IP5 Statistics Report

2017 Edition

Europäisches Patentamt
European Patent Office
Office européen des brevets

JPO

Korean Intellectual Property Office

UNITED STATES PATENT AND TRADEMARK OFFICE
uspto

fiveIPoffices
European Patent Office /// Japan Patent Office ///
Korean Intellectual Property Office ///
National Intellectual Property Administration, PRC ///
United States Patent and Trademark Office

IP5 Statistics Report 2017 Edition

European Patent Office,
Japan Patent Office,
Korean Intellectual Property Office,
National Intellectual Property Administration of the People's Republic of China,
United States Patent and Trademark Office

Edited by
EPO, October 2018

Executive Summary

The IP5 Statistics Report (IP5 SR) is an annual compilation of patent statistics for the five largest intellectual property offices – the IP5 Offices – namely the European patent Office (EPO), the Japan patent Office (JPO), the Korean Intellectual Property Office (KIPO), the National Intellectual Property Administration of the P.R. Chnia (CNIPA) and the United States Patent and Trademark Office (USPTO).

- At the end of 2016, 11.8 million patents were in force in the world (+11.8 percent). 91 percent of these patents were in force in one of the IP5 Office jurisdictions.

- In 2016, 2.8 million patent applications were filed worldwide, either as direct national, direct regional or international phase PCT applications, of which 94 percent originated from the IP5 Blocs.

- In 2016, 89 percent of the worldwide patent applications were filed as direct national applications. The proportion of applications filed via the PCT remained stable.

- In 2017, 2.7 million patent applications were filed at the IP5 Offices (+1.8 percent).

- Together the IP5 Offices granted 1.2 million patents in 2017 (+4 percent)

- In 2017, the main developments at the IP5 Offices were:

  - IP5: In June, the 10th meeting of the IP5 Heads of Office was held in Valletta, Malta. Together with representatives of industry groups from the five regions, the IP5 Heads of Office celebrated ten years of IP5 cooperation. Major achievements included the Global Dossier, the Common Citation Document, the IP5 Common Application Format, the IP5 Patent Prosecution Highway, the IP5 patent information Policy, the IP5 Quality Management Meeting, the Mutual machine Translation and the IP5 Industry Consultation Group.

  - EPO: There was a further increase in the number of grants at EPO by 10 percent, while applications increased by almost 4 percent. Processing times for Office actions continued to improve. The EPO Quality Management System was re-certified according to a more stringent version of ISO 9001, that also covered oppositions and patent information activities. A validation agreement with Tunisia entered into force.

  - JPO: With the acceleration of the intellectual property creation cycle - intellectual property creation, the establishment of rights, and utilization of rights - there is a growing need to reduce the time of total pendency. JPO speeded up examinations under the next decade goal for 2023, established in 2014. This is to bring the “total pendency” down to an average of 14 months and the first action pendency down to 10 months or less. The JPO has almost achieved the goal: the “total pendency” was 14.1 months and the first action pendency was 9.3 months.

  - KIPO: Prior art searches were expanded, examination quality was enhanced and customized examination services were provided. The annual average first

office action pendency period was 10.4 months for patents and utility models, 5.0 months for trademarks and 4.9 months for designs. KIPO lent a total of 324.5 million USD to SMEs. Several Memoranda of Understanding were signed with foreign IPR authorities. These included one on CSP with SIPO and one to extend the CSP with USPTO. Agreements were also made with the EUIPO on an exchange of IPR data and with the EPO on CPC.

- CNIPA: In 2018, in order to further improve the IP administration system and to promote IP creation, protection and utilization, SIPO has been restructured to add the duty of trademark and geographical indication management. Due to these changes, in August 2018 the English name SIPO was changed to the National Intellectual Property Administration, PRC (abbreviated as CNIPA). The number of invention patent applications filed for which relevant fees were paid increased by 14.2 percent and grants for inventions by 3.9 percent, while the average pendency period for grants was approximately 22 months

- USPTO: Final action pendency decreased from 25.3 months to 24.2 months (for FY 2017). The backlog of unexamined patent applications was reduced by 2 percent to 526 579, despite an annual filing growth of 2.7 percent over the last 5 years. The USPTO finalized a revised patent fee schedule designed to recover aggregate estimated costs of the Patent operations, Patent Trial and Appeal Board (PTAB) operations, and administrative services. The full version of PatentsView was released allowing users to explore 40 years of data on inventors, their organizations, locations, and overall patenting activity.

Preface

The IP5 Statistics Report (IP5 SR) is jointly produced by the "IP5 Offices," a group that consists of the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the China National Intellectual Property Administration (CNIPA)[1] and the United States Patent and Trademark Office (USPTO), along with the support of the International Bureau (IB) of the World Intellectual Property Organization (WIPO). It follows on from a provisional Key IP5 statistical indicators 2017 data report that was made earlier in 2018. The latest reports, along with other data exchanges and information about the Group, can be found at the IP5 Offices homepage www.fiveipoffices.org.

On 1 June 2017, the 10th meeting of the IP5 Heads of Office was held in Valletta, Malta. Together with representatives of industry groups from the five regions, the IP5 Heads of Office celebrated ten years of IP5 cooperation. The major achievements include, the Global Dossier, the Common Citation Document, the IP5 Common Application Format, the IP5 Patent Prosecution Highway, the IP5 patent information Policy, the IP5 Quality Management Meeting, the Mutual machine Translation and the IP5 Industry Consultation Group.

The Heads of Office agreed to envision patent harmonisation of practices and procedures, enhanced work sharing, high quality and timely search and examination results, and seamless access to patent information in order to promote an efficient, cost effective and user friendly international patent landscape. The vital importance of cooperation with industry was restated.

In addition to promoting a better understanding of patenting activity, both at the IP5 Offices and worldwide, this report explains each office's operations and informs about patent grant procedures. It discusses background activities at each office, reviews worldwide patenting developments and then compares the patent related work at the IP5 Offices. The IP5 SR supplements annual reports for each of the IP5 Offices and also includes some statistics that are collected and published by the WIPO.

As the global patent system becomes more harmonized, common economic driving forces have been a major influence on patent filings at the offices. There are diverse factors that influence patent filing trends. Trend breaks can be caused by changes to patent rules and fees as well as by changes in the economic climate.

According to the World Economic Outlook[2] of the International Monetary Fund (IMF), global growth for 2018 and 2019 is projected to be 3.7 percent for both years, but the expansion is becoming less even and risks to the outlook are mounting. Financial market conditions remain accommodative for advanced economies, which is where many patent applications are made. It seems likely that the drivers for patent applications will remain positive unless there is a major disruption to world economies.

At the IP5 Offices in 2017, the applications increased 3.9 percent at the EPO and 3.2 percent at the CNIPA, stabilized at the JPO and at the USPTO, while they decreased

[1] From August 28, 2018, the English name abbreviation of National Intellectual Property Administration, PRC changed from State Intellectual Property Office of the People's Republic of China (SIPO) to China National Intellectual Property Administration (CNIPA).
[2] World Economic Outlook October 2018: www.imf.org

by 1.9 percent at the KIPO. The data showed annual growth of 1.8 percent for overall applications at the IP5 Offices (See Chapters 2 and 4 of this report).

Political and technological factors also influence the levels of patent filings. Globalization of markets and production continues to be a key business trend. There is a worldwide tendency to harmonize patent laws with common international standards and to facilitate filing of applications across borders. Common vehicles for applying across different jurisdictions have also appeared, such as the PCT system, the validation agreements with the EPO and the Patent Prosecution Highway (PPH). These factors have had a positive impact on worldwide patent growth over recent years.

While applications are user driven, grants show the production capacity of the offices on those applications after some delay.

The IP5 Offices hope that this report provides useful information to the readers. The IP5 Offices will continue to improve and refine the report to better serve expectations and objectives of the public. Definitions related to the terminology used in the report are given in Annexes 1 and 2 at the end.

When reading this report, please bear in mind that the procedures and practices among the IP5 Offices differ in a number of areas. Therefore, care should be taken when analysing, interpreting and comparing the various statistics.

Materials from this report can be freely reproduced in other publications, but we request that this should be accompanied by a reference to the title and the web site location of this report, (www.fiveipoffices.org/statistics.html). Please also note a new page at the IP5 website that links to statistics at each Office (/www.fiveipoffices.org/resources/annualreports.html).

The web version of the report has an additional annex which is a glossary of patent-related terms. It also has a statistical table file that includes extended time series and graphs of much of the data found in this report.

EPO, JPO, KIPO, CNIPA and USPTO
With cooperation of WIPO
October 2018

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Chapter 1

INTRODUCTION

Intellectual Property (IP) refers to a variety of mechanisms that have been established for protecting "creations of the mind"[3], including:

- Patents for invention
- Utility models
- Industrial designs
- Trademarks
- Geographic indications

to protect industrial innovations, and

- Copyrights

for literary and artistic creations.

This report focuses on industrial property rights and almost exclusively on patents for Invention[4]. It is notable that the activity of patents for invention is recognised throughout the world as a useful indicator of innovative activity.

In order to obtain protection for their innovations, applicants for patents for invention may use the following types of granting procedures, or combinations of them:

- National procedures
- Regional procedures (for example, those created by the African, Eurasian, European and Gulf regional organizations)
- The Patent Cooperation Treaty (PCT) procedure

Each country and region maintains its own patent procedures in order to encourage innovative activities and to optimise the regional benefits of innovation. Enhanced international cooperation led to the establishment of different regional and international patenting procedures. But the patent laws vary from country to country. The scope of an individual patent application can also differ according to location. These factors limit the degree to which the patenting activity in different countries and regions can be directly compared.

The patent systems at the IP5 Offices are all based on the first-to-file principle and follow the Paris Convention. To a large extent, this drives the usage of the patent systems worldwide. A first patent application is usually filed to the local national authority to protect the invention, followed within a one year priority period by subsequent applications to expand protection to other countries.

Separate references are made to "direct" applications filed under national and regional procedures and "PCT" international phase applications, in order to

[3] See also, World Intellectual Property Organization, "What is Intellectual Property?" www.wipo.int/about-ip/en/ and World Intellectual Property Indicators – 2017, www.wipo.int/publications/en/details.jsp?id=4234

[4] Patents for invention are called utility patents in the case of the USPTO which are different from utility model patents as explained in Chapter 6.

distinguish the two subsets of applications handled by the patent offices. While applications filed under national procedures are handled by national authorities, regional applications are subject to a centralised procedure and usually only after grant do they fall under national (post grant) regulations. PCT applications are handled at first by the appointed offices during the international phase. Up to about 30 months after the first filing, the PCT applications enter the national/regional phase to be treated as national or regional applications according to the regulations of each designated office.

In this report, patenting activities are presented for the following six geographical blocs:

- The European Patent Convention (EPC) contracting states (EPC states in this report) corresponding to the territory of the 38 states party to the EPC at the end of 2017
- Japan (Japan in this report)
- Republic of Korea (R. Korea in this report)
- People's Republic of China (P.R. China in this report)
- United States of America (U.S. in this report)
- The rest of the world (Others in this report)

The first five of these blocs are called the "IP5 Blocs." Throughout the report, the blocs are referred to as blocs of origin on the basis of the residence of the applicant or as filing blocs on the basis of the place where the patents are sought.

The contents of each chapter in this report are briefly described below. With the exception of some items presented in Chapter 6, the statistics relate to patents for invention.

Please refer to Annex 2 for explanations of the statistical and procedural terms that are used.

The web version of the report has an additional annex including a glossary of patent-related terms. It also has a statistical table file that includes extended time series and graphs of much of the data found in this report[5].

Chapter 2 - The IP5 Offices

A summary of the recent developments in each of the IP5 Offices is presented in Chapter 2. The terminologies for the budget items that appear are provided in Annex 1.

Chapter 3 - Worldwide Patenting Activity

An assessment of worldwide patent activity is presented in Chapter 3. This covers not only patenting activity at the IP5 Offices, but in the rest of the world as well.

The numbers of applications filed are presented in separate sections that use different definitions for counting. This provides a description of worldwide bloc-wise patenting activity for filings, first filings, applications, demands for national patent rights, grants and national patent rights granted. Next, a description of inter-bloc

[5] www.fiveipoffices.org/statistics/statisticsreports.html

activity is presented, firstly in terms of the flows of applications between the IP5 Blocs, and then in terms of patent families[6].

The statistics are mainly derived from the WIPO Statistics Database[7] that includes data from each country and region.

Chapter 4 – Patent Activity at the IP5 Offices

The substantive activities of the IP5 Offices are presented in Chapter 4. This gives statistics on patent application filings and grants at the offices, as well as some comparative data on operations. The statistics are derived from IP5 Offices' internal databases.

Firstly, statistics are given for requests for patents with the IP5 Offices, including domestic and foreign filing breakdowns. Then, statistics are provided displaying the breakdown of applications by sectors and fields of technology according to the International Patent Classification (IPC)[8].

Then, the numbers of grant actions by the IP5 Offices, broken down by the blocs of origin of the grants, are provided. The distributions of the numbers of grants per applicant are also described.

To illustrate the similarities as well as the differences in the granting procedures at the IP5 Offices, characteristics and statistics of the five patent granting procedures are given in the last part of the chapter.

Chapter 5 – The IP5 Offices and the Patent Cooperation Treaty (PCT)

In Chapter 5, the influence of the PCT on patenting activities is displayed through worldwide activities broken down by geographical blocs and IP5 Offices, particularly in terms of proportions of patent filings that use the PCT, proportions of PCTs from the international phase that then enter the national/regional phase, the share of PCTs among applications, the share of PCTs among grants and the proportions of PCT usage within patent families. As with Chapter 3, statistics are derived primarily from the WIPO Statistics Database, that includes data collected from each country and region. Statistics are also included to describe the PCT related activities of the IP5 Offices including activities as Receiving Office (RO), International Searching Authority (ISA) and International Preliminary Examining Authority (IPEA).

Chapter 6 – Other Work

This chapter is dedicated to some other patenting activities that are not common to all of the IP5 Offices, as well as to work related to other types of industrial property rights. This supplements the information that is provided in the rest of the report.

Annex 1 – Definitions for IP5 Offices' expenditures

This explains some terms that appear in Chapter 2.

[6] For a further discussion of patent families, see Chapter 3 and the term definitions in Annex 2.
[7] This edition refers to general patent data as of March 2018, and to PCT international phase application data as of June 2018, www.wipo.int/ipstats/en/index.html
[8] www.wipo.int/classifications/ipc/en/

Annex 2 – Definitions of terms and statistics on procedures

This gives more detailed information on the statistics that appear in the report, particularly for Table 4.3 in Chapter 4.

Annex 3 – Acronyms

This writes acronyms in full and in each case refers to the page of first occurrence of the acronym.

Chapter 2

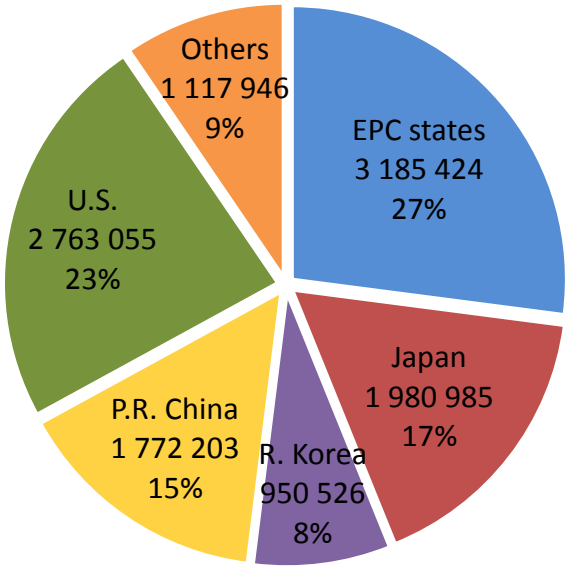
THE IP5 OFFICES

This chapter details developments at each of the IP5 offices[9].

International trade and markets continue to be of great importance, so innovators want their intellectual creations to be protected concurrently in multiple major markets. It is estimated that each year more than 250 000 first filings from the IP5 Offices result in subsequent patent applications to at least one other IP5 Office, accounting for over 500 000 applications including the resulting duplicates for the same inventions. To address the issue of the backlogs that can build up as a result of this, the IP5 Offices are working together to try to reduce the amount of repetition of similar work that takes place between offices for these patent applications.

Patents are used to protect inventions and their counts are recognized as a measure of innovative activity. Fig. 2.1 shows the number of patents in force worldwide at the end of 2016. The data are based on worldwide patent information available from the WIPO Statistics Database[10].

Fig. 2.1: PATENTS IN FORCE END OF 2016



At the end of 2016, 91 percent of the 11.8 million patents that were in-force were valid in one of the IP5 Offices jurisdictions. This demonstrates the prominent role that is played by the IP5 Offices.

[9] The statistical tables file found in the web version of this report includes extended time series for some of the data included in this chapter. http://www.fiveipoffices.org/statistics/statisticsreports.html

[10] www.wipo.int/ipstats/en/index.html Data for patents in force for 2016 are missing for some countries in the WIPO data. Where available, the most recent previous year's data were substituted for missing 2016 data. Data for 2017 are not yet available from WIPO.

EUROPEAN PATENT OFFICE

The mission of the EPO is to support innovation, competitiveness, and economic growth across Europe through a commitment to high quality and efficient services. Its main task is to grant European patents according to the EPC. Moreover, under the PCT, the EPO acts as a receiving office as well as a searching and examining authority. A further task is to perform, on behalf of the patent offices of several member states (Belgium, Cyprus, France, Greece, Italy, Latvia, Lithuania, Luxembourg, Malta, Monaco, the Netherlands and San Marino), state of the art searches for the purpose of national procedures. The EPO plays a major role in the patent information area, developing tools and databases.

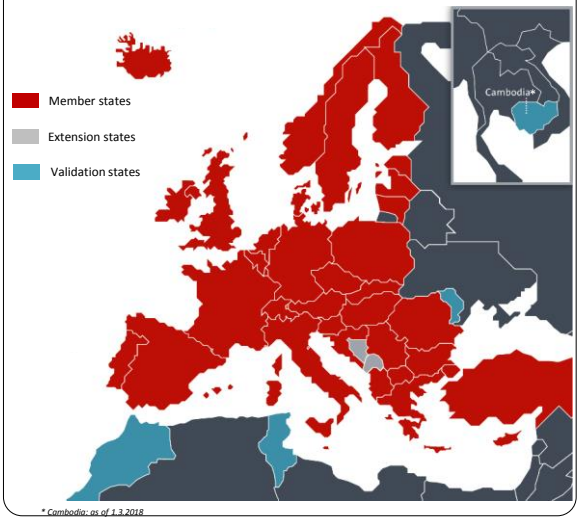
Member states

The EPO is the central patent granting authority for Europe, providing patent protection in up to 44 countries on the basis of a single patent application and a unitary grant procedure.

At the end of 2017, the 38 members of the underlying European Patent Organization were:

Albania	Austria	Belgium	Bulgaria	Croatia
Cyprus	Czech Republic	Denmark	Estonia	Finland
France	Germany	Greece	Hungary	Iceland
Ireland	Italy	Latvia	Liechtenstein	Lithuania
Luxembourg	Malta	F.y.r.o Macedonia	Monaco	Netherlands
Norway	Poland	Portugal	Romania	San Marino
Servia	Slovakia	Slovenia	Spain	Sweden
Switzerland	Turkey	United Kingdom		

Fig. 2.2: EPC MEMBER, EXTENSION AND VALIDATION STATES



Bosnia-Herzegovina and Montenegro, had agreements with the EPO to allow applicants to request an extension of European patents to their territories.

Moldova, Morocco and Tunisia had agreements to validate European patents in their territories.

A similar agreement was signed with Cambodia and entered into force in March 2018.

The national patent offices of all the above states also grant patents. After grant, a European patent becomes a bundle of national patents to be validated in the states that were designated at grant. The 44 countries for which European patents provide protection represent a population of around 700 million people.

Highlights of 2017

In 2017 applications grew almost 4 percent. For the first time the EPO published more than 100 000 granted European patents (a 10 percent increase on the 2016 level). This further large growth in the EPO performance was a positive effect that was caused by the internal reforms implemented as part of the Quality and Efficiency strategy that prioritized examination work and increased productivity, as well as further recruitment of examiners.

In 2017, the EPO production increased further by almost 5 percent, in particular the number of final actions in examination increased by more than 10 percent.

In response to users' need for timely delivery of services, the EPO undertook an initiative, known as Early Certainty, to speed up the patent granting process. Launched in 2014, Early Certainty from Search aimed at increasing legal certainty for applicants by providing a search report with written opinion within 6 months from filing. The programme led to some significant improvements in terms of timeliness. The EPO now focuses on the timeliness of examination and opposition (down to 22.1 months[11] and 22.4 months respectively in 2017). The percentage of EPO PCT international search reports published along with the application (i.e. A1 publications) rose to 97 percent in 2017.

In December 2017, the EPO Quality Management System was re-certified according to the latest revised ISO 9001 standard with no instances of nonconformity. This covered also the opposition procedure and the patent information activity of the EPO.

Every year the EPO carries out user satisfaction surveys on its search, examination and opposition services including patent administration. These surveys obtain input that is considered together with other quality-related data to enable reviews to be made of the quality and efficiency of the EPO internal processes in these areas. The result for 2017 shows 80 percent markings of good or very good for search and examination and an increase to 89 percent in markings of good or very good for patent administration. The Intellectual Assets Magazine (IAM) ranked the EPO at number 1 for the quality of its products and services in its sixth consecutive survey.

EPO production information

Activities associated with searches, examinations, oppositions, appeals and classifications are all performed by EPO staff. The EPO does not outsource any of its core activities. The decision to grant or refuse a patent is taken by a division of three examiners. In Table 2.1, production figures for filings, applications, searches, examinations, oppositions and appeals in the European procedure are given for the years 2016 and 2017. There was a further increase in demand in 2017 as represented by the number of patent applications.

[11] In the case of decision to grant a patent.

Table 2.1: EPO PRODUCTION INFORMATION

EPO PRODUCTION FIGURES	2016	2017	Change	% Change
Patent applications (Euro-direct & Euro-PCT regional phase)	**159 316**	**165 590**	**+ 6 274**	**+ 3.9%**
Searches carried out				
European (including PCT supplementary)	133 544	137 348	+ 3 804	+ 2.8%
PCT international	83 581	83 752	+ 171	+ 0.2%
On behalf of national offices	27 564	26 403	- 1 161	- 4.2%
Total production search	**244 689**	**247 503**	**+ 2 814**	**+ 1.2%**
Examination-Opposition (final actions)				
European	137 939	153 858	+15 919	+ 11.5%
PCT Chapter II	9 180	8 836	- 344	- 3.7%
Oppositions	4 102	4 072	- 30	-0.7%
Total final actions examination-opposition	**151 121**	**166 766**	**+15 545**	**+ 10.3%**
European granted patents	**95 940**	**105 635**	**+ 9 695**	**+ 10.1%**

The EPO fast track procedure, Programme for Accelerated Prosecution of European Patent Applications (PACE), can be requested without an additional fee and is open for any field of technology. However, with the introduction of Early Certainty initiative, the normal procedure has been accelerated. As a consequence, the number of such requests decreased markedly. In 2017, PACE was requested for 5 percent of the European examinations.

Patent information

A key activity of the EPO is collating patent data and making it available to the public through its products and services, such as Espacenet, and as raw data for commercial providers.

The EPO's patent databases remain the most comprehensive collection of patent literature. The total number of records in the EPO worldwide bibliographic database recently passed the 100 million mark. EPO databases are accessible through services such as Espacenet and also via numerous commercial providers. For users interested in performing statistical analyses of patent data, the EPO's PATSTAT database and the PATSTAT online services are the most relevant. They form a unique basis for conducting sophisticated analyses of bibliographic and legal status data for patent intelligence and analytics.

As a result of co-operation with patent offices worldwide, full-text patent collections in languages such as Chinese, Japanese, Korean and Russian are being added. Patent Translate is the EPO's free online machine translation service that is built specifically in order to handle complex, technical patent vocabulary. Integrated into the EPO's Espacenet worldwide patent database and European publication server, it provides translations for a total of 32 different languages. In March 2017, Patent Translate for the first time made use of "neural machine translation" (NMT) technology. Since the

end of August 2017, all the 32 languages are supported by NMT. There are currently approximately 20 000 translation requests per working day on Patent Translate from around the globe.

International and European Cooperation

The EPO engaged in different types of co-operation programmes both inside and outside Europe. In Europe, the EPO continued to build on its close relations with national patent offices, for example by renewing bilateral agreements to support projects in office automation and expert training to better serve the needs of local businesses. Outside Europe, the EPO focused on three areas: firstly, work within the Trilateral (EPO, JPO and USPTO) and the IP5 frameworks; secondly, bilateral co-operation with countries in Asia and Latin America; and thirdly the mounting interest of countries outside the European Patent Organisation to recognise European patents on their territory by concluding validation agreements with the EPO. In 2017, the EPO signed new bilateral cooperation agreements with Argentina and South Africa. In November 2017, the EPO signed a comprehensive strategic partnership agreement with CNIPA, which reinforces a historic co-operation going back more than 30 years. Following Morocco and the Republic of Moldova, a validation agreement with Tunisia entered into force in 2017. A validation agreement was also signed with Cambodia and became effective as of 1st March 2018.

The EPO continues to test utilisation of available work-results via the Patent Prosecution Highway (PPH) programme which leverages fast-track patent examination procedures already available at the offices to allow applicants to obtain corresponding patents faster and more efficiently. In the year under review, the EPO expanded its PPH network to the offices of Russia, Malaysia, the Philippines, the Eurasian Patent Office and Brazil, bringing the total number of the EPO PPH partner offices to 15. In the area of the IP5 PPH, the Offices have intensified their efforts towards the development of common, harmonised PPH metrics. This work is expected to facilitate substantially improved reporting on PPH procedural data.

The EPO hosts the Common Citation Document (CCD), which in 2017 contained over 280 million citations from 33 patent offices world-wide. The CCD currently contains enriched citation data from EPO, China, Croatia, Japan and Switzerland search/examination reports. More countries are expected to become available in the context of the Quality at Source project, such as Estonia, Spain, Lithuania and Portugal.

Economic studies

In 2017, the EPO Chief Economist Unit published two new studies. *Patents and the Fourth Industrial Revolution*[12]*,* conducted in cooperation with Handelsblatt Research Institute, analysed the innovation trends underlying the Fourth Industrial Revolution (4IR). *Patents, Trade and Foreign Investments in the EU*[13] analysis highlighted the role to be played by the Unitary Patent to further increase trade and Foreign Direct Investment (FDI) in high-tech sectors and boost technology transfer within the EU. A set of 12 case studies was also published that show how patents can enhance the performance of some small and medium sized firms.

[12] See www.epo.org/service-support/publications.html?pubid=163#tab3
[13] See www.epo.org/service-support/publications.html?pubid=162#tab3

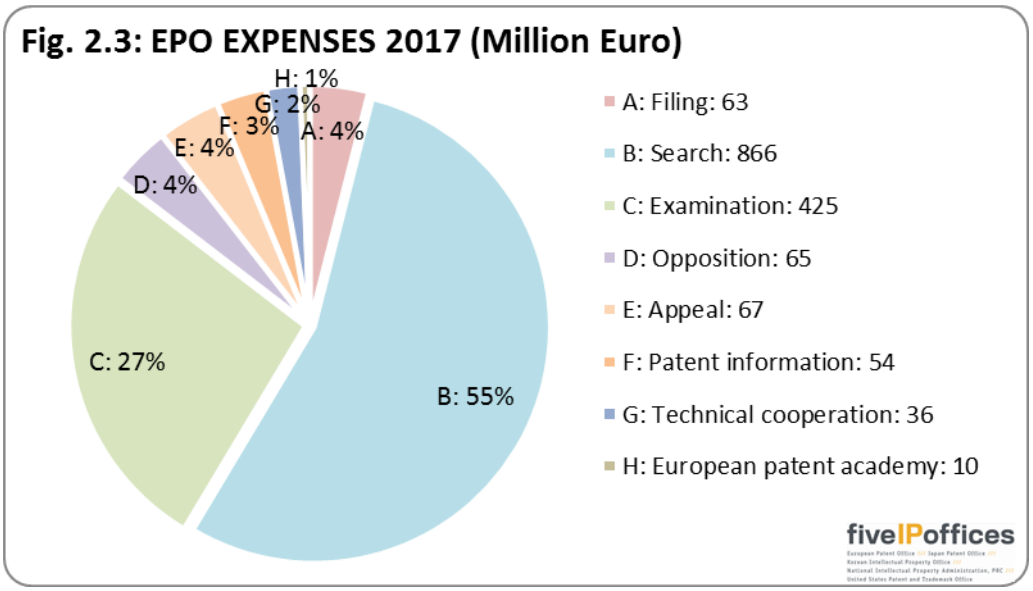
EPO budget

The EPO is financially autonomous and does not receive any subsidies from the Contracting States of the Organisation. Expenses are therefore mainly covered by revenue from fees paid by applicants and patentees. In 2017, the EPO budget amounted to 2.3 billion EURO.

Fees related to the patent grant process, such as the filing, search, examination, and appeal fees as well as renewal fees for European patent applications (i.e. before grant) are paid to the EPO directly. 50 percent of the renewal fees for European patents (i.e. after grant) are kept by the Contracting States of the Organisation where the European patent is validated after the central grant process.

On the expenses side, in addition to the salaries and allowances supported by a patent office, the EPO, as the office of an international organisation, also finances other social staff expenses such as pensions, fees for sickness and long-term care as well as education costs for the children of the employees. The EPO community consists of about 23 000 persons (active staff, pensioners, and their respective family members).

