventions. Disclosure of an invention is a generally recognized requirement for the granting of a patent.

To eliminate the need to deposit a microorganism in each country in which patent protection is sought, the Budapest Treaty provides that the deposit of a microorganism with any IDA suffices for the purposes of patent procedure at national patent offices of all contracting states, and before any regional patent office that recognizes the effects of the treaty. An IDA is a scientific institution – typically a "culture collection" – capable of storing microorganisms. Presently, there are 40 such authorities. Further details about the Budapest Treaty are available at: *www.wipo.int/treaties/en/registration/budapest/.*

A.1

PATENT APPLICATIONS AND GRANTS WORLDWIDE

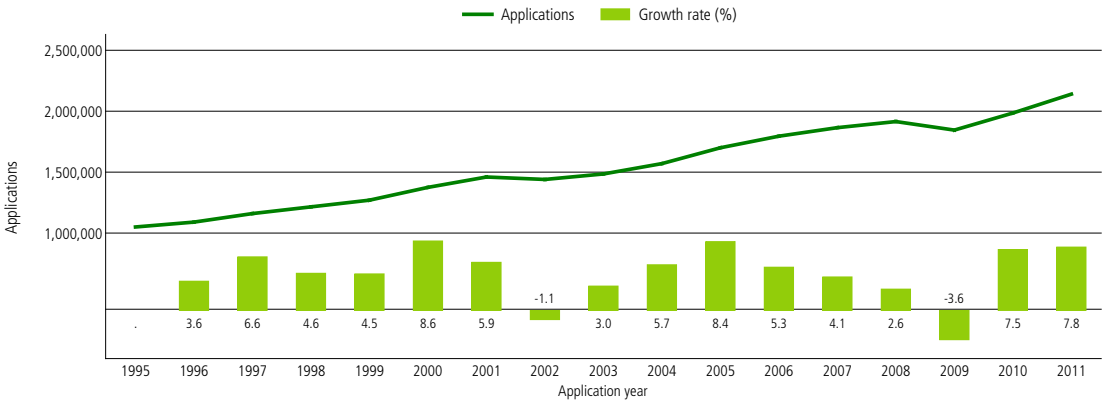
A.1.1 Applications worldwide

Figures A.1.1.1 to A.1.1.3 depict the total number of patent applications worldwide between 1995 and 2011.[1] World totals are WIPO estimates covering around 125 offices, which include both direct national and regional applications and international applications filed through the PCT that subsequently entered the national or regional phase.

For the first time, in 2011, the total number of patent applications filed worldwide exceeded the two million mark. Following a drop in 2009 (-3.6%), patent applications rebounded strongly in 2010 and 2011. For the first time since 1995, the growth rate has exceeded seven percent for two consecutive years (Figure A.1.1.1) – this is noteworthy considering the fragility of the world economy.

The long-term trend shows continuous growth in applications, except for declines in 2002 and 2009. Patent applications worldwide doubled from approximately 1.05 million in 1995 to around 2.14 million by 2011. This is mostly due to rapid growth in applications filed in China and the United States of America (US).

Figure A.1.1.1 Trend in patent applications worldwide

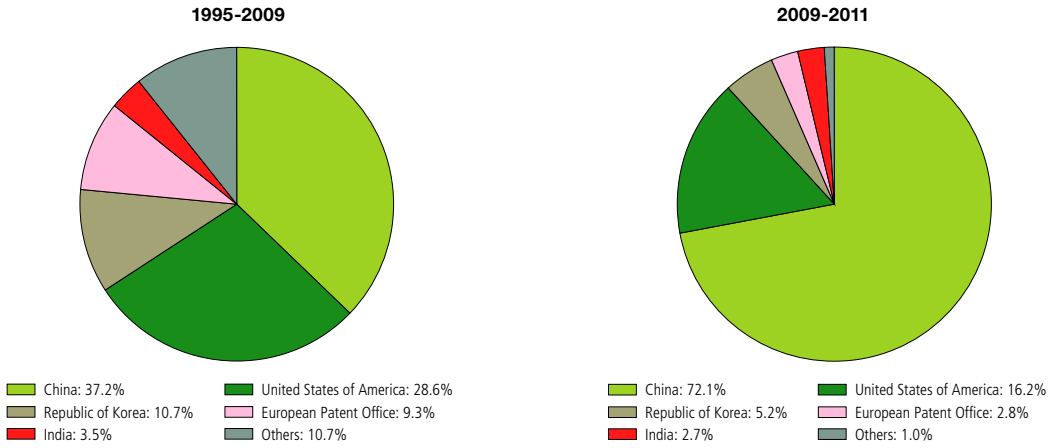


Note: World totals are WIPO estimates covering around 125 patent offices (see Data Description). These estimates include direct applications and PCT national phase entry data.

Source: WIPO Statistics Database, October 2012

1 Throughout this publication, "patents" refers to patents for invention.

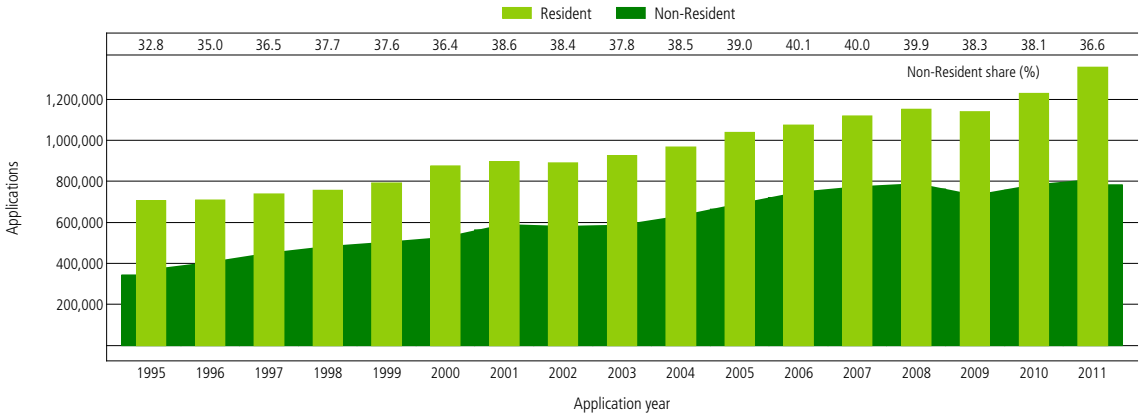
Figure A.1.1.2 Contribution of offices to growth in patent applications worldwide



Note: The Japan Patent Office (JPO) – third largest in the world – is not included in this figure, as it did not account for any growth in worldwide patent applications. Since 2005, the total number of patent applications at the JPO has continuously declined (see Figure A.2.1.1).

Source: WIPO Statistics Database, October 2012

Figure A.1.1.3 Resident and non-resident patent applicants worldwide



Note: See note for Figure A.1.1.1.

Source: WIPO Statistics Database, October 2012

To determine the source of growth in applications worldwide, Figure A.1.1.2 breaks down application growth by office for the 1995-2009 and 2009-2011 periods. Two-thirds of the growth in applications between 1995 and 2009 can be attributed to the patent offices of China and the US.[2] However, the patent office of China was the main contributor to growth in worldwide applications from 2009 to 2011 - accounting for 72% of total growth.

The contribution of China to total growth in applications has increased in recent years while that of other major offices has declined. This reflects the shift in the geography of patent applications from the US and Europe towards China.

2 For simplicity, country names rather than office names are used to label graphs. As an example, the patent office of China is referred to as "China" rather than the "State Intellectual Property Office of the People's Republic of China".

Figure A.1.1.3 provides a breakdown of patent applications worldwide by residency of the applicant. A resident application is defined as an application filed with a patent office by an applicant residing in the country in which that office has jurisdiction. For example, a patent application filed with the Japan Patent Office (JPO) by a resident of Japan is considered a resident application for the JPO. A non-resident application is an application filed with the patent office of a given country by an applicant residing in another country. For example, a patent application filed with the United States Patent and Trademark Office (USPTO) by an applicant residing in France is considered a non-resident application for the USPTO. In this report, regional patent office application data are divided into resident and non-resident applications. An application at a regional office is considered a resident application if the applicant is a resident of one of its member states; and it is considered a non-resident application if the applicant is not a resident of one of its member states.[3]

The 2.14 million applications filed in 2011 consist of 1.36 million resident and 0.78 million non-resident applications (Figure A.1.1.3). Compared to 2010, both resident and non-resident applications grew in 2011; however, resident applications grew at a faster rate (10.4%) than non-resident applications (3.7%). Growth in resident applications in China accounted for around 96% of the growth in resident applications worldwide. Growth in non-resident applications in China and the US accounted for 70% of growth in non-resident applications worldwide.

In 2011, non-resident applications accounted for 36.6% of applications worldwide. However, the non-resident share in total applications has followed a downward trend since its peak of 40.1% in 2006. This downward trend, despite growth in non-resident applications, is due to the substantial growth in resident applications in China. Compared to other types of IP rights, patent applications exhibited the highest non-resident share.[4]

A.1.2 Grants worldwide

The total numbers of patents granted worldwide have recorded uninterrupted growth since 2001 (Figure A.1.2.1). In 2011, grants worldwide approached the one million mark, with 606,800 resident and 390,000 non-resident grants.[5] Patent grants grew by 12.3% in 2010 and 9.7% in 2011. For both years, growth in resident grants accounted for around two-thirds of total growth.

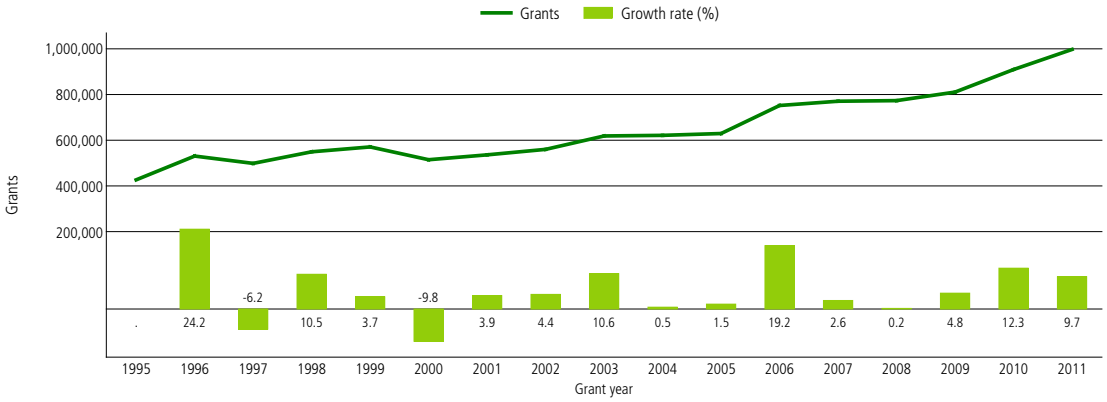
Figure A.1.2.2 provides a breakdown of the growth of patent grants worldwide for the periods 1995-2009 and 2009-2011. From 2009 to 2011, the number of grants issued worldwide increased by 23.9%. The US accounted for 30.4% of total growth, followed by Japan (23.9%), China (23.3%) and the Republic of Korea (20.2%). This is in contrast to patent application data, according to which China accounted for 72.1% of the growth in applications worldwide (Figure A.1.1.2). The substantial increase in the number of grants combined with a drop in the number of applications at the JPO has resulted in a significant decrease in the number of pending applications undergoing examination at the JPO (Figure A.11.3).

3 Resident and non-resident applications are also known as domestic and foreign applications.

4 The non-resident share for patents was 36.6%, compared to 27.1% for trademarks and 10.9% for industrial designs.

5 The distribution of resident and non-resident grants is 61% and 39%, respectively. The non-resident share in total grants is slightly higher than the non-resident share in total applications (see Figure A.1.1.3).

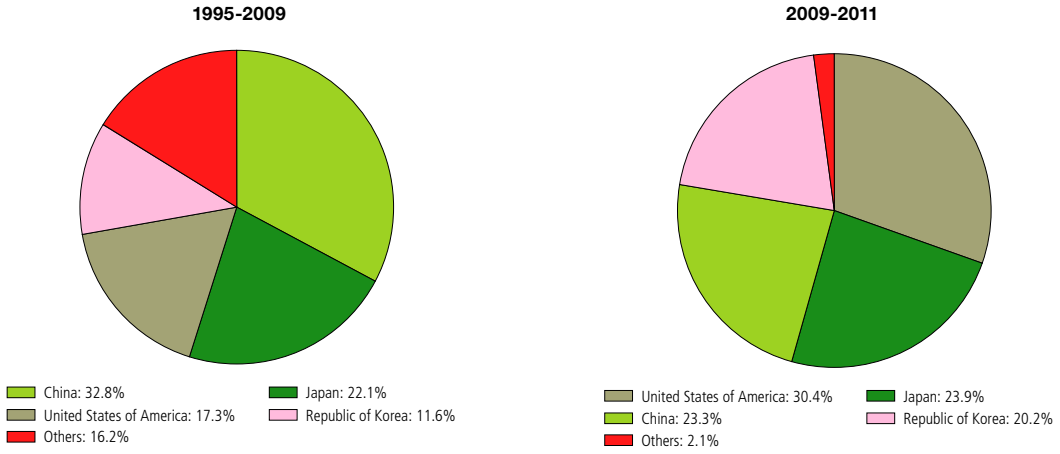
Figure A.1.2.1 Trend in patents granted worldwide



Note: World totals are WIPO estimates covering around 115 patent offices (see Data Description). These estimates include patent grants based on direct applications and PCT national phase entry data.

Source: WIPO Statistics Database, October 2012

Figure A.1.2.2 Contribution of offices to growth in patents granted worldwide



Source: WIPO Statistics Database, October 2012

A.2

Patent applications and grants by office

This subsection provides detailed data on patent applications and grants by office - national or regional. For presentational purposes, country names (rather than office names) are used to label graphs for national offices. For example, patent data for China are labeled "China" rather than the "State Intellectual Property Office of the People's Republic of China" (SIPO).

A.2.1 Applications by office

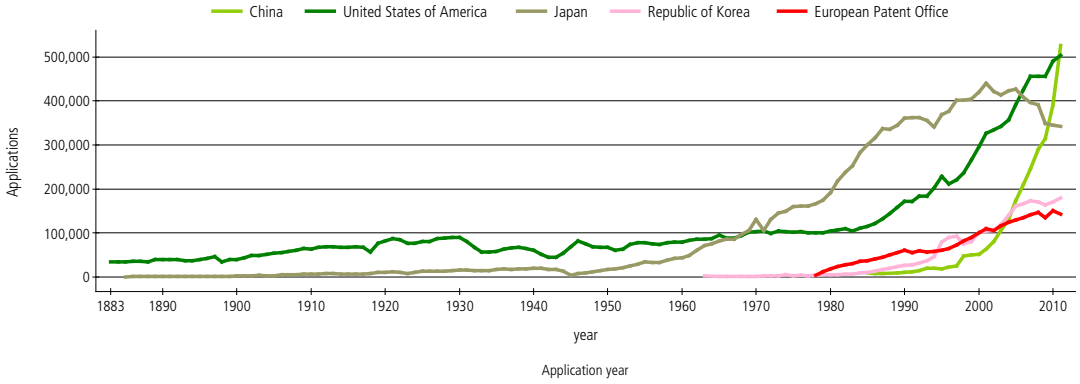
Figure A.2.1.1 shows the long-term trend in total number of applications for the top five offices. These offices were selected according to their 2011 totals.[6] Application numbers were stable until the early 1970s when the JPO started seeing rapid growth in applications, a pattern that was also observed for the USPTO from the 1980s onwards. From 1883 to 1967, the USPTO was the leading office in the world by filings. The JPO surpassed the USPTO in 1968 and maintained the top position until 2005. However, since 2005, the number of applications received by the JPO has followed a downward trend

Both the European Patent Office (EPO) and the Korean Intellectual Property Office (KIPO) have seen increases in the numbers of applications received since the early 1980s. The volumes received by these offices are of similar magnitude, but far below those of the JPO and the USPTO.

SIPO has seen rapid growth in applications since 1985, leading it to surpass both the EPO and KIPO in 2005. Furthermore, in the past two years, SIPO has experienced substantial growth in applications.[7] As a result, SIPO overtook the JPO in 2010 and the USPTO in 2011 to become the largest patent office in the world.

Figure A.2.1.2 depicts the long-term trend of patent applications for five additional selected offices. Compared to the top five offices mentioned earlier, these offices received lower volumes of applications, but experienced strong growth in applications over the past 10 years. For example, the number of applications received by the patent office of India increased from approximately 11,000 in 2002 to around 42,000 in 2011. Similarly, the patent office of the Russian Federation received around 8,000 more applications in 2011 than in 2002.

Figure A.2.1.1 Trend in patent applications for the top five offices

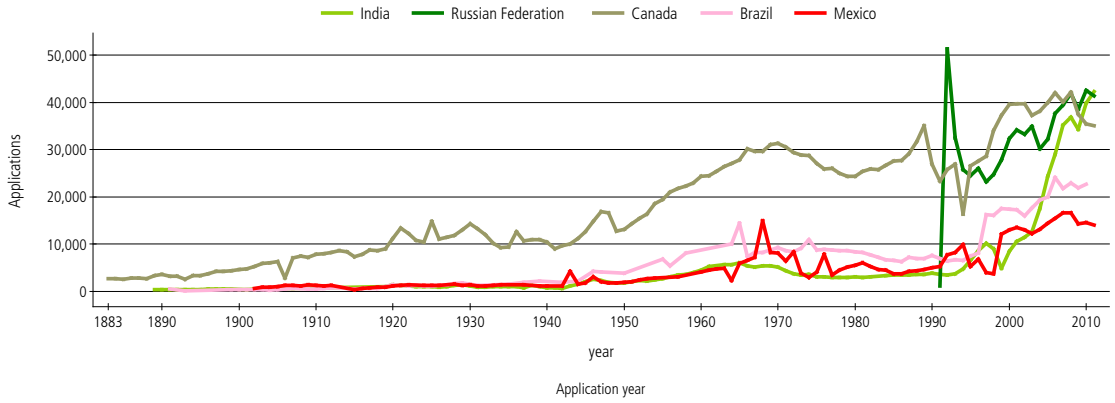


Source: WIPO Statistics Database, October 2012

6 State Intellectual Property Office of China (SIPO), United States Patent and Trademark Office (USPTO), Japan Patent Office (JPO), Korean Intellectual Property Office (KIPO) and European Patent Office (EPO).

7 Patent applications at SIPO grew by 24.3% in 2010 and 34.6% in 2011.

Figure A.2.1.2 Trend in patent applications for selected offices



Source: WIPO Statistics Database, October 2012

Figure A.2.1.3 shows the number of patent applications broken down by resident and non-resident applications for the top 20 offices. As mentioned above, SIPO (with 526,412 applications) overtook the USPTO (503,582) in 2011 to become the largest office in the world - in terms of applications received. This is due to substantial growth in resident applications over the past few years. The JPO (with 342,610), KIPO (178,924) and the EPO (142,793) also received considerable numbers of applications. Together, the top five offices accounted for around four-fifths of the world total, and their combined share has increased over the last decade – from 69.5% in 1998 to 79% in 2011.[8]

The list of the top 20 offices consists mostly of those located in high-income countries, but there are also a few in middle-income countries (e.g., China and India). The patent offices of India and the Russian Federation each received more than 40,000 applications in 2011. Brazil and Mexico also received a large number of applications, the bulk of which were from non-resident applicants.

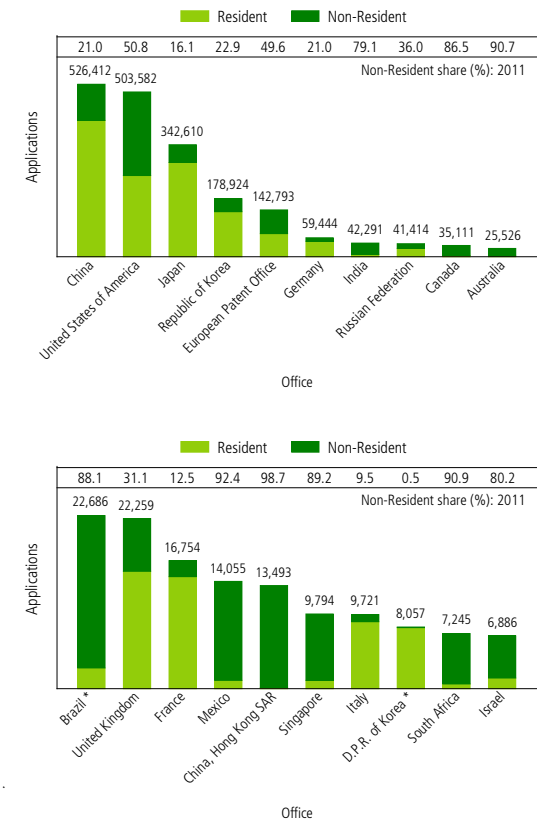
At the global level, the non-resident share of total applications filed was 36.6% (Figure A.1.1.3), but this differs significantly among offices. The non-resident share ranged from 98.7% (China, Hong Kong SAR) to 0.5% (Democratic People's Republic of Korea) in 2011. For 8 of the top 20 offices, non-resident applications accounted for more than four-fifths of total applications. The distribution of resident and non-resident applications was almost equal at the EPO and the USPTO. In contrast, resident applications accounted for the bulk of total applications received by KIPO, the JPO and SIPO. Among the reported offices, SIPO had the largest drop in its non-resident share in 2011 compared to 2010.[9] The Russian Federation and South Africa, however, had the largest increases in non-resident shares.[10]

8 The 2011 shares held by the top five offices are: SIPO (24.6%), the USPTO (23.5%), the JPO (16%), KIPO (8.4%) and the EPO (6.7%).

9 SIPO saw growth in both resident and non-resident applications, but growth in resident applications outpaced growth in non-resident applications, resulting in a decline in the non-resident share of total applications for this office.

10 The patent offices of the Russian Federation and South Africa saw drops in resident applications and growth in non-resident applications, resulting in an increase in the non-resident share of total applications for these offices.

Figure A.2.1.3 Patent applications for the top 20 offices, 2011



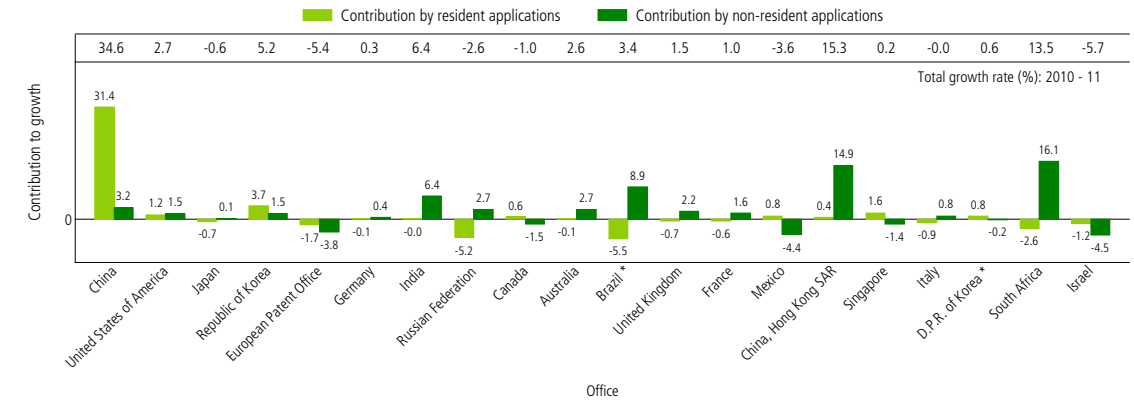
Note: *2010 data; D.P.R. of Korea = Democratic People's Republic of Korea

Source: WIPO Statistics Database, October 2012

Between 2010 and 2011, the majority of the offices listed saw growth in applications. China had the largest growth (34.6%), while the EPO (-5.4%) and Israel (-5.7%) saw the largest declines in applications. To identify the source of growth, Figure A.2.1.4 provides a breakdown of total growth by resident and non-resident applications. Growth in resident applications is the main factor behind the growth in total applications in China and the Republic of Korea. For example, growth in resident applications accounted for 31.4 percentage points of the 34.6% increase in applications in China.

