IP5 Statistics Report

2019 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 /// State Intellectual Property Office of the People's Republic of China ///
United States Patent and Trademark Office

IP5 Statistics Report 2019 Edition

European Patent Office,
Japan Patent Office,
Korean Intellectual Property Office,
China National Intellectual Property Administration,
United States Patent and Trademark Office

Edited by
CNIPA, December 2020

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 China National Intellectual Property Administration (CNIPA) and the United States Patent and Trademark Office (USPTO).

- At the end of 2018, 13.9 million patents were in force in the world (+1.8 percent). 91 percent of these patents were in force in one of the IP5 Office jurisdictions.

- In 2018, 2.9 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 2018, 89 percent of the worldwide patent applications were filed as direct national applications. The proportion of applications filed via the PCT remained stable.

- In 2019, 2.7 million patent applications were filed at the IP5 Offices (-4.0 percent).

- Together the IP5 Offices granted 1.3 million patents in 2019 (+5.9 percent).

- In 2019, the main developments at the IP5 Offices were:

- IP5: In June, the 12th meeting of the IP5 Heads of Office was held in Incheon, Korea. The IP5 Heads agreed in the meeting to launch a New Emerging Technologies/Artificial Intelligence Task Force with a view to responding appropriately to and exploring future joint initiatives related to global technological developments. The five leaders also agreed to improve the IP5 structure to achieve greater efficiency within the IP5 cooperation framework.

- EPO: In June 2019, the Administrative Council of the EPO approved the Strategic Plan 2023 aiming at delivering sustainability and excellence. Three new Vice-Presidents took up their duties on 1 January. In 2019, applications grew by 4 percent to 181,400 and almost 138,000 European patents were published. The pendency in examination was further reduced.

- JPO: the JPO has been aiming to achieve the “world’s fastest and utmost quality patent examinations”, and implementing various measures focused on “maintaining speed”, “granting high quality rights”. In 2019, the JPO received 307,969 patent applications, and the total pendency and the first action (FA) pendency were 14.3 and 9.5 months on average, respectively. Furthermore, the number of international search reports the JPO prepared under the PCT has been increasing in recent years and reached a record high of 51,666.

- KIPO: The annual average first office action pendency period was 10.3 months for patents and utility models. KIPO received a preliminary total of 510,968 applications for IPRs, including patents, utility models in 2019. The number of PCT applications filed from R. Korea increased by 11.5 percent from 16,991 in 2018 to 18,885 in 2019, which is the 5th largest amount by country of origin.

- CNIPA: The CNIPA led the formulation of the Opinions on Strengthening the Protection of Intellectual Property Right, which put forward 99 targeted measures. In 2019, 453,000 invention patents were granted in CNIPA with an increase of 4.8 percent, while the average pendency period for grants was approximately 22.2 months.

- USPTO: In 2019, the USPTO hosted a conference on Artificial Intelligence: Intellectual Property Policy Considerations, with IP specialists from around the world involved. The USPTO successfully met its pendency goals and achieved its lowest first action pendency since January 2002, despite total application filings nearly doubling in that period.

Preface

The IP5 Statistics Report (IP5 SR) is jointly produced by the "IP5 Offices," hereafter referred to as the Group, which consist of the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the China National Intellectual Property Administration (CNIPA), 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 2019 data report that was made earlier in 2020. The latest reports, along with other data exchanges and information about the Group, can be found at the IP5 Offices homepage www.fiveipoffices.org.

In June 2019, the KIPO hosted the IP5 Heads of Office meeting held in Incheon, Korea. The IP5 consists of the EPO, the JPO, the KIPO, the CNIPA, and the USPTO. During the meeting, the Heads of Office noted various cooperation achievements over the past year, approved the work plan for the next phase and signed the 2019 IP5 Joint Statement. The statement summarizes the cooperation achievements of the five offices in recent years in the areas of coordination and simplification of procedures, enhancement of work sharing, improvement of patent quality, convenient provision of patent information and statistical data, and timely revision of patent classification, and points out that the future IP5 cooperation will focus on the aspects of coping with global technological change, providing high-quality and reliable examination, and innovating and improving the IP5 cooperation mechanism.

According to the World Economic Outlook[1] of the International Monetary Fund (IMF), the global economy is projected to decrease at 4.4 percent in 2020 and grow at 5.2 percent in 2021, The growth projections imply wide negative output gaps and elevated unemployment rates in 2020 and in 2021 across both advanced and emerging market economies.

At the IP5 Offices in 2019, the applications increased 4.1 percent at the EPO, 4.3 percent at the KIPO, 4.1 percent at the USPTO, while they decreased by 1.8 percent at the JPO and 9.2 percent at the CNIPA. The data showed annual growth 5.6 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.

[1] World Economic Outlook October 2020: www.imf.org

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 especially 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 the links to statistics at each Office (www.fiveipoffices.org/resources/annualreports.html).

Together with this report, there is a separate glossary of patent-related terms and a set of statistical tables that show extended time series and graphs for most of the data found in this report.

EPO, JPO, KIPO, CNIPA, and USPTO
With cooperation of WIPO
December 2020

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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”[2], 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[3]. 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 distinguish the two

[2] See also, World Intellectual Property Organization, “What is Intellectual Property?” www.wipo.int/about-ip/en/ and World Intellectual Property Indicators – 2019, https://www.wipo.int/publications/en/details.jsp?id=44644

[3] 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.

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 2019
- 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.

Together with this report, there is an annex including a glossary of patent-related terms and a statistical table file that includes extended time series and graphs of much of the data found in this report[4].

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 activity is presented, firstly in terms of the flows of applications between the IP5 Blocs, and then in terms of patent families[5].

[4] www.fiveipoffices.org/statistics/statisticsreports.html
[5] For a further discussion of patent families, see Chapter 3 and the term definitions in Annex 2.

The statistics are mainly derived from the WIPO Statistics Database[6], 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)[7].

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] This edition refers to general patent data as of April 2020, and to PCT international phase application data as of May 2020, www.wipo.int/ipstats/en/index.html
[7] 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

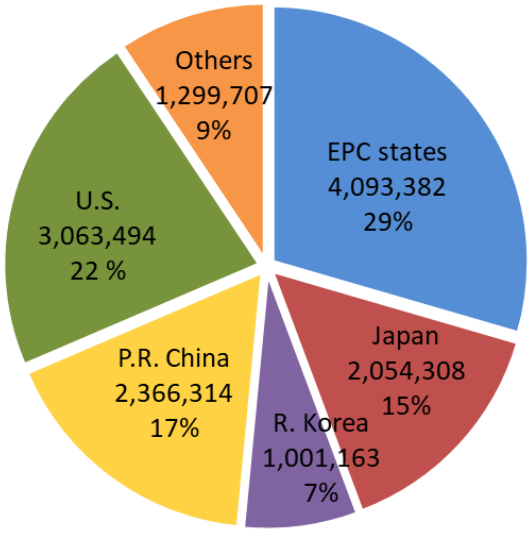
THE IP5 OFFICES

This chapter details developments at each of the IP5 offices[8].

International trade and markets continue to be of great importance, so innovators want their intellectual creations to be protected concurrently in multiple major markets.

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 2018. The data are based on worldwide patent information available from the WIPO Statistics Database[9].

Fig. 2.1: PATENTS IN FORCE END OF 2018

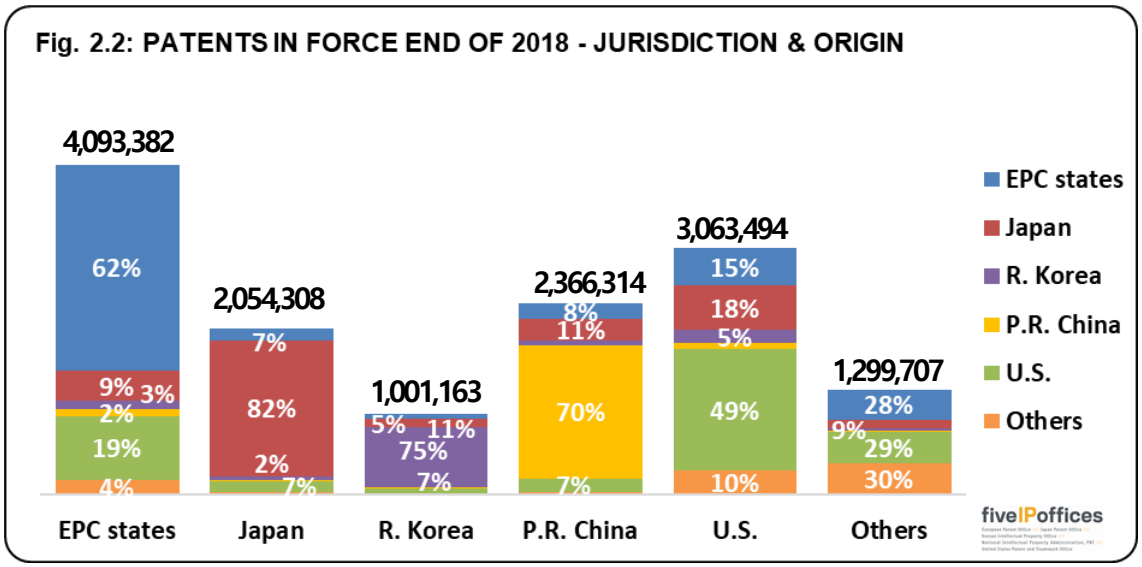


At the end of 2018, 91 percent of the 13.9 million patents that were in force were valid in one of the IP5 Offices jurisdictions. This demonstrates the prominent role that is played by the IP5 Offices.

[8] 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

[9] www.wipo.int/ipstats/en/index.html Data for patents in force for 2018 are missing for some countries in the WIPO data. Where available, the most recent previous year's data were substituted for missing 2018 data. Data for 2019 are not yet available from WIPO.

Fig. 2.2 shows the residence of the holders of the patents in force at the end of 2018 in the regions of the IP5 Offices.



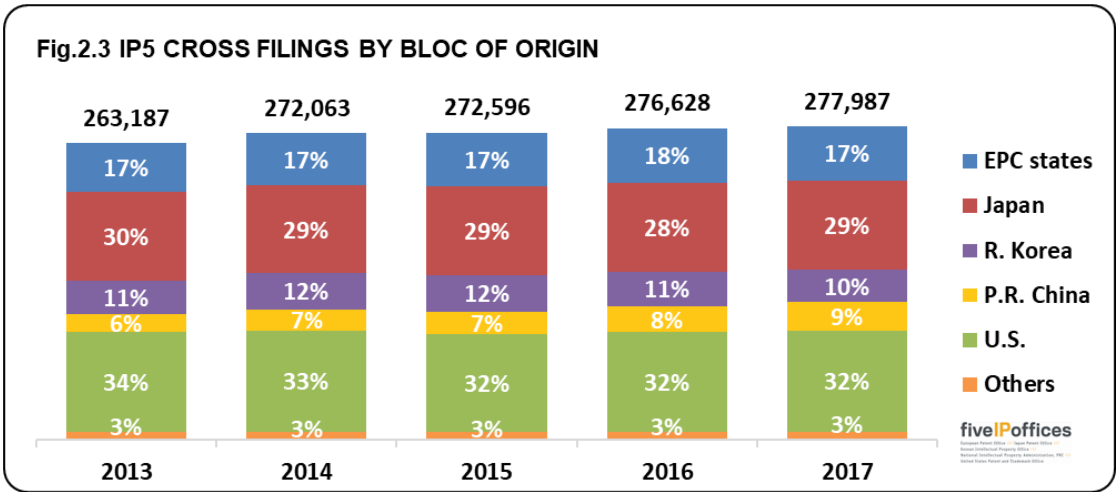
At the end of 2018, of the 13.9 million patents in force, 29 percent were valid in the EPC states, 22 percent in the U.S. 15 percent in Japan, 7 percent in R. Korea and 17 percent in P. R. China.

In 2018, while 82 percent of the patents valid in Japan originated in Japan[10], only 49 percent of the U.S. patents had a U.S. origin. For EPC States, the corresponding shares was 60 percent, it was 75 percent for R. Korea, and 70 percent for P.R. China.

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.

Figure 2.3 shows the development of the number of cross filings between the IP5. Offices over the period 2013 to 2017 according to the bloc of the corresponding first filing.

[10] Patent origin is based on the patent's first-named inventor or applicant.



The Figure 2.3 is based on published applications data allowing to track subsequent applications in other jurisdictions. As a consequence, data beyond 2017 are not yet complete.

EUROPEAN PATENT OFFICE

The mission of the EPO is to deliver high-quality patents and efficient services that foster innovation, competitiveness and economic growth. 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.

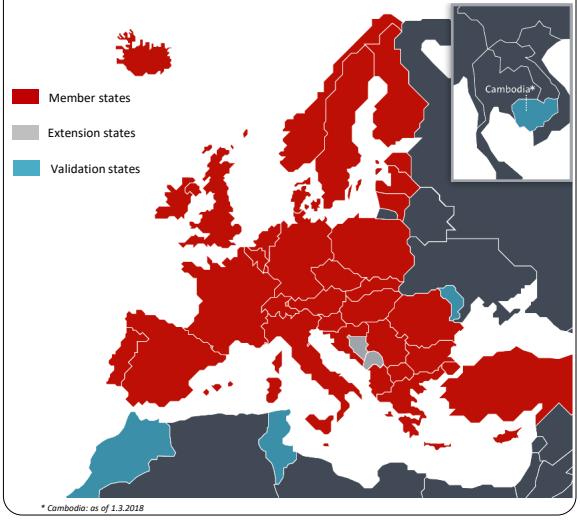
Member states

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 2019, the 38 members of the underlying EPO were:

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

Fig. 2.4: 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.

Cambodia, Moldova, Morocco and Tunisia had agreements to validate European patents in their territories. Similar agreement with other states are under negotiations.

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 2019

In January 2019, the EPO welcome three new Vice-Presidents. Mrs Simon, Mr Rowan and Mr Ernst, took up respectively responsibility for the General Corporate Services, the Patent Granting Process and the Legal & international affairs.

The number of patent applications filed with the European Patent Office (EPO) grew by 4 percent, to exceed 181,000. The internal reforms implemented as part of the Quality and Efficiency strategy that prioritized examination work and increased productivity led to a further reduction of volume of pending applications. This allowed to re-orient partially the production leading to further increase of the number of granted patents to almost 138,000.