Fig. 2.3 shows EPO expenses[14], based on the International Finance Reporting Standards (IFRS) by category in 2017.



A description of the items in Fig. 2.3 can be found in Annex 1.

EPO Staff

At the end of 2017, the EPO staff totalled about 6 850 employees from 35 different European countries[15]. The total number of search, examination, and opposition examiners reached a record figure of 4 378. Boards of appeal are composed of 148 members.

[14] The EPO uses the word “expenses” in accordance with the IFRS reporting approach.
[15] For more details, see the 2017 EPO social report at www.epo.org/about-us/annual-reports-statistics.html

Following their recruitment, examiners are included in a training programme for three years. The staff works in the three official languages of the EPO (English, German, and French).

More information

Further information can be found on the EPO's Homepage:
www.epo.org

JAPAN PATENT OFFICE

The JPO has been aiming to achieve the “world’s fastest and utmost quality patent examinations” so that once applicants obtain patents in Japan, they may also be able to obtain patents abroad, even smoothly on the ground that the JPO’s examination results are used as trustworthy judgements when foreign IP offices conduct examinations. To this end, the JPO has been implementing various measures focused on “maintaining speed”, “granting high quality rights”, and “cooperating and collaborating with foreign IP offices”.

1) Initiatives to Speed up Examinations

a) Securing the Necessary Number of Examiners

In order to maintain and strengthen the patent examination system, the JPO is working to secure the necessary number of patent examiners and to rehire some of the fixed-term examiners whose term of employment had expired. For FY 2017, the JPO secured a capacity of 1 696 examiners (including fixed-term examiners).

b) Outsourcing Preliminary Prior Art Searches

By outsourcing prior art searches to registered search organizations, the JPO promotes the speeding up of examinations through utilization of the private sector. As of December 2017, there were ten registered search organizations.

In FY 2017, the number of searches outsourced was approximately 153 000, and of those, approximately three-quarters (or approximately 114 000 searches) also involved searches of foreign patent documents in addition to patent documents in Japanese

2) Further Improvement of Examination Quality

a) Quality Management Initiatives

The JPO has published its “Quality Policy on Patent Examination”, which constitutes the JPO’s fundamental principles of quality management, and its “Quality Management Manual for Patent Examination” (Quality Management Manual), which documents quality management and its implementation system. Under the Quality Policy and the Quality Management Manual, the JPO has been engaging in the initiatives towards realizing the utmost quality of patent examinations in the world. Moreover, in March 2017, the JPO established quantitative goals for the quality of patent examinations to be achieved in FY 2017.

Furthermore, in August 2014, the JPO established the Subcommittee on Examination Quality Management, which consists of external experts, under the Intellectual Property Committee of the Industrial Structure Council of the Ministry of Economy, Trade and Industry, for the purpose of receiving objective validation and evaluation regarding the implementation system and status of quality management. The JPO implements initiatives in the quality management of patent, design, and trademark examinations based on reports by the Subcommittee on Examination Quality Management.

b) Improving an environment for Prior Art Search

Prior art searches are one of the important pillars for maintaining and improving examination quality, and a constant improvement of the foundation for prior art searches for both patent documents and non-patent literature is therefore crucial. As part of the improvement of the foundation for prior art searches, the JPO actively proposes to revise the International Patent Classification (IPC) so as to incorporate the useful classification entries of FI[16] and F-Terms[17] into the IPCs. In FY 2017, the JPO made IPC revision proposals for eight broad technical fields in mechanical, chemical, and electrical areas. As part of improving the search environment for standards-related documents, in FY 2017 the JPO made a formal agreement with the International Telecommunication Union (ITU) to provide standards-related documents to the JPO. The JPO is beginning to assign further subdivided CS Terms in order to search for computer software-related non-patent literature efficiently.

c) Initiatives Related to the Examination Handbook for Patent and Utility Model

In March 2017, in order to clearly show the practice of examination to the users, the JPO added 11 case examples to the Examination Handbook for Patent and Utility Model, including the cases of trained AI models and the cases of data, data structures and the like of IoT or 3D printing related technologies, and published it in Japanese and English.

3) Association and Cooperation with Overseas Offices

a) Patent Prosecution Highway

The PPH is a framework that allows an application that is determined to be patentable by the Office of First Filing (OFF) to undergo, at the request of the applicant, an accelerated examination with simplified procedures at the Office of Second Filing (OSF) that participates in the PPH with the OFF.

The world's first PPH advocated by the JPO was launched between Japan and the U.S. in July 2006 as a pilot program. As of December 2017, the number of IP offices participating in the PPH has increased to 47. As of December 2017, the JPO has been implementing the PPH with 40 IP offices, including new PPH collaborations with Brazil and Argentina in April, with New Zealand in July, with Chile in August, and with Peru in November 2017.

The PPH Portal Site allows one-stop access to the PPH implementation status and statistical information for participating IP offices. The JPO serves as the secretariat of the "Global Patent Prosecution Highway" (GPPH), which is a multinational framework launched in January 2014. In the GPPH, all types of PPH including PPH-MOTTAINAI and PCT-PPH are available among the participating IP offices. Colombia and New Zealand newly participated in this framework in July 2017 and, as a result, the number of the offices participating in the GPPH has expanded to 24.

[16] An FI (File Index) means an original classification by the JPO that is a further development of the IPC.
[17] An F-Term (File Forming Term) means an original classification by the JPO expanded to various technical aspects (e.g., purpose, use, structure, material, manufacturing method, processing and operational method, and means of control) by technical area (theme).

b) International Examiner Exchange Program

The international examiner exchange program is an initiative through which the JPO examiners directly discuss with or provide training on examination practices with examiners from foreign IP offices, primarily for the following purposes:

・To promote work-sharing of patent examinations among the IP offices based on a mutual understanding of prior art searches and examination practices;
・To harmonize examinations at a higher level of quality;
・To harmonize patent classifications.

In recent years, in addition to dispatching examiners to and receiving examiners from developed countries, the JPO has also been striving to contribute to the establishment of proper IP systems and the development of human resources in emerging countries such as India and the ASEAN countries, by dispatching JPO examiners and providing training on examination practices. Cumulatively, from April 2000 to December 2017, the JPO has executed the international examiner exchange program, either on a short-term or mid-to-long term basis, with 29 IP offices. In 2017, the JPO dispatched 31 JPO examiners to foreign IP offices and received 16 examiners from foreign IP offices.

c) US -JP Collaborative Search Pilot Program (US-JP CSP)

The JPO launched US-JP Collaborative Search Pilot Program (US-JP CSP) with the USPTO on August 1, 2015 with the aim of improving the predictability of the timing of examination and patent granting in the U.S. and Japan and supporting users to acquire stronger and more stable patent rights. In this program, the JPO and the USPTO examiners independently conduct their own prior art searches for an invention for which a patent application has been filed in both offices, and after sharing their search results and opinions, both offices respectively send their first examination results to the applicant early and around the same time.

The first phase of US-JP CSP, which lasted for two years, ended on July 31, 2017, and the second phase of US-JP CSP commenced with new operations on November 1, 2017 and will last for three years.

JPO Production information

Table 2.2 shows production figures for applications, examinations, grants, appeals or trials and PCT activities in the Japanese procedure in 2016 and 2017.

Table 2.2: JPO PRODUCTION INFORMATION

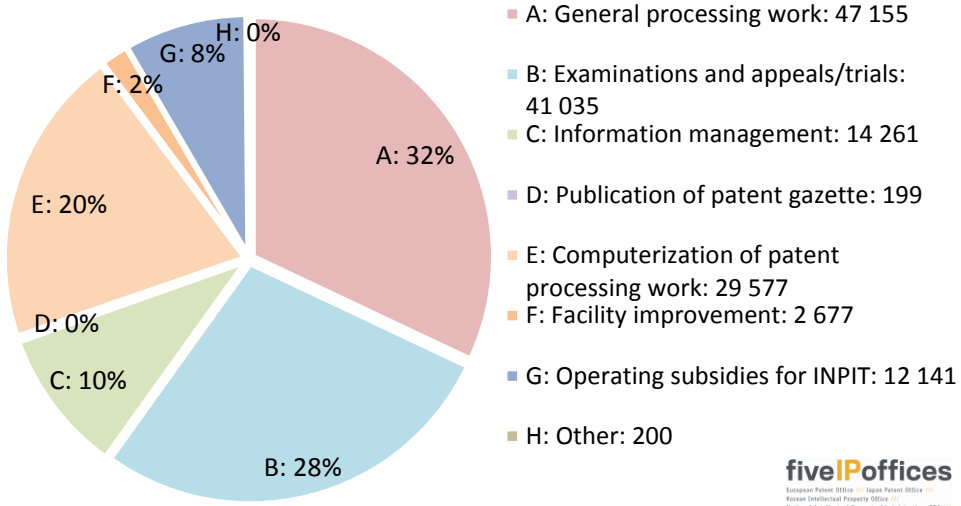
JPO PRODUCTION FIGURES	2016	2017	Change	% Change
Applications filed (by Origin of Application)				
Domestic	260 244	260 290	+ 46	+ 0.0%
Foreign	58 137	58 189	+ 52	+ 0.1%
Total	**318 381**	**318 479**	**+ 98**	**+ 0.0%**
Applications filed (by Type of Application)				
Divisional[18]	29 717	27 535	- 2 182	- 7.3%
Converted[19]	104	105	+ 1	+ 1.0%
Regular	288 560	290 839	+ 2 279	+ 0.8%
Total	**318 381**	**318 479**	**+ 98**	**+ 0.0%**
Examination				
Requests	240 455	240 118	- 337	- 0.1%
First Actions	246 879	239 236	- 7 643	- 3.1%
Final Actions	251 877	246 500	- 5 377	- 2.1%
Grants				
Domestic	160 643	156 844	- 3 799	- 2.4%
Foreign	42 444	42 733	+ 289	+ 0.7%
Total	**203 087**	**199 577**	**- 3 510**	**- 1.7%**
Appeals/Trials				
Demand for Appeal against refusal	18 898	18 591	- 307	- 1.6%
Demand for Trial for invalidation	140	161	+ 21	+ 15.0%
PCT Activities				
International searches	44 321	45 948	+ 1 627	+ 3.7%
International preliminary examinations	2 021	1 903	- 118	- 5.8%

[18] Divisional application(s) is/are one or more new patent application(s) which is/are filed by dividing a part of the patent application that includes two or more inventions under certain conditions.
[19] Converted applications include patent applications which are converted from an application for utility model registration or design registration (under Article 46 of Patent Act), and patent applications filed based on a registration of utility model (under Article 46bis).

JPO budget

Fig. 2.4 shows JPO expenditures by category in 2017.

Fig. 2.4: JPO EXPENDITURES 2017 (Million Yen)



A description of the items in Fig. 2.4 can be found in Annex 1.

JPO Staff Composition

As of the end of FY 2017, the total number of staff at the JPO was 2 788. This includes 499 fixed-term patent examiners.

Examiners: Patent / Utility model:	1 696
Design:	48
Trademark:	136
Appeal examiners:	383
General staff:	525
Total:	2 788

More information

Further information can be found on the JPO's Homepage:
www.jpo.go.jp

KOREAN INTELLECTUAL PROPERTY OFFICE

Overview

As the Korean governmental agency primarily responsible for overseeing intellectual property rights (IPRs), the Korean Intellectual Property Office (KIPO) strives to conduct its intellectual property (IP) administration in accordance with the national paradigm of creative economy, which seeks to foster innovation and new engines of economic growth to drive Korea's future prosperity.

Domestically, KIPO has put as great an emphasis as possible on further developing its examination services, as well as promoting economic sustainability through a virtuous cycle of IP creation, utilization, and protection. On the international front, KIPO strengthened our cooperative ties with foreign IP offices and other international organizations.

Examination Service

In 2017, KIPO maintained its reduced first office action pendency while policy focus remained on examination quality. To ensure each examiner was allocated with a reasonable workload, KIPO increased our outsourcing of prior art searches. KIPO also promoted diverse forms of collaborative examinations by introducing consultative examinations and public examinations in which outside experts are invited to partake in necessary examinations. The annual average first office action pendency period in 2017 was recorded at 10.4 months for patents and utility models, 5.0 months for trademarks and 4.9 months for designs.

1) Further outsourcing of prior art searches

To maintain the level of first office action pendency, a total of 87 594 cases of patent and utility models applications, which was 49.3 percent of all examination cases handled in 2017, were subject to prior art searches. A total of 101 609 cases of trademark applications, which was 77.6 percent of all trademark applications submitted in 2017, and 29 194 cases of design applications, 43.3 percent of all design applications submitted in 2017, were sent to independent agencies for prior trademark and design searches.

2) Enhancing examination quality

In 2017, the Examination Quality Assurance Division (EQAD) reviewed examinations of 4 123 (2.3 percent) patents and utility models, 5 482 (2.4 percent) trademarks and designs, and 452 PCT reports were subjected to examination reviews.

3) Customized examination services

KIPO shifted our examination from the existing system, in which examiners simply give their reason for refusal, to a more customer-oriented examination system. The "Patent Examination 3.0" helps applicants acquire high quality patents by boosting interactive communication with examiners throughout the entire examination proceeding. Services include:

a) Preliminary examination

Preliminary examination was first introduced in 2014, enabling applicants and patent examiners to communicate with each other prior to a first office action in order to discuss the overall direction of the examination and resolve any possible reasons for refusal. In 2017, to enhance the effectiveness, the results of the preliminary examination were notified before the interview with the examiner.

b) Preliminary amendment review

The process of reviewing preliminary amendment was introduced in 2015 as a way of informing applicants of whether reasons for refusal of the claims presented in the preliminary amendment can be resolved prior to the final amendment. In 2017, the number of applicants who requested reviews of preliminary amendment increased 1.9 times compared to 2016.

c) Batch examination

Batch examination is a customized service in which, at the applicant's request, separate applications for patent, design, and/or trademark rights for a single product are examined simultaneously. In 2015, the service was further expanded to include new technologies resulting from national R&D projects.

Promoting the Creation and Utilization of IP

1) Korea IPRs Information Service (KIPRIS)

The Korea Intellectual Property Rights Information Service (KIPRIS) is a free online search service we provide to the general public so they can conveniently browse both international and domestic IP information.

KIPRIS makes IP information accessible to the public. The available information includes new information on Chinese designs, full publications of Taiwanese patents, information on design related administrations, and citations. In 2017, the system added a search function for similar patents.

To promote the use, public relations (PR) activities include site-visits upon request, distribution of KIPRIS's magazine, and hosting seminars on how to better utilize KIPRIS.

2) Enhancing the IP Capacities of SMEs and Promising Enterprises

To help support small and medium-sized enterprises (SMEs) possessing outstanding patents and cutting-edge technology, KIPO established an IP financing system that allows IP as collateral for attaining substantial loans. In 2017, KIPO expanded this system to include participation from private banks, rather than limiting it solely to public banks. The result was an accumulative sum of around 324.5 million USD lent to SMEs.

Since beginning of the 'Global IP Star Companies Growth Projects' in 2010, KIPO has assisted 1 454 promising SMEs. In 2017 alone, 288 companies have been added to the list and many have succeeded in entering the global market even with no prior export experience. To clearly demonstrate the effectiveness of the project, key corporate management indicators also recorded a 6.9 percent increase in revenue, 8.2 percent increase in employment and 7.9 percent in export as of 2016.

3) IP-DESK

KIPO operates IP-DESKs to protect and further promote IPRs belonging to Korean companies with businesses overseas. Recently, additional IP-DESKs were added in areas where Korean companies are frequently embroiled in IPR disputes. KIPO set up an IP-DESK in Frankfurt, Germany in 2014 and then added an IP-DESK in Tokyo, Japan in 2015.

In 2016, KIPO set up an IP-DESK in Xi'an, China, which is an economic hub of western China. Finally, KIPO added IPDESKs in New Delhi, India and Jakarta, Indonesia in 2017.

As of December 2017, KIPO were operating a total of 14 IPDESKs in eight countries.

Global IP Cooperation

1) Bilateral Cooperation

The launch of the “ASEAN (10 countries) + 1 framework” in February 2017 was finally decided after 4 years of discussions. ASEAN IPR infrastructure improvement projects and protection of IPR of Korean companies in the ASEAN region will be further strengthened.

As part of the trilateral cooperation with the JPO, KIPO and CNIPA, KIPO hosted the TRIPO Heads Meeting in December 2017 in Jeju. The three offices officially approved the “Trilateral Cooperation Framework” and adopted an official emblem proposed by KIPO.

KIPO signed several meaningful Memorandums of Understanding (MOUs) in 2016 to further cooperation with foreign IPR authorities. A new MOU on CSP was signed with CNIPA while the existing CSP with USPTO was agreed to be extended. Talks with the European Union Intellectual Property Office (EUIPO) reached an agreement on an exchange of IPR data, as well as an agreement for an MOU on Cooperative Patent Classification (CPC) with the EPO.

Furthermore, KIPO signed comprehensive cooperation MOUs with Argentina and the Ukraine, both recognized as regional hubs with high industrial development and technological advancement, thus expanding the number of countries that KIPO cooperates with in the IPR field.

2) International IT cooperation

a) Bilateral IT Cooperation

In February and June 2017, discussions took place on the issue of KIPO officially participating in the web-based ePCT, currently operated by WIPO. It was decided that from October 2017, patent applicants from Korea can also use ePCT without installing complicated software. In November, KIPO and WIPO jointly held high-level talks on PCT automation and operations to further discuss ways of utilizing ePCT to make applications even more convenient and expanding PCT related e-document exchanges.

b) Expand the overseas export of KIPOnet

In February 2016, KIPO signed on a contract for an United Arab Emirates (UAE) patent IT system based on Korea's patent automation system KIPOnet. Experts from KIPO were sent over to the UAE in August 2016 to facilitate the system development and operations. The UAE system was successfully completed in February 2017.

Also, in cooperation with the Ministry of Strategy and Finance and other relevant agencies, KIPO signed an MOU with the Egyptian Patent Office (EGPO) in April 2017 to cooperate in patent automation. Under the MOU, KIPO provides consulting services for system set up and enhancement of the patent administration automation system, and shares experience in KIPOnet development and operations.

KIPO Production information

Table 2.3 shows production figures for applications, examinations, grants, appeals or trials and PCT activities for 2016 and 2017.

Table 2.3: KIPO PRODUCTION INFORMATION

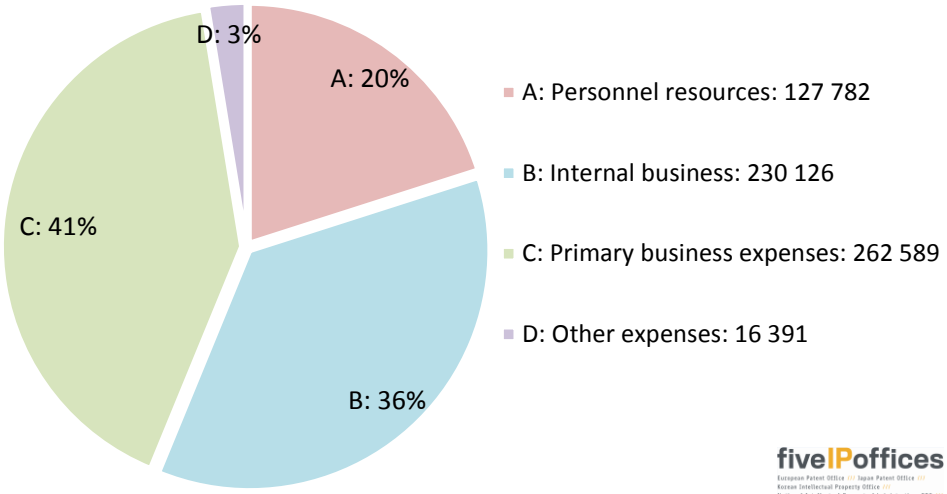
KIPO PRODUCTION FIGURES	2016	2017	Change	% Change
Applications filed				
Domestic	163 423	**159 031**	- 4 392	- 2.7%
Foreign	45 407	45 744	+ 377	+ 0.7%
Total	**208 830**	**204 775**	**- 4 055**	**- 1.9%**
Applications filed (by type of application)				
Divisional[20]	10 030	11 291	+ 1 261	+ 12.6%
Converted[21]	56	33	- 23	- 41.1%
Others	198 744	193 451	- 5 293	- 2.7%
Total	**208 830**	**204 775**	**- 4 055**	**- 1.9%**
Examination				
Requests	172 948	172 635	- 313	- 0.2%
First actions	174 792	171 112	- 3 680	- 2.1%
Final actions	172 053	177 118	+ 5 065	+ 2.9%
Grants				
Domestic	82 400	90 847	+ 8 447	+ 10.3%
Foreign	26 475	29 815	+ 3 340	+ 12.6%
Total	**108 875**	**120 662**	**+11 787**	**+ 10.8%**
Appeals/Trials	6 796	4 880	- 1 916	- 28.2%
Request for appeal against refusal	5 616	4 351	- 1 265	- 22.5%
Request for trial for invalidation	1 180	529	- 651	- 55.2%
PCT activities				
International searches	28 107	25 920	- 2 187	- 7.8%
International preliminary examinations	209	169	- 40	- 19.1%

[20] A divisional application is filed to divide a patent application (known as the parent application) into two or more applications.
[21] A patent applicant may convert an application for utility model registration to a patent application within the scope of matters stated in the description or drawing initially attached to the patent application.

KIPO budget

Fig. 2.5 shows KIPO expenditures by category in 2017.

Fig. 2.5: KIPO EXPENDITURES 2017 (Million Won)



A description of the items in Fig. 2.5 can be found in Annex 1.

KIPO Staff Composition

At the end of 2017, the KIPO had a total staff 1 627. The breakdown is as follows.

Examiners	
Patents and Utility Model	866
Designs and Trademarks	162
Appeal examiners	106
Other staff	493
Total	1 627

More information

Further information can be found on KIPO's Homepage:
www.kipo.go.kr

NATIONAL INTELLECTUAL PROPERTY ADMINISTRATION, PRC

Main Responsibilities

Organizing and coordinating IPR protection work nationwide and improving the construction of IPR protection system; standardizing the basic orders of patent administration; drawing up the policies of foreign-related IP work; working out the development programs for the patent work nationwide, drafting patent working plans, examining and approving special working plans, taking up the responsibility of the construction of the national public service system of patent information, promoting the spread and utilization of patent information with related departments and undertaking the work of patent statistics; laying down the criteria of affirming the exclusive rights of patents and integrated circuit layout designs and appointing organizations to manage the work of right affirmation; publicizing and popularizing patent laws, regulations and policies; and drafting plans of IP-related education and training according to regulations.

Statistical Overview of 2017

1) Patent Examination Status

In accordance with the Patent Law of the People's Republic of China, the CNIPA is the authority to receive and examine applications for invention, utility model and design patents, and to grant patent rights in compliance with the Patent Law. The mechanism of earlier publication and request for substantive examination applies when processing invention patent applications, while the duration of patent rights for invention is 20 years, counted from the date of filing. The preliminary examination mechanism applies when processing utility model and design applications, while the duration of patent rights for utility models and designs is 10 years, counted from the date of filing.

2) Patent Applications in 2017

In 2017, the number of applications for the three kinds of patents in P.R. China was nearly 3.70 million. Among these applications, there were 1.38 million applications for invention patents, an increase of 14.2 percent compared to the previous year, 1.69 million applications for utility model patents and 0.63 million applications for design patents.

3) Patents Granted in 2017

In 2017, the CNIPA granted 0.42 million patents for invention, with an increase of 3.9 percent compared to the previous year, 0.97 million patents for utility model and 0.44 million patents for industrial design.

CNIPA production information

Table 2.4 shows production figures for applications, examination, grants, re-examination and invalidation, PCT activities are given for the years 2016 and 2017. The data in table 2.4 concentrate only on patents for invention.

Table 2.4: CNIPA PRODUCTION INFORMATION

CNIPA PRODUCTION FIGURES	2016	2017	Change	% Change
Applications filed				
Domestic	1 204 981	1 245 709	n.a.	n.a.
Foreign	133 522	135 885	n.a	n.a
Total	**1 338 503**	**1 381 594**[22]	**n.a**	**+ 14.2 %**[23]
Examination				
First actions	681 931	827 217	+ 145 286	+ 21.3%
Final actions	675 341	744 490	+ 69 149	+ 10.2%
Grants				
Domestic	302 136	326 970	+ 24 834	+ 8.2%
Foreign	102 072	93 174	- 8 898	- 8.7%
Total	**404 208**	**420 144**	**+ 15 936**	**+ 3.9%**
Re-examination and invalidation				
Re-examination requests	13 107	28 472	+ 15 365	+ 117.2%
Invalidation request	3 969	1 126	- 2 843	- 71.6%
PCT activities				
International searches	39 775	47 235	+ 8 460	+ 21.8%
International preliminary examinations	427	300	- 127	- 29.7%

n.a = not available

4) Examination Period

The CNIPA adopted time-sliced segment management (where the whole procedure was monitored and managed by divided time point and period) in the whole examination procedure for examination period management by objectives to ensure

[22] As for the year of 2017, the application number 1,381,594 is the number of invention patent applications filed with the CNIPA with filing fees paid, while for the year of 2016, the application number 1,338,503 is the number of invention patent applications received by the CNIPA, thus the application number of 2017 can't be compared to the number of 2016 directly.

[23] As the methodology of calculating application number has changed, the CNIPA provided the year on year growth rate of the total number, which is +14.2 percent, while the CNIPA could not retrospectively provide application numbers as well as the change broken down by domestic and foreign origins, which are noted as "n.a." in this table.

well-distributed and reasonable examination period. In 2017, the pendency period for the granting of invention patents was approximately 22.0 months.

Informatisation and Documentation

In order to support the national technological innovation, the national economic growth and the patent examination, the CNIPA has always highly valued the construction of its patent documentation and information system. Its unremitting efforts for years have resulted in the current various patent information resources, and automatic search and management system.

1) Patent Information Services to the Public

The CNIPA took multiple measures to improve patent information public service capabilities. The mid-term reporting mechanism of The CNIPA patent information service (regional) centres was established to enhance their capabilities to carry out services. The CNIPA steadily carried out the pilot program on the “New Generation Search and Analysis System for Regional Patent Information Service Center” and continued to promote the sharing of patent data resources. The CNIPA improved the Chinese and Foreign Examination Information Search System and made available to the public the dossier information reminder function in May 2017.

2) Documentation Resources and Services

Throughout 2017, the CNIPA allocated 162 types of documentation resources, including nine types of patent resources and 153 types of non-patent resources, providing solid support to patent examination, patent information public services, macro-management and research. The CNIPA maintained bilateral exchange of patent documentation with 34 countries, regions or organizations and provided Chinese patent documentation to seven PCT international Search and Authorities and international Preliminary Examination Authorities.

By the end of December 2017, the CNIPA had over 539 types of patent documentation resources, including 191 types of bibliographic items, 166 types of full-image data and other types of data. The bibliographic data covers 104 countries, regions or organizations. The full-image data covers 103 countries, regions or organizations.

Based on the needs of the examination process, the CNIPA continued to offer quality and efficient services on documentation extraction and consultation, carried out knowledge-based services for patent examination and provided relevant technical information on green chemistry, new energy, smart manufacturing, and internet of Energy to the examination departments.

The CNIPA deepened the service model of “internet+ Patent Examination” and made available multi-layered, open and characteristic services. The CNIPA used its official website, the “Patent Documentation Sharing” WeChat public platform, WeChat groups and email to push relevant knowledge and information on patent documentation and provides services such as online consultation and documentation transmission.

International Cooperation

In 2017, the CNIPA continued to comprehensively deepen international cooperation in the IP field and played a constructive role in international and regional IP affairs. Throughout the year, the CNIPA signed 52 new bilateral and multi-lateral cooperation agreements, memoranda of understanding, joint statements, records of discussion, work plans in the IP field.

The CNIPA secured resources from various channels to implement *the Common Initiatives for Strengthening the Cooperation between Countries along the Belt and Road in the Field of Intellectual Property.* In May, on behalf of the Chinese Government, the CNIPA signed with the World Intellectual Property Organization *the agreement on Enhancing "Belt and Road" Intellectual Property Cooperation between the Government of the People's Republic of China and the World Intellectual Property Organization (WIPO)* during the Belt and Road Forum for International Cooperation. The two sides agreed to deepen their cooperation in relation to the Belt and Road Initiative and facilitate the development of IP in Belt and Road countries.

The CNIPA continued its deep involvement in the China-U.S. inter-governmental dialogue mechanisms and its active participation in other meeting, consultation and negotiation mechanisms such as the China-EU Intellectual Property Dialogue, the China-UK and the China-France Economic and Financial Dialogues, the China-Italy Inter-governmental Commission, and the China-EU, China-Switzerland IP working group/unit meetings. The CNIPA also actively participated in the negotiations on the IP chapters of the China-Japan-Korea Free Trade Area and the Regional Comprehensive Economic Partnership (RCEP), China-Georgia Free Trade Agreement and Economic and Trade Cooperation Agreement between China and the Eurasian Economic Union.

The CNIPA continued in-depth participation in the conferences of the IP5 and the Industrial Designs 5 (ID5) Offices Cooperation. In 2017, Commissioner Shen Changyu led a delegation to participate in the 10th Meeting of IP5 Heads of Office in Valletta, Malta, and facilitated the signature of the Joint Statement of the IP5 2017. The IP cooperation in China, Japan and Korea, BRICS counties, China-ASEAN, and China Mongolia and Russia was reinforced and developed.

The CNIPA further deepened cooperation with EPO, European Union Intellectual Property Office (EUIPO), EAPO, United States, EU and European Countries, Neighboring and Asian Countries, African Countries, Latin American Countries and Oceanian countries.

