



WORLD
INTELLECTUAL
PROPERTY
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WORLD PATENT REPORT

A STATISTICAL REVIEW



2008





WORLD PATENT REPORT

A STATISTICAL REVIEW

2008 Edition



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FOREWORD

Intellectual property rights have been high on the policy agenda in recent years. Understanding the evolution and use of the patent system is critical to understanding policy debates, including the role of intellectual property in economic growth and development, and the relationship between IP policy and key public policy concerns, such as health and the environment, and for developing initiatives to improve the efficiency of the patent system itself.

This report provides readers with statistical indicators that shed light on issues such as the functioning of the patent system and its use by both developed and developing countries. The statistical information provided in this report allows users to analyze and monitor the latest trends in patent activity based on objective and detailed information.

The World Patent Report – A Statistical Review is an annual publication and the 2008 edition is the third edition in the series. There is a continuing effort at WIPO to improve statistical information on patent activity covering as many countries as possible across the world and to develop and provide new indicators that are relevant to current policy issues.

The report contains a wide range of indicators, some of which are published for the first time in the 2008 edition, covering areas such as:

- > Patent filings and grants by offices and countries of origin with the aim of providing an overview of the level of patent activity across the world.
- > Patent statistics by field of technology which highlight and identify key / emerging technologies.
- > Use of utility models as an alternative to patents for protecting intellectual property rights.
- > International filings through the Patent Cooperation Treaty, indicating the level of internationalization of technologies.
- > Use of the patent system in emerging countries.
- > Processing of patent applications, including pendency volume and time, which highlight the challenges faced by patent offices with rapidly increasing numbers of patent filings.
- > Opposition and invalidation.
- > Cost of patenting.

All statistics included in this report and additional data (i.e. longer time series and more countries / patent offices) are available for download from WIPO's statistics website: www.wipo.int/ipstats/en/statistics/.

This report was prepared by Mosahid Khan, Ryan Lamb, Bruno Le Feuvre, William Meredith, Catherine Calais Regnier, Alex Riechel, and Hao Zhou of the Patent Information and IP Statistics Service of the World Intellectual Property Organization.

We would like to thank the many National and Regional Intellectual Property Offices that shared their statistics with WIPO, without the contribution of which this report would not have been possible.



Francis GURRY
Deputy Director General

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HIGHLIGHTS

Worldwide patent activity increased by 4.9% between 2005 and 2006, mostly due to increased filings by applicants from China, the Republic of Korea and the United States of America

- > The total number of applications filed across the world in 2006 is estimated to be 1.76 million, representing a 4.9% increase from the previous year. Between 2005 and 2006, the number of filings worldwide by applicants from China, the Republic of Korea and the United States of America increased by 32.1%, 6.6% and 6.7% respectively.
- > The United States Patent and Trademark Office was the largest recipient of patent filings, for the first time since 1963, with a total of 425,966 patent applications filed in 2006. There was a small decrease in the number of patents filed at the Japan Patent Office in 2006 (408,674). The patent offices of China (210,501), the Republic of Korea (166,189), and the European Patent Office (135,231) also received a large number of filings.
- > Patent applicants tend to come from a relatively small number of countries of origin. For example, applicants from Japan, the United States of America, the Republic of Korea, Germany and China accounted for 76% of total patent filings in 2006. Chinese residents increased their share of total worldwide patent filings from 1.8% to 7.3% between 2000 and 2006, mostly due to increases in domestic patent filings.
- > Although the number of patent applications filed across the world has increased at a steady pace, the rate of increase is less than the rate of increase observed for other economic indicators such as GDP and trade.
- > In 2006, approximately 727,000 patents were granted across the world. Similar to patent filings, patent grants are concentrated in a small number of countries. Applicants from Japan, the United States of America, the Republic of Korea and Germany received 73% of total patent grants worldwide. Between 2000 and 2006, the number of patents granted to applicants from China and the Republic of Korea grew by 26.5% and 23.2% a year, respectively (average annual growth rate).
- > There has been an increase in the level of patenting activity in emerging countries. The patent offices of India, Brazil and Mexico all received a large number of filings in 2006. However, for the majority of the reported emerging countries, non-resident applicants accounted for the largest share of total filings in these countries. There has also been an increase in the use of the PCT System by emerging countries for international filings.

Increasing internationalization of the patent system

- > There has been a significant increase in the level of internationalization of patent activity as reflected by non-resident patent filings and international filings through the PCT System. The non-resident filings share of total patent filings increased from 35.7% in 1995 to 43.6% in 2006.
- > Non-resident patent filings originate from a relatively small number of countries, led by the United States of America (21.9% of non-resident filings worldwide), Japan (21.7%) and Germany (10.8%). The 8 largest countries of origin increased their share of worldwide non-resident patent filings from 66% to 74% between 2000 and 2006. Applicants from emerging economies, including China, file relatively few patent applications outside their home countries.

- > Many inventions result in filings in multiple offices. Approximately 24% of all patent families are filed in 2 or more offices. 10% of patent families are filed in 4 or more offices.
- > The level of internationalization varies across countries/economies. The share of non-resident patent filings is very high in the patent offices of Hong Kong (SAR), China, Israel, Mexico and Singapore – where more than 90% of total filings are accounted for by non-resident applicants. In addition, between 2005 and 2006, non-resident patent filings increased by 7.4%, whereas resident filings increased by 3.1%.
- > The number of international patent filings filed through the PCT in 2007 is estimated to be 158,400, representing a 5.9% increase from the previous year. Emerging countries such as India, Brazil and Turkey are increasingly using the PCT System to file international applications.

Approximately 6.1 million patents were in force in 2006

- > Approximately 6.1 million patents were in force in 2006. The largest number of patents in force were in the United States of America (1.8 million in 2006). However, the majority of patents in force were owned by applicants from Japan.
- > Both measures of patents in force, by country of origin (ownership of the patent) and by patent office (where the patent is in force), reflect an increase in the number of patents in force in 2006.
- > Although patent rights are conferred to the applicant for up to 20 years, available data show that only a minority of patents are maintained for the full 20 year term. More than half of the patents in force in 2006 were filed during the period between 1997 and 2003.

Increase in patent filings in computer technology, telecommunications and electrical machinery technologies, but a decrease in biotechnology

- > In 2005, a large number of patent filings were filed across the world in computer technology (144,594), telecommunications (116,770), and electrical machinery (121,350) technologies. Between 2001 and 2005, patent filings in computer technology, optics, and semiconductors grew by 5.3%, 5.0% and 4.9%, a year, respectively. There was a modest increase in pharmaceuticals filings (1.7%) and a decrease in biotechnology filings (-2.7%).
- > The recent pressures on energy resources have created an increase in patenting activity related to energy technologies. Examples can be seen in patent filings related to solar (thermal and photo) energy, fuel cells and wind energy. Patent filings in the fields of solar energy and fuel cells mainly originated from Japan. Patent applications in the field of wind energy were evenly distributed, with Germany and Japan being the top two countries of origin for this technology.

Large volume of pending applications at some patent offices

- > There has been an increase in the number of pending patent applications at the United States Patent and Trademark Office (USPTO). By 2006, the number of patent applications awaiting examination at the USPTO was 1,051,502. There has also been an increase in the application processing time, as reflected by the increase in the number of months for first office action and total pendency time.
- > Between 2004 and 2005, there was a sharp increase in the number of pending applications at the Japanese Patent Office (JPO). In 2006, there were around 836,801 patent applications awaiting examination at the

JPO. However, the increase at the JPO was mostly due to the shortening of the time limit for request for examination, from 7 years to 3 years, which has created an increased examination workload for a period of several years. Since 2005, the volume of pending applications at the JPO has stabilized and it is expected to decrease in the near future.

- > The number of pending applications at other large patent offices, such as Germany (265,395) the European Patent Office (247,165) and Canada (205,776), is relatively small (compared to the USPTO and the JPO) and has been stable over time.

Increased opposition and invalidation requests

- > In most of the reported offices, the numbers of opposition or invalidation requests are loosely correlated with the number of patents granted, the exception being Germany where requests have declined while the number of granted patents has increased. In general, there is an upward trend in the numbers of opposition or invalidation requests which may reflect an increasing interest in the challenging of granted patents by third parties.

METHODOLOGICAL INFORMATION

A patent is an exclusive right granted by law to applicants / assignees to make use of and exploit their inventions for a limited period of time (generally 20 years from filing). The patent holder has the legal right to exclude others from commercially exploiting his invention for the duration of this period. In return for exclusive rights, the applicant is obliged to disclose the invention to the public in a manner that enables others, skilled in the art, to replicate the invention. The patent system is designed to balance the interests of applicants / assignees (exclusive rights) and the interests of society (disclosure of invention).

Patent statistics as an indicator of inventive activity

It is widely accepted that patent statistics are a reliable (although not perfect) indicator of innovative activity. Therefore, it has become standard practice to use patent statistics for monitoring innovative activities and the development of new technologies. However, when using patent statistics as an indicator of inventive activity, the following points should be taken into consideration:

- > Not all inventions are patented. There are other alternatives such as trade secrecy or technical know-how available to inventors for protecting their inventions.
- > Use of the patent system for protecting inventions varies across countries and industries. Applicants' different filing strategies or filing preferences may render direct comparison of patent statistics difficult.
- > Differences in patent systems may influence the applicant's patent filing decisions in different countries.
- > Due to the increase in the internationalization of research and development (R&D) activity, R&D may be conducted in one location but the protection for the invention might be sought in a different one.
- > Cross-border patent filings depend on various factors, such as trade flows, foreign direct investment, market size of a country, etc.

Notwithstanding the points mentioned above, patent statistics do provide valuable information about innovative activity.

Patent statistics methodology

To obtain patent rights, the applicant must file a patent application and pay fees. The patent office examines the application and decides whether to grant or reject the application. A large volume of data is generated during the patent application process, which are frequently used by researchers to construct statistical indicators for measuring innovative activity, patenting activity of offices and countries, etc. However, for correctly interpreting patent statistics, it is important to understand the methodology used in constructing the indicators.

- > **Date:** patent indicators are often constructed based on dates. Indicators used in this report are based, in general, on the following concepts:
 - Patent filing (application) indicators are constructed according to the patent filing date.
 - Patent grant indicators are based on the grant date.
 - Patent families data are based on the priority (first filing) date.
 - Technology indicators are based on the publication date.

- > **Country of origin:** patent applications include information pertaining to the country of residence of the inventor and the applicant (or assignee). Patent statistics based on the country of residence of the inventor may indicate the location of the invention, whereas the country of residence of the applicant (or assignee) provides information about the owner of the patent at the time of the application.
 - Country of origin used in this report is based on the country of residence of the first-named applicant (or assignee), which will include companies that are domiciled in a country but which may be effectively owned or controlled by overseas interests. This is particularly the case in countries with large foreign direct investments.
 - Statistics based on the concept of resident and non-resident filings are included in this report. Resident filing refers to an application filed at an office of or acting for the State in which the first-named applicant in the application concerned has residence. Likewise, non-resident filing refers to an application filed at an office of or acting for the State in which the first-named applicant in the application concerned does not have residence.

Data sources

The patent statistics published in this report are taken from the WIPO Statistics Database, which is based on information supplied to WIPO by patent offices in annual surveys and data generated at WIPO during the PCT application process. Each year, WIPO collects patent statistics from patent offices, including the number of patent applications filed and patents granted and enforced, broken down by country of origin, date and a number of other criteria. A continuing effort is made to improve the quality and availability of patent statistics. It is difficult to obtain data for all patent offices with all possible breakdowns, however every effort is made to cover data for all patent offices / countries. When it is necessary and feasible, missing data are estimated by WIPO on an aggregate level.

The statistics on field of technology and patent families are constructed by WIPO based on data obtained from the PATSTAT database, which is maintained by the EPO. Macroeconomic and research and development data are obtained from the World Bank and UNESCO.

Pending applications and pendency time statistics are obtained from WIPO Statistics Database, supplemented with data from the Trilateral statistical reports and annual reports of patent offices. The opposition/invalidation request data were derived from National IP Offices annual reports and publications as well as from statistics requested by WIPO directly from IP Offices.

Please note that due to the continual updating of missing data and the revision of historical statistics, data provided in this report may be different from previously published figures.

National and international patent systems

The procedures for patent rights are governed by the rules and regulations of national and regional offices. There are a number of international (e.g. see PCT section below) and regional treaties in existence, which have brought national legal frameworks governing patent systems closer together. However, in order to accommodate different national interests and needs, there are differences in the architecture of patent systems at the national level. While more commonalities among the national legal systems are found with regard to certain elements of the patent system, other aspects reflect substantially different approaches. The existence of differences within the patent system has a significant impact on the statistical indicators and may hamper proper interpretation of such indicators. For example:

- > The existence of alternative forms of patent rights to standard patents, such as utility models, provisional patent applications and design patents may result in fewer standard patent applications.
- > There are differences in the patentability of subject matter. For example, it is possible to protect business method inventions in some jurisdictions but not in others.
- > In some patent offices, submission of a patent application automatically results in search and/or examination, while in other offices an applicant is required to make a request for examination within a specified time limit.

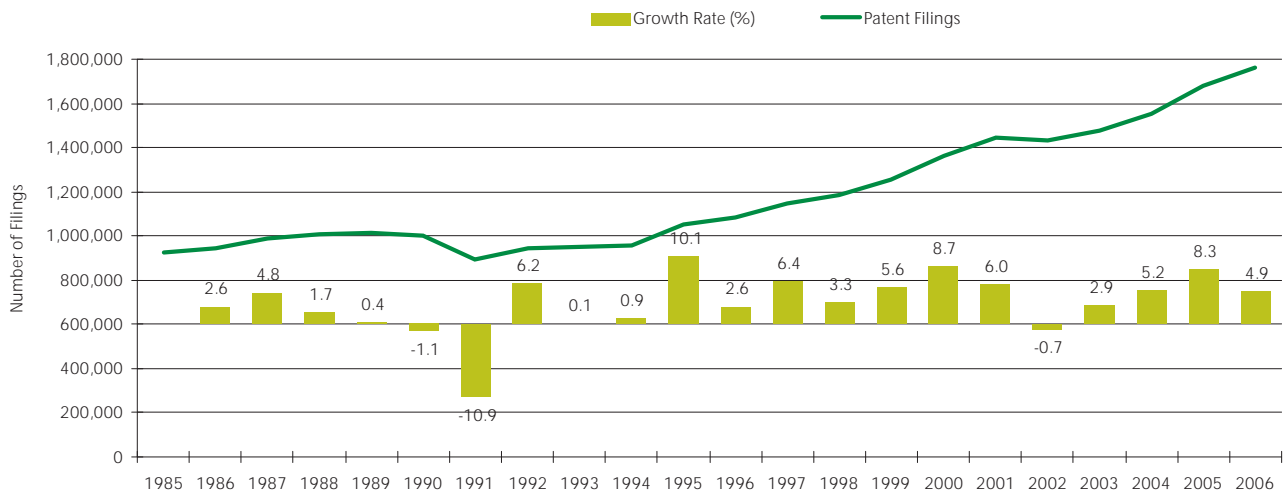
To assist users in correctly interpreting and analyzing patent statistics, WIPO has collected and published information on the characteristics of different national patent systems which is available at <http://www.wipo.int/ipstats/en/resources/>.

The Patent Cooperation Treaty (PCT)

The Patent Cooperation Treaty (PCT) is an international treaty administered by the World Intellectual Property Organization (WIPO). The PCT makes it possible to seek patent protection for an invention simultaneously in a large number of countries by filing a single "international application" with a single patent office (i.e. receiving Office). The PCT system simplifies the process of multi-national patent filings by reducing the requirement to file multiple patent applications for multi-national patent rights. The PCT international applications do not result in the issuance of "international patents" and the International Bureau (IB) does not grant patents. The decision on whether to confer patent rights remains in the hands of the national and/or regional patent offices, and the patent rights are limited to the jurisdiction of the patent granting authority. The PCT procedure consists of an international phase and a national/regional phase. The PCT international application process starts with the international phase and concludes with the national/regional phase. For further details about the PCT system, refer to: <http://www.wipo.int/pct/en/> and <http://www.wipo.int/ipstats/en/statistics/pct/>.

A.1.1. TOTAL PATENT FILINGS

Trends in total patent filings, 1985-2006



Distribution of total patent filings by residents and non-residents, 1985-2006



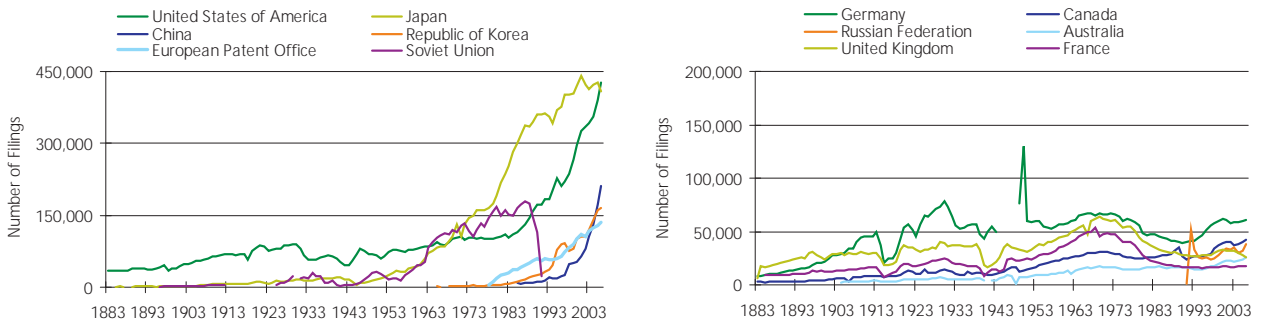
Note: PCT national phase entry data is incomplete prior to 1995.

Source: WIPO Statistics Database

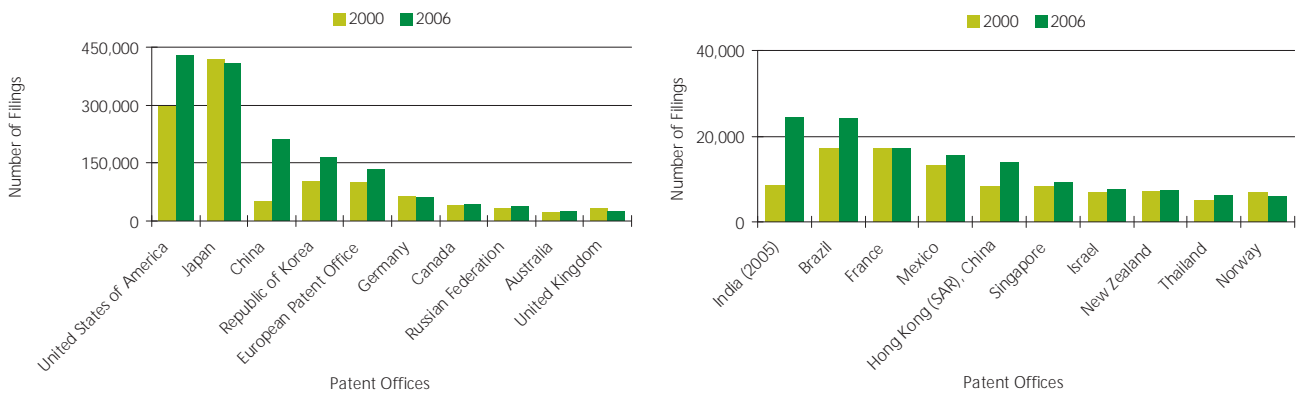
- > In 2006, the total number of patent applications filed across the world is estimated to be around 1.76 million, representing a 4.9% increase from the previous year.
- > Between 1995 and 2006, the mean yearly growth rate of total number of filings was 5.3%. The growth of total patent filings is lower than that of other economic indicators. For example, the mean yearly growth rate of the volume of world trade was 7.2% over the same period.
- > Over the past two decades, there has been a significant increase in the share of non-resident patent filings. In 2006, the share of non-resident patent filings accounted for 43.6% of total filings, representing an 8.0 percentage point increase from the 1995 level. Concurrently, the share of resident patent filings decreased from 64.3% to 56.4%.

A.1.2. PATENT FILINGS BY PATENT OFFICE

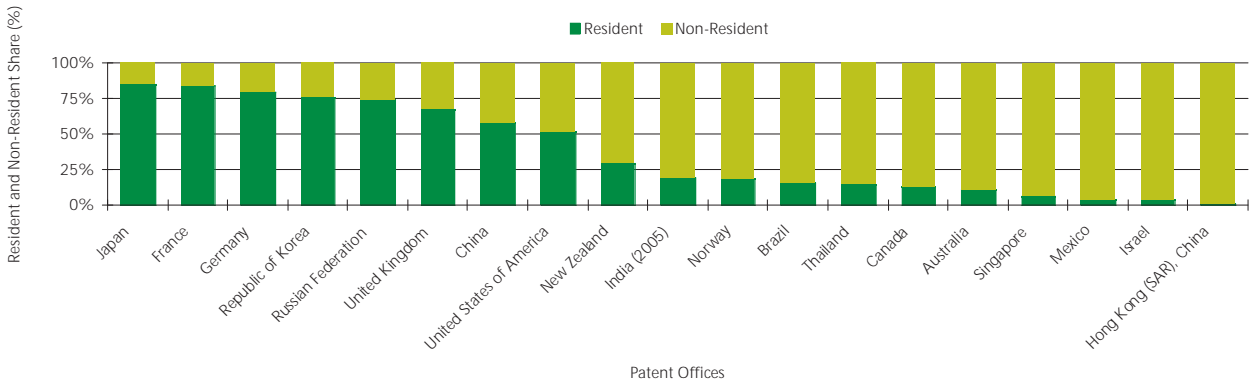
Trends in patent filings at selected patent offices, 1883-2006



Patent filings by patent office: top 20 offices, 2006



Distribution of resident and non-resident patent filings by office, 2006



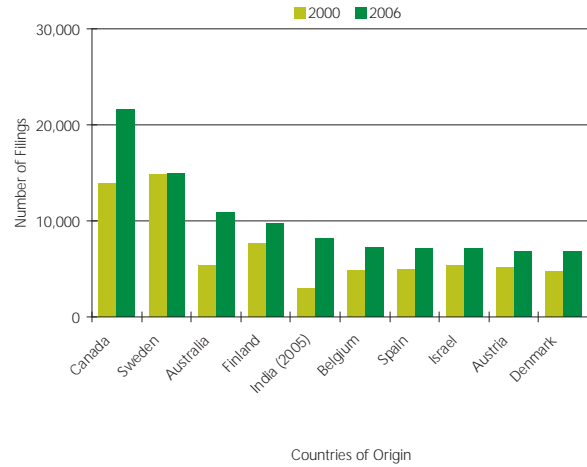
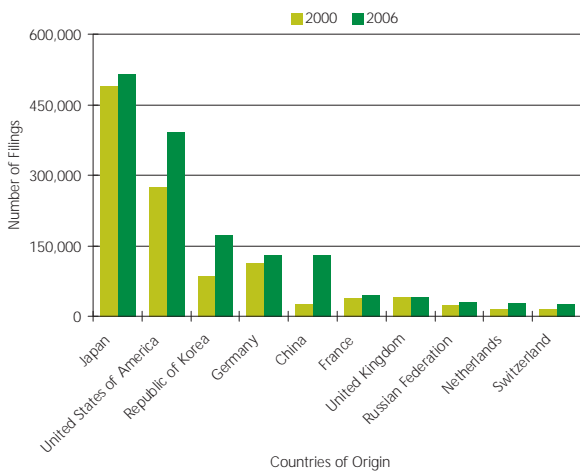
Note: The share of non-resident filings in France is very low which is partly due to the fact that the PCT national phase route is closed for France. A PCT applicant seeking protection in France must therefore enter the PCT regional phase at the EPO.

Source: WIPO Statistics Database

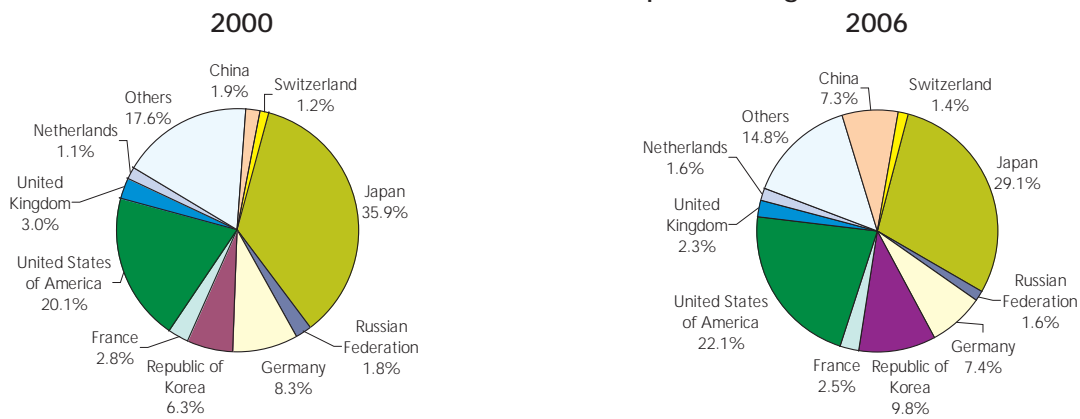
- > Long-term trends of patent filings at selected patent offices show that filings were stable between the early 1880s to mid-1960s, after which there has been a steady increase in filings in most offices. The most notable increases were at the patent offices of the United States of America (USPTO), Japan (JPO), China (SIPO), Republic of Korea (KIPO) and the European Patent Office (EPO).
- > In recent years, there has been a downward trend in filings in France, Germany and the United Kingdom. This is due to the fact that two routes are available for filings in Europe (national route and regional route through the EPO).
- > In 2006, the USPTO received the largest number of filings (425,966), followed by JPO (408,674), SIPO (210,501) and KIPO (166,189). Between 2000 and 2006, filings at SIPO and KIPO increased by 26.3% and 8.5% a year (average annual growth rate), respectively. In contrast, patent filings at the JPO decreased by 0.4% a year.
- > Non-resident filings account for a small share of total filings in Japan (15.1%) and France (15.8%). However, the share of non-resident filings is very high in Mexico (96.3%), Israel and (96.6%) Hong Kong (SAR), China (98.8%).

A.1.3. PATENT FILINGS BY COUNTRY OF ORIGIN

Patent filings by country of origin: top 20 origins, 2006



Share of countries in total patent filings



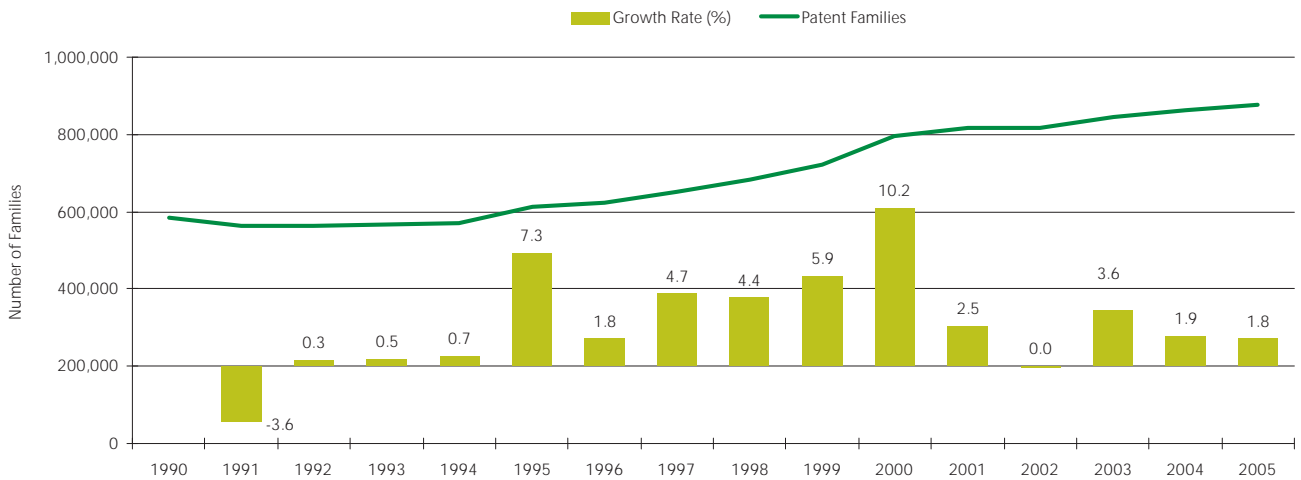
Note: The data includes patent filings in the office of the country of residence as well as patent filings abroad.

Source: WIPO Statistics Database

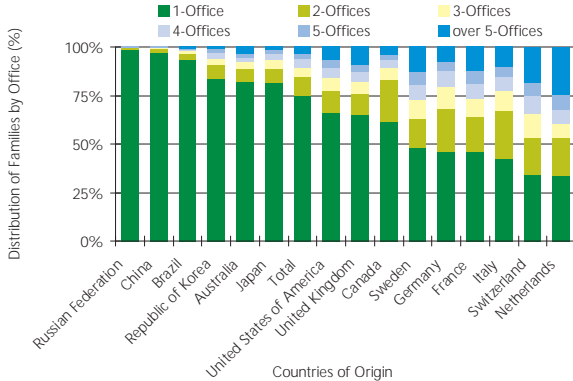
- > In 2006, applicants from Japan (514,047) and the United States of America (390,815) filed the largest numbers of patent applications worldwide. A substantial number of filings also originated from the Republic of Korea (172,709), Germany (130,806) and China (128,850).
- > Between 2000 and 2006, there was a significant increase in the number of filings originating from Australia, China, India and the Republic of Korea. The average annual growth rate for these countries was far above that of all reported European and North American countries. Japan, the United Kingdom and Sweden experienced a modest growth in filings (less than 1% a year).
- > Between 2000 and 2006, Japan's share in total patent filings decreased by 6.7 percentage points. The share of patent filings originating from China, the Republic of Korea and the United States of America increased by 5.4, 3.5 and 2.0 percentage points, respectively. The share of the top 10 countries of origin increased from 82.4% (2000) to 85.2% (2006), reflecting an increasing level of concentration.

A.2.1. PATENT FAMILIES

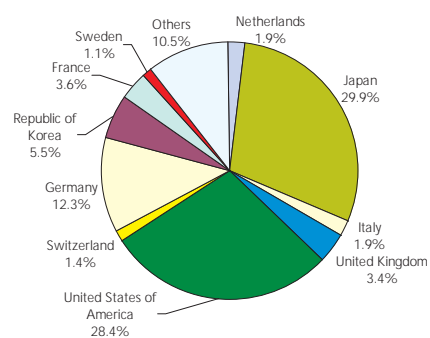
Trends in total patent families, 1990-2005



Distribution of patent family size by country of origin, 2001-2005



Share of countries in total foreign-oriented patent families, 2001-2005



Note: Country share is based on foreign-oriented patent families (i.e. patent families that include at least two patent offices).