Growth in both resident and non-resident applications contributed to the overall growth in the US. For a number of offices (e.g., Australia and South Africa), growth in non-resident applications was the main contributor to total growth.

Figure A.2.1.4 Contribution of resident and non-resident applications to total growth for the top 20 offices, 2010-11

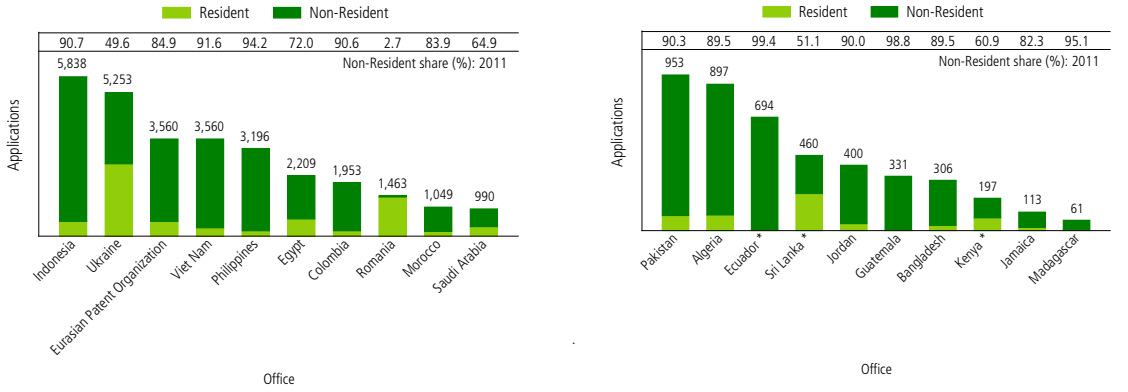


Note: *Growth rate refers to 2009-2010; D.P.R. of Korea = Democratic People's Republic of Korea

Source: WIPO Statistics Database, October 2012

High-income countries are prominent in the list of top 20 offices (Figure A.2.1.3). However, a considerable amount of IP activity also occurs in the offices of middle- and low-income countries. Figure A.2.1.5 depicts patent application data for selected middle- and low-income countries.[11] The patent offices of Indonesia and Ukraine each received more than 5,200 applications in 2011. The Eurasian Patent Organization (EAPO) and the offices of Viet Nam and the Philippines also received large numbers of applications. In all offices listed, except Ukraine and Romania, non-resident applications accounted for the bulk of total applications. For example, non-resident applications accounted for almost all applications filed in Ecuador and Guatemala. However, for a number of these offices, the contribution of resident applications to overall growth outweighed that of non-resident applications (Figure A.2.1.6). For example, growth in resident applications accounted for more than half of the 4.3% overall growth in Colombia.

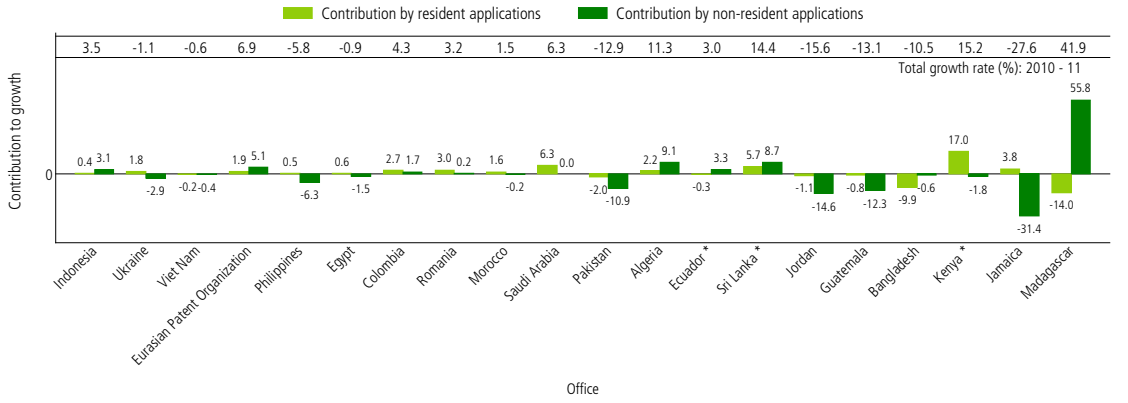
Figure A.2.1.5 Patent applications for offices of selected middle- and low-income countries, 2011



Note: *2010 data

Source: WIPO Statistics Database, October 2012

Figure A.2.1.6 Contribution of resident and non-resident applications to total growth for offices of selected middle- and low-income countries, 2010-11



Note: *Growth rate refers to 2009-2010.

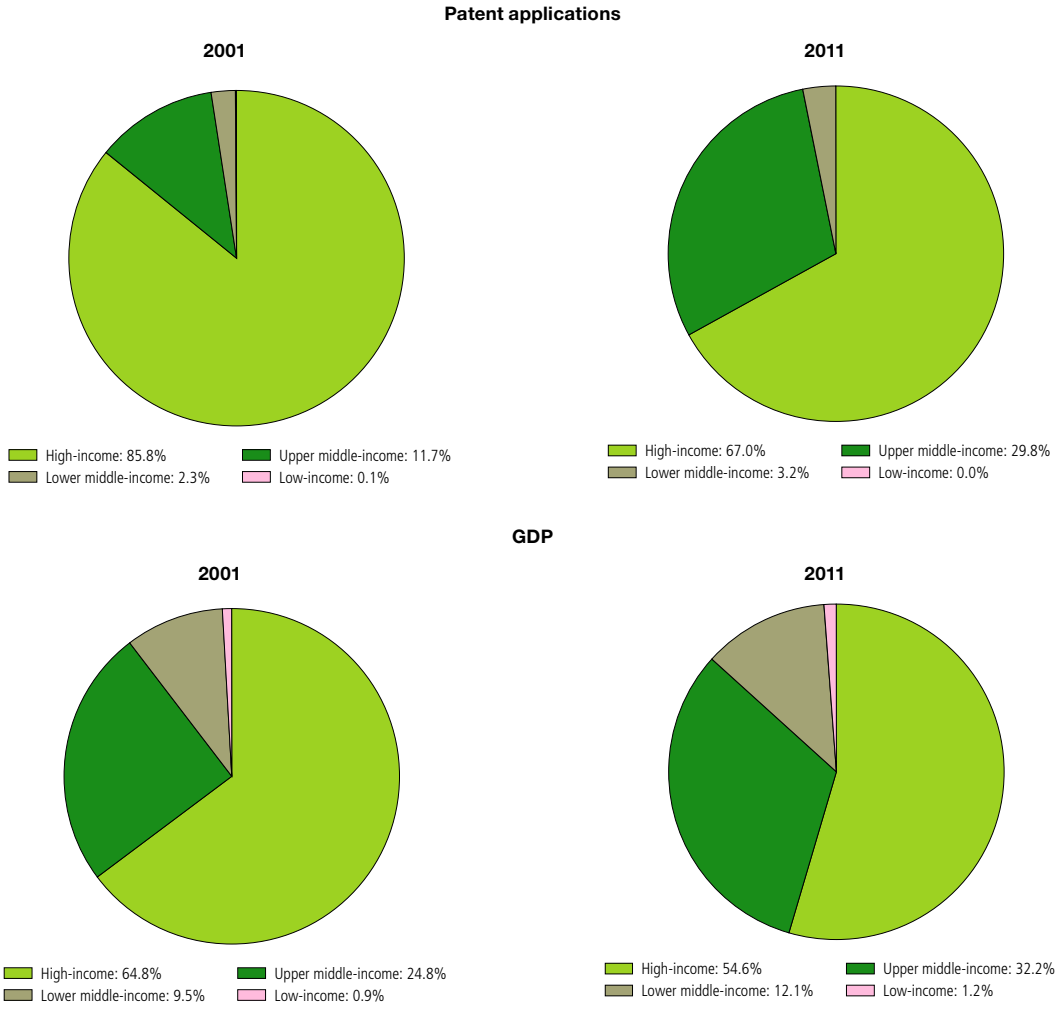
Source: WIPO Statistics Database, October 2012

11 The selected offices are from different world regions. Data for all available offices are presented in the statistical annex.

Figure A.2.1.7 shows the distribution of patent applications worldwide and that of gross domestic product (GDP) by income group.[12] The share of high-income countries in patent applications worldwide declined from 85.8% in 2001 to 67% in 2011. Despite the decline, they accounted for two-thirds of the world total, which is substantially higher than their GDP share (54.6%).

Over the past decade, China saw rapid growth in both patent applications and GDP. This resulted in a considerable increase in the share of upper middle-income countries in the world total for both patents and GDP. Furthermore, patent applications grew more rapidly than did economic output in China, so that the gap between patent applications and GDP shares of the upper middle-income countries narrowed considerably between 2001 and 2011.

Figure A.2.1.7 Patent applications and GDP share by income group



Source: WIPO Statistics Database and World Bank, October 2012

12 The income groups correspond to those used by the Word Bank. Economies are divided according to 2011 gross national income (GNI) per capita, calculated using the World Bank Atlas method. The groups are: low-income (US$1,025 or less); lower middle-income (US$1,026-$4,035); upper middle-income (US$4,036-$12,475); and high-income (US$12,476 or more).

Figure A.2.1.8 Resident and non-resident patent applications worldwide by income, 2011

Source: WIPO Statistics Database, October 2012

In both high-income and upper middle-income countries, resident applications accounted for the majority of total applications (Figure A.2.1.8). In contrast, resident applications accounted for around one-fifth of total applications in lower middle-income countries. For high-income countries, the non-resident share increased from around 35% in 2001 to 38% in 2011, while that of upper middle-income countries declined from 60% to 26.8%. This is due to the substantial growth in resident applications in China. Excluding data for China, the non-resident share for upper middle-income countries was around 65% in 2001 and 58% in 2011.

A.2.2 Grants by office

The JPO (238,323) issued the largest number of patents in 2011, followed by the USPTO (224,505). The number of patents granted by SIPO grew considerably in absolute terms (+37,003) in 2011, but its rank in third position did not change.[13] Brazil, one of the top 20 offices in terms of applications, does not, however, appear in the top 20 list for grants. Of the top 20 offices, India showed the largest difference between its numbers of applications and grants. In contrast, application and grant numbers for Mexico were of similar magnitude.[14]

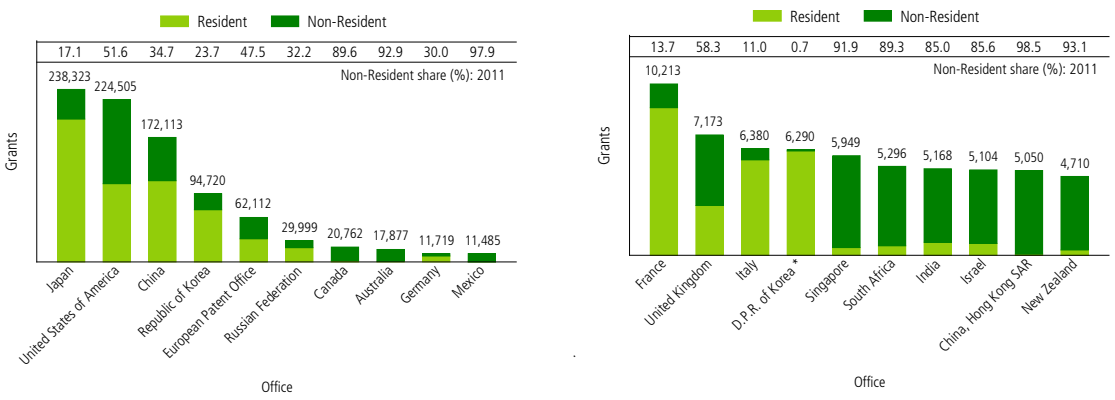
The combined shares of the top five offices for applications and grants worldwide were nearly equal (around 79%). However, when looking at the JPO's and SIPO's shares in total applications and grants worldwide, large differences emerge. SIPO accounted for 24.6% of applications but only 17.3% of grants worldwide, but the JPO witnessed an opposite trend, with 16% of applications and 24% of grants worldwide.

The non-resident share ranged from 0.7% in the Democratic People's Republic of Korea to 98.5% in China, Hong Kong SAR. For a number of offices, the non-resident share exceeded 80%. However, for most offices, non-resident application and grant shares (Figure A.2.1.3) were of similar magnitude. Exceptions include China, Germany and the United Kingdom (UK), which all have higher non-resident shares for grants than for applications.

13 In absolute numbers, SIPO had the largest increase in patent grants (+37,003), followed by KIPO (+25,877) and the JPO (+15,630).

14 In 2011, the patent office of India received 42,291 applications and issued 5,168 patents, while the patent office of Mexico received 14,055 applications and issued 11,485 patents. However, care should be exercised in making direct comparisons between application and grant data, due to the time lag between application and grant dates.

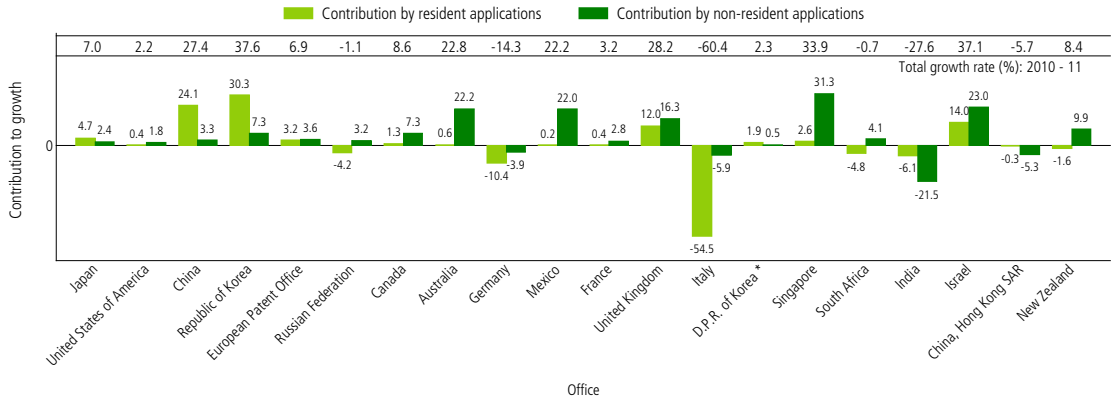
Figure A.2.2.1 Patent grants for the top 20 offices, 2011



Note: *2010 data; D.P.R. of Korea = Democratic People's Republic of Korea

Source: WIPO Statistics Database, October 2012

Figure A.2.2.2 Contribution of resident and non-resident patent grants to total growth for the top 20 offices, 2010-11



Note: *2010 data

Source: WIPO Statistics Database, October 2012

The majority of the top 20 offices issued more patents in 2011 than in 2010 (Figure A.2.2.2). In percentage terms, KIPO had the highest growth rate (37.6%), followed by Israel (37.1%) and Singapore (33.9%).[15]

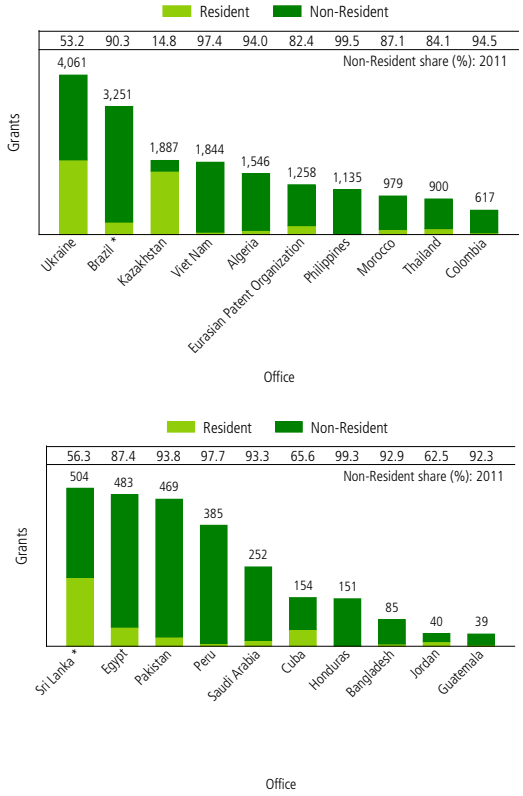
For all offices, except the JPO, KIPO and SIPO, the increase in non-resident grants was the main contributor to each office's growth. For example, the increases in Australia, Mexico and Singapore were almost entirely driven by growth in non-resident grants. Italy saw a substantial drop in patent grants (-60.4%) in 2011. India also issued fewer patents in 2011 than in 2010 (-27.6%), due to declines in both resident and non-resident grants.

Figure A.2.2.1 illustrates that high-income countries are prominent in the list of top 20 offices for patent grants. Figure A.2.2.3 presents grant data for offices of selected middle- and low-income countries.[16] Among these countries, Ukraine issued the largest number of patents, followed by Brazil, Kazakhstan and Viet Nam. In all offices, except Kazakhstan, non-resident grants accounted for the largest share in total grants. The majority of reported offices issued more patents in 2011 than in 2010.

15 For absolute numbers, see footnote 13.

16 The selected offices are from different world regions. Data for all available offices are presented in the statistical annex.

Figure A.2.2.3 Patent grants for offices of selected middle- and low-income countries, 2011



Note: *2010 data

Source: WIPO Statistics Database, October 2012

A.3

Patent applications and grants by origin

Patent application counts based on the applicant's origin complement the picture of patent activity worldwide. Patent activity by origin includes resident applications and applications abroad.[17] The origin of a patent application is determined based on the residency of the first-named applicant. As some offices do not provide data broken down by origin, the number of applications and grants by origin reported here is likely to be lower than the actual number.

Applications at regional offices are equivalent to multiple applications in the respective states members of those offices. This subsection reports figures based on an equivalent applications or grants concept. For instance, to calculate the number of equivalent applications or grants for the EAPO or the African Intellectual Property Organization (OAPI), each application is multiplied by the corresponding number of member states. By contrast, the EPO and the African Regional Intellectual Property Organization (ARIPO) do not issue patents with automatic region-wide applicability. Thus, for these two offices, each application is counted as one application abroad if the applicant does not reside in a member state; or as one resident and one application abroad if the applicant resides in a member state. This method might underestimate the number of applications at the EPO or ARIPO, as applications at these offices may lead to protection in more than one jurisdiction. Uncertainty and lack of data on designations or validations in member states are the main reasons for limiting the number of applications abroad to one for these two offices.

17 See Glossary for the definition of resident application and application abroad.

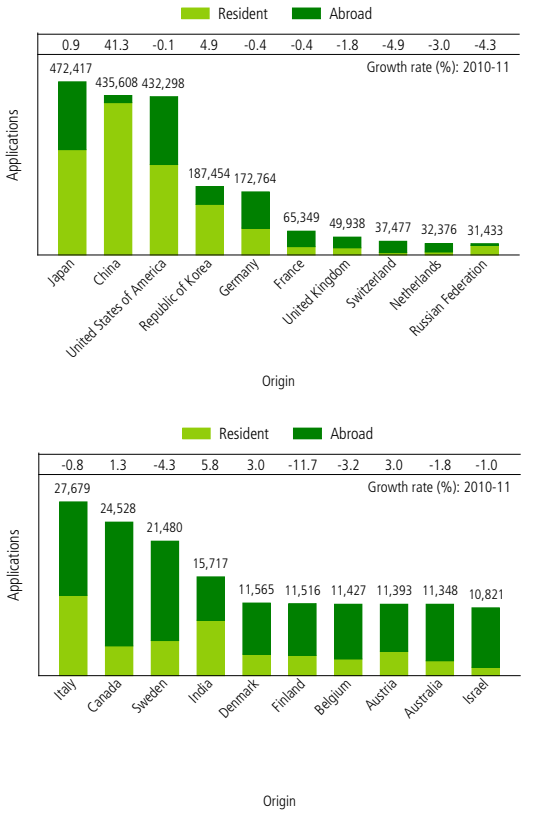
A.3.1 Applications and grants by origin

Figure A.3.1.1 presents equivalent patent application data for the top 20 origins. Residents of Japan filed the largest number of applications across the world (472,417) in 2011.[18] China, which saw a 41.3% increase in 2011, overtook the US to become the second largest country for origin counts.[19] The ranking of the top three origins is different than that for offices. In terms of offices, China ranked first, but it ranked second for origin data. In contrast, Japan ranked third for office data, but first for origin data. Large differences in the numbers of applications abroad for China and Japan partly explain the differences in the ranking between office and origin data (See Figure A.3.2.1). The majority of origins filed fewer than 50,000 applications in 2011. China, India and the Russian Federation are the only three middle-income origins in the top 20 list.

Residents of China filed fewer than 20,000 applications abroad (i.e., 4.5% of all applications worldwide). In contrast, Japan and the US each filed around 184,000 applications abroad. All European countries, Australia, Canada, and Israel filed a high proportion of their total applications abroad.[20]

Among the top 20 origins, most countries saw growth in applications between 2010 and 2011. China was the only country with double-digit growth, due mostly to growth in resident applications. Finland and Switzerland saw considerable declines in applications. In the case of Finland, the drop in applications abroad was the main contributor to the overall decline. As for Switzerland, the fall in resident applications was the main factor for the overall decrease.

Figure A.3.1.1 Equivalent patent applications for the top 20 origins, 2011



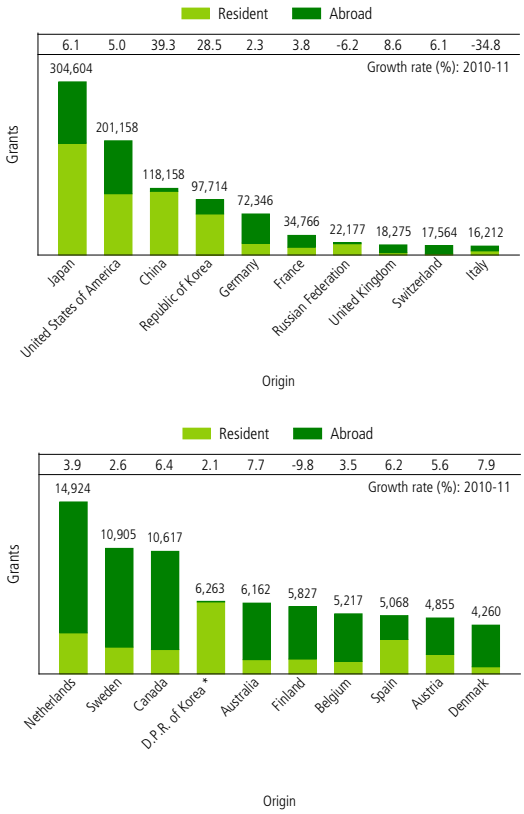
Source: WIPO Statistics Database, October 2012

18 The sum of resident applications and applications abroad.

19 If the present trend continues, China will soon overtake Japan to become the top origin.

20 For these offices, shares of applications filed abroad ranged from 87% for Israel to 57% for Germany.

Figure A.3.1.2 Equivalent patent grants for the top 20 origins, 2011



Note: *2010 data; D.P.R. of Korea = Democratic People's Republic of Korea

Source: WIPO Statistics Database, October 2012

For the majority of origins, equivalent patent grants show similar trends to those for equivalent applications. However, the applications and grants profiles of China and the US differ significantly. These two origins had similar numbers of applications (Figure A.3.1.1), but there was a substantial difference in their numbers of grants received. Residents of China received 118,185 equivalent grants in 2011, compared to 201,158 for US residents. However, care should be exercised when comparing application and grant data as it takes time (several years) to process applications. Furthermore, in recent years there has been substantial growth in applications filed by residents of China. Once those applications are processed, China's grant total will increase.

For all origins reported – except Finland, Italy and the Russian Federation – the number of equivalent grants increased between 2010 and 2011.[21] Thirteen of these 20 origins were granted the majority of their patents by foreign patent offices.[22] Residents of Denmark and Switzerland obtained more than four-fifths of their total patents from offices other than their national patent office.