The CNIPA pressed ahead with pragmatic cooperation in patent examination. The CNIPA continued to expand the PPH cooperation network and officially launched the China-Egypt PPH pilot program, and signed PPH cooperation agreements with IP authorities of Czech Republic, Chile, the Eurasian Patent Office, the African Regional Intellectual Property Organization and Brazil. Users of Common PPH Request Form increased to 19.

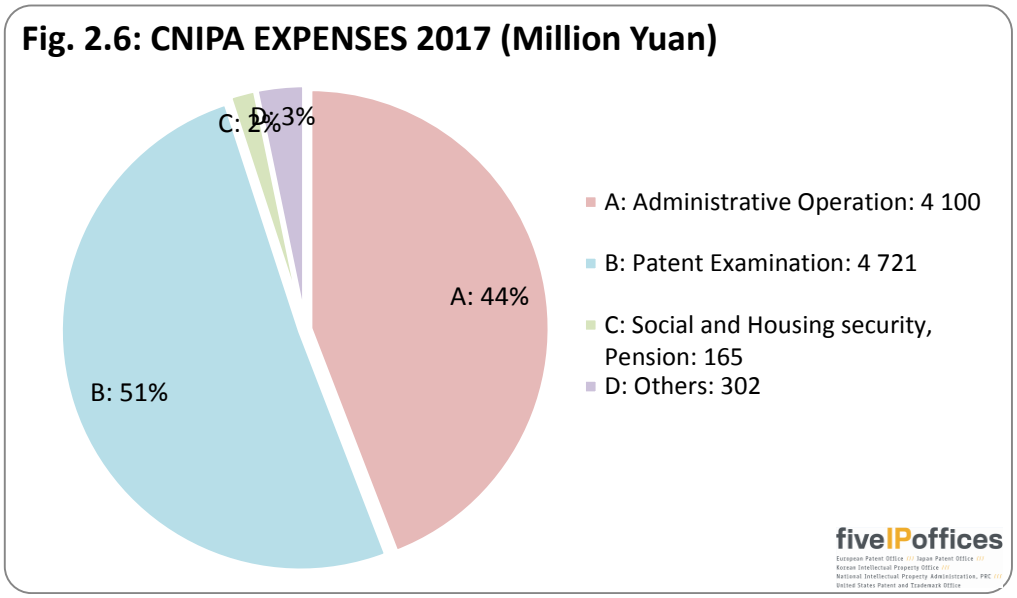
The CNIPA carried out cooperation in data exchanges with 26 countries, regions and organizations. It had bilateral and multi-lateral exchanges and cooperation with 21 countries, regions and organizations, of which 9 were newly established cooperation partners and 6 among the Belt and Road countries.

The CNIPA actively explored for new models in providing training support to

developing countries and helped developing countries to utilize the IP system in the process of economic development and jointly facilitated the improvement and development of the international IP rules.

The CNIPA budget

Fig 2.6 shows CNIPA expenditures by category in 2017.



A description of the items in Fig. 2.6 can be found in Annex 1.

The CNIPA Staff Composition

By the end of 2017, the CNIPA has seven functional departments (vice bureau level), 15 subordinate units, two enterprises and three social organizations.

In 2017, there were 2,600 patent examiners in the departments under the headquarters of the CNIPA. By the end of 2017, as direct affiliates of the Patent Office of the CNIPA, the seven Patent Examination Centers in Beijing, Jiangsu, Guangdong, Henan, Hubei, Tianjin and Sichuan had a combined total of 8 900 patent examiners. In total, the CNIPA has 11 421 patent examiners.

More information

Further information can be found on the CNIPA's Homepage:
www.cnipa.gov.cn

UNITED STATES PATENT AND TRADEMARK OFFICE

Mission Statement

The mission of the United States Patent and Trademark Office (USPTO) is:

> *Fostering innovation, competitiveness and economic growth, domestically and abroad by delivering high quality and timely examination of patent and trademark applications, guiding domestic and international intellectual property policy, and delivering intellectual property information and education worldwide, with a highly skilled, diverse workforce.*

The USPTO is pivotal to the success of innovators. In fulfilling the mandate of Article 1, Section 8, Clause 8, of the U.S. Constitution, “To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries”, the USPTO is on the cutting edge of technological progress and achievement in the United States.

The USPTO provides valued products and services to its customers in exchange for fees that are appropriated to fund its operations. The powers and duties of the USPTO are vested in the Under Secretary of Commerce for Intellectual Property and Director of the USPTO, who consults with the Patent Public Advisory Committee and the Trademark Public Advisory Committee. The USPTO operates with two major business lines, Patents and Trademarks.

The USPTO’s Strategic Plan for Fiscal Years 2014-2018 sets forth the Agency's three mission-focused strategic goals and one management goal, as well as the proposed objectives and initiatives to meet those goals. The plan is designed to continue strengthening the capacity of the USPTO, improve the quality of issued patents and registered trademarks, and shorten the time it takes to get a patent. This plan will continue to enhance and accelerate the innovation and job growth needed to transform the U.S. economy, foster competitiveness, and drive the creation and growth of U.S. businesses. This plan was developed with input from the public advisory committees, stakeholders, the public, and USPTO employees. A new Strategic Plan is being developed, and is expected to be published at the end of 2018.

- Goal 1: Optimize Patent Quality and Timeliness.
- Goal 2: Optimize Trademark Quality and Timeliness.
- Goal 3: Provide Domestic and Global Leadership to Improve IP Policy, Protection, and Enforcement Worldwide.
- Management Goal: Achieve Organization Excellence.

Agency News

In FY 2017, USPTO patent examiners continued to reduce total patent application pendency by an additional 1.1 month, to 24.2 months. Significant progress was also made in reducing the unexamined backlog to 526 579, 2.1 percent lower than last year.

In November 2017, the USPTO finalized a revised patent fee schedule. This fee schedule is designed to recover the aggregate estimated cost of the USPTO’s patent operations, Patent Trial and Appeal Board operations, and administrative services. The additional fee collections will support the USPTO’s progress toward its strategic goals like pendency and backlog reduction, patent quality enhancements, technology modernization, staffing optimization and financial sustainability.

As part of the President's efforts to encourage innovation, the USPTO expanded the activities to help applicants and their representatives navigate the patent prosecution process. One of these activities is the USPTO Pro Se Assistance Program where support, in the form of dedicated educational resources to these applicants, in-person assistance, and centralized examination of these applications are provided for inventors applying for patents without an attorney.

FY 2017 was busy with preparations for the issuance of the 10 millionth patent, complete with a new cover design. Since the first U.S. patent was granted in 1790, there have been twelve major design changes to the patent cover. The first patents were hand written and signed by President George Washington, later the cover became a typeset form with blanks filled in by a calligrapher, and the next major change included decorative engravings to meet the styles of the time. The 10 millionth patent granted in 2018 shows the increasing demand for patent protection in the U.S. The first millionth milestone of granted patents took 121 years. The next ones took twenty four, twenty six, fifteen, fifteen, eight, seven, five, four, and this latest millionth has taken just three years. Patent 10 million for “Coherent LADAR Using Intra-Pixel Quadrature Detection” symbolizes the breadth of America invention, with applications in such varied fields as autonomous vehicles, medical imaging devices, military defense systems, and space and undersea exploration.

In FY 2017, the USPTO launched the full version of *PatentsView* (www.patentsview.org), the patent data Web tool that allows users to explore 40 years of data on inventors, their organizations, locations, and overall patenting activity. Throughout FY 2017, the USPTO released new and updated datasets in forms convenient for public use and academic research on matters relevant to IP, entrepreneurship, and innovation. New in 2017 was the inclusion of comprehensive data on rejections issued by patent examiners.

USPTO continued its work to encourage even more electronic filing and processing in FY 2017. Trademark applications are currently filed electronically more than 99.9 percent of the time. The push to increase end to end electronic processing of Trademark applications began in 2003 when filings were done on paper about half the time. Recently, select Trademark fees were raised to further promote electronic filing and processing. Currently Trademarks is considering mandatory electronic filing, submissions, and correspondence. Patent applications are currently filed electronically more than 96 percent of the time. USPTO’s Patent Business Line has also been working to encourage electronic filing and processing of applications with more effort on this planned for the future.

One important IP case settled in FY 2017 was Matal v. Tam, a case concerning the constitutionality of section 2(a) of the Trademark Act that precludes the USPTO from registering marks that “disparage . . . persons, . . . institutions, beliefs, or national symbols.” The Supreme Court struck down the disparagement provision of section 2(a) as unconstitutional, holding that it violated the First Amendment’s Free Speech Clause. In a related case, In re Brunetti, The Court of Appeals for the Federal Circuit held that the prohibition on immoral or scandalous trademarks is an unconstitutional restriction of free speech.

At the end of FY 2017, 11 105 employees agency-wide were working from home at least one day per week, translating to 88 percent of the USPTO workforce. This was an increase of 226 teleworking employees from last fiscal year. A structured telework program provides cost savings by reducing the need for additional office space, enhances recruitment and retention, fosters greater efficiency in production

and management and provides opportunities for expanded work flexibility and better work–life balance for participating employees. USPTO's teleworkers help to minimize the USPTO's impact on the environment in the Washington, D.C., metropolitan area, and in FY 2017, they spared the environment more than 48 932 tons in estimated CO2 emissions.

International Cooperation and Work Sharing

The USPTO is engaged in specific application-level work sharing with 31 different IP offices through the Global Patent Prosecution Highway (PPH) system or bilateral PPH agreements. As part of this international cooperation, in early October 2017 the USPTO signed an agreement with KIPO and JPO to launch the second phase of the Collaborative Search Pilot (CSP) program which provides examiners the best prior art to improve compact prosecution and enhance patent quality. The initial program resulted in a significant reduction in prosecution time and a substantially reduced need for Requests for Continued Examination (RCEs) to complete prosecution, with over a 90 percent allowance rate. This expansion is designed to build on these successes and continue improvement; a third phase to further this progress has been agreed upon by the IP5.

In FY 2017, the USPTO worked with the Industrial Design 5 (ID5) offices (EUIPO, JPO, KIPO, CNIPA and USPTO) on collaborative efforts to reduce costs and create greater predictability for the industrial design stakeholders. One recent accomplishment of this cooperation was the publication of common industrial design statistics.

The USPTO continues to provide leadership at the International Union for the Protection of New Varieties of Plants, an intergovernmental organization that promotes the development of new varieties of plants. With USPTO support, the organization developed a system for submitting forms electronically. In FY 2017, this system was expanded to include an additional 16 countries and to allow submissions regarding five additional crops.

The USPTO also partners with the TM5, the framework that brings together the world's five largest trademark offices (EUIPO, JPO, KIPO, CNIPA, USPTO) whose mission is to promote cooperation and collaboration among its members and to contribute to more user-friendly, and if possible, interoperable trademark systems. One important ongoing TM5 project is the TM5 Identification (TM5 ID) List, which entails the ongoing development of a harmonized pick-list of descriptions of goods and services that are acceptable in applications for trademark registration submitted to all participating IP offices. During FY 2017, led by the USPTO, work continued on expanding the number of identification entries and their translation into multiple languages. IP offices from countries that are not TM5 members have been invited, and are actively participating, in this project. To date, the TM5 partners have developed more than 17 600 entries for the list.

The USPTO provides IP educational and training programs both to improve IP laws and their administration around the world and to enhance IP awareness and technical capacity. In FY 2017, Office of Policy and International Affairs conducted a total of 143 such training programs through its Global Intellectual Property Academy (GIPA), serving more than seven thousand individuals consisting of IP rights owners, patent, trademark, and copyright officials, prosecutors, police, customs officials and IP policymakers.

In addition to conducting live, in-person programs, the USPTO continues to utilize technology to make its training programs more efficient and to expand their reach. Both live online and on-demand modes of training and education are provided to increase just-in-time learning. When possible, IP awareness programs are webcast live to reach attendees from all over the country. In FY 2017, GIPA presented 24 programs with a distance-learning or remote engagement component. OPIA produces and maintains in-depth, on-demand distance learning modules available in five languages and covering patents, trademarks, copyrights, geographical indications, and trade secrets.

USPTO production information

Table 2.5 includes production figures for application filings, PCT searches and examination, first actions, grants, applications in appeal and interference, and patent cases in litigation for the years 2016 and 2017.

Table 2.5: USPTO PRODUCTION INFORMATION

USPTO PRODUCTION FIGURES	2016	2017	Change	% Change
Applications filed				
Utility (patents for invention)[24]	605 571	606 956	+ 1 385	+ 0.2%
Domestic	295 327	293 904	- 1 423	- 0.5%
Foreign	310 244	313 052	+ 2 808	+ 0.9%
Plant	1 177	1 059	- 118	- 10.0%
Reissue	1 087	1 012	- 75	- 6.9%
Total utility, plant & reissue	**607 835**	**609 027**	**+ 1 192**	**+ 0.2%**
Design	42 571	43 340	+ 769	+ 1.8%
Provisional	166 565	167 642	+ 1 077	+ 0.6%
Total	**816 971**	**820 009**	**+ 3 028**	**+ 0.4%**
Request for continued examination (RCE)[25]	191 820	183 446	- 8 374	- 4.4%
PCT Chapter I searches	**21 360**	**21 663**	**+ 303**	**+ 1.4%**
PCT Chapter II examinations	**1 211**	**1 309**	**+ 98**	**+ 8.1%**
First actions (utility, plant, reissue)	**568 923**	**607 928**	**+ 39 005**	**+ 6.9%**
Grants (total)	**303 049**	**318 829**	**+ 15 780**	**+ 5.2%**
U.S. residents	143 723	150 949	+ 7 226	+ 5.0%
Foreign	159 326	167 880	+ 8 554	+ 5.4%
Japan	49 800	49 677	- 123	- 0.2%
EPC states	47 910	50 660	+ 2 750	+ 5.7%
R. Korea	19 494	20 717	+ 1 223	+ 6.3%
P.R. China	10 462	13 243	+ 2 781	+ 26.6%
Others	31 660	33 583	+ 1923	+ 6.1%
Applications in appeal and interference proceedings				
Ex-parte cases received	9 059	11 347	+ 2 288	+ 25.3%
Ex-parte cases disposed	15 034	13 171	- 1 863	- 12.4%
Inter-partes cases received	64	46	- 18	- 28.1%
Inter-partes cases disposed	157	70	- 87	- 55.4%
Patent cases in litigation				
Cases filed	650	515	- 135	- 20.8%
Cases disposed	451	471	+ 20	+ 4.4%
Pending cases (end of calendar year)	540	606	+ 66	+ 12.2%

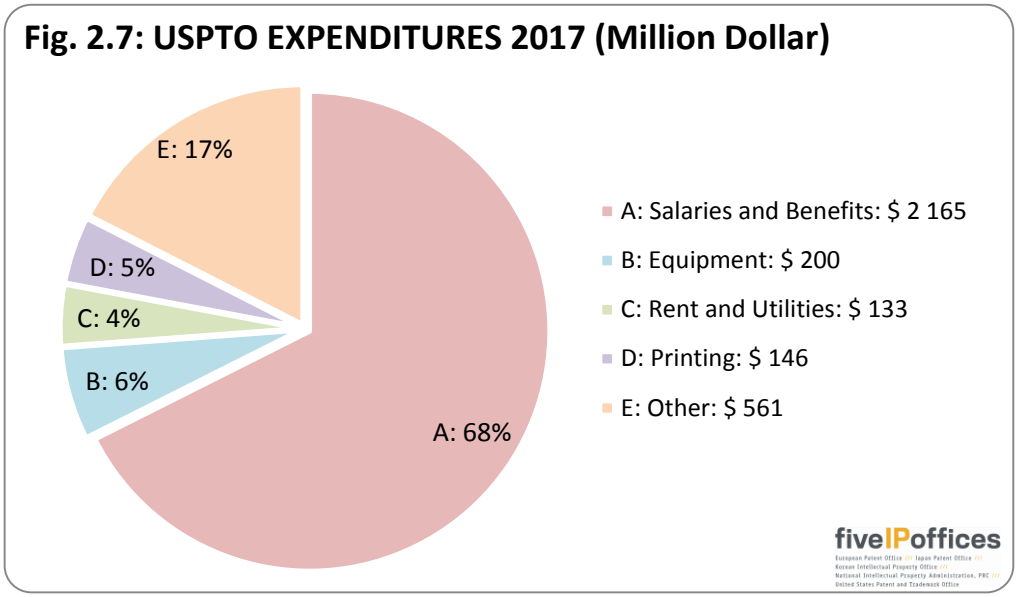
[24] Unless otherwise noted, the USPTO statistics presented elsewhere in this report are limited to utility patent applications and grants.
[25] A Request for Continued Examination is a USPTO procedure under which an applicant may obtain continued examination of an application by filing a submission and paying a specified fee, even if the application is under a final rejection, appeal, or a notice of allowance.

USPTO budget

The USPTO utilizes an activity based information methodology to allocate resources and costs that support programs and activities within each of the three strategic goals. In FY 2017, USPTO expenditures totalled $3 204.0 million. Agency-wide, 19.2 percent of expenditures were allocated to IT security and associated IT costs.

Goal 1 – Optimize Patent Quality and Timeliness	$ 2 875.3 million
Goal 2 – Optimize Trademark Quality an Timeliness	$ 281.9 million
Goal 3 – Provide Domestic and Global Leadership to Improve IP Policy, Protection and Enforcement Worldwide	$ 46.8 million

Fig. 2.7 shows USPTO expenditures by category in 2017



A description of the items in Fig. 2.7 can be found in Annex 1

USPTO Staff Composition

At the end of FY 2017, the USPTO work force was composed of 12 588 federal employees. Included in this number are 7 961 Utility, Plant, and Reissue patent examination staff and 186 Design examination staff; 549 Trademark examiner attorney staff, and 3 892 managerial, administrative and technical support staff.

More information

Further information can be found on the USPTO's website:
www.uspto.gov

Chapter 3

WORLDWIDE PATENTING ACTIVITY

Patenting activity is recognized as an indicator of innovation. This chapter examines worldwide patent activities in terms of patent applications and grants. The statistics mostly cover the five-year period from 2012 to 2016[26].

Hereafter, the counts of applications and filings are by the calendar year of filing and grants by the calendar year of grant. Statistics are derived primarily from the WIPO Statistics Database[27], as collected from offices all over the world. Patent statistics are sometimes retroactively updated and, where necessary, possible missing counts have been supplemented using other sources. But otherwise no estimated counts have been included to compensate for missing data. Considering that not all the offices report their filing statistics to the WIPO regularly enough, some of these data should be interpreted with care, especially when referring to countries outside the IP5 Blocs.

It should be noted that the number of inventions that lead to patent applications is less than the total number of applications filed. This is because the first filing for an invention that is made in one office is often followed by applications to some other offices, with each such application claiming the priority of the earlier first filing. First filings can be seen as an indicator of innovative activity, while foreign filings are an indicator of an intention to utilise such activity for international trade and globalisation.

While demand for patent protection is considered principally by counting each national, regional, or PCT international application only once, alternative representations are also given in this chapter in terms of the demand for rights, after cumulating the number of designated countries over applications within regional procedures.

[26] The statistical tables file found in the web version of this report includes extended time series for much of the data included in this chapter, www.fiveipoffices.org/statistics/statisticsreports.html

[27] This edition refers to general patent data as of March 2018, and to PCT international phase application data as of May 2018, www.wipo.int/ipstats/en/index.html. For some statistics on 2017, see Chapter 4.

In this chapter, applications are counted in terms of patent filings, first filings, patent applications, and demand for national patent rights. These counting methods are associated with separate sections within the chapter.

- "Patent filings" include direct national, direct regional, and international phase PCT filings;
- "First filings" include initial patent applications filed prior to any later subsequent filings to extend the protection to other countries;
- "Patent applications" include direct national, direct regional, national stage PCT, and regional stage PCT applications;
- "Demand for national patent rights" includes direct national, national stage PCT, and designations in regional and in regional stage PCT applications.

See “Guide to Figures in Chapter 3” on the next page, and also the explanatory text associated with the individual figures, for further discussion about the applications associated with each of these counting methods.

Patent grants are counted in the year that the grants are issued or published. As with the applications, alternative presentations are also given in this chapter for grants in terms of rights, after cumulating the number of designated countries in grants obtained from regional procedures.

The last part of this chapter discusses inter-bloc patent activity in terms of application flows between blocs and in terms of patent families. A patent family is a group of patent filings that claim the priority of a single filing, including the original priority forming filing itself and any subsequent filings made throughout the world. The set of distinct priority forming filings (that indexes the set of patent families) in principle constitutes a better measure for first filings than aggregated domestic national filings. IP5 patent families are a highly filtered subset of patent families for which there is evidence of patenting activity in all IP5 Blocs.

GUIDE TO FIGURES IN CHAPTER 3

Due to the complexity of the patent system, different representations of the patent filing process are made to illustrate complementary parts of the process. The following scheme guides the reader to graphs that correspond to the different representations. This also describes the terminology used throughout the Chapter 3. Additional explanatory text can be found with each of the referenced figures.

- **Figs. 3.1, 3.2, 3.3, and 3.4** show the numbers of *patent filings* in terms of application forms filled out. The counts include: direct national, direct regional filings (filed with the ARIPO, EAPO, EPO, GCCPO, OAPI [28]), and PCT international filings.

- **Figs. 3.5, 3.6, 3.7 and 3.13** show the numbers of requests for patents as *patent applications*. Direct applications to the offices are counted at the date of filing. PCT applications are counted at the moment they enter the national or regional phase. While direct national and direct regional filings are counted once, PCT filings are replicated over the numbers of national/regional procedures that are started.

- **Figs. 3.8, 3.9, and 3.10** show the numbers of *demands for national patent rights*. Direct national filings are counted only once. The counts for PCT applications entering national procedures are replicated over the number of countries where they enter this phase. This cumulates the demands for distinct national legal rights over the countries concerned. The counts for direct regional filings and PCT regional phase filings are replicated over the number of countries designated in the applications at the time that they enter the regional procedure. This gives a representation in terms of national patenting.

- **Fig. 3.11** shows the numbers of *granted patents*. All grants are counted only once (in an analogous way to Figs. 3.5, 3.6, 3.7, and 3.13 for applications).

- **Fig. 3.12** shows the numbers of *validated national patent grants*. Direct national grants are counted only once, but the counts for regional office grants are replicated over the numbers of countries for which the grant is validated. This gives a representation in terms of national patent rights obtained in each bloc (comparable to Figs. 3.8, 3.9, and 3.10 for applications).

- **Figs. 3.14, 3.15, 3.16 and Table 3** show the numbers of *patent families* that are generated by the set of first filings. They also show the flows between blocs in terms of the first filings for which claims to priority rights were made by subsequent filings in other countries.

[28] The ARIPO is the African Regional Intellectual Property Office. The EAPO is the Eurasian Patent Organization. The EPO is the Eurasian Patent Office. The GCCPO is the Gulf Cooperation Council Patent Office. The OAPI is the African Intellectual Property Organization.

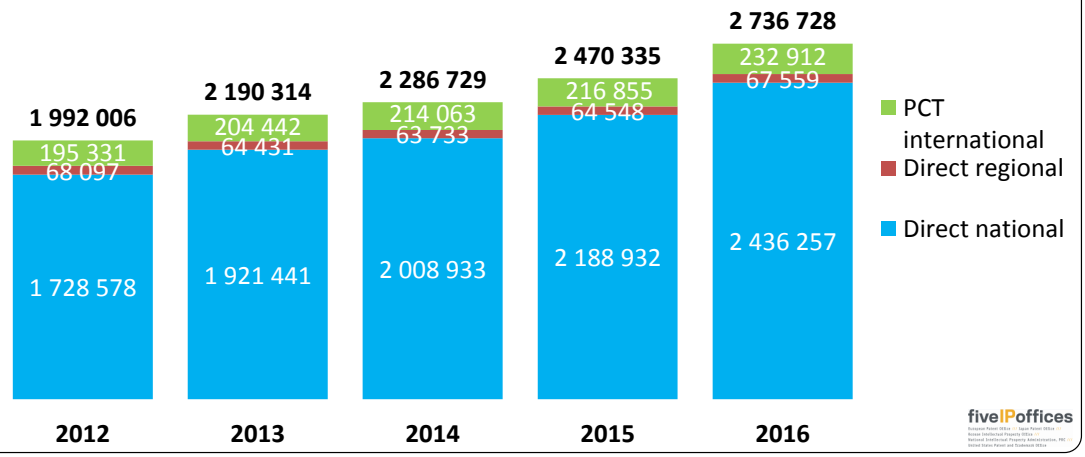
PATENT FILINGS

The patent filings that are counted in this section include direct national, direct regional and PCT filings in the international phase.

Figs. 3.1, 3.2, and 3.3 show the numbers of patent filings that were made throughout the world. Here, the filings are counted only once, which means that the number of countries designated in regional filings and in PCT international filings are not used in determining these counts. The total number represents a measure of the overall numbers of actions taken to assert IP rights around the world, although some inventions lead to filings in more than one office.

Fig. 3.1 shows a breakdown of patent filings according to the three types of filing procedures.

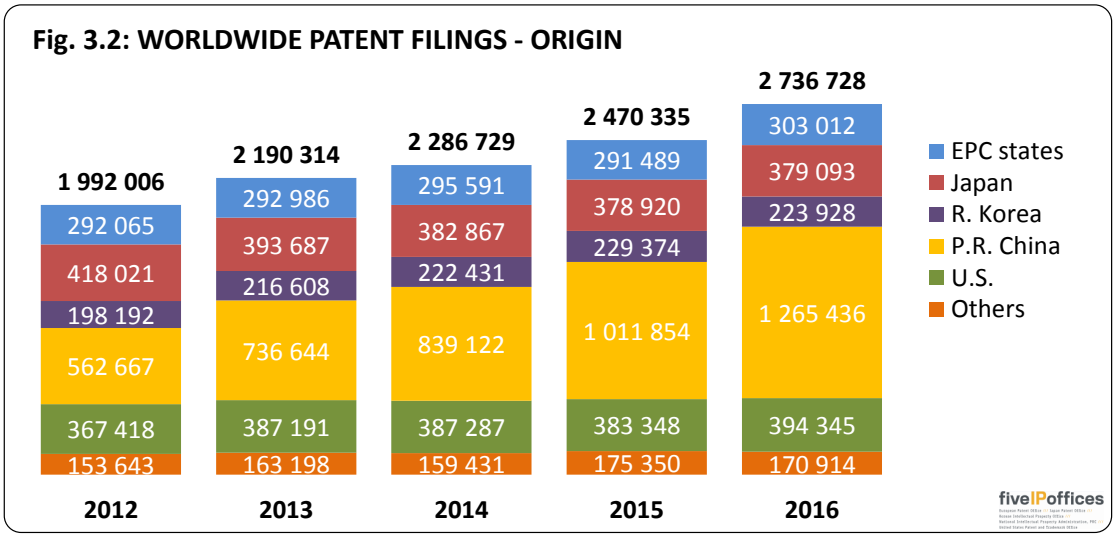
Fig. 3.1: WORLDWIDE PATENT FILINGS - FILING PROCEDURES



In 2016, the number of patent filings increased by 11 percent, to 2.7 million. The number of direct national filings increased by 11 percent, while the number of direct regional and PCT international phase filings increased by 5 percent and 7 percent. Overall, 89 percent of the filings were made according to direct national procedures.

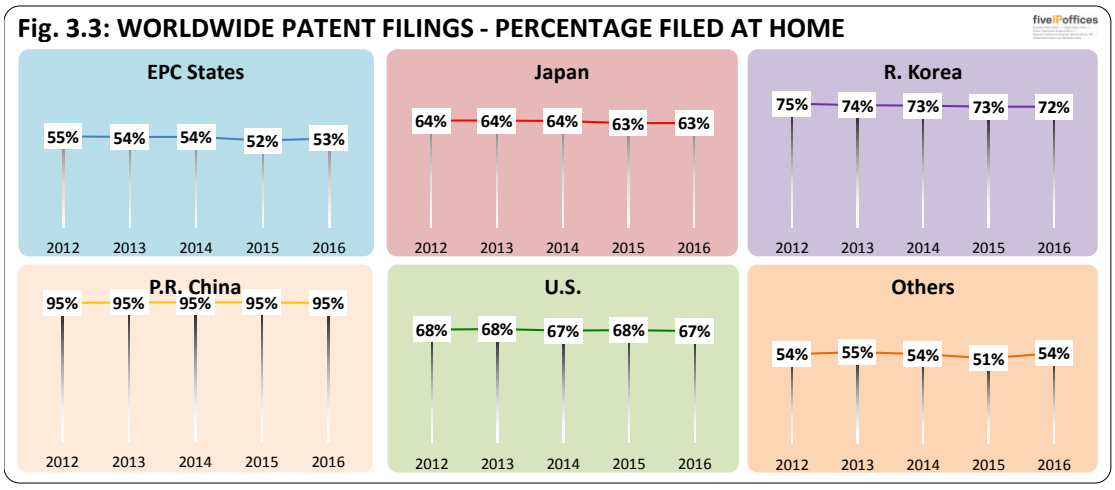
The contribution of the PCT system to filings will be discussed later in this chapter and in Chapter 5.

Fig. 3.2 shows the worldwide patent filings of Fig. 3.1 broken down by blocs of origin (residence of first-named applicant or inventor).



From 2012 to 2016, the IP5 Bloc's annual share increased slightly from 92 percent to 94 percent. In 2016, the number of patent filings increased by 11 percent. The number of patent filings that originated from P.R. China increased by 25 percent. The number of patent filings originating from the EPC states and the U.S. increased by 4 percent and 3 percent respectively, while those originating from R. Korea decreased by 2 percent. Patent flings originating from Japan increased by less than 1 percent.