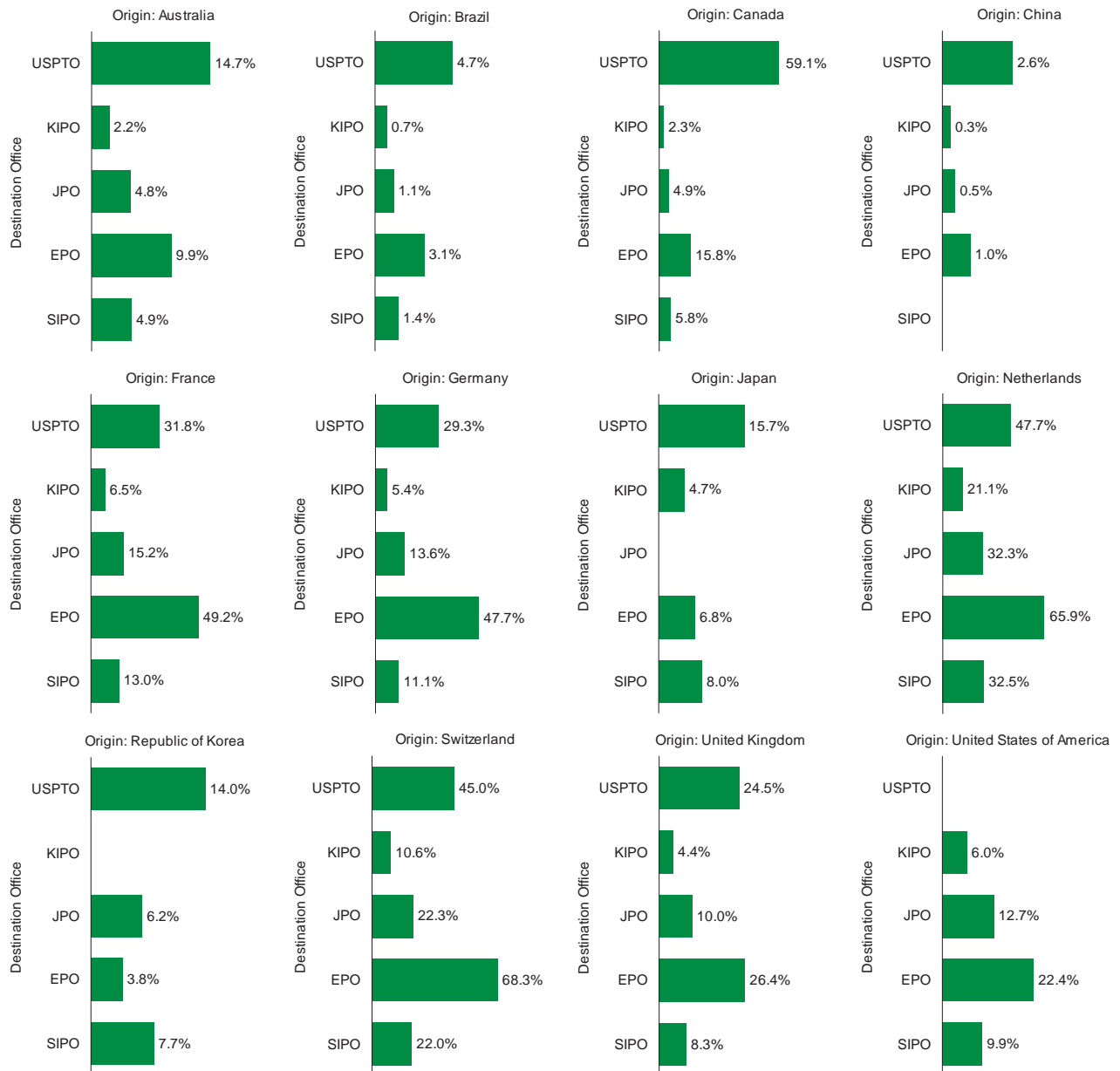
Source: WIPO Statistics Database

- > A patent family is defined as a set of patent applications inter-related by either priority claims or PCT national phase entries, normally containing the same subject matter. Statistics based on patent family data eliminate double counts of patent applications that are filed with multiple offices for the same invention.
- > Many inventions result in filings in multiple offices. Approximately 24% and 10% of all patent families are filed in 2 or more offices and 4 or more offices, respectively.
- > The latest available data show that the total number of patent families created across the world in 2005 amounted to 876,432. Since the mid-1990s, there has been a steady increase in the total number of patent families.
- > The distribution of patent family by size (i.e. number of offices in which applications for the same invention are filed) shows considerable variation. For example, most of the patent families originating from the Russian Federation, China and Brazil are domestic-oriented patent families. A large share of patent families originating from the Netherlands, Switzerland, Italy, France and Germany are foreign-oriented patent families.

- > Japan (29.9%) and the United States of America (28.4%) accounted for the largest share of total foreign-oriented patent families. Although in recent years, there has been an increase in the number of foreign-oriented patent filings originating from Brazil and China, their combined share is less than 1%.
- > Patent families increased at a slower pace than total filings. For example, between 1995 and 2005, patent families increased by 3.6% a year (average annual growth rate), whereas total filings increase by 4.8% a year.

A.2.2. PATENT FAMILIES BY ORIGIN AND DESTINATION

Distribution of patent families by country of origin and destination office:
selected countries of origin, 2001-2005



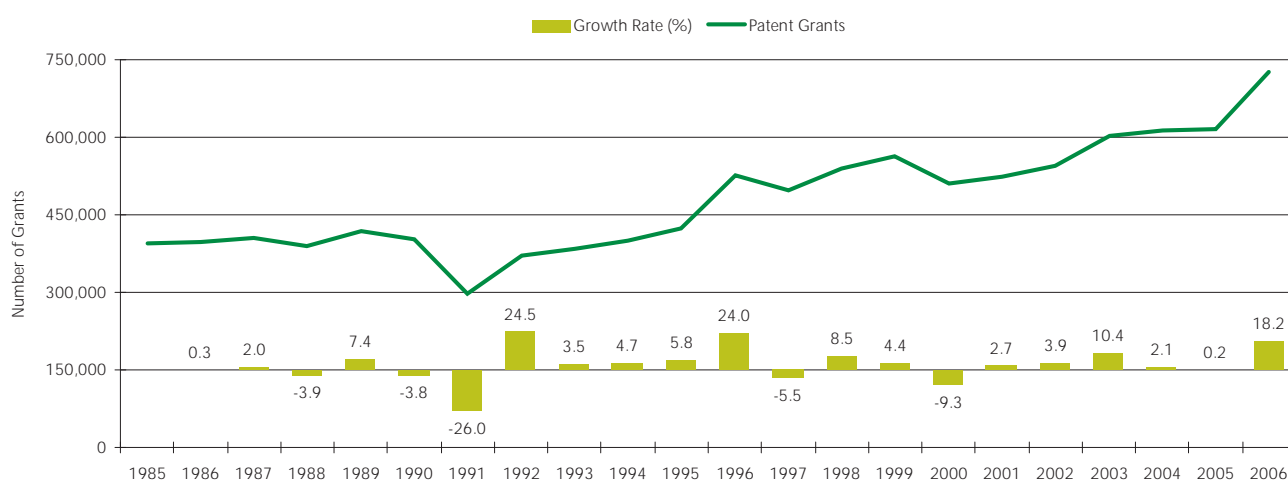
Note: European Patent Office (EPO), Japan Patent Office (JPO), Korean Intellectual Property Office (KIPO), State Intellectual Property Office (SIPO, China) and United States Patent and Trademark Office (USPTO).

Source: WIPO Statistics Database

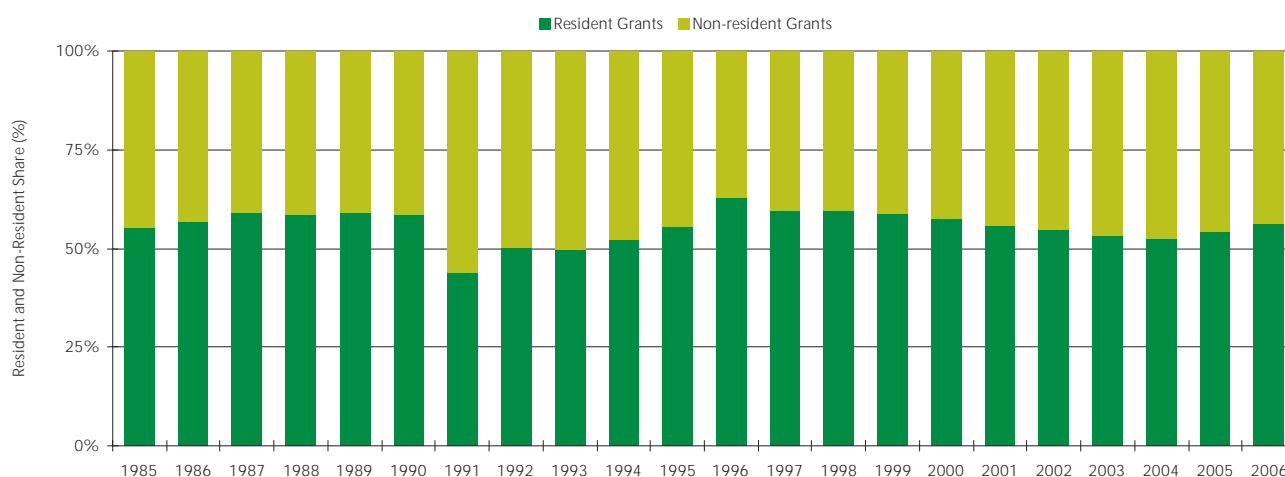
- > The graphs above show a breakdown of patent families by countries of origin (owner of the invention) and destination office (five largest patent offices). It provides some indication of the ownership of the invention and the region where the owner wishes to protect the invention.
- > Although the largest share of patent families originating from Japan and the Republic of Korea contain patent applications filed with the USPTO, a significant proportion of their patent families also contain patent applications filed with the patent office of China (SIPO). A large proportion of patent families originating from Canada (59%) contain patent applications filed with the USPTO, reflecting the impact of the geographical proximity to and the market size of the United States of America. European countries tend to have a high share of patent families containing patent applications filed with the European Patent Office.

A.3.1. TOTAL PATENT GRANTS

Trends in total patent grants, 1985-2006



Distribution of total patent grants by resident and non-resident, 1985-2006

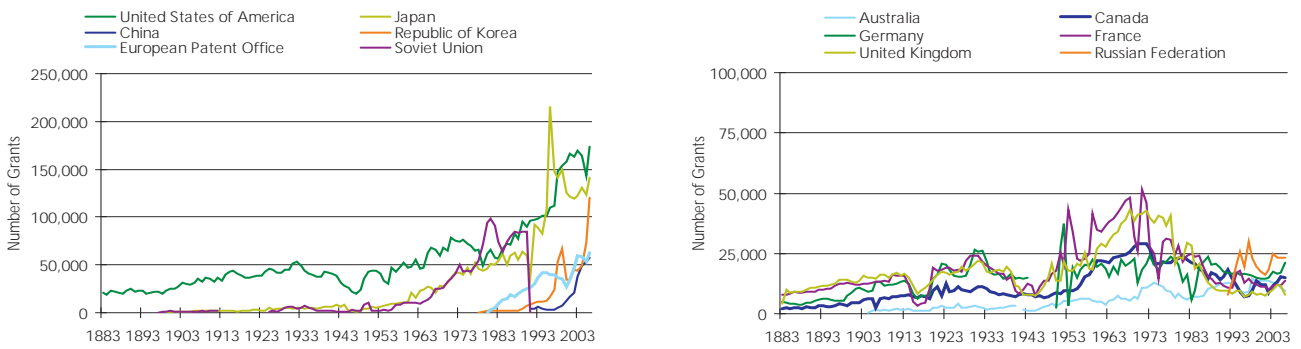


Source: WIPO Statistics Database

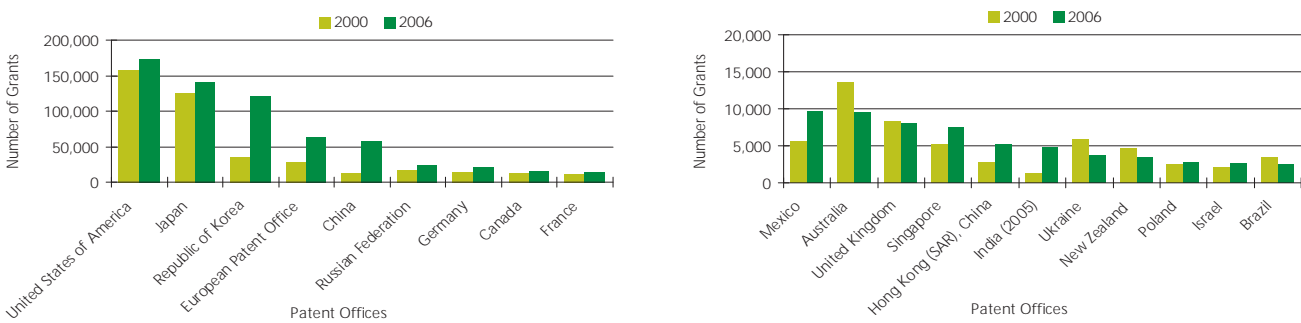
- > In 2006, approximately 727,000 patents were granted by patent offices around the world, representing an 18.2% increase from the previous year. The increase could be due to increasing efforts by patent offices to reduce backlog and the substantial increase in the number of patents granted by the patent offices of China and the Republic of Korea (see A.3.2).
- > Since 1991, there has been an upward trend in the number of grants, similar to the trend observed for the number of patent filings (see A.1.1). However, the trend in patent grants is more volatile than patent filings. The number of patents granted by patent offices depends on resources available to the offices (e.g. number of examiners, IT infrastructures, etc.)
- > The share of non-resident patent grants has remained more or less stable over the past six years. This is in contrast to the trend observed for patent filings, which shows an increase in the share of non-resident filings (see A.1.1).

A.3.2. TOTAL PATENT GRANTS BY PATENT OFFICE

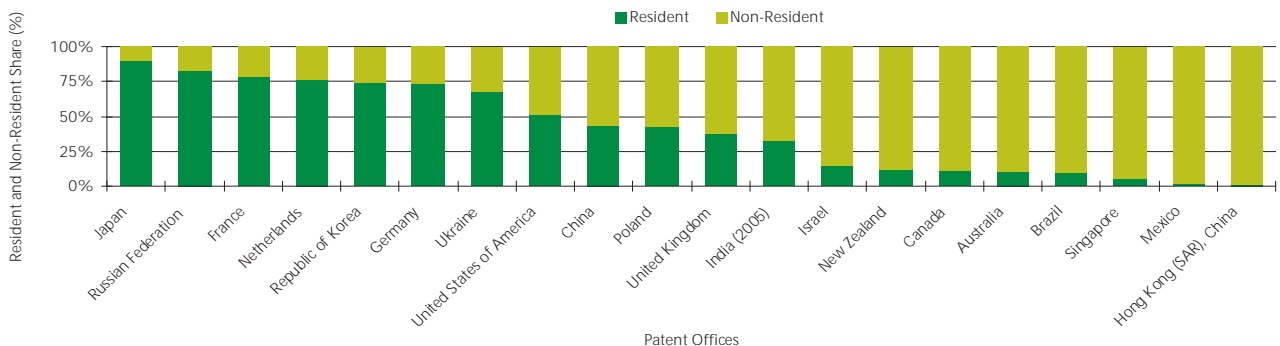
Trends in patent grants at selected patent offices, 1883-2006



Patent grants by patent office: top 20 offices, 2006



Distribution of resident and non-resident patent grants by office, 2006

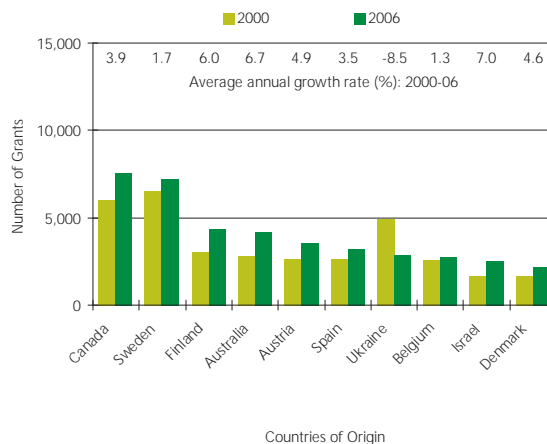
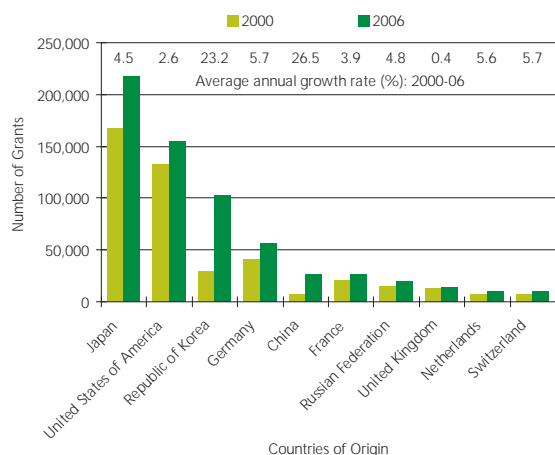


Source: WIPO Statistics Database

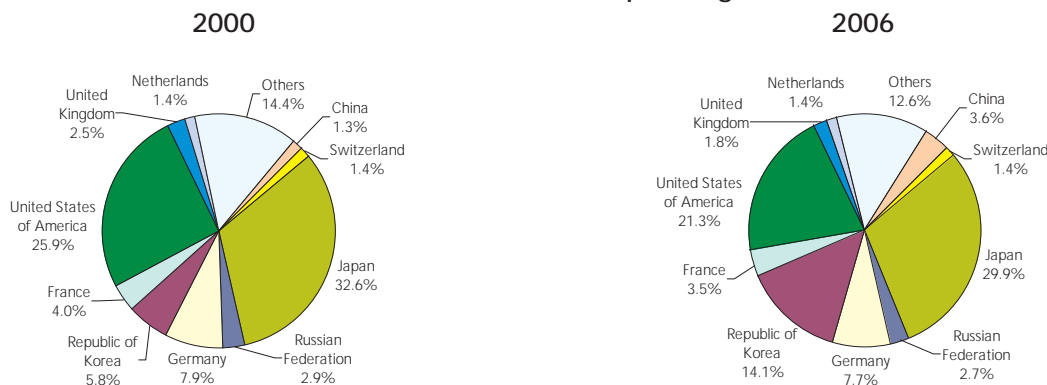
- > The long-term trends of patent grants by the five largest patent offices show that the number of patent grants was stable for the period of 1880-1950 followed by an upward trend between the early/mid-1960s and the early 1990s, and the rate of increase accelerated from the mid-1980s.
- > The numbers of patents granted by the patent offices of France, Germany and the United Kingdom have been decreasing over the past 15 years. This is due to the existence of two parallel routes for obtaining patent protection in these countries (the national route and the regional route through the EPO).
- > In 2006, the five largest patent offices (patent offices of the United States of America, Japan, the Republic of Korea, China and the European Patent Office) accounted for approximately 76.5% of the total patent grants, representing a 6.3 percentage point increase from the 2000 level.
- > The share of non-resident grants (in total grants) varies across patent offices, ranging from 99% in Hong Kong (SAR), China to 10.3% in Japan. It is also very high in Mexico and Singapore. In contrast, the non-resident grant share is very low in Japan and the Russian Federation.

A.3.3. TOTAL PATENT GRANTS BY COUNTRY OF ORIGIN

Patent grants by country of origin: top 20 origins, 2006



Share of countries in total patent grants

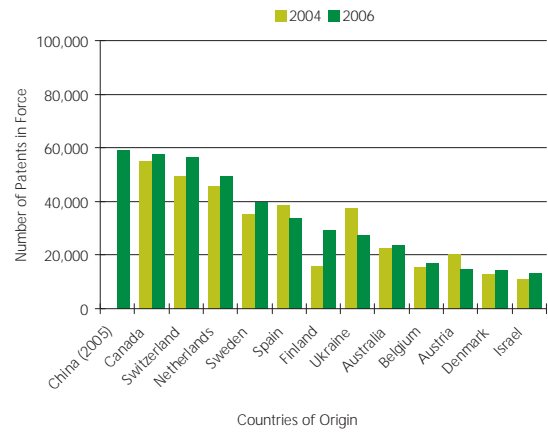
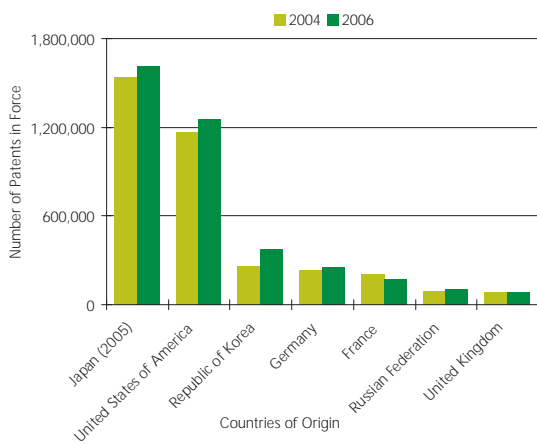


Source: WIPO Statistics Database

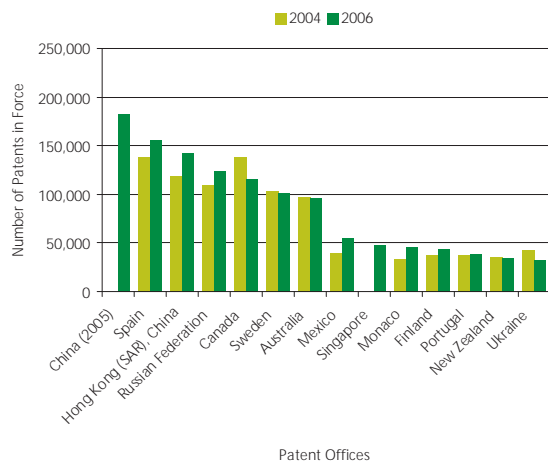
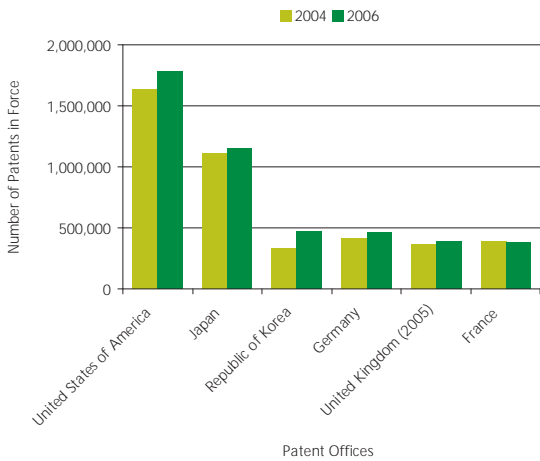
- > In 2006, applicants from Japan received approximately 217,000 patents. Applicants from the United States of America and the Republic of Korea also received a substantial number of patents. Between 2000 and 2006, the number of patents granted to applicants from China and the Republic of Korea grew significantly. All the reported countries, except Ukraine, experienced an increase in the number of grants.
- > In 2006, residents of Japan (29.9%) and the United States of America (21.3%) accounted for the largest share of world patent grants. However, their combined share of total grants decreased from 58.6% to 51.2% between 2000 and 2006. The share of patents granted to applicants from the top 10 countries of origin has increased from 85.6% to 87.4%, reflecting a slight increase in the concentration level. A similar trend is observed for patent filings (see A.1.3)

A.4.1. PATENTS IN FORCE

Patents in force by country of origin, 2006



Patents in force by patent office, 2006



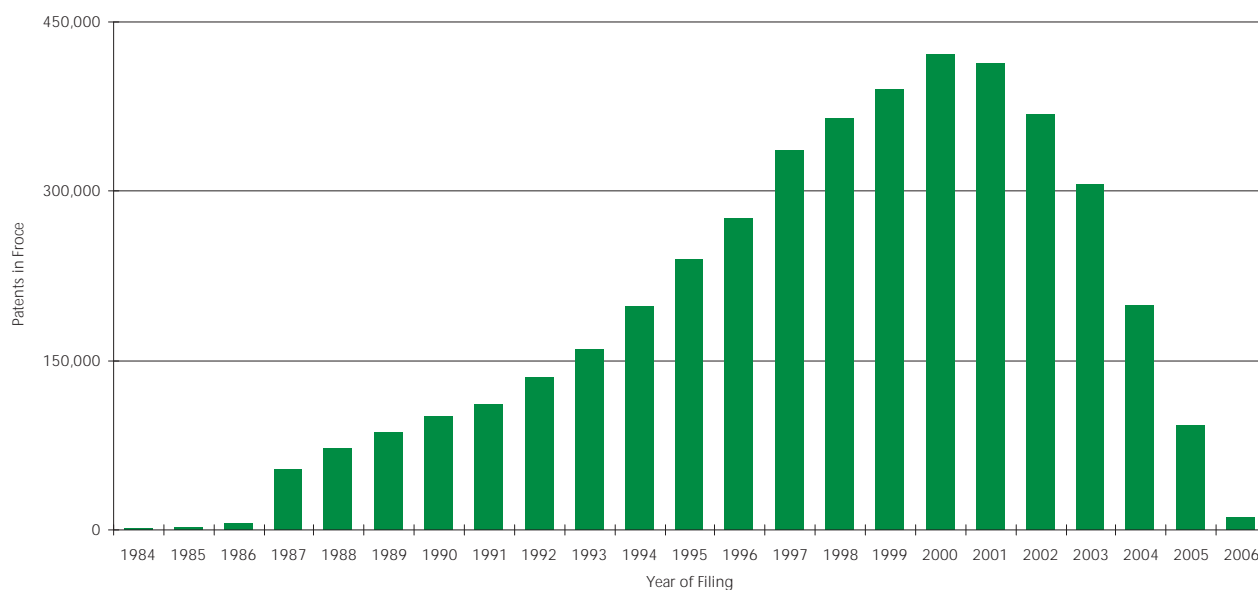
Note: The number of patents in force by country of origin is underestimated because approximately 0.5 million patents in force are of unknown origin.

Source: WIPO Statistics Database

- > In 2006, the total number of patents in force across the world is estimated to be around 6.1 million.
- > Applicants from Japan (approximately 1.6 million) and the United States of America (approximately 1.2 million) own the majority of patents that were in force in 2006.
- > For all countries, except Austria, France, Spain and Ukraine, the number of patents in force in 2006 is higher than the 2004 level.
- > The largest number of patents in force is in the United States of America (approximately 1.8 million).
- > France, Switzerland and the Netherlands rank higher in terms of the number of patents in force by country of origin than by patent office. In contrast, Hong Kong (SAR), China, and Mexico rank higher in terms of patents in force by patent office. This reflects the presence of a large number of foreign applicants in their respective domestic markets (see A.3.2)

A.4.2. AGE PROFILE OF PATENTS IN FORCE

Number of patents in force by year of filing, 2006



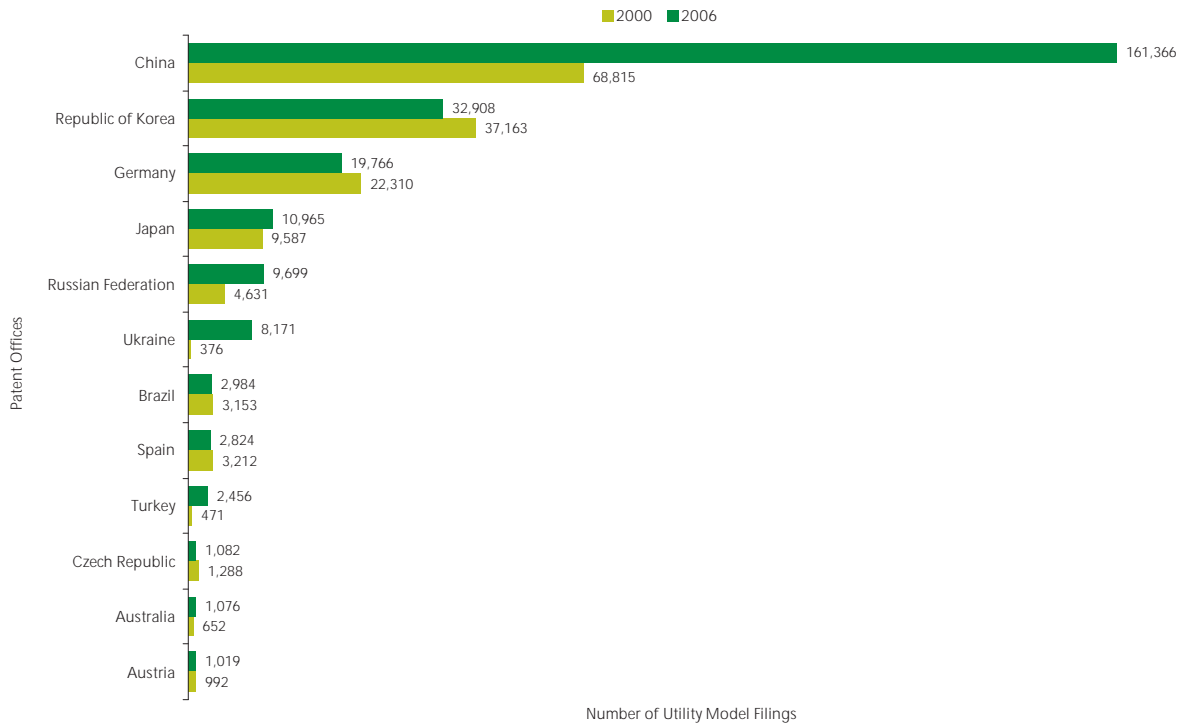
Note: The above graph does not include data for the Japan Patent Office and the State Intellectual Property Office of China.