A.3.2 Applications abroad by origin

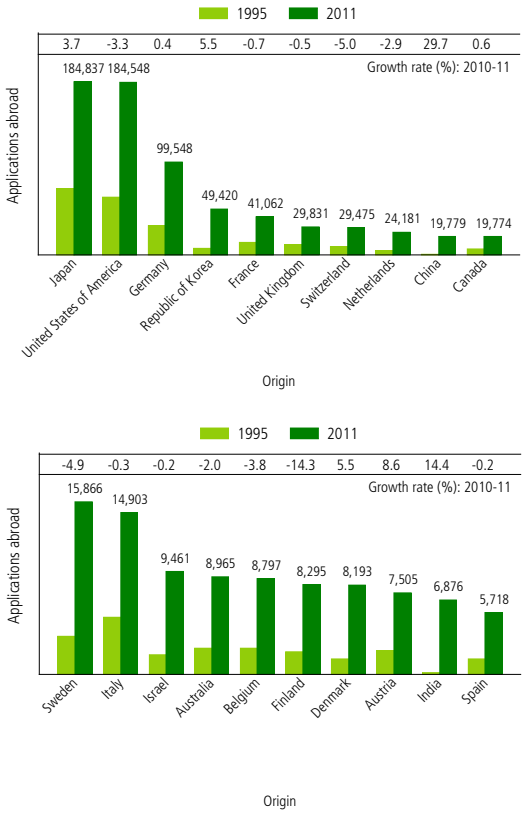
The volume of filings abroad reflects, to some extent, the impact of globalization on IP protection strategies. Companies that expand operations to foreign countries might have a business need to seek IP protection in those countries.[23] Therefore, patent applications abroad provide some indication of how companies are expanding their businesses into overseas markets. Japan and the US, by far, filed the largest number of applications abroad – each filing more than 184,000 applications in 2011.

21 These three origins saw drops in equivalent applications and grants in 2011.

22 Eleven of the 13 origins are members of the EPO – a regional office. Patents granted by the EPO are counted as grants abroad, hence EPO members have a high share in total grants abroad.

23 It goes without saying that expanding operations abroad does not necessarily mean that companies will seek additional patent rights. For example, companies might rely on other types of IP protection, or IP protection might not be necessary at all due to the nature of the business activity.

Figure A.3.2.1 Applications abroad for the top origins



Source: WIPO Statistics Database, October 2012

For the resident applications measure, China ranked first; however, for the applications abroad measure it ranked below Japan, the Republic of Korea, the US and several larger European countries. All reported countries saw substantial growth in applications abroad between 1995 and 2011. However, a closer look at the data for 2009 to 2011 reveals the negative impact of the economic downturn. All top origins, except Austria and China, saw decreases in applications abroad at the start of the economic downturn in 2008. For example, between 2008 and 2009, applications abroad for Japan, the US and Germany – the top three origins – declined by 6.4%, 12.3% and 6.9%, respectively. However, the 2011 data show that there are signs of recovery. The top five origins, except the US, filed more applications abroad in 2011 than in 2008 (2008 being the peak year).

A.3.3 Applications by office and origin

To provide a detailed picture of patent flows across countries, Tables A.3.3.1 and A.3.3.2 present a breakdown of patent application data by origin (source) and office (destination). Data are reported for top offices and top origins.[24] When deciding where to seek patent protection, applicants consider factors such as market size and geographical proximity. At larger patent offices (e.g., China, Germany, Japan and the Republic of Korea), resident applicants accounted for more than three-quarters of total applications. The US is an exception, where there was an equal distribution between resident and non-resident applications.

Excluding resident filings, applications of US origin accounted for the largest shares of total patent applications in all reported offices, except China, France and the Republic of Korea. At the patent offices of China and the Republic of Korea, the largest shares belonged to residents of Japan, while in France, German residents accounted for the largest share. In a number of offices, residents of the US filed more applications than domestic applicants. For example, at the patent office of India, residents of the US accounted for a larger share of total applications than residents of India. A similar profile is visible at the offices of Australia, Canada, Mexico and Singapore. Residents of Japan accounted for the largest share of non-resident applications at the patent offices of China, the Republic of Korea and the US. The share of China at most offices was less than 2%, reflecting the relatively small number of applications that residents of China file abroad.

24 "Origin data" refers to simple application count rather than equivalent application count as presented in Figure A.3.1.1.

Table A.3.3.1 Number of patent applications by office and origin: top offices and origins, 2011

Origin	Office														
	CN	US	JP	KR	EP	DE	IN	RU	CA	AU	GB	FR	MX	HK	SG
Australia	621	3,767	464	167	837	16	341	70	462	2,383	109	8	123	172	188
Austria	598	1,849	288	190	1,734	836	269	195	243	212	35	17	62	54	34
Belgium	592	2,115	457	263	1,994	53	323	192	324	281	241	76	180	162	88
Canada	1,033	11,975	751	466	2,346	35	583	197	4,754	548	203	8	278	353	126
China	415,829	10,545	1,401	752	2,548	91	976	393	352	383	118	71	203	544	167
Denmark	781	1,974	418	187	1,798	24	411	149	312	287	76	8	169	124	75
Finland	964	2,551	319	334	1,571	116	451	225	273	172	52	4	62	75	40
France	3,973	10,563	3,447	1,753	9,632	230	1,669	1,033	1,793	806	127	14,655	546	312	422
Germany	11,422	27,935	6,773	3,598	26,230	46,986	4,097	2,302	2,723	1,698	372	590	1,252	931	667
India	202	4,548	170	109	473	12	8,841	56	141	169	24	2	80	50	55
Israel	532	5,436	413	212	1,053	15	330	97	308	240	96	3	88	118	83
Italy	1,245	4,282	753	358	3,982	109	700	409	498	298	29	61	241	196	99
Japan	39,231	85,184	287,580	15,234	20,568	3,001	5,048	1,931	1,794	1,691	616	128	759	1,729	1269
Netherlands	2,999	4,418	2,374	1,045	5,610	65	1,513	989	666	606	203	20	445	188	173
Republic of Korea	8,129	27,289	5,007	138,034	4,889	999	737	318	338	339	143	39	183	86	105
Russian Federation	120	719	38	31	168	39	55	26,495	47	16	4	18	13	23	8
Sweden	1,730	4,140	1,342	573	3,610	232	854	340	472	441	77	21	206	243	149
Switzerland	2,665	4,086	2,139	1,073	6,405	853	1,652	803	1,326	1,111	242	213	820	732	516
United Kingdom	1,876	11,279	1,739	737	4,764	111	1,142	404	1,286	1,214	15,343	69	403	450	388
United States of America	28,457	247,750	23,414	12,139	34,987	4,499	10,575	3,707	15,342	11,002	2,525	417	6,182	5,901	3594
Other / Unknown	3413	31177	3323	1669	7594	1122	1724	1109	1657	1629	1624	326	1760	1050	1548
Total	526,412	503,582	342,610	178,924	142,793	59,444	42,291	41,414	35,111	25,526	22,259	16,754	14,055	13,493	9,794

Note: CN (China), US (United States of America), JP (Japan), KR (Republic of Korea), EP (European Patent Office), DE (Germany), IN (India), RU (Russian Federation), CA (Canada), AU (Australia), GB (United Kingdom), FR (France), MX (Mexico), HK (China, Hong Kong (SAR)) and SG (Singapore)

Source: WIPO Statistics Database, October 2012

Table A.3.3.2 Distribution of patent applications by office and origin: top offices and top origins, 2011

Origin	Office														
	CN	US	JP	KR	EP	DE	IN	RU	CA	AU	GB	FR	MX	HK	SG
Australia	0.1	0.7	0.1	0.1	0.6	0.0	0.8	0.2	1.3	9.3	0.5	0.0	0.9	1.3	1.9
Austria	0.1	0.4	0.1	0.1	1.2	1.4	0.6	0.5	0.7	0.8	0.2	0.1	0.4	0.4	0.3
Belgium	0.1	0.4	0.1	0.1	1.4	0.1	0.8	0.5	0.9	1.1	1.1	0.5	1.3	1.2	0.9
Canada	0.2	2.4	0.2	0.3	1.6	0.1	1.4	0.5	13.5	2.1	0.9	0.0	2.0	2.6	1.3
China	79.0	2.1	0.4	0.4	1.8	0.2	2.3	0.9	1.0	1.5	0.5	0.4	1.4	4.0	1.7
Denmark	0.1	0.4	0.1	0.1	1.3	0.0	1.0	0.4	0.9	1.1	0.3	0.0	1.2	0.9	0.8
Finland	0.2	0.5	0.1	0.2	1.1	0.2	1.1	0.5	0.8	0.7	0.2	0.0	0.4	0.6	0.4
France	0.8	2.1	1.0	1.0	6.7	0.4	3.9	2.5	5.1	3.2	0.6	87.5	3.9	2.3	4.3
Germany	2.2	5.5	2.0	2.0	18.4	79.0	9.7	5.6	7.8	6.7	1.7	3.5	8.9	6.9	6.8
India	0.0	0.9	0.0	0.1	0.3	0.0	20.9	0.1	0.4	0.7	0.1	0.0	0.6	0.4	0.6
Israel	0.1	1.1	0.1	0.1	0.7	0.0	0.8	0.2	0.9	0.9	0.4	0.0	0.6	0.9	0.8
Italy	0.2	0.9	0.2	0.2	2.8	0.2	1.7	1.0	1.4	1.2	0.1	0.4	1.7	1.5	1.0
Japan	7.5	16.9	83.9	8.5	14.4	5.0	11.9	4.7	5.1	6.6	2.8	0.8	5.4	12.8	13.0
Netherlands	0.6	0.9	0.7	0.6	3.9	0.1	3.6	2.4	1.9	2.4	0.9	0.1	3.2	1.4	1.8
Republic of Korea	1.5	5.4	1.5	77.1	3.4	1.7	1.7	0.8	1.0	1.3	0.6	0.2	1.3	0.6	1.1
Russian Federation	0.0	0.1	0.0	0.0	0.1	0.1	0.1	64.0	0.1	0.1	0.0	0.1	0.1	0.2	0.1
Sweden	0.3	0.8	0.4	0.3	2.5	0.4	2.0	0.8	1.3	1.7	0.3	0.1	1.5	1.8	1.5
Switzerland	0.5	0.8	0.6	0.6	4.5	1.4	3.9	1.9	3.8	4.4	1.1	1.3	5.8	5.4	5.3
United Kingdom	0.4	2.2	0.5	0.4	3.3	0.2	2.7	1.0	3.7	4.8	68.9	0.4	2.9	3.3	4.0
United States of America	5.4	49.2	6.8	6.8	24.5	7.6	25.0	9.0	43.7	43.1	11.3	2.5	44.0	43.7	36.7
Other / Unknown	0.6	6.2	1.0	0.9	5.3	1.9	4.1	2.7	4.7	6.4	7.3	1.9	12.5	7.8	15.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: See note for Table A.3.3.1

Source: WIPO Statistics Database, October 2012

A.4

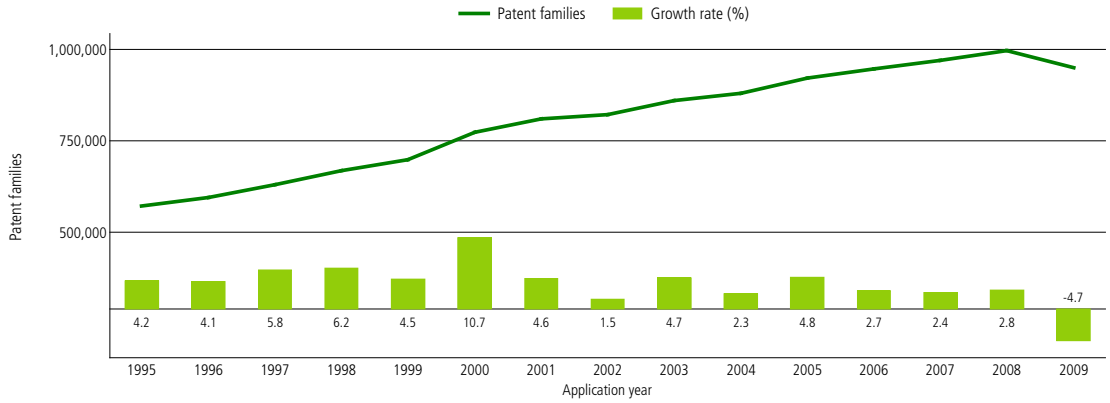
Patent Families

Applicants often file patent applications in multiple jurisdictions, leading to some inventions being counted more than once in patent counts. To account for this, WIPO has developed indicators related to so-called patent families, defined as a set of patent applications interlinked by – or by a combination of – priority claim, PCT national phase entry, continuation, continuation-in-part, internal priority, addition or division.[25] A special subset of patent families consists of foreign-oriented patent families, which include only patent families having at least one filing office that is different from the office of the applicant's country of origin.[26] By contrast, domestic patent families are patent families having only one filing office that is the same as the office of the first-named applicant's country of origin.

A.4.1 Patent families

Figure A.4.1.1 shows the number of patent families worldwide for 1995-2009.[27] Between 1995 and 2008, the total number of patent families continuously increased, followed by a 4.7% drop in 2009. The drop in the total number of patent families in 2009 coincided with the economic downturn, and was consistent with the drop in patent applications worldwide (Figure A.1.1.1).

Figure A.4.1.1 Trends in patent families



Note: The patent family dataset includes only published patent applications. Unpublished patent applications (e.g., patent applications withdrawn before publication) and provisional applications are not included in the patent family count. WIPO's patent family dataset has the following features: (1) each "first-filed" patent application forms a patent family; all subsequent patent filings are added to that family; (2) one patent application may belong to more than one patent family due to the existence of multiple priority claims. "Patent family" is defined as a set of patent applications interlinked by – or by a combination of – priority claim, PCT national phase entry, continuation, continuation-in-part, addition or division. "Foreign-oriented patent family" is defined as a patent family having at least one filing office that is different from the office of the first-named applicant's country of origin.

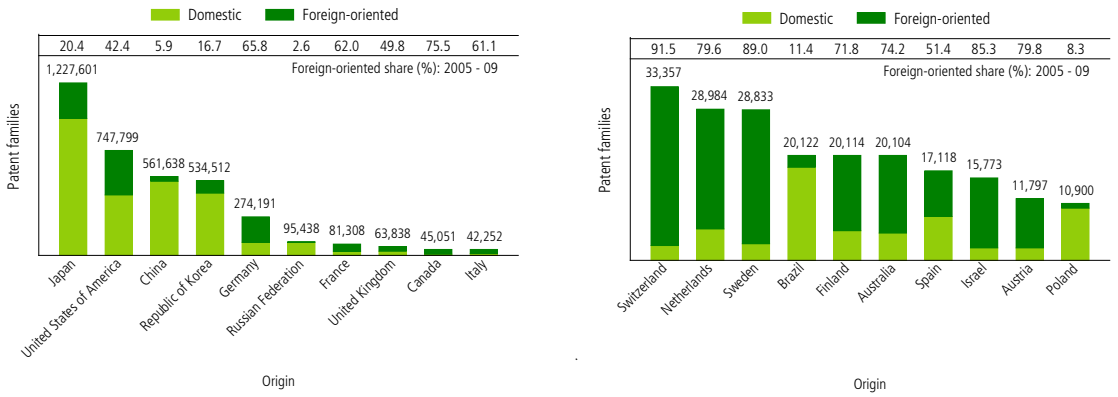
Sources: WIPO Statistics Database and EPO PATSTAT Database, October 2012

25 In this publication, patent families include only those families associated with patent applications for inventions and exclude families associated with utility model applications.

26 Some foreign-related patent families contain only one filing office, as 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, form a foreign-oriented patent family.

27 Patent family data are based on published applications. There is a minimum delay of 18 months between the application and publication dates. For this reason, 2009 is the latest available year for which complete patent family data exist.

Figure A.4.1.2 Domestic and foreign-oriented patent families for the top origins, 2005-09



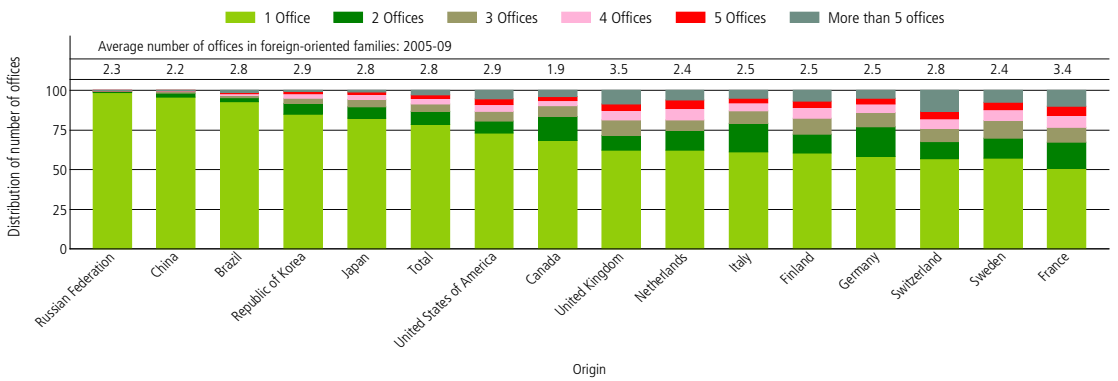
Sources: WIPO Statistics Database and EPO PATSTAT Database, October 2012

Figure A.4.1.2 presents the number of domestic and foreign-oriented patent families for the top origins for 2005-2009. Between 2005 and 2009, the largest number of patent families originated in Japan – the only origin with more than 1.2 million families – followed by the US, China and the Republic of Korea. However, for these origins, the distribution of domestic and foreign-oriented families differed considerably. More than 40% of total patent families originating in the US were foreign-oriented. In contrast, less than 6% of all patent families originating in China were foreign-oriented. Patent families originating in Switzerland (91.5%), Sweden (89%) and Israel (85.3%) were predominantly foreign-oriented.

A.4.2 Patent families by office and origin

Figure A.4.2.1 shows the distribution of total patent families by number of offices for selected origins. The majority of patent families contain only one office, most often the national patent office of the applicant. On average, 22.6% of patent families created worldwide between 2005 and 2009 included at least two patent offices. However, there was considerable variation among the top origins. A small fraction of total patent families originating in Brazil (1.7%), China (4.8%) and the Russian Federation (8.5%) included at least two patent offices. In contrast, large shares of patent families originating in European countries, such as France (49.5%) and Sweden (45.3%), included at least two patent offices.

Figure A.4.2.1 Distribution of total patent families by number of offices, 2005-09



Note: The definition of a patent family is explained in the note for Figure A.4.1.1.

Sources: WIPO Statistics Database and EPO PATSTAT Database, October 2012

Table A.4.2.2 illustrates the flow of patent filings from source countries to destination offices. Data reported in this table give lower numbers than the applications abroad data reported in subsection A.3 due to data consolidation – that is, repeated filings at the same office within the same patent family are counted only once.

The USPTO is the most popular destination for foreign-oriented patent families – around 67% of foreign-oriented patent families from non-US residents included at least one filing at the USPTO. More than four-fifths of foreign-oriented patent families originating in Japan and the Republic of Korea included filings at the USPTO. About 38% of foreign-oriented families from non-EPC members contained applications at the EPO, whereas 60% of those owned by EPC members had EPO filings. The percentage of foreign-oriented families by non-resident applicants that had filings at SIPO was around 35%. Japan and the Republic of Korea had a high tendency to file at SIPO – more than two-fifths of total foreign-oriented families from these origins included filings at SIPO. A small proportion of foreign-oriented patent families by non-resident applicants included filings at the patent offices of Brazil, Israel and New Zealand.[28]

Table A.4.2.2 Foreign-oriented patent families for selected offices and origins, 2005-09

Origin	Office															
	Australia	Brazil	Canada	China	European Patent Office	France	Germany	Israel	Japan	Mexico	New Zealand	Republic of Korea	Russian Federation	United Kingdom	United States of America	Total families
Australia	5,080	442	2,741	4,146	4,434	14	96	354	2,448	512	2,349	1,749	435	573	8,077	14,909
Austria	590	189	864	1,709	5,899	97	3,256	123	1,170	230	109	690	640	85	3,432	9,415
Belgium	1,053	352	1,321	2,207	5,131	333	255	347	1,621	562	342	1,189	450	1,046	3,726	8,859
Canada	2,405	485	11,603	5,457	9,146	65	245	377	3,082	1,107	478	2,817	645	1,007	24,756	34,000
China	1,167	310	1,306	22,583	9,284	298	632	125	4,777	257	134	2,681	983	572	24,947	33,239
Finland	928	395	1,433	4,520	7,470	32	517	154	1,683	449	85	2,369	1,145	386	8,637	14,450
France	3,380	2,388	8,416	15,069	39,272	32,742	1,075	1,464	14,151	2,633	784	7,281	3,933	602	28,565	50,397
Germany	6,136	3,850	11,667	42,230	100,596	2,504	83,860	1,903	63,186	4,506	1,293	17,210	8,616	1,944	83,756	180,303
Israel	1,143	259	1,685	2,422	4,677	13	128	3,278	1,931	446	141	1,599	359	378	9,983	13,449
Italy	1,494	1,119	2,555	5,498	18,838	241	494	579	3,016	979	338	1,690	1,589	289	10,935	25,813
Japan	5,529	1,644	5,898	106,400	68,739	1,405	12,644	455	209,886	1,236	414	51,100	3,112	2,339	199,513	250,004
Netherlands	1,549	535	1,976	7,166	10,967	91	447	360	5,935	635	475	3,442	1,409	763	11,807	23,057
Republic of Korea	1,844	746	1,623	35,835	20,767	396	3,365	116	25,394	1,095	109	79,869	1,838	805	75,140	89,080
Singapore	373	47	203	1,650	1,276	4	504	66	1,190	72	58	773	68	334	4,632	6,774
Spain	702	383	1,091	1,485	5,635	257	179	294	974	750	153	473	570	193	3,413	8,797
Sweden	1,853	897	2,363	7,984	13,372	146	1,155	493	5,026	1,061	509	2,923	1,573	572	13,518	25,650
Switzerland	3,928	1,536	5,161	9,106	16,377	361	3,847	1,328	7,014	2,786	1,097	4,939	2,677	1,490	12,884	30,519
United Kingdom	5,788	1,059	6,348	7,998	20,904	158	418	1,293	8,158	1,874	1,501	3,489	1,601	20,450	22,886	31,808
United States of America	45,602	14,532	81,315	125,256	150,139	1,382	16,110	11,049	98,014	29,233	9,201	67,309	15,090	16,203	159,816	317,340
Others	21,116	7,140	26,568	104,719	128,128	2,614	9,218	6,268	140,048	10,501	6,223	64,138	15,554	7,146	201,762	268,189
Total families	111,660	38,308	176,137	513,440	641,051	43,153	138,445	30,426	598,704	60,924	25,793	317,730	62,287	57,177	912,185	1,436,052

Note: For the definition of a patent family, refer to the note for Figure A.4.1.1.

Sources: WIPO Statistics Database and EPO PATSTAT Database, October 2012

28 Similarly, a small proportion of foreign-oriented families included filings at the patent offices of France, Germany and the UK. This can be explained by the fact that applicants have the option of filing at the EPO, which later (after the granting process) reaches the national patent offices of EPC member states.

A.5

Patent applications filed through the Patent Cooperation Treaty

The PCT, an international treaty administered by WIPO, offers patent applicants an advantageous route for seeking patent protection internationally. It serves as an alternative to the Paris Convention for the Protection of Industrial Property (the Paris Convention) for pursuing the acquisition of patent rights in different countries. The main advantages of the PCT are that applicants and patent offices of PCT contracting states benefit from uniform formality requirements, international search, optional supplementary international search and preliminary examination reports, and centralized international publication. This can lead to time and cost savings for applicants. Starting with only 18 members in 1978, there were 144 PCT members in 2011.