Fig. 3.3 shows the proportion of patent filings throughout the world that are filed within the home bloc of origin (residence of first-named applicants or inventors).



For the IP5 Blocs, P.R. China had the largest proportion of filings made at home in 2016 with 95 percent. Among the IP5 blocs, the EPC states had[29] the lowest proportion with 53 percent in 2016.

Most national filings are made by residents of the countries concerned. To a large extent, filings abroad are made using regional or PCT procedures.

[29] For the purpose of reporting statistics for the EPC states considered as a bloc, a filing by a resident in an EPC state to another EPC state or to the EPO is considered to be filed within the bloc of origin. See the EPO section of Chapter 2 for a listing of the EPC states.

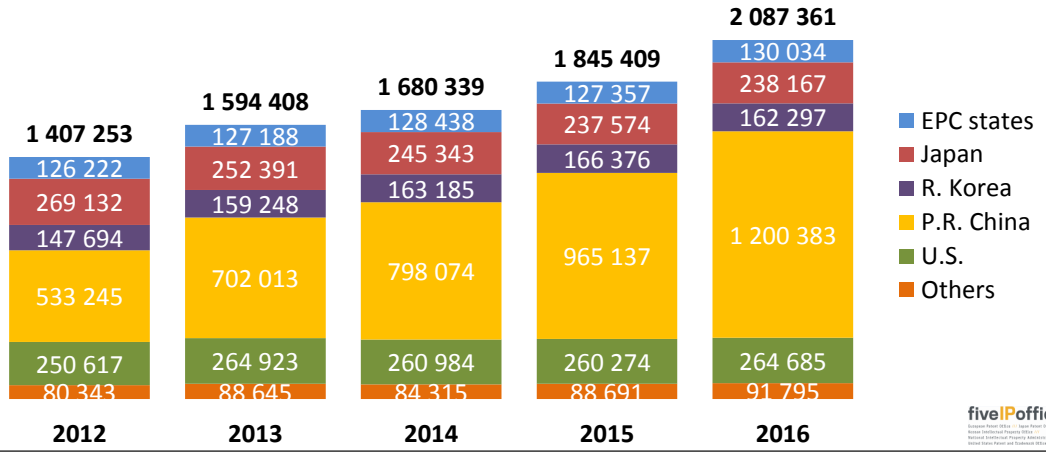
FIRST FILINGS

For the first filings counted in this section, all of the following appear only once: direct national, direct regional filings and PCT international phase filings.

The process of obtaining patent protection starts with the first filing, an initial patent filing made to protect an invention or an innovation prior to any subsequent filings to extend the protection to other countries.

Fig. 3.4 shows the development of first filings in the major filing blocs of origin (residence of first-named applicants or inventors).

Fig. 3.4: WORLDWIDE PATENT FIRST FILINGS - ORIGIN



P.R. China recorded 1 200 383 first filings in 2016, the highest number of first filings by any bloc within the IP5 area up to this point. This was an increase of 24 percent compared to 2015. There were also increases in first filings from the EPC states and from the U.S. of 2 percent each, while R. Korea had a decrease of 2.5 percent and Japan was steady. Overall, first filings increased by 13 percent between 2015 and 2016.

Comparison of Figs. 3.2 and 3.4 enables an evaluation of the numbers of subsequent filings, where the first filing for an invention at one office leads on to further filings, either elsewhere or at the same office. From the difference in the total for 2016 between Fig. 3.2 and Fig. 3.4, it can be estimated that there are 649 367 subsequent filings, meaning that on average there were 0.35 subsequent filings per first filing made in 2015, assuming a one year delay (649 367 / 1 845 409 = 0.35).

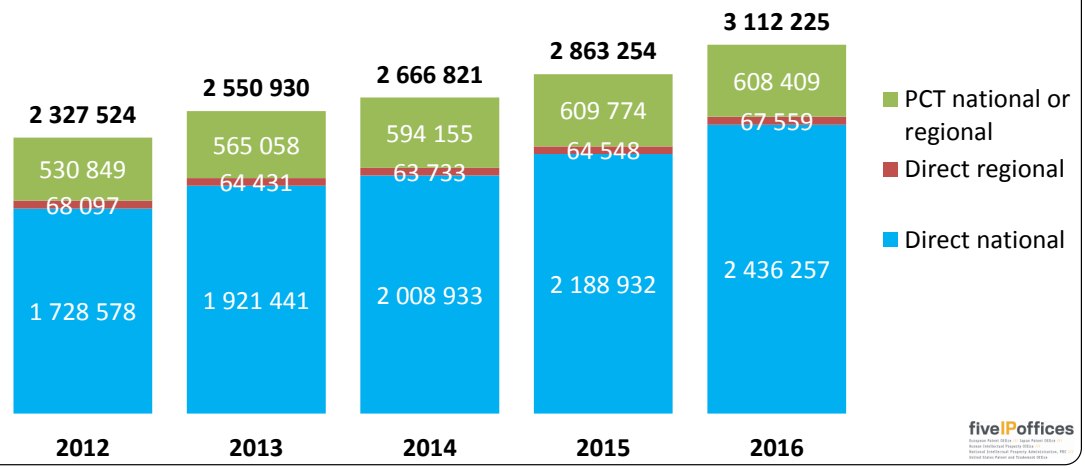
PATENT APPLICATIONS

Patent applications counted in this section include direct national, direct regional, national stage PCT and regional stage PCT applications.

Figs. 3.5, 3.6 and 3.7 describe the development of the numbers of patent applications in terms of requests for patents that entered a grant procedure. Note that direct national and direct regional applications enter a grant procedure when filed while, in the case of PCT applications, the grant procedure is delayed to the end of the international phase[30]. In the following figures, the number of PCT applications consists of a count of the applications that entered a national or regional stage in the corresponding year. This leads to higher numbers than in the previous section, because one PCT international filing usually enters into several national or regional procedures. For example, one PCT application (as reported in Fig. 3.1) may result in an EPO PCT regional phase entry, a U.S. PCT national phase entry, and an Australian PCT national phase entry, thus producing three PCT national/regional phase entry applications.

Fig. 3.5 shows the development of worldwide patent applications broken down by filing procedures.

Fig. 3.5: WORLDWIDE PATENT APPLICATIONS - FILING PROCEDURES



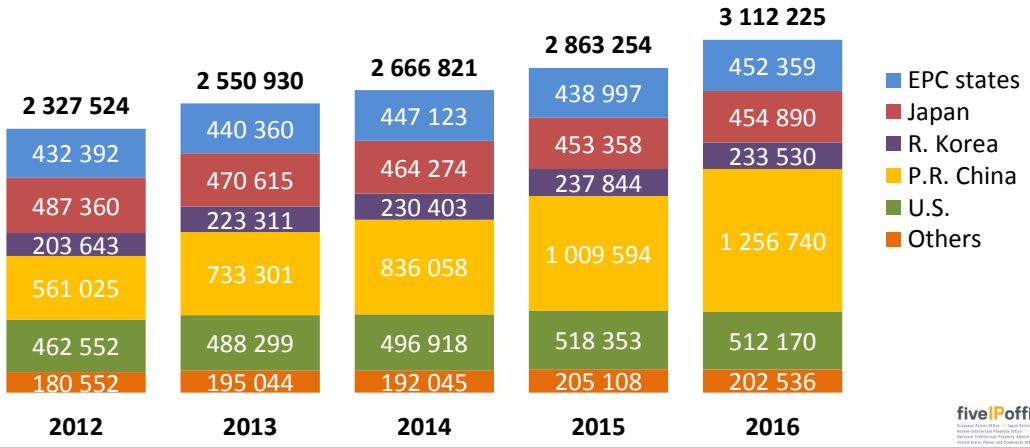
In 2016, 3.1 million patent applications were filed worldwide. This represents a 9 percent increase compared to 2015.

The number of direct national applications increased by 11 percent and the number of PCT national/regional applications decreased by less than 1 percent. This decrease follows from a large increase in PCT national/regional applications that originated from the U.S. in 2015.

[30] The national or regional phase under the PCT is entered up to 30 months or 31 months after the priority date of the first filing.

Fig. 3.6 shows the origins (residence of first-named applicants or inventors) of the worldwide patent applications of Fig. 3.5 entering a national or regional grant procedure.

Fig. 3.6: WORLDWIDE PATENT APPLICATIONS - ORIGIN

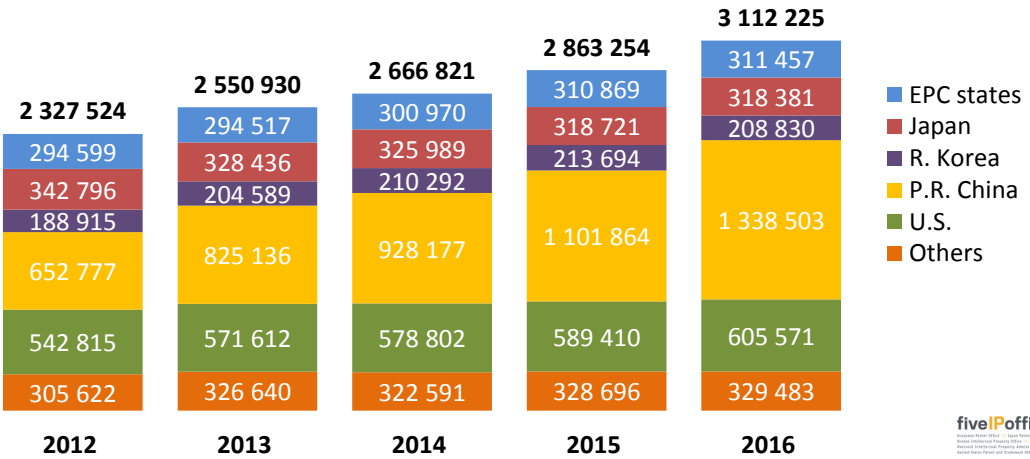


In 2016, the largest share of applications in the IP5 Bloc originated from P.R. China. P.R. China also had the largest percentage increase in applications by origin in 2016 (24 percent). The numbers of applications from EPC states and Japan increased by 3 percent and 0.3 percent respectively, while the numbers from R. Korea and the U.S. decreased by 2 percent and 1 percent respectively.

The data for the Others can only be compared between years with care. The changes from year to year reflect different numbers of countries reporting their count of applications as well as changes in the numbers of applications.

Fig. 3.7 shows the distribution of the worldwide patent applications according to the filing or target blocs and is based on the same data as in Fig. 3.5 and Fig. 3.6.

Fig. 3.7: WORLDWIDE PATENT APPLICATIONS - FILING OR TARGET BLOC



In 2016, P.R. China had the largest increase at 21 percent. The EPC states increased 0.2 percent and the U.S. by 3 percent, while the number of patent applications in Japan and R. Korea decreased by 0.1 percent and 2 percent respectively.

DEMAND FOR NATIONAL PATENT RIGHTS

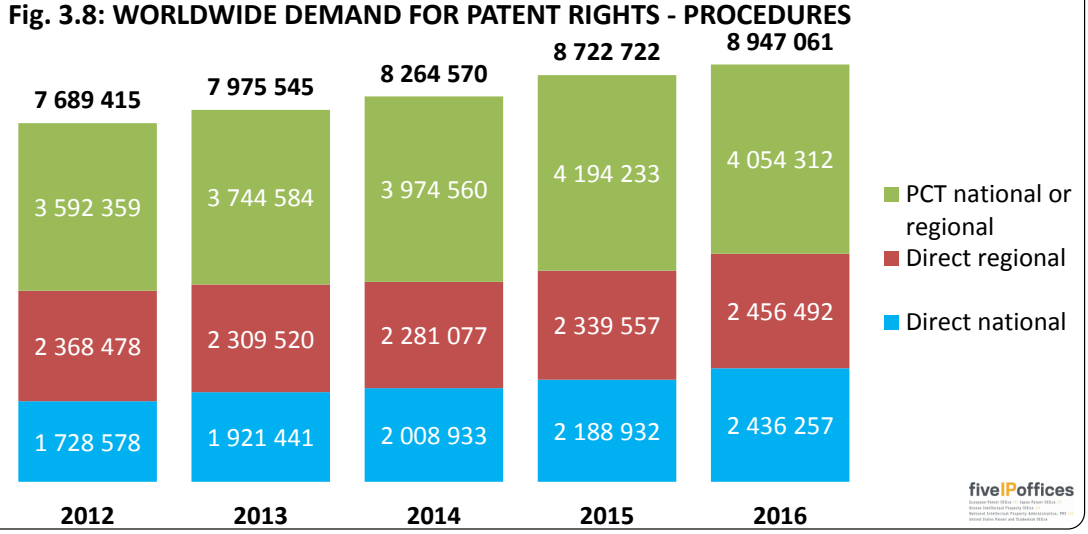
Patent applications counted in this section include direct national applications, national stage PCT applications and designated countries both in direct regional and in regional stage PCT applications.

With an increasing use of PCT and regional systems, and also the increasing number of countries joining such systems, the number of applications filed corresponds to a large number of demands for national patent rights. The number cumulates designated countries that are covered by the applications. This effectively measures the number of national patent applications that would have been necessary to seek patent protection in the same countries if there were no PCT or regional systems.

The direct national applications have effect in one country only, as does any PCT application entering one national phase procedure. But direct regional applications and PCT applications entering a regional system are demands for almost each and every individual member country. So, demand counts for regional offices are expanded to the numbers of countries covered by regional systems[31].

Fig. 3.8 shows the demand for national patent rights broken down by filing procedures.

Fig. 3.8: WORLDWIDE DEMAND FOR PATENT RIGHTS - PROCEDURES

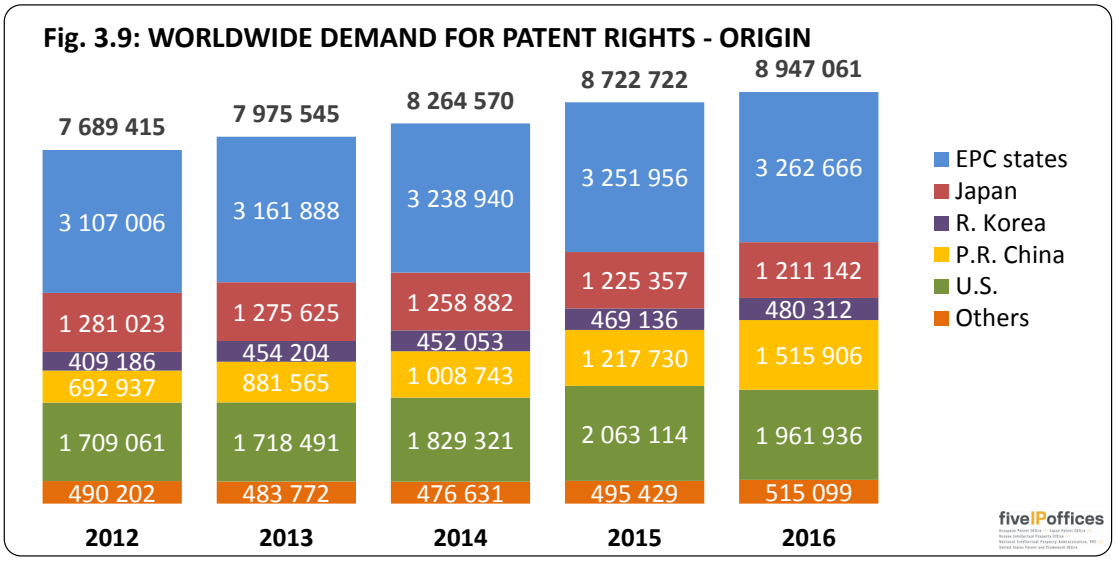


In 2016, there was an increase in the use of two of the three filing procedures noted in Figure 3.8. The use of the direct national and direct regional procedures continued their upward trends of the past few years with increases of 11 percent and 5 percent, respectively. The use of the PCT procedure decreased 3 percent in 2016.

Centralized filing procedures (PCT and direct regional) made up about 73 percent of the total demand in 2016. This illustrates the importance of these procedures to help users to expand their patent protection without needing to make separate applications to every country of interest.

[31] At the end of 2016, 88 states were party to a regional patent system, ARIPO 19, EAPC 8, EPC 38, GCCPO 6 and OAPI 17. This compares to 87 states at the beginning of 2012. Also at the end of 2016, 151 states were party to the PCT, compared to 146 states at the end of 2012. In addition, national patents can also be created in other states that have extension or validation agreements with the EPO (see Chapter 2).

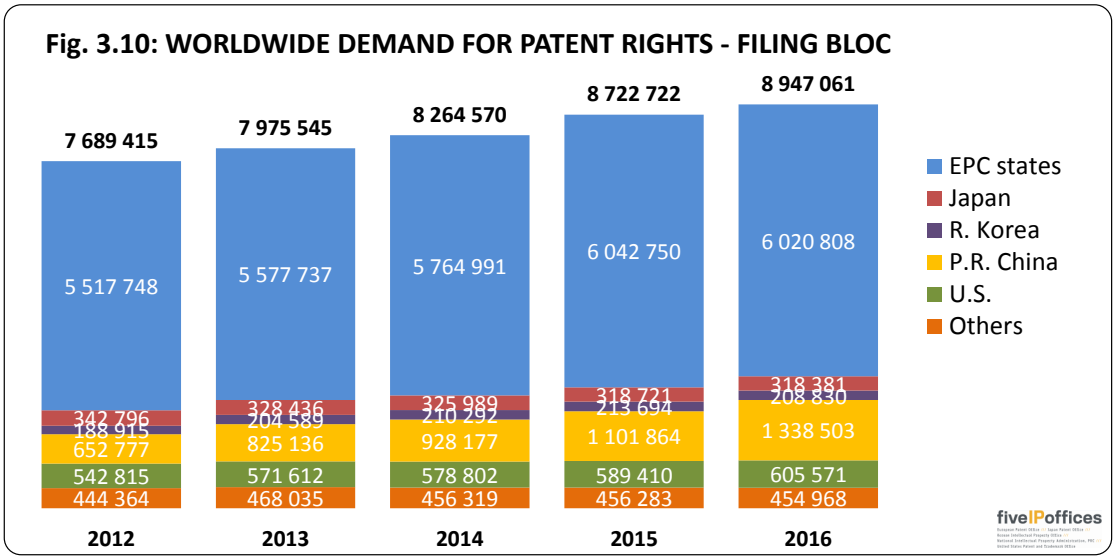
Fig. 3.9 shows the demand for national patent rights by blocs of origin (residence of first-named applicants or inventors) and is based on the same data as Fig. 3.8.



From 2015 to 2016, the worldwide demand for patent rights increased by 2.6 percent. Demand from P.R. China, R. Korea and the EPC states increased by 24 percent, 5 percent and 0.3 percent, respectively, while the demand decreased by 1 percent from Japan and by 5 percent from the U.S..

The large share of the EPC states reflects, among other factors, the intensive use of the international and regional systems there. This is shown even more clearly in the next chart for the distribution of the patent rights.

Fig. 3.10 shows the demand for national patent rights according to the filing or targeted blocs and is based on the same data as in Fig. 3.8 and Fig. 3.9.



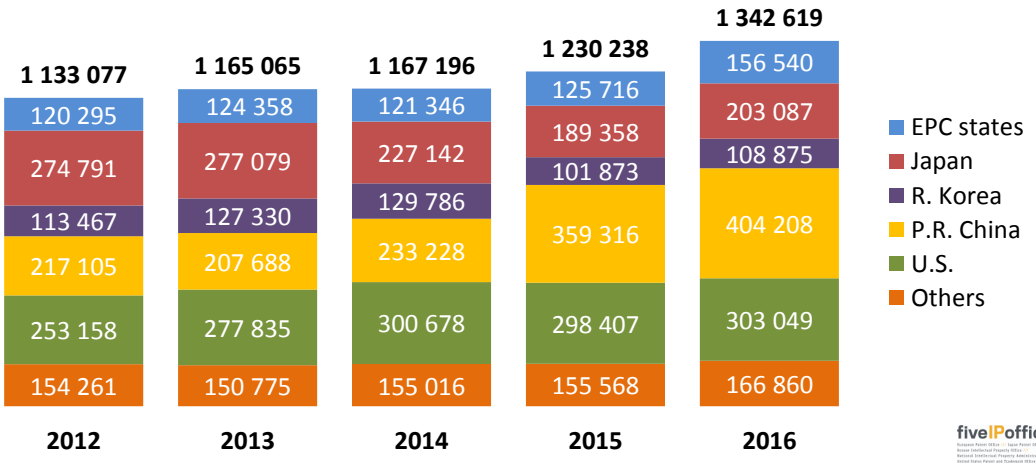
This chart illustrates the influence of regional patent systems. In 2016, the demand for national patent rights increased in P.R. China and the U.S., while it decreased in the EPC states, Japan and R. Korea. P.R. China had the largest increase at 21 percent.

GRANTED PATENTS

The development of the use of patents is shown in this section in terms of grants.

Fig. 3.11 displays the breakdowns of the numbers of granted patents in each of the blocs.

Fig. 3.11: WORLDWIDE GRANTED PATENTS - FILING BLOC

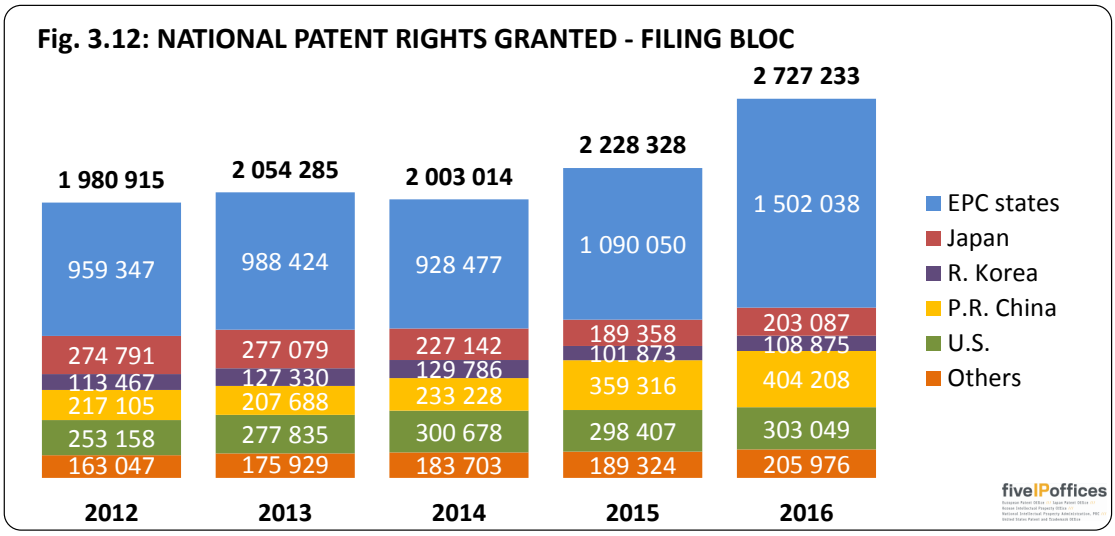


The total number of worldwide granted patents increased by 9 percent in 2016 to more than 1.3 million. The numbers of granted patents increased in all blocs. The EPC states had the largest percentage increase at 25 percent, followed by P.R. China at 12 percent. The numbers of granted patents in Japan, R. Korea and the U.S. increased by 7 percent, 7 percent, and 2 percent, respectively.

The data for Others should be compared between years with caution. The changes from year to year may reflect different numbers of countries reporting their counts of grants as well as changes in the numbers of grants.

Patent grants are counted only once per office, although the same invention may lead to grants at several offices. However, each grant action by a regional office (e.g. the EPO) can lead to as many national patents as the number of member states that have been designated. This has an effect only in the EPC states and Others, as shown in the following Fig. 3.12.

Fig. 3.12 shows validated national grants resulting from the decisions reported in Fig. 3.11. Direct national grants are counted only once, but the counts for regional office grants are replicated over the numbers of countries for which the grant is validated. This gives a representation in terms of national patent rights obtained in each bloc.



In 2016, more than 2.7 million patent rights were granted, which represents a 22 percent increase compared to 2015.

The fact that the EPC states bloc is made up of many countries, with an option for a centralized grant procedure at the EPO, explains why the number of patent rights granted there in Fig. 3.12 is much larger than the number of grant actions shown in Fig. 3.11.

As a consequence of the large increase in grants at the EPO in 2016, the number of national patent rights granted by the EPC states increased by 38 percent. Information for the Japan, P.R. China, R. Korea, and U.S. blocs is the same as in Fig 3.11 as on the previous page.

The data for Others should be compared between years with caution. The changes from year to year may reflect different numbers of countries reporting their count of grants as well as changes in the numbers of grants and countries covered there by regional patents.

INTER-BLOC ACTIVITY

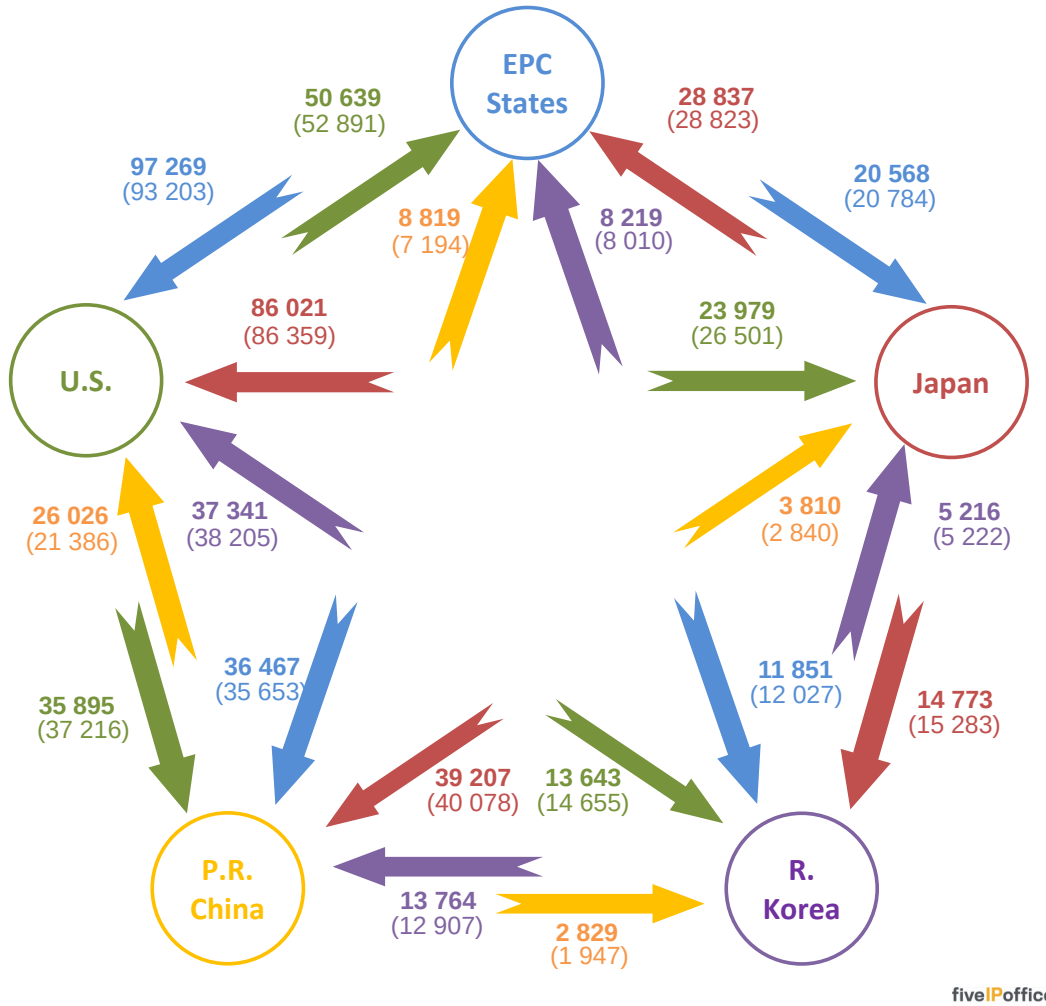
In this section, the flows between the different blocs and especially the IP5 Blocs are analysed first in terms of applications and then in terms of patent families.

FLOWS OF APPLICATIONS

Fig. 3.13 shows the flows of patent applications between IP5 Blocs (residence of first-named applicants or inventors, as in Fig. 3.5) in 2016, with 2015 figures given in parentheses.

Direct applications to the offices are counted at the date of filing. PCT applications are counted at the moment they enter the national or regional phase. Direct national and direct regional applications are counted only once. PCT applications are replicated over the numbers of national or regional procedures that are started.

Fig. 3.13: INTERBLOC ACTIVITY - APPLICATIONS 2016



As a general pattern, when applying abroad there were more applications in the U.S. than in any of the other IP5 Blocs. When filing abroad, U.S. applicants applied more in the EPC states than in any of the other IP5 Blocs.

In 2016, eleven of the twenty inter-bloc flows decreased to some extent. All flows starting from the U.S. decreased, with the flow from U.S. to Japan decreasing by nearly as much as 10 percent. Flows from Japan to U.S., to P.R. China and to R. Korea decreased. Flows from the EPC states to Japan and to R. Korea decreased and flows from R. Korea to Japan and to U.S. decreased.

The other nine of the twenty inter-bloc flows increased. In particular all flows starting from P.R. China increased markedly. The largest percentage increase of flow is from P.R. China to R. Korea (45 percent, compared to 2015).

PATENT FAMILIES

A patent family is a group of patent filings that claim the priority of a single first filing.