Source: WIPO Statistics Database

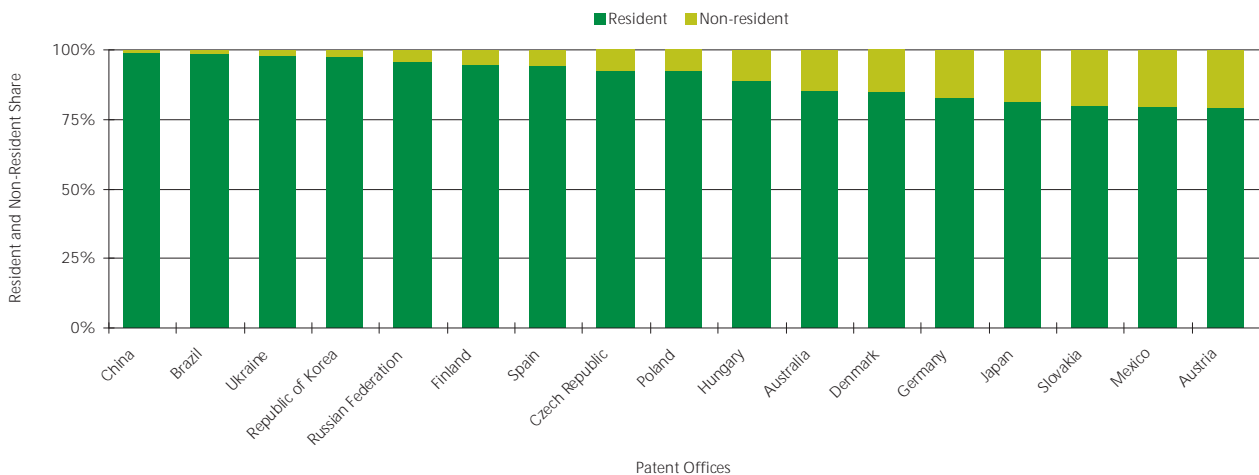
- > Patent rights are conferred to the applicant (inventor) for a limited period, generally 20 years. The patent holder has to pay maintenance / renewal fees at specific intervals to the patent office to keep the patent in force. For example, maintenance fees for patents granted by the United States Patent and Trademark Office are due at 3.5 years, 7.5 years and 11.5 years. The time interval for paying maintenance fees varies between patent offices.
- > More than half of the patents in force in 2006 were filed during the period between 1997 and 2003. A minority of patents are maintained for the full term of 20 years from filing.

A.5.1. UTILITY MODEL FILINGS

Utility model filings by patent office: selected offices, 2006



Distribution of utility model filings by resident and non-resident and by patent office, 2006

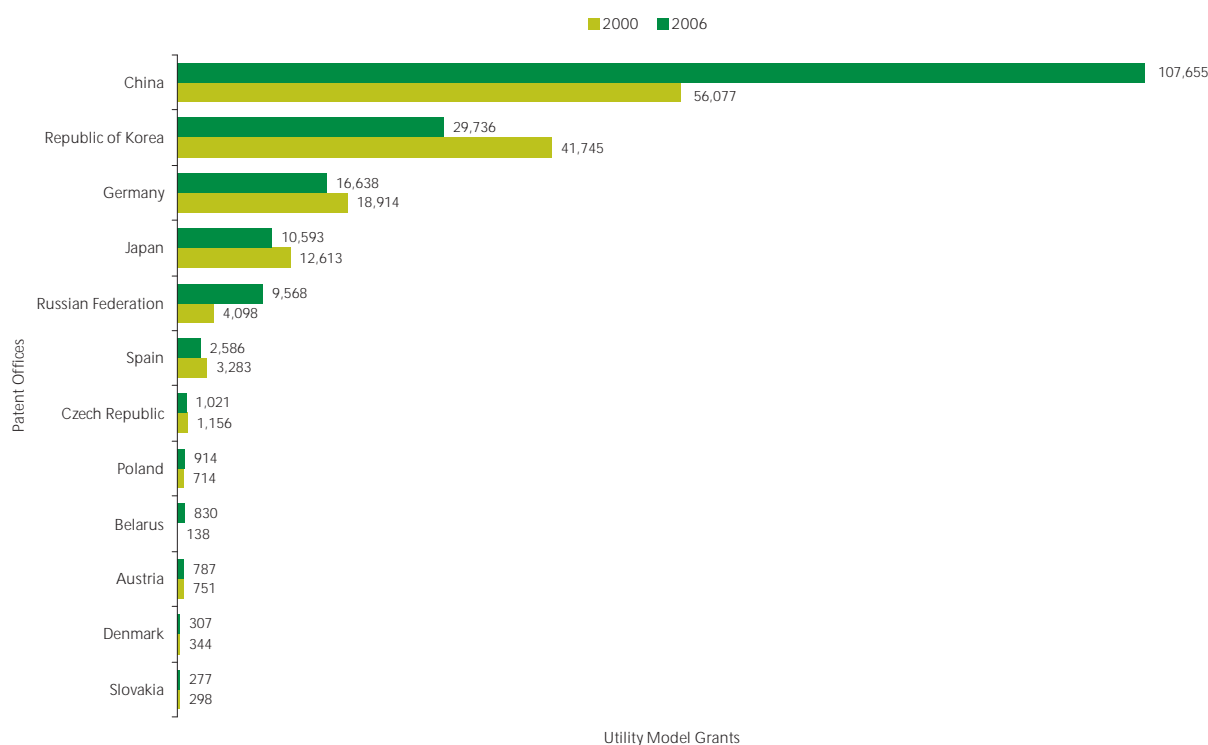


Source: WIPO Statistics Database

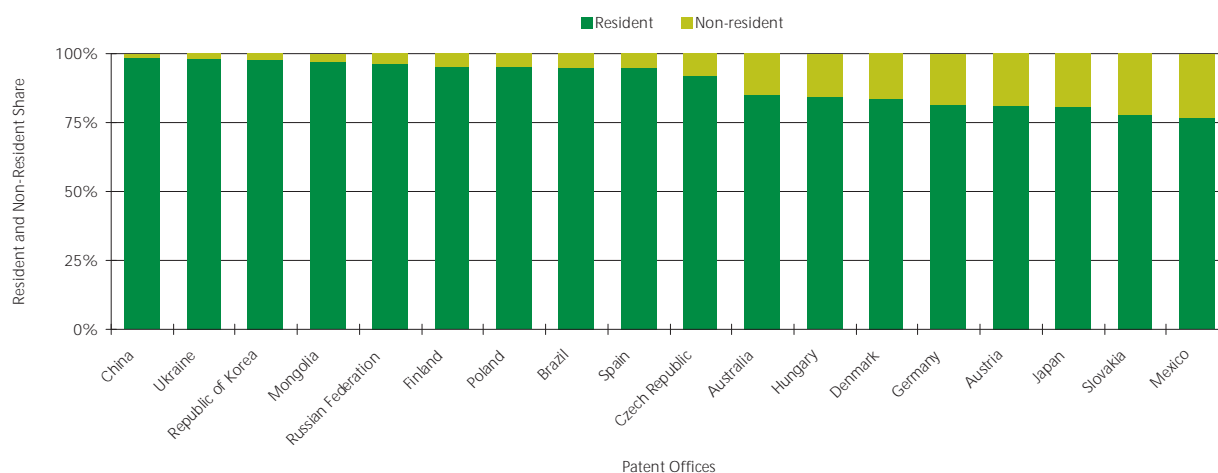
- > Utility models are a special form of IP rights for inventions granted by a State to an inventor or his assignee for a fixed period of time. The terms and conditions of granting a utility model are different from that for normal patents (e.g. shorter term and less stringent examination requirements). Utility models are an important alternative to patents in the countries where they are available.
- > In 2006, the Chinese patent office received 161,366 utility model filings. The patent offices of the Republic of Korea and Germany also received large numbers of filings. Between 2000 and 2006, there was a substantial increase in filings at the patent offices of China, the Russian Federation, Ukraine and Turkey.
- > In 2006, the share of non-resident filings varied from 0.8% in China to 20.9% in Austria. Non-resident filings accounted for a small fraction of total filings at the patent offices of Brazil, Ukraine, the Republic of Korea and the Russian Federation (less than 5%). The share of non-resident utility model filings is below that of non-resident patent filings (see A.1.2). This indicates that utility models are mostly used for protecting inventions in the domestic market.

A.5.2. UTILITY MODEL GRANTS

Utility model grants by patent office, 2006



Distribution of utility model grants by resident and non-resident and by patent office, 2006

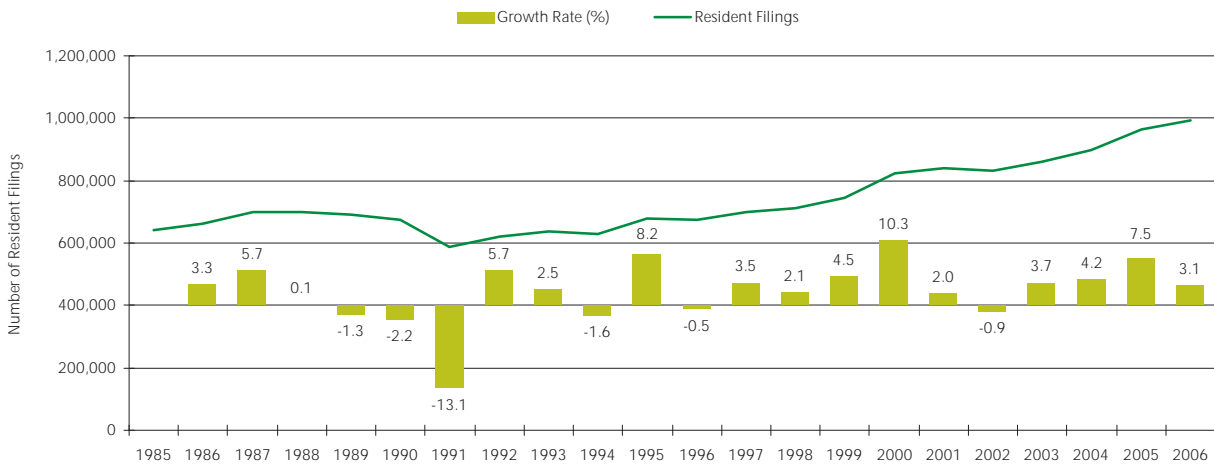


Source: WIPO Statistics Database

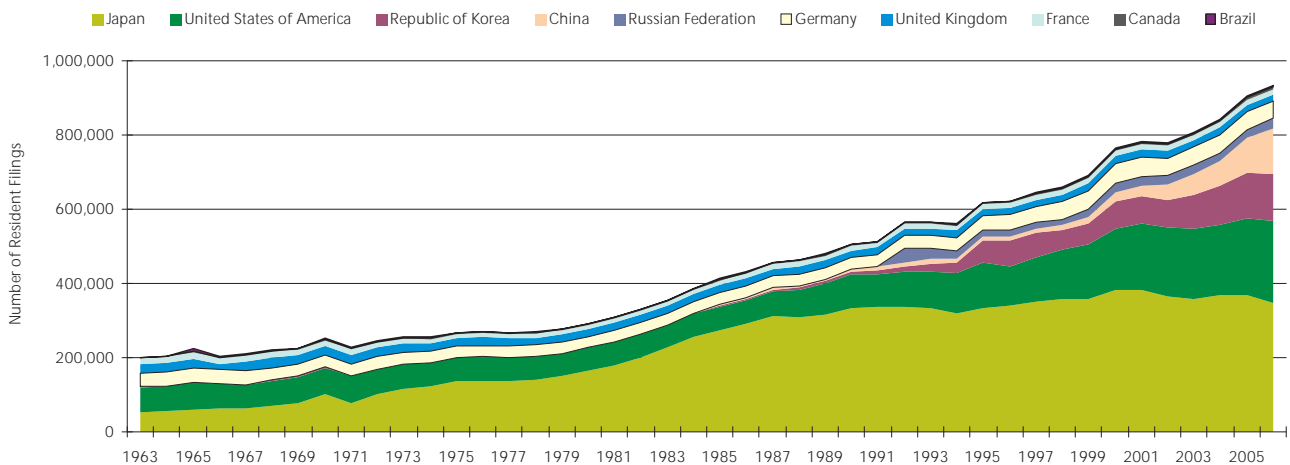
- > In 2006, the number of utility model grants at the Chinese patent office was 107,655. The patent offices of the Republic of Korea (29,736), Germany (16,638), Japan (10,593) and Russian Federation (9,568) also issued large numbers of utility models. Between 2000 and 2006, there was a substantial increase in the number of grants at the Chinese and Russian patent offices. In contrast, there was a decrease in the number of grants at the patent offices of Germany, Japan and the Republic of Korea.
- > The share of non-resident grants varied from 1.2% in China to 22.9% in Mexico. The share of non-resident grants is high at the patent offices of Mexico, Slovakia, Japan and Austria, while it is very low at the patent offices of China, Ukraine, the Republic of Korea, Mongolia and the Russian Federation.

B.1.1. RESIDENT PATENT FILINGS

Trends in total resident patent filings, 1985-2006



Trends in resident patent filings by patent office: top 10 offices, 1963-2006



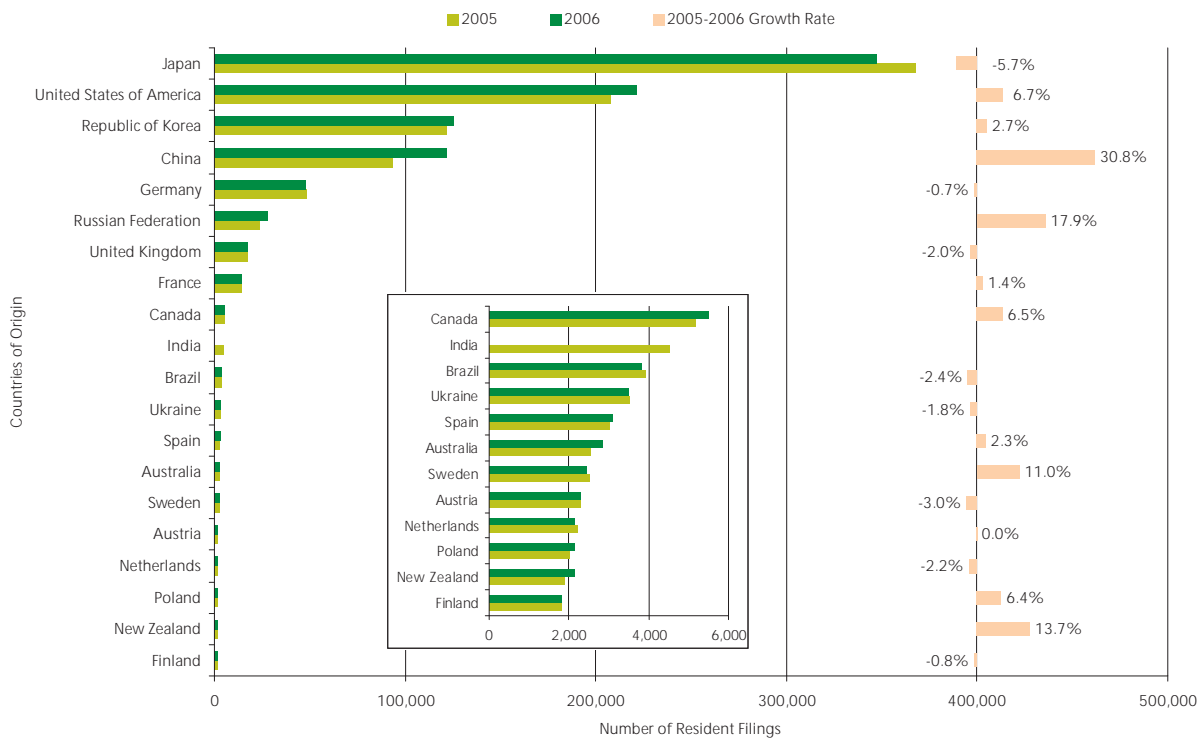
Note: Patent filings at the European Patent Office are considered to be non-resident filings and they are often preceded by a filing at a national patent office (see C.1.1).

Source: WIPO Statistics Database

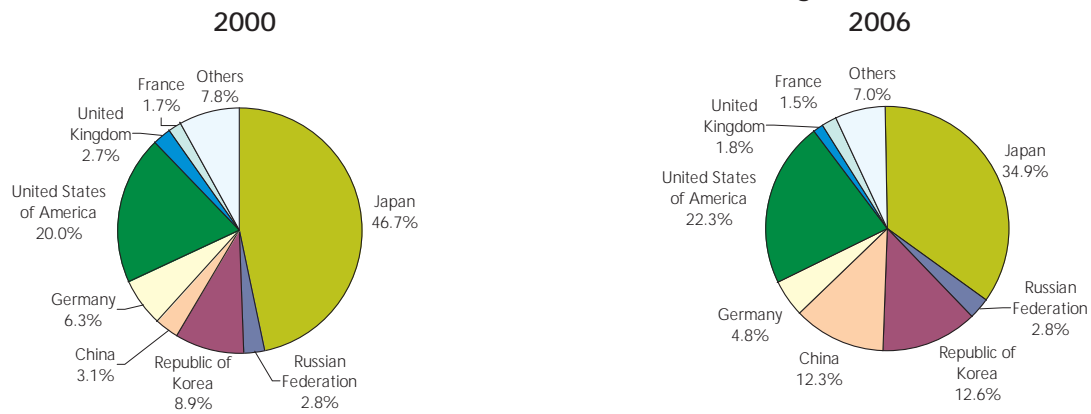
- > In 2006, the total number of resident patent filings is estimated to be around 994,525, representing a 3.1% increase from the previous year.
- > Since the mid-1990s, resident patent filings have followed an upward trend, with a high growth rate between 1997-2000 and 2003-2006. A notable decrease in filings occurred in 1990-1991.
- > In 2006, the top ten patent offices received approximately 94% of the total resident patent filings. Over the past 10 years, resident filings in France, Germany, Japan and the United Kingdom have remained relatively stable. In contrast, filings in China, the Republic of Korea, and the United States of America increased significantly.

B.1.2. RESIDENT PATENT FILINGS BY COUNTRY OF ORIGIN

Resident patent filings: top 20 origins, 2006



Share of countries in total resident filings

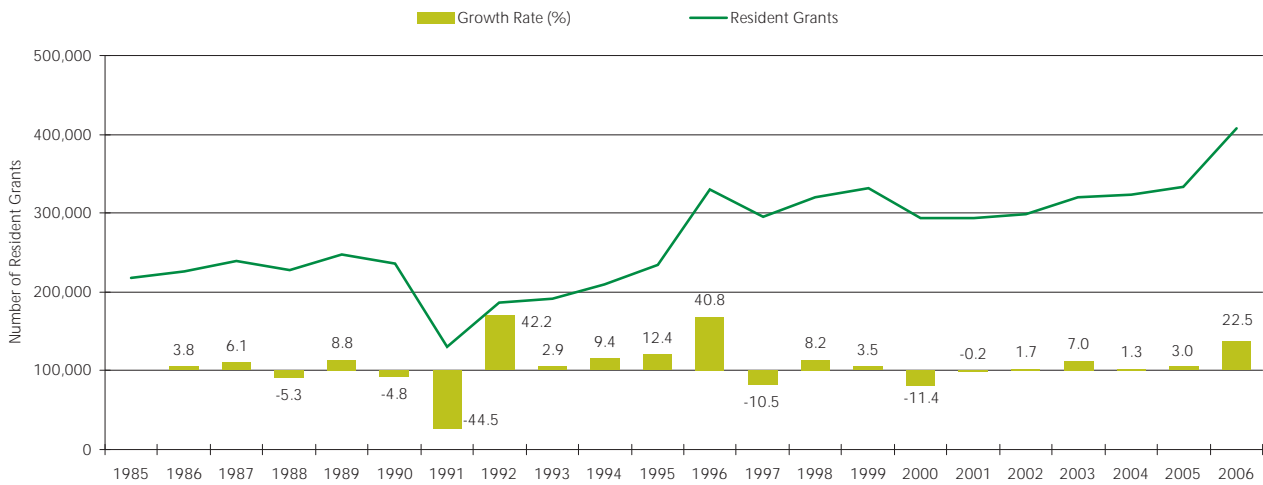


Source: WIPO Statistics Database

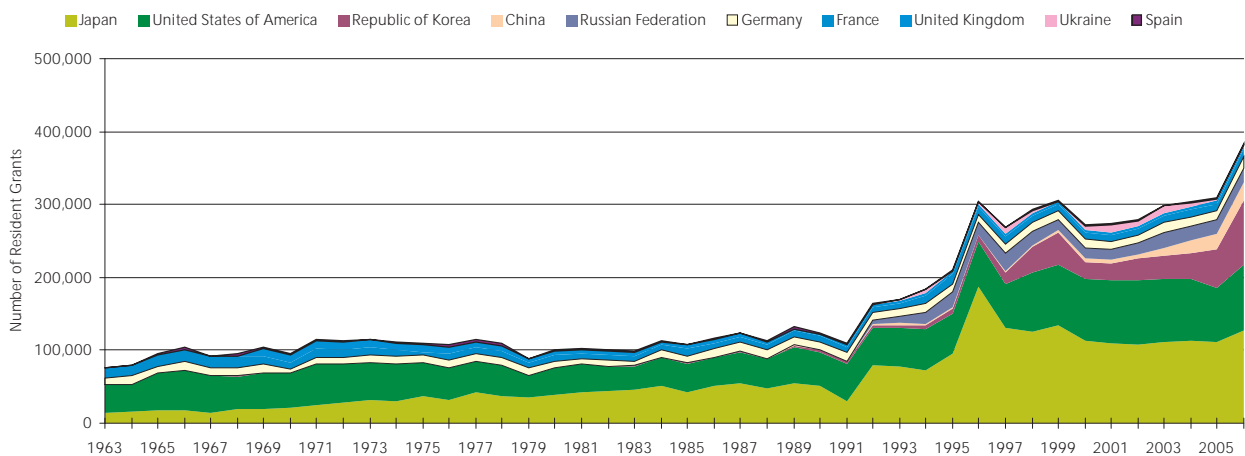
- > In 2006, Japan had the largest number of resident patent filings (347,060), followed by the United States of America (221,784), the Republic of Korea (125,476) and China (122,318). For the majority of the reported countries, the number of filings in 2006 is higher than the 2005 level. The most notable increase in filings occurred in China and the Russian Federation, whereas Japan experienced the decrease.
- > Although Japan had the largest share of resident filings in 2006, its share decreased by 11.8 percentage points during the 2000-2006 period. China, on the other hand, had increased its share by 9.2 percentage points.
- > European countries' share is, to a certain extent, underestimated because residents of European countries may also file applications directly at the European Patent Office which are considered as non-resident filings in this report.

B.2.1. RESIDENT PATENT GRANTS

Trends in total resident patent grants, 1985-2006



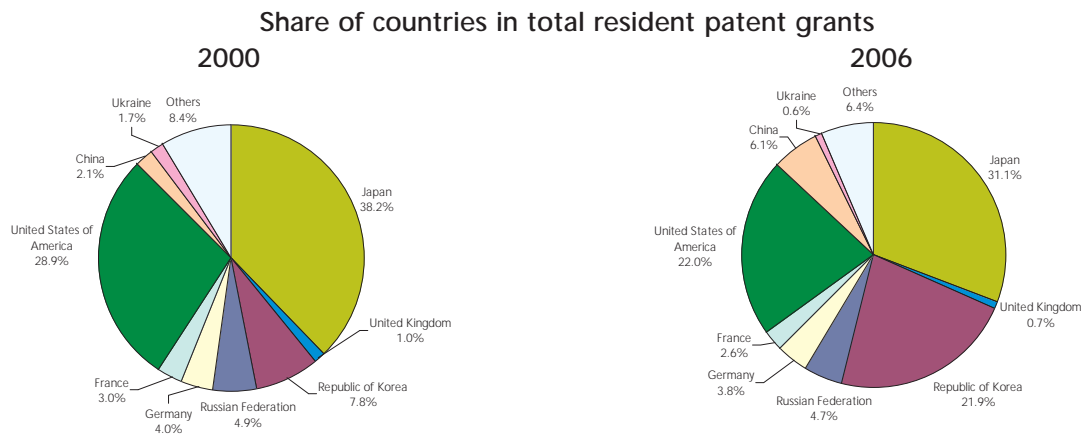
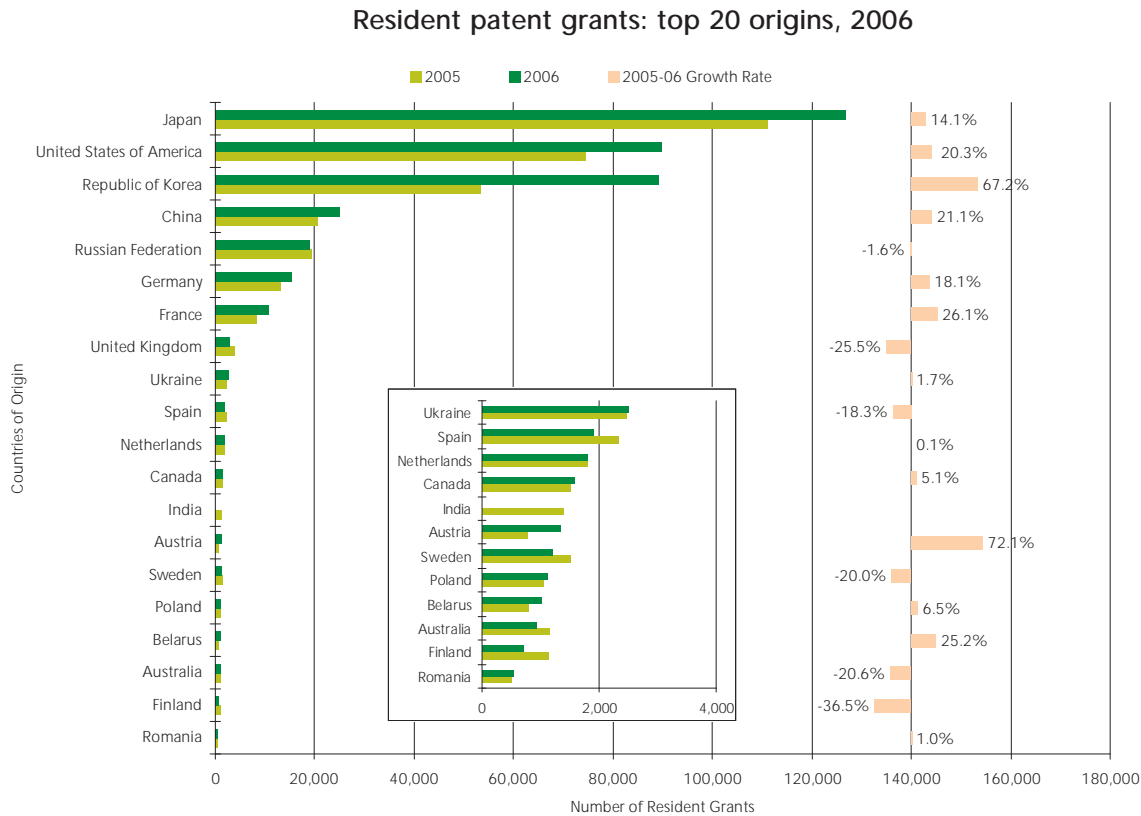
Trends in resident patent grants by patent office: top 10 offices, 1963-2006



Source: WIPO Statistics Database

- > The total number of resident patent grants was stable during the 1985-1990 period (on average 232,000 grants a year), followed by a steady increase during the 1991-1996 period and a stable growth rate between 1998 and 2004. In 2006, around 407,864 resident patents were granted around the world, representing a 22.5% increase from the previous year.
- > The trend in patent grants is much more volatile than the trends in patent filings because the processing of patent applications depends on the resources available to patent offices (e.g. number of examiners, IT infrastructure, etc.).
- > The number of patents granted by the top ten patent offices was stable from 1963 to 1990, after which there has been a steady increase in the number of patent grants.
- > In 2006, the top five patent offices (patent offices of Japan, the United States of America, the Republic of Korea, China and the Russian Federation) accounted for 85.8% of total resident patent grants. Between 2000 and 2006, the share of patents granted by those five offices increased by 3.9 percentage points.

B.2.2. RESIDENT PATENT GRANTS BY COUNTRY OF ORIGIN

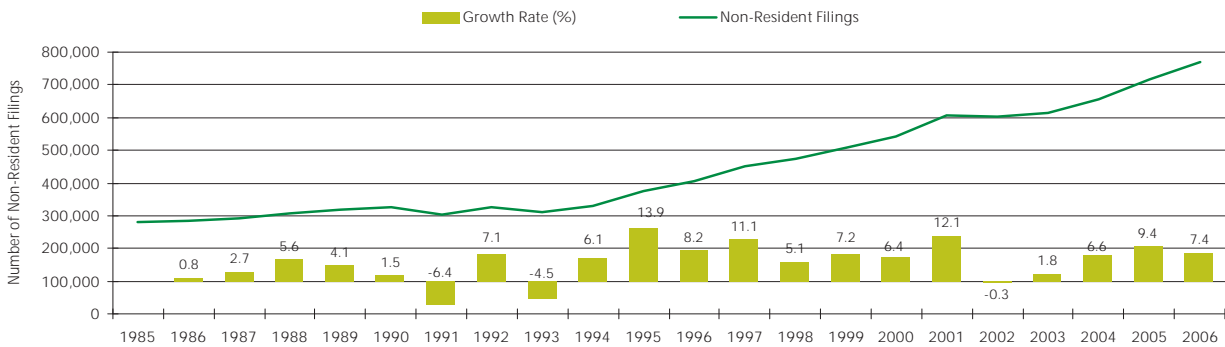


Source: WIPO Statistics Database

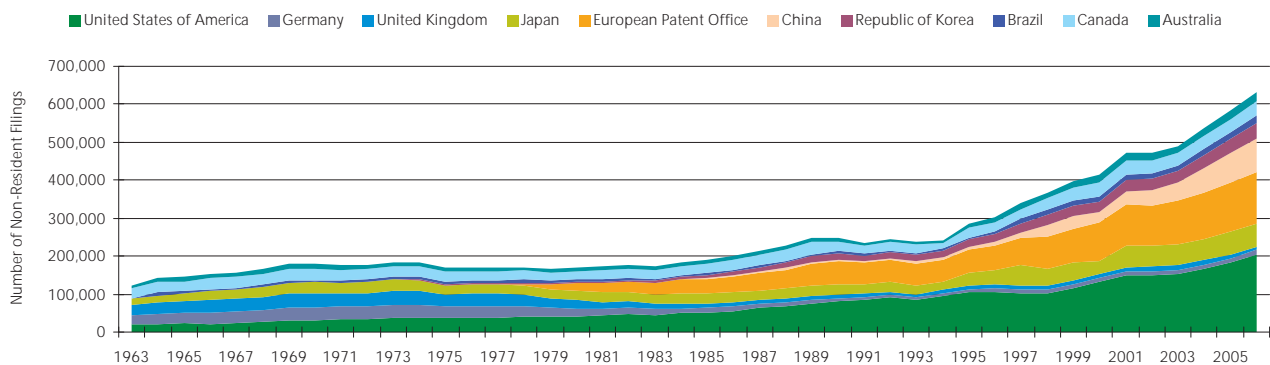
- > In 2006, Japanese residents (126,804) received the largest number of patents. The number of patents granted to residents of the United States of America was similar to that of the Republic of Korea (around 90,000). Between 2005 and 2006 there was a significant increase in the number of resident grants for Austria and the Republic of Korea, whereas Finland, the United Kingdom, Australia and Sweden experienced a considerable decrease.
- > Between 2000 and 2006, the share of resident patent grants of Japan and the United States of America decreased by 7.1 and 6.9 percentage points, respectively, while that of the Republic of Korea increased by 14.1 percentage points.
- > To a certain extent, the share for the European countries is underestimated, because patents granted by the European Patent Office are considered as non-resident grants.