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. In 2019, the EPO kept focusing on the timeliness of examination and opposition reduced by 3.7 and 1.7 months respectively in 2019[11]. The percentage of EPO PCT international search reports published along with the application (i.e. A1 publications) remains high above 96 percent in 2019.

In June 2019, the EPO published its Strategic Plan 2023. It presents a strategy for a modernised and sustainable of the office organisation. The Strategic Plan provides also a clear roadmap for achieving that vision distributed over five goals. It outlines the actions and initiatives to be taken and the improvements required if the EPO is to deliver sustainability and excellence. It also explains how the EPO intend to achieve the five strategic goals not only on behalf of its stakeholders, but in partnership with them too. After all, this is a joint venture for all those involved and the Plan relies on effective and transparent co-operation with its stakeholders. More information can be found on the EPO homepage.

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 2018 and 2019. There was a further increase in demand in 2019 as represented by the number of patent applications.

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 2018, PACE was requested for 5 percent of the European examinations.

[11] The new methodology is based on mean average delays. In the case of the examination it measures time until the decision to grant the patent.

Table 2.1: EPO PRODUCTION INFORMATION

EPO PRODUCTION FIGURES	2018	2019	Change	%Change
Patent applications (Euro-direct & Euro-PCT regional phase)	**174,481**	**181,406**	**+ 6,925**	**+ 4.0%**
Searches carried out				
European (including PCT supplementary)	122,403	123,722	+ 1,319	+ 1.1%
PCT international	84,224	83,960	- 264	- 0.3%
On behalf of national offices	26,499	25,380	- 1,119	- 4.2%
Total production search	**233,126**	**233,062**	**- 64**	**- 0.0%**
Examination-Opposition (final actions)				
European	185,364	177,872	- 7,492	- 4.0%
PCT Chapter II	7,867	6,339	- 1,528	- 19.4%
Oppositions	4,061	3,977	- 84	- 2.1%
Total final actions examination-opposition	**197,292**	**188,188**	**- 9,104**	**- 4.6%**
European granted patents	**127,625**	**137,784**	**+ 10,159**	**+ 8.0%**

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 bulk data for commercial providers and partner institutions. Today, the EPO aim to go further than that. The EPO is not only a provider of patent information, but seeks to inspire its users to turn that into patent knowledge. The EPO's goal is to take users on a journey starting at patent information and ending with in-depth IP knowledge, so they can take informed IP-related decisions with confidence at every step of the way.

The EPO's patent databases remain the most comprehensive collection of patent literature. The total number of records in the EPO worldwide bibliographic database (DOCDB) recently passed the 120 million mark and EPO worldwide legal event data (INPADOC) more than 300 million. EPO databases are accessible through services such as Espacenet and also via numerous commercial providers and partner institutions. 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.

To demonstrate the value and utility of patent information and to encourage users to acquire and develop their own patent knowledge, the EPO published several "Patent insight reports". These are studies covering a number of diverse emerging technologies and have included graphene composites, quantum metrology, blockchain and cancer immunotherapy. They have been published in the EPO's online and print media, and in peer-reviewed journals such as Nature Biotechnology.

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. Integrated into the EPO's Espacenet worldwide patent database and European publication server, it provides translations for a total of 32 different languages. There are currently approximately 20,000 translation requests per working day on Patent Translate from around the globe.

The journey from patent information to patent knowledge cannot be embarked upon with data alone; the user also needs the right tools to access that data. So, after intensive user consultations and testing, an enriched version of the EPO's Espacenet patent search service was launched in November 2019. This marked a major step towards making the EPO's patent information more accessible to users. Access is free. The latest version offers some advanced functions, including:

- A dynamic query builder for easier searching;
- A richer, cleaner result list;
- An improved legal status overview covering the entire patent family;
- A responsive design to facilitate searching from different devices.

International and European Cooperation

2019 was a momentous year for the EPO in terms of its efforts to build a European patent network with a global impact. Since the adoption of SP2023 in June 2019, the EPO's geographical coverage has grown sharply. In 2019 the EPO signed a validation agreement with Georgia and seven reinforced partnership agreements with Ethiopia, Argentina, Malaysia, Mexico, Indonesia, Brazil and ARIPO. This brings the potential coverage of the EPO's products and services up to 1.9 billion inhabitants across 38 member states, two extension states, four validation states and eight reinforced partnerships. Effective coordination with other IP offices and international organisations enables the EPO to avoid duplication of efforts.

In 2019, 29 patent offices were using the Cooperative Patent Classification (CPC) to classify their own publications. At the end of the year, about 55.5 million patent documents were classified in the CPC, of which 6.7 million were classified by the publishing offices themselves.

In 2019 the EPO continued to invest in the Patent Prosecution Highway (PPH) and initiated the gradual implementation of this scheme in a permanent manner. The PPH provides European applicants with simplified, cost-efficient access to accelerated prosecution elsewhere on the basis of high-quality EPO work products indicating patentable claims. The EPO PPH network currently comprises of 16 partner offices, while PPH arrangements with further offices are scheduled to become operational in due course. PPH participation volumes continued to increase in 2019 suggesting that expedited processing remains an appealing option for applicants in certain technical fields with short product life-cycles.

The EPO hosts the Common Citation Document (CCD), which in 2019 contained over 350 million citations from 35 patent offices world-wide. The CCD currently contains enriched citation data, i.e. data indicating the claims to which the citation is relevant in the patent application for which the search was done and the pertinent passage in the cited document, from 18 patent offices, including the EPO, CNIPA, JPO and WIPO.

Economic studies

In 2019, the EPO Chief Economist Unit published three new studies on the economic impact of patents. The first two studies were carried out jointly with the Chief Economist of the EU Intellectual Property Office (EUIPO). They address, respectively, the contribution of IPR-intensive industries to the EU economy (www.epo.org/ipr-intensive-industries) and the interplay between the use of IPR by European SMEs and their ability to grow in subsequent years (www.epo.org/high-growth). The third study is an EPO scoreboard assessing the success and challenges of the commercialisation of patents filed with the EPO by European SMEs (www.epo.org/scoreboard-smes). This study was launched at the first ever "High Growth Technology Business conference" jointly organised by the EPO and Licensing Executive Society International in Dublin in December 2019.

EPO budget

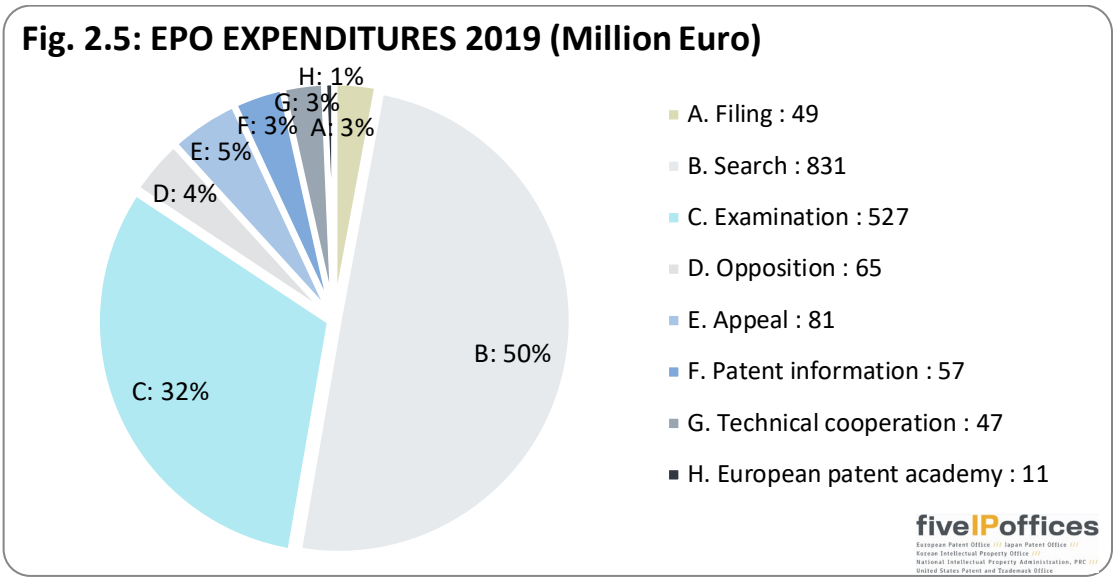
The EPO is financially autonomous and does not receive any subsidies from the Contracting States of the Organisation. Expenses are therefore mainly covered by revenue from fees paid by applicants and patentees. In 2019, the EPO budget amounted to 2.4 billion EURO.

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. 2.4 shows EPO expenses[12], based on the International Finance Reporting Standards (IFRS) by category in 2019.

Fig. 2.5: EPO EXPENDITURES 2019 (Million Euro)



[12] The EPO uses the word "expenses" in accordance with the IFRS reporting approach.

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

EPO Staff

At the end of 2019, the EPO staff totalled about 6,608 employees (-1.3 percent) from 35 different European countries[13]. This comprises 4,240 search, examination, and opposition examiners and 189 Boards of appeal members.

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

[13] For more details, see the 2018 EPO social report at www.epo.org/about-us/annual-reports-statistics.html

JAPAN PATENT OFFICE

The JPO has been aiming to achieve the "world's fastest and utmost quality patent 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) Examination Performance
With the acceleration of the intellectual property creation cycle, there is a growing need to shorten total pendency, and the JPO has been engaging in initiatives to speed up examinations. In 2019, the JPO achieved 9.5 months on average for FA pendency and 14.3 months on average for Total Pendency respectively.

2) Accelerated Examination System
Under certain conditions, the JPO offers an accelerated examination system/super-accelerated examination system that, upon the request of an applicant, expedites the commencement of an examination. An accelerated examination system may be applied for applications that are also filed in one or more other countries and applications by small and medium-sized enterprises, etc. The JPO is running pilot programs for a super-accelerated examination system for highly important applications, such as applications for inventions that have already been put into practice and that are also filed in one or more other countries. In principle, this system aims for the period from request to first action to be within one month (within two months for PCT National Entry Phase applications) [14].

3) Quality Management Initiatives

Under the "Quality Policy on Patent Examination", which constitutes the JPO's fundamental principles of quality management, and the "Quality Management Manual for Patent Examination" (Quality Management Manual), the JPO has been engaging in the following initiatives in order to realize the utmost quality of patent examinations in the world.[15]

Quality Assurance

Before sending applicants and agents documents by examiners regarding notices and decisions, etc., managers in the examination office check substantive and formal aspects of such documents for all cases. Examiners consult with other examiners in order to share search know-how and knowledge, etc., in order to curb search and decision discrepancies among examiners.

Quality Verification

Decisions and notices, etc. prepared by examiners are audited by quality management officers to check compliance and validity in terms of content and format before sending official documents to applicants and agents. In order to ascertain various user needs, the JPO conducts interviews at informal meetings with businesses, accepts information provided in relation to individual cases, and expands the scope of user satisfaction surveys covering overseas users and small-scale users.

[14] For more information on Accelerated Examination System, please visit JPO's website.
https://www.jpo.go.jp/e/system/patent/shinsa/jp-soki/index.html
[15] For more details about Quality Management Initiatives, please visit the following:
https://www.jpo.go.jp/e/introduction/hinshitu/shinsa/index.html

4) International Cooperation on Examination

Patent Prosecution Highway (PPH)

The PPH is a framework that allows an application determined to be patentable by the Office of First Filing (OFF) to undergo, at the request of the applicant, accelerated examination with simplified procedures at the Office of Second Filing (OSF) that is a PPH partner of 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 January 2020, the number of IP offices participating in the PPH has increased to 54. [16]
- As of January 2020, the JPO has been implementing the PPH with 44 IP offices, including new PPH collaboration with the Department for Promotion of Industry and Internal Trade (DPIIT) of the Ministry of Commerce and Industry of India from December 2019, and the Saudi Authority for Intellectual Property (SAIP) from January 2020.
- With regard to the PPH program between the JPO and the National Institute of Industrial Property (INPI) of Brazil, restrictions on the technical fields eligible for PPH requests to the INPI were eased in April 2019, and all technical fields became eligible in December 2019.
- In addition, the JPO serves as the secretariat of the "Global Patent Prosecution Highway (GPPH)", a multinational framework launched in January 2014. In January 2019, the National Institute for the Defense of Free Competition and the Protection of Intellectual Property (INDECOPI) of Peru joined the GPPH framework, bringing the number of IP offices participating in the GPPH to 26. In the GPPH, all types of PPH, including PPH-MOTTAINAI and PCT-PPH[17], are available among the participating IP offices.

Patent Prosecution Highway Plus (PPH Plus)

The PPH Plus is a framework that accelerates acquisition of right for an application of the same invention which is already granted a patent in Japan, by utilizing the examination results by the JPO. The JPO is currently implementing this framework with the Brunei Intellectual Property Office.

Cooperation for facilitating Patent Grant (CPG)

CPG is a framework that accelerates patent grant without conducting substantial examination, for an application of the same invention which is already granted a patent in Japan. The JPO is currently implementing this framework with the Ministry of Industry and Handicraft of Cambodia, and the Department of Intellectual Property, Ministry of Science and Technology of Lao PDR.

4) Recent Trends in AI-related Inventions

[16] The PPH Portal Site provides one-stop access to the PPH implementation status and statistical information for participating IP offices.
https://www.jpo.go.jp/e/toppage/pph-portal/index.html
[17] PPH-MOTTAINAI is a framework that enables an applicant to request PPH for an application determined to be patentable by the Office of Earlier Examination (OEE), regardless of which of the two partner offices first receives the patent application. PCT-PPH is a framework that enables an applicant to request PPH for an application whose patentability is positively assessed in a written opinion or international preliminary examination report at the PCT international phase.

Taking into account recent advances in AI technology centering on deep learning, the JPO studied the status of patent applications for AI-related inventions in Japan and overseas and released a report and previous data in July 2019.[18]

This study defines "AI-related invention"[19] as (1) AI core invention (FI: G06N) and (2) inventions in which AI has been applied to various technical fields and examined such inventions. An overview of the study findings is as follows.

- Domestic patent applications for AI-related inventions have increased rapidly since 2014 due to the impact of the third AI boom.
- Applications for AI-related inventions referring to deep learning have increased rapidly since 2014. In 2017, nearly half of domestic patent applications for AI-related inventions referred to deep learning.
- For AI-applied areas, applications stand out in the fields of image processing, information retrieval and recommendation, business-related, and medical diagnosis. Between 2015 and 2017, applications for control and robotics fields increased in particular. Applications related to AI core technology (IPC: G06N) are on the rise, both to the IP5 Offices and PCT. Among them, the number of applications to the USPTO and the CNIPA is particularly high.