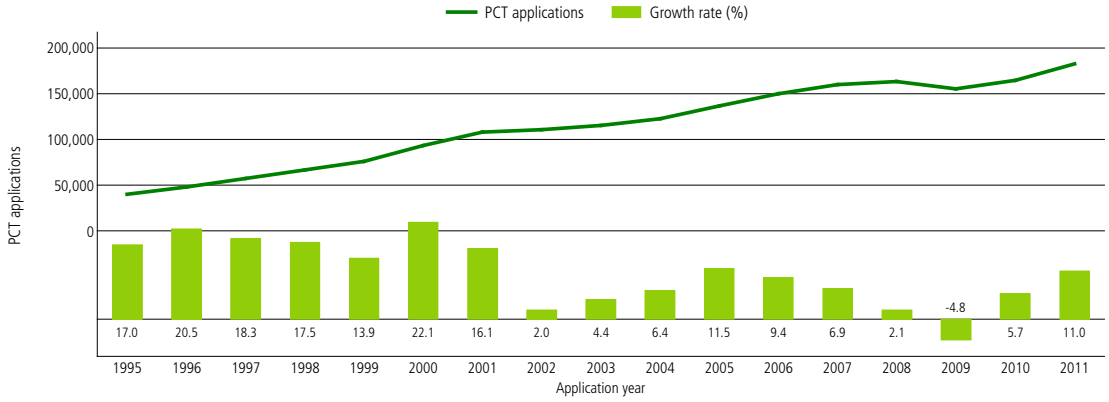
PCT application data presented in A.5.1 and A.5.2 refer to the international phase of the PCT procedure, while data presented in A.5.3 refer to PCT national phase entries.

A.5.1 PCT applications

Figure A.5.1.1 depicts the total number of PCT applications filed between 1995 and 2011. Despite difficult economic conditions, PCT applications set a new record in 2011 with 182,354 applications. This represents an 11% increase on 2010 and the fastest growth since 2005. Patent applications originating in China, Japan and the US accounted for 82% of total growth.

The long-term trend shows that the number of PCT applications grew at a double-digit rate until 2001, followed by a slowdown in growth between 2002 and 2004.[29] Since the system's establishment, 2009 was the only year in which there was a drop in applications; however, PCT applications have rebounded strongly in the past two years.

Figure A.5.1.1 Trend in PCT applications



Note: Data refer to the international phase of the PCT system. Counts are based on the international application date.

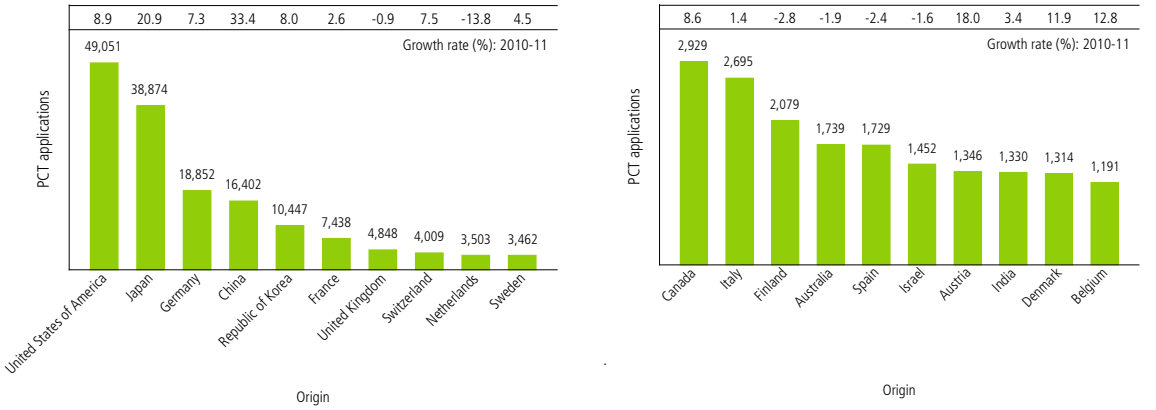
Source: WIPO Statistics Database, October 2012

29 The double-digit growth in PCT applications during this period was partly due to an increase in the use of the PCT system, as well as expanded PCT membership.

Figure A.5.1.2 provides a breakdown of PCT applications by country of origin. The list of top 20 origins consists mostly of high-income countries – China and India being the exceptions.[30] The US, with 49,051 applications, was the largest user of the PCT system in 2011, followed by Japan (38,874), Germany (18,852) and China (16,402). Among the top four origins, the US and Japan each had more than twice as many applications as Germany or China.

For the top 20 origins, China (+33.4%) saw the fastest growth in applications in 2011, followed by Japan (+20.9%) and Austria (+18%). Four countries – three of which are European – saw decreases in applications in 2011, with the Netherlands recording the largest drop.[31] Following three consecutive years of decline, applications filed by the US grew by 8.9% in 2011. However, the number of applications filed in 2011 was still below the pre-crisis peak reached in 2007.

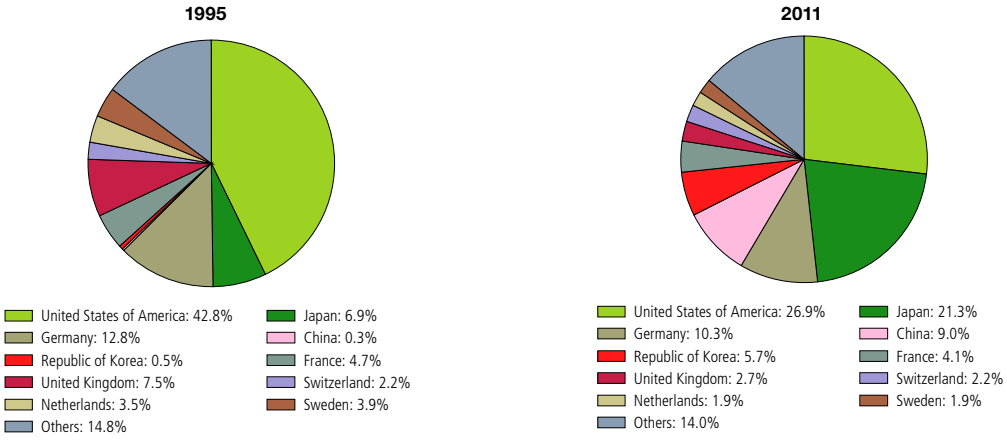
Figure A.5.1.2 PCT applications for the top 20 origins, 2011



Note: Data refer to the international phase of the PCT system. Counts are based on residency of the first-named applicant and the international application date.

Source: WIPO Statistics Database, October 2012

Figure A.5.1.3 Country share in total PCT applications



Note: See note for Figure A.5.1.2

Source: WIPO Statistics Database, October 2012

30 The share of high-income countries in total PCT applications was around 88%.

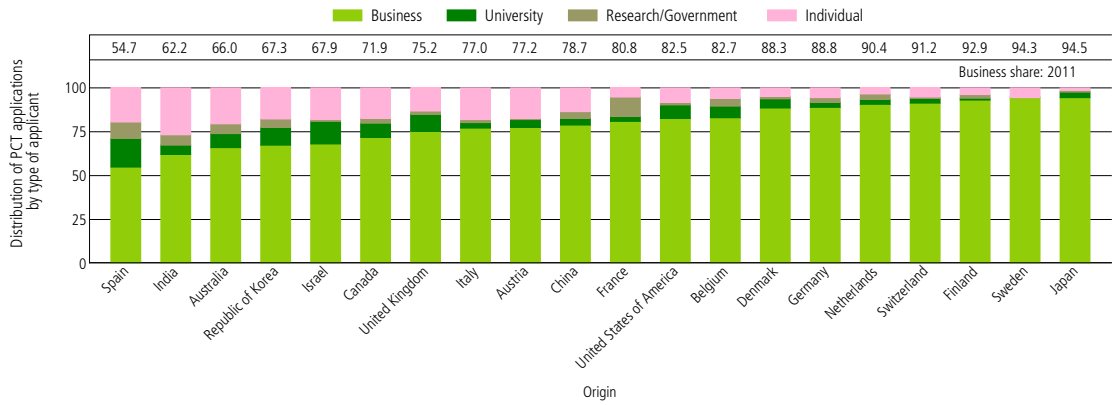
31 Over the past two years, the Netherlands saw a considerable drop in PCT applications (-8.9% in 2010 and -13.8% in 2011).

Figure A.5.1.3 depicts the country share in total PCT applications for the top 10 origins for 1995 and 2011. The combined share of China, Japan and the Republic of Korea in total PCT applications grew by 28 percentage points between 1995 and 2011. In contrast, the US share declined by 16 percentage points. For all European countries, except Switzerland, the 2011 share was lower than the 1995 share. This reflects the shift in geography of PCT applications from the US and Europe towards Asia.

A.5.2 PCT applications by type of applicant

Figure A.5.2.1 presents the distribution of PCT applications for the top 20 origins broken down by four types of applicants – business, university, government and research institution, and individual. Overall, the business sector accounted for more than 80% of total applications. However, the share of the business sector varied across origins. For the top 20 origins, shares ranged from 54.7% for Spain to 94.5% for Japan. For all origins, except China, the business sector share remained more or less stable between 2006 and 2011. For China, the share increased from 58% to 78.7% over the same period. Universities accounted for a large share of total applications for Spain (16.3%), Israel (13.1%) and the Republic of Korea (10%). France and Spain had a high share of applications from government and research institutions – around 10%.

Figure A.5.2.1 PCT applications by type of applicant for the top 20 origins, 2011



Note: Data refer to the international phase of the PCT system. Due to confidentiality requirements, counts are based on publication date.

Source: WIPO Statistics Database, October 2012

Table A.5.2.2 lists the top 50 PCT applicants, based on the residency of the first-named applicant and publication date. It shows that in 2011, ZTE Corporation of China, with 2,826 published applications, overtook Panasonic Corporation of Japan, which ranked first in 2010. Between 2009 and 2011, applications from ZTE Corporation increased five-fold, leading the company to surge from 20th position to the top spot. Sharp Kabushiki Kaisha of Japan ranked fourth, also seeing considerable growth in published applications over the same period.

The top five applicants saw considerable growth in published applications in 2011. Qualcomm Incorporated, the highest ranked US applicant, and Koninklijke Philips Electronics of the Netherlands recorded the largest declines in 2011. Japan, with 21 different applicants, had the largest number of applicants ranked among the top 50. China, with the highest ranked applicants, has only three different applicants in the top 50 list.

Table A.5.2.2 Top PCT applicants

Rank	Applicant's Name	Origin	PCT applications			Change compared to 2010
			2009	2010	2011	
1	ZTE CORPORATION	China	517	1,868	2,826	958
2	PANASONIC CORPORATION	Japan	1,891	2,153	2,463	310
3	HUAWEI TECHNOLOGIES CO., LTD.	China	1,847	1,527	1,831	304
4	SHARP KABUSHIKI KAISHA	Japan	997	1,286	1,755	469
5	ROBERT BOSCH CORPORATION	Germany	1,588	1,301	1,518	217
6	QUALCOMM INCORPORATED	United States of America	1,280	1,675	1,494	-181
7	TOYOTA JIDOSHA KABUSHIKI KAISHA	Japan	1,068	1,095	1,417	322
8	LG ELECTRONICS INC.	Republic of Korea	1,090	1,297	1,336	39
9	KONINKLIJKE PHILIPS ELECTRONICS N.V.	Netherlands	1,295	1,433	1,148	-285
10	TELEFONAKTIEBOLAGET LM ERICSSON (PUBL)	Sweden	1,241	1,147	1,116	-31
11	NEC CORPORATION	Japan	1,069	1,106	1,056	-50
12	SIEMENS AKTIENGESELLSCHAFT	Germany	932	830	1,039	209
13	MITSUBISHI ELECTRIC CORPORATION	Japan	569	726	834	108
14	BASF SE	Germany	739	817	773	-44
15	SAMSUNG ELECTRONICS CO., LTD.	Republic of Korea	596	574	757	183
16	NOKIA CORPORATION	Finland	663	632	698	66
17	INTERNATIONAL BUSINESS MACHINES CORPORATION	United States of America	401	416	661	245
18	HEWLETT-PACKARD DEVELOPMENT COMPANY, L.P.	United States of America	554	564	591	27
19	3M INNOVATIVE PROPERTIES COMPANY	United States of America	688	586	563	-23
20	HITACHI, LTD.	Japan	190	372	547	175
21	KABUSHIKI KAISHA TOSHIBA	Japan	327	319	517	198
22	CANON KABUSHIKI KAISHA	Japan	401	379	499	120
23	FUJITSU LIMITED	Japan	817	475	494	19
24	PROCTER & GAMBLE COMPANY	United States of America	341	359	488	129
25	MITSUBISHI HEAVY INDUSTRIES, LTD.	Japan	373	391	480	89
26	SONY CORPORATION	Japan	328	347	471	124
27	MICROSOFT CORPORATION	United States of America	644	470	446	-24
27	SUMITOMO CHEMICAL COMPANY, LIMITED	Japan	353	323	446	123
29	E.I. DUPONT DE NEMOURS AND COMPANY	United States of America	509	452	424	-28
30	SCHAEFFLER TECHNOLOGIES GMBH & CO. KG	Germany		167	422	255
31	BOSCH-SIEMENS HAUSGERATE GMBH	Germany	413	371	421	50
32	HONDA MOTOR CO., LTD.	Japan	318	309	418	109
33	FUJIFILM CORPORATION	Japan	264	275	414	139
34	DOW GLOBAL TECHNOLOGIES INC.	United States of America	304	288	399	111
35	SEMICONDUCTOR ENERGY LABORATORY CO., LTD.	Japan	45	76	382	306
36	KYOCERA CORPORATION	Japan	362	279	356	77
37	PANASONIC ELECTRIC WORKS CO., LTD.	Japan	235	206	353	147
38	BAKER HUGHES INCORPORATED	United States of America	375	307	336	29
39	NOKIA SIEMENS NETWORKS OY	Finland	313	345	332	-13
40	HUAWEI DEVICE CO., LTD.	China		164	327	163
41	NTT DOCOMO, INC.	Japan	249	298	323	25
42	MURATA MANUFACTURING CO., LTD.	Japan	254	305	318	13
43	INTEL CORPORATION	United States of America	176	201	309	108
44	APPLIED MATERIALS, INC.	United States of America	296	313	308	-5
45	THOMSON LICENSING	France	359	311	303	-8
46	ASAHI GLASS COMPANY, LIMITED	Japan	177	180	291	111
46	GENERAL ELECTRIC COMPANY	United States of America	307	274	291	17
48	ALCATEL LUCENT	France	283	275	287	12
49	SANYO ELECTRIC CO., LTD.	Japan	142	129	285	156
50	UNIVERSITY OF CALIFORNIA	United States of America	321	304	277	-27

Note: Data refer to the international phase of the PCT system. Due to confidentiality requirements, counts are based on publication date. Top applicants are selected according to the 2011 total.

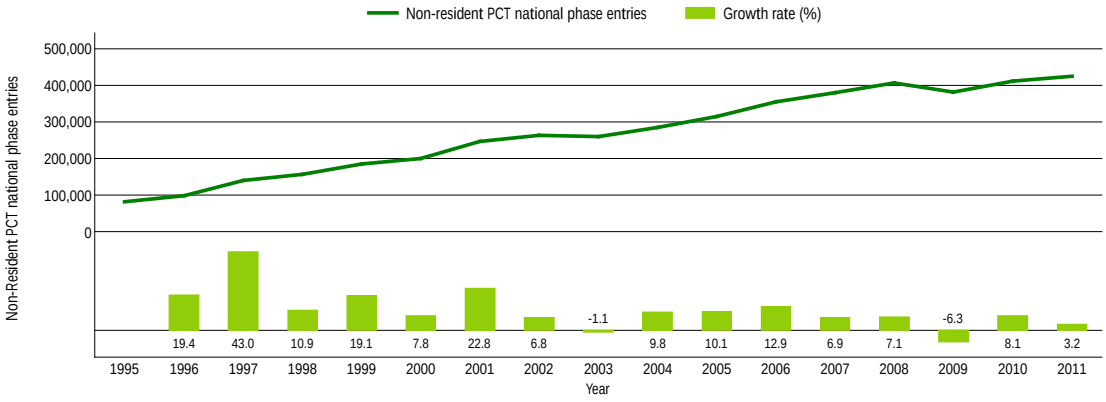
Source: WIPO Statistics Database, October 2012

A.5.3 PCT national phase entries

The PCT application process starts with the international phase and concludes with the national phase. The national or regional patent office at which the applicant enters the PCT national phase initiates the granting procedure according to prevailing national law. PCT national phase entry (NPE) statistics shed light on international patenting strategies. The NPE data presented here refer only to non-resident applications – that is, resident application data for the national phase are excluded.[32] For example, if a PCT application filed by a resident of China enters the national phase procedure at SIPO, it is excluded from the statistics reported here.

32 The share of resident PCT NPEs out of total NPEs stood at around 15% in 2011.

Figure A.5.3.1 Trend in non-resident PCT national phase entries



Note: WIPO estimates

Source: WIPO Statistics Database, October 2012

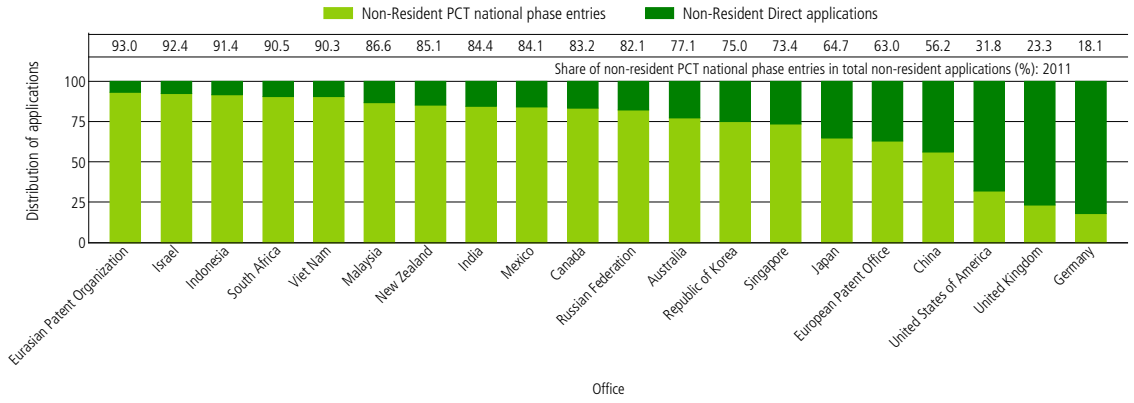
Table A.5.3.2 PCT national phase entries by office and origin for top offices and origins, 2011

Origin	Office														
	US	EP	CN	JP	KR	IN	CA	AU	RU	MX	SG	ZA	IL	MY	NZ
Australia	1,731	704	507	347	158	329	430	996	67	108	134	57	67	108	335
Austria	856	726	479	210	172	239	201	175	162	56	29	195	12	19	16
Belgium	1,165	704	481	361	256	316	298	249	139	155	75	108	3	58	66
Canada	1,642	1,206	801	562	403	516	1,506	422	185	229	88	117	55	47	92
China	3,455	2,008	2,289	954	585	915	307	342	369	184	147	120	61	109	40
Denmark	1,182	874	600	314	171	384	303	236	136	149	66	88	31	42	76
Finland	925	1,156	766	234	320	374	251	156	195	58	32	101	18	22	11
France	6,017	5,189	3,058	2,761	1,512	1,429	1,528	695	906	496	327	357	162	281	165
Germany	12,766	11,621	7,483	4,982	3,055	3,372	2,284	1,432	1,960	1,106	515	723	22	462	328
India	801	373	202	154	104	216	136	149	52	76	51	103	33	58	54
Israel	1,525	802	428	283	190	308	254	173	87	79	56	54	418	1	31
Italy	2,232	1,774	961	524	296	538	386	247	325	215	59	90	15	47	56
Japan	25,938	12,052	16,591	15,897	8,992	3,727	1,565	1,255	1,471	649	865	291	214	766	186
Netherlands	2,688	2,927	2,307	1,883	946	1,472	630	545	937	409	117	155	48	156	101
Republic of Korea	4,304	2,082	2,850	1,972	363	621	313	290	266	162	71	37	32	151	31
Spain	760	682	337	198	112	178	200	148	127	164	34	57	19	23	41
Sweden	2,470	2,489	1,434	1,076	492	828	458	399	329	186	114	154	51	99	112
Switzerland	1,899	2,622	1,786	1,524	931	1,359	1,233	920	696	743	444	419	12	288	212
United Kingdom	5,303	3,146	1,694	1,336	707	1,084	1,192	1,048	369	368	279	506	211	263	274
United States of America	16,120	23,903	17,324	14,627	10,526	9,120	12,129	7,950	3,040	4,883	2,651	1,905	2,345	1,375	1,550
Others / Unknown	3,782	3,235	2,108	1,320	748	1,131	1,155	1,020	469	525	572	503	1,696	312	268
Total	97,561	80,275	64,486	51,519	31,039	28,456	26,759	18,847	12,287	11,000	6,726	6,140	5,525	4,687	4,045

Note: Data include both resident and non-resident NPEs. US (United States of America), EP (European Patent Office), CN (China), JP (Japan), KR (Republic of Korea), IN (India), CA (Canada), AU (Australia), RU (Russian Federation), MX (Mexico), SG (Singapore), ZA (South Africa), IL (Israel), MY (Malaysia) and NZ (New Zealand)

Source: WIPO Statistics Database, October 2012

Figure A.5.3.3 Share of PCT non-resident national phase entries in total non-resident applications for selected offices, 2011



Source: WIPO Statistics Database, October 2012

In 2011, the number of non-resident PCT NPEs totaled 424,800, representing a 3.2% increase on 2010 (Figure A.5.3.1).[33] The USPTO received the largest number of PCT NPEs in 2011 (19% of the total), followed by SIPO (14.6%) and the EPO (10.5%). Offices of middle-income countries, such as India, Mexico and South Africa, also received large numbers of NPEs.

The long-term trend shows strong year-on-year growth in non-resident NPEs for all years, except 2003 and 2009. Growth in NPEs partly reflects the increasing trend of protecting inventions abroad, as well as increasing PCT membership which has made the PCT system more attractive to its users.

Table A.5.3.2 presents PCT NPE data broken down by the top offices and top origins. It provides information on the "flow of patent applications" across countries, as facilitated by the PCT system. Note that this table includes all PCT NPE data – that is, resident and non-resident NPEs.

The USPTO was the most preferred office by destination in 2011, with 97,561 NPEs. Residents of Germany and Japan accounted for around 40% of all NPEs at the USPTO. The EPO, SIPO and JPO each received more than 50,000 NPEs in 2011. At the EPO and SIPO, the largest number of NPEs originated in the US, while at the JPO, residents of Japan accounted for the largest share of total NPEs. The US was the main source of NPEs at all reported offices, except the JPO and the USPTO.

Figure A.5.3.3 depicts the distribution of total non-resident applications by filing route (PCT NPEs and direct applications, also known as the Paris route) for selected offices. At the global level, the share of PCT NPEs in total non-resident applications was around 54%, but it varied across individual offices. Use of the PCT system is popular for filing applications in offices of middle-income countries. For example, the PCT NPE shares at the patent offices of Indonesia, South Africa and Viet Nam were above 90%.

33 The total number of PCT NPEs – resident plus non-resident – amounted to around 500,400 in 2011.

Among the five largest offices, KIPO had the highest share of PCT NPEs in total non-resident applications.[34] In contrast, PCT NPEs accounted for less than one-third of all non-resident applications at the USPTO.[35] However, there was a considerable increase in the share of PCT NPEs at the USPTO – from 20% in 2007 to 31.8% in 2011.[36]

34 The EPO, the JPO, KIPO, SIPO and the USPTO are the top five offices in terms of number of non-resident PCT NPEs (Table A.5.3.2).