C.1.1. NON-RESIDENT PATENT FILINGS

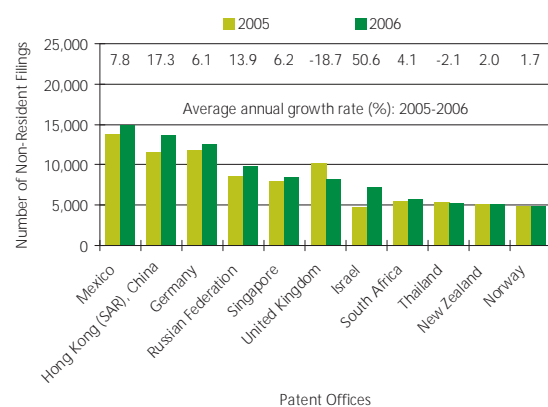
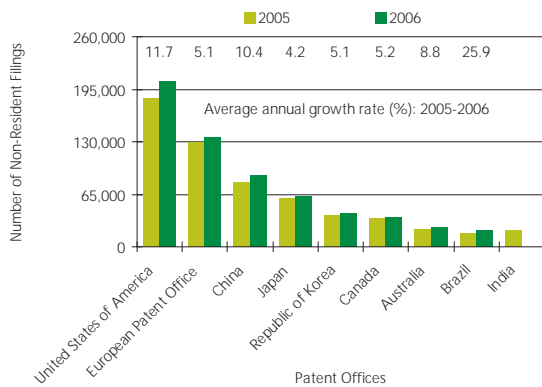
Trends in total non-resident patent filings, 1985-2006



Trends in non-resident patent filings by patent office, 1963-2006



Non-resident patent filings by patent office: top 20 offices, 2006

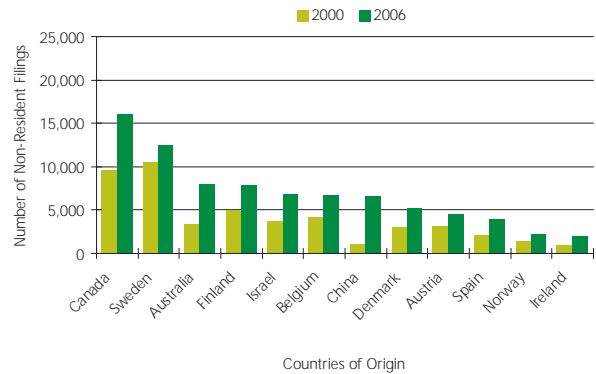
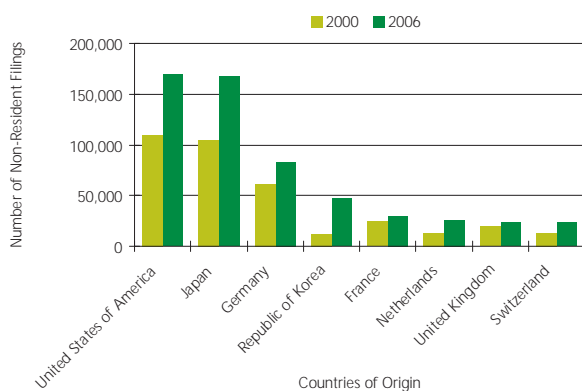


Source: WIPO Statistics Database

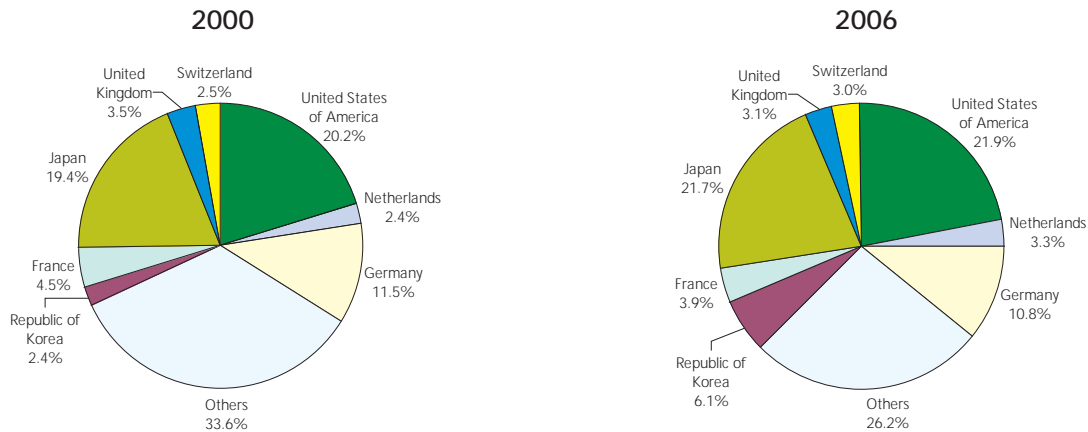
- > The total number of non-resident filings increased at a steady pace during the period of 1985-1994, after which there has been a faster increase in filings. Between 1994 and 2006, non-resident filings grew by 7.3% a year (average annual growth rate).
- > In 2006, the total number of non-resident filings is estimated to be around 770,109, representing a 7.4% increase from the previous year. For the most recent years, the growth rate of non-resident filings has been higher than the growth rate of resident patent filings (see B1.1).
- > In 2006, the patent office of the United States of America received in excess of 200,000 non-resident filings, which is significantly higher than other offices.
- > For all the reported patent offices, except Thailand and the United Kingdom, the number of non-resident filings in 2006 is higher than the 2005 level. The most notable increase in non-resident filings occurred in Israel, Brazil and Hong Kong (SAR), China.

C.1.2. NON-RESIDENT PATENT FILINGS BY COUNTRY OF ORIGIN

Non-resident patent filings by country of origin: top 20 origins, 2006



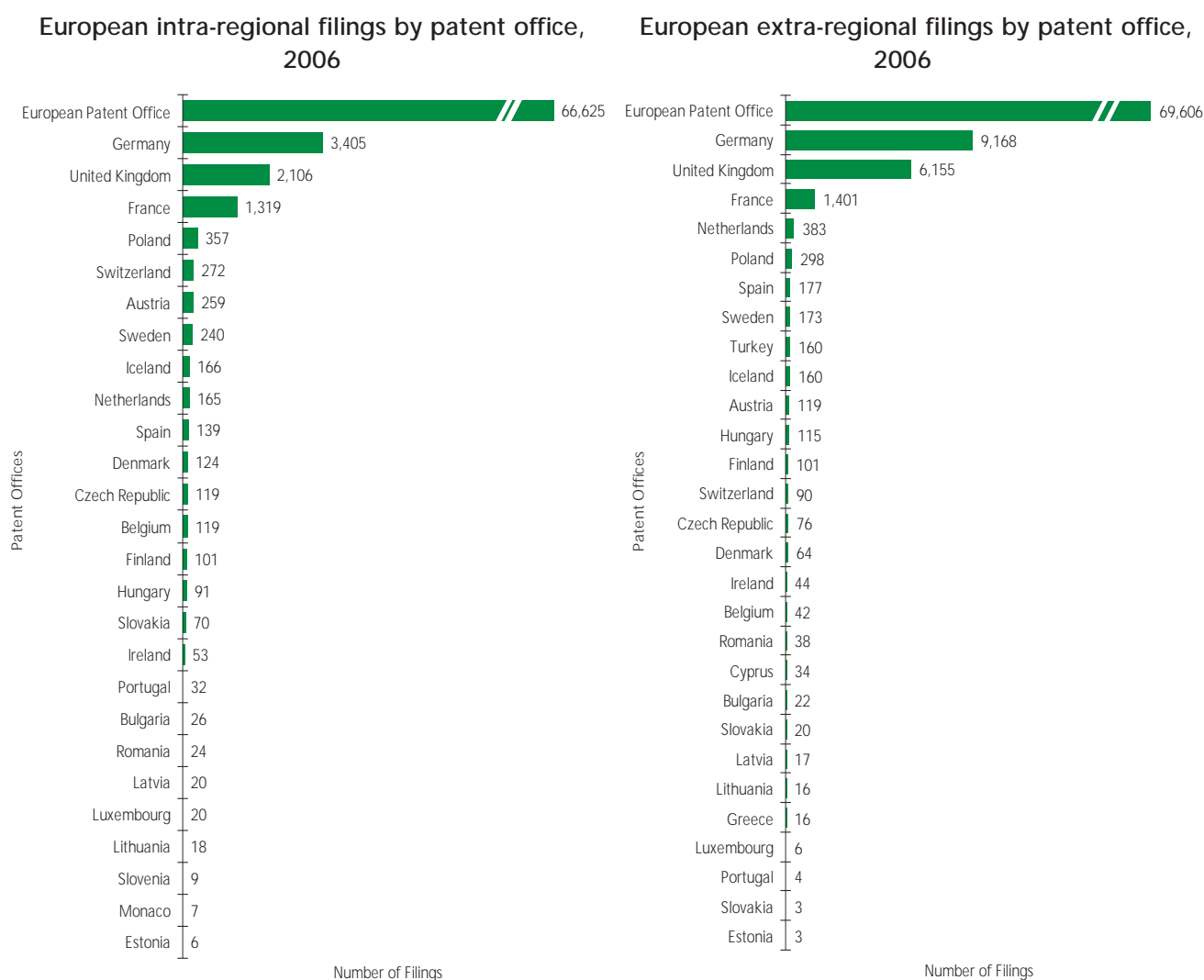
Share of countries in total non-resident filings



Source: WIPO Statistics Database

- > In 2006, the largest number of non-resident patent filings originated from the United States of America (169,031) and Japan (166,987). Applicants from Norway, India, Spain and Austria, on the other hand, filed fewer than 5,000 applications each.
- > China accounted for a low number of non-resident filings in 2006. However, the number of filings originating from China has increased at a rapid pace. The average annual growth rate was in excess of 30% during the period of 2000-2006.
- > Between 2000 and 2006, the Republic of Korea and Japan had the largest increase in the country share of non-resident filings. The combined share of the top eight countries increased from 66.4% in 2000 to 73.8% in 2006, reflecting an increasing level of concentration.

C.1.3. EUROPEAN REGIONAL FILINGS BY OFFICE

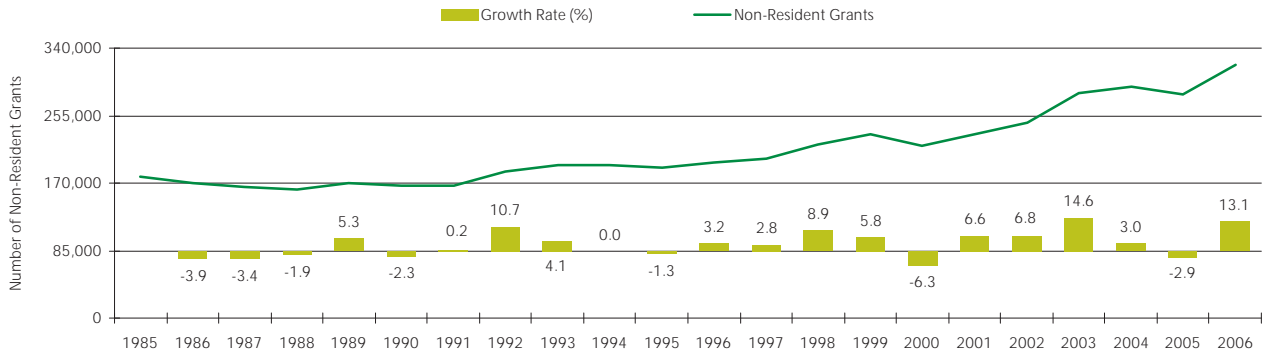


Source: WIPO Statistics Database

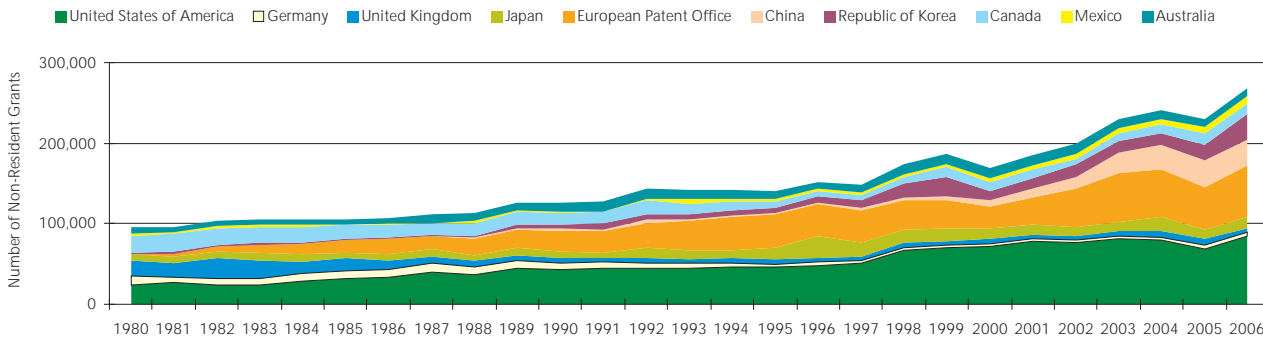
- > There are two options for applicants seeking patent protection in the European region, direct filing with an European national office, or filing at the European Patent Office.
- > The intra-regional indicator shows the patent filing activity of residents of EPC (European Patent Convention) countries by patent office. The European Patent Office (EPO) accounted for the bulk of EPC countries' intra-regional patent filings (87.6%). When seeking patent protection in other EPC countries, applicants prefer to file at the EPO rather than at the national patent offices.
- > The extra-regional indicator shows the patent filing activity of non-EPC applicants by patent office. The trend for the extra-regional filings is similar to that of the intra-regional filings. The EPO accounted for the majority of filings (78.6%) originating from non-EPC residents who intend to protect their inventions in the EPC region. However, the EPO has a lower share of extra-regional filings than intra-regional filings. The patent offices of Germany and the United Kingdom have a higher share of extra-regional filings than intra-regional filings.

C.2.1. NON-RESIDENT PATENT GRANTS

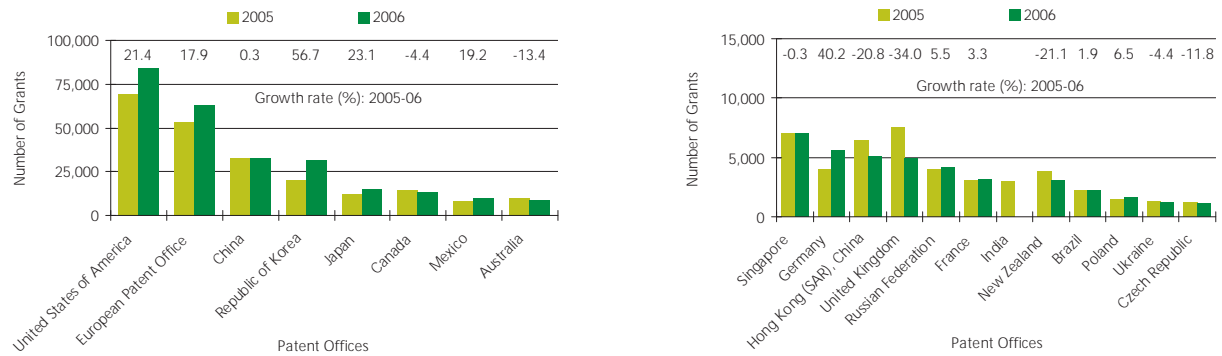
Trends in total non-resident patent grants, 1985-2006



Trends in non-resident patent grants by patent office, 1980-2006



Non-resident patent grants by patent office: top 20 offices, 2006

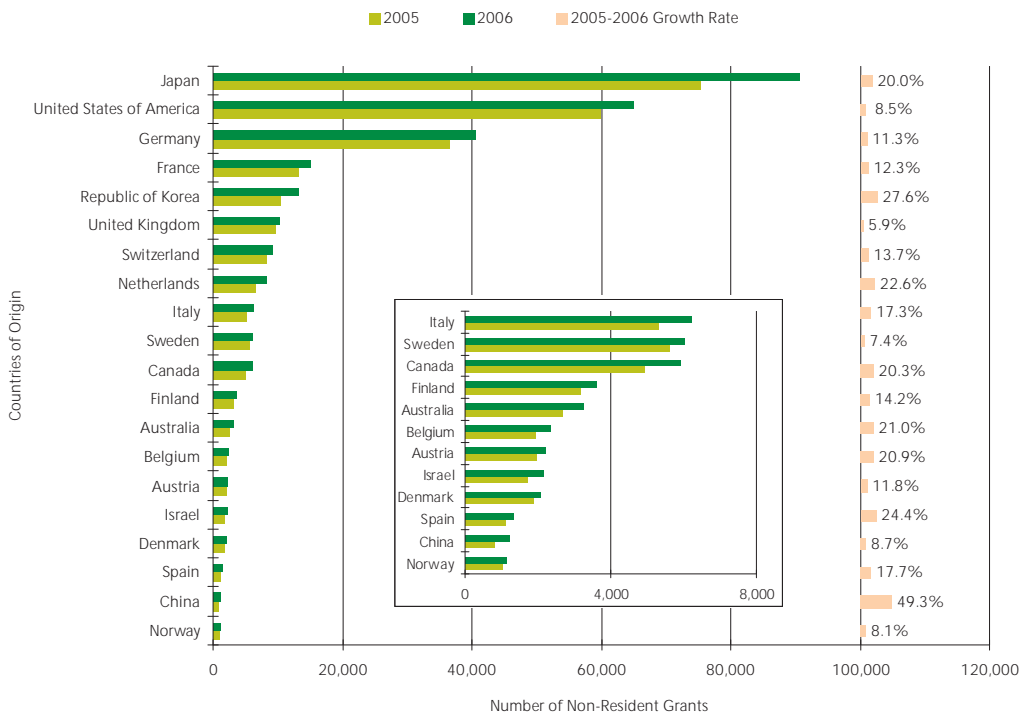


Source: WIPO Statistics Database

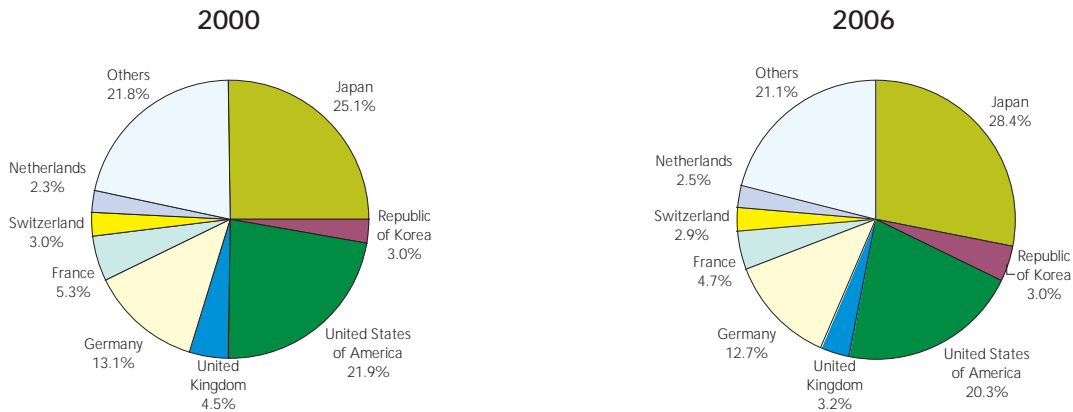
- > The number of non-resident patent grants has increased from around 177,617 in 1985 to around 319,429 in 2006. The trend of non-resident grants is similar to that of non-resident filings (see C.1.1). Average annual growth rate for the period of 1995-2006 is higher than the growth rate for the period of 1985-1994.
- > In 2006, the patent office of the United States of America (83,947) issued the largest number of non-resident patents. The number of patents granted to non-residents by the patent offices of China and the Republic of Korea are of a similar magnitude (approximately 32,000).
- > Between 2005 and 2006, there was a significant increase in the number of patents granted to non-residents by the patent offices of Germany, Japan, the Republic of Korea and the United States of America.
- > The number of non-resident patents issued by the patent office of China increased substantially until 2004, after which there has been a slowdown in the grant rate.

C.2.2. NON-RESIDENT PATENT GRANTS BY COUNTRY OF ORIGIN

Non-resident patent grants by country of origin: top 20 origins, 2006



Share of countries in total non-resident grants: selected countries

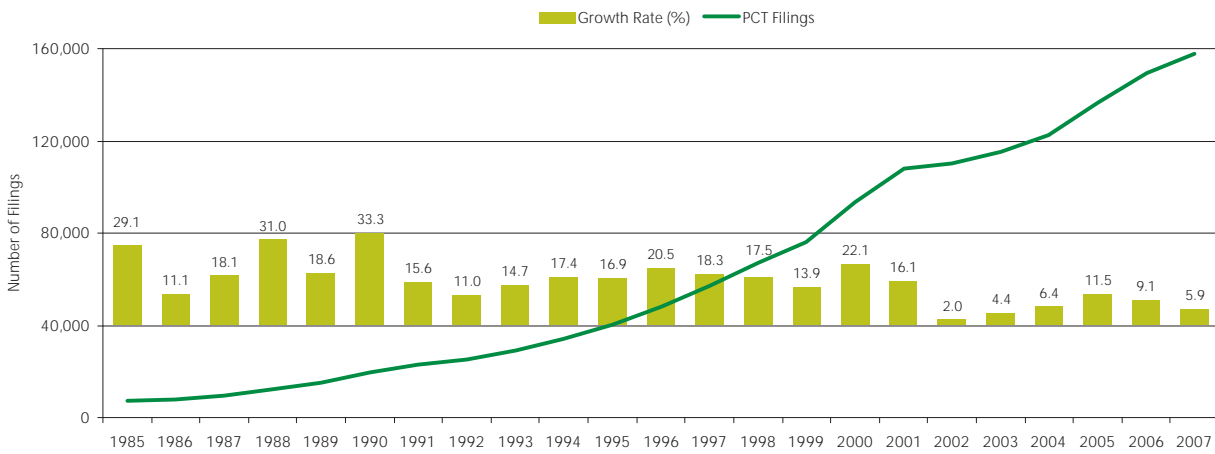


Source: WIPO Statistics Database

- > Emerging countries such as Brazil, China, India and Mexico have a low ranking for non-resident grants by country of origin compared to their ranking by patent office (see C.1.1). This indicates that these countries have a low patenting activity abroad and a high presence of foreign applicants in their respective domestic markets (see A.1.2 and A.3.2).
- > In 2006, applicants from Japan (28.4%) and the United States of America (20.3%) received the largest share of total non-resident patent grants. Germany also had a high share of total non-resident patent grants. Between 2000 and 2006, Japan's share increased by 3.2 percentage points, while that of the United States of America and the United Kingdom decreased by 1.6 and 1.3 percentage points, respectively. The combined share of the top eight countries has remained more or less constant.

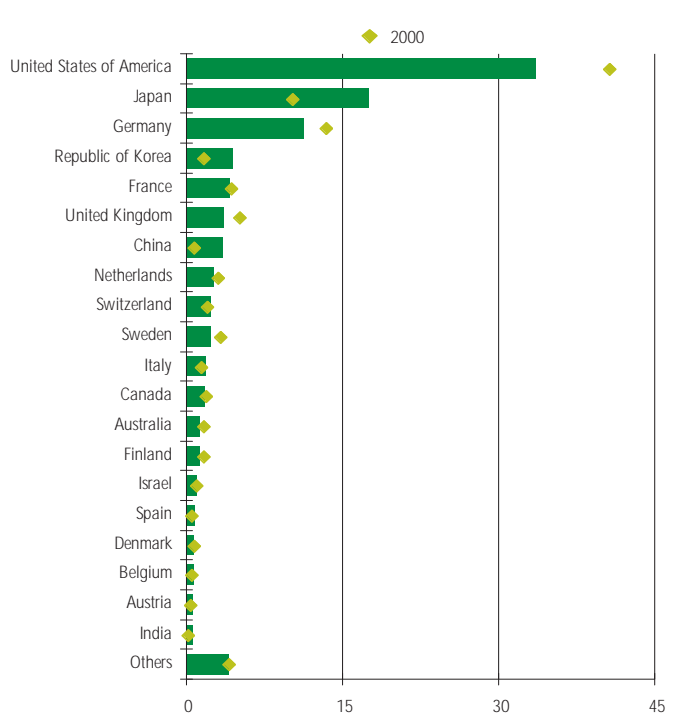
D.1.1. INTERNATIONAL FILINGS THROUGH THE PATENT COOPERATION TREATY (PCT)

Trends in PCT filings, 1985-2007



PCT filings by country of origin, 2007

Share of countries in total PCT filings, 2007

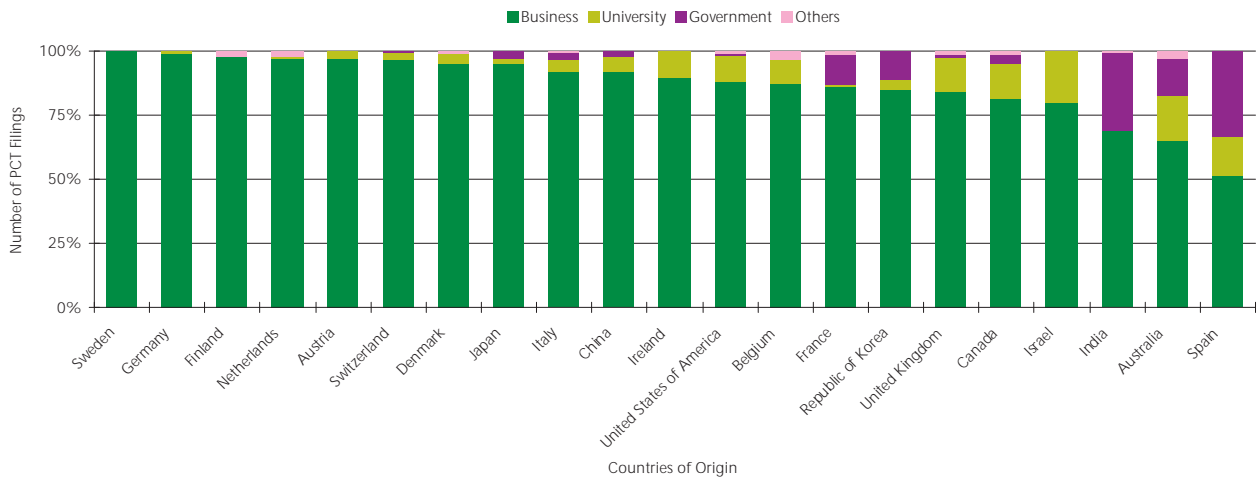


Source: WIPO Statistics Database

- > The total number of PCT filings (international patent applications filed through the Patent Cooperation Treaty) in 2007 was approximately 158,400, representing a 5.9% increase from the previous year. PCT filings grew rapidly until 2001 (yearly growth rate in excess of 10%) and since then, there has been a slowdown in the yearly growth rate.
- > The United States of America is by far the largest user of the PCT system. In 2006, 33.6% of all PCT filings originated from the United States of America, which is almost double the share of the next largest user, Japan (17.5%). PCT filings originating from India, Austria, Spain and Italy are relatively low, however, in recent years there has been an increase in the number of filings originating from these countries.
- > Between 2000 and 2006, the share of filings originating from Japan, the Republic of Korea and China increased significantly, while a notable decrease has been observed for the United States of America.

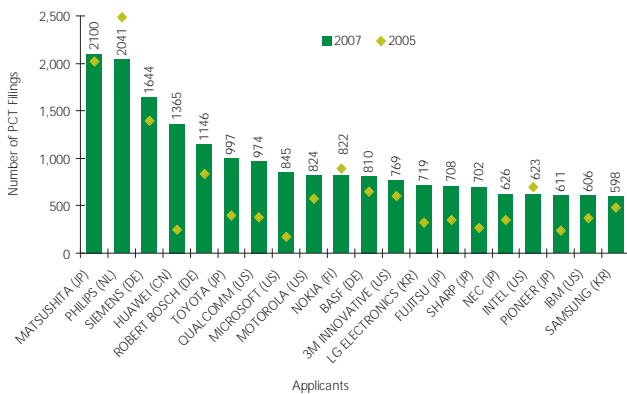
D.1.2. PATENT COOPERATION TREATY (PCT): PCT INTERNATIONAL FILINGS BY OWNERSHIP TYPE

Distribution of PCT filings by ownership types, 2002-2007

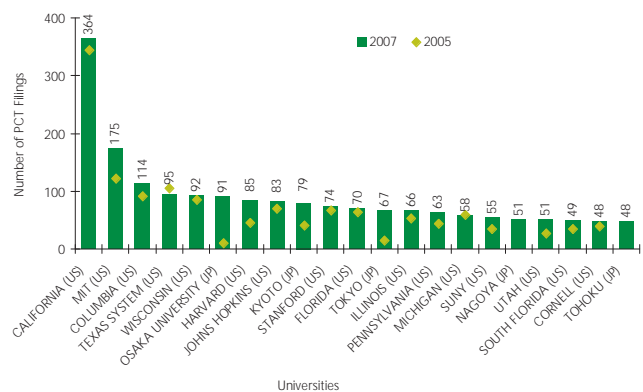


Top PCT applicants, 2007

Business sector



University sector



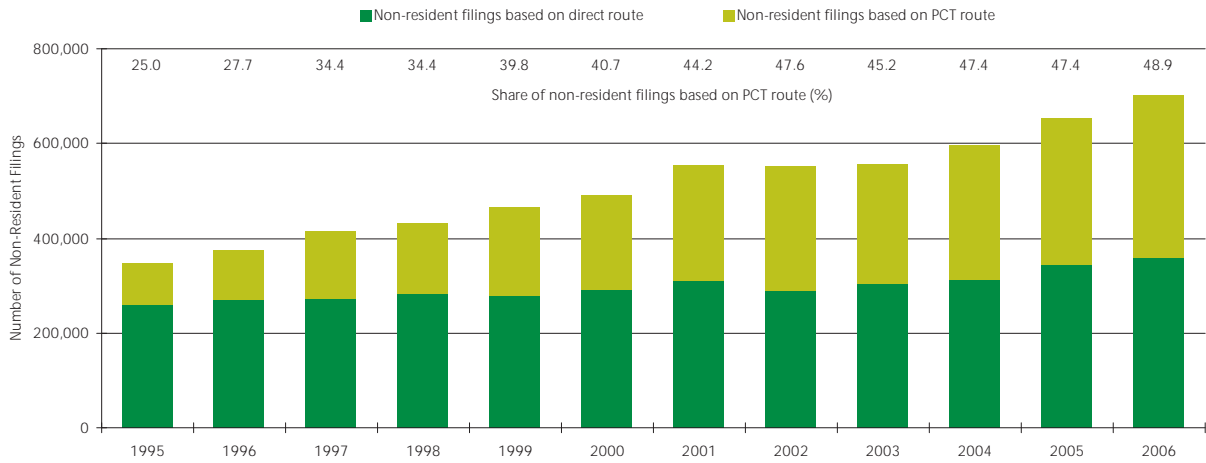
Note: The above graphs are based on data for the top 3,000 applicants. Counts are based on publication date. The "others" category includes research institutions, private non-profit organizations, etc. See annex A for the full name of applicants.