[18] https://www.jpo.go.jp/e/system/patent/gaiyo/ai/ai_shutsugan_chosa.html
[19] The above definition of "AI-related invention" is used only in this research, and does not represent an official definition by the JPO.

JPO Production information

Table 2.2 shows production figures for applications, examinations, grants, appeals or trials and PCT activities in the Japanese procedure in 2018 and 2019.

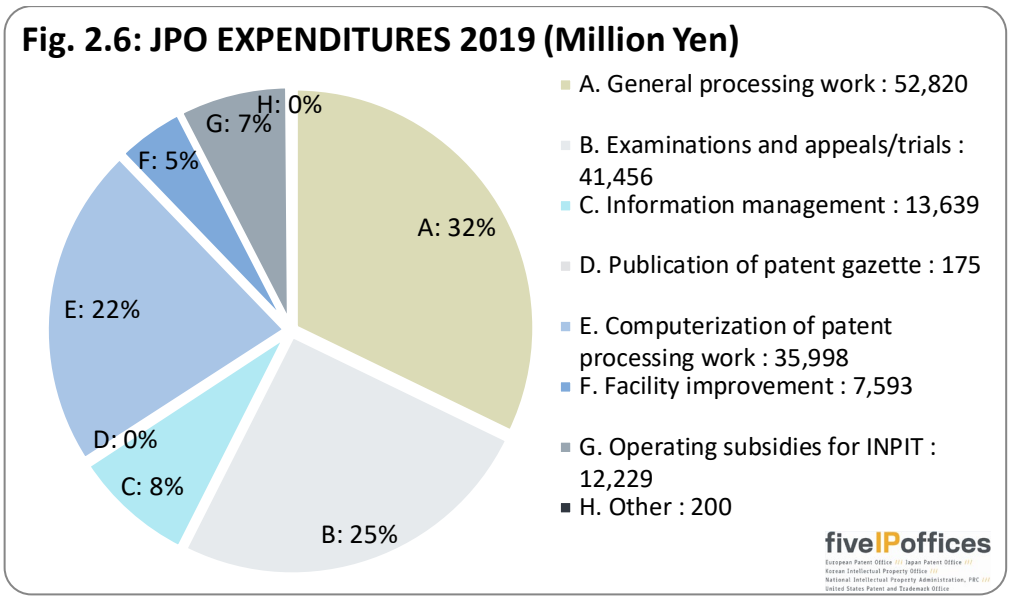
Table 2.2: JPO PRODUCTION INFORMATION

JPO PRODUCTION FIGURES	2018	2019	Change	% Change
Applications filed (by Origin of Application)				
Domestic	253,630	245,372	- 8,258	- 3.3%
Foreign	59,937	62,597	+ 2,660	+ 4.4%
Total	**313,567**	**307,969**	**- 5,598**	**- 1.8%**
Applications filed (by Type of Application)				
Divisional[20]	27,267	27,665	+ 398	+ 1.5%
Converted[21]	93	92	- 1	- 1.1%
Regular	286,207	280,212	- 5,995	- 2.1%
Total	**313,567**	**307,969**	**- 5,598**	**- 1.8%**
Examination				
Requests	234,309	235,182	+ 873	+ 0.4%
First Actions	232,701	227,293	- 5,408	- 2.3%
Final Actions	236,279	224,375	- 11,904	- 5.0%
Grants				
Domestic	152,440	140,865	- 11,575	- 7.6%
Foreign	42,085	39,045	- 3,040	- 7.2%
Total	**194,525**	**179,910**	**- 14,615**	**- 7.5%**
Appeals/Trials				
Demand for Appeal against refusal	16,536	16,699	+ 163	+ 1.0%
Demand for Trial for invalidation	159	113	- 46	- 28.9%
PCT Activities				
International searches	47,934	51,666	+ 3,732	+ 7.8%
International preliminary examinations	2,131	2,000	- 131	- 6.1%

[20] 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.
[21] 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 2019.



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

JPO Staff Composition

As of the end of FY 2019, the total number of staff at the JPO was 2,792.

Examiners	
Patent / Utility model	1,682
Design	48
Trademark	140
Appeal examiners	383
General staff	539
Total	2,792

More information

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

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 its cooperative ties with foreign IP offices and other international organizations.

Premium Examination Services
KIPO aims to provide fast, high-quality, and customer-oriented examination services by continuing to improve examination systems, raise the quality of IP administration, and reduce first action pendency. The average first office pendency in 2019 was 10.8 months for patents and utility models, 6.8 months for trademarks, and 5.4 months for industrial designs.

IP Competitiveness
In 2019, KIPO received a preliminary total of 510,968 applications filing for patents, utility models, industrial designs, and trademarks in 2019. Out of that number, 84,216 applications were filed by residents of foreign countries.

PCT Applications
The number of PCT applications from Korea has continually grown every year. The KIPO has the 5th largest amount of PCT applications by country of origin. There were 18,885 PCT applications in total for 2019 which is an 11.5 increased from 16,991 applications in 2018.

The Korean language is also the 5th most commonly used language as an official PCT publication language.

Korea Becomes the World's 7th Country to Surpass 2 Million Patent Registrations
Since the first establishment of a legal system for intellectual property (IP) in the Republic of Korea in 1946, the quantity and range of IP applications have exponentially increased. The Korean Intellectual Property Office (KIPO) registered the first patent registration in 1948 and reached the registration of one million patents after sixty-two years in 2010. In just a few years afterwards, KIPO issued the registration of its second millionth patent by 2019, becoming the 7th country in the world to achieve this milestone.

500,000 in Annual IPR Filings

For the first time, the total volume of intellectual property right (IPR) filings for a one-year period recorded 510,968 cases in 2019, which is a 6.4 percent increase from previous year. Additionally, the Korean patent market for small and medium-sized enterprises (SMEs) has been rapidly growing as the volume of patent application by SMEs have surpassed that of large enterprises since 2015.

PROVIDING IP SERVICES

1. Examination for Fourth Industrial Revolution Technologies

1) Convergence Technology Examination Bureau

In order to adapt to the developments in the IP environment and provide sufficient IP services, KIPO implemented measures to improve its patent examination accordingly. In 2019, an organizational restructuring was initiated within KIPO which led to the new establishment of a “Convergence Technology Examination Bureau” dedicated to the examination of technologies related to the Fourth Industrial Revolution (4IR) such as artificial intelligence (AI), big data, and bio-health.

Patent examination was originally carried out by four bureaus: the Patent Examination Policy Bureau and Patent Examination Bureau 1, 2, and 3. A more efficient system was established through reorganization by fields of technology and relocation of examiners with specific expertise which would support technological innovation and advancement. As of 2019, there are five bureaus organized to carry out patent examinations: the Patent Examination Policy Bureau, the Convergence Technology Examination Bureau, the Electricity & Telecommunications Examination Bureau, the Chemical & Biotechnology Examination Bureau, and the Machinery & Metals Examination Bureau.

2) Consensus-based Consultative Examination Among Examiners

Patent examination is generally conducted by one examiner for each invention. Even if consultation with other examiners was provided, the examination is processed under the name of one main examiner. Along with the new establishment of the Convergence Technology Examination Bureau in 2019, KIPO began implementation of examinations based on the consultation and consensus of three examiners specializing in 4IR technologies.

In this newly implemented system, three examiners in the Convergence Technology Examination Bureau consult from the onset of examination and come to a consensus, similar to that of the Intellectual Property Trial Tribunal.

Due to many 4IR-related inventions often incorporating two or more different technical fields, a group of examiners makes it possible to provide relatively higher-quality examination services and increase examination consistency by sharing opinions on patentability requirements and reducing discrepancies.

2. Introducing the “Venture Team” Project at KIPO

Government organizations are often occupied with undertaking their entrusted obligations rather than supporting the implementation of innovative but challenging ideas which could greatly improve convenience for its users. Therefore, a “venture team,” based on conceptualized ideas for policies and services, can be temporarily formed within the organization dedicated to actualizing the idea.

On June 12, 2019, the Ministry of Interior and Safety of Korea hosted a “Venture Team Idea Competition. Two of KIPO’s ideas were selected as winners of the competition and KIPO permitted to establish two new ”Venture Teams” within its organization to carry out their ideas, accordingly.

Promoting IP Creation and Utilization

1. Expanding Patent Big Data Utilization in Industry

1) Expansion of IP-R&D Centered on Materials, Parts, and Equipment
KIPO began implementing an IP-R&D plan for securing core technologies already known in patents and improve the efficiency of R&D projects. This plan to strengthen R&D consists of three major tasks: expanding IP-R&D program in public R&D projects; supporting IP-R&D customized to each stage of growth of companies; and strengthening the foundation for IP-R&D proliferation in industry, academia, and research.

2) Commencing an Era of 1 Trillion Won in IP-backed Financing
IP-backed financing provides funds to companies by a means of a loan or investment based on their IP assets. In 2019, the total amount of IP-backed financial transactions reached 1.35 trillion South Korean Won (equivalent to 1.11 billion US Dollar) in Korea. The first loan based on IP was made with the Korea Development Bank (KDB) in 2013, and transactions for IP-backed financing have increased steadily ever since. Notably, the overall scale of 1.35 trillion South Korean Won in total transactions for 2019 shows a significant growth in IP-backed financing, a 77 percent increase from that of 2018.

3) Launching the Patent Mutual Aid Program
KIPO implemented the Patent Mutual Aid program as a policy program to provide a stable management base which can alleviate and resolve IP risk while also support advancement into overseas markets. The program provides mutual aid among companies when SMEs need funds in disputes related to domestic and overseas IP or for securing IPRs in other countries. The Patent Mutual Aid Center began operation of in August 2019 after the Korea Technology Finance Corporation was selected as the operating agency to entrust the mutual aid program.

Establishing Global IP Cooperation

1. Hosting the Heads of the World’s Five Largest IP Offices

On June 12, 2019, the 12th IP5 Heads of Office Meeting was convened in Songdo, Incheon. The meeting was concluded with the adoption of a Joint Statement on improving the global patent system in response to changes brought on by the fourth Industrial Revolution technologies. The heads of IP5 Office also agreed to launch a task force whose main assignment is to explore collaborative approaches to innovative technologies such as AI.

2. Advancing Korea-ASEAN IP Cooperation

On November 25, 2019, the second Korea-ASEAN Heads of IP Office Meeting was held in Seoul, Korea since the first meeting launched in 2018 after five years of consultation with the ASEAN member states. Under the chairmanship of KIPO Commissioner Won-joo Park, the future direction of Korea-ASEAN IP cooperation was presented to the attending delegations from the IP offices from all ten ASEAN member states, and the "Joint Statement on Korea-ASEAN Intellectual Property" was adopted laying a foundation for deeper cooperation toward the achievement of IP-driven mutual prosperity.

KIPO Production information

Table 2.3 shows production figures for applications, examinations, grants, appeals or trials and PCT activities for 2018 and 2019.

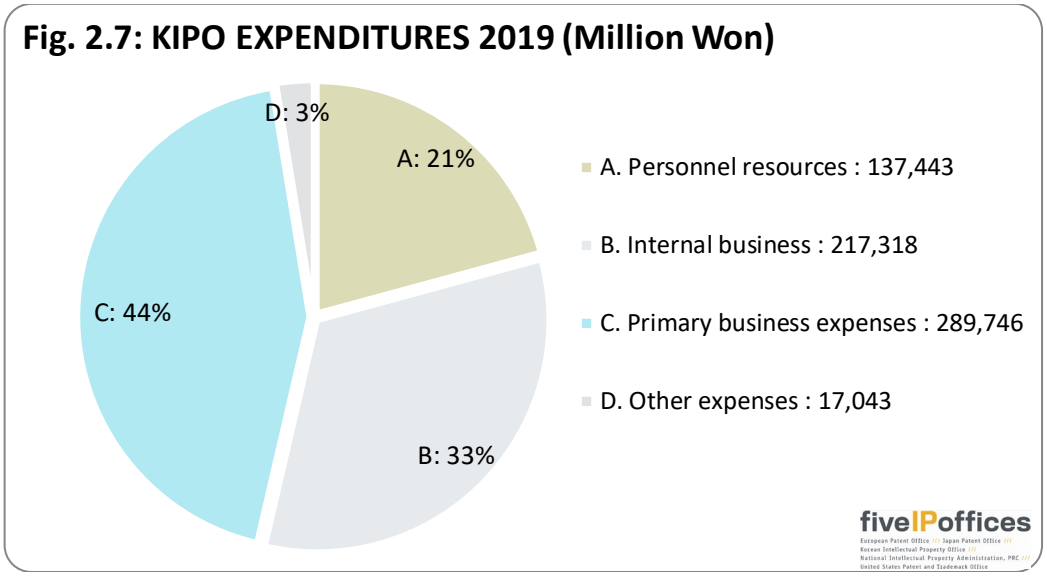
Table 2.3: KIPO PRODUCTION INFORMATION

KIPO PRODUCTION FIGURES	2018	2019	Change	% Change
Applications filed (by Origin of Application)				
Domestic	162, 561	171,603	+ 9,042	+ 5.6%
Foreign	47,431	47,372	- 59	- 0.1%
Total	**209,992**	**218,975**	**+ 8,983**	**+ 4.3%**
Examination				
Requests	180,680	183,816	+ 3,136	+ 1.7%
First Actions	162,689	172,371	+ 9,682	+ 6.0%
Final Actions	165,902	170,160	+ 4,258	+ 2.6%
Grants				
Domestic	89,227	94,852	+ 5,625	+ 6.3%
Foreign	29,785	30,809	+ 1,024	+ 3.4%
Total	**119,012**	**125,661**	**+ 6,649**	**+ 5.6%**
Appeals/Trials				
Demand for Appeal against refusal	3,624	2,820	- 804	- 22.2%
Demand for Trial for invalidation	460	477	+ 17	+ 3.7%
PCT Activities				

International searches	24,104	27,154	+ 3,050	+ 12.7%
International preliminary examinations	131	131	+ 0	+ 0.0%

KIPO budget

Fig. 2.6 shows KIPO expenditures by category in 2019.



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

KIPO Staff Composition

At the end of 2019, the KIPO had a total staff 1,741. The breakdown is as follows.