35 The low share of PCT NPEs at the USPTO does not accurately reflect usage of the PCT system at that office, as many PCT applicants took advantage of a special legal provision in US patent law allowing PCT applications to proceed directly to the USPTO (the so-called "by-pass route"). In such cases, the PCT application is converted into a continuation or continuation-in-part application, which is counted as a direct filing.

36 National offices in European countries exhibited low shares of PCT NPEs, as PCT applicants often enter the national phase at the EPO instead of at national offices.

A.6

International collaboration

Developing modern technology is an increasingly complex undertaking. Very often, it requires collaboration across countries. Such collaboration involves joint research among institutions across countries, and employing scientists and engineers from foreign countries. This subsection presents two indicators of cross-country collaboration based on published PCT applications.

Figure A.6.1 illustrates the share of published PCT applications with foreign inventors (i.e., residency in a foreign country) for the top 20 applicants' countries of origin. On average, 26% of PCT applications included at least one foreign inventor in 2011. However, the level of cross-border collaboration varied across countries. In 2011, around four-fifths of applications filed by Swiss companies included at least one foreign inventor. In contrast, less than 10 percent of PCT applications originating in China, India, Japan and the Republic of Korea included foreign inventors. Medium-sized European countries (such as the Netherlands and Finland) and North American countries had a high rate of collaboration with foreign inventors, compared to larger European countries. Between 2006 and 2011, all reported origins except China saw increases in the share of PCT applications with at least one foreign inventor.

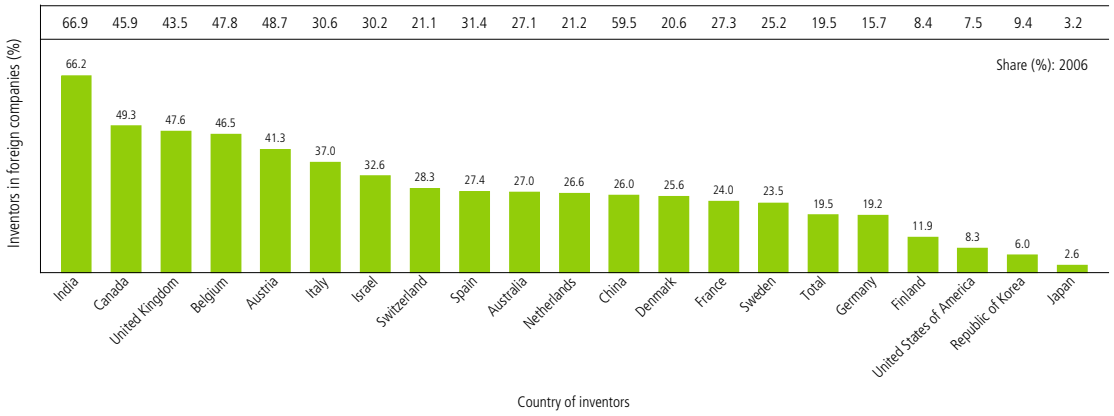
Another way to look at cross-border collaboration is to ask how many inventors from around the world reside in a country different from that of the PCT applicant. Figure A.6.2 also depicts the percentage of PCT applications having at least one foreign inventor, but here the data are broken down by the top 20 inventors' origins. Around two-thirds of Indian inventors named in PCT applications were associated with foreign PCT applications. The share of inventors associated with foreign PCT applications was also high for Belgium, Canada and the UK. In contrast, fewer than 10 percent of inventors from Japan, the Republic of Korea and the US contributed to foreign PCT applications.

Figure A.6.1 Share of PCT applications with at least one foreign inventor for the top 20, 2011

Note: Counts are based on corporate applicants only (thus excluding natural persons). Due to confidentiality requirements, PCT data are based on the publication date.

Source: WIPO Statistics Database, October 2012

Figure A.6.2 Inventors in foreign-owned PCT applications, 2011



Note: See note for Figure A.6.1

Source: WIPO Statistics Database, October 2012

A.7

Patents by field of technology

Patent applications span a wide range of technologies. Furthermore, the tendency to file patent applications differs across technologies, as some technologies depend more heavily on the patent system than others. To understand activity patterns and trends across technologies, this section presents data by field of technology.

Every patent application is assigned one or more International Patent Classification (IPC) symbols. WIPO has developed a concordance table to link these IPC symbols to corresponding field(s) of technology (see *www.wipo.int/ipstats/en*). The data presented here are based on this concordance table. Where a patent application relates to multiple fields of technology, it is divided into equal shares, each representing one field of technology (so-called "fractional counting"). Applications with no IPC symbol are not considered. All the data reported in this subsection relate to published patent applications. There is a minimum delay of 18 months between the application and publication dates. For this reason, 2010 is the latest available year for statistics on patents by technology field.

A.7.1 Applications by field of technology

Patent data can be broadly categorized as complex or discrete technologies. Complex technologies are usually defined as those for which the resulting products or processes consist of numerous separately patentable elements and for which patent ownership is typically widespread. Discrete technologies, in turn, describe products or processes that consist of a single or relatively few patentable elements and for which patent ownership is more concentrated. For example, smartphones fall into the category of complex technologies, whereas pharmaceuticals are considered a discrete technology.[37] Figure A.7.1.1 shows the application trends for these two categories for the world total and the top five origins. Data for the latest available year, 2010, are partial and incomplete. This could partly explain the downward trend for some origins. Since 1995, growth in patent applications for complex technologies has been consistently faster than that for discrete technologies (since 2003 for China).[38] At the global level, the volume of applications for complex technologies increased by 2.4-fold between 1995 and 2010, compared to 1.9-fold for discrete technologies. All reported origins showed similar trends.

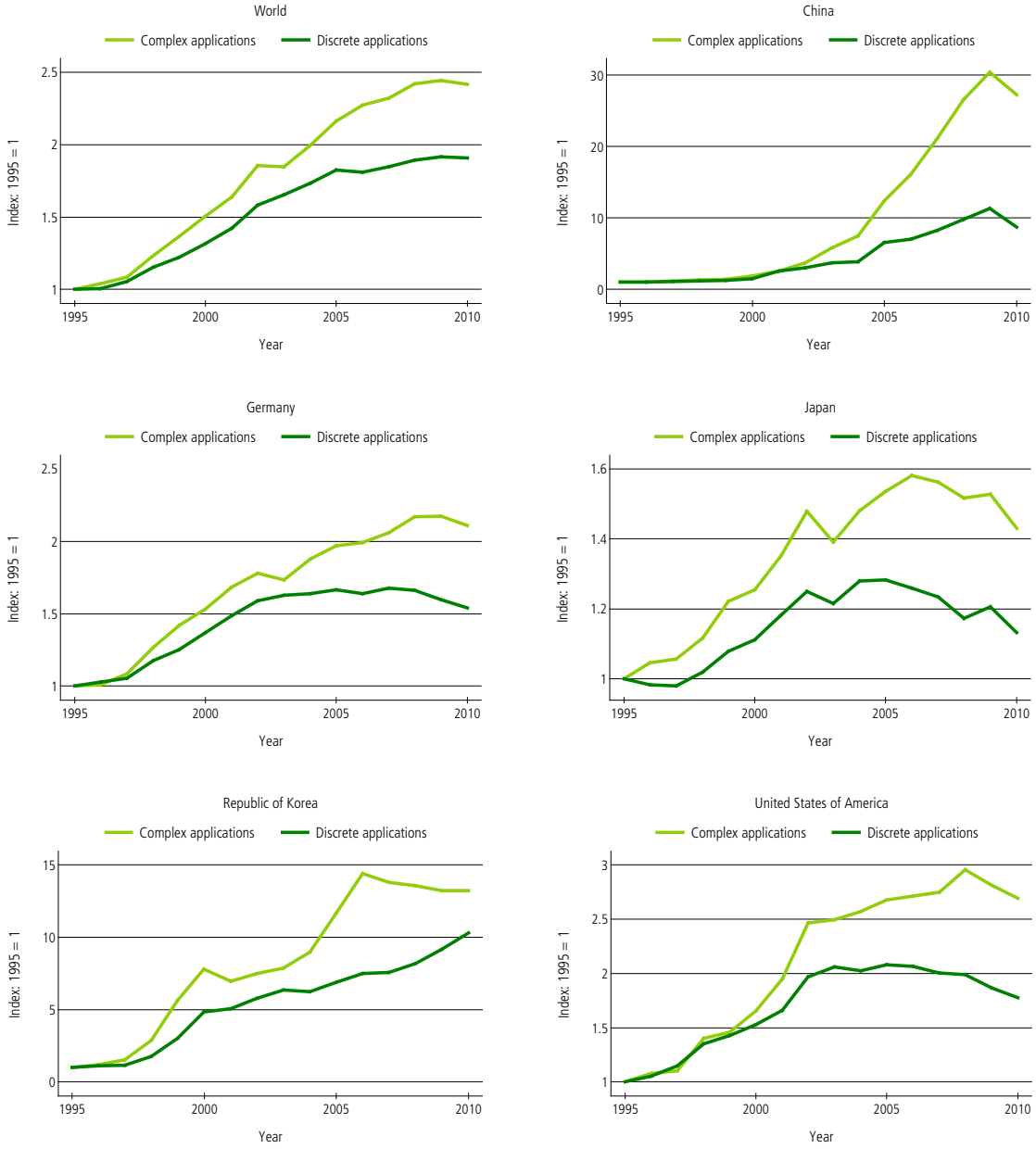
Table A.7.1.2 shows the number of patent applications worldwide by field of technology. In 2010, computer technology (126,897) and electrical machinery (112,896) accounted for the largest numbers of applications. Digital communication recorded the highest annual growth rates between 2006 and 2010, while telecommunications and audio-visual technology both experienced declines during the same period, reflecting the shift towards widespread use of digital technologies.[39] Pharmaceutical patent applications have continuously declined since 2007.

37 For a definition of complex and discrete technologies, refer to annex A of *World Intellectual Property Indicators*, 2011 edition, available at: *www.wipo.int/ipstats/en/wipi/*

38 The distribution of complex and discrete technologies for the 1995-2009 period is: World (69% complex, 31% discrete), China (59%, 41%), Germany (65%, 35%), Japan (77%, 23%), the Republic of Korea (84%, 16%) and the US (65%, 35%).

39 The micro-structural and nano-technology field saw the highest growth (11%) in 2011, but it accounted for only a low number of applications. The number of applications for digital communications grew by 19,054 while that for micro-structural and nano-technology grew by only 988.

Figure A.7.1.1 Trend in complex and discrete technology patent applications for the top five origins



Note: For a definition of complex and discrete technologies, refer to annex A of World Intellectual Property Indicators, 2011 edition, available at: *www.wipo.int/ipstats/en/wipi/*. The data refer to published patent applications. Data for the latest available year, 2010, are partial and incomplete. This could partly explain the downward trend for some origins.

Sources: WIPO Statistics Database and EPO PATSTAT Database, October 2012

Table A.7.1.2 Patent applications worldwide by field of technology

Field of Technology	Publication Year					Growth Rate 2006-10 (%)
	2006	2007	2008	2009	2010	
Electrical engineering						
Electrical machinery, apparatus, energy	96,308	98,889	102,947	109,288	112,896	4.1
Audio-visual technology	94,227	90,504	88,905	83,071	78,637	-4.4
Telecommunications	69,290	67,506	68,419	59,161	54,416	-5.9
Digital communication	52,445	55,471	61,604	66,167	71,499	8.1
Basic communication processes	16,723	16,650	17,096	16,542	15,919	-1.2
Computer technology	117,471	120,999	131,533	129,952	126,897	1.9
IT methods for management	18,789	18,810	21,087	24,354	22,633	4.8
Semiconductors	73,709	74,893	78,978	76,273	75,213	0.5
Instruments						
Optics	73,284	73,937	72,815	67,833	62,385	-3.9
Measurement	61,089	63,950	69,242	73,627	73,905	4.9
Analysis of biological materials	10,189	10,431	10,495	11,045	10,553	0.9
Control	26,069	26,696	27,977	28,422	27,986	1.8
Medical technology	65,841	70,779	72,560	73,353	72,630	2.5
Chemistry						
Organic fine chemistry	50,499	49,271	50,178	49,480	49,055	-0.7
Biotechnology	32,311	32,242	33,564	35,802	36,362	3.0
Pharmaceuticals	68,289	69,207	68,649	66,981	63,992	-1.6
Macromolecular chemistry, polymers	25,516	26,323	26,820	27,284	27,309	1.7
Food chemistry	20,003	21,137	22,807	26,587	26,840	7.6
Basic materials chemistry	35,158	37,205	39,351	40,522	41,746	4.4
Materials, metallurgy	27,650	29,313	32,568	33,904	35,651	6.6
Surface technology, coating	27,972	28,437	29,777	31,871	32,222	3.6
Micro-structural and nano-technology	1,893	2,147	2,281	2,648	2,881	11.1
Chemical engineering	30,991	31,802	33,650	34,539	35,123	3.2
Environmental technology	20,286	21,186	22,030	23,706	24,810	5.2
Mechanical engineering						
Handling	41,295	41,624	41,515	41,464	41,099	-0.1
Machine tools	35,472	35,653	37,264	39,662	42,165	4.4
Engines, pumps, turbines	38,912	40,910	42,315	46,979	47,033	4.9
Textile and paper machines	36,177	34,914	32,706	31,348	29,739	-4.8
Other special machines	43,182	42,720	44,511	46,320	47,320	2.3
Thermal processes and apparatus	24,298	24,797	25,213	26,829	28,875	4.4
Mechanical elements	41,126	42,989	46,316	46,032	45,143	2.4
Transport	62,678	63,876	66,049	68,948	65,305	1.0
Other fields						
Furniture, games	43,192	43,670	44,085	43,020	41,722	-0.9
Other consumer goods	32,049	31,083	31,145	31,425	31,302	-0.6
Civil engineering	51,645	52,089	51,722	54,228	55,049	1.6

Note: The IPC-technology concordance table (available at: *www.wipo.int/ipstats/en*) was used to convert IPC symbols into 35 corresponding fields of technology. The data refer to published patent applications.

Sources: WIPO Statistics Database and EPO PATSTAT Database, October 2012

The aggregate data reported in Table A.7.1.2 provide an overview of applications by field of technology. However, they do not provide any insight into the innovative strength of countries in relation to different technology fields. Table A.7.1.3 reports patent application data by field of technology for the top origins.

For a number of origins, applications are concentrated in the fields of computer technology, digital communications, and telecommunications. For example, telecommunications accounted for the largest share of all applications originating in Canada and the US. For Finland and Sweden, digital telecommunications constituted the largest share. Switzerland and the UK tended to file large numbers of applications for pharmaceuticals.

Table A.7.1.3 Patent applications by field of technology and for the top origins, 2006-10

Field of Technology	Origin															
	AU	CA	CH	CN	DE	FI	FR	GB	IT	JP	KR	NL	RU	SE	US	Others
Electrical engineering																
Electrical machinery, apparatus, energy	1,016	3,723	7,214	39,158	59,646	1,805	15,832	7,455	4,661	192,766	61,066	8,061	3,860	2,243	75,511	63,718
Audio-visual technology	888	2,612	2,506	25,838	20,975	2,467	12,310	4,751	929	183,468	70,297	14,966	851	2,630	54,372	48,144
Telecommunications	905	4,967	1,249	29,921	14,447	6,530	9,152	4,431	1,163	91,761	57,046	3,779	1,413	8,353	68,690	26,082
Digital communication	657	8,228	1,554	60,273	16,598	11,655	15,300	5,609	1,755	50,637	31,782	5,460	430	13,933	81,701	20,539
Basic communication processes	122	817	654	4,116	6,276	726	2,463	1,206	396	26,357	7,644	2,544	894	1,088	20,743	10,278
Computer technology	2,891	9,799	4,110	40,283	33,565	6,255	14,444	9,915	2,315	156,855	58,339	11,579	1,325	5,490	223,694	64,031
IT methods for management	1,185	1,886	1,135	4,545	4,077	595	1,630	2,060	358	17,880	18,568	703	275	646	40,160	13,109
Semiconductors	444	683	1,298	14,638	24,102	464	5,541	1,950	1,065	147,908	77,636	6,414	775	471	61,347	41,582
Instruments																
Optics	708	1,178	1,721	14,793	15,173	586	5,271	2,823	1,049	191,867	46,079	7,475	879	973	38,123	29,349
Measurement	1,731	3,739	10,408	33,987	45,059	1,918	12,623	8,844	3,009	96,125	18,003	8,832	8,007	3,305	70,201	40,487
Analysis of biological materials	652	1,020	2,236	3,712	5,404	330	2,592	2,643	560	7,354	2,026	1,393	1,789	972	18,358	7,155
Control	1,064	1,571	2,288	11,725	16,023	572	4,513	3,479	1,612	38,090	9,223	1,756	1,587	1,335	32,693	18,756
Medical technology	4,225	4,399	15,805	13,206	35,251	996	10,485	11,095	4,661	50,829	13,215	7,698	9,374	6,335	145,420	47,403
Chemistry																
Organic fine chemistry	942	2,705	15,811	18,730	37,794	550	19,488	11,740	4,323	36,941	9,504	5,807	2,007	5,277	73,308	42,537
Biotechnology	2,413	3,225	6,586	16,163	16,232	769	7,208	6,661	2,161	20,210	8,229	4,903	1,754	1,713	62,881	27,269
Pharmaceuticals	3,485	6,137	21,478	43,967	30,781	909	16,911	14,854	7,069	27,743	8,654	5,904	5,344	7,433	118,744	67,124
Macromolecular chemistry, polymers	368	759	3,199	10,733	18,848	2,281	3,952	1,597	2,375	44,887	7,394	4,284	886	296	28,988	14,639
Food chemistry	906	1,056	4,243	20,180	5,144	393	2,459	2,283	1,074	13,267	11,028	6,058	13,484	332	19,211	23,926
Basic materials chemistry	985	1,888	6,385	24,854	33,583	786	5,568	6,450	1,494	41,648	10,433	6,738	3,234	643	45,944	26,595
Materials, metallurgy	1,764	1,562	1,928	29,455	15,966	1,601	5,995	2,227	1,461	43,091	11,047	1,703	7,430	1,421	18,639	25,735
Surface technology, coating	717	1,315	2,336	11,239	15,290	1,002	4,467	2,365	1,586	52,075	9,085	1,805	1,700	1,210	34,817	17,245
Micro-structural and nano-technology	100	92	132	1,375	1,291	105	550	129	89	2,401	2,168	198	367	110	2,066	1,296
Chemical engineering	1,392	2,138	4,064	16,148	24,386	1,792	6,816	5,207	2,810	32,561	11,855	4,630	4,220	2,165	37,869	25,297
Environmental technology	797	1,452	1,464	13,211	13,132	758	4,608	2,608	1,414	27,430	12,305	2,216	2,178	1,025	18,397	17,372
Mechanical engineering																
Handling	1,745	2,316	9,830	9,219	27,487	2,751	8,695	6,043	7,299	58,572	11,481	4,534	1,639	2,267	40,821	31,484
Machine tools	1,136	1,980	3,401	17,622	32,113	1,022	5,262	2,747	3,706	48,140	13,147	1,490	4,280	3,550	31,695	32,449
Engines, pumps, turbines	1,038	2,511	3,017	11,859	43,358	498	12,093	5,375	3,135	67,864	13,194	1,211	4,773	2,214	37,580	24,789
Textile and paper machines	2,794	567	4,435	10,827	22,597	2,772	3,083	1,995	2,763	73,057	8,878	2,362	632	990	20,834	16,504
Other special machines	2,010	4,021	4,419	18,103	28,399	1,494	9,341	4,676	5,464	52,611	16,680	5,316	6,614	2,407	40,184	41,020
Thermal processes and apparatus	813	1,377	1,861	15,361	15,628	885	3,926	2,000	2,652	36,098	19,303	1,466	2,297	1,504	14,704	19,761
Mechanical elements	1,635	2,098	3,072	12,301	51,797	821	10,636	5,555	3,962	68,069	12,438	2,064	3,185	3,974	34,338	26,989
Transport	1,491	3,705	2,665	12,965	70,171	746	25,817	6,331	5,736	102,613	31,383	2,950	4,557	6,051	45,770	32,981
Other fields																
Furniture, games	2,440	3,032	3,733	10,512	15,602	409	5,923	6,729	4,204	52,539	20,112	2,996	1,037	1,783	46,017	50,137
Other consumer goods	1,301	1,833	4,158	11,340	18,393	407	6,810	5,284	3,892	30,176	24,954	2,128	1,572	1,135	29,254	27,089
Civil engineering	3,883	6,476	3,542	22,845	29,187	1,792	11,513	9,448	5,538	42,090	31,358	7,880	7,755	3,902	46,797	57,872

Note: The IPC-technology concordance table (available at: *www.wipo.int/ipstats/en*) was used to convert IPC symbols into 35 corresponding fields of technology. Assigning a field of technology to a patent family is done based on all applications associated with that family rather than just first applications. The data refer to published patent applications. AU (Australia), CA (Canada), CH (Switzerland), CN (China), DE (Germany), FI (Finland), FR (France), GB (United Kingdom), IT (Italy), JP (Japan), KR (Republic of Korea), NL (Netherlands), RU (Russian Federation), SE (Sweden) and US (United States of America)

Sources: WIPO Statistics Database and EPO PATSTAT Database, October 2012

A.7.2 Applications in selected energy-related technologies

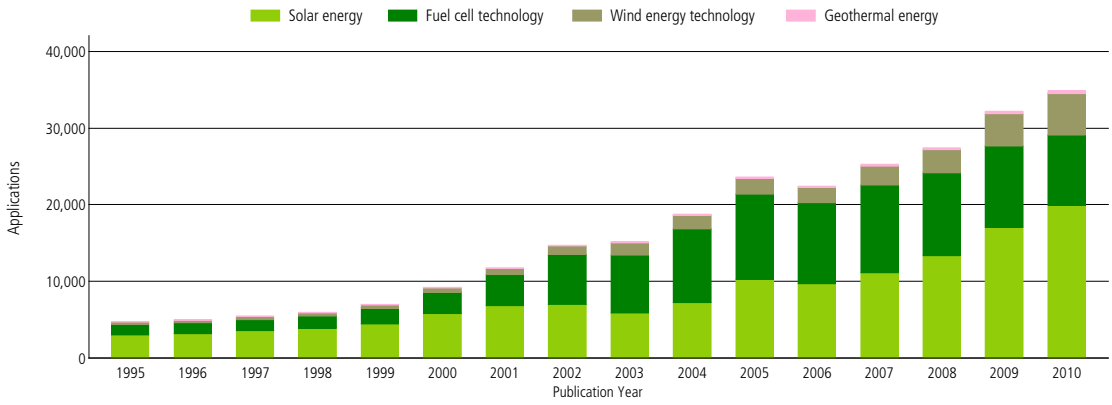
The development of energy-related technologies, such as those associated with renewable energy, plays an important role in tackling climate change. This subsection presents statistics on patent activity for selected energy-related technologies – namely, fuel cells, geothermal, solar and wind energy. Annex A provides definitions of these technologies according to IPC symbols.[40]

The total number of patent applications in the four energy-related fields grew continuously between 1995 and 2010, except for a small drop in 2006. Solar, geothermal and wind energy showed upward trends in applications, while fuel cell technology grew only until 2007; whereafter it has declined each year.

In 2011, the total number of patent applications for these four categories amounted to 34,873, representing 8 percent growth on 2009. Applications related to solar energy accounted for the largest share (57%), followed by fuel cell technology (26%) and wind energy (15%). The number of applications for geothermal energy was low.

Figure A.7.2.2 shows the source of energy-related patent applications for the 2006-2010 period. Japan had the highest share of applications related to solar energy (29.2%), followed by the Republic of Korea (17.2%) and the US (14.3%). Japan accounted for more than half of all patent applications for fuel cell technology; the US also filed a substantial number of applications in this field. Germany and the US were the two top origins for wind and geothermal energy patent applications. Compared to fuel cell technology, patent applications for wind and geothermal technologies were more evenly distributed among several origins.