Source: WIPO Statistics Database

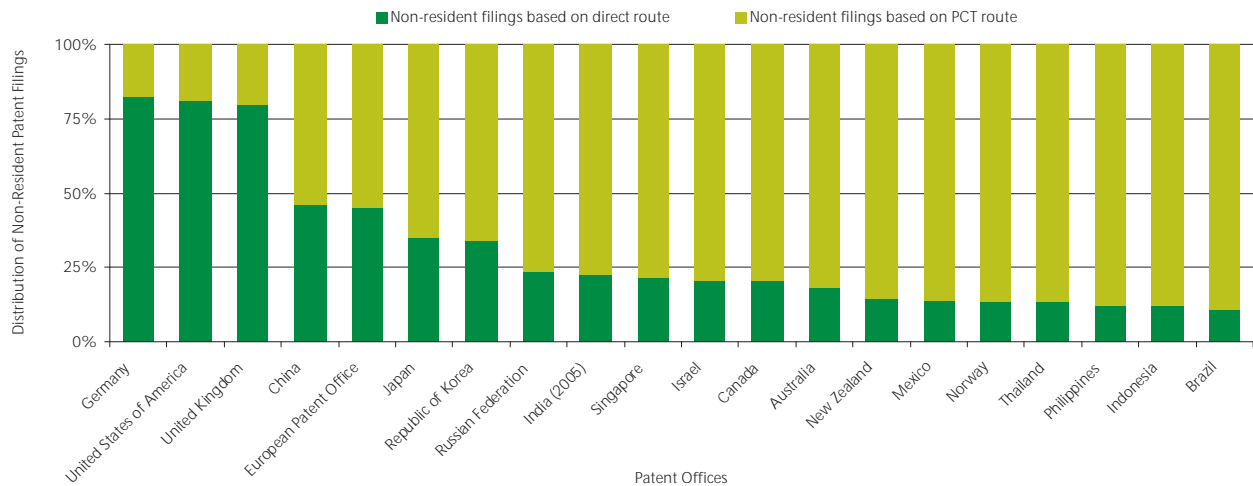
- > The majority of PCT filings originated from the business sector. However, it should be noted that the share of the business sector in PCT filings might be overstated as the distribution is calculated based on the top 3,000 PCT applicants (i.e. it excludes individual filers and applicants with fewer than 5 filings). The share of the business sector varied from 99% in both Sweden and Germany to 52% in Spain.
- > The university sector has a high share of PCT filings in Israel (19.9%), Australia (17.5%) and Spain (15.2%). The government sector accounted for more than 30% of PCT filings in Spain and India.
- > Japan and the United States of America have six companies each in the top 20 ranking. For all top 20 business sector applicants, except Philips, Nokia and Intel, the number of PCT filings in 2007 is higher than the 2005 level.
- > All of the top 20 university applicants using the PCT system are from the United States of America (15) and Japan (5). The University of California is by far the largest PCT applicant from the university sector. The highest ranking non-US universities are Kyoto and Tokyo universities (Japan).

D.1.3. NON-RESIDENT FILINGS BY FILING ROUTE

Trends in non-resident filings by direct and PCT route, 1995-2006



Distribution of non-resident filings by direct and PCT route by patent office: selected offices, 2006



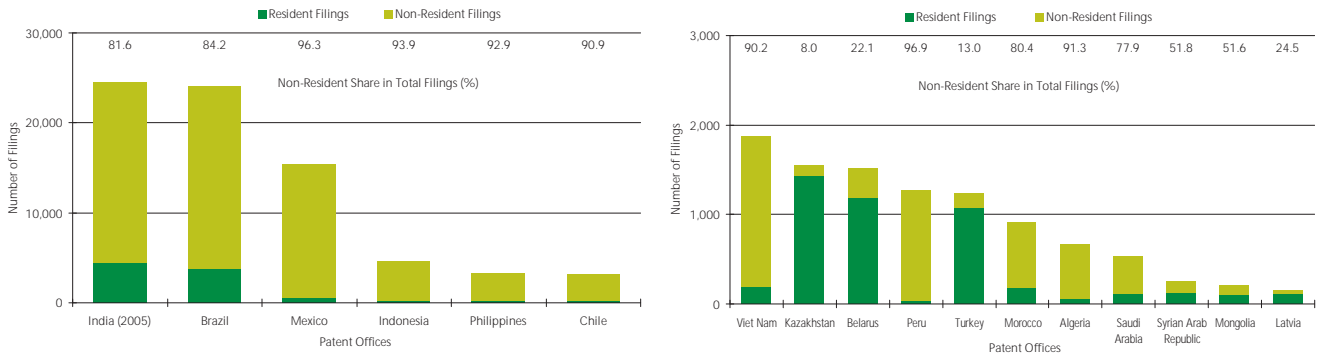
Note: The offices of France, The Netherlands, Italy and several other European States are not shown above since PCT applicants seeking protection in those states must enter the PCT regional phase at the EPO.

Source: WIPO Statistics Database

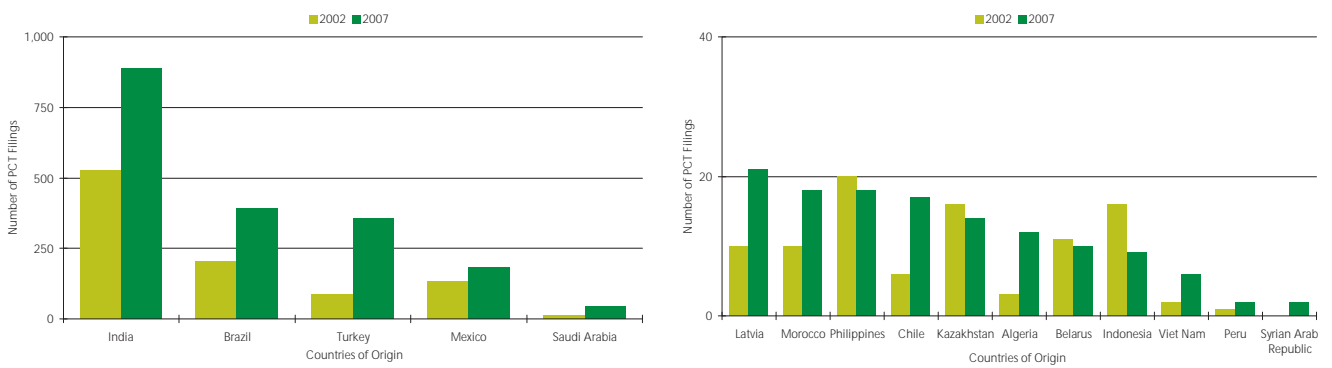
- > To file a patent application in a foreign country, applicants may either file directly or via the Patent Cooperation Treaty (PCT route). In both cases, the foreign filing is made within the 12 month priority period provided by the Paris Convention.
- > There has been a significant increase in the use of the PCT route for foreign filings. Between 1995 and 2006, the share of non-resident filings based on the PCT route increased from 25.0% to 48.9%.
- > The use of the PCT route for foreign filings varies across patent offices. More than 85% of non-resident filings at the patent offices of Brazil, Indonesia, Philippines, Thailand, Norway and Mexico are filed via the PCT route. In contrast, less than one-fifth of the non-resident filings in Germany, the United States of America and the United Kingdom are filed via the PCT route.

E.1.1. PATENT FILINGS IN SELECTED EMERGING COUNTRIES

Patent filings by patent office: selected offices, 2006



PCT filings by country of origin: selected origins, 2007

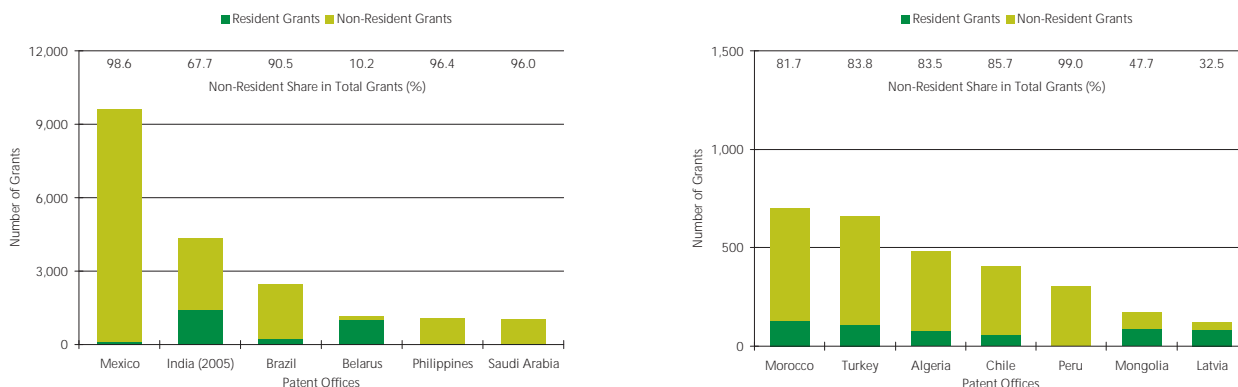


Source: WIPO Statistics Database

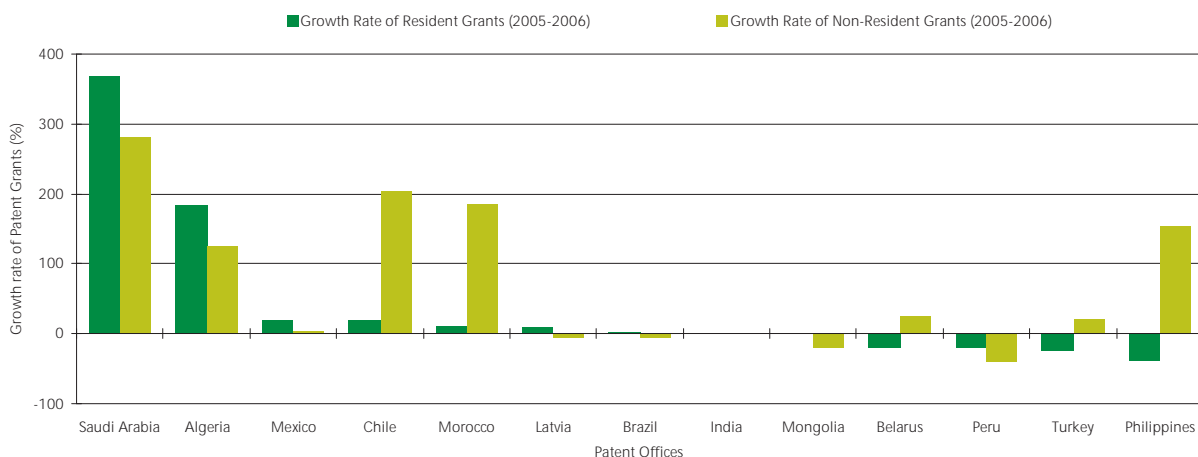
- > The use of the patent system has been increasing in emerging economies in recent years. India, Brazil and Mexico all received a large number of patent filings in 2006.
- > For the majority of these patent offices, non-resident applicants accounted for the largest share of total filings. For example, non-resident applicants accounted for almost all the filings at the patent offices of Peru and Mexico.
- > For the majority of reported countries, the number of PCT filings in 2007 is higher than the 2002 level. Algeria, Turkey and Saudi Arabia had the most notable increase (average annual growth) in PCT filings. However, the combined share of all reported emerging countries in total PCT filings was only 2.5% in 2007.

E.2.1. PATENTS GRANTED IN SELECTED EMERGING COUNTRIES

Patent grants by patent office: selected offices, 2006



Growth rate of patent grants by patent office: selected emerging countries, 2005-2006



Source: WIPO Statistics Database

- > Of the selected offices, the patent office of Mexico (9,632) awarded the largest number of patents in 2006. The patent offices of India (4,320) and Brazil (2,465) also granted a significant number of patents. For the majority of patent offices, the share of patents granted to non-resident applicants is far above that for resident applicants. For example, 98.6% of total patents granted by Mexico were to non-resident applicants. The exceptions are Belarus and Latvia, where non-resident applicants accounted for a small share of total grants.
- > There has been a considerable increase in patents granted to both resident and non-resident applicants in Saudi Arabia and Algeria and a large increase in non-resident patents granted in Chile, Morocco and the Philippines.

F.1. PATENT FILINGS BY FIELD OF TECHNOLOGY

Table 1. Total number of patent filings by field of technology

| Fields of Technology | Year of Filing | | | | | Annual Growth |
|---|----------------|---------|---------|---------|---------|---------------|
| | 2001 | 2002 | 2003 | 2004 | 2005 | |
| I - Electrical engineering | | | | | | |
| Electrical machinery, apparatus, energy | 101,276 | 98,673 | 101,959 | 114,426 | 121,350 | 4.6% |
| Audio-visual technology | 90,401 | 84,928 | 91,405 | 106,765 | 109,253 | 4.8% |
| Telecommunications | 96,631 | 91,313 | 94,867 | 105,652 | 116,770 | 4.8% |
| Digital communication | 44,017 | 42,977 | 45,076 | 48,995 | 50,069 | 3.3% |
| Basic communication processes | 21,889 | 20,651 | 20,653 | 21,691 | 21,671 | -0.2% |
| Computer technology | 117,545 | 111,675 | 116,656 | 132,787 | 144,594 | 5.3% |
| IT methods for management | 34,070 | 25,110 | 21,615 | 21,267 | 22,579 | -9.8% |
| Semiconductors | 78,398 | 78,729 | 81,411 | 89,548 | 95,107 | 4.9% |
| II - Instruments | | | | | | |
| Optics | 85,113 | 84,236 | 86,565 | 94,868 | 103,390 | 5.0% |
| Measurement | 72,009 | 69,353 | 71,859 | 77,042 | 81,038 | 3.0% |
| Analysis of biological materials | 18,518 | 17,878 | 16,861 | 15,789 | 14,416 | -6.1% |
| Control | 38,100 | 34,937 | 35,351 | 37,883 | 37,921 | -0.1% |
| Medical technology | 108,106 | 107,072 | 105,554 | 99,868 | 99,195 | -2.1% |
| III - Chemistry | | | | | | |
| Organic fine chemistry | 64,170 | 64,026 | 59,622 | 59,835 | 63,317 | -0.3% |
| Biotechnology | 45,573 | 47,576 | 44,632 | 41,993 | 40,861 | -2.7% |
| Pharmaceuticals | 69,355 | 69,160 | 66,050 | 68,650 | 74,254 | 1.7% |
| Macromolecular chemistry, polymers | 41,842 | 38,615 | 36,656 | 36,108 | 38,137 | -2.3% |
| Food chemistry | 21,296 | 23,535 | 24,850 | 23,110 | 24,653 | 3.7% |
| Basic materials chemistry | 51,058 | 48,418 | 46,106 | 45,508 | 48,040 | -1.5% |
| Materials, metallurgy | 39,882 | 37,451 | 36,813 | 35,579 | 37,705 | -1.4% |
| Surface technology, coating | 41,086 | 39,478 | 39,894 | 41,208 | 42,437 | 0.8% |
| Micro-structural and nano-technology | 3,425 | 2,770 | 2,994 | 2,967 | 3,357 | -0.5% |
| Chemical engineering | 51,319 | 48,148 | 46,306 | 44,906 | 44,845 | -3.3% |
| Environmental technology | 29,889 | 28,718 | 28,636 | 28,365 | 28,650 | -1.1% |
| IV - Mechanical engineering | | | | | | |
| Handling | 52,960 | 50,088 | 49,897 | 51,465 | 52,072 | -0.4% |
| Machine tools | 44,722 | 41,703 | 41,147 | 42,018 | 43,691 | -0.6% |
| Engines, pumps, turbines | 45,462 | 45,213 | 46,531 | 47,896 | 48,725 | 1.7% |
| Textile and paper machines | 49,570 | 48,276 | 48,519 | 48,459 | 51,090 | 0.8% |
| Other special machines | 63,169 | 60,912 | 57,225 | 55,465 | 56,157 | -2.9% |
| Thermal processes and apparatus | 27,958 | 27,856 | 28,203 | 29,526 | 30,314 | 2.0% |
| Mechanical elements | 54,363 | 51,874 | 52,268 | 53,861 | 55,277 | 0.4% |
| Transport | 70,698 | 69,533 | 75,362 | 78,067 | 82,031 | 3.8% |
| V - Other fields | | | | | | |
| Furniture, games | 44,921 | 44,821 | 46,419 | 49,331 | 51,219 | 3.3% |
| Other consumer goods | 38,596 | 36,850 | 38,305 | 40,254 | 40,741 | 1.4% |
| Civil engineering | 56,701 | 54,694 | 56,680 | 57,450 | 60,245 | 1.5% |

Note: The International Patent Classification (IPC) symbols assigned to the patent document are linked to the fields of technology by a concordance (see annex B for further details). Because a patent application may be assigned multiple IPC symbols, the sum of patent filings by fields of technology is higher than the total number of patent filings. Annual growth refers to the average annual growth rate between 2001 and 2005.

Source: WIPO Statistics Database

- > Electrical engineering, which includes computer technology, telecommunications, electrical machinery, apparatus, energy and audio-visual technology, was the most active technical sector according to the number of patent applications. A high number of applications were also filed in the fields of optics and medical technology.
- > Between 2001 and 2005, patent applications in the fields of computer technology, optics and semiconductors grew by relatively high percentages. Patent applications in the fields of IT methods for management, analysis of biological materials and chemical engineering, on the other hand, decreased during the same period.

F.2. FOREIGN-ORIENTED PATENT FAMILIES BY FIELD OF TECHNOLOGY AND ORIGIN

Table 2. Foreign-oriented patent families by field of technology and country of origin: top 15 origins, 2001-2005

| Fields of Technology | Origin of Patent Families | | | | | | | | | | | | | | | |
|---|---------------------------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | JP | US | DE | KR | GB | FR | NL | IT | CH | SE | AU | CA | CN | FI | DK | Other |
| I - Electrical engineering | | | | | | | | | | | | | | | | |
| Electrical machinery, apparatus, energy | 48,183 | 23,805 | 13,305 | 8,169 | 2,525 | 3,687 | 2,206 | 1,495 | 1,294 | 677 | 572 | 762 | 928 | 461 | 303 | 6,969 |
| Audio-visual technology | 54,961 | 21,126 | 5,544 | 10,736 | 2,174 | 1,993 | 3,845 | 413 | 635 | 513 | 512 | 497 | 766 | 496 | 312 | 6,668 |
| Telecommunications | 39,479 | 34,627 | 7,539 | 10,959 | 3,411 | 4,205 | 2,699 | 689 | 721 | 1,818 | 565 | 1,250 | 1,586 | 2,193 | 182 | 5,067 |
| Digital communication | 14,835 | 24,197 | 4,433 | 4,575 | 2,143 | 2,828 | 1,309 | 345 | 315 | 1,084 | 305 | 954 | 1,233 | 1,465 | 87 | 2,260 |
| Basic communication processes | 10,542 | 7,353 | 2,633 | 2,206 | 738 | 892 | 1,120 | 250 | 161 | 288 | 93 | 181 | 139 | 278 | 41 | 1,741 |
| Computer technology | 51,087 | 48,398 | 10,128 | 8,764 | 4,060 | 3,657 | 3,517 | 925 | 935 | 1,060 | 1,112 | 1,514 | 1,072 | 1,207 | 242 | 7,531 |
| IT methods for management | 6,198 | 9,908 | 1,100 | 555 | 658 | 414 | 301 | 132 | 206 | 150 | 371 | 290 | 76 | 192 | 37 | 1,066 |
| Semiconductors | 48,369 | 20,431 | 6,923 | 10,751 | 1,454 | 1,630 | 2,462 | 501 | 507 | 296 | 262 | 138 | 418 | 221 | 88 | 6,724 |
| II - Instruments | | | | | | | | | | | | | | | | |
| Optics | 54,278 | 18,012 | 5,691 | 8,580 | 1,770 | 1,643 | 2,446 | 493 | 621 | 375 | 377 | 287 | 469 | 211 | 154 | 4,820 |
| Measurement | 25,455 | 25,231 | 12,744 | 2,337 | 3,211 | 2,935 | 1,529 | 938 | 1,837 | 936 | 623 | 627 | 478 | 551 | 312 | 3,957 |
| Analysis of biological materials | 4,125 | 15,976 | 2,368 | 275 | 1,487 | 725 | 424 | 176 | 351 | 282 | 351 | 178 | 119 | 113 | 234 | 955 |
| Control | 12,613 | 11,785 | 5,533 | 1,297 | 1,384 | 1,567 | 570 | 639 | 593 | 450 | 504 | 354 | 189 | 222 | 123 | 2,297 |
| Medical technology | 17,611 | 57,902 | 11,277 | 1,429 | 7,156 | 3,790 | 1,982 | 1,924 | 2,437 | 2,032 | 1,619 | 721 | 747 | 385 | 1,423 | 6,618 |
| III - Chemistry | | | | | | | | | | | | | | | | |
| Organic fine chemistry | 10,918 | 30,613 | 9,014 | 1,141 | 4,525 | 3,609 | 1,050 | 946 | 1,363 | 803 | 475 | 200 | 414 | 163 | 718 | 4,038 |
| Biotechnology | 7,094 | 32,139 | 4,396 | 820 | 3,062 | 1,440 | 1,083 | 419 | 603 | 421 | 760 | 278 | 367 | 192 | 971 | 2,521 |
| Pharmaceuticals | 7,738 | 43,317 | 6,095 | 894 | 5,693 | 2,525 | 1,020 | 1,064 | 1,197 | 1,058 | 958 | 353 | 613 | 177 | 1,192 | 5,006 |
| Macromolecular chemistry, polymers | 14,397 | 11,327 | 5,647 | 1,087 | 966 | 1,310 | 577 | 583 | 526 | 130 | 163 | 174 | 165 | 188 | 101 | 1,387 |
| Food chemistry | 3,447 | 6,017 | 1,608 | 394 | 733 | 592 | 942 | 448 | 462 | 121 | 249 | 116 | 119 | 104 | 358 | 1,468 |
| Basic materials chemistry | 14,314 | 16,889 | 7,329 | 1,227 | 2,199 | 1,487 | 985 | 478 | 934 | 201 | 347 | 243 | 340 | 150 | 262 | 2,612 |
| Materials, metallurgy | 12,513 | 8,104 | 4,477 | 1,016 | 768 | 1,340 | 415 | 480 | 426 | 365 | 338 | 281 | 252 | 210 | 131 | 2,187 |
| Surface technology, coating | 19,390 | 14,295 | 5,512 | 1,931 | 1,154 | 1,371 | 558 | 607 | 648 | 390 | 271 | 291 | 195 | 241 | 127 | 2,304 |
| Micro-structural and nano-technology | 1,395 | 1,900 | 571 | 356 | 102 | 240 | 99 | 49 | 39 | 62 | 43 | 15 | 30 | 21 | 23 | 237 |
| Chemical engineering | 11,743 | 16,332 | 8,250 | 1,613 | 2,035 | 2,156 | 902 | 1,226 | 947 | 592 | 542 | 495 | 381 | 435 | 339 | 2,975 |
| Environmental technology | 7,058 | 6,663 | 3,875 | 676 | 912 | 1,123 | 449 | 495 | 270 | 301 | 277 | 285 | 122 | 211 | 152 | 1,632 |
| IV - Mechanical engineering | | | | | | | | | | | | | | | | |
| Handling | 11,868 | 11,190 | 6,700 | 1,132 | 1,964 | 2,093 | 901 | 2,209 | 1,597 | 586 | 621 | 521 | 131 | 429 | 350 | 2,862 |
| Machine tools | 11,257 | 9,207 | 7,290 | 853 | 925 | 1,306 | 464 | 1,268 | 908 | 767 | 357 | 442 | 183 | 275 | 152 | 2,795 |
| Engines, pumps, turbines | 16,696 | 10,779 | 10,143 | 1,229 | 1,497 | 2,058 | 370 | 945 | 780 | 501 | 252 | 440 | 165 | 119 | 273 | 2,147 |
| Textile and paper machines | 22,557 | 9,844 | 6,290 | 1,323 | 1,063 | 1,095 | 610 | 1,028 | 1,081 | 371 | 252 | 166 | 164 | 715 | 116 | 2,004 |
| Other special machines | 14,251 | 14,971 | 8,721 | 1,143 | 1,862 | 2,358 | 1,072 | 1,850 | 1,120 | 582 | 734 | 747 | 237 | 315 | 390 | 3,814 |
| Thermal processes and apparatus | 6,830 | 5,951 | 4,159 | 1,854 | 749 | 893 | 428 | 757 | 454 | 339 | 278 | 342 | 226 | 194 | 205 | 1,794 |
| Mechanical elements | 16,476 | 11,318 | 12,478 | 1,132 | 1,858 | 2,700 | 519 | 1,471 | 829 | 988 | 585 | 504 | 176 | 250 | 332 | 2,719 |
| Transport | 24,479 | 14,842 | 17,108 | 1,486 | 1,960 | 5,212 | 798 | 1,734 | 539 | 1,176 | 654 | 660 | 214 | 235 | 168 | 3,174 |
| V - Other fields | | | | | | | | | | | | | | | | |
| Furniture, games | 7,347 | 10,493 | 3,535 | 1,651 | 1,656 | 1,451 | 687 | 1,251 | 661 | 397 | 690 | 596 | 233 | 141 | 206 | 2,922 |
| Other consumer goods | 8,679 | 9,629 | 4,098 | 2,606 | 1,375 | 1,836 | 643 | 1,283 | 711 | 343 | 440 | 393 | 217 | 142 | 160 | 2,658 |
| Civil engineering | 6,207 | 12,290 | 6,532 | 807 | 2,329 | 2,460 | 958 | 1,529 | 844 | 707 | 1,160 | 1,021 | 196 | 333 | 351 | 4,440 |

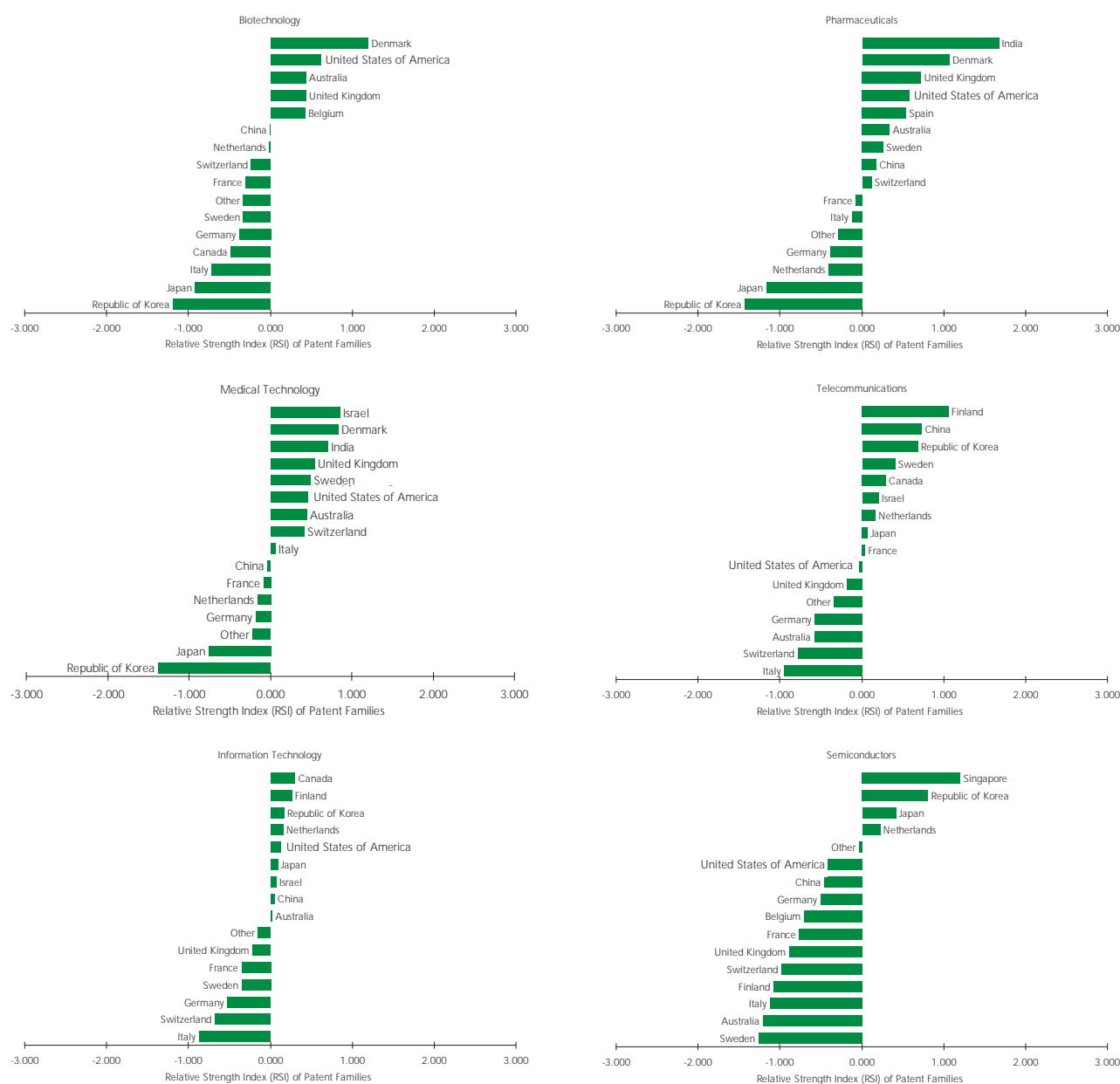
Note: The patent families definition adopted here implies that patent applications will be filed with at least one foreign patent office, therefore, they are referred to as "foreign-oriented families". Foreign-oriented patent families provide some indication of inventions that applicants consider worth protecting in multiple countries.

Source: WIPO Statistics Database

- > It is common for applicants to seek patent rights for the same invention in multiple jurisdictions, generating multiple patent applications. Therefore, counts of patent filings have a tendency to over-estimate the number of inventions. The number of patent families which are based on the first filed patent applications, on the other hand, better reflects the number of inventions created because it eliminates multiple counts of the same invention.
- > Table 2 provides a breakdown of foreign-oriented patent families by field of technology for the top 15 countries of origin. In most fields of technology, the largest number of patent families was created by applicants from Japan and the United States of America.
- > The top rankings based on total number of foreign-oriented patent families are dominated by industrialized countries, China being the only exception, ranked 13th. This shows that even though emerging countries such as India, Brazil and Mexico have a high level of patent activity in their respective domestic markets, only a small proportion of their total patent filings are filed in a foreign country.