Examiners	
Patents and Utility Model	868
Designs and Trademarks	195
Appeal examiners	107
Other staff	571
Total	1,741

More information

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

China National Intellectual Property Administration

Statistical Overview of 2019

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 2019

In 2019, the number of applications for the three kinds of patents in P.R. China was nearly 4.38 million. Among these applications, there were 1.40 million applications for invention patents, a decrease of 9.2 percent compared to the previous year, 2.27 million applications for utility model patents and 0.71 million applications for design patents.

3) Patents Granted in 2019

In 2019, the CNIPA granted 0.45 million patents for invention, with an increase of 4.8 percent compared to the previous year, 1.58 million patents for utility model and 0.56 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 2018 and 2019. The data in table 2.4 concentrate only on patents for invention.

Table 2.4: CNIPA PRODUCTION INFORMATION

CNIPA PRODUCTION FIGURES	2018	2019	Change	% Change
Applications filed				
Domestic	1,393,815	1,243,568	- 150,247	- 10.8%
Foreign	148,187	157,093	+ 8,906	+ 6.0%
Total	**1,542,002**	**1,400,661**	**- 141,341**	**- 9.2%**
Examination				
First actions	838,869	1,069,288	+ 230,419	+ 27.5%
Final actions	808,474	1,023,221	+ 214,747	+ 26.6%
Grants				
Domestic	345,959	360,919	+ 14,960	+ 4.3%
Foreign	86,188	91,885	+ 5,697	+ 6.6%
Total	**432,147**	**452,804**	**+ 20,657**	**+ 4.8%**
Re-examination and invalidation				
Re-examination requests	28,695	44,138	+ 15,443	+ 53.8%
Invalidation request	1,387	1,403	+ 16	+ 1.2%
PCT activities				
International searches	52,497	55,776	+ 3,279	+ 6.2%
International preliminary examinations	451	527	+ 76	+ 16.9%

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 well-distributed and reasonable examination period. In 2019, the pendency period for the granting of invention patents was approximately 22.2 months.

Information 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 Public Service System

In 2019, The CNIPA completed the catalogue on basic IP Information, developed a management system, issued the Measures for the Management of IP Basic Information and Data. The CNIPA made the IP basic data further available, continued to improve the patent data service test system, and added five types of data resources, such as the status of the Chinese laws, invalidation, and re-examination. The types of

data available for the public to download rose to 34 with the download bandwidth doubled, and the paper agreements were replaced by electronic protocols. In 2019, the number of registered users of the patent data service test system reached 15, 000, with an increase of 10 percent, and the total amount of data downloaded accumulatively by users exceeded 478TB, with an increase of 59 percent. The international data exchange and the data sharing among domestic ministries and commissions were actively advanced.

2) Documentation Resources and Services

Throughout 2019, a total of 149 types of documentation resources were allocated, including six types of patent resources and 143 types of non - patent resources, which provided solid support for patent examination, patent information public services and others. CNIPA continued to exchange patent documentation with 31 countries (regions) or organizations and provided Chinese patent documentation to 6 PCT international search and preliminary examination authorities.

As of the end of 2019 , CNIPA had 540 types of patent documentation resources , including 191 types of bibliographic data, 167 types of full-image data, 83 types of full-text data, 18 types of special theme data, 72 types of auxiliary search, and 20 types of other categories. The bibliographic data covered 104 countries (regions) or organizations; the full-image data covered 103 countries (regions) or organizations; and the full-text data covered 36 countries (regions) or organizations At present, CNIPA had nearly 130 million pieces of patent documentation.

Documentation Services Focusing on the improvement in the patent examination quality and efficiency, CNIPA compiled the Documentation Resources Quick Guide. Feedback on the progress of the full-text submission form was ensured to be given within one hour during the working days. Throughout the Year ' CNIPA provided examiners with 2,685 pieces of patent documentation and 23,600 pieces of non-patent documentation , held multi-level training on the use of non-patent documentation resources to improve the efficiency of their use , and organized 14 training courses on various types of non-patent databases throughout the year , with more than 2,800 people trained accumulatively.

CNIPA made continuous efforts in innovating services, enriching online and offline service means, spreading IP knowledge and culture by online public lectures, virtual IP exhibition an and others, providing information services such as on-site, telephone and online consultations, commissioned searches and others, and comprehensively improving the service quality and efficiency of service counters .

International Cooperation

In 2019, CNIPA continued its in -depth participation in the reform of the global IP governance system, actively promoted the formulation of international IP rules by participating in international affairs, and promoted multilateral and bilateral cooperation in a balanced manner, as to significantly raise China's voice and influence in global IP affairs . CNIPA strived to build a new IP international cooperation framework, featuring coordinated progress in multilateral, plurilateral, bilateral cooperation and collaboration with neighboring countries.

The CNIPA steadily pressed ahead with the eight pragmatic cooperation projects established at the 2018 High- level Conference on IP for Countries Along the Belt and Road. In May, The Belt and Road IP Training Workshop was organized in Chengdu, Sichuan. In July, the 2019 CNIPA Seminar on Intellectual Property Protection and Examination Practice for Latin American Countries, as well as the patent examination training workshop for the GCC Patent offices were held in Beijing. A total of 26 Students from the Second batch of " Belt and Road "master program on IP completed their Studies in China. CNIPA sent IP experts to the IP authorities of Laos, Vietnam , Ecuador, Ethiopia, Cambodia , Saudi Arabia, and relevant regional organizations, such as the African Regional Intellectual Property organization (ARIPO) and the Gulf Cooperation Council (GCC) to carry out training on IP examination, laws and regulations, etc.,

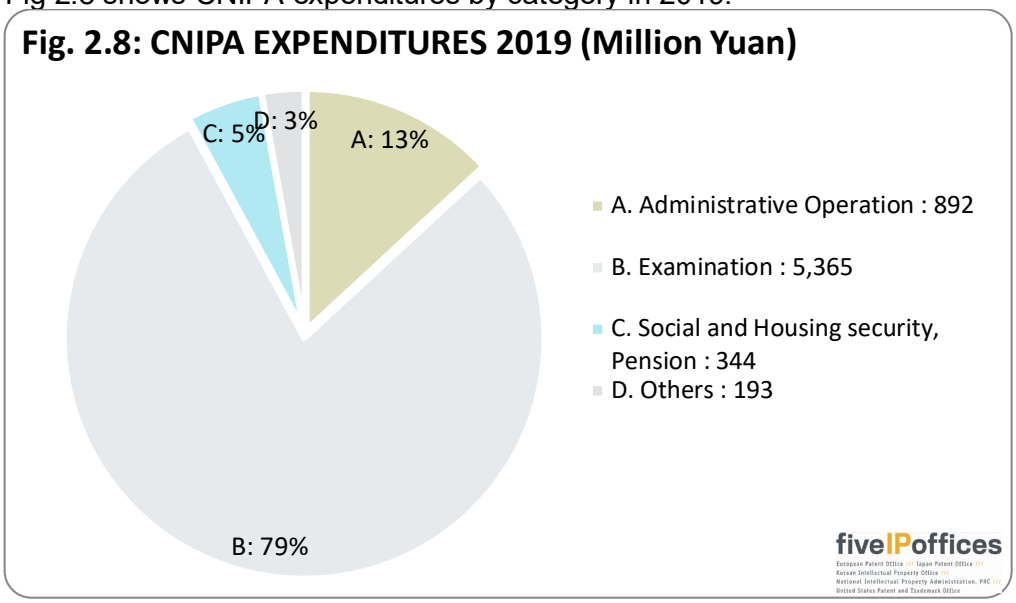
In 2019, the total number of partners that signed PPH cooperation agreements with the CNIPA has increased to 29 , and the launched PPH pilot programs have increased to 27 Among them , CNIPA initiated a new pilot program with Argentina, signed the cooperation agreement on a new pilot program with Norway and planned to sign a new pilot program cooperation agreement with Saudi Arabia. The pilot programs with Iceland and Egypt were successfully extended. CNIPA also signed the extension agreements on pilot programs with IP authorities of Singapore and the Czech Republic. The IP5 PPH will also be extended for three years. The extension agreement on pilot programs with Brazil was also signed. In addition, the consultation on projects with the African Regional Intellectual Property organization proceeded smoothly.

Since its official launch on January 1, 2019, the China-Korea Cooperative Search Pilot (CSP) operated smoothly. PCT Collaboratives Search and Examination Pilot (PCT CS&E) continued to progress steadily, and the work related to the expansion of non-English languages led by CNIPA was also successfully launched. At present, the pilot program has received applications in languages other than English, Chinese, Japanese, Korean, French and German. Based on users' demand for information related ted to patents granted overseas, CNIPA continued to carry out promotion and training activities in relation to the international cooperation projects on examination and their outcomes through various Channels.

CNIPA continued to carry out data exchange cooperation with 26 countries, regions and organizations. The African Regional Intellectual Property Organization and Kyrgyzstan IP authority newly joined the Cloud Patent Examination System (CPES), bringing the total number of users to 51.

The CNIPA budget

Fig 2.8 shows CNIPA expenditures by category in 2019.[22]



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

The CNIPA Staff Composition

By the end of 2019, the CNIPA has 8 functional departments (vice bureau level).

More information

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

[22] Percentages may not total 100 due to rounding.

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 core business units, Patents and Trademarks.

The USPTO’s Strategic Plan for Fiscal Years (FY)[23] 2018-2022 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 strategic goals collectively focus efforts on issuing predictable, reliable, and high-quality IP rights, aligning patent and trademark examination capacity with current and projected workloads, modernizing information technology, enhancing the customer experience, promoting IP rights abroad, monitoring and helping address dynamic IP issues in Congress and the Courts, maintaining a sustainable funding model, and developing IP policy. This plan was developed with input from the public advisory committees, stakeholders, the public, and USPTO employees.

- 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, Enforcement, and Protection Worldwide.
- Management Goal: Deliver Organization Excellence.

Agency News

In FY 2019, the USPTO exceeded patent pendency goals with an average filing to first action pendency of 15.4 months and 23.9 months for total pendency. This achievement marks the USPTO’s lowest first action pendency since January 2002, despite total application filings nearly doubling in that time, from 353,000 in FY 2002 to 667,000 in FY 2019.

[23] USPTO’s Fiscal Year is October 1 to September 30.

FY 2019 marks the 14th consecutive year that the USPTO Trademark examining attorneys surpassed pendency and quality targets. Additionally, in FY 2019, Trademark Operations took several important actions toward enhancing the accuracy of the U.S. Trademark Register and reducing fraudulent filings. Such actions include the expansion of random post-registration audits, implementation of a new U.S. Counsel Rule, and educating applicants and the public on counterfeiting.

The USPTO's Pro Se Art Unit provides dedicated educational and practical resources to small businesses, independent inventors, and under-resourced inventors. In FY 2019, around 1,200 patents were granted in applications handled by examiners in the Pro Se Art Unit. Through education and enhanced customer service, the Pro Se Art Unit helped increase accessibility to patent protection with almost 37 percent of all pro se applications examined by the Pro Se Art Unit resulting in a patent grant. In addition, examiners in the Pro Se Art Unit worked with unrepresented applicants on thousands of applications to help make the patent system more accessible, transparent and understandable.

The USPTO continued to evaluate programs designed to advance the progress of a patent application and to provide applicant assistance, including programs such as Track One for Prioritized Examination, First Action Interview Pilot Program, Quick Path Information Disclosure Statement (QPIDS), the After Final Consideration Pilot 2.0 (AFCP 2.0), and Patents 4 Patients (the Cancer Immunotherapy Pilot Program). As a result of this continued evaluation, QPIDS was established as a permanent program this year. In addition, effective September 3, 2019, the limit on the number of Track One requests that may be granted in a fiscal year was increased from 10,000 to 12,000. The goal of the Track One program is to offer faster patent examination, by allowing applicants to receive final disposition within about 12 months.

In FY 2019, the USPTO took a closer look at the progress and potential of women in patenting, publishing a Progress and Potential report that studied U.S. women inventors named on U.S. patents granted from 1976 through 2016 and examined the trends and characteristics of their patents.

In addition to the Progress and Potential Report, the USPTO also published a Report to Congress pursuant to The Study of Underrepresented Classes Chasing Engineering and Science Success (SUCCESS) Act. This report contained a literature review and found a need for additional information to determine the participation rates of women, minorities, and veterans. The report concluded with six new USPTO initiatives and five legislative recommendations for increasing the participation of women, minorities, and veterans as inventor-patentees and entrepreneurs. The initiatives include creating an IP toolkit for corporate employee inventors to help demystify the patent process and encourage greater participation; recognizing individuals and/or organizations that are undertaking efforts and/or accelerating diversity among entrepreneurs; establishing a council to develop a national strategy for promoting and increasing innovation inclusiveness; expanding USPTO educational outreach programs for youth and teachers; working with other relevant U.S. Government (USG) agencies to develop workforce training materials with information on how to obtain a patent and the importance of invention and IP protections; and increasing the development of IP training materials for educators. The legislative recommendations are to enhance USPTO authority to gather information in a voluntary, confidential, biennial survey of individuals named in patent applications that have been filed with the USPTO; enhance authority for USG interagency data sharing and cooperation; expand the purposes/scopes of relevant USG federal grant programs to include activities that promote invention and entrepreneurship, as well as the protection of inventions and innovations using IP among underrepresented groups; create a set of commemorative

innovation quarters and postage stamps to be released into circulation that feature a spectrum of American inventors from a variety of backgrounds, including those from underrepresented groups; and support exhibits at national museums featuring inventors/entrepreneurs from underrepresented groups.

At the end of FY 2019, 11,084 employees agency-wide were working from home at least one day per week, translating to 87 percent of the USPTO workforce. 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 2019, they spared the environment more than 51,000 tons in estimated CO^2 emissions.

International Cooperation and Work Sharing

The USPTO provides IP educational and training programming both to improve IP laws and their administration around the world, and to enhance IP awareness and technical capacity. The USPTO's programs address a full range of IP protection and enforcement matters, including enforcement of IP rights at national borders, Internet piracy, health and safety threats from counterfeit goods, trade secret protection and enforcement, copyright policy, and patent and trademark examination. In FY 2019, the Office of Policy and International Affairs conducted a total of 140 such training activities through its Global Intellectual Property Academy (GIPA), reaching over 9,500 individuals. Approximately 45 percent of all individuals served were U.S. IP rights owners and users, and approximately 55 percent were patent, trademark, and copyright officials from 123 countries; prosecutors; police; customs officials; and IP policymakers. In FY 2019, GIPA continued its nearly decade-long commitment to the production and maintenance of in-depth, on-demand content through distance-learning on the USPTO website and its YouTube playlist. These modules are available in five languages and cover six areas of IP protection and enforcement.