The information in this section on the flows of patent families between blocs was obtained from the DOCumentDataBase (DOCDB)[32] of worldwide patent publications. The statistics are based on the references to priorities that were given in published applications and grants. For counts of first filings in this section, the numbers of domestic national filings are taken, as in Fig. 3.4. Due to the delay in publication (relative to the time of filing), patent families counts can only be reported with accuracy after several years have passed.

The following Table 3 shows the numbers of first filings per bloc and details of flows of patent families between blocs for the priority years 2012 and 2013. Each percentage under a number translates this number into a proportion of the number of first filings made in the initial filing bloc where the priority filings were made.

Table 3: NUMBERS OF PATENT FAMILIES

Year of priority: 2012

Bloc of origin from which priority is claimed	**First Filings** in Bloc of Origin	**Flows to Subsequent Filings** First filings in Bloc of Origin leading to priority claims in filings in:								**IP5 Patent Families** from bloc of origin
		Any other Blocs	Any other IP5 Bloc	EPC States	Japan	R. Korea	P.R.China	U.S.	Other countries	
EPC States	126 222	51 911 (41.1%)	49 901 (39.5%)		15 996 (12.7%)	10 022 (7.9%)	30 788 (24.4%)	43 844 (34.7%)	20 012 (15.9%)	6 659 (5.3%)
Japan	269 132	77 264 (28.7%)	75 116 (27.9%)	30 296 (11.3%)		18 164 (6.7%)	47 256 (17.6%)	62 237 (23.1%)	18 997 (7.1%)	8 322 (3.1%)
R.Korea	147 694	25 093 (17.0%)	24 858 (16.8%)	7 783 (5.3%)	6 057 (4.1%)		11 674 (7.9%)	22 583 (15.3%)	3 415 (2.3%)	3 183 (2.2%)
P.R.China	533 245	19 304 (3.6%)	18 111 (3.4%)	7 796 (1.5%)	3 504 (0.7%)	2 096 (0.4%)		16 567 (3.1%)	6 363 (1.2%)	1 181 (0.2%)
U.S.	250 617	94 176 (37.6%)	81 802 (32.6%)	68 621 (27.4%)	32 455 (13.0%)	22 595 (9.0%)	52 715 (21.0%)		52 631 (21.0%)	13 985 (5.6%)
Five blocs subtotal	1 326 910	267 748 (20.2%)	249 788 (18.8%)	114 496 (8.6%)	58 012 (4.4%)	52 877 (4.0%)	142 433 (10.7%)	145 231 (10.9%)	101 418 (7.6%)	33 330 (2.5%)
Others	80 343	20 022 (24.9%)	20 022 (24.9%)	4 837 (6.0%)	2 265 (2.8%)	1 250 (1.6%)	6 671 (8.3%)	17 266 (21.5%)		581 (0.7%)
Global total	1 407 253	287 770 (20.4%)	269 810 (19.2%)	119 333 (8.5%)	60 277 (4.3%)	54 127 (3.8%)	149 104 (10.6%)	162 497 (11.5%)	101 418 (7.2%)	33 911 (2.4%)

Year of priority: 2013

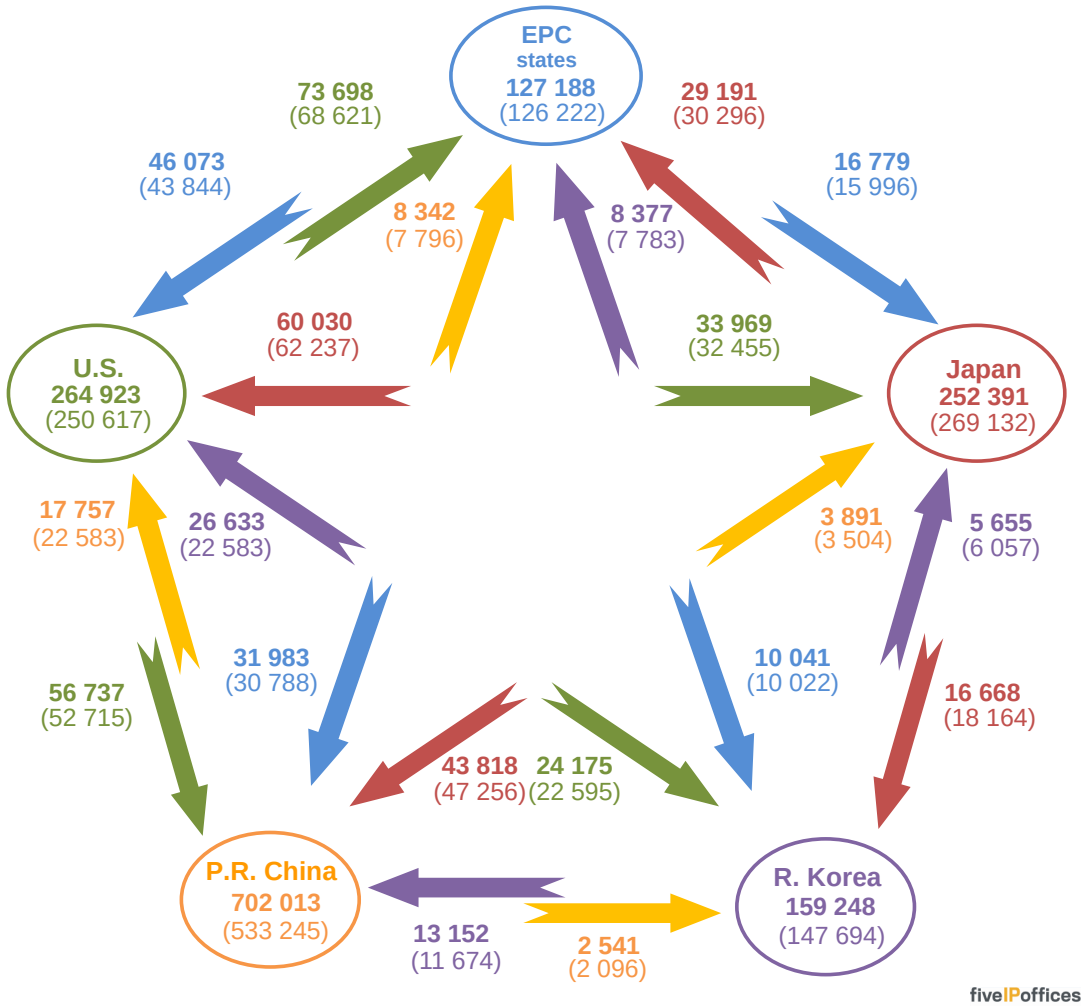
Bloc of origin from which priority is claimed	**First Filings** in Bloc of Origin	**Flows to Subsequent Filings** First filings in Bloc of Origin leading to priority claims in filings in:								**IP5 Patent Families** from bloc of origin
		Any other Blocs	Any other IP5 Bloc	EPC States	Japan	R. Korea	P.R.China	U.S.	Other countries	
EPC States	127 188	53 568 (42.1%)	51 838 (40.8%)		16 779 (13.2%)	10 041 (7.9%)	31 983 (25.1%)	46 073 (36.2%)	18 881 (14.8%)	6 763 (5.3%)
Japan	252 391	74 585 (29.6%)	72 370 (28.7%)	29 191 (11.6%)		16 668 (6.6%)	43 818 (17.4%)	60 030 (23.8%)	17 939 (7.1%)	7 484 (3.0%)
R.Korea	159 248	29 471 (18.5%)	29 158 (18.3%)	8 377 (5.3%)	5 655 (3.6%)		13 152 (8.3%)	26 633 (16.7%)	3 701 (2.3%)	2 889 (1.8%)
P.R.China	702 013	21 061 (3.0%)	19 695 (2.8%)	8 342 (1.2%)	3 891 (0.6%)	2 541 (0.4%)		17 757 (2.5%)	5 718 (0.8%)	1 545 (0.2%)
U.S.	264 923	100 669 (38.0%)	87 697 (33.1%)	73 698 (27.8%)	33 969 (12.8%)	24 175 (9.1%)	56 737 (21.4%)		54 406 (20.5%)	15 084 (5.7%)
Five blocs subtotal	1 505 763	279 354 (18.6%)	260 758 (17.3%)	119 608 (7.9%)	60 294 (4.0%)	53 425 (3.5%)	145 690 (9.7%)	150 493 (10.0%)	100 645 (6.7%)	33 765 (2.2%)
Others	80 343	19 523 (24.3%)	19 523 (24.3%)	4 638 (5.8%)	2 355 (2.9%)	1 176 (1.5%)	6 419 (8.0%)	16 647 (20.7%)		450 (0.6%)
Global total	1 586 106	298 877 (18.8%)	280 281 (17.7%)	124 246 (7.8%)	62 649 (3.9%)	54 601 (3.4%)	152 109 (9.6%)	167 140 (10.5%)	100 645 (6.3%)	34 215 (2.2%)

Source: EPO DOCDB Database

[32] DOCDB is the EPO master documentation database of patent publications, with worldwide coverage containing bibliographic data, abstracts and citations (but not the full text of the applications).

Fig. 3.14 shows the flows of patent families from first filings (at the patent offices of the specified IP5 Bloc) to subsequent filings among the IP5, with application counts based on the bloc of the patent office from which the claimed priority was filed. The number given for each bloc is the total number of first filings in 2013. The flow figures between blocs of origin and target blocs indicate the numbers of 2013 first filings from the bloc of origin that led to subsequent filings in the target bloc. The comparable figures for 2012 are given in parentheses.

Fig. 3.14: INTERBLOC ACTIVITY - FIRST FILINGS 2013 FILED ABROAD



From information in Table 3, out of all first filings in the IP5 Blocs in 2013 (1 505 763), 17 percent formed patent families that included at least one of the remaining IP5 Blocs (260 758). Proceeding to a higher degree of selectivity, only 2.2 percent of all first filings in the IP5 Blocs in 2013 formed IP5 patent families, where activities of first and/or subsequent filings were made in all the IP5 Blocs.

The IP5 patent family proportion of first filings in 2013 differed considerably according to the bloc of origin of the first filings, as can be seen in Table 3 (U.S. 5.7 percent, EPC states 5.3 percent, Japan 3.0 percent, R. Korea 1.8 percent, P.R. China 0.2 percent and for Others 0.6 percent).

Fig. 3.15 presents a separate diagram for each IP5 Bloc to display the percentages of first filings in that Bloc that led to subsequent filings in each of the other IP5 Blocs. The diagrams show graphical displays of 2013 patent family data as presented in Table 3. Four coloured circles appear in each diagram, with each circle representing the percentage of subsequent filings in an IP5 Bloc that resulted from the number of first filings in the bloc of origin. Areas where the circles overlap correspond to subsequent filings in more than one other IP5 Bloc. Recall that, in the case of the EPC states, the activities at national offices are included as well as at the EPO.

Above each diagram appears the total number of first filings that were received in each of the IP5 Blocs in 2013. Then the proportions of those first filings that led on to subsequent filings in each other bloc are shown. Some of these percentages also appear in the upper part of Table 3.

Underneath the coloured diagrams, the percentages next to the bloc combinations show subsidiary percentages of subsequent filings that flowed to more than one other IP5 Bloc.

For instance, patent families from first filings in EPC member states that were subsequently filed in the P.R. China and the U.S. blocs are indicated in the graphical display by the area where the green and yellow circles overlap in the first diagram. The corresponding percentage is 19.1 percent, as shown next to the pair of yellow and green dots that appear lower down in the figure. The non-overlapping areas of the graphical displays are representative of the percentage or number of patent families that were not subsequently filed in any of the other IP5 Blocs. For instance, for first filings in EPC states, the small non-overlapping area of the Japan circle indicates that only a small percentage and number of the patent families from EPC states were filed in Japan without also being filed in at least one of the other IP5 Blocs, as well.

The last row of the table in Fig. 3.15 shows the proportions of IP5 patent families, as also appear in the last column of the upper part of Table 3.

Fig. 3.15: 2013 PATENT FAMILIES - PERCENTAGES OF FIRST FILINGS WITH SUBSEQUENT FILINGS IN OTHER IP5 BLOCS

fiveIPoffices

First filings in	EPC states offices* 127 188	Japan (JPO) 252 391	R.Korea (KIPO) 159 248	P.R.China (CNIPA) 702 013	U.S. (USPTO) 264 923
Bilateral families with subsequent filings in					
EPC states	-	11.6%	5.3%	1.2%	27.8%
Japan	13.2%	-	3.6%	0.6%	12.8%
R. Korea	7.9%	6.6%	-	0.4%	9.1%
P.R. China	25.1%	17.4%	8.3%	-	21.4%
U.S.	36.2%	23.8%	16.7%	2.5%	-
Three bloc families with subsequent filings in					
EPC states & Japan	-	-	2.0%	0.4%	11.4%
EPC states & R. Korea	-	3.3%	-	0.3%	7.5%
EPC states & P.R. China	-	8.7%	4.1%	-	17.5%
EPC states & U.S.	-	10.5%	5.0%	1.0%	-
Japan & R. Korea	5.9%	-	-	0.3%	6.5%
Japan & P.R. China	10.8%	-	2.8%	-	10.3%
Japan & U.S.	12.4%	-	3.1%	0.5%	-
R. Korea & U.S.	7.2%	4.9%	-	0.3%	-
P.R. China & R. Korea	7.1%	5.5%	-	-	7.8%
P.R. China & U.S.	21.1%	13.3%	7.0%	-	-
Four bloc families with subsequent filings in					
EPC states & Japan & R. Korea	-	-	-	0.2%	6.0%
EPC states & Japan & P.R. China	-	-	1.9%	-	9.6%
EPC states & Japan & U.S.	-	-	1.9%	0.4%	-
EPC states & R. Korea & P.R. China	-	3.1%	-	-	6.9%
EPC states & R. Korea & U.S.	-	3.1%	-	0.3%	-
EPC states & P.R. China & U.S.	-	8.2%	4.0%	-	-
Japan & R. Korea & P.R. China	5.5%	-	-	-	6.1%
Japan & R. Korea & U.S.	5.6%	-	-	0.2%	-
Japan & P.R. China & U.S.	10.4%	-	2.6%	-	-
P.R. China & R. Korea & U.S.	6.6%	4.1%	-	-	-
IP5 families	5.3%	3.0%	1.8%	0.2%	5.7%

** EPO or EPC states national offices*

From Fig. 3.15 and Table 3, the 2013 data indicate that the U.S. market may be considered as the most important foreign market for the other IP5 Blocs since, for each of those blocs, subsequent applications in the U.S. represent the highest percentages among target blocs. The second most important market for the other IP5 Blocs is P.R. China and for USPTO the most important foreign market is the EPC States.

For the first filings in the EPC member states, the largest percentage of subsequent filings is directed to the U.S. (36.2 percent). In general, first filings in the EPC member states tend to result in a higher percentage of subsequent filings overseas, as compared to the first filings in other IP5 Blocs as seen in Fig. 3.15 and the first data row of Table 3.

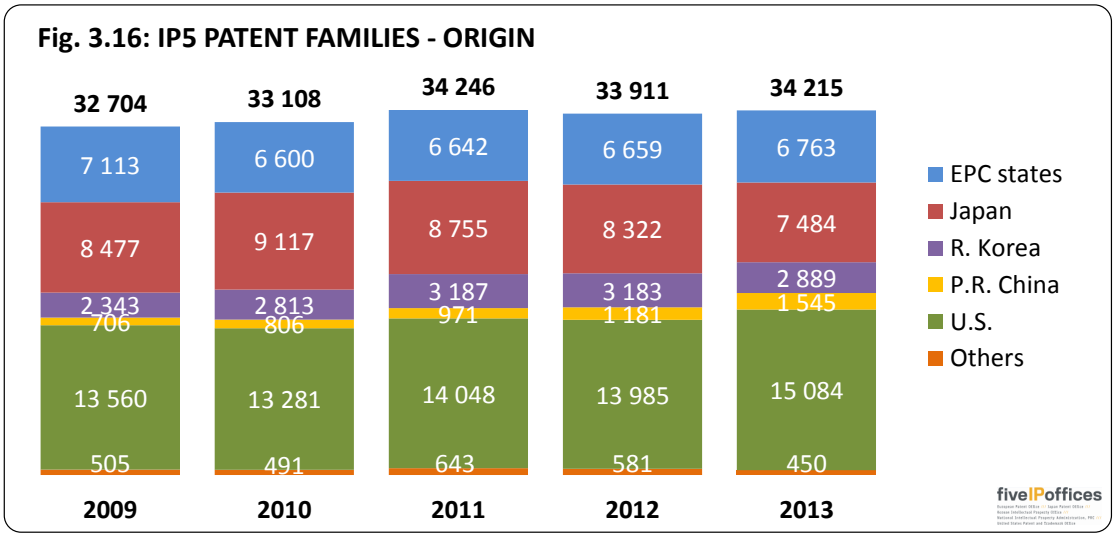
For the first filings in Japan, the largest percentage of subsequent applications is directed to the U.S. (23.8 percent) and P.R. China is the next largest (17.4 percent), while the EPC states is 11.6 percent.

For the first filings in R. Korea, as with the other blocs, the percentage of subsequent applications filed in the U.S. (16.7 percent) is the largest, followed by P.R. China (8.3 percent). The percentage of subsequent applications filed in the EPC member states is 5.3 percent. This last percentage is close to the percentage of subsequent applications filed in both the EPC member states and the U.S. together (5.0 percent), indicating that most of the subsequent applications filed in the EPC member states have been also filed in the U.S.

For the first filings in P.R. China, the percentage of subsequent applications filed in the U.S. (2.5 percent) is the largest. The percentage filed in both the EPC member states and Japan is 0.4 percent. The percentage of subsequent applications that were filed in the EPC member states, Japan, and the U.S. is close at 0.4 percent, indicating that most likely the subsequent applications filed in both the EPC states and Japan have also been filed in the U.S. Despite the low proportions of first filings in P.R. China that led to subsequent applications anywhere else, rapidly growing numbers of first filings have resulted in continued growth of the absolute numbers of patent families flowing out to other IP5 Blocs, as can be seen by comparing the 2012 and the 2013 data displayed in Table 3 (18 111 compared to 19 695, respectively).

Among the first filings in the U.S., the highest percentage flows to the EPC member states (27.8 percent). The percentage filed in the P.R. China (21.4 percent) is the next highest, while filings in Japan and R. Korea are at 12.8 percent and 9.1 percent, respectively.

Fig. 3.16 shows the development over time of IP5 patent families by bloc of origin (residence of first-named applicants or inventors) of the priority forming filings.



The total number of IP5 patent families in 2013 was 34 215, of which 44 percent were from the U.S., 22 percent were from Japan, 20 percent were from the EPC states, 8 percent were from R. Korea, 5 percent were from P.R. China, and 1 percent were from Others.

Chapter 4

PATENT ACTIVITY AT THE IP5 OFFICES

This chapter presents trends in patent application filings and grants at the IP5 Offices only, including also some breakdowns by technologies. While in Chapter 3 the latest data were for 2016, most of the information that appears here includes data also for 2017[33]. The patent office statistics for Europe in this chapter are for the EPO only and do not include statistics from the EPC states' National Offices. Whereas the EPO is indicated from the viewpoint of an office, the EPC states are still indicated as a bloc of origin.

The activities at the IP5 Offices are demonstrated by counts of the patent applications that were filed. For patent applications, the representations are analogous to those appearing in Chapter 3 (Figs. 3.5, 3.6, 3.7, and 3.13) which show the numbers of requests for patents as patent applications[34]. Direct applications to the offices are counted at the date of filing. PCT applications are counted at the moment they enter the national or regional phase. Direct national and direct regional filings are counted only once. PCT national/regional phase filings are replicated over the numbers of procedures that are started.

The demand at the EPO is given in terms of applications rather than in terms of designations.

For granted patents, the statistics combine information by office and bloc of origin, displaying comparisons by year of grant. The representations here are similar to those for Fig. 3.11, where granted patents are counted only once, except that, for EPC states, only the EPO is considered as the granting authority. Hereinafter, "patent grants" will signify the number of grant actions (issuances or publications) by the IP5 Offices.

For information about specific terminology and associated definitions used in Chapter 4, please refer to Annex 2.

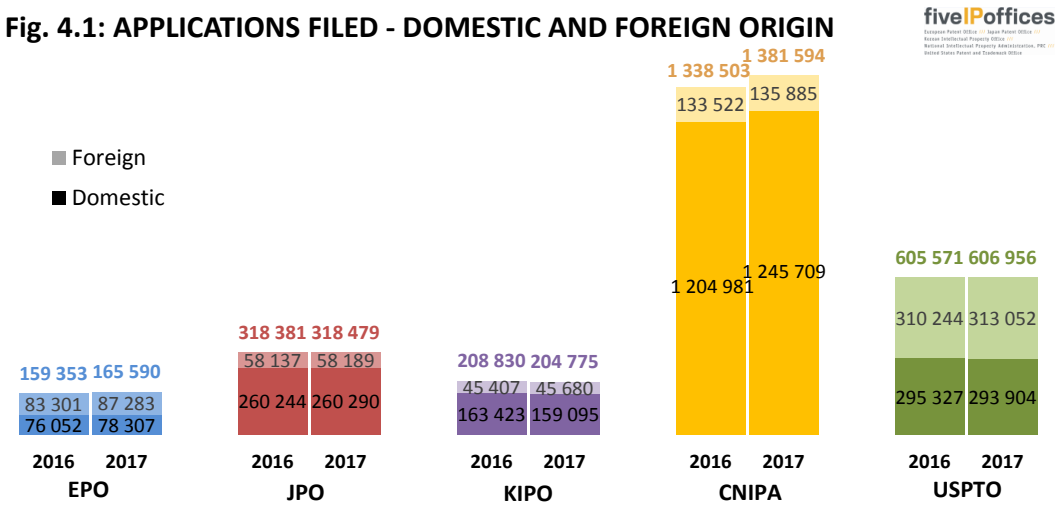
[33] The statistical tables file found in the web version of this report includes extended time series for much of the data included in this chapter. http://www.fiveipoffices.org/statistics/statisticsreports.html
[34] See the section "Guide to figures in Chapter 3" at the beginning of Chapter 3.

PATENT APPLICATIONS

ORIGIN

Fig. 4.1 shows the number of patent applications that were filed at each of the IP5 Offices during the two most recent years, broken down by domestic and foreign origin (based on the residence of first-named applicants or inventors). For the EPO, domestic applications correspond to those filed by residents of the EPC states.

Fig. 4.1: APPLICATIONS FILED - DOMESTIC AND FOREIGN ORIGIN



In 2017, a total of 2 677 394 patent applications were filed at the IP5 Offices, an increase of 1.8 percent from 2016 (2 630 638).

Patent applications increased by 4 percent at the EPO and by 3 percent at the CNIPA. Applications remained stable at the JPO and at the USPTO, while decreasing by 2 percent at the KIPO.

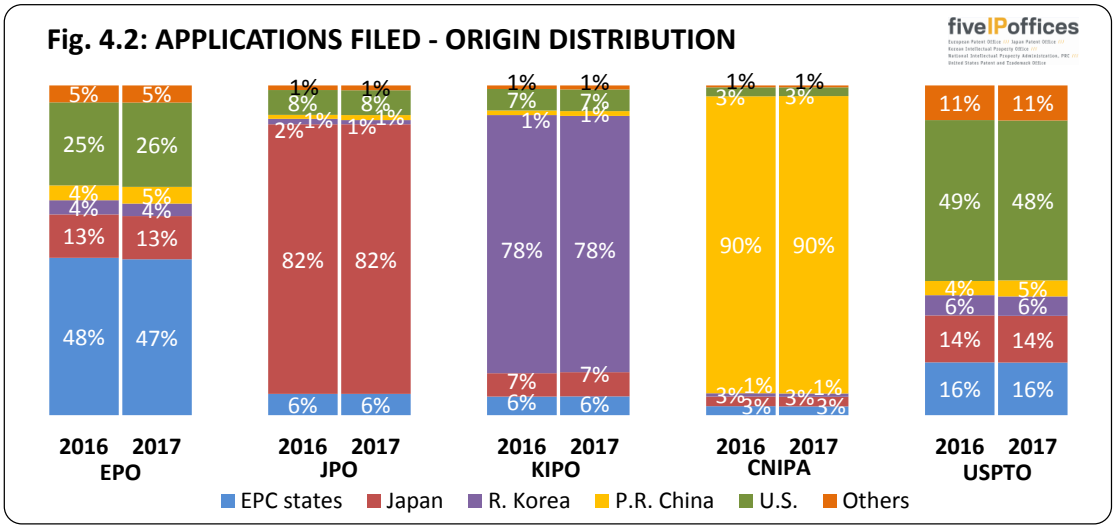
Domestic and foreign applications both increased at the EPO and at the CNIPA. At the KIPO, domestic applications decreased by 3 percent and foreign applications increased by 1 percent. At the USPTO, domestic applications decreased by less than 1 percent and foreign applications increased by 1 percent.

Table 4.1 shows the number of patent application filings by origin (residence of first-named applicants or inventors) relative to total filings at each office for 2017.

Table 4.1: 2017 APPLICATIONS FILED - ORIGIN

Office / Origin	EPO	JPO	KIPO	CNIPA	USPTO	Total
EPC States	78 307	20 559	11 697	36 818	96 995	244 376
Japan	21 712	260 290	15 044	40 908	86 113	424 067
R. Korea	6 261	4 172	159 031	13 180	35 565	218 209
P.R. China	8 330	4 735	3 015	1 245 709	29 674	1 291 463
U.S.	42 300	23 949	13 497	36 980	293 904	410 630
Others	8 680	4 774	2 491	7 999	64 705	88 649
Total	**165 590**	**318 479**	**204 775**	**1 381 594**	**606 956**	**2 677 394**

Fig. 4.2 shows the respective shares of patent applications filings by origin (residence of the first-named applicant or inventor) relative to the total number of applications filed at each office, for 2016 and 2017.



Caution should be used when comparing the numbers of applications across the IP5 Offices, due to the fact that the average number of claims contained in individual applications varies significantly between the IP5 Offices. On average, in 2017, an application filed at the EPO contained 14.7 claims, (14.1 in 2016) while an application filed at the JPO contained an average of 10.4 claims (10.1 in 2016), and an application filed at the KIPO contained an average of 11.2 claims (11.2 in 2016). At the CNIPA, an application contained an average of 8.1 claims (7.7 in 2016), while one filed at the USPTO had 17.6 claims (18.6 in 2016) on average.

The shares of patent application filings by bloc of origin are generally consistent for 2016 and 2017 for each office.

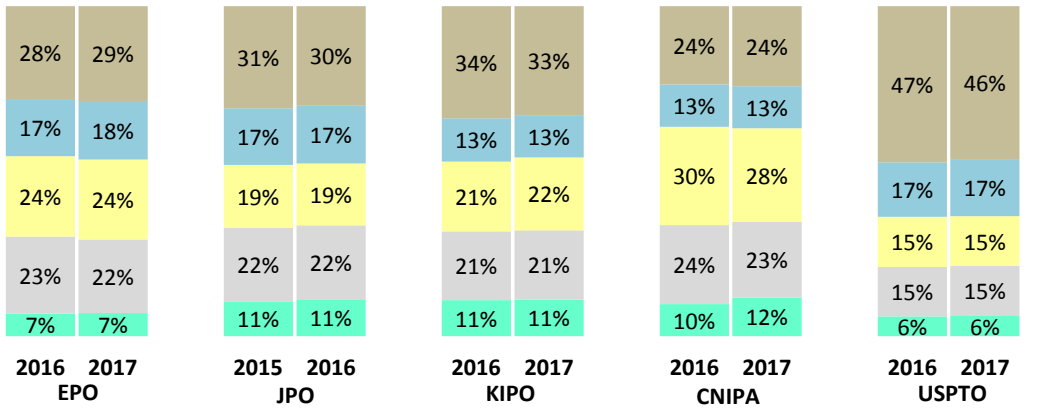
See the annexed statistical tables for longer trends.

SECTORS AND FIELDS OF TECHNOLOGY

Patents are classified by the IP5 Offices according to the IPC. This provides for a hierarchical system of language independent symbols for the classification of patents and utility models according to the different areas of technology to which they pertain. The WIPO established a concordance table to link the IPC symbols with thirty-five fields of technology grouped into five sectors[35]. Fig. 4.3 shows the distribution of applications at each office according to the five main sectors of technology.

The classification takes place at a different stage of the procedure in the offices. As a result, data are shown for the EPO, the KIPO, the CNIPA, and the USPTO for the filing years 2016 and 2017, while for the JPO the breakdown is given for the filing years 2015 and 2016[36].

Fig. 4.3: APPLICATIONS FILED - SECTOR OF TECHNOLOGY



The Electrical engineering sector is more prominent at the USPTO than in the other IP5 Offices. A higher proportion of applications are filed in the Chemistry sector at the CNIPA and at the EPO than in the other IP5 Offices. At each office, the distribution between sectors of technology was fairly stable between the two years reported. On the longer term, there are some slow variations that can be seen in the statistical annex. For example, at JPO there was a slow decline in the proportion for the Electrical Engineering sector since 2011.

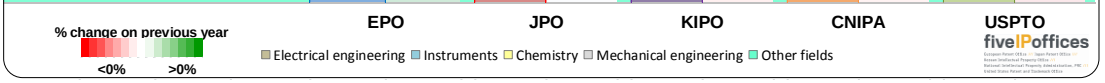
[35] www.wipo.int/meetings/en/doc_details.jsp?doc_id=117672
www.wipo.int/export/sites/www/ipstats/en/statistics/patents/xls/ipc_technology.xls

[36] JPO data for 2016 are the most recent available figures because the IPC assignment is completed just before the publication of the Unexamined Patent Application Gazette (18 months after the first filing).