F.3. RELATIVE SPECIALIZATION INDEX (RSI) OF FOREIGN-ORIENTED PATENT FAMILIES BY ORIGIN

RSI by country of origin for selected fields of technology: top 15 origins, 2001-2005



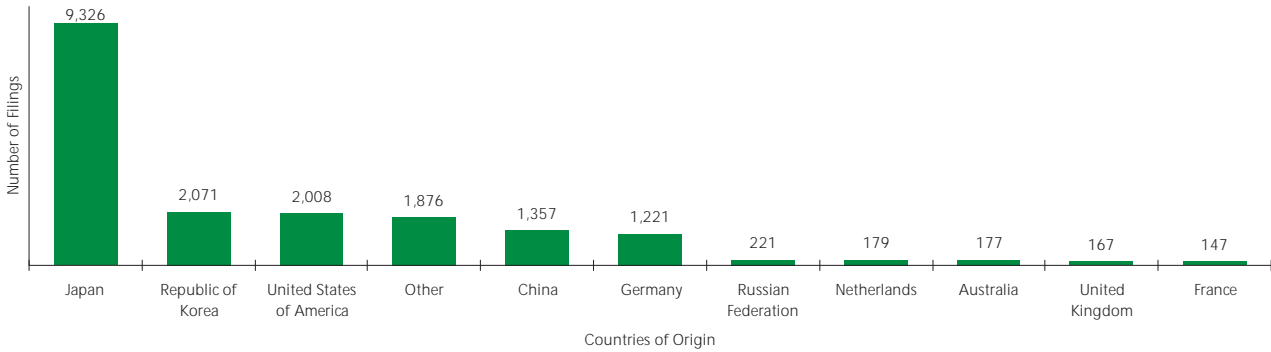
Note: The Relative Specialization Index (RSI) shows the technologies in which countries have above or below-average concentrations of filings. The RSI corrects for the effects of country size and focuses on the concentration of patent filings in each country/technology. A positive (negative) RSI value for a particular technology implies that the country has a relatively high (low) share of patent families in that technology. The RSI indicators above are based on foreign-oriented patent families, as defined above. For the definitions of technology fields, see annex B; see annex C for detailed RSI indicators.

Source: WIPO Statistics Database

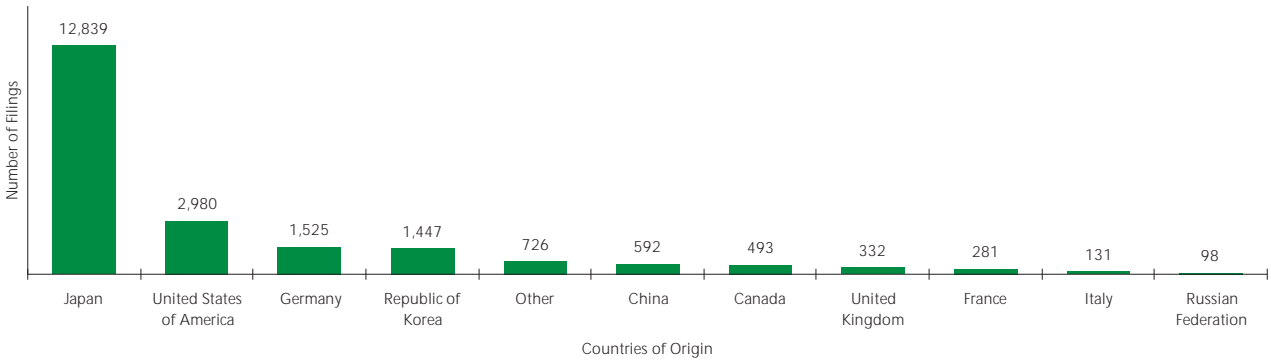
- > While the total number of patent families indicates the overall strength of the countries' research and development (R&D) activities, the relative specialization index (RSI) provides an indication of countries' R&D strength in a particular field of technology.
- > In each field of technology, we can identify countries having an above-average concentration of foreign-oriented patent families (i.e. a positive RSI value). Examples include Denmark and the United States of America in the fields of biotechnology, India in the field of pharmaceuticals, Israel, Denmark and India in the field of medical technology, Finland, China, the Republic of Korea and Sweden in the field of telecommunications, Canada and Finland in the field of information technology, and Singapore and the Republic of Korea in the field of semiconductors.

F.4. PATENT FILINGS IN ENERGY TECHNOLOGY

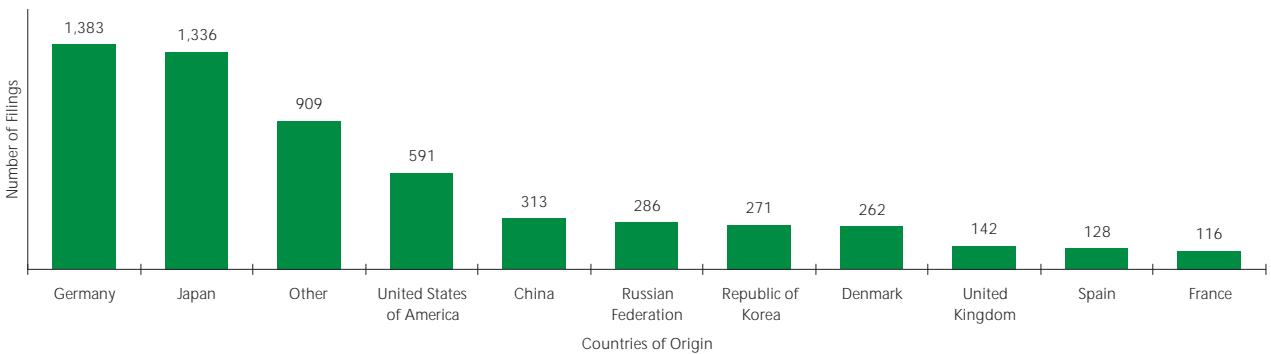
Solar energy technology patent filings by country of origin, 2001-2005



Fuel cell technology patent filings by country of origin, 2001-2005



Wind energy technology patent filings by country of origin, 2001-2005



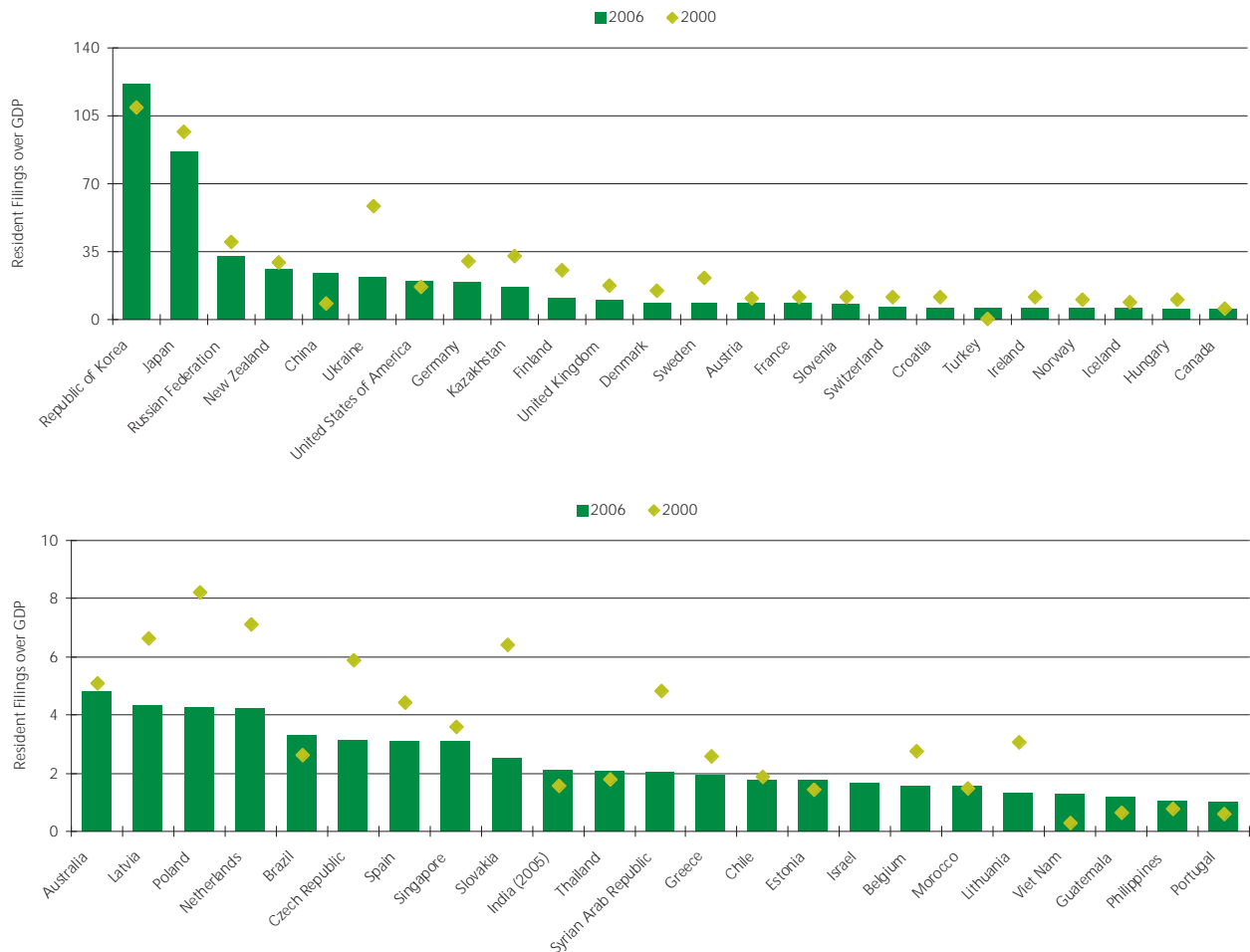
See annex B for definitions.

Source: WIPO Statistics Database

- > The recent pressures on energy resources have created an increase in patenting activity related to energy technologies. Examples can be seen in the patent filings related to solar (thermal and photo) energy, fuel cell and wind energy (definitions based on the international patent classification symbols assigned to patent applications). The distribution of these applications by countries of origin reveals the concentration of research activities in these technologies.
- > Patent filings in the fields of solar energy and fuel cell mainly originated from Japan. Patent applications in the field of wind energy were evenly distributed, with Germany and Japan being the top two countries of origin for this technology.
- > The total number of patent applications in the field of wind energy was considerably less than that in the other two technological fields.

G.1.1. RESIDENT PATENT FILINGS PER GROSS DOMESTIC PRODUCT

Resident patent filings per gross domestic product: selected countries, 2006



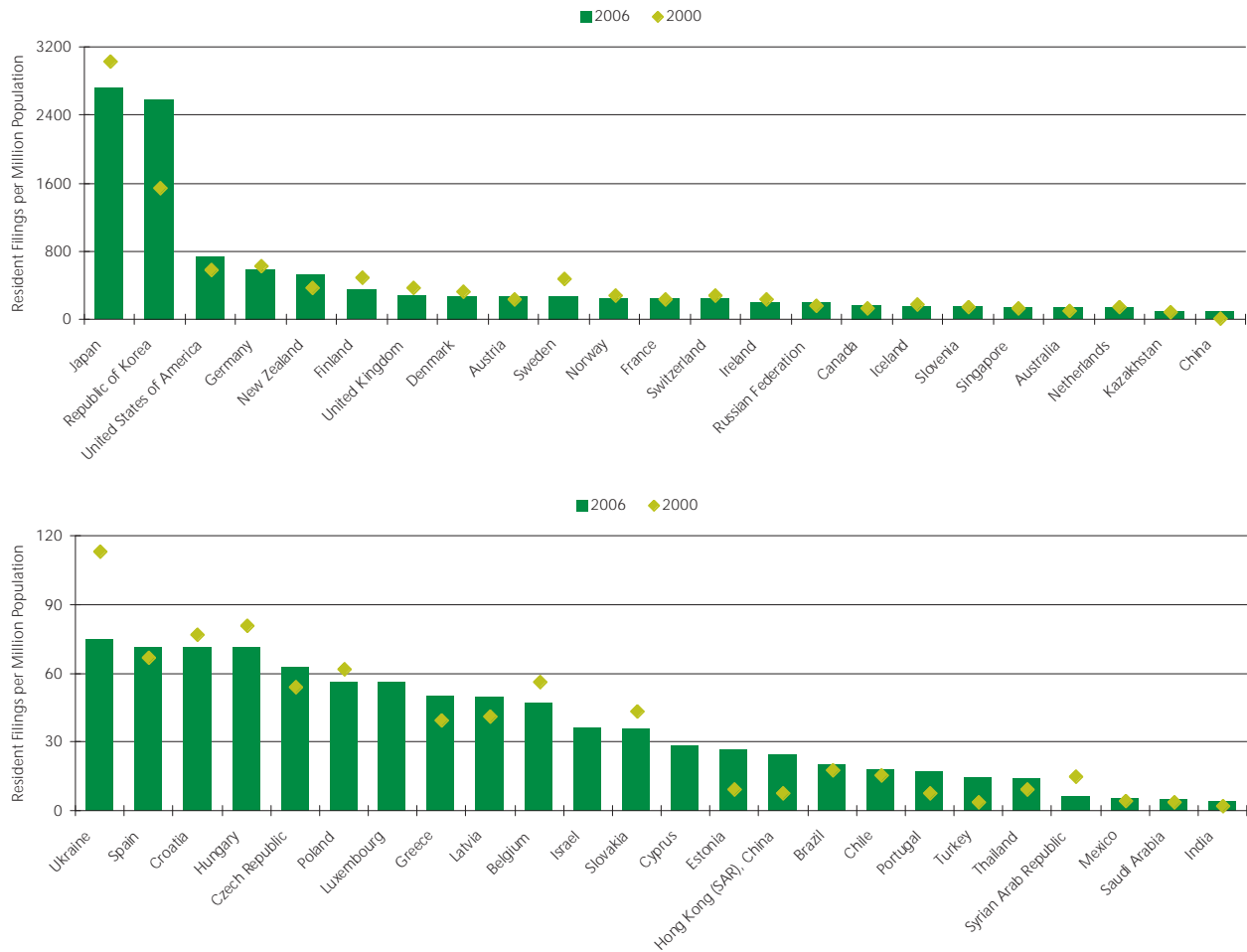
Note: GDP data are in billions of constant US dollars based on purchasing power parities.

Source: WIPO Statistics Database and World Bank (World Development Indicators)

- > The ratio of resident patent filings to GDP corrects for the effects of country size and improves comparability across countries.
- > The gap between the Republic of Korea and Japan for the resident patent filings per GDP (Gross Domestic Product) indicator is considerably smaller than the gap observed for the resident patent filings indicator (see B.1.2).
- > The United States of America has higher resident filings than China and the Russian Federation, however, when the size of the GDP is taken into consideration both China and the Russian Federation have a higher resident filing to GDP ratio.
- > For the majority of reported countries, the 2006 resident filings to GDP ratio is lower than the 2000 ratio, which is mainly due to the fact that GDP increased at a faster rate than resident patent filings. China and the Republic of Korea are two notable exceptions, whose 2006 resident filings to GDP ratio is higher than the 2000 ratio.

G.1.2. RESIDENT PATENT FILINGS PER MILLION POPULATION

Resident filings per million population: selected countries / territories, 2006

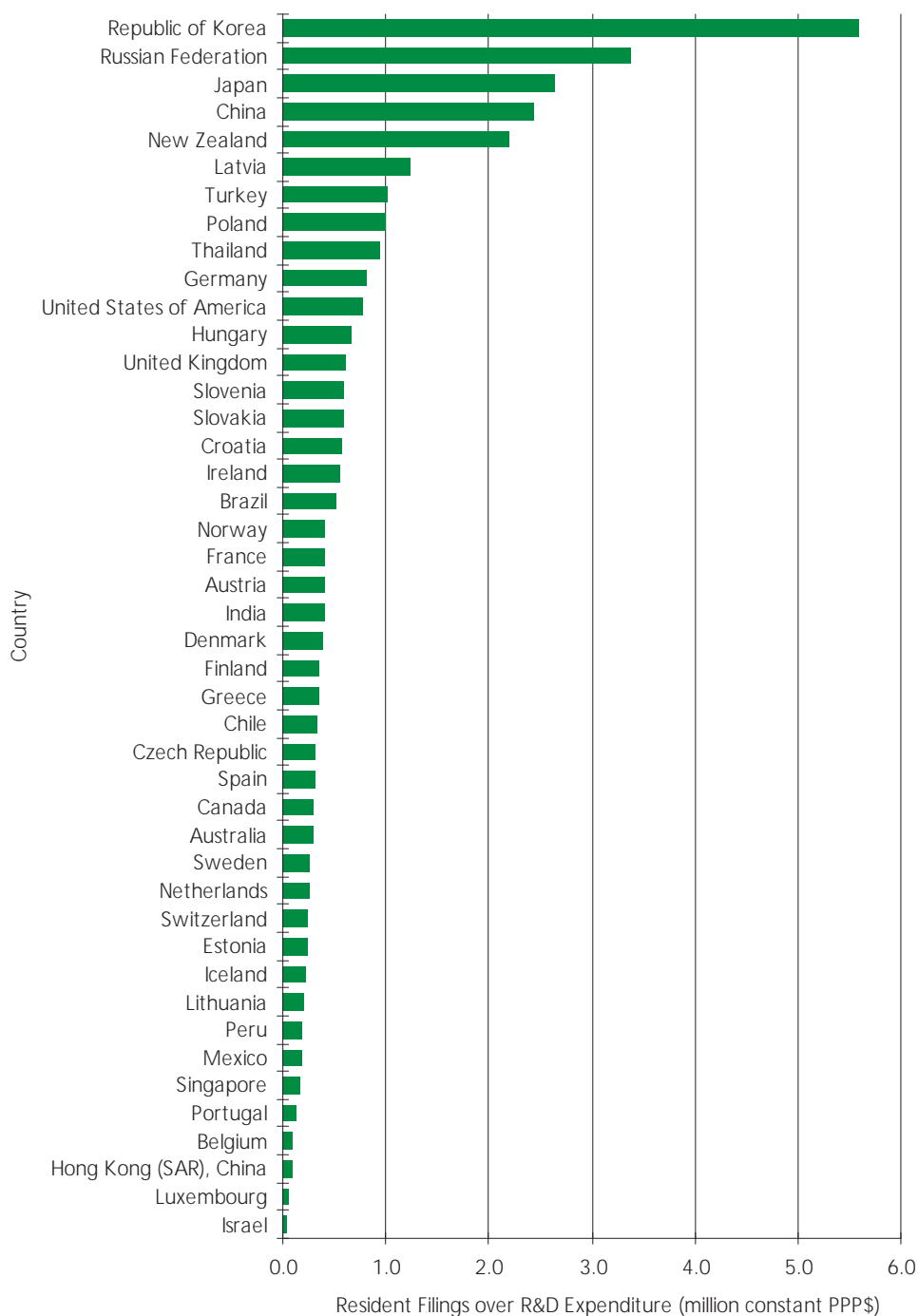


Source: WIPO Statistics Database and World Bank (World Development Indicators)

- > The resident filings to population ratio shows a trend similar to that of the resident filings to GDP ratio (see G.1.1). However, there are a few notable differences. For example, due to the population size, China, India and Russian Federation have a lower ranking for the resident filings to population ratio than their rankings under the resident filings to GDP ratio.
- > The most notable increases between 2000 and 2006 occurred in the Republic of Korea, the United States of America, New Zealand and China. Japan, Sweden and Finland, on the other hand experienced a decrease in the resident filings to population ratio over the same period.

G.1.3. RESIDENT PATENT FILINGS PER RESEARCH AND DEVELOPMENT EXPENDITURE

Resident patent filings per research and development expenditure: selected countries / territories, 2006



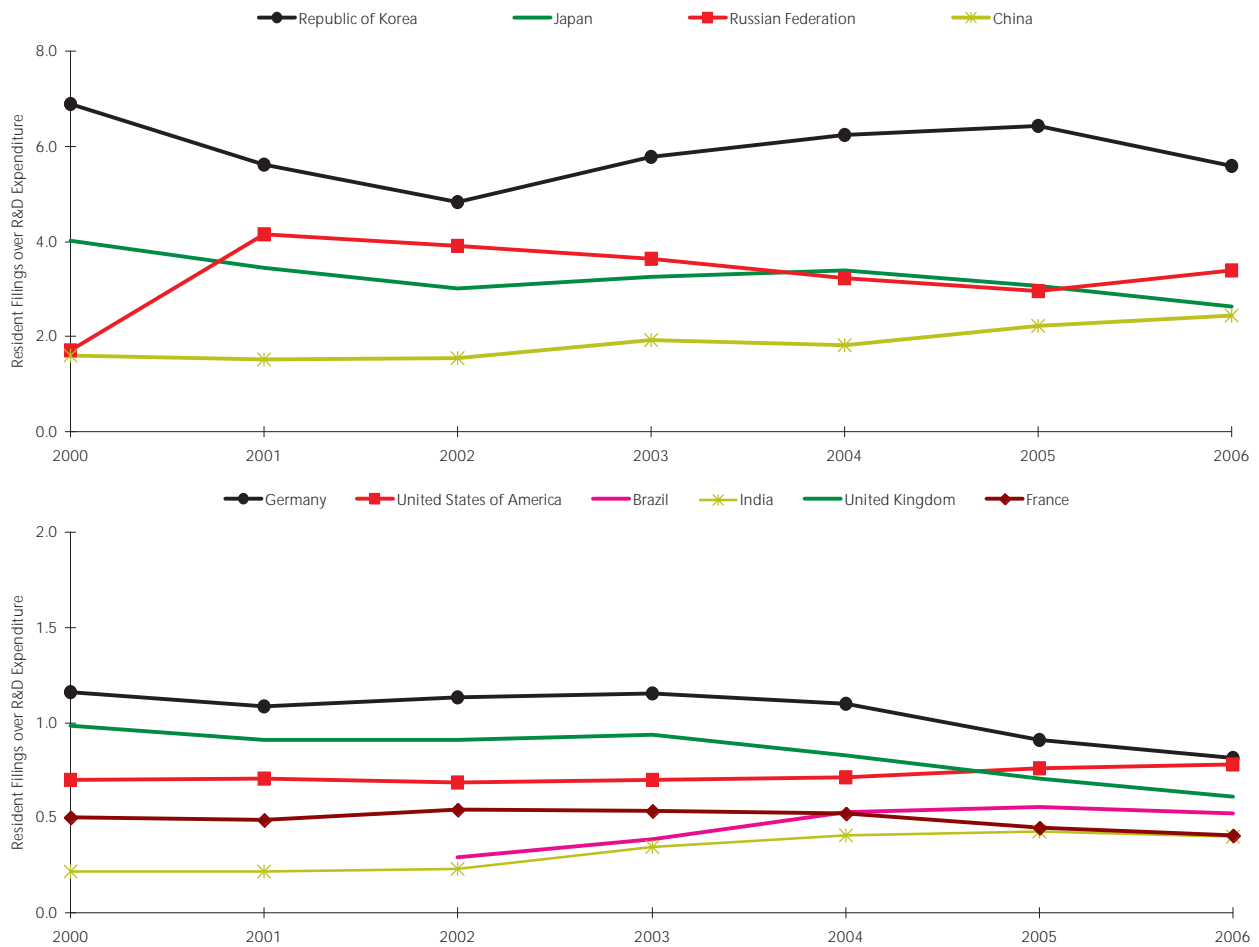
Note: Research and development expenditure are in millions of constant US dollars, based on purchasing power parities and lagged by 2 years to derive the resident filings to R&D ratio.

Source: UNESCO and WIPO Statistics Database

- > Research and development (R&D) expenditure and patent filings are highly correlated. Countries with a high level of R&D investment tend to have a high resident filings to R&D expenditure ratio (patent intensity). The Republic of Korea, Russian Federation, Japan, China and New Zealand have a high patent intensity.

G.1.4. TRENDS IN RESIDENT PATENT FILINGS PER RESEARCH AND DEVELOPMENT EXPENDITURE

Trends in resident patent filings per research and development expenditure: selected countries



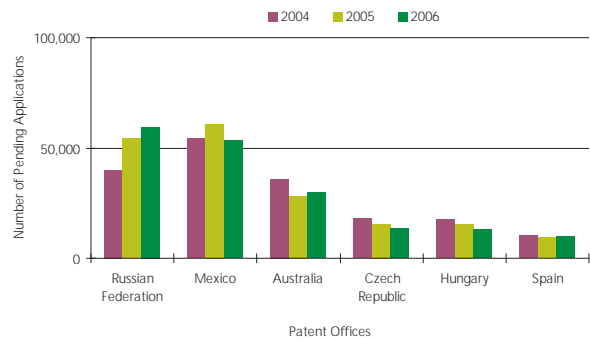
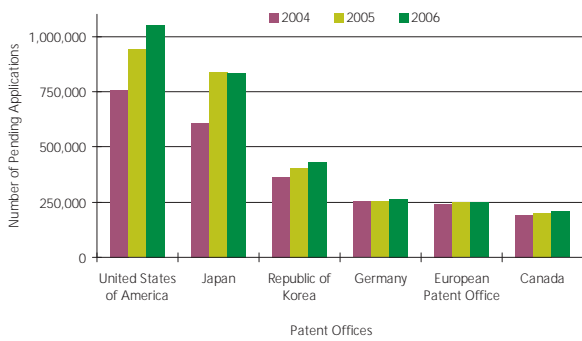
Note: Research and development expenditure are in millions of constant US dollars, based on purchasing power parities and lagged by 2 years to derive the resident filings to R&D ratio.

Source: UNESCO and WIPO Statistics Database

- > From 2000 to 2006, the patent intensity ratio (resident filings per research and development expenditure) of China and India has increased slightly, which is mostly due to the higher growth rate of resident filings relative to that of R&D expenditure.
- > The patent intensity ratio of Germany, Japan and the United Kingdom, on the other hand, has declined, especially for the most recent years. The decrease in patent intensity ratio of Germany, Japan and the United Kingdom is mostly due to the fall in resident filings.

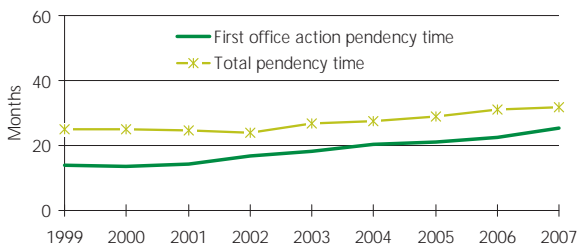
H.1. PATENT PROCESSING ACTIVITY

Pending patent applications by patent office: selected offices

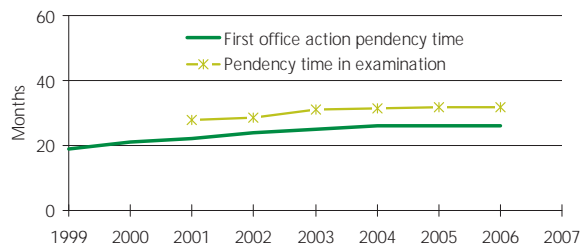


Average pendency time by patent office: selected offices

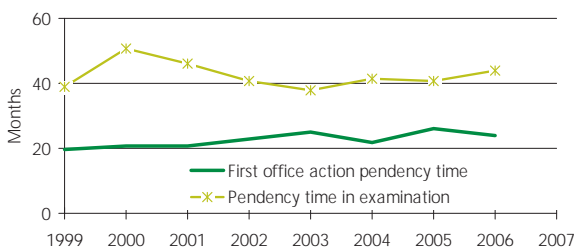
United States Patent and Trademark Office



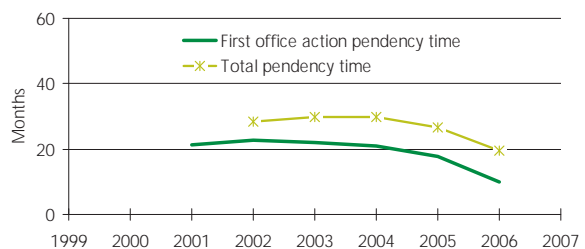
Japan Patent Office



European Patent Office



Korean Intellectual Property Office



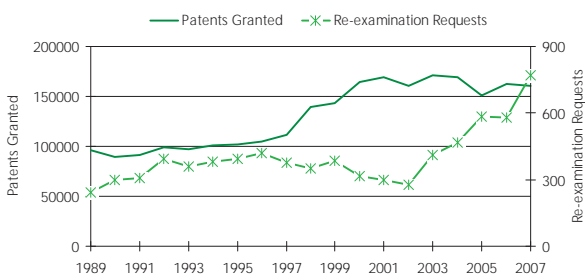
Note: The data presented above may not be comparable between patent offices due to the specificities of each office. The average delay until first office action or examination may depend on the workload and resources of each office. The change in the request for examination rule (shortened from 7 to 3 years) at JPO has created an additional workload, which the JPO estimates will be reduced considerably in the near future.

Source: WIPO Statistics Database

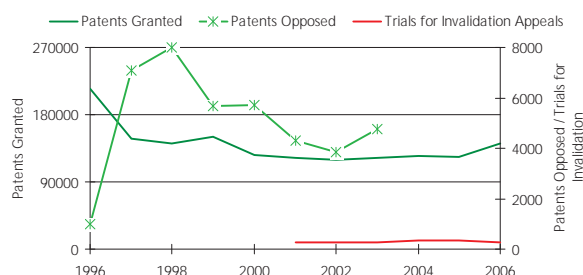
- > In 2006, the number of pending applications (i.e. patent applications waiting for examination) at the patent office of the United States of America (USPTO) was in excess of 1 million. The patent office of Japan (JPO) also had a large number of pending applications.
- > Between 2004 and 2006, the number of pending applications at the patent offices of the Russian Federation, the United States of America and Japan increased by 49.2%, 38.4% and 38.1%, respectively. However, the increase in Japan, to a certain extent, is due to the change in the request for examination rule, shortened from 7 to 3 years, which came into force in 2004. The number of pending applications at the European Patent Office (EPO) has been stable.
- > The average pendency time for first office action at EPO, JPO and USPTO has increased during the period of 1999-2006. KIPO has the lowest pendency time for first office action and it has decreased over the same period.
- > The EPO has the highest average total pendency time (or pendency time in examination) and the latest available data shows that the total pendency time is almost twice the pendency time of first office action.