Figure A.7.2.1 Patent applications in energy-related technologies

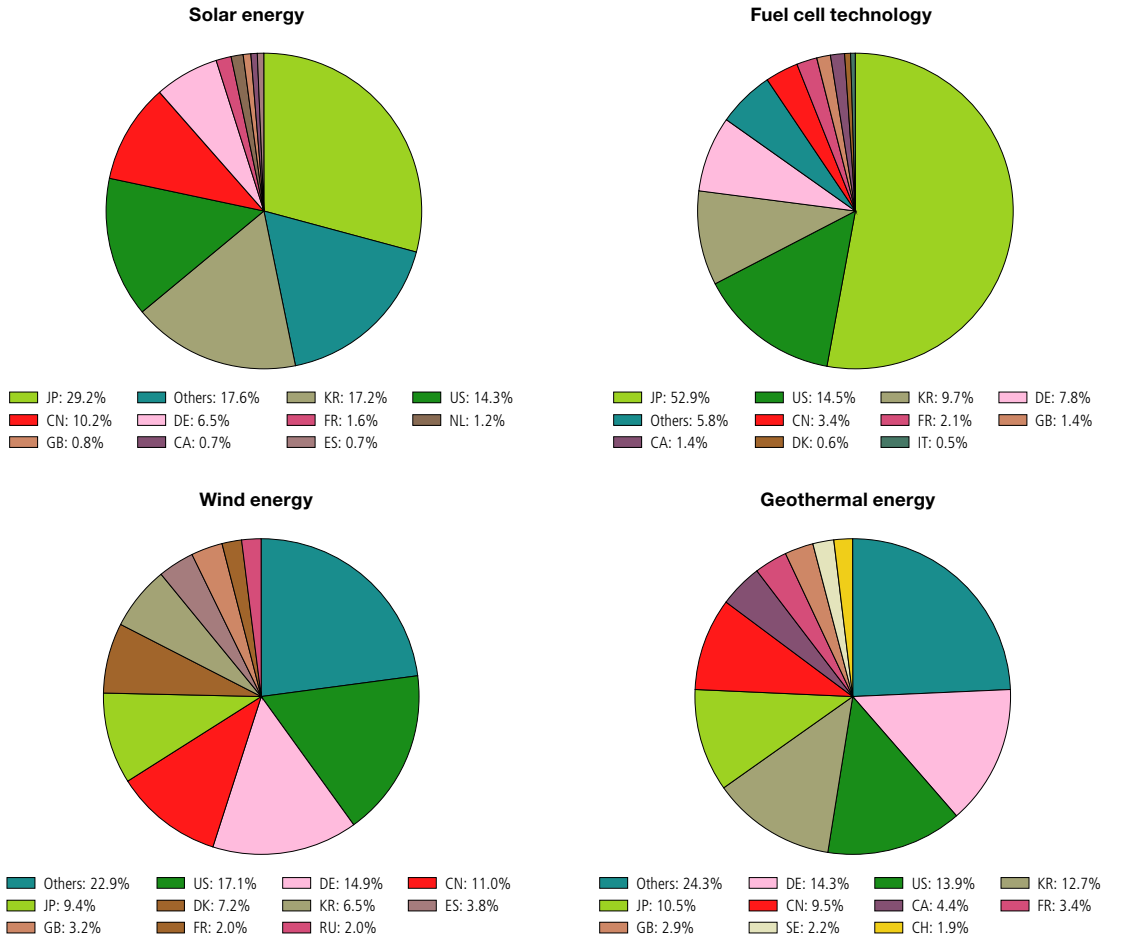


Note: For definitions of the technologies, refer to Annex A.

Sources: WIPO Statistics Database and EPO PATSTAT Database, October 2012

40 The correspondence between IPC symbols and technology fields is not always clear-cut (i.e., there is no one-to-one relationship). It is therefore difficult to capture all patents in a specific technology field. Nonetheless, the IPC-based definitions of the four energy-related technologies employed here are likely to capture the vast majority of patents in these areas.

Figure A.7.2.2 Share of patent applications in energy-related technologies for the top origins, 2006-10



Note: For definitions of the technologies, refer to Annex A. Country codes: CA (Canada), CH (Switzerland), CN (China), DE (Germany), DK (Denmark), ES (Spain), FR (France), GB (United Kingdom), IT (Italy), JP (Japan), KR (Republic of Korea), NL (Netherlands), RU (Russian Federation), SE (Sweden) and US (United States of America)

Sources: WIPO Statistics Database and EPO PATSTAT Database, October 2012

A.8

Patents per GDP and R&D expenditure

Differences in patent activity across economies reflect their size and level of development. For purposes of cross-country comparison, it is instructive to express patent applications relative to GDP and business sector research and development (R&D) expenditure.[41] Both indicators are frequently referred to as "patent activity intensity" indicators.

Figure A.8.1 shows the trend in resident patent applications, GDP and R&D expenditure (left-hand graph) and resident patents per GDP and per R&D (right-hand graph). Since the mid-2000s, business sector R&D expenditure has grown at a faster rate than have resident patents, with the result that the number of resident applications per R&D dollar (R&D productivity) has followed a downward trend since 2007. Both resident applications and GDP have increased at a similar rate; however, starting in 2009, resident patent growth has since outpaced GDP growth. As a result, the patent application per GDP ratio has increased for the past two years.

Figure A.8.2 shows R&D productivity for the top five origins. For these origins, R&D productivity was more or less stable until 2002, followed by a sharp upward trend for China, the Republic of Korea (until 2006) and the US (until 2007). In contrast, Germany and Japan have seen persistent declines in R&D productivity.[42]

The global patent applications per GDP and per R&D expenditure ratios (20.3 and 1.7, respectively) mask considerable variation across origins. For the top 20 origins, patents per GDP varied from around 100 for the Republic of Korea to 8 for Armenia (Figure A.8.3). The majority of origins tended to file 20 or fewer resident patents per billion GDP. Switzerland (26.6) and Germany (26) were the two highest ranked European countries. China recorded the largest increase in patent application-to-GDP ratio between 2006 and 2011 – jumping from 20.2 to 41.6. In contrast, Japan saw a considerable decline during the same period – from 87.7 to 73.4.[43]

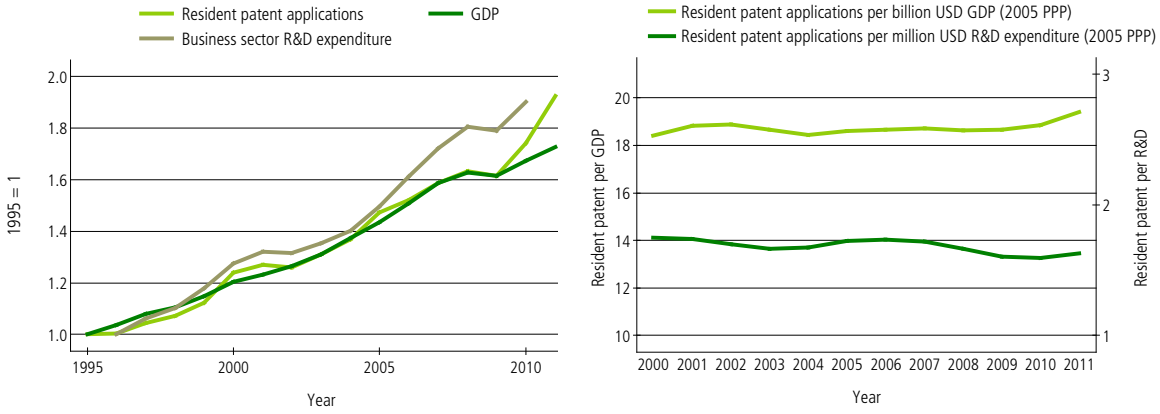
The Republic of Korea, with 3.7 resident patents per million R&D expenditure, had the highest patent-to-R&D expenditure ratio (Figure A.8.4). China filed more patents per R&D expenditure than Japan, which was not the case for the patent-to-GDP ratio. For both indicators, China, Japan and the Republic of Korea ranked higher than European countries and the US. R&D expenditure in the US was more than double that of China, but the patent-to-R&D ratio of the US was considerably lower than for China. Between 2006 and 2011, the patent-to-R&D expenditure ratio for reported European countries and the US remained more or less stable. The ratios for China and Poland increased, while they declined for Japan and the Republic of Korea.

41 Both GDP and business sector R&D expenditure are in constant 2005 PPP dollars.

42 Of the top five origins, China is the only origin for which R&D productivity continuously increased between 2003 and 2011.

43 Between 2006 and 2011, the patent-to-GDP ratio for China increased from 20.2 to 41.8 due to substantial growth in resident applications. Japan saw a considerable drop in resident applications which caused the patent-to-GDP ratio to fall from 87.7 to 73.4.

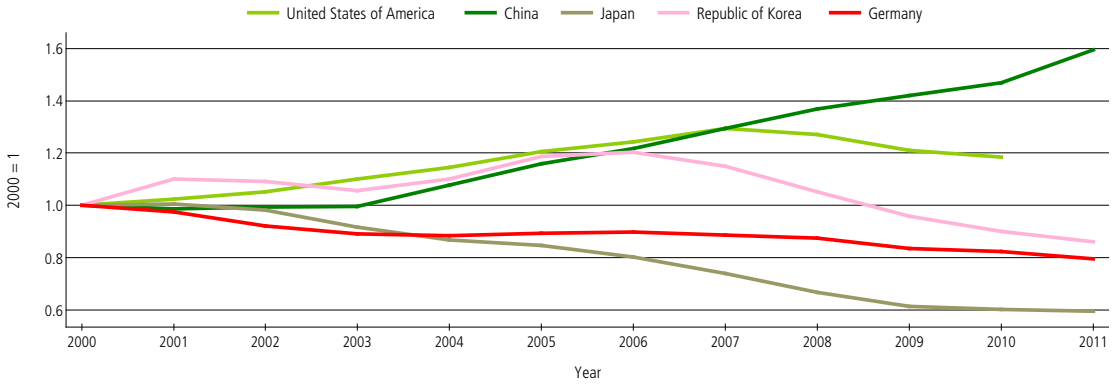
Figure A.8.1 Trend in resident patent applications worldwide per GDP and R&D expenditure



Note: GDP and R&D expenditure are in constant 2005 purchasing power parity (PPP) dollars. R&D data are lagged by one year to derive the patent-to-R&D ratio. Patent-to-GDP and patent-to-R&D ratios are presented as a three-year moving average.

Sources: WIPO Statistics Database, UNESCO Institute for Statistics and World Bank, October 2012

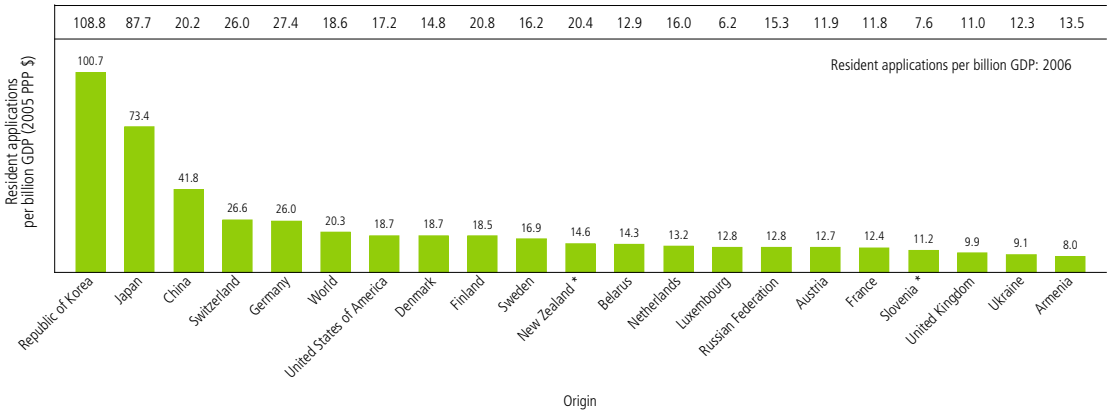
Figure A.8.2 Trend in resident patent applications per R&D expenditure for the top five origins



Note: R&D expenditure is in constant 2005 PPP dollars. R&D data are lagged by one year to derive the patent-to-R&D ratio, which is presented as a three-year moving average.

Sources: WIPO Statistics Database and UNESCO Institute for Statistics, October 2012

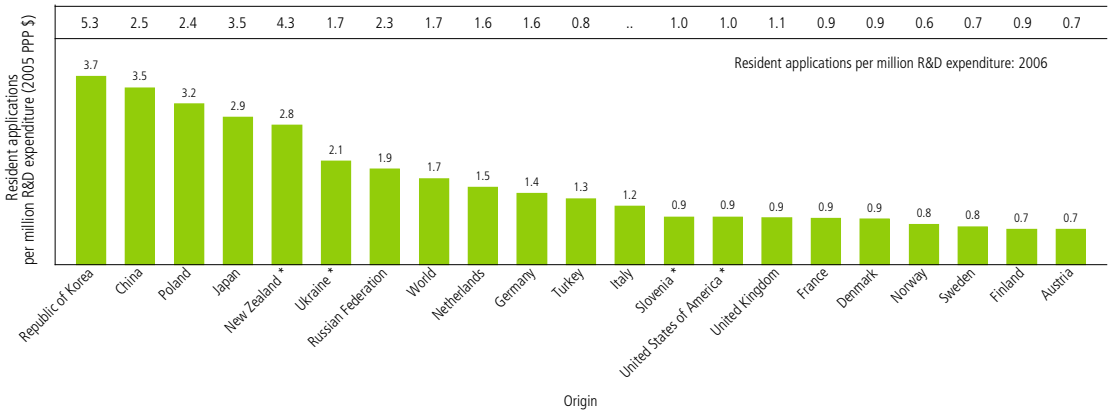
Figure A.8.3 Resident patent applications per GDP for selected origins, 2011



Note: *2010 data. GDP data are in constant 2005 PPP dollars. For the resident patent-per-GDP indicator, countries were selected if they had a GDP greater than 15 billion PPP dollars and more than 100 resident patent applications. However, not all countries that fulfill these criteria are included in the graphs due to space constraints.

Sources: WIPO Statistics Database and World Bank, October 2012

Figure A.8.4 Resident patent applications per R&D expenditure for selected origins, 2011



Note: *2010 data; '..' not available; R&D expenditure is in constant 2005 PPP dollars. For the resident patent-per-R&D expenditure indicator, countries were selected if they had R&D expenditure greater than 500 million PPP dollars and more than 100 resident patents. R&D data are lagged by one year to derive the patent-to-R&D expenditure ratio. However, not all countries that fulfill these criteria are included in the graphs due to space constraints.

Sources: WIPO Statistics Database and UNESCO Institute for Statistics, October 2012

A.9

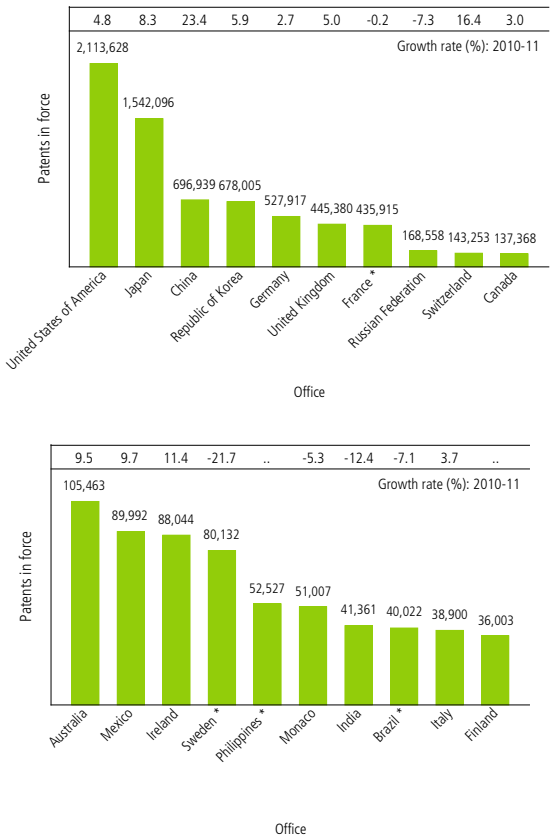
Patents in force

Patent rights last for a limited period – generally 20 years from the date of filing. Patents-in-force indicators provide information on the volume of patents currently valid as well as the historical "patent life cycle".

The estimated number of patents in force worldwide increased from 6.88 million in 2008 to 7.88 million in 2011.[44] Figure A.9.1.1 depicts the number of patents in force by office for the top 20 offices. The USPTO had the largest number of patents in force – in excess of 2.1 million patents. The JPO also had a substantial number of patents in force (1.54 million). The number of patents in force at SIPO has increased rapidly over the past few years and, in 2011, it surpassed that of the Republic of Korea.[45] Residents owned the bulk of patents in force at the JPO (87%). In contrast, patents in force at SIPO and the USPTO were almost equally distributed among resident and non-resident holders.

Apart from China, Ireland and Switzerland were the only two offices listed to see double-digit growth between 2010 and 2011. In contrast, India, Monaco and the Russian Federation recorded declines in patents in force for the same period.[46]

Figure A.9.1.1 Patents in force by office for the top 20 offices, 2011



Note: *2010 data; '..' not available; Growth rate refers to 2009-2010.

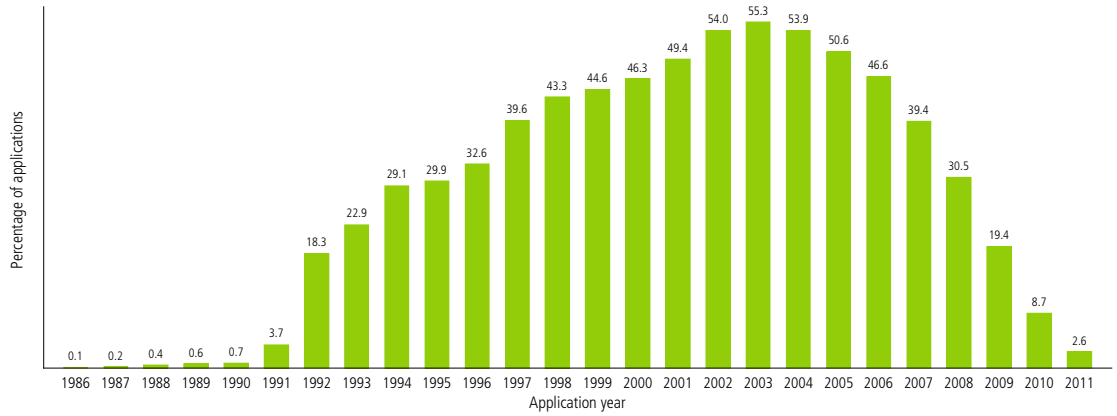
Source: WIPO Statistics Database, October 2012

44 The global number of patents in force is a WIPO estimate based on data from 81 offices. These estimates, which cover data from the same offices, are 7.18 million for 2009 and 7.37 million for 2010.

45 Between 2005 and 2011, patents in force in China grew by around 25% a year, which is far above the growth rates of Japan, the Republic of Korea and the US.

46 The number of patents in force also fell in Brazil, France and Sweden, but the data refer to 2009-2010.

Figure A.9.1.2 Patents in force in 2011 as a percentage of total applications



Note: Percentages are calculated as follows: number of patent applications filed in year t and in force in 2011 divided by the total number of patent applications filed in year t. The graph is based on data from 65 offices.

Source: WIPO Statistics Database, October 2012

Patent holders must pay maintenance fees to keep their patents valid. Depending on technological and commercial considerations, patent holders may opt to let a patent lapse before the end of the full protection term. Figure A.9.1.2 depicts the distribution of patents in force in 2011 as a percentage of total applications in the year of filing. Unfortunately, not all offices provide these data. However, the data available show that more than half of the applications for which patents were eventually granted remained in force at least eight years after the application date. Around 18% of these lasted the full 20-year patent term.

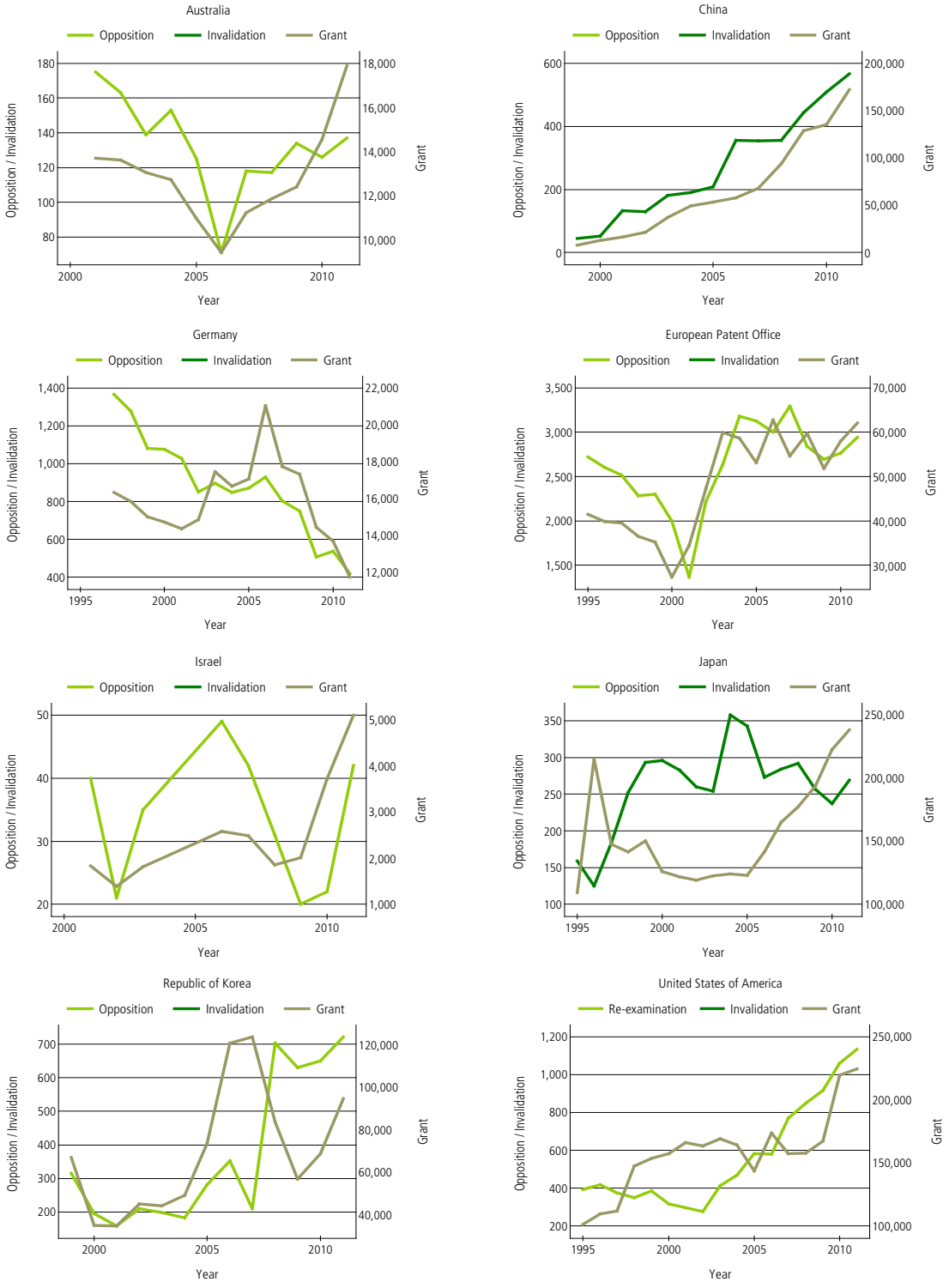
A.10

Opposition and invalidation of patents granted

The purpose of opposition procedures is to provide third parties with the possibility to oppose the grant of a patent. This also provides an alternative to potentially lengthy and costly judicial proceedings. Requests for opposition provide an important avenue to ensure patent quality. The exact legal mechanism for achieving this differs from office to office. For example, the USPTO uses a re-examination system, whereby third parties can present evidence of prior art and request that a patent be re-examined by the office. The EPO utilizes a post-grant opposition system whereby any party can contest a patent granted not only on prior art grounds of patentability but also on other substantive grounds.[47] Differences in opposition procedures make it difficult to directly compare opposition-related statistics across patent offices, so data are comparable over time only within a particular office.