The USPTO has also entered into a number of agreements with intergovernmental organizations. One of these was an agreement with INTERPOL's Illicit Goods and Global Health Program to cooperate on training and capacity-building programs to promote effective IP enforcement internationally. These collaborations included a July 2019 Central Asia regional program on trafficking in counterfeit goods. In a related development, in FY 2019, the USPTO finalized an interagency agreement under the State Department's Middle East Partnership to conduct IP enforcement programs in Morocco, Algeria, Tunisia, Jordan, Qatar, Bahrain, and Kuwait.

The USPTO continued to be a global leader in developing work-sharing programs that result in efficiencies for patent applicants and examiners. The USPTO continued to optimize its Patent Prosecution Highway (PPH) programs, which have proven to increase efficiencies and decrease costs for applicants filing in multiple offices. At the end of FY 2019, a total of 61,944 applications with petitions had been filed under the PPH, with 53,814 patents granted.

The USPTO also continued its stewardship of the Global Dossier, a set of business services that provide a single point of access to related applications filed in multiple patent offices at no cost to users. The USPTO continues to evaluate how to add more functionality to Global Dossier to benefit its stakeholders, including providing legal status information and increasing the scope of application data available in the service.

In addition, the USPTO continued to pilot innovative collaborative search programs to enhance predictability and reliability of IP rights worldwide.

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 2018 and 2019.

Table 2.5: USPTO PRODUCTION INFORMATION

USPTO PRODUCTION FIGURES	2018	2019	Change	% Change
Applications filed				
Utility (patents for invention)[24]	597,141	621, 453	+ 24,312	+ 4%
Domestic	285,095	292,998	+ 7,903	+ 2.8%
Foreign	312,046	328,455	+ 16,409	+ 5.3%
Plant	1,079	1,134	+ 55	+ 5%
Reissue	1,013	1,110	+ 97	+ 10%
Total utility, plant & reissue	**599,233**	**623,697**	**+ 24,464**	**+ 4%**
Design	45,083	46,847	+ 1,764	+ 4%
Provisional	169,340	170,089	+ 749	+ 0%
Total	**813,656**	**840,633**	**+ 26,977**	**+ 3%**
Request for continued examination (RCE)[25]	170,366	170,568	+ 202	+ 0%
PCT Chapter I searches	22,210	22,465	+ 255	+ 1%
PCT Chapter II examinations	991	1,003	+ 12	+ 1%
First actions (utility, plant, reissue)	**592,895**	**600,057**	**+ 7,162**	**+ 1%**
Grants (total)	**307,759**	**354,430**	**+ 46,670**	**+ 15%**
U.S. residents	144,413	167,115	+ 22,703	+ 16%
Foreign	163,346	187,315	+ 23,967	+ 15%
Japan	47,566	53,542	+ 5,975	+ 13%
EPC states	48,963	55,638	+ 6,675	+ 14%
R. Korea	19,780	21,684	+ 1,904	+ 10%
P.R. China	14,488	19,209	+ 4,724	+ 33%
Others	32,549	37,242	+ 4,689	+ 14%
Applications in appeal and interference proceedings				
Ex-parte cases received	8,684	6,889	-1,795	- 21%
Ex-parte cases disposed	10,989	11,353	+ 364	+ 3%
Inter-partes cases received	26	10	- 16	- 62%
Inter-partes cases disposed	38	19	- 19	- 50%
Patent cases in litigation				
Cases filed	669	682	+ 13	+ 2%
Cases disposed	645	778	+ 133	+ 21%
Pending cases (end of calendar year)	639	561	- 78	- 12%

[24] Unless otherwise noted, the USPTO statistics presented elsewhere in this report are limited to utility patent applications and grants, and include Requests for Continued Examination (RCEs)..

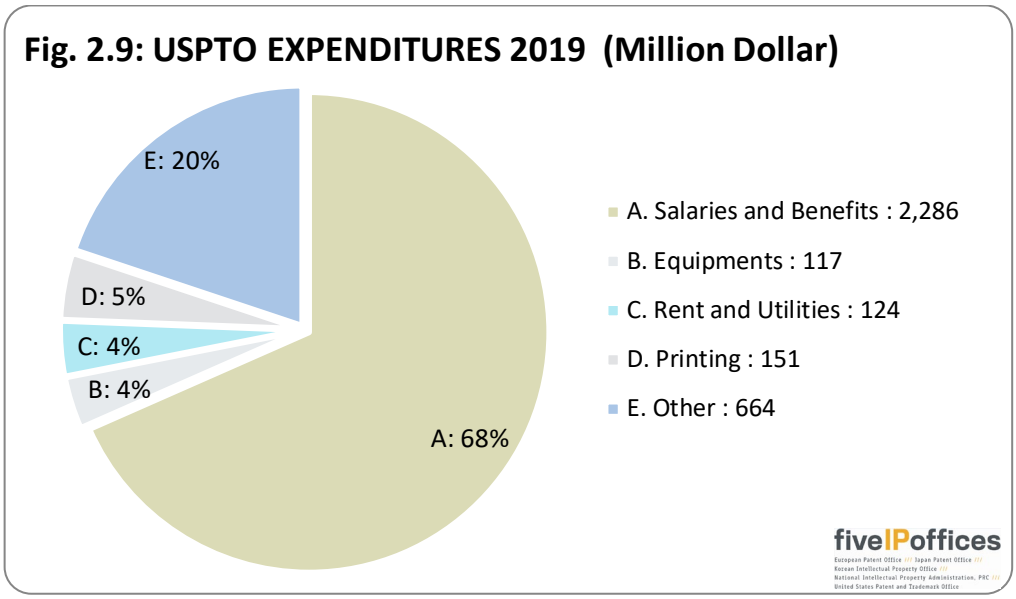
[25] A Request for Continued Examination is a USPTO procedure under which an applicant may obtain continued examination of an application by filing a submission and paying a specified fee, even if the application is under a final rejection, appeal, or a notice of allowance.

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 2019, USPTO expenditures totalled $3.341 billion. Agency-wide, 18.7 percent of expenditures were allocated to IT security and associated IT costs.

Goal 1 – Optimize Patent Quality and Timeliness	$ 2.940 billion
Goal 2 – Optimize Trademark Quality an Timeliness	$ 334.2 million
Goal 3 – Provide Domestic and Global Leadership to Improve IP Policy, Protection and Enforcement Worldwide	$ 66.9 million

Fig. 2.9 shows USPTO expenditures by category in 2019[26]



A description of the items in Fig. 2.9 can be found in Annex 1

USPTO Staff Composition

At the end of FY 2019, the USPTO work force was composed of 12,652 federal employees. Included in this number are 8,125 Utility, Plant, and Reissue patent examination staff and 171 Design examination staff; 627 Trademark examining attorney staff, and 3,729 managerial, policy, legal, administrative and technical support staff.

More information

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

[26] Percentages may not total 100 due to rounding.

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 2014 to 2018[27].

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[28], 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.

[27] 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

[28] This edition refers to general patent data as of April 2020, and to PCT international phase application data as of May 2020, www.wipo.int/ipstats/en/index.html. For some statistics on 2019, 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 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[29]), and PCT international filings.

- **Figs. 3.5, 3.6, 3.7 and 3.14** 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 and 3.12** show the numbers of *granted patents*. All grants are counted only once (in an analogous way to Figs. 3.5, 3.6, 3.7, and 3.14 for applications).

- **Fig. 3.13** shows the numbers of *national patent rights granted*. 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. 3.15, 3.16, 3.17 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.

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

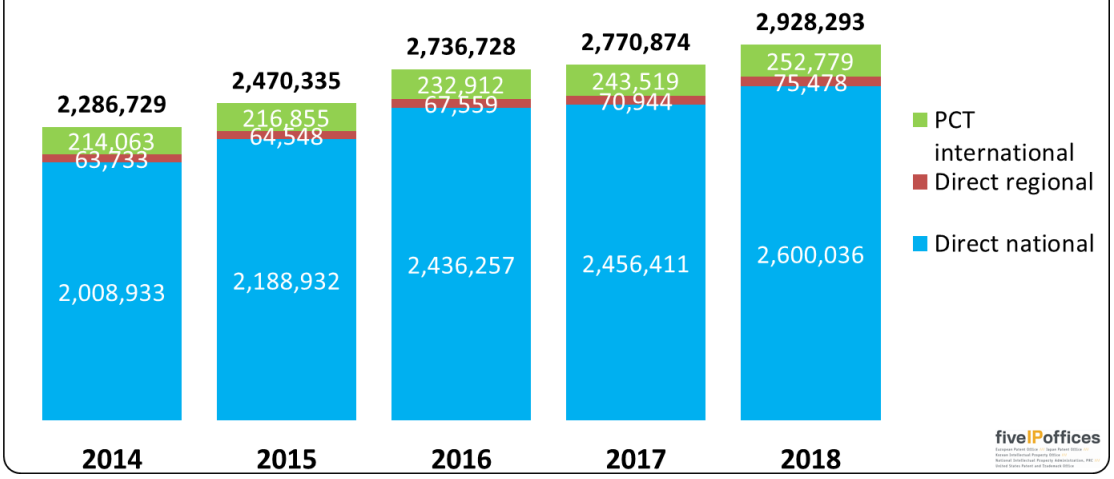
PATENT FILINGS

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.

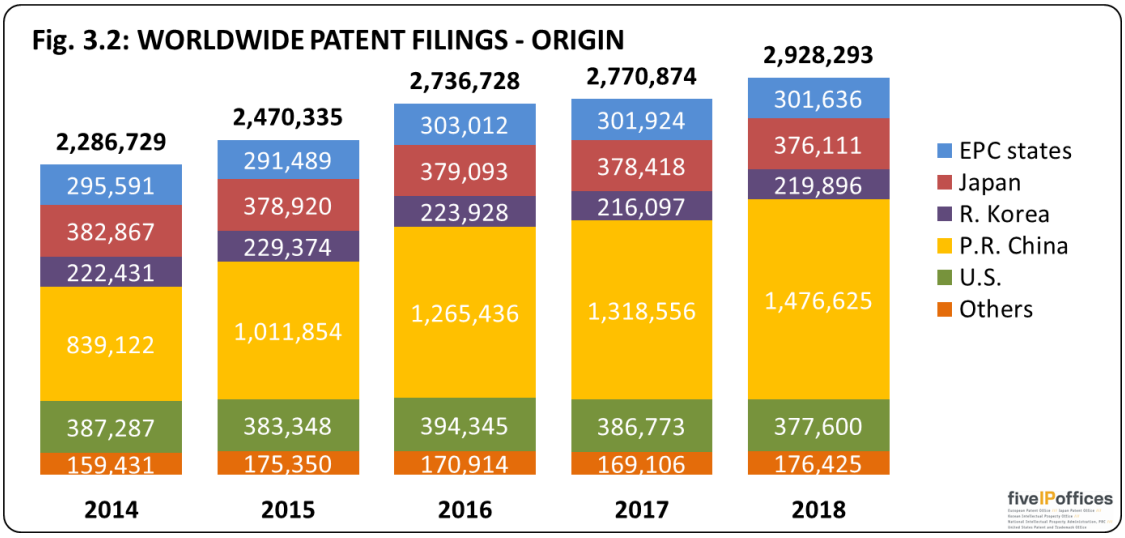
Fig. 3.1: WORLDWIDE PATENT FILINGS - FILING PROCEDURES



In 2018, the number of patent filings increased by 6 percent, to nearly 3.0 million. The number of direct national filings and the numbers of direct regional both increased by 6 percent, while the PCT international phase filings increased by 4 percent. Overall, 89 percent of the filings were made according to direct national procedures.

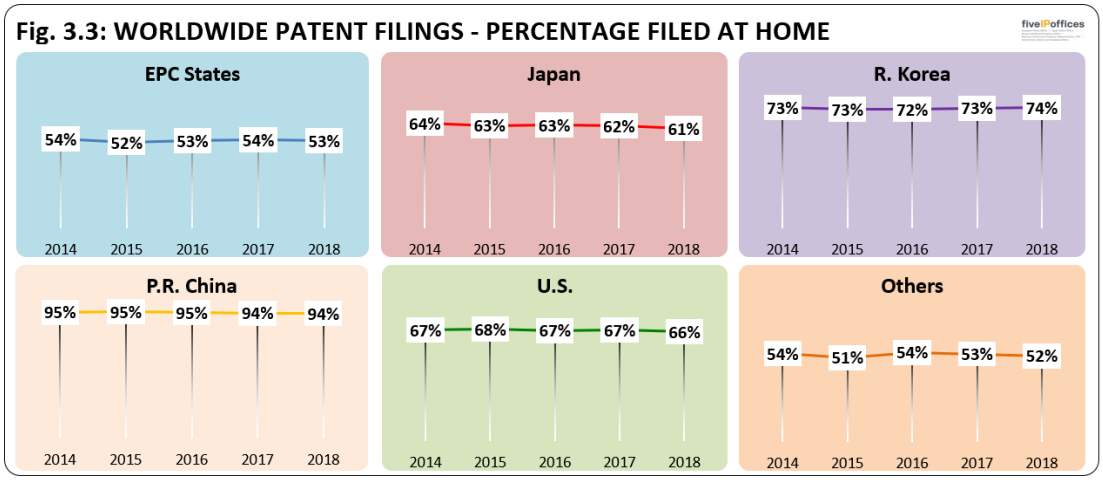
The contribution of the PCT system to filings will be discussed later in this chapter and in Chapter 5.

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 2014 to 2018, the IP5 Bloc's annual share increased slightly from 93 percent to 94 percent. In 2018, the number of patent filings increased by 6 percent. The number of patent filings that originated from P.R. China and R. Korea increased by 12 percent and 2 percent. It remained almost unchanged in EPC states, while those originating from Japan and U.S. decreased by 1 percent and 2 percent, respectively.

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 2018 with 94 percent. Among the IP5 blocs, the EPC states had[30] the lowest proportion with 53 percent in 2018.