I.1. STATISTICS ON OPPOSITION AND INVALIDATION BY PATENT OFFICE

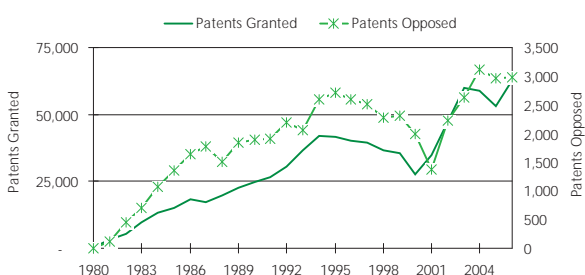
United States Patent and Trademark Office



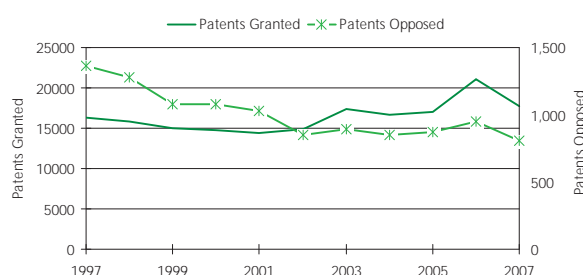
Japan Patent Office



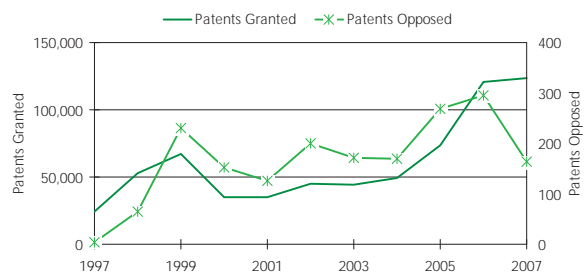
European Patent Office



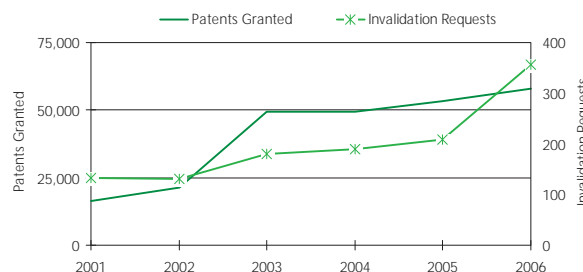
German Patent and Trademark Office



Korean Intellectual Property Office



Chinese Patent Office



Note: Chinese data are estimated except for 2002 and 2006. Different procedures exist in different Offices for opposing or invalidating the decision of the granting of a patent. In Germany, the European Patent Office (EPO) and the Republic of Korea, this is simply called "opposition", however, in the USA, it is referred to as "Re-examination". In China, the procedure is called an "Invalidation Request", and in Japan it is called a "Trial for invalidation".

Source: WIPO Statistics Database

- > For the reported offices, the number of patents subjected to a request to oppose or invalidate the granting thereof, consists of, for the most part, less than 6% of total patents granted by that office for the same year, and for most large offices, less than 1% of patents granted, the EPO being the exception.
- > The sudden drop in the number of patents opposed in Japan is explained by a change in 2003 at the JPO from an opposition procedure after an examiner's decision to grant a patent to a trial for invalidation.
- > In most of the reported offices, the numbers of opposition or invalidation requests is loosely correlated with the number of patents granted, the exception being Germany where requests have declined at the same time that the number of granted patents has increased. In general, there is an upward trend in the numbers of opposition or invalidation requests which may reflect an increasing interest in challenging granted patents by third parties.

J. COST OF PATENTING

| U.S. \$ | 2 countries | | | | 7 countries | | | | 15 countries | | | |
|---------------|------------------|-------|------------------|-------|------------------|-------|------------------|-------|-------------------|-------|-------------------|-------|
| | Direct | Share | PCT | Share | Direct | Share | PCT | Share | Direct | Share | PCT | Share |
| Official fees | 6,442 | 38.0% | 9,001 | 48.9% | 20,067 | 33.8% | 21,449 | 35.5% | 36,258 | 30.4% | 36,799 | 31.1% |
| Excluding | | | | | | | | | | | | |
| Maintenance | 5,607 | 33.3% | 8,302 | 45.5% | 12,960 | 21.8% | 14,664 | 24.2% | 21,810 | 18.3% | 23,203 | 19.6% |
| Maintenance | 835 | 4.9% | 700 | 3.4% | 7,108 | 12.0% | 6,785 | 11.2% | 14,448 | 12.1% | 13,595 | 11.5% |
| Legal costs | 4,398 | 25.9% | 4,274 | 21.0% | 25,836 | 43.5% | 25,539 | 42.2% | 61,697 | 51.7% | 60,353 | 51.0% |
| Excluding | | | | | | | | | | | | |
| Maintenance | 4,156 | 24.5% | 4,156 | 20.4% | 21,616 | 36.4% | 21,854 | 36.1% | 50,247 | 42.1% | 50,129 | 42.4% |
| Maintenance | 242 | 1.4% | 118 | 0.6% | 4,220 | 7.1% | 3,685 | 6.1% | 11,450 | 9.6% | 10,224 | 8.6% |
| Translation | | | | | | | | | | | | |
| costs | 6,131 | 36.1% | 6,131 | 30.1% | 13,494 | 22.7% | 13,494 | 22.3% | 21,426 | 17.9% | 21,188 | 17.9% |
| Total | \$ 16,971 | | \$ 19,406 | | \$ 59,397 | | \$ 60,481 | | \$ 119,381 | | \$ 118,339 | |

Note: The patenting costs are based on estimates sourced from Global IP Estimator (<http://www.globalip.com/>). They include filing, examining, prosecution, granting costs and the international phase for PCT scenarios. They do not include in-house and pre-filing costs. The figures shown above are based on typical cost schedules which are indicative only; actual costs will vary widely depending on the many options that are available to applicants and the many differences in costs and fees (including legal and translation costs) around the world. The last maintenance year is 10 years from filing. See annex D for further details regarding the methodology used.

Source: WIPO

- > The scenario above shows that translation costs can make up between 18% and 36% of total costs, depending upon the number of countries.
- > Official fees represent approximately a third of total costs whereas legal costs vary from approximately a quarter to half of the total, depending on the number of countries selected.
- > Official fees are higher when filing through the Patent Cooperation Treaty (PCT) system despite the fact that the maintenance costs are postponed. However, the more countries selected, the less significant the differences.

ANNEX A. TOP PCT APPLICANTS

| Short Name | PCT Applicant Name: Business Sector |
|---------------------|---|
| MATSUSHITA (JP) | MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD. |
| PHILIPS (NL) | KONINKLIJKE PHILIPS ELECTRONICS N.V. |
| SIEMENS (DE) | SIEMENS AKTIENGESELLSCHAFT |
| HUAWEI (CN) | HUAWEI TECHNOLOGIES CO., LTD. |
| ROBERT BOSCH (DE) | ROBERT BOSCH GMBH |
| TOYOTA (JP) | TOYOTA JIDOSHA KABUSHIKI KAISHA |
| QUALCOMM (US) | QUALCOMM INCORPORATED |
| MICROSOFT (US) | MICROSOFT CORPORATION |
| MOTOROLA (US) | MOTOROLA, INC. |
| NOKIA (FI) | NOKIA CORPORATION |
| BASF (DE) | BASF AKTIENGESELLSCHAFT |
| 3M INNOVATIVE (US) | 3M INNOVATIVE PROPERTIES COMPANY |
| LG ELECTRONICS (KR) | LG ELECTRONICS INC. |
| FUJITSU (JP) | FUJITSU LIMITED |
| SHARP (JP) | SHARP KABUSHIKI KAISHA |
| NEC (JP) | NEC CORPORATION |
| INTEL (US) | INTEL CORPORATION |
| PIONEER (JP) | PIONEER CORPORATION |
| IBM (US) | INTERNATIONAL BUSINESS MACHINES CORPORATION |
| SAMSUNG (KR) | SAMSUNG ELECTRONICS CO., LTD. |

| Short Name | PCT Applicant Name: University Sector |
|-----------------------|--|
| CALIFORNIA (US) | THE REGENTS OF THE UNIVERSITY OF CALIFORNIA |
| MIT (US) | MASSACHUSETTS INSTITUTE OF TECHNOLOGY |
| COLUMBIA (US) | THE TRUSTEES OF COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK |
| TEXAS SYSTEM (US) | BOARD OF REGENTS, THE UNIVERSITY OF TEXAS SYSTEM |
| WISCONSIN (US) | WISCONSIN ALUMNI RESEARCH FOUNDATION |
| OSAKA UNIVERSITY (JP) | OSAKA UNIVERSITY |
| HARVARD (US) | PRESIDENT AND FELLOWS OF HARVARD COLLEGE |
| JOHNS HOPKINS (US) | THE JOHNS HOPKINS UNIVERSITY |
| KYOTO (JP) | KYOTO UNIVERSITY |
| STANFORD (US) | THE BOARD OF TRUSTEES OF THE LELAND STANFORD JUNIOR UNIVERSITY |
| FLORIDA (US) | UNIVERSITY OF FLORIDA RESEARCH FOUNDATION, INC. |
| TOKYO (JP) | THE UNIVERSITY OF TOKYO |
| ILLINOIS (US) | THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ILLINOIS |
| PENNSYLVANIA (US) | THE TRUSTEES OF THE UNIVERSITY OF PENNSYLVANIA |
| MICHIGAN (US) | THE REGENTS OF THE UNIVERSITY OF MICHIGAN |
| SUNY (US) | THE RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK |
| NAGOYA (JP) | NATIONAL UNIVERSITY CORPORATION NAGOYA UNIVERSITY |
| UTAH (US) | UNIVERSITY OF UTAH RESEARCH FOUNDATION |
| SOUTH FLORIDA (US) | UNIVERSITY OF SOUTH FLORIDA |
| CORNELL (US) | CORNELL RESEARCH FOUNDATION, INC. |
| TOHOKU (JP) | TOHOKU UNIVERSITY |

ANNEX B. IPC AND TECHNOLOGY CONCORDANCE TABLE

| Field of Technology | International Patent Classification (IPC) Symbols |
|---|--|
| I - Electrical engineering | |
| Electrical machinery, apparatus, energy | F21#, H01B, H01C, H01F, H01G, H01H, H01J, H01K, H01M, H01R, H01T, H02#, H05B, H05C, H05F, H99Z |
| Audio-visual technology | G09F, G09G, G11B, H04N-003, H04N-005, H04N-009, H04N-013, H04N-015, H04N-017, H04R, H04S, H05K |
| Telecommunications | G08C, H01P, H01Q, H04B, H04H, H04J, H04K, H04M, H04N-001, H04N-007, H04N-011, H04Q |
| Digital communication | H04L |
| Basic communication processes | H03# |
| Computer technology | (G06# not G06Q), G11C, G10L |
| IT methods for management | G06Q |
| Semiconductors | H01L |
| II - Instruments | |
| Optics | G02#, G03B, G03C, G03D, G03F, G03G, G03H, H01S |
| Measurement | G01B, G01C, G01D, G01F, G01G, G01H, G01J, G01K, G01L, G01M, (G01N not G01N-033), G01P, G01R, G01S; G01V, G01W, G04#, G12B, G99Z |
| Analysis of biological materials | G01N-033 |
| Control | G05B, G05D, G05F, G07#, G08B, G08G, G09B, G09C, G09D |
| Medical technology | A61B, A61C, A61D, A61F, A61G, A61H, A61J, A61L, A61M, A61N, H05G |
| III - Chemistry | |
| Organic fine chemistry | (C07B, C07C, C07D, C07F, C07H, C07J, C40B) not A61K, A61K-008, A61Q |
| Biotechnology | (C07G, C07K, C12M, C12N, C12P, C12Q, C12R, C12S) not A61K |
| Pharmaceuticals | A61K not A61K-008 |
| Macromolecular chemistry, polymers | C08B, C08C, C08F, C08G, C08H, C08K, C08L |
| Food chemistry | A01H, A21D, A23B, A23C, A23D, A23F, A23G, A23J, A23K, A23L, C12C, C12F, C12G, C12H, C12J, C13D, C13F, C13J, C13K |
| Basic materials chemistry | A01N, A01P, C05#, C06#, C09B, C09C, C09F, C09G, C09H, C09K, C09D, C09J, C10B, C10C, C10F, C10G, C10H, C10J, C10K, C10L, C10M, C10N, C11B, C11C, C11D, C99Z |
| Materials, metallurgy | C01#, C03C, C04#, C21#, C22#, B22# |
| Surface technology, coating | B05C, B05D, B32#, C23#, C25#, C30# |
| Micro-structural and nano-technology | B81#, B82# |
| Chemical engineering | B01B, B01D-000#, B01D-01##, B01D-02##, B01D-03##, B01D-041, B01D-043, B01D-057, B01D-059, B01D-06##, B01D-07##, B01F, B01J, B01L, B02C, B03#, B04#, B05B, B06B, B07#, B08#, D06B, D06C, D06L, F25J, F26#, C14C, H05H |
| Environmental technology | A62D, B01D-045, B01D-046, B01D-047, B01D-049, B01D-050, B01D-051, B01D-052, B01D-053, B09#, B65F, C02#, F01N, F23G, F23J, G01T, E01F-008, A62C |

IV - Mechanical engineering

| | |
|---------------------------------|--|
| Handling | B25J, B65B, B65C, B65D, B65G, B65H, B66#, B67# |
| Machine tools | B21#, B23#, B24#, B26D, B26F, B27#, B30#, B25B, B25C, B25D, B25F, B25G, B25H, B26B |
| Engines, pumps, turbines | F01B, F01C, F01D, F01K, F01L, F01M, F01P, F02#, F03#, F04#, F23R, G21#, F99Z |
| Textile and paper machines | A41H, A43D, A46D, C14B, D01#, D02#, D03#, D04B, D04C, D04G, D04H, D05#, D06G, D06H, D06J, D06M, D06P, D06Q, D99Z, B31#, D21#, B41# |
| Other special machines | A01B, A01C, A01D, A01F, A01G, A01J, A01K, A01L, A01M, A21B, A21C, A22#, A23N, A23P, B02B, C12L, C13C, C13G, C13H, B28#, B29#, C03B, C08J, B99Z, F41#, F42# |
| Thermal processes and apparatus | F22#, F23B, F23C, F23D, F23H, F23K, F23L, F23M, F23N, F23Q, F24#, F25B, F25C, F27#, F28# |
| Mechanical elements | F15#, F16#, F17#, G05G |
| Transport | B60#, B61#, B62#, B63B, B63C, B63G, B63H, B63J, B64# |

V - Other fields

| | |
|----------------------|--|
| Furniture, games | A47#, A63# |
| Other consumer goods | A24#, A41B, A41C, A41D, A41F, A41G, A42#, A43B, A43C, A44#, A45#, A46B, A62B, B42#, B43#, D04D, D07#, G10B, G10C, G10D, G10F, G10G, G10H, G10K, B44#, B68#, D06F, D06N, F25D, A99Z |
| Civil engineering | E02#, E01B, E01C, E01D, E01F-001, E01F-003, E01F-005, E01F-007, E01F-009, E01F-01#, E01H, E03#, E04#, E05#, E06#, E21#, E99Z |

| Definition for energy technology | International Patent Classification (IPC) Symbols |
|--|---|
| Solar energy solar (includes photovoltaic power and solar thermal power) | F03G 6/06, F24J 2/00, F24J 2/02, F24J 2/04, F24J 2/05, F24J 2/06, F24J 2/07, F24J 2/08, F24J 2/10, F24J 2/12, F24J 2/13, F24J 2/14, F24J 2/15, F24J 2/16, F24J 2/18, F24J 2/23, F24J 2/24, F24J 2/36, F24J 2/38, F24J 2/42, F24J 2/46, F03G 6/06, G02B 5/10, H01L 31/052, E04D 13/18, H01L 25/00, H01L 31/04, H01L 31/042, H01L 31/052, H01L 31/18, H02N 6/00, E04D 1/30, G02F 1/136, G05F 1/67, H01L 25/00, H01L 31/00, H01L 31/042, H01L 31/048, H01L 33/00, H02J 7/35, H02N 6/00 |
| Fuel cells technology | H01M 4/00, H01M 4/86, H01M 4/88, H01M 4/90, H01M 8/00, H01M 8/02, H01M 8/04, H01M 8/06, H01M 8/08, H01M 8/10, H01M 8/12, H01M 8/14, H01M 8/16, H01M 8/18, H01M 8/20, H01M 8/22, H01M 8/24 |
| Wind energy technology | F03D*, B60L 8/00 |

For further details about IPC see, www.wipo.int/classifications/ipc/en/

Source: WIPO

ANNEX C. RELATIVE SPECIALIZATION INDEX (RSI) OF FOREIGN-ORIENTED PATENT FAMILIES BY ORIGIN

| Fields of Technology | AU | AT | BE | CA | CN | DK | FI | FR | DE | IN |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| I - Electrical engineering | | | | | | | | | | |
| Electrical machinery, apparatus, energy | -0.56 | 0.14 | | -0.19 | 0.21 | | -0.48 | -0.08 | 0.01 | |
| Audio-visual technology | -0.63 | | | -0.58 | 0.05 | -0.61 | -0.37 | -0.65 | -0.82 | |
| Telecommunications | -0.58 | | | 0.29 | 0.73 | | 1.07 | 0.04 | -0.57 | |
| Digital communication | -0.57 | | | 0.65 | 1.11 | | 1.29 | 0.27 | -0.47 | |
| Basic communication processes | | | | -0.23 | -0.30 | | 0.41 | -0.10 | -0.21 | 0.30 |
| Computer technology | -0.12 | | | 0.27 | 0.12 | | 0.25 | -0.31 | -0.49 | |
| IT methods for management | 0.68 | | | 0.52 | -0.62 | | 0.32 | -0.59 | -0.81 | |
| Semiconductors | -1.21 | | -0.71 | | -0.46 | | -1.08 | -0.76 | -0.51 | |
| II - Instruments | | | | | | | | | | |
| Optics | -0.83 | | -0.37 | -1.02 | -0.33 | | -1.12 | -0.74 | -0.69 | |
| Measurement | -0.15 | | | -0.06 | -0.13 | | 0.02 | 0.02 | 0.29 | |
| Analysis of biological materials | 0.37 | | 0.31 | -0.23 | -0.43 | 0.47 | | -0.29 | -0.30 | |
| Control | 0.37 | 0.25 | | 0.10 | -0.33 | | -0.15 | 0.12 | 0.19 | |
| Medical technology | 0.45 | | | | -0.04 | 0.84 | | -0.08 | -0.18 | 0.71 |
| III - Chemistry | | | | | | | | | | |
| Organic fine chemistry | -0.24 | | | | -0.10 | 0.68 | | 0.40 | 0.12 | 1.88 |
| Biotechnology | 0.44 | | 0.43 | -0.48 | -0.01 | 1.20 | | -0.30 | -0.38 | |
| Pharmaceuticals | 0.34 | | | | 0.18 | 1.07 | | -0.07 | -0.39 | 1.67 |
| Macromolecular chemistry, polymers | -0.72 | -0.22 | 0.84 | -0.57 | -0.43 | | -0.29 | -0.02 | 0.25 | |
| Food chemistry | 0.52 | | 0.80 | | | 1.39 | | 0.00 | -0.19 | 1.13 |
| Basic materials chemistry | -0.22 | | 0.45 | -0.49 | 0.04 | 0.01 | | -0.15 | 0.25 | 0.50 |
| Materials, metallurgy | 0.16 | 0.87 | 0.74 | 0.06 | 0.15 | | | 0.15 | 0.17 | |
| Surface technology, coating | -0.45 | -0.04 | 0.46 | -0.30 | | | -0.28 | -0.21 | -0.02 | |
| Micro-structural and nano-technology | -0.04 | | | | -0.12 | -0.15 | -0.47 | 0.30 | -0.03 | |
| Chemical engineering | 0.21 | | | 0.20 | 0.14 | 0.25 | 0.28 | 0.20 | 0.35 | |
| Environmental technology | 0.27 | 0.59 | | 0.38 | | 0.18 | 0.29 | 0.28 | 0.33 | |
| IV - Mechanical engineering | | | | | | | | | | |
| Handling | 0.46 | | | 0.37 | | 0.40 | 0.39 | 0.30 | 0.27 | |
| Machine tools | 0.07 | 0.92 | | 0.37 | -0.31 | | 0.10 | -0.01 | 0.51 | |
| Engines, pumps, turbines | -0.51 | 0.22 | | 0.13 | -0.65 | 0.09 | | 0.21 | 0.61 | |
| Textile and paper machines | -0.51 | 0.11 | 0.85 | -0.85 | | | 0.82 | -0.43 | 0.13 | |
| Other special machines | 0.45 | 0.62 | 0.69 | 0.55 | | 0.33 | | 0.23 | 0.35 | |
| Thermal processes and apparatus | 0.23 | 0.99 | | 0.52 | 0.31 | 0.44 | | 0.02 | 0.36 | |
| Mechanical elements | 0.22 | 0.52 | | 0.15 | | 0.16 | | 0.37 | 0.70 | |
| Transport | 0.02 | 0.41 | | 0.11 | | | -0.72 | 0.71 | 0.70 | |
| V - Other fields | | | | | | | | | | |
| Furniture, games | 0.86 | 0.98 | | 0.79 | 0.05 | | | 0.22 | -0.09 | |
| Other consumer goods | 0.37 | 0.49 | | 0.34 | -0.06 | | | 0.41 | 0.02 | |
| Civil engineering | 1.16 | 1.37 | | 1.11 | | | | 0.53 | 0.31 | |

Note: Relative Specialization Index (RSI) is calculated as the country's share foreign-oriented patent families in a specific technology over country's share in all foreign-oriented patent families. A positive (negative) RSI value for a particular technology implies that the country has a relatively high (low) share of patent families in that technology. RSI provides an indication of countries' R&D strength in a particular field of technology. Country codes: Australia (AU), Austria (AT), Belgium (BE), Canada (CA), China (CN), Denmark (DK), Finland (FI), France (FR), Germany (DE), India (IN), Israel (IL), Italy (IT), Japan (JP), Republic of Korea (KR), Netherlands (NL), Norway (NO), Singapore (SG), Spain (SP), Sweden (SE), Switzerland (CH), United Kingdom (UK), United States of America (US).

The formula used for the Relative Specialization Index is the following: where F is the number of filings or patent families in a given technology field and country of origin and c, t are indexes for the country of origin and technology field respectively:

$$RSI = \log \left(\frac{F_{ct} / \sum_t F_{ct}}{\sum_c F_{ct} / \sum_{ct} F_{ct}} \right)$$

| IL | IT | JP | KR | NL | NO | SG | SP | SE | CH | UK | US | Others |
|------|-------|-------|-------|-------|------|------|------|-------|-------|-------|-------|--------|
| | -0.16 | 0.28 | 0.40 | -0.02 | | | | -0.57 | -0.18 | -0.47 | -0.39 | 0.02 |
| | -1.41 | 0.45 | 0.71 | 0.57 | | | | -0.81 | -0.86 | -0.58 | -0.48 | 0.07 |
| 0.21 | -0.94 | 0.07 | 0.68 | 0.17 | | | | 0.41 | -0.78 | -0.18 | -0.03 | -0.34 |
| 0.21 | -1.01 | -0.28 | 0.44 | 0.07 | | | | 0.52 | -0.98 | -0.02 | 0.24 | -0.53 |
| | -0.55 | 0.16 | 0.49 | 0.70 | | 1.06 | | -0.03 | -0.87 | -0.30 | -0.18 | -0.14 |
| 0.05 | -0.87 | 0.11 | 0.24 | 0.22 | | | | -0.35 | -0.74 | -0.22 | 0.09 | -0.14 |
| 0.19 | -0.91 | -0.09 | -0.61 | -0.34 | | | | -0.40 | -0.35 | -0.14 | 0.40 | -0.20 |
| | -1.12 | 0.42 | 0.81 | 0.22 | | 1.20 | | -1.26 | -0.99 | -0.89 | -0.42 | -0.04 |
| | -1.12 | 0.54 | 0.59 | 0.22 | | | | -1.02 | -0.77 | -0.68 | -0.53 | -0.20 |
| 0.29 | -0.30 | -0.03 | -0.53 | -0.07 | | | | 0.08 | 0.49 | 0.09 | -0.01 | -0.21 |
| | -0.88 | -0.76 | -1.58 | -0.26 | | | | -0.03 | -0.08 | 0.41 | 0.62 | -0.58 |
| | 0.05 | 0.00 | -0.38 | -0.32 | | | | 0.08 | 0.09 | -0.01 | -0.04 | -0.03 |
| 0.86 | 0.06 | -0.75 | -1.37 | -0.16 | | | | 0.50 | 0.42 | 0.54 | 0.46 | -0.21 |
| | -0.11 | -0.70 | -1.07 | -0.26 | | | 0.46 | 0.11 | 0.37 | 0.62 | 0.36 | -0.53 |
| | -0.72 | -0.92 | -1.18 | -0.02 | | | | -0.33 | -0.23 | 0.44 | 0.62 | -0.33 |
| | -0.12 | -1.17 | -1.43 | -0.41 | | | 0.54 | 0.26 | 0.12 | 0.73 | 0.58 | -0.28 |
| | -0.01 | 0.17 | -0.52 | -0.27 | | | | | 0.01 | -0.34 | -0.05 | -0.76 |
| | 0.54 | -0.45 | -0.72 | 1.03 | | | 0.98 | -0.38 | 0.69 | 0.20 | 0.14 | 0.17 |
| | -0.46 | -0.09 | -0.66 | 0.01 | | | | | 0.33 | 0.23 | 0.10 | -0.31 |
| | -0.05 | 0.18 | -0.44 | -0.45 | | | | 0.06 | -0.05 | -0.42 | -0.23 | -0.03 |
| | -0.21 | 0.22 | -0.19 | -0.54 | | | | -0.27 | -0.02 | -0.40 | -0.05 | -0.32 |
| | -0.47 | -0.16 | 0.37 | -0.02 | | 1.31 | | 0.15 | -0.58 | -0.57 | 0.18 | -0.38 |
| | 0.46 | -0.31 | -0.40 | -0.10 | | | | 0.12 | 0.32 | 0.13 | 0.05 | 0.04 |
| | 0.29 | -0.09 | -0.54 | -0.06 | | | | 0.17 | -0.20 | 0.06 | -0.12 | 0.09 |
| | 1.17 | -0.18 | -0.64 | 0.02 | | | 0.87 | 0.23 | 0.97 | 0.22 | -0.21 | -0.01 |
| | 0.78 | -0.07 | -0.76 | -0.48 | | | | 0.66 | 0.56 | -0.37 | -0.25 | 0.15 |
| | 0.25 | 0.09 | -0.62 | -0.94 | | | | 0.00 | 0.18 | -0.12 | -0.32 | -0.34 |
| | 0.33 | 0.39 | -0.56 | -0.44 | | | | -0.30 | 0.50 | -0.47 | -0.41 | -0.58 |
| | 0.81 | -0.18 | -0.81 | 0.02 | | | | 0.04 | 0.43 | -0.02 | -0.10 | 0.07 |
| | 0.67 | -0.16 | 0.43 | -0.15 | | | | 0.25 | 0.28 | -0.17 | -0.27 | 0.14 |
| | 0.58 | -0.04 | -0.82 | -0.71 | | | 0.34 | 0.57 | 0.13 | -0.02 | -0.38 | -0.29 |
| | 0.43 | 0.04 | -0.86 | -0.60 | | | 0.64 | 0.42 | -0.62 | -0.28 | -0.43 | -0.54 |
| | 0.89 | -0.37 | 0.03 | 0.04 | | | 0.74 | 0.13 | 0.37 | 0.33 | 0.01 | 0.26 |
| | 0.88 | -0.24 | 0.45 | -0.07 | | | 0.71 | -0.06 | 0.41 | 0.11 | -0.11 | 0.16 |
| | 0.87 | -0.76 | -0.91 | 0.15 | 1.60 | | 1.08 | 0.48 | 0.40 | 0.46 | -0.05 | 0.34 |

ANNEX D. COST OF PATENTING METHODOLOGY

The patenting costs of Section J are based on estimates provided by Global IP Estimator (<http://www.globalip.com/>). The cost estimations include the following stages: filing, examining, prosecution and granting; and the international phase for PCT scenarios. They do not include any in-house and pre-filing costs. Global IP bases its legal and translation costs estimates on typical fee schedules supplied by foreign associates. All figures are in US dollars.

In all scenarios, the applicant is the assignee and is a large company based in the USA, filing electronically when possible. It should be noted that the costs of patenting are relatively similar regardless the country of origin of the applicant.

The priority year is 2006 and the last maintenance year 2016. The patent application has 30 pages (including 2 pages of drawings), contains 15 claims and has 2 convention priorities.

No legal costs have been counted for the procedure at the United States Patent and Trademark Office (USPTO) as it is assumed that the applicant can follow that procedure without external support. When filing PCT in the 2 countries scenario, the International Searching Authority (ISA) is the USPTO, otherwise it is the European Patent Office. No chapter II demand has been made.

The countries selected by the applicant for patent protection are the following:

| 2 countries | 7 countries | 15 countries |
|--------------------------|---|---|
| Japan | China | Australia |
| United States of America | European Patent Office (validation in France, Germany and United Kingdom) | Brazil |
| | Japan | Canada |
| | United States of America | China |
| | Republic of Korea | European Patent Office (validation in France, Germany and United Kingdom) |
| | | Israel |
| | | India |
| | | Japan |
| | | Mexico |
| | | United States of America |
| | | Republic of Korea |
| | | Russian Federation |
| | | Singapore |

GLOSSARY

Applicant. An individual or company that files an application for patent rights. The name of the patent applicant is used to determine the owner of the patent rights.

Application (Filing) Date. The date on which the patent office received the patent application that meets the minimum requirements.

Country of Origin. The country of residence of the first-named applicant or assignee of a patent application. Country of origin is used to determine the origin of the patent application.

European Patent Convention. The Convention on the Grant of European Patents, commonly known as the European Patent Convention (EPC), is a multilateral treaty instituting the European Patent Organization and providing a legal system according to which European patents are granted. The EPC permits the applicant to file a single application at the European Patent Office and to designate any of the EPC Member States.

European Patent Office. The European Patent Office (EPO) is one of the regional patent offices, created under the European Patent Convention (EPC), responsible for granting European patents for the Member States of the EPC. The EPO also acts as an international searching authority and international preliminary examining authority for the PCT and performs searches on behalf of some national offices.

Extra-Regional Filings. Patent applications by applicants who are not resident of a member State of a region (such as the EPC) filed at Offices of that region.

Foreign-Oriented Patent Families. A set of inter-related patent applications filed in one or more foreign countries to protect the same invention.

Grant Date. The date on which the patent office granted patent rights.

Gross Domestic Product. Gross Domestic Product (GDP) is one of the measures of national income and output for a given country's economy.

International Bureau. International Bureau (IB) of the World Intellectual Property Organization. In addition to its task as receiving Office for PCT international applicants from all Contracting States, it handles certain processing tasks in respect of all international applications filed with all receiving Offices worldwide. 18 months after the filing date or the priority date if any, the international application is published by the IB, in one of the languages of publication.