47 According to Article 100 of the European Patent Convention (EPC), grounds for opposition include: the subject matter of the patent not being patentable; the invention not being sufficiently disclosed to allow a person skilled in the art to carry it out; and the content of the patent extending beyond the content of the application filed.

Figure A.10.1 Opposition and invalidation of patents granted



Note: Different procedures exist across patent offices for opposing or invalidating patent granting decisions. At the EPO and the patent offices of Germany and India, the procedure is called “opposition”. At the USPTO, it is referred to as “re-examination”. At SIPO and the JPO, the procedures are called “invalidation requests” and “trials for invalidation”, respectively.

Source: WIPO Statistics Database, October 2012

Figure A.10.1 presents data on opposition and invalidation requests for selected offices and compares them to the number of patents granted. The number of oppositions or requests for re-examination (or invalidation) appears small compared to total patents granted. For example, at the EPO, 4.7% of patents granted were opposed in 2011. Similarly, at the USPTO, the re-examination ratio – requests for re-examination divided by the number of patents granted – stood at 0.5% in 2011.[48] This ratio was similar to that for SIPO, where the number of invalidation requests to patents granted stood at around 0.3%.

The number of opposition and invalidation requests usually correlates positively with the number of patents granted. However, there are a few exceptions. At the USPTO, there has been an upward trend in the re-examinations-to-patents granted ratio since 2002. Similarly, the opposition-to-grant ratio at KIPO has increased since 2007.[49] In other words, there has been an increase in the tendency of third parties to challenge patents granted by KIPO and the USPTO. JPO is another exception in that, since 2004, it has witnessed a decline in patent invalidation requests, while the number of patents granted has been increasing.[50]

48 The opposition- and re-examination-to-grant ratios presented here are rough approximations, because the numerator and denominator do not cover the same period. For example, the 4.7% opposition ratio at the EPO was derived by dividing the number of oppositions filed in 2011 by the number of patents granted in 2011. Patents granted by the EPO can be opposed within nine months of the publication of the grant of the European patent in the European Patent Bulletin. Therefore, the number of oppositions filed in 2011 could refer to patents granted in 2010 and 2011.

49 There was a change in the opposition procedure at KIPO in 2006. Since July 2007, post-grant opposition has been integrated into the invalidation procedure and applies to all patents granted after June 2007.

50 From 1994 to 2004, the JPO had a dual opposition/invalidation system in which only certain parties could file an appeal. Since 2004, the JPO has maintained a single opposition procedure that allows anyone to file an appeal for revocation of a patent.

A.11

Pending patent applications

The processing of patents is time- and resource-intensive. Patent offices need to carefully assess whether the claims described in patent applications meet the standards of novelty, non-obviousness and industrial applicability as set out in national laws. For operational planning and to assess the effectiveness of the patent system more broadly, it is important to know how many patent applications are pending.

Unfortunately, differences in procedures across patent offices complicate the measurement of pending applications (see Box 1). In some offices, such as the USPTO, patent applications automatically proceed to the examination stage unless applicants withdraw them. In contrast, patent applications filed at other offices do not proceed to the examination stage unless applicants file a separate request for examination. For example, in the case of the JPO, applicants have up to three years to file such a request.

For offices that automatically examine all patent applications, it seems appropriate to count as pending all applications that await a final decision. However, where offices require separate examination requests, it may be more fitting to consider pending applications to be those for which the applicant has requested examination.

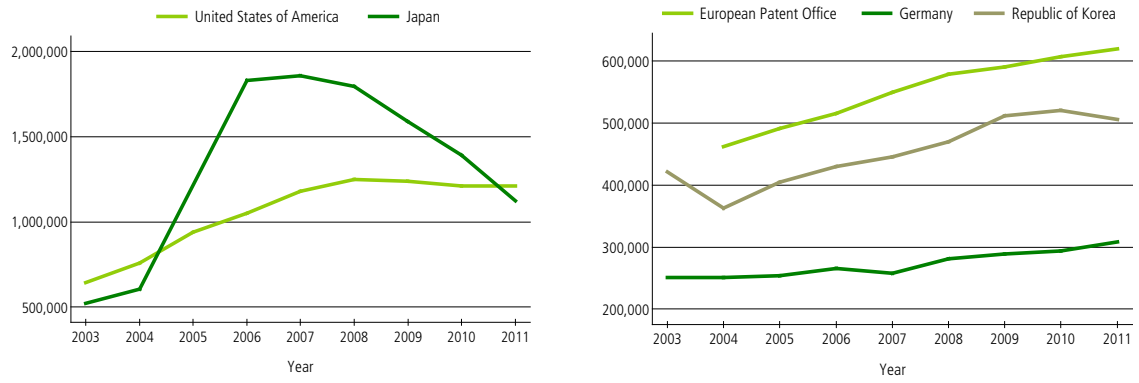
To take account of this procedural difference, pending application data for both definitions of pendency are presented below. In particular, statistics on potentially pending applications include all patent applications, at any stage in the process, that await a final decision by the patent office, including those applications for which applicants have not filed a request for examination (where applicable). Statistics on pending patent applications undergoing examination include only those applications for which the applicant has requested examination (where such separate requests are necessary).

Since the early 2000s, a number of offices have seen a rise in the number of pending applications. However, growth in the number of pending applications has varied across offices. Figure A.11.1 presents potentially pending application data for the top five offices.[51] The JPO saw a dramatic increase until 2006, followed by a decline from 2008 onwards. The drop was due to decreases in the number of new applications received and an increase in the number of applications processed. The USPTO saw a substantial increase until 2008, and the number of potentially pending applications has since remained more or less stable. The EPO, Germany and KIPO each witnessed upward trends.

The total number of potentially pending applications across the world declined from 5.1 million in 2010 to 4.8 million in 2011. Japan accounted for almost the entire drop in backlogs. The world total is based on data from 76 patent offices, which include the top 20 offices except those of China, the Democratic People's Republic of Korea and India.

In absolute terms, the US had the largest number of potentially pending applications in 2011 (Figure A.11.2). Japan saw a 19% drop in 2011, but still had a backlog of more than 1.1 million applications. The majority of top 20 offices had fewer potentially pending applications in 2011 than in 2010, notable exceptions being Viet Nam (+13%) and Germany (+4.9%).

Figure A.11.1 Trend in potentially pending applications for the top five offices

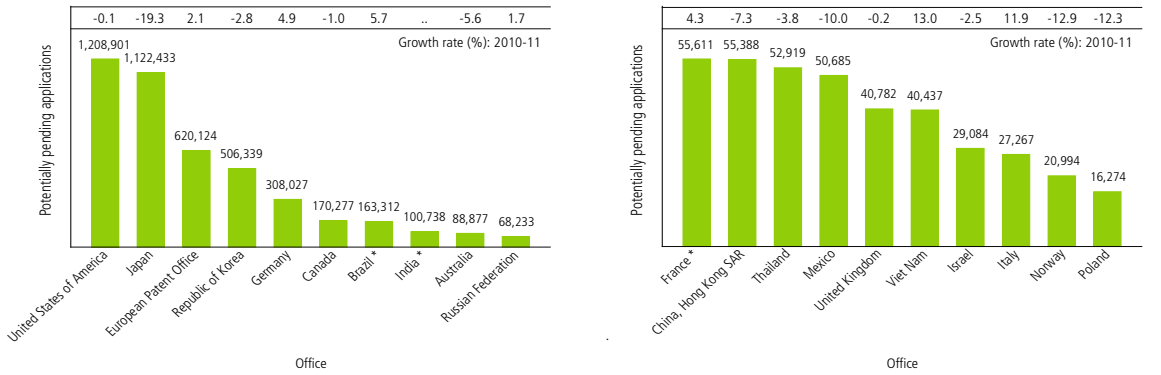


Note: Potential pending applications include all patent applications, at any stage in the process, awaiting a final decision by the patent office, including those applications for which applicants have not filed a request for examination (where applicable).

Source: WIPO Statistics Database, October 2012

51 SIPO, the largest office in terms of patent applications, is not included due to data unavailability.

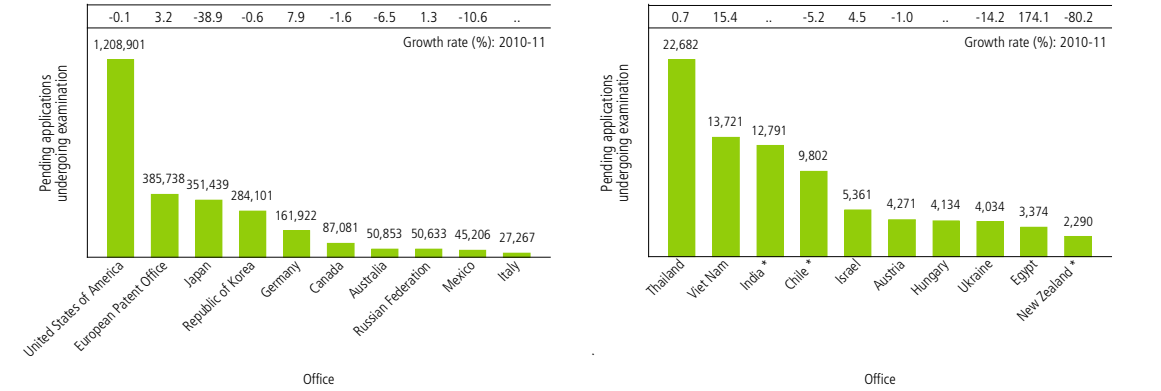
Figure A.11.2 Potentially pending applications, 2011



Note: *2010 data; '..' not available; Growth rate refers to 2009-2010. Potentially pending applications include all patent applications, at any stage in the process, that await a final decision by the patent office, including those applications for which applicants have not filed a request for examination (where applicable).

Source: WIPO Statistics Database, October 2012

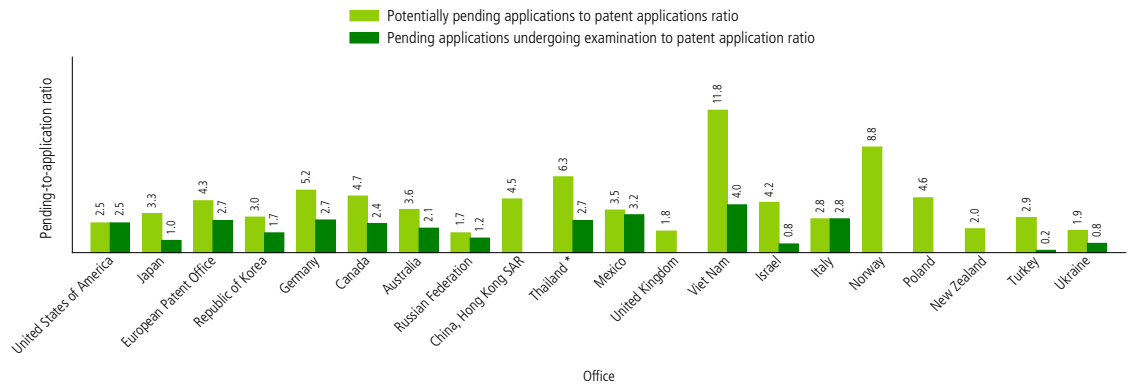
Figure A.11.3 Pending applications undergoing examination, 2011



Note: *2010 data; '..' not available; Growth rate refers to 2009-2010.

Source: WIPO Statistics Database, October 2012

Figure A.11.4 Pending applications undergoing examination ratio, 2011



Note: The 2011 ratio is calculated using applications pending in 2011 divided by the average number of applications received by the office during 2009-2011. The average number of applications for Thailand refers to 2007-2009. This is due to its recent membership in the PCT, following which the number of applications received declined temporarily as non-resident applicants switched from using the Paris route to the PCT system.

Source: WIPO Statistics Database, October 2012

The number of pending applications undergoing examination shows a trend similar to that of potentially pending applications. The majority of reported offices had fewer applications undergoing examination in 2011 than in 2010. For example, applications undergoing examination in Japan declined by around 224,000.

Figure A.11.4 depicts the number of pending applications relative to incoming applications. The patent offices of Thailand, Norway and Viet Nam showed small absolute numbers of potentially pending applications. However, these offices had a high ratio of potentially pending applications to total patent applications.[52] For example, at the patent office of Viet Nam, the number of potentially pending applications (40,437) was 11.8 times higher than the average number of patent applications (3,428) received between 2009 and 2011. The number of potentially pending applications in Germany was far below that of Japan and the US, but of all of these offices, Germany had the highest potential pending applications-to-patents ratio.

52 The potentially pending applications to patent applications ratio is high for Norway. Norway became a member of the EPO in January 2008, which prompted a sharp fall in applications received by the national patent office as users switched to using the EPO route. The fall in application numbers resulted in a high ratio for Norway. The total numbers of patent applications filed at the patent office of Norway were: 5,430 (2008), 3,604 (2009), 1,813 (2010) and 1,776 (2011).

Box 1: Measuring patent backlogs: A new framework for cross-country comparison[53]

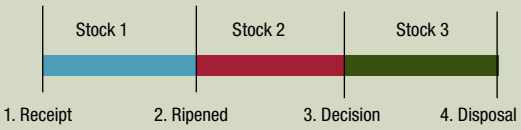
National offices tend to think about patent backlogs differently, owing to different rules and processes employed in making patenting decisions. In the US, the backlog is typically defined as the quantity of unexamined applications, while in the UK the backlog is generally considered to be the number of applications that remain unexamined after a certain time period. Each of these definitions has its own reasonable logic but, to date, the lack of standardization in measurement has led to an inability to compare backlogs, as well as misunderstanding of their causes and consequences. Similar problems arise in comparing examination pendency across offices.

The UK Intellectual Property Office (UKIPO) and the USPTO have jointly conducted a study on patent application backlogs. As part of that study – and with input from WIPO's Patent Economists Group[54] – the offices have developed a framework to facilitate cross-country comparison of backlogs. The framework identifies four milestones in the examination process common to most patent systems. These milestones divide the overall patent application inventory into three distinct stocks, or inventories, of applications (see Figure A). Within each of these stocks, it is possible to further distinguish those applications awaiting a patent office action and those awaiting an applicant response.

This taxonomy not only facilitates cross-country comparison, but also aids in highlighting the relationship between application stocks and examination pendency. By utilizing detailed information on measured stocks, offices can more precisely estimate pendency at any phase of the examination process. Further, the joint UKIPO-USPTO study shows that changes in the different stocks have differential impacts on patent pendency and on abandonment rates. Understanding these relationships is critical for better evidence-based policymaking.

Results of the UKIPO-USPTO backlog study will be made available in early 2013 at: *www.uspto.gov/ip/officechiefecon/index.jsp* and *www.ipo.gov.uk/pro-ipresearch.htm*

Figure A: Stocks of patent backlogs



53 WIPO is grateful to the UKIPO and USPTO for providing the content in Box 1.

54 See *www.wipo.int/econ_stat/en/news/2010/news_0001.html.*

A.12

Patent prosecution highway

As described earlier, there has been an increase in the number of cross-border applications – i.e., a patent application for the same invention filed in multiple jurisdictions. In such situations, the same application is examined multiple times by different patent offices. Although there are substantial differences among national patent laws, the criteria for granting patents are similar: novelty, inventive step and industrial applicability. Therefore the same set of questions – whether the invention is new, whether it is obvious and whether one can make industrial use of it – is asked multiple times.

With the increasing number of applications and limited resources, patent offices may find it difficult to process applications in a timely manner. This is reflected by the large stock of pending applications across the world (See A.11).

To avoid unnecessary duplication of work and improve the efficiency of the examination process, patent offices increasingly seek to make use of the search and examination results of other offices. So-called Patent Prosecution Highways (PPH) have institutionalized such cooperation between offices. A PPH refers to a bilateral agreement between two offices that enables applicants to request a fast-track examination procedure whereby patent examiners can make use of the work of the other office. This includes positive search and examination results from the office of first filing. It can also include the positive results of a written opinion by the International Searching Authority (ISA), the written opinion of the International Preliminary Examining Authority (IPEA) or the international preliminary examination report issued within the framework of the PCT – a practice referred to as PCT-PPH. Since offices handling subsequent filings would use the work done earlier by other offices, they can shorten processing time and contribute to better examination quality.

This section presents statistics relating to the use of the PPH system at several offices.[55] Table A.12.1 shows the number of PPH requests made up to the end of December 2011 (cumulative total from the date on which PPH became operational).

The largest number of PPH requests occurred between the JPO and the USPTO. In particular, the JPO received 6,817 applications for which applicants subsequently filed a PPH request; the USPTO received the largest number of those requests (4,703 or 69%), followed by KIPO (1,025 or 15%). As for applications filed at the USPTO, the Canadian patent office received the largest number of PPH requests (44%), followed by the JPO (33%). The Canadian office, the JPO, KIPO and the USPTO accounted for 88% of total PPH requests (13,272). The majority of offices received a low number of PPH requests (Table A.12.1). PCT-PPH requests showed a similar trend. The JPO and the USPTO received 95% of all PCT-PPH requests (Table A.12.2).

55 For further information and a definition of PPH statistics refer to: *www.jpo.go.jp/cgi/cgi-bin/ppph-portal/statistics/statistics.cgi*

Statistics on examination procedures can shed some light on how PPHs affect office performance. Table A.12.3 presents grant percentage and average pendency time figures. Due to significant differences in examination procedures and legislation across offices, the data presented here do not allow for direct cross-office comparisons. The grant percentages for applications having made use of PPH and PCT-PPH procedures were higher than for those using the normal examination procedure. This may be at least partly due to the requirement that, in order to benefit from PPH acceleration, applications filed at the office of second filing may only contain claims that correspond to those claims which have already been found to be patentable by the office of first filing. For example, the grant percentage when requesting the PPH procedure is 87% (excluding PCT-PPH) at the USPTO, compared to 49% for all applications (PPH and non-PPH). For all reported offices, the grant rate for PCT-PPH applications is higher than "regular" PPH applications. Similarly, and for related reasons, the average pendency – both first office action and final decision – for applications using PPH and PCT-PPH procedures is significantly shorter than average pendency for all applications.

Table A.12.1 Number of PPH requests, cumulative total up to the end of December 2011

		Office of subsequent filing																						
		Australia	Austria	Canada	China	Denmark	European Patent Office	Finland	Germany	Hungary	Iceland	Israel	Japan	Mexico	Norway	Others	Portugal	Republic of Korea	Russian Federation	Singapore	Spain	United Kingdom	United States of America	Total
Office of first filing	Australia	n/a																					109	109
	Austria		n/a					0		0			1										0	1
	Canada			n/a		0		1	0				2					1			0		107	111
	China				n/a								1										0	1
	Denmark			1		n/a							7					4					90	102
	European Patent Office						n/a						40										191	231
	Finland		0	1				n/a		0			5					0	0		0		19	25
	Germany			11					n/a				80					13					65	169
	Hungary		0					0		n/a			2										3	5
	Iceland										n/a		0										0	0
	Israel											n/a											1	1
	Japan		0	73	53	2	394	1	495	0	0		n/a	1	0			1,025	42	8	0	20	4,703	6,817
	Mexico												0	n/a							0		0	0
	Norway												0		n/a								0	0
	Others															n/a							0	0
	Portugal																n/a				0			0
	Republic of Korea			5		0		0	1				160					n/a	0		1	4	851	1,022
	Russian Federation							0					3					0	n/a		0		8	11
	Singapore												0							n/a			2	2
	Spain			0				0					0				0	0	0		n/a		0	0
	United Kingdom												52					19	1			n/a	205	277
	United States of America	146	0	1,922	0	1	254	1	40	1	0	0	1,438	15	2	39		475	9	9	0	36	n/a	4,388
	Total	146	0	2,013	53	3	648	3	536	1	0	0	1,791	16	2	39	0	1,537	52	17	1	60	6,354	13,272

Note: For a definition of PPH statistics refer to: *www.jpo.go.jp/cgi/cgi-bin/ppph-portal/statistics/statistics.cgi*

Source: WIPO, based on data from the JPO, October 2012

Table A.12.2 Number of PCT-PPH requests, cumulative total up to the end of December 2011

		Office of filing																	
		Australia	Austria	Canada	China	Denmark	European Patent Office	Finland	Iceland	Japan	Mexico	Nordic Patent Institution	Norway	Republic of Korea	Russian Federation	Spain	Sweden	United States of America	Total
ISA or IPEA	Australia	3																88	91
	Austria						0											8	8
	Canada			20														3	23
	China									0								2	2
	Denmark																		0
	European Patent Office									338								814	1,152
	Finland		0					0		0					0			35	35
	Iceland																		0
	Japan				7	0	188	0	0	765	0					0	0	537	1,498
	Mexico																		0
	Nordic Patent Institution									0								3	3
	Norway																		0
	Republic of Korea													12				963	975
	Russian Federation		0				0											7	7
	Spain						0	0		0								4	4
	Sweden									5							1	21	27
	United States of America	5	0		0	0	11	0	0	10				8	1	0	0	137	172
	Total	8	0	20	7	0	199	0	0	1,118	0	0	0	20	2	0	1	2,622	3,997

Note: For a definition of PPH statistics refer to: *www.jpo.go.jp/cgi/cgi-bin/ppph-portal/statistics/statistics.cgi*

Source: WIPO, based on data from the JPO, October 2012

Table A.12.3 Grant rate and pendency time for patents filed using the PPH procedure, July – December 2011

	PPH procedure, excluding PCT-PPH														PCT-PPH					
	Office of subsequent filing														Office of subsequent filing					
	Australia	Canada	Finland	Germany	Hungary	Japan	Mexico	Others	Republic of Korea	Russian Federation	Singapore	Spain	United Kingdom	United States of America	Australia	Canada	Japan	Republic of Korea	Russian Federation	United States of America
Grant Rate {%}	100	91	100			76.6	81.8	100	90.3	95	100		97.6	87	100	100	95.4			91
	(-)	-64	(-)	(-)	-24.4	-58.9	(-)	-57	-66.3	-80.2	(-)	(-)	(-)	-49	(-)	-64	-58.9	-66.3	-74	-49
First Action Allowance Rate {%}	44.4	42	66		0	22.9	81.8	87.5	27.1	50	100	100	4.8	26	33.3	75	58			19
	(-)	-4.9	(-)	(-)	-9.7	-11.2	(-)	-9.2	-10.1	-12.3	(-)	-35	(-)	-14	(-)	-4.9	-11.2	-10.1	-8.5	-14
Average Pendency from PPH Request to First Office Action {months}	0.5	1.6	1	5.6	1	1.8	0.83	1.1	1.8	1.7		3.5	1.8	6.1	0.5	1	1.9	2.2	1.3	4.3
	(-)	-22.2	-8.5	(-)	-76.1	-26.3	(-)	-41.1	-16.8	-10.9	(-)	-23	(-)	-23.6	(-)	-22.2	-26.3	-16.8	-11	-23.6
Average Pendency from PPH Request to Final Decision {months}	1.5	5.5	6			7.1	0.83	1.2	4.9	6.8			4.8	11.6	1.7	2.5	3.5			7
	(-)	-40.5	-60	(-)	-71.7	-32.4	(-)	-45.7	-22.8	-18	(-)	-33	(-)	-33.8	(-)	-40.5	-32.4	-22.8	-25	-33.8
Average Number of Office Actions	0.55	0.7	1			1.06	0	0.13		0.6	0.17		1.14	2.3	0.66	0.3	0.46			1.6
	(-)	-1.6	(-)	(-)	-0.7	-1.1	(-)	-0.94	(-)	-1.65	(-)	-2	(-)	-2.6	(-)	-1.6	-1.1	(-)	-2.6	-2.6

Note: For a definition of PPH statistics refer to: *www.jpo.go.jp/cgi/cgi-bin/ppph-portal/statistics/statistics.cgi*. The numbers in brackets refer to all applications (i.e., PPH and non-PPH data).