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

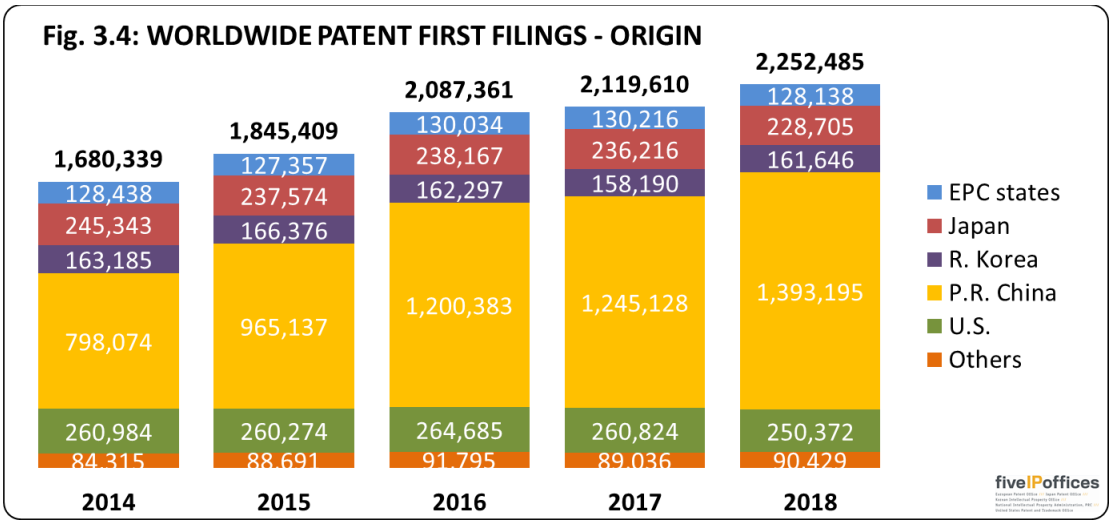
[30] For the purpose of reporting statistics for the EPC states considered as a bloc, a filing by a resident in an EPC state to another EPC state or to the EPO is considered to be filed within the bloc of origin. See the EPO section of Chapter 2 for a listing of the EPC states.

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).



The number of worldwide first filings increased by 6 percent from 2017 to 2018. P.R. China recorded 1,393,195 first filings in 2018, the highest number of first filings by any bloc within the IP5 area up to this point. This was an increase of 12 percent compared to 2017.There was also an increase in first filings from the R. Korea of 2 percent, while EPC states, Japan and U.S. had a decrease of 2 percent, 3 percent and 4 percent.

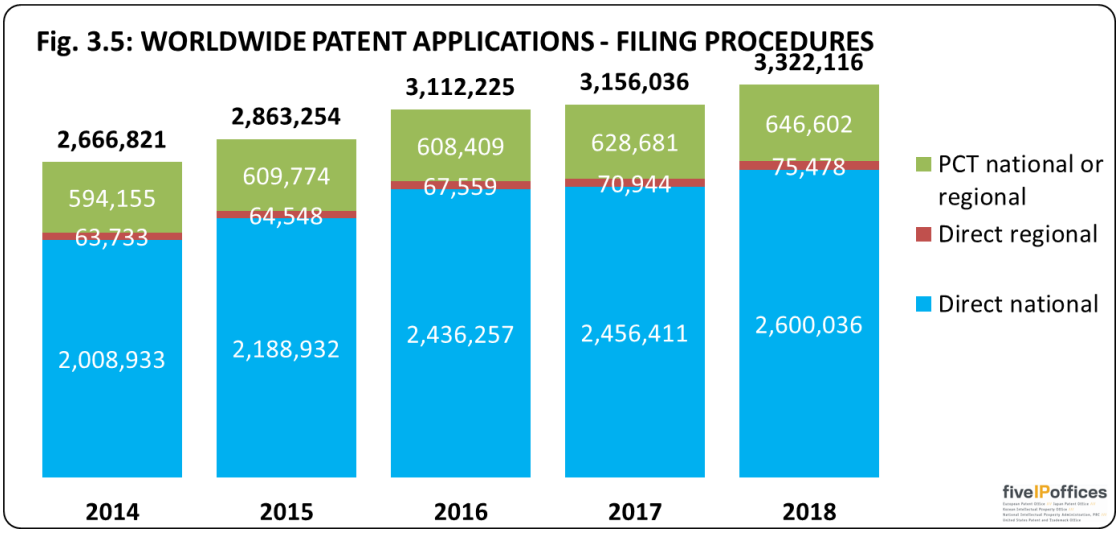
Comparison of Fig. 3.2 and 3.4 enables an evaluation of the numbers of subsequent filings, where the first filing for an invention at one office leads on to further filings, either elsewhere or at the same office. From the difference in the total for 2018 between Fig. 3.2 and Fig. 3.4, it can be estimated that there are 675,808 subsequent filings, meaning that on average there were 0.32 subsequent filings per first filing made in 2017, assuming a one year delay (675,808 / 2,119,610= 0.32).

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[31]. 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.

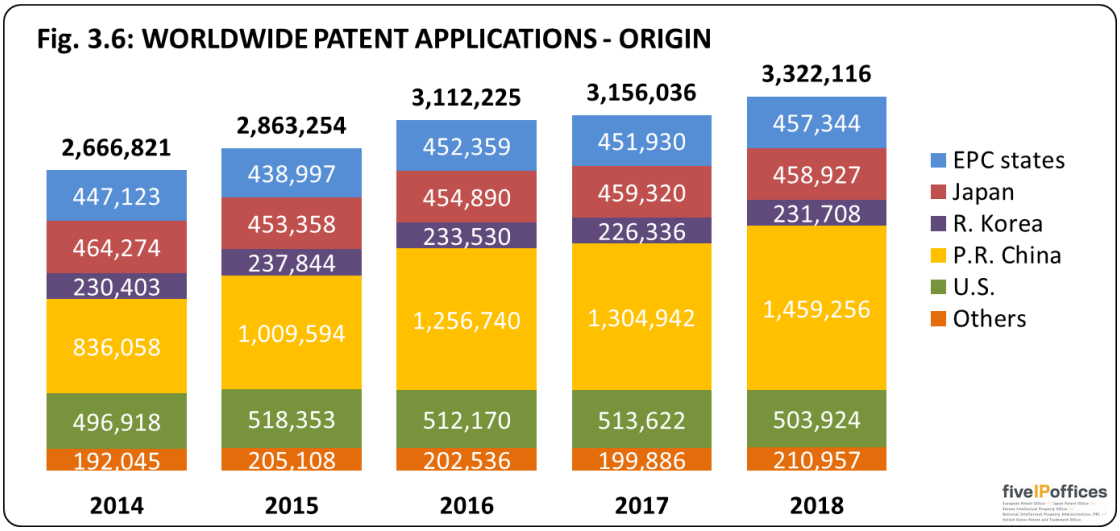


In 2018, 3.3 million patent applications were filed worldwide. This represents a 5 percent increase compared to 2017.

The number of direct national applications increased by 6 percent and the number of PCT national/regional applications increased by 3 percent.

[31] 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.

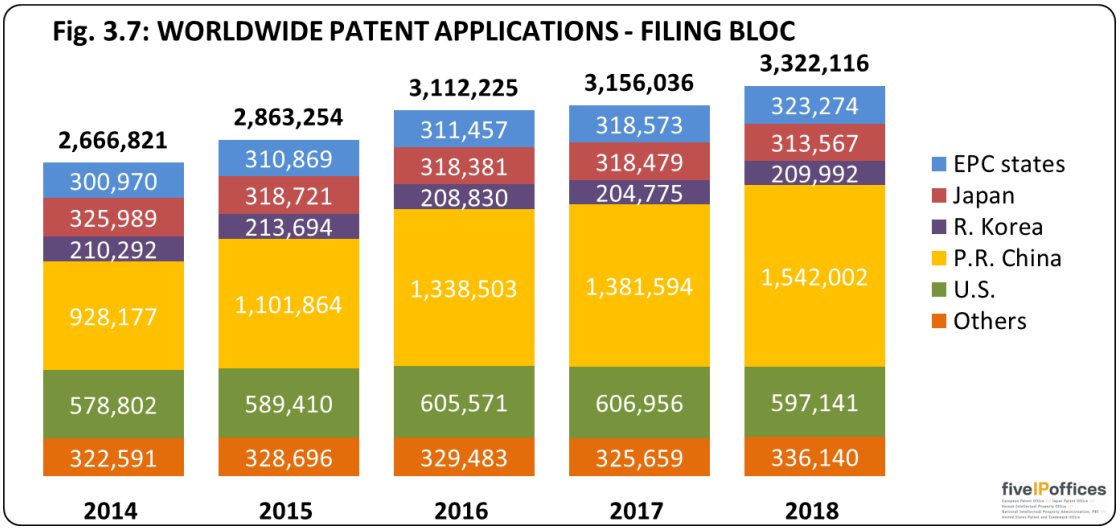
Fig. 3.6 shows the origins (residence of first-named applicants or inventors) of the worldwide patent applications of Fig. 3.5 entering a national or regional grant procedure.



In 2018, 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 2018 (12 percent). The numbers of applications from the EPC states and R. Korea increased by 1 percent and 2 percent, while the numbers from U.S. a decreased by 2 percent. The numbers of applications originating from the Japan remained stable compared to 2017.

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 blocs and is based on the same data as in Fig. 3.5 and Fig. 3.6.



In 2018, applications increased by 12 percent in P.R. China, by 1 percent in the EPC states and by 3 percent in R. Korea. The number of patent applications decreased in the Japan and the U.S. by 2 percent each.

DEMAND FOR NATIONAL PATENT RIGHTS

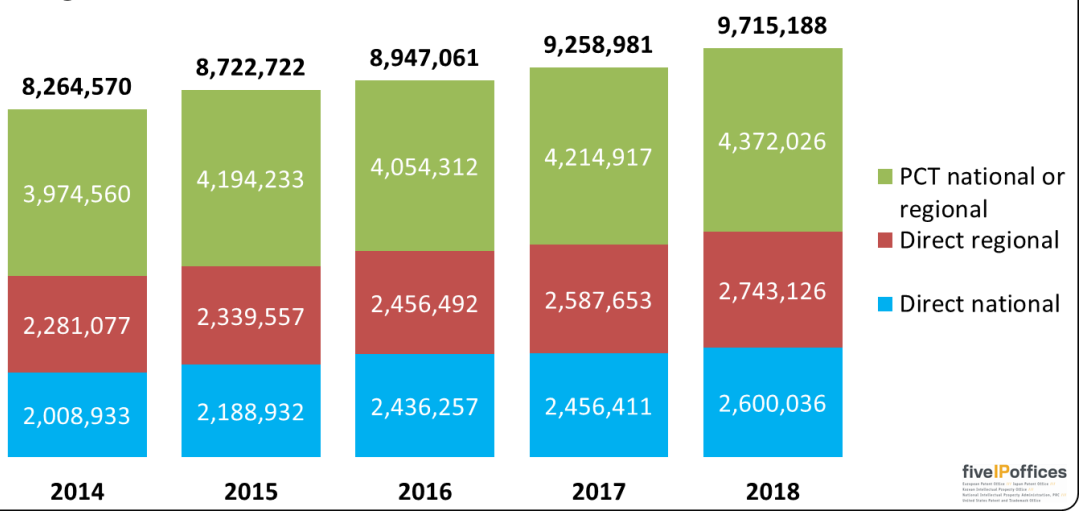
Patent applications counted in this section include direct national applications, national stage PCT applications and designated countries both in direct regional and in regional stage PCT applications.

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[32].

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

Fig. 3.8: WORLDWIDE DEMAND FOR PATENT RIGHTS - PROCEDURES

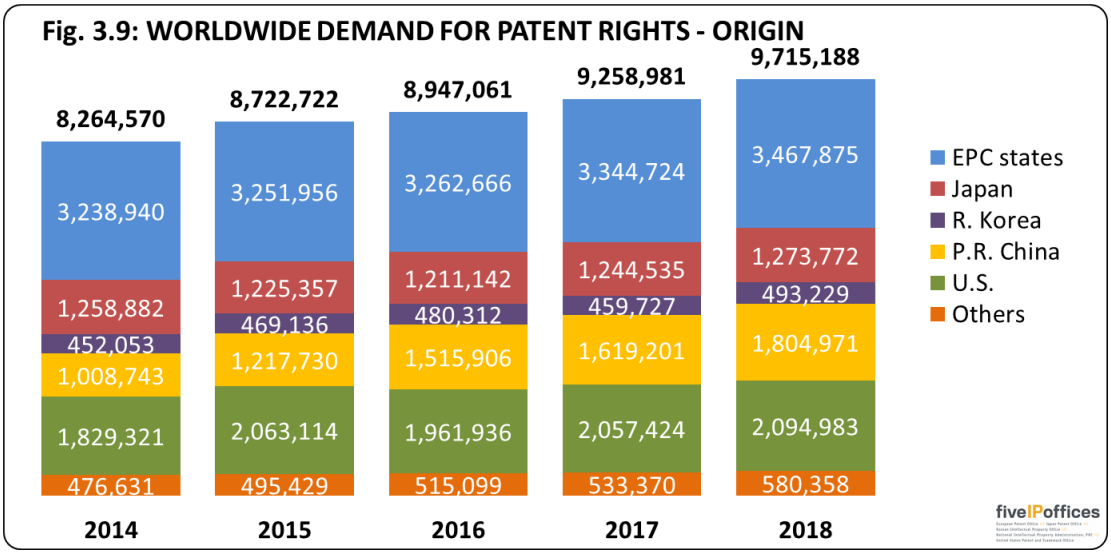


From 2017 to 2018, the worldwide demand for patent rights increased by 5 percent. In 2018, there was an increase in the use of all three filing procedures noted in Figure 3.8. The use of the direct national and direct regional procedures continued their upward trends of the past few years with increases of 6 percent each. The use of the PCT procedure increased 4 percent in 2018.

Centralized filing procedures (PCT and direct regional) made up about 72 percent of the total demand in 2018. 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.

[32] At the end of 2018, 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 2014. Also at the end of 2018, 152 states were party to the PCT, compared to 148 states at the end of 2014. In addition, national patents can also be created in other states that have extension or validation agreements with the EPO (see Chapter 2).