Fig. 4.4 describes the distribution of the 2017 applications by the more detailed fields of technology at each office (left column for each IP5 Office), and the change in application counts compared to 2016 (right column). Actual shares and percentage changes in application counts are shown for the top 10 leading fields at each Office. The distribution of applications is represented by a colour scale: the darker the shade of a colour, the greater the share. The extent of change is reflected by a red–to-green colour scale, the dark red indicates a marked decrease and dark green indicates a marked increase.

Fig. 4.4: DISTRIBUTION OF APPLICATIONS FILED BY FIELD OF TECHNOLOGY - 2017

	EPO		JPO		KIPO		CNIPA		USPTO	
	Share	Change	Share	Change	Share	Change	Share	Change	Share	Change
1. Electrical machinery, apparatus, energy	6%	+4%	9%	-4%	8%	-3%	6%	-5%	6%	-2%
2. Audio-visual technology			4%	+3%					4%	-9%
3. Telecommunications										
4. Digital communication	7%	+6%			4%	-4%	4%	+3%	9%	-5%
5. Basic communication processes										
6. Computer technology	7%	+4%	6%	-5%	6%	-1%	7%	+26%	15%	-5%
7. IT methods for management					5%	-6%			3%	-2%
8. Semiconductors			4%	-6%	5%	-1%			5%	-2%
9. Optics			5%	-2%					3%	-2%
10. Measurement	5%	+7%	5%	+2%	4%	-7%	6%	+9%	4%	+5%
11. Analysis of biological materials										
12. Control										
13. Medical technology	8%	+6%	5%	+4%	4%	+1%			7%	+0%
14. Organic fine chemistry	4%	+4%								
15. Biotechnology	4%	+14%								
16. Pharmaceuticals	4%	+8%								
17. Macromolecular chemistry, polymers										
18. Food chemistry							4%	-8%		
19. Basic materials chemistry							4%	+15%		
20. Materials, metallurgy										
21. Surface technology, coating										
22. Micro-structural and nano-technology										
23. Chemical engineering										
24. Environmental technology										
25. Handling			3%	+3%						
26. Machine tools							4%	+3%		
27. Engines, pumps, turbines										
28. Textile and paper machines										
29. Other special machines	3%	+0%			4%	+5%	5%	+22%		
30. Thermal processes and apparatus										
31. Mechanical elements										
32. Transport	5%	-4%	5%	+0%	5%	-8%			4%	+3%
33. Furniture, games			7%	+14%						
34. Other consumer goods							5%	+107%		
35. Civil engineering					5%	-2%	4%	-1%		



Three fields are leading fields at all the IP5 Offices: *1.Electrical machinery, apparatus, energy*, *6.Computer technology* and *10.Measurement*.

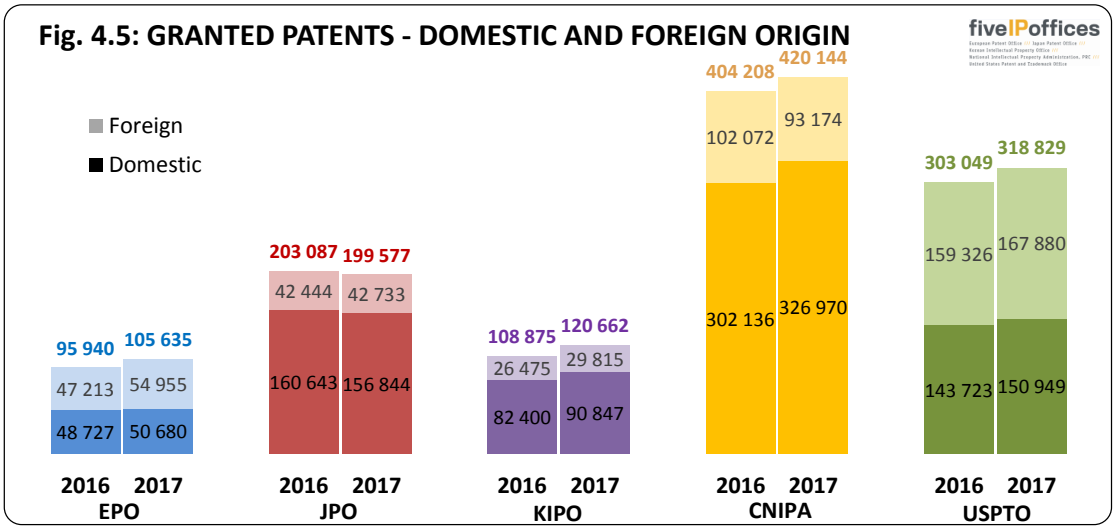
Six of the leading fields at the USPTO and five of the leading fields at the KIPO are related to the Electrical engineering sector (1 to 8). At the JPO and the KIPO, most of leading fields are related to the Electrical engineering sector (1 to 8) or to Instruments sector (9 to 13). At the EPO, the leading fields are in the Electrical engineering (1 to 8) and in the Chemistry (14 to 24) sectors, while leading fields at the CNIPA are within all sectors.

The highest share in a field can be found in *6.Computer technology* receiving 15 percent of all applications at the USPTO. Applications in the leading fields at the CNIPA experienced very diverging growth.

GRANTED PATENTS

ORIGIN

Fig. 4.5 shows the numbers of granted patents by the IP5 Offices, according to the bloc of origin (residence of first-named owner or inventor).



Together the IP5 Offices granted a total of 1 164 847 patents in 2017. This was 49 688 more than in 2016 and represents an increase of 4.5 percent.

The numbers of granted patents increased in 2017 at the EPO, the KIPO, the CNIPA and the USPTO. At the KIPO, there was an increase of approximately 11 percent, by 10 percent at the EPO, by 4 at the CNIPA and 5 percent at the USPTO. At the JPO, the number of granted patents decreased by 2 percent.

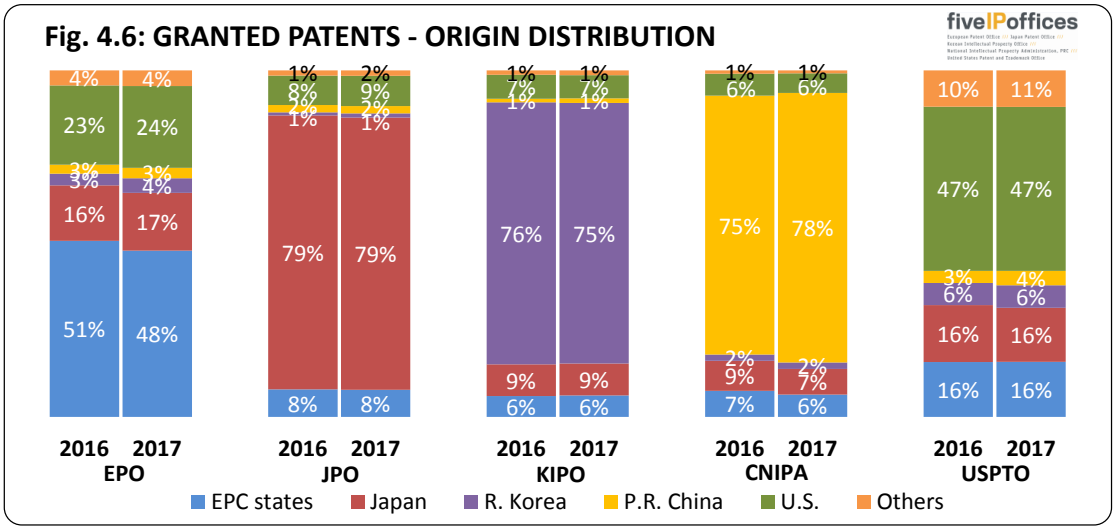
The differences between the IP5 Offices regarding the absolute numbers of granted patents can only be partly explained by differences in the numbers of corresponding applications. These numbers are also affected by differing grant rates and durations to process applications by the IP5 Offices (see the section below "Statistics on Procedures").

Table 4.2 shows the number of granted patents by origin (residence of first-named owner or inventor) at each office for 2017.

Table 4.2: 2017 GRANTED PATENTS – ORIGIN

Office / Origin	EPO	JPO	KIPO	CNIPA	USPTO	Total
EPC States	50 680	15 584	7 458	27 091	50 660	151 473
Japan	17 660	156 844	11 081	31 090	49 677	266 352
R. Korea	4 435	2 415	90 847	7 857	20 717	126 271
P.R. China	3 180	4 232	1 556	326 970	13 243	349 181
U.S.	24 960	17 451	8 096	23 673	150 949	225 129
Others	4 720	3 051	1 624	3 463	33 583	46 441
Total	**105 635**	**199 577**	**120 662**	**420 144**	**318 829**	**1 164 847**

Fig. 4.6 shows the shares of granted patents by origin (residence of first-named owner or inventor) at each office for 2016 and 2017.



Comparison with Fig. 4.2 shows that the share of Japan in granted patents at each foreign IP5 Office is systematically slightly higher than the corresponding share in applications.

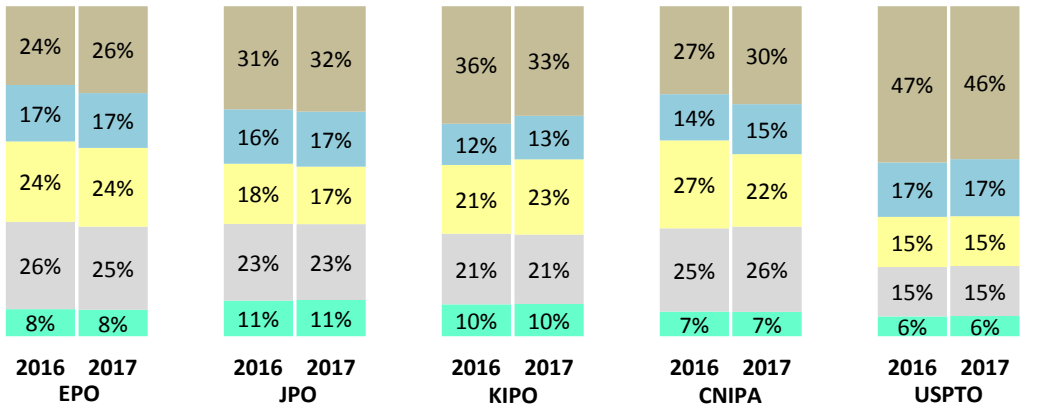
At the EPO, the share of domestic granted patents is higher than that of domestic applications, but that it continued to decline in 2017.

At the other offices, the share of domestic granted patents is slightly lower than the share of domestic applications. But in the case of CNIPA, the difference is much larger, which can be partially explained by the strong growth in domestic applications observed during the past few years. This is not yet reflected in the distribution of granted patents.

SECTORS AND FIELDS OF TECHNOLOGY

Fig. 4.7 shows the distribution of the granted patents in 2016 and 2017 at each office according to the five main sectors of technology.

Fig. 4.7: GRANTED PATENTS - SECTOR OF TECHNOLOGY

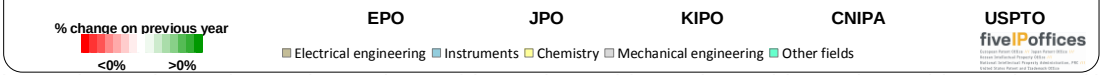


The distribution of granted patents by sectors is fairly consistent with that shown in Fig. 4.3 for applications. At the CNIPA, the share of Chemistry in granted patents is noticeably lower than the share in applications.

Fig. 4.8 describes the distribution of the 2017 granted patents by the more detailed fields of technology at each office (left column for each IP5 Office), and the change in granted patents counts compared to 2016 (right column). Actual shares and percentage changes in patent counts are shown for the top 10 leading fields at each Office. The distribution of applications is represented by a colour scale: the darker the shade of a colour, the greater the share. The extent of change is reflected by a red–to-green colour scale, the dark red indicates a marked decrease and dark green indicates a marked increase.

Fig. 4.8: DISTRIBUTION OF GRANTED PATENTS BY FIELD OF TECHNOLOGY - 2017

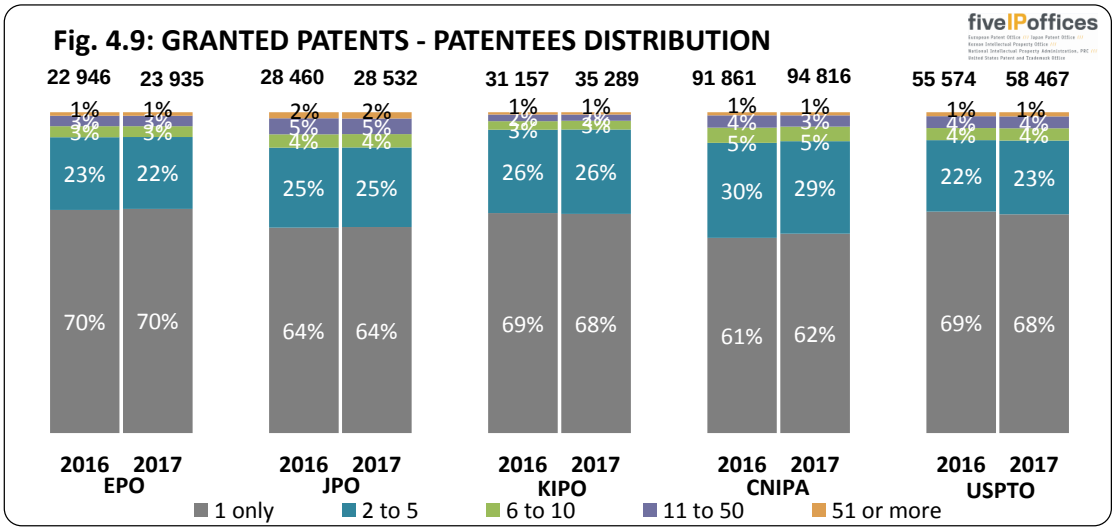
	EPO		JPO		KIPO		CNIPA		USPTO	
	Share	Change	Share	Change	Share	Change	Share	Change	Share	Change
1. Electrical machinery, apparatus, energy	7%	+16%	10%	+6%	9%	+18%	8%	+7%	6%	-2%
2. Audio-visual technology			4%	0%	4%	+1%			4%	-9%
3. Telecommunications										
4. Digital communication	7%	+27%			4%	-7%	5%	+2%	9%	-5%
5. Basic communication processes										
6. Computer technology	4%	+35%	6%	-6%	6%	-2%	8%	+32%	15%	-5%
7. IT methods for management									3%	-2%
8. Semiconductors			4%	-4%	5%	-4%			5%	-2%
9. Optics			5%	-6%					3%	-2%
10. Measurement	5%	+15%	5%	+2%	4%	+26%	7%	+16%	4%	+5%
11. Analysis of biological materials										
12. Control										
13. Medical technology	8%	+1%	5%	+3%	4%	+6%			7%	+0%
14. Organic fine chemistry	4%	+2%								
15. Biotechnology										
16. Pharmaceuticals										
17. Macromolecular chemistry, polymers										
18. Food chemistry										
19. Basic materials chemistry										
20. Materials, metallurgy							4%	-8%		
21. Surface technology, coating										
22. Micro-structural and nano-technology										
23. Chemical engineering										
24. Environmental technology										
25. Handling							3%	+11%		
26. Machine tools							5%	+6%		
27. Engines, pumps, turbines	4%	+10%								
28. Textile and paper machines										
29. Other special machines	4%	+8%			4%	+23%	4%	+2%		
30. Thermal processes and apparatus										
31. Mechanical elements										
32. Transport	6%	8%	5%	+2%	6%	+9%	4%	+2%	4%	+3%
33. Furniture, games			6%	-3%						
34. Other consumer goods										
35. Civil engineering	4%	+23%	3%	+6%	5%	+13%	5%	-1%		



At the USPTO, the leading fields are the same as for applications (see. Fig. 4.4). At the EPO *27.Engines, pumps, turbines* and *35.Civil engineering* are leading fields in granted patents but not in applications. At the JPO, *35.Civil engineering* is a leading field in granted patents but not in applications. At the KIPO *2.Audio-visual technology* is a leading field in granted patents but not in applications. At the CNIPA, *20.Materials, metallurgy*, *25.Handling* and *32.Transport* are leading fields in granted patents but not in applications.

The large increase in the number of granted patents by the EPO and the KIPO are reflected by a higher number of fields for which the count of granted patents increased.

Fig. 4.9 shows the breakdown of patentees by numbers of granted patents in 2016 and in 2017.



This diagram shows that the distribution of grants to patentees is similar at each office in that it is highly skewed at all of them, because there are many more grantees that receive low numbers of grants rather than high numbers of grants. The proportions are generally consistent between 2016 and 2017 for each office. See the annexed statistical tables for longer term trends. These data are fairly static.

At the CNIPA there is a slightly higher share of the “2 to 5” category than at the other IP5 Offices.

Most of the patentees received only one grant in a year. In 2017, the proportion was between 62 percent (CNIPA) and 70 percent (EPO). The proportion of patentees that received less than 6 patents was between 89 percent for the JPO and 94 percent for the KIPO. The proportion of patentees receiving 11 or more patents was higher at the JPO (7 percent) than at the USPTO (5 percent), at the EPO (4 percent), at the CNIPA (4 percent) and at the KIPO (3 percent).

In 2017, the average number of granted patents received remained unchanged for most offices when comparing 2016 to 2017. The numbers were 4 for the EPO, 7 at the JPO, 3 at the KIPO, 4 at the CNIPA and 5 at the USPTO. The greatest number of patents granted to a single applicant was 1 792 at the EPO, 4 481 at the JPO, 2 881 at the KIPO, 3 622 at the CNIPA and 8 996 at the USPTO. This maximum number for 2017 was larger than for 2016 at the EPO, the JPO and the USPTO.

MAINTENANCE

A patent is enforceable for a fixed term that depends on actions taken by the owner. In the IP5 Offices, the maximum term is usually twenty years term from the date of filing the application. In order to maintain protection during this period, the applicant has to pay what are variously known as renewal, annual or maintenance fees in the countries for which the protection pertains. Maintenance systems differ from country to country. In most jurisdictions, including those of the IP5 Offices, protection expires if a renewal fee is not paid in due time.

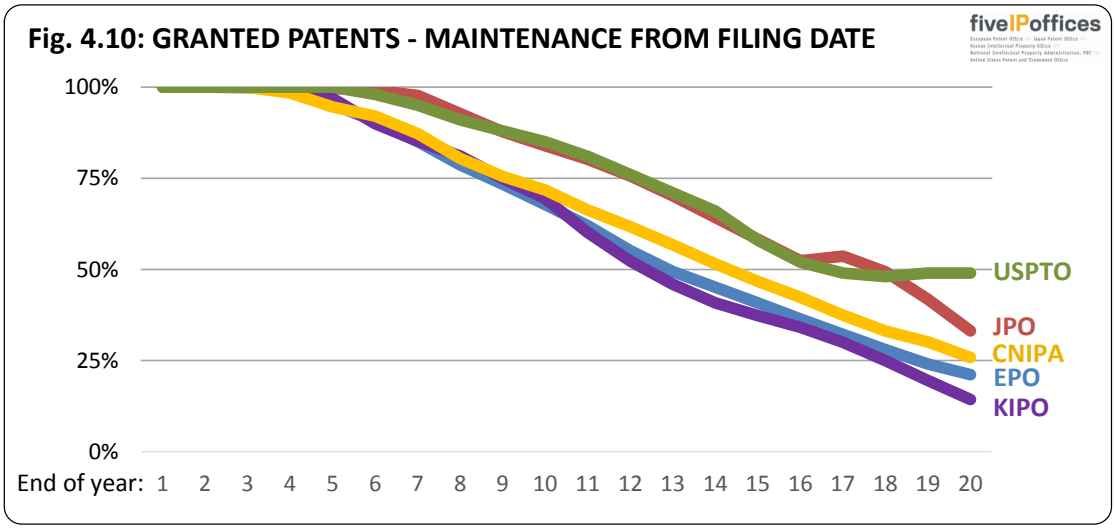
At the EPO, annual renewal fees are payable at the beginning of the year from the third year after filing in order to maintain the application. After the patent has been granted, renewal fees are then paid to the national office of each designated EPC contracting state in which the patent has been registered. These national patents can be maintained for different periods in the contracting states. Therefore, rather than maintaining one patent after grant, patentees have to deal with the maintenance of several patents and need to choose how long to maintain each one.

For a Japanese or Korean patent, the annual fees for the first three years after patent registration are paid as a lump-sum and for subsequent years there are annual fees. The applicant can pay either yearly or in advance.

At the CNIPA, the annual fee for the year in which the patent right is granted is paid at the time of going through the formalities of registration, and the subsequent annual fees are paid before the expiration of the preceding year. The date at which the time limit for payment expires is the date of the current year corresponding to the filing date.

The USPTO collects maintenance fees at 3.5, 7.5, and 11.5 years after the date of grant and does not collect an annually payable maintenance fee.

Fig. 4.10 shows the proportions of granted patents by each office that are maintained for differing lengths of time. It compares the rate of granted patent registrations existing and in force each patent year starting with the year of application. Figures are based on the most recent relevant data that are available at each IP5 Office. The EPO proportion represents a weighted average ratio of the maintenance of the validated European patents in the 38 EPC states[37].



At the USPTO, 49 percent of the granted patents are maintained for the 20 years from filing. This compared to 33 percent at the JPO, 26 percent at the CNIPA, 21 percent at the EPO and 14 percent at the KIPO.

More than 50 percent of the JPO granted patents are maintained for at least 17 years, compared to 16 years at the USPTO, 14 years at the CNIPA and 12 years at the EPO and at the KIPO.

In addition to patentees' behaviour, these differences can be partly explained by differences in the procedures, such as a multinational maintenance system (EPO), deferred examination (JPO, KIPO, CNIPA) and a stepped maintenance payment schedule (USPTO). Changes in patent laws and administrative processes also may have some effect on maintenance rates.

The USPTO payment schedule is somewhat hidden because the data are shown on a time basis (by year after application) that is different from the time basis used for collection of the fees (by year after patent grant).

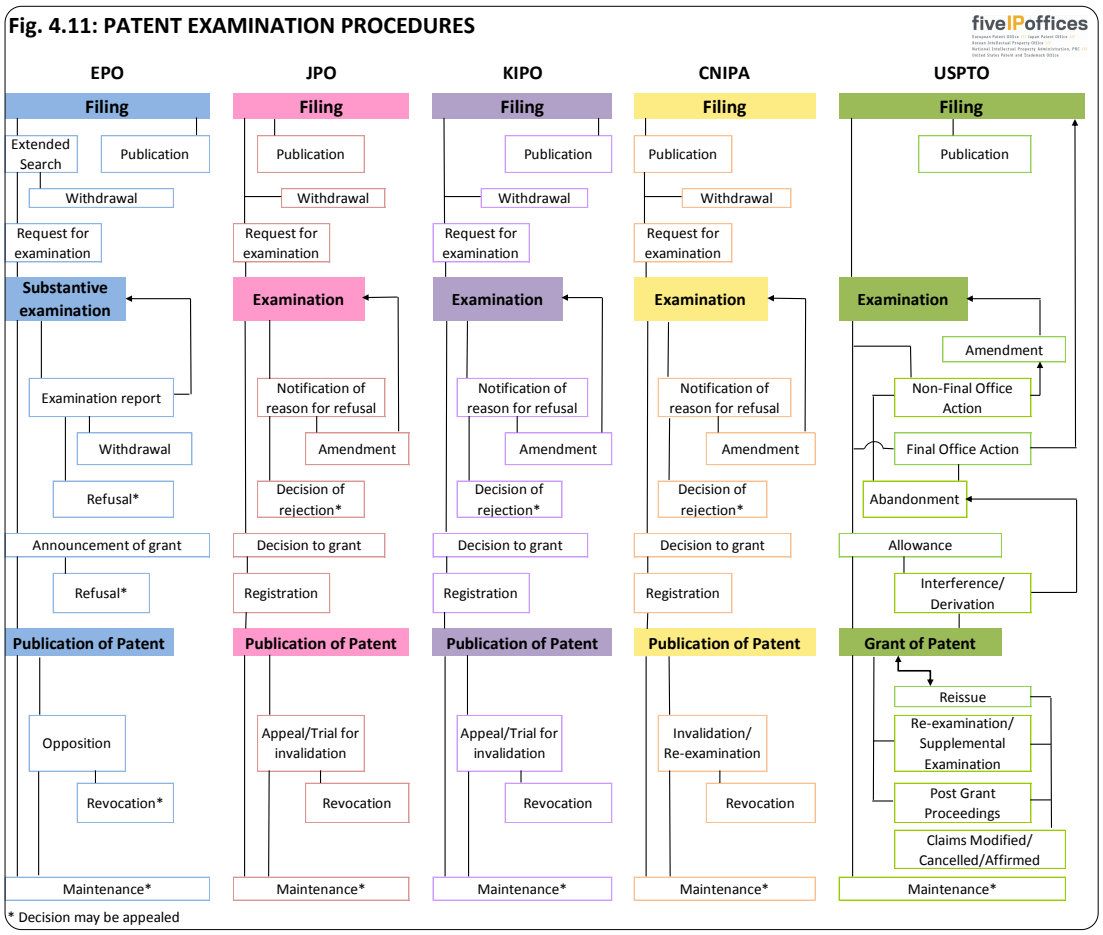
[37] Once granted by the EPO, European patents need to be validated to come into force in the various member states that are designated at the time of grant.

PATENT EXAMINATION PROCEDURES

PROCEDURE FLOW CHART

Fig. 4.11 is a simplified view of the major phases of the procedures at the IP5 Offices and concentrates on the similarities between offices to motivate the comparative statistics to be presented in Table 4.3. However, the reader should bear in mind when interpreting such statistics that details of the procedures differ between offices, sometimes to quite a large degree (e.g. in time lags between stages of the procedures).

Fig. 4.11: PATENT EXAMINATION PROCEDURES



See Annex 2 for some further details about the procedures.

Fees are due at different stages of the procedure. Information on main comparable fees at the IP5 Offices is made available online on the IP5 home page[38].

[38] See www.fiveipoffices.org/statistics/statisticaldata.html under fees. These data are not guaranteed to be entirely accurate or up to date. Official fee schedule information and associated regulations from each IP5 Office take precedence.

STATISTICS ON THE PROCEDURES

Table 4.3 shows various statistics as average rates and numbers where applicable for 2016 and 2017. Definitions of the various terms are given in Annex 2.

Details on the definition of the terms presented in Table 4.3 can found in Annex 2. In the following cases, there exist some differences between the offices:

- Pending examination: For the KIPO, only the unexamined patent applications with a request for examination filed have been counted. In the reports prior to the 2016 edition, the figure of this category included the entire unexamined patent applications.

- Pendency first office action: For the EPO, the first office action is the search report that includes a written opinion on patentability.

- Pendency final action: The pendency in examination is calculated from the date at which the file was allocated for examination (EPO, usually 6 months after the first action), the date of the request for examination (JPO, KIPO), the date on which the application enters the substantive examination phase (CNIPA), and the filing date (USPTO).

  For the JPO, the pendency time is the number of months in FY 2016 or FY 2017 and excludes some cases where the JPO requests an applicant to respond to the second notification of reasons for refusal and where the applicant performs procedures they are allowed to use, such as requests for extension of the period of response and for an accelerated examination.

Table 4.3: STATISTICS ON PROCEDURES

Definitions of the various terms are given in Annex 2.

Progress in the procedure Rates in percentage	**Year**	**EPO**	**JPO**	**KIPO**	**CNIPA**	**USPTO**
Examination	2016	94.9	71.2	85.1	n.a.	100.0
	2017	94.9	71.8	85.4	75.8	100.0
Grant	2016	54.8	75.8	60.0	n.a.	70.3
	2017	57.1	74.6	63.1	56.4	71.9
Opposition	2016	4.0	0.6	-	-	n.a.
	2017	3.7	0.6	-	-	n.a.
Appeal on examination	2016	18.1	32.3	8.3	n.a.	3.7
	2017	18.2	30.7	6.9	14.7	3.1
Pendency	**Year**	**EPO**	**JPO**	**KIPO**	**CNIPA**	**USPTO**
Awaiting request for examination	2016	24 422	657 453	292 664	n.a.	-
	2017	24 299	643 788	294 257	466 067	-
Pending examinations	2016	409 049	175 290	154 378	n.a.	549 741
	2017	407 443	171 508	151 352	1 431 757	546 286
Pendency first action (months)	2016	5.1	9.5	10.6	16.9	15.7
	2017	4.8	9.3	10.4	14.4	15.7
Pendency final action (months)	2016	26.5	14.6	16.2	22.0	25.6
	2017	24.9	14.1	15.9	22.0	24.2
Pendency invalidaiton (months)	2016	-	10.5	-	5.1	-
	2017	-	10.6	-	5.2	-

- = not applicable n.a = not available

RATES

The examination rate at the USPTO is 100 percent, since filing implies a request for examination, whereas at the EPO, the JPO, the KIPO and the CNIPA a specific request for examination has to be made. At the EPO, a large proportion of PCT applications in the granting procedure give a high examination rate, as almost all of them proceed to examination. The examination rate is somewhat lower at the JPO and the KIPO since the deferred examination system allows more time for the applicants to evaluate whether or not to proceed further with the application.

The grant rates at the EPO, KIPO and at the USPTO increased between 2016 and 2017. At the JPO, the grant rate decreased between 2016 and 2017.

The appeal on examination rates vary between offices, mainly due to the differing procedures.

PENDENCIES

In the successive stages of the procedure, there are pending applications awaiting action in the next step of the procedure. The number of pending applications gives an indication of the workload (per stage of procedure) from the patent grant procedure in each of the IP5 Offices. Although this may seem to be an indicator for the backlog in handling applications within the offices, it is not in fact a particularly good one because substantial parts of pending applications are awaiting action from the applicant. This could be for instance a request for examination or a response to actions communicated by the office.