International Patent Classification. International Patent Classification (IPC) is an internationally recognized patent classification system. IPC is a hierarchical system that divides technology into a range of sections, classes, subclasses and groups.

Intra-Regional Filings. Patent applications by applicants who are resident of a member State of a region (such as the EPC) filed at Offices of the same region.

Maintenance. The process by which patent protection is maintained (or kept in force). This usually consists of paying maintenance (renewal) fees to the patent office at regular intervals. If maintenance (renewal) fees are not paid, patent protection may lapse.

Non-Resident Filings. A "non-resident" filing refers to an application filed at the Office of or acting for the State in which the first-named applicant in the application concerned does not have residence. This criterion is used to compile non-resident patent statistics. For example, a patent application filed by an American applicant at the Japan Patent Office (JPO) is considered as a non-resident filing for JPO statistics.

Opposition. An administrative process for disputing the validity of a granted patent that is often limited to a specific time period after the patent has been granted. For example, this may be up to nine months from the date of grant of a European patent.

Paris Convention. The Paris Convention for the Protection of Industrial Property, signed in Paris, France, on March 20, 1883, is one of the first and most important intellectual property treaties. Thanks to this treaty, intellectual property systems, including patent systems, of any contracting state are accessible to the nationals of other States party to the Convention. In particular, the Paris Convention establishes the “right of priority” which enables a patent applicant, when filing an application in countries other than the original country of filing, to claim priority of up to 12 months for this filing.

Patent Application. The procedure for requesting patent protection at a patent office. To obtain patent rights, the applicant must request patent rights and provide the patent office with all relevant documents and fees. The patent office examines the application and decides whether to grant or reject the application.

Patent Cooperation Treaty. Patent Cooperation Treaty (PCT) is an international treaty administered by the World Intellectual Property Organization (WIPO). The PCT makes it possible to seek patent protection for an invention simultaneously in a large number of countries by filing a single “international application” with a single patent office (i.e. receiving Office). The PCT system simplifies the process of multi-national patent filings by reducing the requirement to file multiple patent applications for multi-national patent rights. PCT international applications do not result in the issuance of “international patents” and the International Bureau (IB) does not grant patents. The decision on whether to confer patent rights remains in the hands of the national and/or regional patent offices, and patent rights are limited to the jurisdiction of the patent granting authority.

Patent Family. A patent family is a set of inter-related patent applications filed in one or more countries to protect the same invention.

Patent Grant. Legal rights conferred on the applicant by a patent office for a limited period (normally 20 years).

Patent in Force. A patent that is currently valid. To remain in force, a patent must be maintained, usually by paying maintenance (renewal) fees to the patent office at regular intervals.

Patent. A patent is an exclusive right granted by law to applicants / assignees to make use of and exploit their inventions for a limited period (generally 20 years from filing). The patent holder has the legal right to exclude others from commercially exploiting his invention for this limited period. In return for exclusive rights, the applicant is obliged to disclose the invention to the public in a manner that enables others, skilled in the art, to replicate the invention. The patent system is designed to balance the interests of applicants / assignees (exclusive rights) and the interests of society (disclosure of invention).

PCT International Application. A patent application filed under the Patent Cooperation Treaty.

PCT National Phase Entry. A PCT international application which has entered the national/regional phase. The national phase must usually be initiated within 30 months from the priority date of the application (longer time periods are allowed in some offices) and usually requires an explicit action from the applicant and/or payment of fees.

Pending Application. An application for which a patent office has not yet decided whether to grant or reject.

Publication Date. The date on which the patent application is published by the patent office (or the IB when patent application is filed under PCT). Information about the patent application is normally disclosed to the public after the expiration of the 18 months from the priority date.

Regional Application (Grant). A patent application (granted patent) which is filed (granted) by a regional patent office. There are currently four regional patent offices: the African Regional Intellectual Property Organization (ARIPO), the Eurasian Patent Organization (EAPO), the European Patent Office (EPO) and the African Intellectual Property Organization (OAPI).

Research and Development Expenditure. Research and development (R&D) expenditure is the money spent on creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications.

Resident Filing. The "resident" filing refers to an application filed at the Office of or acting for the State in which the first-named applicant in the application concerned has residence. This criterion is used to compile resident patent statistics. For example, a patent application filed by an American applicant at the United States Patent and Trademark Office (USPTO) is considered as a resident filing for USPTO statistics.

Utility Model. A utility model is a special form of IP rights for inventions granted by a State to an inventor or his assignee for a fixed time-period. The terms and conditions of the granting of utility models are different from those for normal patents (e.g. shorter term and less stringent examination requirements). Utility models are an important alternative to patents in countries in which they are available. The terminology used to describe an invention protected by utility models varies between countries. For example, innovation patent (Australia), short-term patent (Ireland), utility innovations (Malaysia), and utility certificate (Uganda).

World Intellectual Property Organization. The World Intellectual Property Organization (WIPO) is a specialized agency of the United Nations. It is dedicated to developing a balanced and accessible international intellectual property (IP) system, which rewards creativity, stimulates innovation and contributes to economic development while safeguarding the public interest. WIPO was established in 1967 with a mandate from its Member States to promote the protection of IP throughout the world through cooperation among states and in collaboration with other international organizations.

STATISTICAL TABLES

Table A1. Patent activity by patent office and country of origin, 2006

| Name | By Patent Offices | | | | Countries of Origin | | |
|----------------------------------|----------------------|----------------------------------|---------------------|---------------------------------|------------------------|----------------------|---------------------|
| | N° of Patent Filings | Share of Resident Filings (in %) | N° of Patent Grants | Share of Resident Grants (in %) | N° of Patents in Force | N° of Patent Filings | N° of Patent Grants |
| Albania | | | | | | 1 | |
| Algeria | 669 | 8.7 | 479 | 16.5 | 2,334 | 61 | 79 |
| Andorra | | | | | | 3 | 1 |
| Angola | | | | | | 1 | |
| Antigua and Barbuda | | | | | | 5 | 1 |
| Argentina | | | | | | 265 | 82 |
| Armenia | 193 | 99.5 | 213 | 98.6 | 404 | 207 | 214 |
| Australia | 26,003 | 10.9 | 9,426 | 9.8 | 95,912 | 10,809 | 4,163 |
| Austria | 2,649 | 85.7 | 1,564 | 84.8 | 10,326 | 6,795 | 3,537 |
| Azerbaijan | | | | | | 7 | 8 |
| Bahamas | 80 | 100.0 | | | | 140 | 16 |
| Bahrain | | | | | | 3 | |
| Bangladesh | 310 | 7.1 | 162 | 9.9 | | 22 | 16 |
| Barbados | | | | | | 447 | 136 |
| Belarus** | 1,525 | 77.9 | 1,130 | 89.8 | | 1,349 | 1,120 |
| Belgium | 651 | 75.3 | 548 | 77.2 | | 7,235 | 2,773 |
| Belize | 37 | 2.7 | 7 | | | 9 | 4 |
| Benin | | | | | | 1 | |
| Bolivia | | | | | | 5 | |
| Bosnia and Herzegovina | 217 | 25.3 | 272 | 14.0 | 178 | 55 | 38 |
| Brazil | 24,074 | 15.8 | 2,465 | 9.5 | 31,223 | 4,747 | 585 |
| Bulgaria | 291 | 83.5 | 317 | 21.8 | 3,441 | 328 | 83 |
| Cameroon | | | | | | 4 | |
| Canada | 42,038 | 13.1 | 14,972 | 10.6 | 115,639 | 21,555 | 7,533 |
| Chad | | | | | | 1 | |
| Chile | 3,215 | 9.1 | 406 | 14.3 | | 428 | 78 |
| China*** | 210,501 | 58.1 | 57,786 | 43.4 | 182,396 | 128,850 | 26,292 |
| Colombia | | | | | | 42 | 7 |
| Cook Islands | | | | | | | 2 |
| Costa Rica | | | | | | 21 | 6 |
| Croatia | 436 | 72.7 | 183 | 24.0 | 1,163 | 415 | 83 |
| Cuba | 257 | 36.6 | 73 | 56.2 | | 159 | 66 |
| Cyprus* | 56 | 39.3 | | | | 127 | 31 |
| Czech Republic | 836 | 76.7 | 1,324 | 19.9 | 10,298 | 1,082 | 403 |
| Democratic Republic of the Congo | | | | | | 1 | |
| Denmark | 1,691 | 88.9 | 162 | 62.3 | 3,688 | 6,734 | 2,170 |
| Dominica | | | | | | 1 | |
| Dominican Republic | 242 | | | | | 8 | 1 |
| Ecuador | | | | | | 12 | 5 |
| Egypt* | 1,377 | 26.8 | | | | 408 | 6 |
| El Salvador | | | | | | 3 | 1 |
| Estonia | 45 | 80.0 | | | 2,033 | 59 | 8 |
| Ethiopia | | | | | | 2 | |
| Eurasian Patent Organization | 2,293 | | 1,251 | | | | |
| European Patent Office | 135,231 | | 62,780 | | | 1 | |

| Name | By Patent Offices | | | | Countries of Origin | | |
|----------------------------|----------------------|----------------------------------|---------------------|---------------------------------|------------------------|----------------------|---------------------|
| | N° of Patent Filings | Share of Resident Filings (in %) | N° of Patent Grants | Share of Resident Grants (in %) | N° of Patents in Force | N° of Patent Filings | N° of Patent Grants |
| Fiji | | | | | | | 1 |
| Finland | 2,018 | 90.0 | 1,059 | 67.8 | 43,345 | 9,681 | 4,341 |
| France | 17,249 | 84.2 | 13,788 | 77.6 | 377,755 | 44,677 | 25,688 |
| Gabon | | | | | | 1 | |
| Georgia | 535 | 44.1 | 287 | 49.5 | 2,606 | 250 | 146 |
| Germany | 60,585 | 79.2 | 21,034 | 73.5 | 460,657 | 130,806 | 56,091 |
| Ghana | | | | | | 1 | |
| Greece* | 572 | 97.2 | | | | 827 | 98 |
| Guatemala | 528 | 5.3 | | | 1,030 | 31 | 1 |
| Honduras | | | | | | 1 | 1 |
| Hong Kong (SAR), China | 13,790 | 1.2 | 5,146 | 1.0 | 141,766 | 1,185 | 406 |
| Hungary | 924 | 77.7 | 1,089 | 12.9 | 8,408 | 1,395 | 399 |
| Iceland | 371 | 12.1 | 112 | 5.4 | 505 | 158 | 63 |
| India (2005) | 24,505 | 18.4 | 4,320 | 32.3 | | 8,094 | 2,267 |
| Indonesia | 4,606 | 6.1 | | | | 308 | 13 |
| Iran (Islamic Republic of) | | | | | | 25 | 4 |
| Iraq | | | | | | 1 | |
| Ireland | 935 | 89.6 | 357 | 80.1 | | 2,877 | 874 |
| Israel | 7,496 | 3.4 | 2,584 | 14.7 | 6,941 | 7,051 | 2,534 |
| Jamaica | 153 | 13.7 | 43 | 20.9 | | 25 | 9 |
| Japan | 408,674 | 84.9 | 141,399 | 89.7 | 1,146,871 | 514,047 | 217,364 |
| Jordan | | | | | | 36 | 1 |
| Kazakhstan | 1,557 | 92.0 | | | | 1,473 | 16 |
| Kenya | 71 | 53.5 | 24 | 29.2 | 120 | 51 | 10 |
| Kuwait | | | | | | 37 | 7 |
| Kyrgyzstan | | | | | | 3 | 4 |
| Latvia | 151 | 75.5 | 120 | 67.5 | 4,167 | 149 | 87 |
| Lebanon | | | | | | 17 | 2 |
| Libyan Arab Jamahiriya | | | | | | 1 | |
| Liechtenstein | | | | | | 667 | 452 |
| Lithuania | 99 | 65.7 | 89 | 66.3 | 739 | 74 | 69 |
| Luxembourg | 52 | 50.0 | 55 | 41.8 | 25,728 | 843 | 337 |
| Macau, China | 131 | | 17 | | 28 | 2 | 2 |
| Madagascar | 44 | 9.1 | 28 | 25.0 | 255 | 4 | 7 |
| Malaysia | | | | | | 490 | 147 |
| Malta | 805 | | 653 | | 1,746 | 41 | 9 |
| Marshall Islands | | | | | | 2 | |
| Mauritania | | | | | | 2 | |
| Mauritius | | | | | | 21 | 8 |
| Mexico | 15,505 | 3.7 | 9,632 | 1.4 | 54,722 | 1,014 | 252 |
| Moldova | 312 | 97.1 | 288 | 99.7 | 1,196 | 308 | 292 |
| Monaco | 13 | 46.2 | 5 | 20.0 | 45,507 | 75 | 31 |
| Mongolia | 213 | 48.4 | 174 | 52.3 | 13,621 | 103 | 91 |
| Morocco | 910 | 19.6 | 699 | 18.3 | | 180 | 133 |
| Namibia | | | | | | 2 | 2 |
| Netherlands | 2,716 | 79.8 | 2,361 | 76.5 | 14,084 | 27,389 | 9,949 |
| New Zealand | 7,365 | 29.2 | 3,412 | 12.2 | 34,291 | 3,589 | 896 |

| Name | By Patent Offices | | | | | Countries of Origin | |
|---|----------------------|----------------------------------|---------------------|---------------------------------|------------------------|----------------------|---------------------|
| | N° of Patent Filings | Share of Resident Filings (in %) | N° of Patent Grants | Share of Resident Grants (in %) | N° of Patents in Force | N° of Patent Filings | N° of Patent Grants |
| Nigeria | | | | | | 3 | |
| Norway | 6,076 | 18.9 | | | | 3,430 | 1,138 |
| Oman | | | | | | 3 | |
| Pakistan | 1,788 | | 299 | | | 13 | 2 |
| Panama | | | | | | 28 | 7 |
| Papua New Guinea | | | | | | 1 | |
| Paraguay | | | | | | 2 | 1 |
| Peru | 1,271 | 3.1 | 306 | 1.0 | 2,167 | 42 | 6 |
| Philippines | 3,265 | 7.1 | 1,053 | 3.6 | | 310 | 76 |
| Poland | 2,812 | 76.7 | 2,686 | 41.8 | | 2,487 | 1,216 |
| Portugal | 220 | 83.6 | 125 | 77.6 | 37,848 | 466 | 196 |
| Qatar | | | | | | 2 | 2 |
| Republic of Korea | 166,189 | 75.5 | 120,790 | 73.9 | 465,988 | 172,709 | 102,633 |
| Romania | 876 | 92.9 | 787 | 67.0 | 8,458 | 877 | 543 |
| Russian Federation | 37,691 | 74.0 | 23,299 | 82.1 | 123,817 | 29,059 | 19,641 |
| Saint Kitts and Nevis | | | | | | 1 | |
| Saint Lucia | | | 34 | | | | |
| Saint Vincent and the Grenadines | | | | | | 2 | |
| San Marino | | | | | | 6 | 2 |
| Saudi Arabia | 538 | 22.1 | 1,044 | 4.0 | | 229 | 73 |
| Serbia and Montenegro (formerly Yugoslavia) | | | | | | 16 | 10 |
| Seychelles | | | | | | 31 | 18 |
| Singapore | 9,163 | 6.8 | 7,393 | 5.9 | 46,823 | 2,243 | 995 |
| Slovakia | 283 | 68.2 | 543 | 13.3 | 4,830 | 303 | 114 |
| Slovenia | 299 | 96.0 | 228 | 94.3 | 7,063 | 463 | 277 |
| South Africa | | | | | | 874 | 354 |
| Spain | 3,427 | 90.8 | 2,165 | 87.9 | 155,621 | 7,093 | 3,221 |
| Sri Lanka | | | | | | 10 | 3 |
| Sweden | 2,859 | 85.6 | 1,490 | 80.7 | 100,836 | 14,915 | 7,224 |
| Switzerland | 2,102 | 82.8 | 948 | 55.1 | 6,573 | 24,861 | 9,857 |
| Syrian Arab Republic | 257 | 48.2 | | | | 130 | 3 |
| T F Y R of Macedonia | | | | | | 2 | |
| Tajikistan | 26 | 100.0 | 437 | 42.8 | 257 | 26 | 187 |
| Thailand | 6,248 | 14.6 | 1,121 | 10.5 | 8,026 | 1,021 | 158 |
| Trinidad and Tobago | 551 | | 81 | 2.5 | | 2 | 5 |
| Tunisia | | | | | | 9 | 3 |
| Turkey | 1,232 | 87.0 | 659 | 16.2 | | 1,419 | 184 |
| Ukraine | 5,890 | 59.0 | 3,705 | 67.6 | 32,399 | 3,909 | 2,889 |
| United Arab Emirates | | | | | | 67 | 16 |
| United Kingdom*** | 25,745 | 67.9 | 7,907 | 37.7 | 383,501 | 41,085 | 13,183 |
| United Republic of Tanzania | | | | | | 1 | |
| United States of America | 425,966 | 52.1 | 173,770 | 51.7 | 1,774,742 | 390,815 | 154,760 |
| Uruguay | | | | | | 16 | 7 |
| Uzbekistan | 509 | 63.5 | 272 | 59.2 | 1,370 | 332 | 162 |
| Vanuatu | | | | | | 3 | 1 |
| Venezuela | | | | | | 30 | 23 |
| Viet Nam* | 1,867 | 9.8 | | | | 189 | |
| Zimbabwe | | | | | | 3 | 1 |
| Others | | | | | | 76,978 | 17,191 |

Note: * Estimated data for patent filings at patent offices, ** Estimated data for patent grants at patent offices. For few countries of origin, statistics might be incomplete, *** Patent in force data refers to 2005 instead of 2006.

Table A2. Patent filings in the international (in 2007) and national (in 2006) phases of the PCT System, by patent office and country of origin

| Name | PCT International Phase Filings in 2007 | | PCT National Phase Entries in 2006 | |
|---|--|-------------------------|---------------------------------------|-------------------------|
| | At Receiving Office | By Country of Origin | At Designated / Elected Office | By Country of Origin |
| African Intellectual Property Organization | 1 | | | |
| Algeria | 11 | 12 | 564 | 3 |
| Andorra | | 3 | | 2 |
| Antigua and Barbuda | | | | 3 |
| Argentina | | 31 | | 45 |
| Armenia | 3 | 4 | 1 | |
| Australia | 2,023 | 2,071 | 20,185 | 6,477 |
| Austria | 577 | 1,000 | 465 | 2,365 |
| Azerbaijan | 7 | 7 | | |
| Bahamas | | 38 | | 31 |
| Barbados | | 168 | | 303 |
| Belarus | 6 | 10 | 148 | 2 |
| Belgium | 130 | 1,117 | | 3,508 |
| Belize | | 1 | 36 | 8 |
| Bolivia | | 1 | | 2 |
| Bosnia and Herzegovina | 11 | 13 | 160 | |
| Brazil | 378 | 394 | 18,057 | 573 |
| Bulgaria | 26 | 29 | 40 | 30 |
| Burundi | | 1 | | |
| Cameroon | | 1 | | 2 |
| Canada | 2,393 | 2,827 | 30,536 | 6,219 |
| Chile | | 17 | | 18 |
| China | 5,456 | 5,470 | 48,200 | 2,260 |
| Colombia | | 45 | | 6 |
| Cook Islands | | 1 | | |
| Costa Rica | 2 | 3 | | 8 |
| Croatia | 59 | 79 | 98 | 56 |
| Cuba | 22 | 22 | | 29 |
| Cyprus | 5 | 74 | | 54 |
| Czech Republic | 119 | 129 | 109 | 251 |
| Democratic People's Republic of Korea | 2 | 2 | 54 | |
| Denmark | 752 | 1,172 | 37 | 3,537 |
| Dominican Republic | 2 | 2 | | |
| Ecuador | 4 | 2 | | 4 |
| Egypt | 42 | 40 | | 19 |
| El Salvador | | | | 1 |
| Estonia | 25 | 29 | 2 | 11 |
| Eurasian Patent Organization | 10 | | 1,867 | |
| European Patent Office | 26,332 | | 74,223 | |
| Fiji | | 1 | | |
| Finland | 1,039 | 1,994 | 73 | 4,958 |
| France | 3,363 | 6,523 | | 16,745 |
| Gabon | | | | 1 |
| Georgia | 6 | 8 | 261 | 7 |
| Germany | 2,329 | 17,889 | 3,008 | 43,611 |

| Name | PCT International Phase Filings in 2007 | | PCT National Phase Entries in 2006 | |
|----------------------------|--|-------------------------|---------------------------------------|-------------------------|
| | At Receiving Office | By Country of Origin | At Designated / Elected Office | By Country of Origin |
| Ghana | 1 | | | |
| Greece | 65 | 86 | | 138 |
| Guatemala | | 2 | | |
| Hong Kong (SAR), China | | 1 | | 60 |
| Hungary | 130 | 161 | 176 | 543 |
| Iceland | 26 | 51 | 329 | 70 |
| India | 607 | 880 | | 1,615 |
| Indonesia | 5 | 9 | 3,805 | 2 |
| International Bureau | 8,916 | | | |
| Iran (Islamic Republic of) | | 3 | | 6 |
| Iraq | | 1 | | |
| Ireland | 125 | 393 | | 1,070 |
| Israel | 1,649 | 1,719 | 5,795 | 3,194 |
| Italy | 924 | 2,911 | | 6,289 |
| Japan | 27,230 | 27,732 | 50,971 | 63,363 |
| Jordan | | 22 | | |
| Kazakhstan | 14 | 14 | | 6 |
| Kenya | | 4 | 30 | 4 |
| Kuwait | | 3 | | 1 |
| Kyrgyzstan | 1 | 2 | | 2 |
| Latvia | 6 | 21 | 20 | 16 |
| Lebanon | | 2 | | 6 |
| Libyan Arab Jamahiriya | | | | 1 |
| Liechtenstein | | 67 | | 166 |
| Lithuania | 10 | 13 | 24 | 7 |
| Luxembourg | | 155 | | 474 |
| Madagascar | | | 39 | |
| Malaysia | 93 | 105 | | 42 |
| Malta | | 13 | | 5 |
| Marshall Islands | | | | 1 |
| Mauritius | | 9 | | 4 |
| Mexico | 157 | 182 | 12,932 | 263 |
| Monaco | | 7 | | 32 |
| Mongolia | | | 101 | |
| Morocco | 13 | 18 | | |
| Namibia | | 2 | | 2 |
| Netherlands | 1,042 | 4,165 | | 16,843 |
| New Zealand | 390 | 395 | 4,494 | 974 |
| Nigeria | | 1 | | |
| Norway | 460 | 596 | 4,264 | 1,572 |
| Pakistan | | 4 | | |
| Panama | | 12 | | 10 |
| Papua New Guinea | | | | 1 |
| Peru | | 2 | | |
| Philippines | 17 | 18 | 2,666 | 20 |
| Poland | 88 | 102 | 443 | 162 |
| Portugal | 51 | 90 | 1 | 144 |
| Republic of Korea | 7,138 | 7,066 | 27,212 | 7,874 |
| Republic of Moldova | 5 | 4 | 7 | |
| Romania | 24 | 29 | 35 | 29 |

| Name | PCT International Phase Filings in 2007 | | PCT National Phase Entries in 2006 | |
|--|--|-------------------------|---------------------------------------|-------------------------|
| | At Receiving Office | By Country of Origin | At Designated / Elected Office | By Country of Origin |
| Russian Federation | 654 | 647 | 7,571 | 643 |
| Saint Kitts and Nevis | | 2 | | |
| Saint Vincent and the Grenadines | | | | 1 |
| San Marino | 2 | 20 | | |
| Saudi Arabia | | 43 | | 27 |
| Senegal | | 1 | | |
| Serbia | 21 | 23 | | 6 |
| Serbia and Montenegro (formerly Yugoslavia) | | 1 | | 6 |
| Seychelles | | 6 | | 10 |
| Singapore | 443 | 533 | 6,922 | 648 |
| Slovakia | 34 | 38 | 59 | 58 |
| Slovenia | 47 | 86 | | 92 |
| South Africa | 87 | 405 | 5,781 | 274 |
| Spain | 984 | 1,290 | 75 | 2,124 |
| Sri Lanka | | 7 | | 2 |
| Sudan | 4 | 4 | | |
| Sweden | 2,272 | 3,646 | 67 | 8,527 |
| Switzerland | 649 | 3,728 | 13 | 12,415 |
| Syrian Arab Republic | 2 | 2 | | |
| T F Y R of Macedonia | 4 | 5 | | 2 |
| Thailand | | 5 | | 12 |
| Trinidad and Tobago | 1 | 1 | 536 | |
| Tunisia | 4 | 7 | | 3 |
| Turkey | 150 | 355 | 182 | 303 |
| Ukraine | 79 | 93 | 2,102 | 38 |
| United Arab Emirates | | 18 | | 32 |
| United Kingdom | 5,605 | 5,610 | 2,011 | 15,100 |
| United Republic of Tanzania | | | | 1 |
| United States of America | 52,969 | 53,147 | 44,842 | 123,824 |
| Uruguay | | 5 | | 2 |
| Uzbekistan | | | 168 | |
| Venezuela | | 4 | | 3 |
| Viet Nam | 3 | 6 | | |
| Zimbabwe | | | | 2 |
| Others | | 209 | | 15,175 |

Note: The table above shows the number of PCT international applications filed in 2007 and the number of PCT national phase entries in 2006 by office and by country of origin. For PCT international applications filed, provisional estimates have been made for the top 15 countries of origin and receiving offices (see paragraphs 3.1 and 4.1.1). The figures shown in this table are thus subject to change.

A PCT applicant seeking protection in any of the States member to the European Patent Convention (EPC) can generally choose between entering the national phase at a national office or the regional phase at the European Patent Office (EPO). This explains why the number of PCT national phase entries at some European national offices is lower than would otherwise be expected. It should be noted that the PCT national phase route is closed for France, Italy, the Netherlands and several other EPC member States. A PCT applicant seeking protection in those countries must enter the PCT regional phase at the EPO.

As an example for understanding the table above, the Algerian patent Office received 11 PCT international application filings in 2007 and 564 PCT national phase entries in 2006, whereas applicants having Algerian origin filed, worldwide, 12 PCT international applications in 2007 and 3 PCT national phase entries in 2006.

Table A3. Resident Patent Filings Intensity, 2006

| Name | Resident Patent Filings per Million population | Resident Patent Filings per \$Billion GDP | Resident Patent Filings per \$Million R&D Expenditures |
|------------------------|--|---|--|
| Algeria | 1.74 | 0.78 | 0.51 |
| Armenia | 63.85 | 14.41 | 11.24 |
| Australia | 138.25 | 4.81 | 0.29 |
| Austria | 275.61 | 8.44 | 0.40 |
| Bahamas | 244.54 | | |
| Bangladesh | 0.15 | 0.13 | |
| Belarus | 122.27 | 63.91 | 12.34 |
| Belgium | 46.73 | 1.56 | 0.09 |
| Belize | 3.36 | | |
| Bosnia and Herzegovina | 14.07 | 2.21 | |
| Brazil | 20.19 | 3.30 | 0.52 |
| Bulgaria | 31.56 | 3.89 | 0.87 |
| Canada | 169.61 | 5.00 | 0.30 |
| Chile | 17.69 | 1.77 | 0.33 |
| China | 93.24 | 23.65 | 2.44 |
| Croatia | 71.43 | 6.06 | 0.56 |
| Cyprus | 28.74 | | |
| Czech Republic | 62.73 | 3.11 | 0.32 |
| Denmark | 276.87 | 8.90 | 0.38 |
| Estonia | 26.84 | 1.76 | 0.24 |
| Finland | 345.57 | 11.20 | 0.35 |
| France | 238.03 | 8.34 | 0.41 |
| Georgia | 53.20 | 18.16 | 9.60 |
| Germany | 582.59 | 19.41 | 0.82 |
| Greece | 50.03 | 1.92 | 0.35 |
| Guatemala | 2.17 | 1.20 | |
| Hong Kong (SAR), China | 24.53 | 0.57 | 0.09 |
| Hungary | 71.40 | 5.61 | 0.66 |
| Iceland | 150.52 | 5.66 | 0.22 |
| India | 4.07 | 2.12 | 0.40 |
| Indonesia | 1.26 | 0.57 | |
| Ireland | 199.08 | 5.97 | 0.56 |
| Israel | 36.51 | 1.66 | 0.04 |
| Jamaica | 7.88 | 2.23 | 3.24 |
| Japan | 2,720.65 | 86.53 | 2.64 |
| Kazakhstan | 93.61 | 16.62 | 8.77 |
| Kenya | 1.08 | | |
| Latvia | 49.85 | 4.31 | 1.23 |
| Lithuania | 19.14 | 1.33 | 0.21 |
| Luxembourg | 56.27 | 0.88 | 0.06 |
| Madagascar | 0.21 | 0.36 | 0.17 |
| Mexico | 5.51 | 0.65 | 0.18 |
| Mongolia | 39.85 | 22.83 | 8.03 |
| Morocco | 5.84 | 1.53 | |
| Netherlands | 132.43 | 4.24 | 0.25 |
| New Zealand | 521.89 | 25.60 | 2.19 |

| Name | Resident Patent Filings per Million population | Resident Patent Filings per \$Billion GDP | Resident Patent Filings per \$Million R&D Expenditures |
|--------------------------|--|---|--|
| Norway | 247.43 | 5.95 | 0.41 |
| Peru | 1.37 | 0.23 | 0.18 |
| Philippines | 2.73 | 1.06 | |
| Poland | 56.60 | 4.27 | 0.99 |
| Portugal | 17.38 | 1.00 | 0.13 |
| Republic of Korea | 2,591.51 | 121.56 | 5.60 |
| Russian Federation | 195.86 | 32.45 | 3.38 |
| Saudi Arabia | 5.03 | 0.32 | |
| Singapore | 142.49 | 3.07 | 0.17 |
| Slovakia | 35.84 | 2.49 | 0.59 |
| Slovenia | 143.67 | 7.81 | 0.60 |
| Spain | 71.44 | 3.08 | 0.31 |
| Sweden | 270.40 | 8.61 | 0.25 |
| Switzerland | 233.82 | 6.74 | 0.24 |
| Syrian Arab Republic | 6.36 | 2.01 | |
| Tajikistan | 3.91 | 6.85 | 10.52 |
| Thailand | 14.14 | 2.07 | 0.95 |
| Turkey | 14.70 | 6.05 | 1.02 |
| Ukraine | 74.60 | 21.76 | 2.33 |
| United Kingdom | 289.66 | 10.13 | 0.61 |
| United States of America | 741.78 | 19.60 | 0.78 |
| Uzbekistan | 12.17 | 85.87 | |
| Viet Nam | 2.18 | 1.27 | |

Note: Research and development expenditure are in millions of constant US dollars, based on purchasing power parities and lagged by 2 years to derive the resident filings to R&D ratio.

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