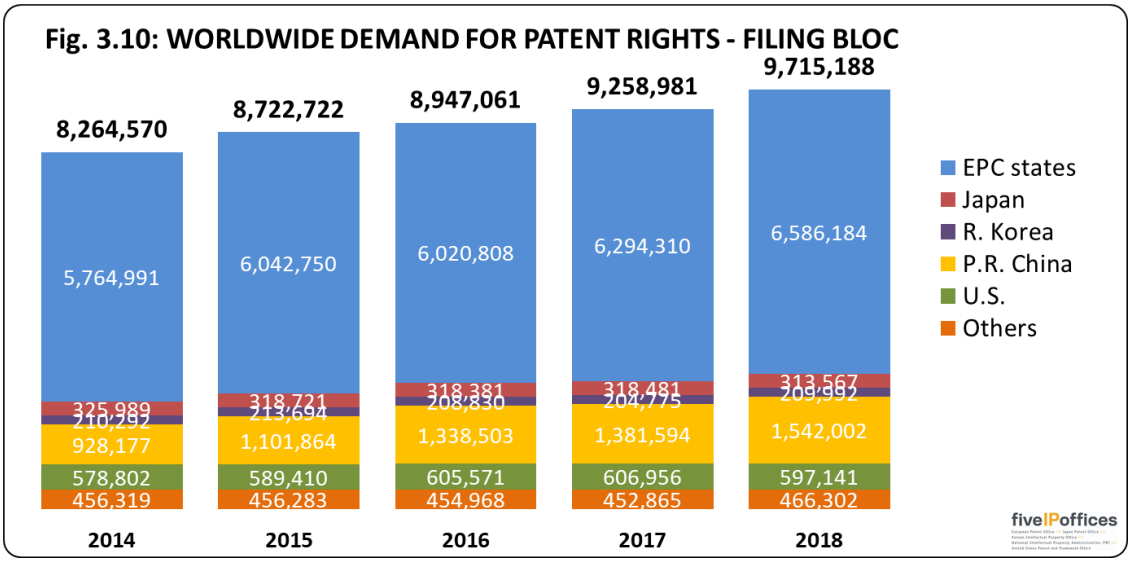
Fig. 3.9 shows the demand for national patent rights by blocs of origin (residence of first-named applicants or inventors) and is based on the same data as Fig. 3.8.



From 2017 to 2018, the worldwide demand for patent right increased by 5 percent. Demand from P.R. China and R. Korea increased by 11 percent and 7 percent. The EPC states, the Japan and the U.S. increased by 4 percent, 2 percent, 2 percent, respectively.

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 blocs and is based on the same data as in Fig. 3.8 and Fig. 3.9.

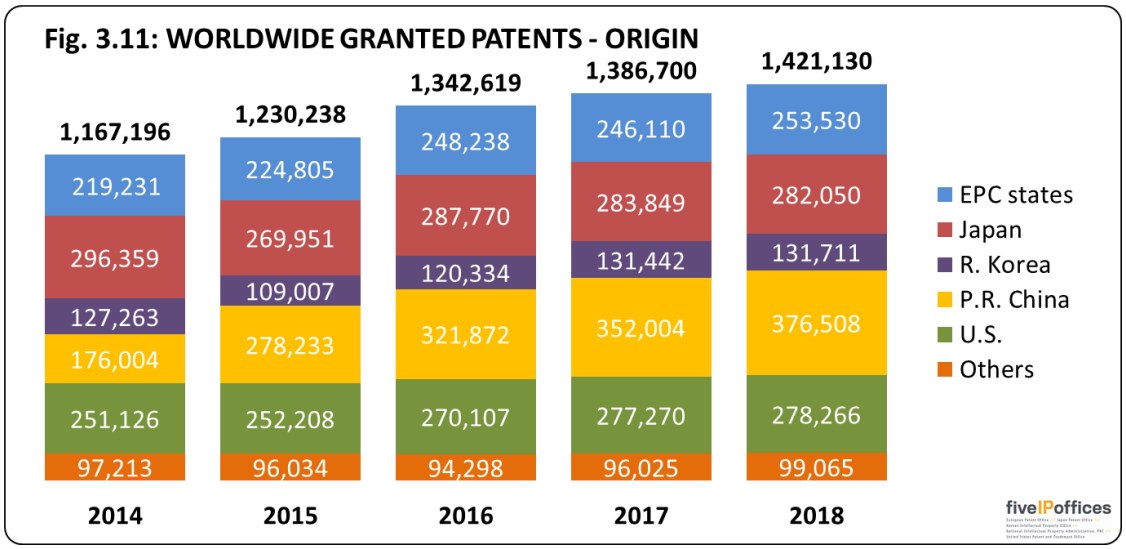


This chart illustrates the influence of regional patent systems. In 2018, the demand for national patent rights increased in EPC states and P.R. China increased by 5 percent and 12 percent respectively, while it decreased in Japan and the U.S. by 2 percent.

GRANTED PATENTS

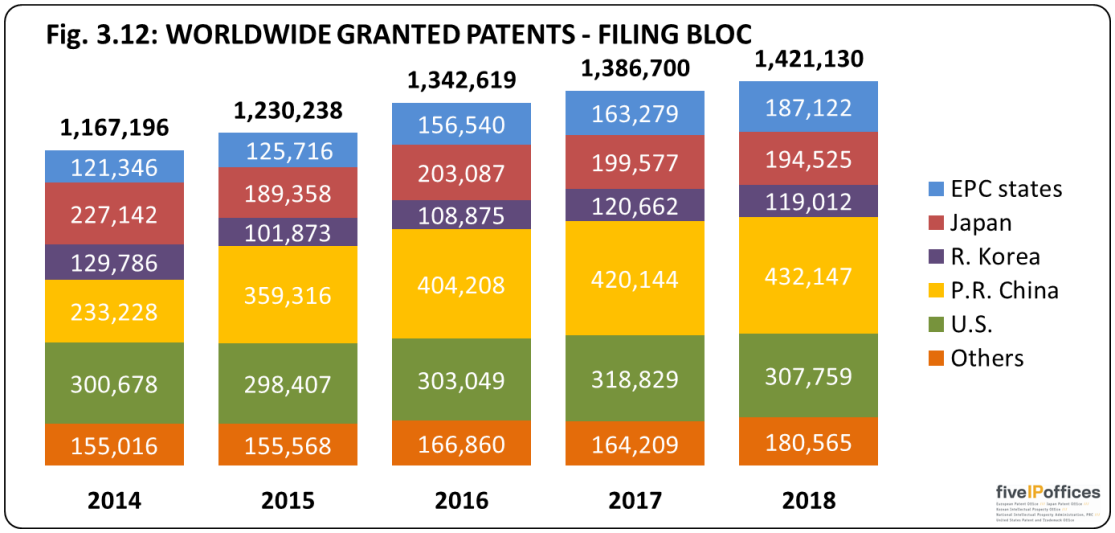
The development of the use of patents is shown in this section in terms of grants.

Fig. 3.11 shows the granted patent by blocs of origin (residence of first-named applicants or inventors).



The total number of worldwide granted patents increased by 2 percent in 2018. Granted patent from the EPC states and the P.R. China increased by 3 percent and 7 percent, respectively. The number of patent applications in the Japan decreased by 1 percent, while in the U.S. and the R. Korea remain stable.

Fig. 3.12 displays the breakdowns of the numbers of granted patents in each of the blocs.



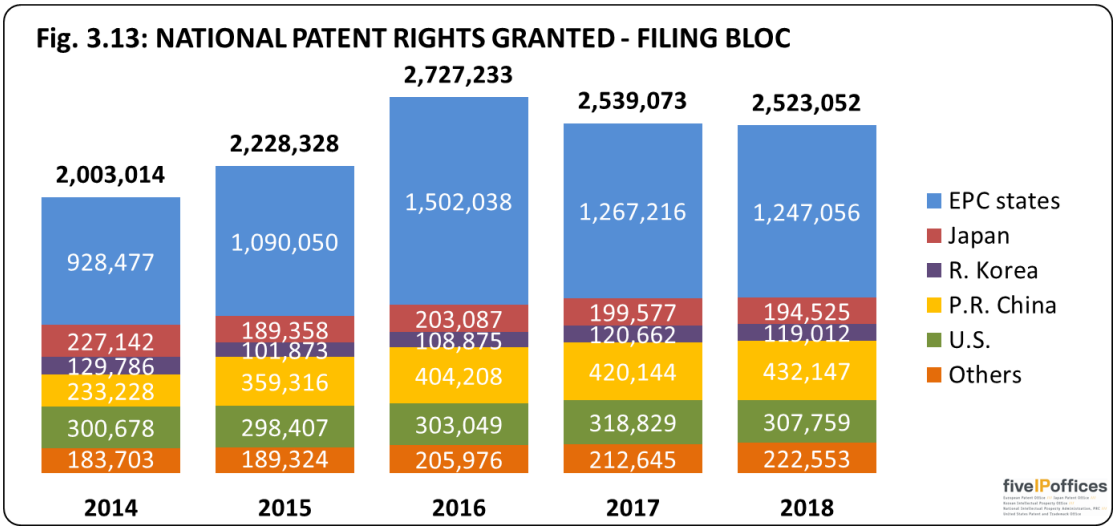
The EPC States had the largest percentage increase at 15 percent. The numbers of granted patents in P.R. China increased by 3 percent, while in Japan, the R. Korea, and the U.S., it decreased by 3 percent, 1 percent and 3 percent, respectively.

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.

Granted patents 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. 3.13 shows validated national grants resulting from the decisions reported in Fig. 3.12. 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.

Fig. 3.13: NATIONAL PATENT RIGHTS GRANTED - FILING BLOC



In 2018, more than 2.5 million patent rights were granted, which represents a 1 percent decrease compared to 2017.

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. 3.13 is much larger than the number of grant actions shown in Fig. 3.12.

The number of national patent rights granted by the EPC states decreased by 2 percent. Information for the Japan, P.R. China, R. Korea, and U.S. blocs is the same as in Fig 3.12 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

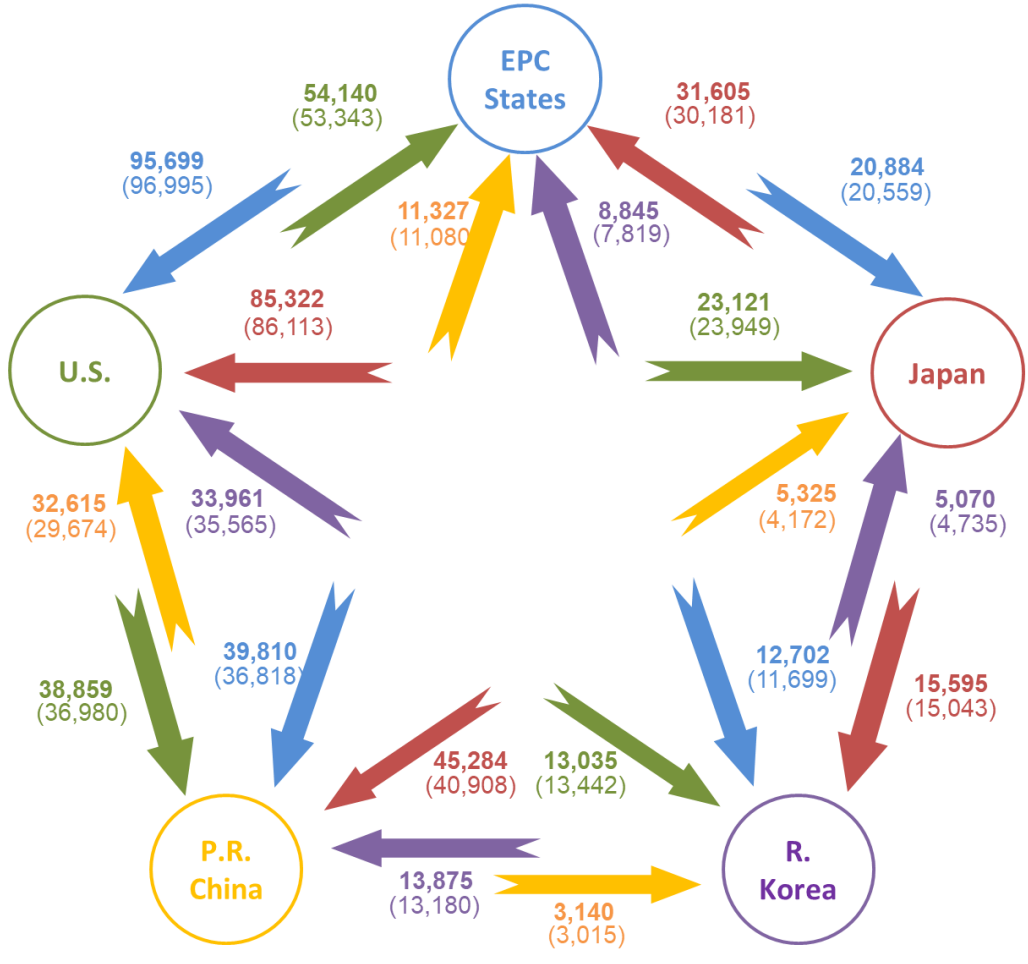
In this section, the flows between the different blocs and especially the IP5 Blocs are analysed first in terms of applications and then in terms of patent families.

FLOWS OF APPLICATIONS

Fig. 3.14 shows the flows of patent applications between IP5 Blocs (residence of first-named applicants or inventors, as in Fig. 3.5) in 2018, with 2017 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. 3.14: INTERBLOC ACTIVITY - APPLICATIONS 2018



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 2018, five of the twenty inter-bloc flows decreased to some extent. Flows from R. Korea to states to U.S. decreased by nearly 5 percent. Flows from U.S. to Japan and to R. Korea decreased. Flows from the EPC states to U.S. decreased as well as flows from Japan to U.S.

The other fifteen 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 Japan (28 percent, compared to 2017).