As shown in Table 4.3, about 4.1 million applications were pending (i.e. awaiting request for examination or pending examination) in the IP5 Offices at the end of 2017. The total number of applications pending at the EPO, the JPO, the KIPO or the USPTO decreased by 1.1 percent between 2016 and 2017.

The pendency to first action decreased at the EPO, the JPO, the KIPO and the CNIPA, while it remained unchanged at the USPTO. The pendency to final action decreased at the EPO, the JPO, the KIPO and the USPTO, but remained unchanged at the CNIPA.

These numbers should be compared with caution, taking account of the differences in the procedures. At the EPO, the examination is done in two phases: a search and a substantive examination, while they are done in one combined phase at the other IP5 Offices.

Contrary to the system at the USPTO, where there is no delay, at the EPO substantive examination may be requested within 6 months after the issue of a search report. For the other IP5 Offices, a request for examination may be made up to three years after filing for the JPO and the CNIPA, and up to five years after filing for the KIPO. This leads to differences between offices in the time periods that are shown.

At all IP5 Offices, various options to initiate a faster examination are available.

Chapter 5

THE IP5 OFFICES AND THE PATENT COOPERATION TREATY (PCT)

This chapter presents firstly the impact of the PCT system on global patenting activity. Then it describes the various activities of the IP5 Offices that relate to the PCT system.

Graphs are presented that display the shares that used the PCT, by origin, of patent applications, grants and patent families. Descriptions are given of additional activities of the IP5 Offices under the PCT as Receiving Offices (RO) for applicants in their respective territories, as International Search Authorities (ISA) and as International Preliminary Examination Authorities (IPEA). PCT searches are a significant workload for the IP5 Offices in addition to those already described in Chapter 4.

Statistics in this chapter have been derived from the WIPO Statistics Database[39] and the IP5 Offices. The graphs cover five-year periods that include the latest year for which reliable data are available[40]. Data for 2017 are presented in all figures except for Fig. 5.1 (proportions of applications filed by PCT) and Fig. 5.6 (IP5 patent families by origin).

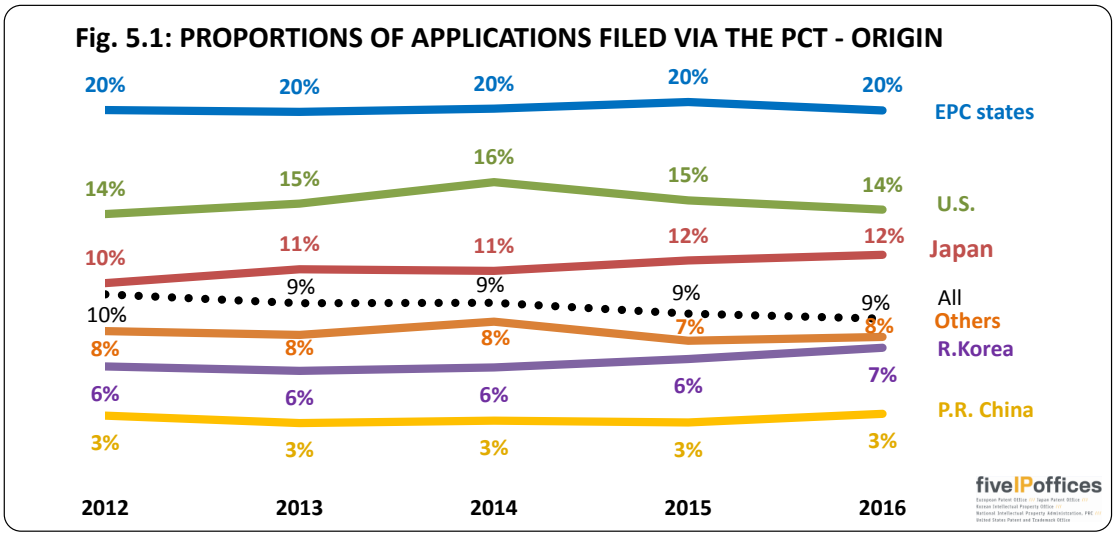
[39] This edition refers to general patent data as of March 2018, and to PCT international application data as of June 2018, www.wipo.int/ipstats/en/index.html

[40] The statistical tables file found in the web version of this report includes extended time series for most of the data included in this chapter. www.fiveipoffices.org/statistics/statisticsreports.html

PCT AS FILING ROUTE

PATENT FILINGS

Fig. 5.1 shows, for each bloc of origin (residence of first-named applicant or inventor), the proportions of all patent filings that are PCT international applications. Applications are counted in the year of filing. These data are comparable to those in Figs. 3.1 to 3.4.



9 percent of worldwide patent filings were made via the PCT route in 2015.

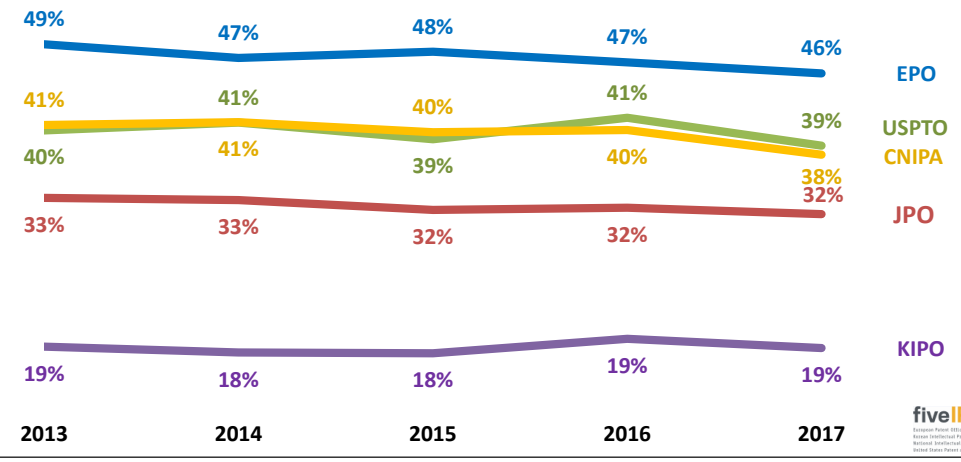
Comparing 2015 and 2016, the proportion of applications filed via the PCT remained stable for applications originating from the EPC states, Japan and P.R. China. For R. Korea the proportion increased by 1 percent, while the U.S. proportion declined by 1 percent. The proportion for the EPC states origin applications continue to be higher than the proportions for applications from the remaining blocs.

NATIONAL / REGIONAL PHASE ENTRY

After the international phase of the PCT procedure, applicants decide whether they wish to continue further with their applications in the national or regional phase for each country or regional organization of interest. If the decision is made to proceed further, then the applicant has to fulfil the various requirements of the selected PCT contracting states or organizations.

Fig. 5.2 shows the proportions of international PCT applications that entered the national or regional phase at each of the IP5 Offices. Applications are counted in the year corresponding to the date when the delay to enter the national or regional phase has expired[41].

Fig. 5.2: PROPORTIONS OF PCT ENTERING NATIONAL/REGIONAL PHASE



A higher proportion enters the regional phase at the EPO than enters the national phase at any of the other IP5 Offices. This is due to the multinational dimension of the EPO, which provides an opportunity to proceed further with a unique procedure for several countries. The proportion remains lowest at the KIPO.

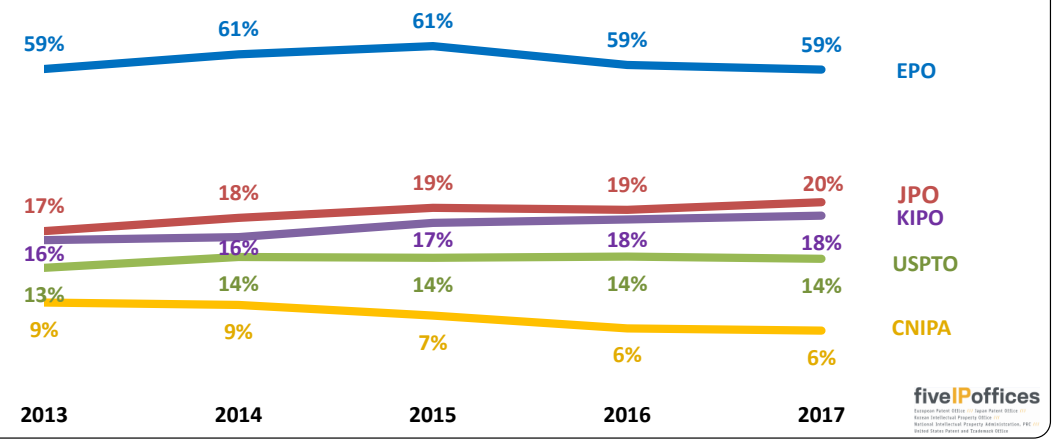
Between 2013 and 2017, the proportion declined slightly at the EPO, the JPO and the CNIPA. It remained essentially stable at the KIPO and at the USPTO.

[41] It should be noted that counts from EPC contracting state national offices are not reported in Figs. 5.2, 5.3, and 5.4.

SHARE OF PCT APPLICATIONS

Fig. 5.3 shows the shares of PCT among all applications in the grant procedure at each office (as presented earlier in Fig. 4.1).

Fig. 5.3: PROPORTIONS OF PCT APPLICATIONS IN THE GRANT PROCEDURE

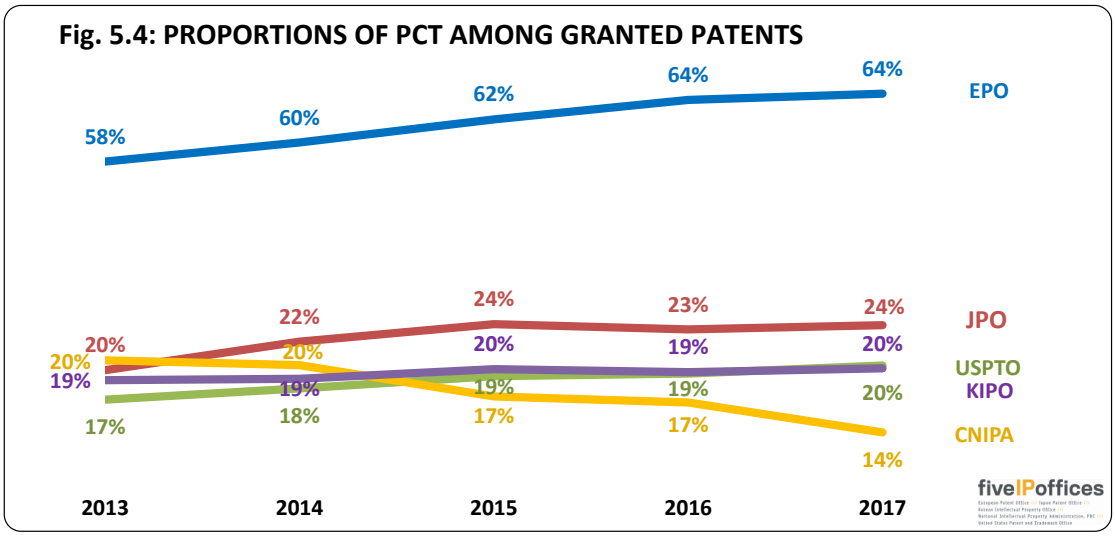


The proportions of PCT national/regional phase applications among all applications remained stable from 2016 to 2017, with the exception of the JPO where the share increased by 1 percent.

EPO continues to have much higher proportion of PCT applications, compared to the other IP5 Offices.

PCT GRANTS

Fig. 5.4 shows the proportions of granted patents by each of the IP5 Offices that were based on PCT applications.



Granted patents generally relate to applications that were filed several years earlier.

Over the 5-year period, there was an increase in the proportion of PCT in patent grants at the EPO, the JPO, the KIPO and the USPTO, of 6 percent, 4 percent, 3 percent and 1 percent respectively. At the CNIPA, the percentage decreased by 6 percent. The percentages of PCTs in patent grants in Fig. 5.4 are always higher than the percentages of PCTs in applications in Fig. 5.3, for all IP5 Offices, except for the EPO before 2015.

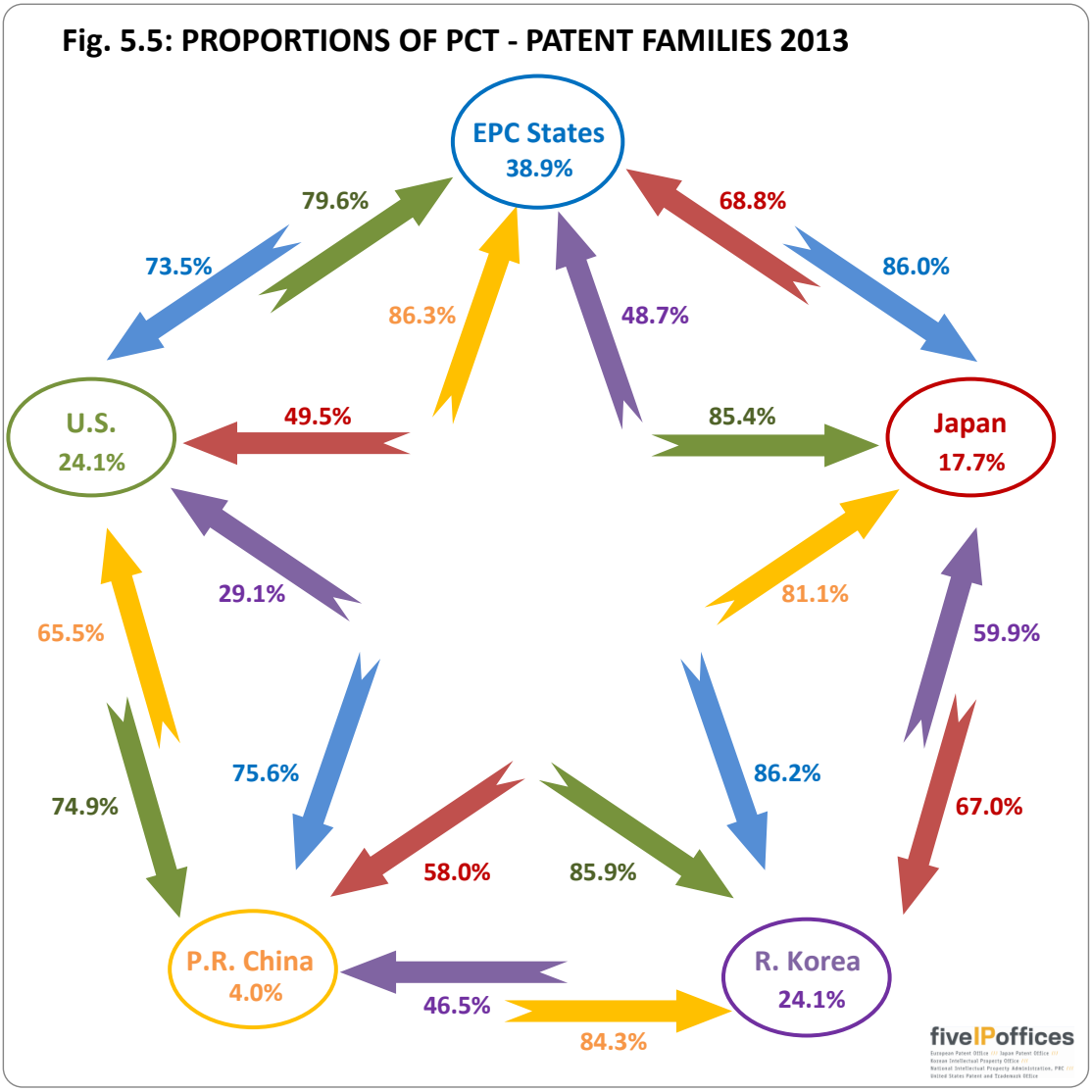
PATENT FAMILIES AND PCT

A patent family is a group of patent filings that claim the priority of a single filing, as was described in the final section of Chapter 3.

The PCT system provides a good way to make subsequent patent applications in a large number of countries. Therefore, it can be expected that many patent families flowing between blocs will use the PCT route. In this section, the usage of the PCT system implies that at least one PCT application has been made within the family of filings that quote the priority of the same first filing.

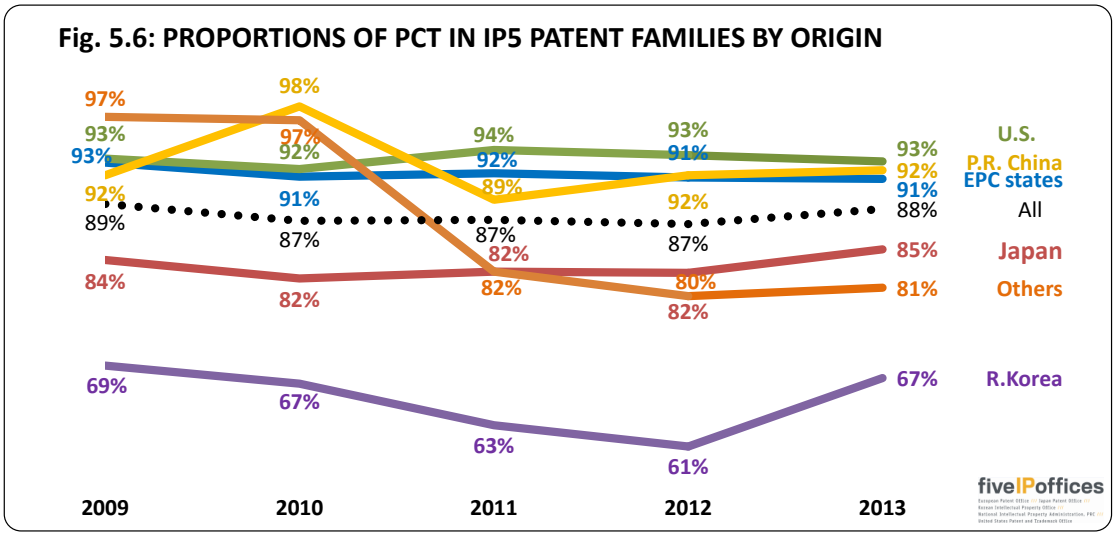
Fig. 5.5 shows the usage of the PCT among patent families in 2013. Two types of percentages are shown. The first, next to the name of each bloc, is the proportion of the overall number of first filings for the bloc that generated families using the PCT. The second, next to the arrows indicating flows between-blocs, shows the share of total patent family flows that used the PCT system. This figure is based on first filings in 2013, and can be compared with Fig. 3.14.

Fig. 5.5: PROPORTIONS OF PCT - PATENT FAMILIES 2013



In general, the usage of the PCT route is far higher when making applications abroad rather than at home. Applicants from the U.S., P.R. China and the EPC states use the PCT system to a greater extent than applicants from Japan and R. Korea.

Fig. 5.6 shows the proportions of IP5 patent families by bloc of origin (residence of first-named applicants or inventors), as given earlier in Fig. 3.15, that made some use of the PCT system. IP5 patent families correspond to filings where activities of the first and/or subsequent associated filings were made in all the IP5 Blocs.



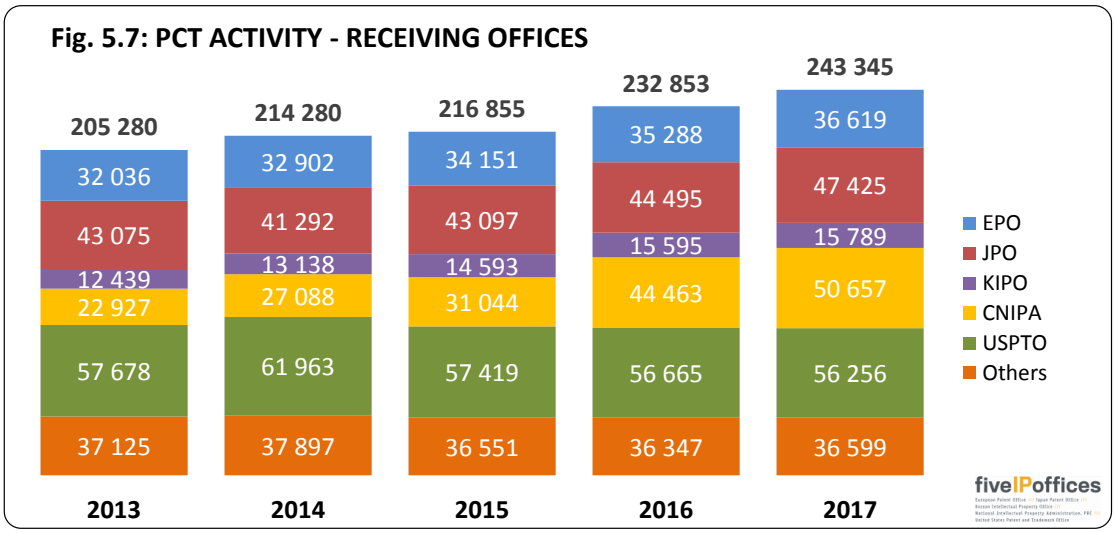
Since IP5 patent families represent highly internationalised applications, the rate of PCT usage is high compared to the overall usage of PCTs among applications in general, as was shown in Fig. 5.1.

In 2013, the percentage of usage of the PCT system remained unchanged in the U.S., the EPC states and P.R. China. Usage in Japan increased by 3 percent and by 6 percent in R. Korea, where it still remains lower than in the other blocs.

PCT AUTHORITIES

Under the PCT, each of the IP5 Offices acts as RO, mainly for applicants from its own geographical zone, and as ISA and IPEA for non-residents and residents. The following graphs show the trends from 2013 to 2017.

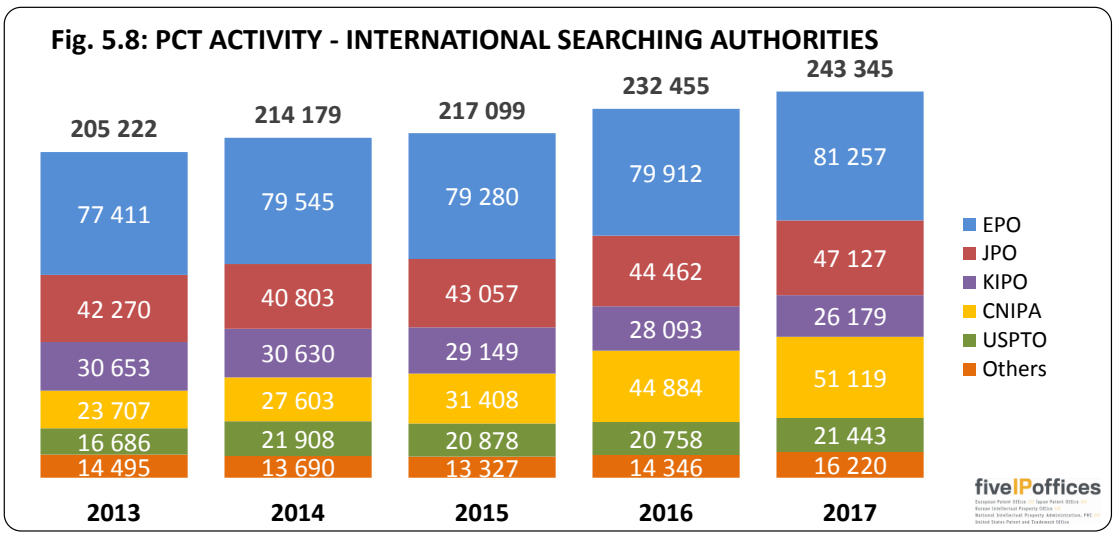
Fig. 5.7 shows the breakdown of PCT international filings by ROs over time.



After a limited growth in 2015, the total number of PCT international phase filings grew at a higher pace in 2016 and 2017. The compound annual growth rate from 2013 to 2017 was 4.3 percent.

In 2017, the IP5 Offices had an overall increase of PCT international filings of 5 percent compared with 2016, although a decrease of 1 percent occurred at USPTO. The CNIPA had the largest percentage increase of 14 percent. Together the IP5 Offices were RO for 85 percent of the PCT international filings in 2017 (82 percent in 2013).

Fig. 5.8 shows the breakdown over time of the numbers of international search requests to offices as ISA, for those applications for which information is known.

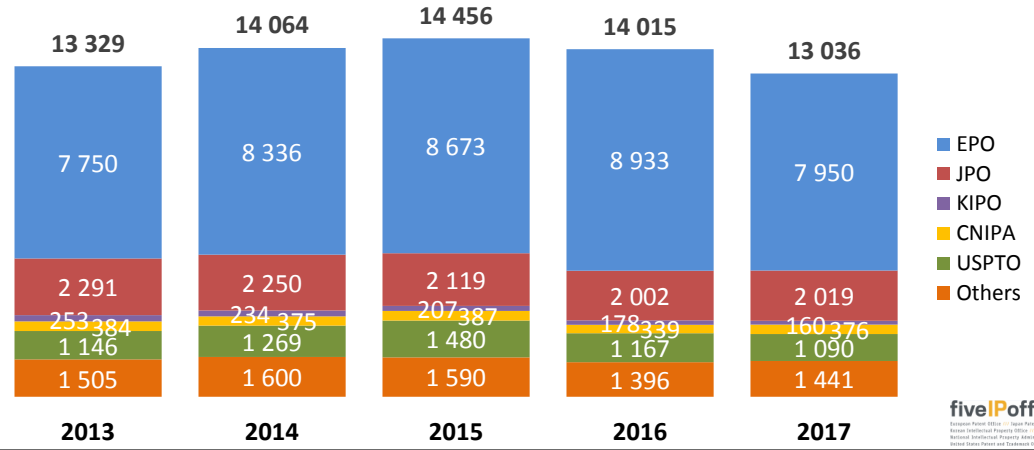


There is a steady increase in total activity over the period described. In 2017, the IP5 Offices received 93 percent of all PCT international search requests, consistent with the percentage of requests received by the IP5 Offices during the previous years. The EPO continues to receive the largest number of requests, receiving 33 percent of all requests in 2017.

CNIPA once again demonstrated strong growth with a 14 percent increase. JPO experienced an increase of 6 percent, while the proportion of requests received at the KIPO decreased by 7 percent.

Fig. 5.9 shows the breakdown over time of the numbers of international preliminary examination requests to IP5 Offices as IPEA.

Fig. 5.9: PCT ACTIVITY - INTERNATIONAL PRELIMINARY EXAMINATION AUTHORITIES



From 2016 to 2017, the total number of requests for international preliminary examinations decreased 7 percent. Despite an increase between 2013 and 2015, it should be born in mind that there had been a decline in the numbers over the past 10 years, as can be seen in the statistical tables that are available at the web-site.

Together, the IP5 Offices were in charge of 89 percent of the IPEA work in 2017. Annually, from 2013 to 2017, the EPO performed around 60 percent of all the international preliminary examinations.

Chapter 6

OTHER WORK

This brief chapter contains statistics about other work done on IP rights that is not common to all five offices. The data presented below supplement the information appearing in earlier chapters of this report.

This includes applications for plant patents (USPTO), reissue patents (USPTO), applications for patents other than those for inventions: utility models (JPO, CNIPA, KIPO), designs (JPO, CNIPA, KIPO, USPTO), trademarks (JPO, KIPO, USPTO), and search requests to be performed on behalf of national offices (EPO).

The utility model is different from the patent for invention[42], because it is used to protect a device in relation to the shape or construction of articles or combination of articles (JPO, CNIPA), or to protect a creation of a technical idea using the rules of nature regarding the shape, structure, or combination of subjects (KIPO). An utility model is registered without a substantive examination as long as it meets basic requirements. The maximum period of protection for a utility model in Japan, R. Korea, and P.R. China is 10 years, which is shorter than for a patent for invention (typically 20 years).

The numbers of requests received for these types of other work are shown for 2016 and 2017 in Table 6.

Table 6: STATISTICS ON OTHER WORK

Activity	Year	EPO	JPO	KIPO	CNIPA	USPTO
Search for national offices	2016	27 564	-	-	-	-
	2017	26 403	-	-	-	-
Design applications	2016	-	30 879	65 659	650 344	42 571
	2017	-	31 961	63 453	628 658	43 340
Utility model applications	2016	-	6 480	7 767	1 475 977	-
	2017	-	6 105	6 809	1 687 593	-
Plant patent applications	2016	-	-	-	-	1 177
	2017	-	-	-	-	1 059
Re-issue applications	2016	-	-	-	-	1 087
	2017	-	-	-	-	1 012
Trademark applications	2016	-	161 859	181 606	-	530 951
	2017	-	190 939	182 918	-	615 251

In 2017, the number of utility model applications increased 14 percent at the CNIPA and decreased by 12 percent at the KIPO. The number of trademark applications increased by 18 percent at the JPO and 6 percent at the USPTO. For design applications, there were increases at JPO and USPTO (by 4 percent and 2 percent, respectively) and decreases at KIPO and CNIPA (by 3 percent at both Offices),

[42] Not to be confused with the utility model, the USPTO's main type of patent, called a utility patent, is a patent for invention that is similar to the standard patent at the other IP5 Offices.

Annex 1

DEFINITIONS FOR IP5 OFFICES EXPENDITURES

EPO EXPENSES UNDER IFRS (Fig. 2.2)

The full costs are distributed to eight types of EPO products (labelled A to H in Fig. 2.2). Of these, five types are directly related to processing of patent applications: filing, search, examination, opposition, and appeal. The other three types are related to different tasks performed by the EPO: patent information, technical cooperation and the European patent academy.

Direct costs immediately related to one product are entirely allocated to this product. The indirect costs are distributed to the products according to staff and usage keys, with information technology costs being distributed according to their catalogue of services.