Source: WIPO, based on data from the JPO, October 2012

A.13

Utility models

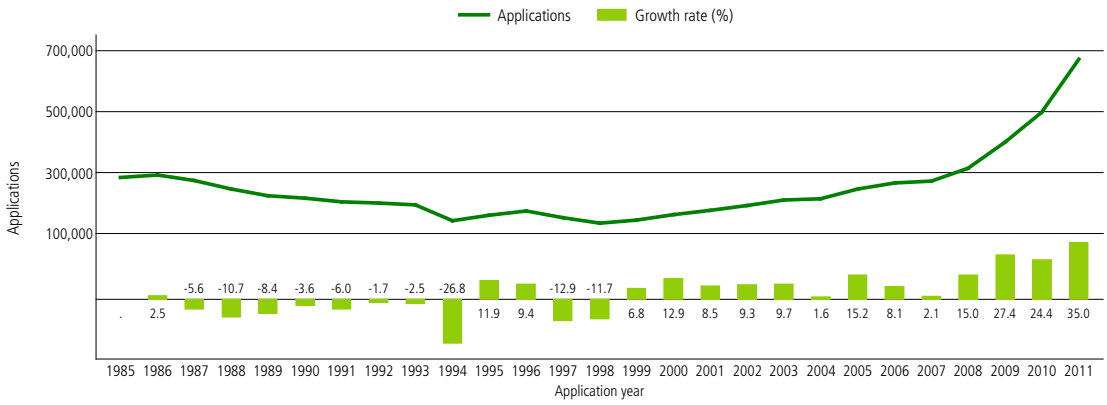
A.13.1 Utility model applications

Figure A.13.1.1 shows data on the total number of utility model (UM) applications filed across the world from 1985 to 2011. World totals are WIPO estimates covering around 60 offices, which include direct national and regional applications and international applications filed through the PCT that subsequently entered the national or regional phase. Between 1985 and 1998, UM applications worldwide followed a downward path. This was due to considerable declines at the JPO, where applications fell from around 204,800 in 1985 to 10,900 in 1998. Since 1998, UM applications have continuously increased, mainly reflecting sustained growth in filings at SIPO. During this period, the IP offices of the Russian Federation and Ukraine also saw growth, while the number of applications fell in those of Germany and the Republic of Korea.

From 2008 to 2011, there was substantial growth in applications worldwide. The latest year, 2011, saw an estimated 670,700 UM applications filed worldwide, corresponding to a 35% increase on 2010. Growth in applications has been entirely due to an increase in applications received by SIPO. Excluding Chinese office data, the world total actually showed a decrease of 1.7% in 2010 and 2% in 2011.

Figure A.13.1.2 depicts the number of UM applications for the top 20 offices. SIPO received 585,467 applications – or 87% of the world total – in 2011, corresponding to 42.9% growth on 2010. Since 1997, it has been the largest office in terms of applications. In 2011, the second largest office, Germany, received around 16,000 applications – only a fraction of the number received in China. Apart from the top five offices, each of the other offices received fewer than 8,000 applications.

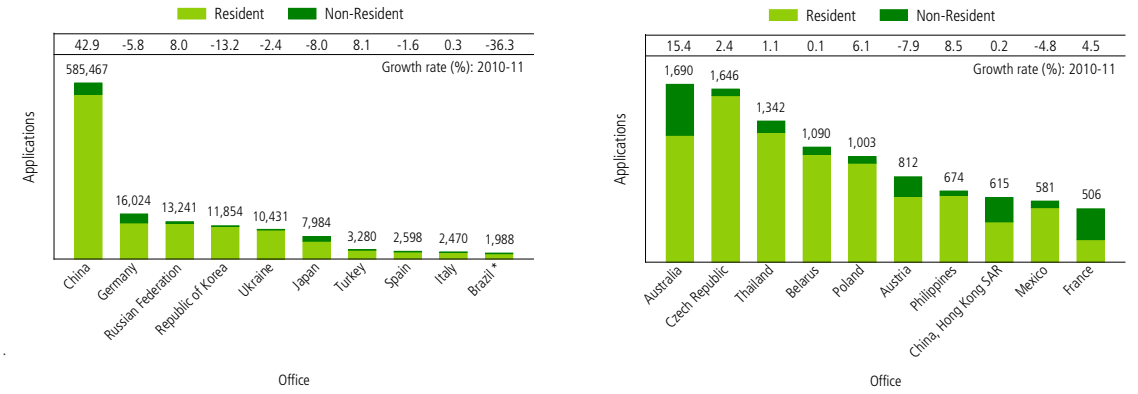
Figure A.13.1.1 Trend in utility model applications worldwide



Note: World totals are WIPO estimates covering around 60 patent offices (see Data Description). These estimates include direct applications and PCT national phase entries.

Source: WIPO Statistics Database, October 2012

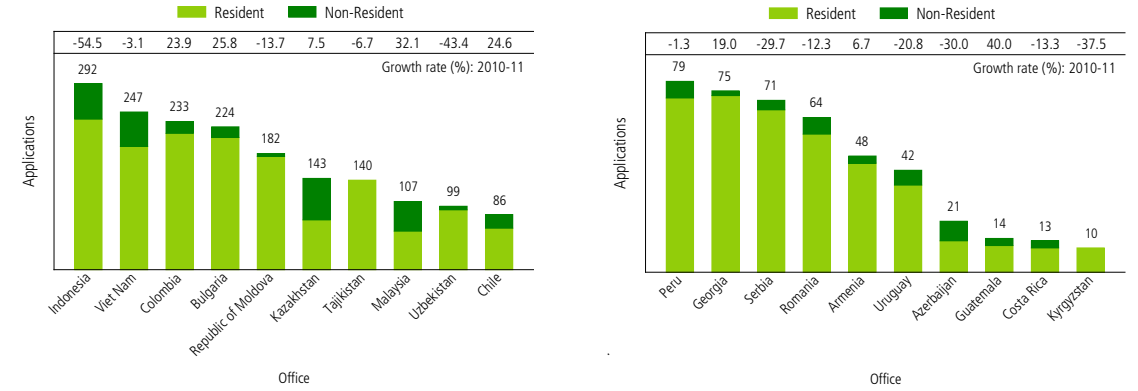
Figure A.13.1.2 Utility model applications for the top 20 offices, 2011



Note: *2010 data; Growth rate refers to 2009-2010.

Source: WIPO Statistics Database, October 2012

Figure A.13.1.3 Utility model applications for offices of selected middle- and low-income countries, 2011



Source: WIPO Statistics Database, October 2012

Unlike patents, UMs are primarily used by resident applicants to protect inventions at their respective national patent offices. In 2011, resident applicants accounted for 98% of the world total, a share that has remained relatively constant over the past 25 years. For the top 20 offices, France is the only one where non-resident applicants accounted for the majority of applications. The non-resident share in total applications at SIPO was less than one percent in 2011. However, in absolute terms, SIPO (with 4,164) received the largest number of non-resident UM applications in 2011, considerably higher than the 1995 level (354 applications). The majority of non-resident applications filed at SIPO originated in Japan and the US.

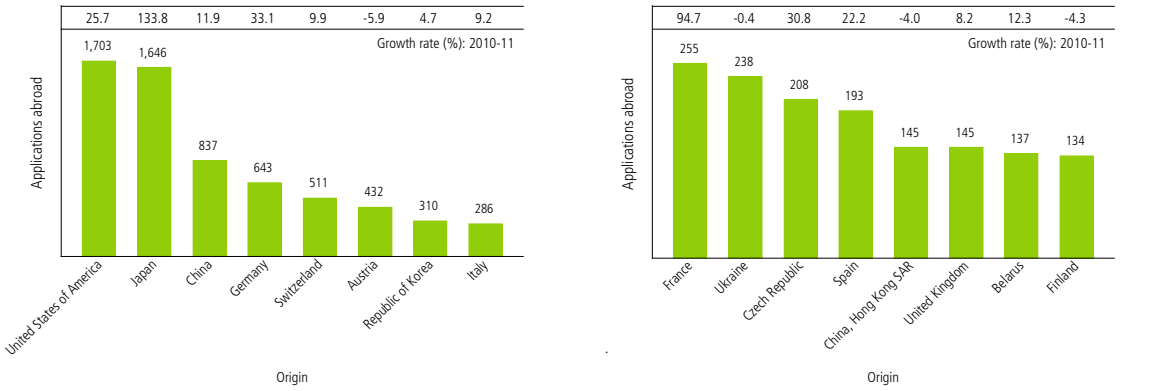
SIPO is the only office with considerable growth in UM applications in 2011. It received 175,631 more applications than in 2010. This exceeds twice the amount of applications received by all other offices combined in 2011. Between 2010 and 2011, the IP offices of Australia, the Russian Federation, the Philippines and Turkey recorded high growth, while Austria, the Republic of Korea and Japan experienced considerable declines.

Figure A.13.1.3 shows the numbers of UM applications received by offices of selected middle- and low- income countries. Similar to the trend observed for the top 20 offices (Figure A.13.1.2), resident applications accounted for the largest share of total applications. Resident shares varied from 55% in Kazakhstan to 100% in Kyrgyzstan and Tajikistan. The majority of these offices received fewer applications in 2011 than in 2010.

Even though the UM system is mostly used by local residents, some applicants seek UM protection abroad. Figure A.13.1.4 presents the total number of applications filed abroad for selected origins. Residents of the US (1,703) and Japan (1,646) filed the largest numbers of UM applications abroad, a large proportion of which were destined for SIPO. Table A.13.1.5 shows the breakdown of Japanese and US applications abroad at SIPO and at other IP offices. The use of UMs by Japanese and US applicants to seek protection in China has considerably increased. In 2000, residents of the US filed 128 UM applications (or 23.7% all applications abroad) at SIPO; by 2011, this number stood at 1,076, constituting 63% of all US applications abroad. Applications abroad data for Japan exhibit a similar trend.

China had the largest number of resident applications (582,140) by origin, of which 581,303 were filed at SIPO and only 837 were filed abroad.

Figure A.13.1.4 Utility model applications filed abroad for selected origins, 2011



Note: The actual numbers of UM applications by origin might be higher than those reported due to incomplete data, and/or because a detailed breakdown by origin is not supplied by some offices.

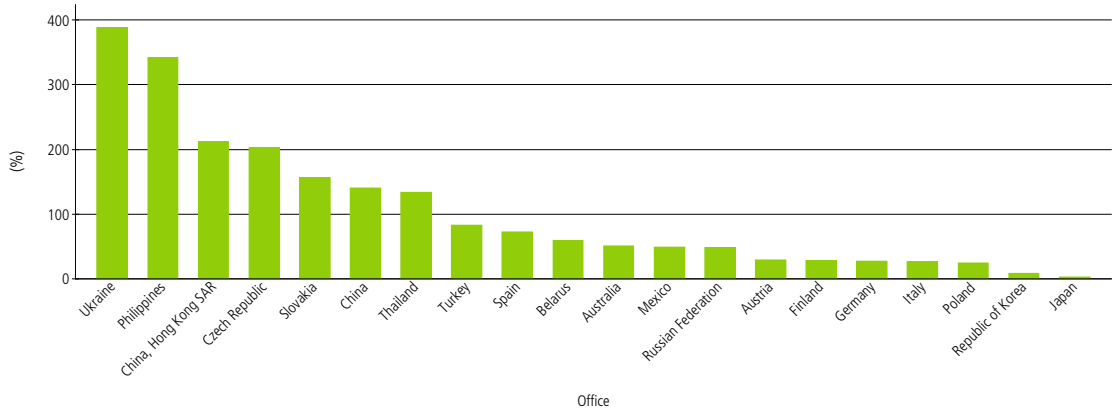
Source: WIPO Statistics Database, October 2012

Table A.13.1.5 Utility model applications filed abroad by residents of Japan and the US

	Origin: Japan						Origin: United States of America					
	UM applications			UM applications (%)			UM applications			UM applications (%)		
Office	2000	2005	2011	2000	2005	2011	2000	2005	2011	2000	2005	2011
China	87	566	1,465	46.8	95.4	89.0	128	360	1,076	23.7	49.0	63.2
Others	99	27	181	53.2	4.6	11.0	412	374	627	76.3	51.0	36.8
Total	186	593	1,646	100.0	100.0	100.0	540	734	1,703	100.0	100.0	100.0

Source: WIPO Statistics Database, October 2012

Figure A.13.1.6 Resident utility model applications as a percentage of resident patent applications, 2011



Source: WIPO Statistics Database, October 2012

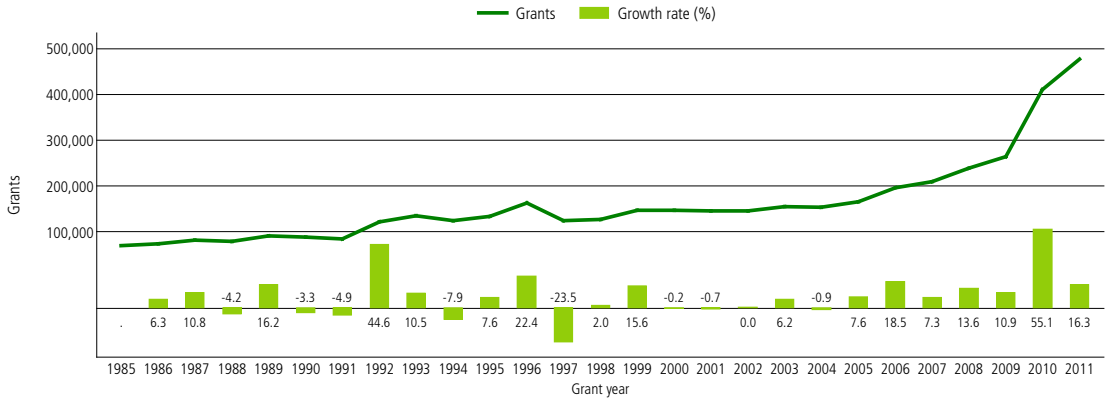
To illustrate the use of the UM system, Figure A.13.1.6 shows resident UM applications relative to resident patent applications. Compared to the patent system, the UM system is used intensively by residents of Ukraine, the Philippines, China Hong Kong (SAR), the Czech Republic, Slovakia, China and Thailand. For example, Ukrainian residents filed about four times more UM applications than patent applications in 2011. Residents of middle-income countries tend to use the UM system more intensively than the patent system. In contrast, residents of high-income countries, such as Germany and Japan, use the patent system more frequently.

A.13.2 Utility model grants

Contrary to applications, UM grants worldwide showed a slight upward trend from the mid-1980s to the mid-2000s, followed by a steep increase from 2006 onwards. UM grants worldwide grew substantially in 1992 (44.6%) and 2010 (55.1%). The 1992 growth was mainly due to the large number of grants issued by the JPO, while the high growth in 2010 resulted from the many grants issued by SIPO. Indeed, the fast growth in grants worldwide since 2006 was almost entirely due to SIPO. The total number of grants worldwide is estimated at around 477,100 in 2011, corresponding to 16.3% growth on 2010. The world total, excluding SIPO data, shows more modest growth over the past two years (+8.2% in 2010 and +5.1% in 2011).

SIPO issued by far the largest number of grants (408,110) in 2011. It accounted for 85% of the world total which, however, is two percentage points below its share in applications worldwide. The IP offices of Germany, the Russian Federation and Ukraine each issued more than 10,000 grants in 2011. The resident and non-resident grant distribution for all reported offices is similar to that of the application distribution, with resident applicants receiving the bulk of total grants in 2011. The majority of the listed offices exhibited growth in grants between 2010 and 2011. However, Austria, Germany and Japan recorded falls in both applications (Figure A.13.1.2) and grants (A.13.2.2).

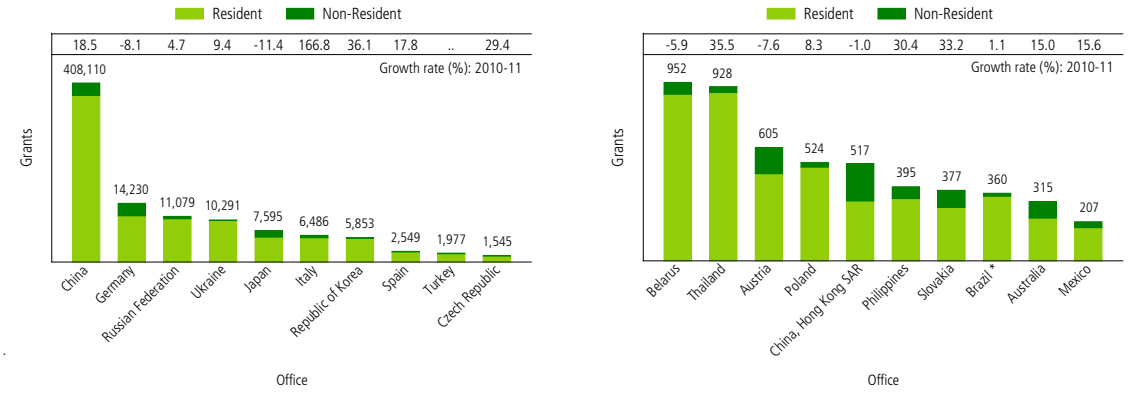
Figure A.13.2.1 Trend in utility model grants worldwide



Note: World totals are WIPO estimates covering around 60 patent offices (see Data Description). These estimates include UM grants based on direct applications and PCT national phase entries.

Source: WIPO Statistics Database, October 2012

Figure A.13.2.2 Utility model grants by office for the top 20 offices, 2011



Note: '..' not available; *2010 data; Growth rate refers to 2009-2010.

Source: WIPO Statistics Database, October 2012

A.14

Microorganisms

In 2011, there were a total of 75 contracting parties to the Budapest Treaty, hosting 40 International Depository Authorities (IDAs). Therefore, not all contracting parties have an IDA within their borders. In 2011, Chile and Morocco signed the treaty, and the Microbial Culture Collection (MCC) of India became an IDA.

Figure A.14.1 shows the long-term trend of total deposits made with all IDAs that receive and store microorganisms. As can be seen, deposits fell from about 3,300 in 2001 to around 2,700 in 2005. They then gradually increased until 2010. The high growth of 19.5% in 2010 can be attributed to increases in the numbers of deposits made in both IDAs located in China and in one located in the US. Together, these three IDAs accounted for 76% of the increase from 2009 to 2010. The 3,866 deposits in 2011 remained relatively unchanged from the previous year's level of 3,857.

Figure A.14.1.2 shows deposit activity from 2001 to 2011 for the top five IDAs, which were selected on the basis of total deposits made at IDAs since the Budapest Treaty became operational in 1981. The top five include authorities from China, Germany, Japan and the US. China's two IDAs included in this list – the China General Microbiological Culture Collection Center (CGMCC) and the China Center for Type Culture Collection (CCTCC) – had the highest five-year average annual growth rates from 2007 to 2011 with 32.8% and 25.6%, respectively. Germany's DSMZ saw more or less stable deposit activity over the same period. By contrast, deposits fell by 12% at Japan's International Patent Organism Depositary (IPOD) and by 1.6% at the US-based American Type Culture Collection (ATCC). Despite year-on-year growth of 7 to 17% from 2008 to 2010, the ATCC experienced a sharp decline in deposits (-30.6%) from 2010 to 2011.

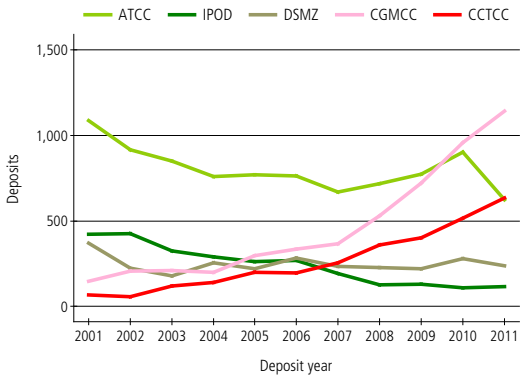
Figure A.14.1.3 presents the shares of the top 10 IDAs in the total number of deposits received in 2001 and 2011. Many of the same IDAs are listed for both years, but Japan's National Institute of Technology and Evaluation, Patent Microorganisms Depositary (NPMD) and the UK-based National Collections of Industrial, Food and Marine Bacteria (NCIMB) were new to the 2011 ranking, replacing the Korean Culture Center of Microorganisms (KCCM) and the European Collection of Cell Cultures (ECACC) of the UK.

Figure A.14.1 Trend in microorganism deposits worldwide

Source: WIPO Statistics Database, October 2012

The two pie charts show that ATCC received 33.1% of all microorganism deposits worldwide in 2001; however, its share in 2011 decreased by roughly half to 16.2%. The China-based CGMCC and CCTCC each increased their shares from 4.5% and 2.1%, respectively, in 2001 to 29.5% and 16.4% in 2011, thus becoming the top two IDAs in terms of deposits received for that year. Combined, they received 45.9% of all deposits in 2011 in contrast with the 20% received by the two US-based IDAs (ATCC and NRRL) and the 5.3% received by the two IDAs of Japan (IPOD and NPMD).

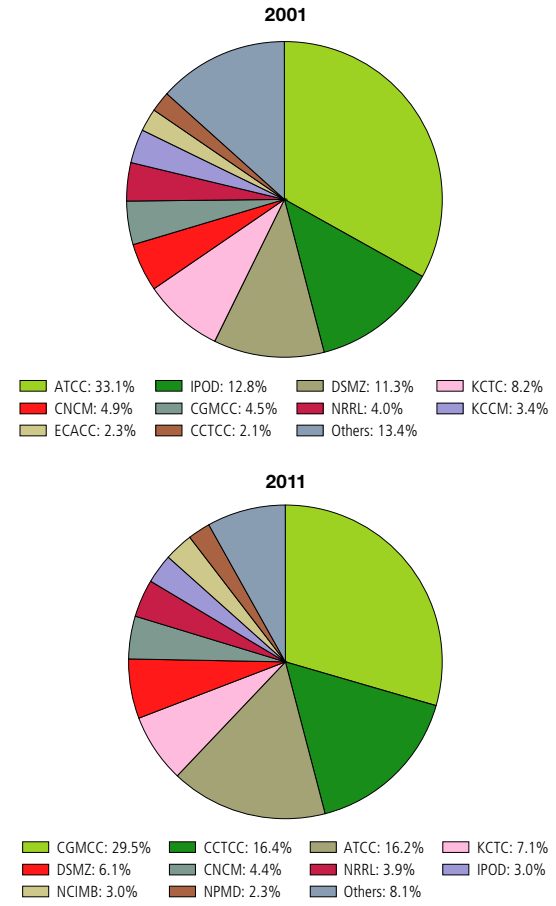
Figure A.14.2 Deposits for the top five IDAs



Note: ATCC (American Type Culture Collection, United States of America), CCTCC (China Center for Type Culture Collection), CGMCC (China General Microbiological Culture Collection Center), DSMZ (Deutsche Sammlung von Mikroorganismen und Zellkulturen GmbH, Germany), IPOD (International Patent Organism Depositary, Japan)

Source: WIPO Statistics Database, October 2012

Figure A.14.3 Share of IDAs in total deposits



Note: ATCC (American Type Culture Collection, United States of America), CCTCC (China Center for Type Culture Collection), CGMCC (China General Microbiological Culture Collection Center), CNCM (Collection nationale de cultures de micro-organismes, France), DSMZ (Deutsche Sammlung von Mikroorganismen und Zellkulturen GmbH, Germany), ECACC (European Collection of Cell Cultures, United Kingdom), IPOD (International Patent Organism Depositary, Japan), KCCM (Korean Culture Center of Microorganisms, Republic of Korea), KCTC (Korean Collection for Type Cultures, Republic of Korea), NCIMB (National Collections of Industrial, Food and Marine Bacteria, United Kingdom), NPMD (National Institute of Technology and Evaluation, Patent Microorganisms Depositary, Japan) and NRRL (Agricultural Research Service Culture Collection, United States of America)

Source: WIPO Statistics Database, October 2012