A-E. Business support and other indirect

- Salaries and allowances of the concerned permanent staff as well as temporary staff, including the yearly variation of liabilities for pensions, long-term care, death, sickness ("current service costs"), and partial tax compensation
- Training, recruitment, transfer and leaving costs, medical care, welfare of these staff
- Their share of depreciation for buildings, IT equipment and other tangible and intangible assets, including the depreciation component of financial leases
- Their share of operating costs related to the maintenance of electronic data processing hardware and software, licenses, programming costs of self-developed systems as far as they do not qualify for capitalization
- Their share of operating costs related to the maintenance of buildings, technical installations, equipment, furniture and vehicles, such as rent, cleaning and repairs, electricity, gas, water
- The relevant business support shared costs that mostly include management, human resources, finance, legal advice and communication functions

F. Patent information

This covers the publication of patent documentation, raw data products, public information, customer services, website, conference, exhibitions and fairs. The product lines bear the full cost of operating such activities.

G. Technical cooperation

Cooperation with contracting states including support to national patent offices, assistance to third countries, Trilateral and IP5 activities, EPOQUE Net. The product lines bear the full cost of operating such activities.

H. European patent academy

The product lines bear the full cost of operating such activities including professional representatives and European qualifying examination support, conference costs.

JPO EXPENDITURES (Fig. 2.3)

Expenses for JPO's business

Expenses for business processing

A. General processing work

- Existing personnel (including increase and transfer)
- General administration
- Various councils
- Encouragement of guidance including patent management
- External rented offices
- Internationalization of industrial property administration
- Project for supporting medium and small company's applications

B. Examination and appeals/trials, etc.

- Infrastructure improvement for examination and appeals/trials
- Disposition of examination and appeals/trials
- Execution of PCT
- Patented micro-organisms deposition organization

C. Information management

Management of information for use in examination and appeals/trials

D. Publication of Patent Gazette, etc.

E. Computers for patent processing work

F. Facility improvement

G. Operating subsidies for INPIT[43]

H. Others

All other expenses not covered by the above.

[43] This term is explained in the glossary that is available with the web-based version of the report, www.fiveipoffices.org/statistics/statisticsreports.html

KIPO EXPENDITURES (Fig. 2.4)

A. Personnel resources

Compensation for the services of employees or the inclusive expenditure of the services of employees: salaries, bonuses, and remuneration of temporary staff.

B. Internal business

Internal business includes Public-employee pension, balance, and transaction between the accounts.

C. Primary business expenses

Primary business expenses include expenditures on the development, operation, and private transfer which mainly related to the business of private organizations or affiliated organizations, including expenses on the business and task.

D. Other expenses

All other expenses not covered by the above.

CNIPA EXPENDITURES (Fig. 2.5)

A. Administrative Operation

B. Patent Examination

C. Social and Housing security, Pension

- Pension of staff in administrative agencies
- Infrastructure-related expenses.

D. Others

All other expenses not covered by the above.

USPTO EXPENDITURES (Fig. 2.6)

A. Salaries and Benefits

Compensation directly related to duties performed for the Government by Federal civilian employees. Also included are benefits for currently employed Federal civilian personnel.

B. Equipment

C. Rent and Utilities

Payments for the use of land, structures, or equipment owned by others and charges for communication and utility services.

D. Printing

Costs incurred for printing and reproduction services including related composition and binding operation.

E. Other expenses

All other expenses not covered by the above (heading for equipment and printing are above) including but not limited to:

- Equipment: Property of a durable nature, which is defined as property that normally may be expected to have a period of service of a year or more, after being put into use, without material impairment of its physical condition or functional capacity. Also included is the initial installation of equipment when performed under contract.
- Printing: Printing and reproduction obtained from the private sector, or from other Federal entities.
- Supplies and Materials: Commodities that are ordinarily consumed or expended within one year after they are put into use, converted in the process of construction or manufacture, used to form a minor part of equipment or fixed property, or other property of little monetary value that does not meet any of the three criteria listed above, at the option of the agency.

Annex 2

DEFINITIONS OF TERMS AND STATISTICS ON PROCEDURES

This annex contains firstly definitions of the main terms used in the report[44]. After that there is an explanation of the patent procedures relating to Fig. 4.9. Then finally there are definitions of the statistics on procedures that appear in Table 4.3.

DEFINITIONS OF TERMS

APPLICATIONS, COUNTING OF

Application counts are mainly determined by counting each national, regional or international application only once. However, alternative representations are also given in Chapter 3 after cumulating the number of designated countries over applications.

In this report, applications are counted in terms of patent filings, first filings, requests for patents entering a grant procedure, and demand for national patent rights.

- Counts of "*Patent filings*" include direct national, direct regional, and initial PCT international phase applications;
- Counts of "*First filings*" include initial patent applications filed prior to any later subsequent filings to extend the protection to other countries;
- Counts of "*Requests for patents entering a grant procedure*" include direct national, direct regional, national phase PCT, and regional phase PCT applications;
- Counts of "*Demands for national patent rights*" include direct national applications counted once each, designations in regional applications, national phase PCT applications, and designations in regional stage PCT applications.

These counting methods are used in various sections of the report, and particularly in Chapter 3. The methods are discussed in greater detail both at the beginning of Chapter 3 and at the beginning of the corresponding sections of Chapter 3.

BLOCS, GEOGRAPHIC

Six geographical blocs are defined in this report. The first five blocs, together, are referred to as the "*IP5 Blocs*". They are:

- The EPC contracting states (EPC states in this report) corresponding throughout the period covered in this report to the territory of the 38 states party to the EPC at the end of 2016;
- Japan (Japan in this report);
- Republic of Korea (R. Korea in this report);
- People's Republic of China (P.R. China in this report);
- United States of America (U.S. in this report).

The remaining geographical areas are grouped together as:

[44] A more extensive glossary of terms is available with the web-based version of the report.

- The rest of the world (Others in this report).

These blocs are referred to as blocs of origin on the basis of the residence of the first-named applicants or inventors (throughout the report) or as filing blocs on the basis of the place where the patents are sought (in Chapters 3 and 5).

DEMANDS FOR PATENT RIGHTS

Demand for patent rights refers to applications for patents for invention. The counts of patent filings (see above) are made principally by counting each national, regional, or international application only once. However, alternative representations are also given in Chapter 3 in terms of the demands for national patent rights, after cumulating the number of designated countries over applications. This makes a difference only in regard to systems where multiple countries can be designated in an application (PCT and regional systems). Demands for "*national*" patent rights effectively measures the number of national patent applications that would have been necessary to seek patent protection in the same number of countries if there were no PCT or regional systems. The counts include direct national filings, designations in regional systems, national stage PCT applications, and designations in regional stage PCT applications.

DIRECT APPLICATIONS

"*Direct*" applications are filed directly with the country or regional patent office where protection is sought and are counted in the year they are filed. They are distinguished from "*PCT*" applications in order to distinguish the two subsets of applications handled by patent offices.

DOMESTIC APPLICATIONS

These are defined as all demands for patents made by residents of the country where the application is filed[45]. For the purpose of reporting statistics for the EPC contracting states considered as a bloc, domestic applications are given with regard to the applications made by residents from anywhere inside the EPC bloc. For example, applications made by residents of France in one of the other EPC contracting states are counted as domestic demand in the EPC bloc.

FIRST FILINGS

These are applications filed without claiming the priority[46] of another previous filing and are counted in the year they are filed. They are usually made in the home country or region. All other applications are subsequent filings, usually made within one year of the first filings. In the absence of a complete set of available statistics on first filings, it is assumed in this report that domestic national filings are equivalent to first filings[47] and that PCT filings are subsequent filings. Currently, USPTO first filing data, unless otherwise noted, also include a substantial proportion of applications

[45] For the USPTO, this is by the residence of the first-named inventor; For the EPO, the JPO, the KIPO, and the CNIPA, this is by the residence of the first-named applicant.
[46] See the Article 4A to 4D of the Paris Convention at the WIPO web site;
www.wipo.int/treaties/en/ip/paris/
[47] The data source used for patent families allows a precise count of first filings. Except in the sections on patent families, an approximation of the number of first filings in the EPC Bloc is made by adding first filings at the EPO to aggregated domestic national applications in the EPC contracting states.

that are continuations of applications previously filed at the USPTO. See also *APPLICATIONS, COUNTING OF*.

FOREIGN APPLICATIONS

These are defined as all demands for patents made by residents of a location outside of the country or region where the application is filed[48]. See the term definition for Domestic Applications for additional details.

GRANTS, COUNTING OF

Grant counts in Chapter 3 are based on the WIPO Statistics Database[49]. They are counted in the year that the grants are issued or published. As with the demand for patent rights, the demand for rights granted in each bloc are considered after cumulating the number of designated countries for which national patent rights have been granted via regional procedures. The counts in Chapter 4 and proportions of PCT grants in Chapter 5 are based on IP5 Offices data.

PATENT FAMILIES

A patent family is a group of patent filings that claim the priority of a single filing, including the original priority forming filing itself and any subsequent filings made throughout the world. Groups containing only utility model applications are excluded. Provisional patent filings are allowed. The patent family counts are made using the reference DOCDB database at EPO, which is fed with data from patent publications from patent offices worldwide. But, only for the patent family measures of first filings in Chapter 3, the numbers of domestic national filings are taken, which means that the numbers of first filings in Table 3 conform to those in Fig. 3.4. This has been implemented since the previous edition of this report. The proportions of the overall numbers of first filings that generated families using the PCT in Fig. 5.5 make use only of patent families data, as in previous reports. For the purposes of this report[50], IP5 patent families are a filtered subset of patent families for which there is evidence of patenting activity in all IP5 Blocs.

PATENTS IN FORCE

Patents in force are patents that have not yet expired. Patents may expire for several reasons, two of the most common being the completion of their patent term and the failure to pay a required maintenance fee.

PCT APPLICATIONS

Applications that are filed under the PCT are first handled by appointed offices during the international phase. About 30 months after the first filing, they enter the national/regional phase to be treated as national or regional applications according to the regulations of each designated office where protection is sought. “PCT” applications are distinguished from “direct” applications in order to distinguish the two subsets of applications handled by patent offices. PCT applications are usually

[48] For the USPTO, this is by the residence of the first-named inventor; For the EPO, the JPO, the KIPO, and the CNIPA, this is by the residence of the first-named applicant.
[49] www.wipo.int/ipstats/en/statistics/pct/index.html
[50] The statistical annex of this report, that is available at the web site, and previous editions of this report, also give statistics on Trilateral Patent families and Four blocs families. These are a filtered subset of patent families for which there is evidence of patenting activity in all the Trilateral blocs (EPC, Japan, and U.S.), or all the Trilateral blocs and R. Korea, respectively.

counted in the year that they enter the national (or regional) phase, although in some parts of this report they are counted in the year of filing in the earlier international phase[51].

REQUESTS FOR PATENTS ENTERING A GRANT PROCEDURE

These are filings that entered a grant procedure and include direct national, direct regional, national phase PCT, and regional phase PCT applications. Direct national and direct regional applications enter a grant procedure when filed, while in the case of PCT applications, the grant procedure is delayed to the end of the international phase.

SUBSEQUENT FILINGS

Subsequent filings are applications filed that claim the priority[52] of a previous filing and usually are made within one year of the first filings. See also FIRST FILINGS. Currently, USPTO subsequent filings data also include a substantial proportion of applications that are continuations of applications previously filed at the USPTO.

[51] An international phase PCT application can in theory be a first filing but is usually a subsequent filing made up to twelve months after a first filing. A national (or regional) phase PCT entry can follow on from the corresponding international phase PCT filing and is made up to 30 months after the first filing.
[52] See the Article 4A to 4D of the Paris Convention at the WIPO web site, www.wipo.int/treaties/en/ip/paris/

EXPLANATIONS OF THE PATENT PROCEDURES

The following section contains additional explanations of the IP5 Offices patent procedures as shown in Fig. 4.9.

EXAMINATION: SEARCH AND SUBSTANTIVE EXAMINATION

Each of the IP5 Offices examines a filed patent application based upon novelty, inventive step, and industrial applicability. At the EPO, the process involves two phases: a search to establish the state of the art with respect to the invention and a substantive examination to evaluate the inventive step and industrial applicability. For the second phase, a separate request has to be filed no later than six months after publication of the search report.

In the national procedures before the JPO, the KIPO, the CNIPA, or the USPTO, the search and substantive examination are undertaken in one phase.

Filing of a national application with the USPTO is taken to imply an immediate request for examination. At the JPO, the KIPO, and the CNIPA, deferred examination systems exist and filing of a national application does not imply a request for examination. This may be made up to three years after filing for the JPO and the CNIPA, and up to five years after filing for the KIPO.

The international searches and international preliminary examinations carried out by the IP5 Offices as PCT authorities are not included in the flow chart.

PUBLICATION

In the IP5 Offices, the application is to be published no later than 18 months after the earliest priority date, or otherwise the date of filing (in case of a first filing). The application can be published earlier at the applicant's request. In each of the IP5 Offices, the publication process is independent of other office processes, such as examination. Also, at the USPTO, an application that has not and will not be the subject of an application filed in foreign countries does not need to be published if an applicant so requests.

GRANT, REFUSAL / REJECTION, WITHDRAWAL

When an examiner intends to grant a patent, this information is communicated to the applicant: announcement of grant (EPO), decision to grant (JPO), decision to grant (KIPO), decision to grant (CNIPA), and notice of allowance (USPTO). If a patent cannot be granted in the form as filed before the office, the intention to reject the application is communicated to the applicant: (unfavourable) examination Report (EPO), notification of reason for refusal (JPO), notification of reason for refusal (KIPO), notification of reason for refusal (CNIPA), and office action of rejection (USPTO). The applicant may then make amendments to the application, generally in the claims, after which examination is resumed. This procedural step is iterated as long as the applicant continues to make appropriate amendments. Then, either the patent is granted or the application is finally rejected-intention to refuse (EPO), decision of rejection (JPO), decision of rejection (KIPO), decision of rejection (CNIPA), final rejection (USPTO) - or withdrawn by the applicant - withdrawal (EPO), withdrawal or abandonment (JPO), withdrawal or abandonment (KIPO), withdrawal or abandonment (CNIPA), and abandonment (USPTO). In addition, if no request for examination for an application is filed to the EPO, the JPO, the KIPO, or the CNIPA within a prescribed period (six months after publication of the search report for the

EPO, three years from the date of filing for the JPO and the CNIPA, and five years from the date of filing for the KIPO), the application will be deemed to have been withdrawn. In all five procedures, an applicant may withdraw or abandon the application at any time before the application is granted or finally refused.

After the decision to grant the patent, the patent specifications are published if certain administrative conditions are fulfilled, known as Publication of patent (EPO, JPO, KIPO, CNIPA, and USPTO). At the USPTO, this action also is referred to as “Patent issuance.” Patents granted by the EPO are also then subject to validation in the designated member states where the applicant is seeking patent protection.

OPPOSITION

The opposition procedures allow third parties to challenge a patent granted before the granting office.

There is no opposition system at the KIPO, and the CNIPA.

At the EPO, the period for filing opposition(s) begins after granting of the patents and lasts nine months. If successful, the opposition can lead to a revocation of the patent or to its maintenance in amended form. Furthermore, the patentee may request a limitation or a revocation of his own patents.

At the JPO, only within six months from the date of publication of the Gazette containing the patent, any person may file an opposition to the grant of the patent. The examination of the opposition shall be conducted by documentary examination.

At the USPTO, prior to the implementation of the AIA on September 16, 2012, there were two types of third party opposition procedures: interference and re-examination. The AIA revised these and introduced some additional procedures. Under the AIA, there are now six distinct procedures for third party opposition, including post grant review, inter parte review, business method review, ex parte re-examination, interference, and derivation.

TRIAL AND APPEAL

An appeal can be filed by any of the parties concerned against a decision taken by the IP5 Offices. In practice, applicants can appeal decisions to reject an application or revoke a patent, while opponents can appeal decisions to maintain a patent. The procedure is in principle similar for the IP5 Offices. The examining department first studies the argument brought forward by the appellant and decides whether the decision should be revised. If not, the case is forwarded to a Board of Appeal, which may take the final decision or refer the case back to the examining department.

The JPO deals with ex parte appeals (e.g. appeals against examiner’s decision of refusal) and inter partes trials (e.g., trials for invalidation). If applicants have an objection to examiner’s decision of refusal, they can file an appeal against the examiner’s decision of refusal with the JPO. In case the applicants have made an amendment at the time of requesting the appeal against the examiner’s decision of refusal, the examination department that has issued said decision will examine the case again. During this examination, only those which are not eligible for patent grant are transferred to the board of trial and appeal where the proceedings of appeals shall be executed. In addition, any interested party can demand a trial for invalidation

upon registration of the establishment of rights. At the trial for invalidation, oral proceedings shall be executed in principle.

The CNIPA has re-examination and invalidation procedures. Where an applicant for a patent is not satisfied with the decision of the CNIPA rejecting the application, the applicant may, within three months from the date of receipt of the notification, request the Patent Re-examination Board to make a re-examination. Where any entity or individual considers the grant of a patent right is not in conformity with the relevant provisions of the Patent Law, a request can be made to the Patent Re-examination Board to declare the patent right invalid.

DEFINITIONS FOR STATISTICS ON PROCEDURES

The following section contains additional definitions for terminology appearing in Table 4.3 follow.

EXAMINATION RATE

This rate shows the proportion of those applications, for which the period to file a request for examination expired in the reporting year, that resulted in a request for examination up to and including the reporting year.

For the EPO, the request for examination has to be filed no later than six months after publication of the search. For example, the rate for 2015 relates to applications mainly filed in the years 2011 and 2014 and 2015.

For the JPO, the period to file a request for examination is three years from filing date. The rate for 2015 relates mainly to applications filed in the year 2012.

For the KIPO, the period to file a request for examination has been changed from 5 years to 3 years from filing date in 2017.

For the CNIPA, the period to file a request for examination is three years from filing date.

At the USPTO, as filing an application implies a request for examination, such a request is made for all applications.

GRANT RATE

For the EPO, this is the number of applications that were granted during the reporting period, divided by the number of disposals in the reporting period (applications granted plus those abandoned or refused).

For the JPO, the grant rate is the number of decisions to grant a patent divided by the number of disposals in the reporting year (decisions to grant or to refuse and withdrawals or abandonment after first office action).

For the KIPO, the grant rate is the number of patent approvals divided by the number of disposals in the reporting year (sum of the numbers of patent approvals, rejections, and withdrawals after first office action).

The USPTO has revised its calculation to present a grant rate that is more consistent with the other IP5 Offices. In reports prior to the 2011 edition, a USPTO allowance rate was reported rather than a grant rate. In this report, the displayed USPTO grant rate is the total number of issued patents divided by the total number of applications disposed of in the reporting year. Requests for continued examination (RCEs) are not included in the disposals. This grant rate differs from the allowance rate usually reported by the USPTO, which counts the total number of applications determined to be eligible by USPTO patent examiners for a patent divided by the total number of applications disposed of in a reporting year. For the allowance rate, RCEs are included in the disposals. Both rates include plant and reissue patent applications in addition to utility patent applications. However, since utility applications comprise over 99 percent of these applications, the rates are almost identical to rates based strictly on utility applications.

OPPOSITION RATE

This term applies to the EPO and the JPO. The USPTO has opposition procedures but does not currently produce an opposition rate.

The opposition rate for the EPO is the number of granted patents for which the opposition period (which is nine months after the date of grant) ended in the reporting year and against which one or more oppositions were filed, divided by the total number of patents for which the opposition period ended in the reporting year.

The JPO rate is the total number of oppositions (counting one(1) for each patent) filed in the calendar year divided by the total number of granted patents in the calendar year.

APPEAL ON EXAMINATION RATE

For the EPO, the rate is the number of decisions to refuse in the examination procedure against which an appeal was lodged in the reporting year, divided by the number of all decisions to refuse for which the time limit for appeal ended in the reporting year.

The JPO rate is the total number of appeals against examiners' decisions of refusal filed in the calendar year divided by the total number of examiners' decisions of refusal rendered by the examiners in the calendar year.

For the KIPO, the rate is the number of appeals filed during the year after the examiner's decision to issue a final rejection against a patent application divided by the number of final rejections issued against a patent application during the year.

The USPTO rate, which includes utility, plant, and reissue categories, captures the number of appeals filed after an examiner's decision to issue a final rejection against a patent application. The rate is the number of examiner answers written during the year in response to appeal briefs divided by the number of final rejections issued that year. This rate includes plant patents and reissue patents in addition to utility patents (see above GRANT RATE).

For all five offices, any subsequent litigation proceedings in national courts are not included.

PENDENCY / EXAMINATION / NUMBER OF APPLICATIONS AWAITING REQUEST FOR EXAMINATION

This does not apply to the USPTO.

This figure indicates the number of filed applications awaiting a request for examination by the applicant.

For the EPO, this indicates the number of applications for which the search report has not been published (pending in search) by the end of the reporting year, added to the number of applications for which the search report has been published but the prescribed period for the request has not expired (six months after publication of the search report).

For the JPO, KIPO, and the CNIPA, the numbers of applications awaiting request for examination indicate the numbers of applications for which no request for examination has been filed by the end of the reporting year, and for which the prescribed period for the request (three years after filing for the JPO and the CNIPA, five years for the KIPO) has not expired.

For the JPO, numbers include the number of abandoned/withdrawn applications.

PENDENCY / EXAMINATION / NUMBER OF PENDING APPLICATIONS

For the EPO, this is the number of applications filed for which the search was completed and the request for examination was filed, yet they have not received a final decision by the examining division (announcement to grant, to refuse or abandonment) by the end of the reporting year.
For the JPO and the KIPO, pending applications in examination are applications for which the requests for examination were filed and which have been waiting for a first action and have not been subject to a final action such as withdrawal or abandonment by the end of the reporting year.

For the JPO, the applications for which the applicants wished to make deferred payment of examination request fee and have been still deferring the payment are not counted in the number of pending examinations.

For the USPTO, pending applications in examination are applications that are waiting for a first action and have not been subject to a final action such as withdrawal or abandonment by the end of the reporting year. These figures do not include other pending applications that have been subject to a first action.

PENDENCY / EXAMINATION / PENDENCY FIRST OFFICE ACTION

This is measuring the delay until the first action on patentability.

For the EPO, the pendency to first office action is the median time period, in months, measured from the date of filing the application to the date of issue of the search report which is extended to include an opinion on the patentability.

For the JPO, pendency first office action is the average time period, in months, from the request for examination to first office action in examination.

For the KIPO, pendency first office action is the average time period, in months, from the request for examination to first office action in examination.

For the CNIPA, pendency first office action is the average time period, in months, from when applications entered the substantive examination phase following the request for examination to first office action in examination.

For the USPTO, pendency first office action is the average amount of time, in months, from filing to First office Action On Merits (FAOM). A FAOM is generally defined as the first time an examiner either formally rejects or allows the claims in a patent application.

PENDENCY / EXAMINATION / PENDENCY FINAL ACTION

For the EPO, the counts relate to pendency until a final decision by the examining division (decisions to grant or refuse) during the reporting year. This is the median time elapsed from the date on which the application enters the substantive examination, once the request for examination has been completed, to the date of the decision by the examining division.

For the JPO and the KIPO, pendency for examination in months is the total number of months taken for disposing applications as final actions (decisions to grant or to refuse, withdrawals, or abandonments) in the reporting year, divided by the number of final actions during the reporting year.

For the JPO, the pendency time is the number of months in FY 2015 and FY 2016, and excludes some cases where the JPO requests an applicant to respond to the second notification of reasons for refusal and where the applicant performs procedures they are allowed to use, such as requests for extension of the period of response and for an accelerated examination.

For the CNIPA, pendency for examination refers to the average time period taken, in months, for the granting of invention patent applications, calculated from the date on which the application enters the substantive examination phase to the date on which the decision to grant is issued.

For the USPTO, pendency examination in months is calculated by measuring the time from filing to abandonment or issue for all applications that are abandoned or issued during a three month period. The average of these times is the pendency in months. This number includes plant patents and reissue patents in addition to utility patents (see above GRANT RATE).

PENDENCY INVALIDATION

The CNIPA, “Pendency time in invalidation” refers to the duration from the date on which the notification of acceptance of request for invalidation is issued to the date on which the examination decision on request for invalidation is issued.

The JPO pendency period is the average processing period for a trial for invalidation in a calendar year from the date a request for a trial for invalidation is filed, to the date a trial decision is dispatched (if an “advance notice of a trial decision” is to be made, it is the date the notice is dispatched), to the date a withdrawal or abandonment is finalized and concluded, or to the date a dismissal is dispatched.

Annex 3

ACRONYMS

4IR	Fourth Industrial Revolution (9) [EPO]
AIA	Leahy-Smith America Invents Act (88) [USPTO]
ARIPO	African Regional Intellectual Property Office (33)
ASEAN	Association of South East Asian Nations (14) [JPO]
CCD	Common Citation Document (9) [EPO]
CNIPA	China National Intellectual Property Administration of the People's Republic of China (i)
CPC	Cooperative Patent Classification (19) [KIPO]
CSP	Collaborative Search Pilot (14) [JPO]
CS term	Computer Software (13) [JPO]
DOCDB	DOCument DataBase (45) [EPO]
EAPC	Eurasian Patent Convention (39)
EAPO	Eurasian Patent Organization (33)
EGPO	Egyptian Patent Office (20) [KIPO]
EPC	European Patent Convention (2) [EPO]
EPO	European Patent Office (i)
EQAD	Examination Quality Assurance Division (17) [KIPO]
EU	European Union (9) [EPO]
EUIPO	European Union Intellectual Property Office (19) [KIPO]
FA	First Action (i) [JPO]
FAOM	First Office Action on the Merits (92) [USPTO]
FDI	Foreign Direct Investment (9) [EPO]
FI	File Index (13) [JPO]
F-term	File Forming Term (13) [JPO]
FY	Fiscal Year (ii) [USPTO]

GCCPO	Gulf Cooperation Council Patent Office (33)
GIPA	Global Intellectual Property Academy (27) [USPTO]
GPPH	Global Patent Prosecution Highway (13) [JPO]
IAM	Intellectual Assets Magazine (7) [EPO]
IB	International Bureau of WIPO (iii)
ID5	Industrial Design 5: JPO, EUIPO, KIPO, CNIPA, USPTO (27) [USPTO]
IFRS	International Financial Reporting Standards (10) [EPO]
loT	Internet of Things (13) [JPO]
IMF	International Monetary Fund (iii)
INPIT	National Center for Industrial Property Information and Training (79) [JPO]
IP	Intellectual Property (1)
IP5	Five IP Offices: EPO, JPO, CNIPA, KIPO, USPTO (i)
IP5 PPH	IP5 Patent Prosecution Highway (9) [EPO]
IP5 SR	IP5 Statistics Report (i)
IPC	International Patent Classification (3)
IPEA	International Preliminary Examination Authority (3)
IPR	Intellectual Property Rights (17) [KIPO]
ISA	International Searching Authority (3)
ITU	International Telecommunication Union (13) [JPO]
JPO	Japan Patent Office (i)
KIPO	Korean Intellectual Property Office (i)
KIPRIS	Korea Intellectual Property Rights Information Service (18) [KIPO]
LADAR	Laser Detection and Ranging (26) [USPTO]
MOU	Memorandum of Understanding (19) [KIPO]
NMT	Neural machine translation (8) [EPO]
OAPI	Organisation Africaine de la Propriété Intellectuelle (33)

OFF	Office of First Filing (13) [JPO]
OPIA	Office of the Administrator for Policy and International Affairs (28) [USPTO]
OSF	Office of Second Filing (13) [JPO]
PACE	Program for Accelerated Prosecution of European Patent Applications (8) [EPO]
PATSTAT	Worldwide Patent Statistical Database (8) [EPO]
PCT	Patent Cooperation Treaty (1)
PCT-PPH	*See PCT and PPH* (13) [JPO]
PPH	Patent Prosecution Highway (iv)
P.R. China	People's Republic of China (2)
PR	Public Relations (18) [KIPO]
RCE	Request for Continued Examination (27) [USPTO]
R. Korea	Republic of Korea (2)
RO	Receiving Office (3)
SME	Small and Medium-Sized Enterprise (ii) [JPO]
TM5	Five Trademark Offices (25) [USPTO]
TM5 ID	TM5 Identification List Project (25) [USPTO]
TRIPO	Trilateral Offices: JPO, KIPO, CNIPA (19) [KIPO]
UAE	United Arab Emirates (20) [KIPO]
U.S.	United States of America (2)
USPTO	United States Patent and Trademark Office (i)
WIPO	World Intellectual Property Organization (iii)

European Patent Office (EPO)
Bob-van-Benthem-Platz 1
80469 Munich
Germany
www.epo.org

Japan Patent Office (JPO)
3-4-3 Kasumigaseki, Chiyoda-ku
Tokyo 100-8915
Japan
www.jpo.go.jp

Korean Intellectual Property Office (KIPO)
Government Complex Daejeon Building 4
189, Cheongsa-ro, Seo-gu, Daejeon, 35208
Republic of Korea
www.kipo.go.kr

National Intellectual Property Administration of the People's Republic of China (CNIPA)
No. 6, Xitucheng Lu, Jimenqiao,
Haidian District
Beijing 100088
People's Republic of China
www.cnipa.gov.cn

United States Patent and Trademark Office (USPTO)
P.O. Box 1450
Alexandria, VA 22313
United States
www.uspto.gov

This report contains statistical information from the five major Patent offices in the world (IP5 Offices). It gives a description of worldwide patenting activities, and provides details and comparison about the business processes taking place at each office.

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