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)[33] 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 2014 and 2015. 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: 2014

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	53,772 (42.3%)	51,849 (40.8%)	-	16,779 (13.2%)	10,042 (7.9%)	31,996 (25.2%)	46,148 (36.3%)	20,083 (15.8%)	6,791 (5.3%)
Japan	252 391	74,632 (29.6%)	72,394 (28.7%)	29,193 (11.6%)	-	16,669 (6.6%)	43,821 (17.4%)	60,097 (23.8%)	18,270 (7.2%)	7,498 (3.0%)
R.Korea	159 248	29,484 (18.5%)	29,171 (18.3%)	8,381 (5.3%)	5,661 (3.6%)	-	13,153 (8.3%)	26,660 (16.7%)	3,748 (2.4%)	2,891 (1.8%)
P.R.China	702 013	21,089 (3.0%)	19,706 (2.8%)	8,350 (1.2%)	3,892 (0.6%)	2,541 (0.4%)	-	17,775 (2.5%)	5,805 (0.8%)	1,548 (0.2%)
U.S.	264 923	100,769 (38.0%)	87,721 (33.1%)	73,717 (27.8%)	33,980 (12.8%)	24,202 (9.1%)	56,755 (21.4%)	-	55,480 (20.9%)	15,104 (5.7%)
Five blocs subtotal	1,505,763	279,746 (17.8%)	260,841 (16.6%)	119,641 (7.6%)	60,312 (3.8%)	53,454 (3.4%)	145,725 (9.3%)	150,680 (9.6%)	103,386 (6.4%)	33,832 (2.2%)
Others	88,645	19,531 (22.0%)	19,531 (22.0%)	4,643 (5.2%)	2,359 (2.7%)	1,176 (1.3%)	6,421 (7.2%)	16,692 (18.8%)	-	471 (0.5%)
Global total	1,594,408	299,277 (18.8%)	280,372 (17.6%)	124,284 (7.8%)	62,671 (3.9%)	54,630 (3.4%)	152,146 (9.5%)	167,372 (10.5%)	103,386 (6.5%)	34,303 (2.2%)

Year of priority: 2015

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	128,438	54,952 (42.8%)	53,253 (41.5%)	-	17,168 (13.4%)	10,277 (8.0%)	33,186 (25.8%)	47,302 (36.8%)	19,529 (15.2%)	7,051 (5.5%)
Japan	245,343	74,823 (30.5%)	72,651 (29.6%)	30,090 (12.3%)	-	16,526 (6.7%)	42,929 (17.5%)	60,628 (24.7%)	17,810 (7.3%)	7,547 (3.1%)
R.Korea	163,185	29,828 (18.3%)	29,522 (18.1%)	8,620 (5.3%)	5,424 (3.3%)	-	13,992 (8.6%)	26,690 (16.4%)	3,042 (1.9%)	2,743 (1.7%)
P.R.China	798,074	23,054 (2.9%)	22,003 (2.8%)	10,181 (1.3%)	4,966 (0.6%)	3,336 (0.4%)	-	19,754 (2.5%)	5,600 (0.7%)	1,977 (0.2%)
U.S.	260,984	93,209 (35.7%)	81 678 (31.3%)	67,900 (26.0%)	31,225 (12.0%)	22,941 (8.8%)	52,345 (20.1%)	-	50,163 (19.2%)	13,830 (5.3%)
Five blocs subtotal	1,596,024	275,866 (17.8%)	259,107 (16.6%)	116,791 (7.6%)	58,783 (3.8%)	53,080 (3.4%)	142,452 (9.3%)	154,374 (9.6%)	96,144 (6.4%)	33,148 (2.2%)
Others	84,315	19,369 (23.0%)	19,369 (23.0%)	4,925 (5.8%)	3,321 (3.9%)	1,246 (1.5%)	6,472 (7.7%)	16,144 (19.1%)	-	566 (0.7%)
Global total	1,680,339	295,235 (17.6%)	278,476 (16.6%)	121,716 (7.2%)	62,104 (3.7%)	54,326 (3.2%)	148,924 (8.9%)	170,518 (10.1%)	96,144 (5.7%)	33,714 (2.0%)

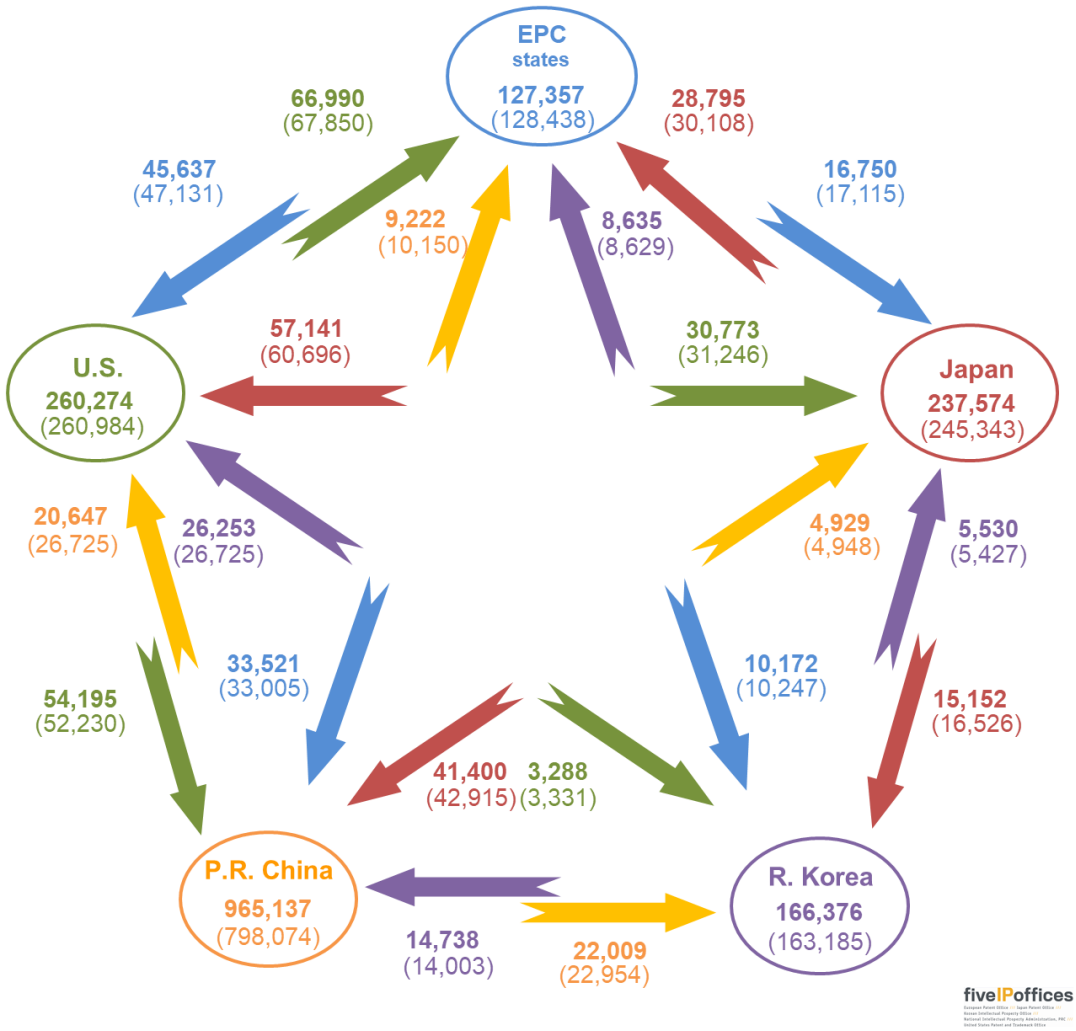
Source: EPO DOCDB Database

Fig. 3.15 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 2015. The flow figures between

[33] 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).

blocs of origin and target blocs indicate the numbers of 2015 first filings from the bloc of origin that led to subsequent filings in the target bloc. The comparable figures for 2014 are given in parentheses.

Fig. 3.15: INTERBLOC ACTIVITY - FIRST FILINGS 2015 FILED ABROAD



From information in Table 3, out of all first filings in the IP5 Blocs in 2015 (1,756,718), 15 percent formed patent families that included at least one of the remaining IP5 Blocs (255,258). Proceeding to a higher degree of selectivity, only 2 percent of all first filings in the IP5 Blocs in 2015 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 2015 differed considerably according to the bloc of origin of the first filings, as can be seen in Table 3 (EPC states 5.5 percent, U.S. 5.1 percent, Japan 3.0 percent, R. Korea 1.6 percent, P.R. China 0.2 percent and for Others 0.6 percent).

Fig. 3.16 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 2015 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 2015. 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 lower 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.

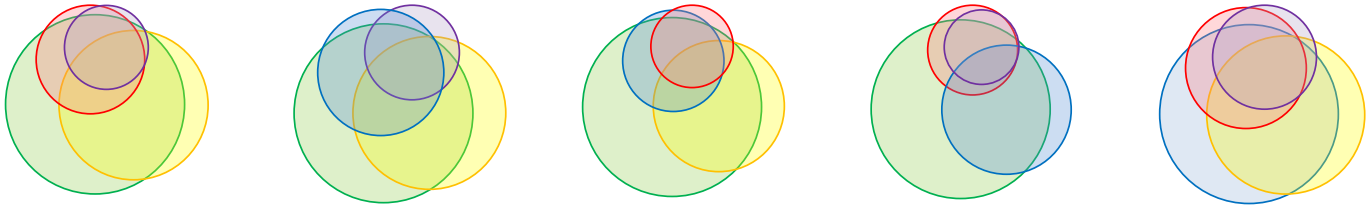
For instance, patent families from first filings in EPC member states that were subsequently filed in the P.R. China and the U.S. blocs are indicated in the graphical display by the area where the green and yellow circles overlap in the first diagram. The corresponding percentage is 22.0 percent, as 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. 3.16 shows the proportions of IP5 patent families, as also appear in the last column of the lower part of Table 3.

Fig. 3.16: 2015 PATENT FAMILIES - PERCENTAGES OF FIRST FILINGS WITH SUBSEQUENT FILINGS IN OTHER IP5 BLOCS

fiveIPoffices

First filings in	EPC states offices* 127,357	Japan (JPO) 237,574	R.Korea (KIPO) 166,376	P.R.China (CNIPA) 965,137	U.S. (USPTO) 260,274
Bilateral families with subsequent filings in					
EPC states	-	12.1%	5.2%	1.0%	25.7%
Japan	13.2%	-	3.3%	0.5%	11.8%
R. Korea	8.0%	6.4%	-	0.3%	8.5%
P.R. China	26.3%	17.4%	8.9%	-	20.8%
U.S.	35.8%	24.1%	15.8%	2.1%	-
Three bloc families with subsequent filings in					
EPC states & Japan	-	-	1.8%	0.4%	10.2%
EPC states & R. Korea	-	3.3%	-	0.3%	6.7%
EPC states & P.R. China	-	9.1%	4.4%	-	16.7%
EPC states & U.S.	-	10.8%	4.9%	0.8%	-
Japan & R. Korea	6.1%	-	-	0.3%	5.8%
Japan & P.R. China	11.2%	-	2.4%	-	9.3%
Japan & U.S.	12.2%	-	2.7%	0.4%	-
R. Korea & U.S.	7.3%	4.7%	-	0.3%	-
P.R. China & R. Korea	7.3%	5.5%	-	-	6.9%
P.R. China & U.S.	22.0%	13.5%	7.4%	-	-
Four bloc families with subsequent filings in					
EPC states & Japan & R. Korea	-	-	-	0.2%	5.3%
EPC states & Japan & P.R. China	-	-	1.7%	-	8.7%
EPC states & Japan & U.S.	-	-	1.7%	0.3%	-
EPC states & R. Korea & P.R. China	-	3.1%	-	-	6.2%
EPC states & R. Korea & U.S.	-	3.1%	-	0.2%	-
EPC states & P.R. China & U.S.	-	8.5%	4.2%	-	-
Japan & R. Korea & P.R. China	5.8%	-	-	-	5.4%
Japan & R. Korea & U.S.	5.7%	-	-	0.2%	-
Japan & P.R. China & U.S.	10.5%	-	2.1%	-	-
P.R. China & R. Korea & U.S.	6.7%	4.1%	-	-	-
IP5 families	5.5%	3.0%	1.6%	0.2%	5.1%



** EPO or EPC states national offices*

From Fig. 3.16 and Table 3, the 2015 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. From U.S., the most important foreign market is the EPC States, followed by P.R. China. From P.R. China, the most important foreign market is U.S., followed by the EPC States.

For the first filings in the EPC member states, the largest percentage of subsequent filings is directed to the U.S. (35.8 percent). 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, except for the case of first filings from U.S. going to Korea.

For the first filings in Japan, the largest percentage of subsequent applications is directed to the U.S. (24.1 percent) and P.R. China is the next largest (17.4 percent), while the EPC states is 12.1 percent.

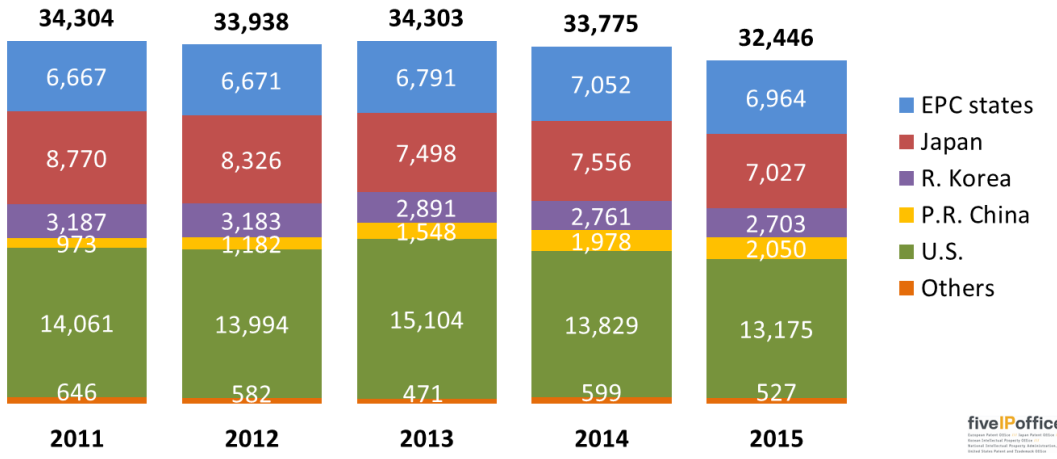
For the first filings in R. Korea, as with the other blocs, the percentage of subsequent applications filed in the U.S. (15.8 percent) is the largest, followed by P.R. China (8.9 percent). The percentage of subsequent applications filed in the EPC member states is 5.2 percent.

For the first filings in P.R. China, the percentage of subsequent applications filed in the U.S. (2.1 percent) is the largest. The percentage filed in the EPC member states is the next largest (1.0 percent), while in the Japan is 0.5 percent. 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 2014 and the 2015 data in Table 3 (21,939 compared to 22,916, respectively).

Among the first filings in the U.S., the highest percentage flows to the EPC member states (25.7 percent). The percentage filed in the P.R. China (20.8 percent) is the next highest, while filings in Japan and R. Korea are at 11.8 percent and 8.5 percent, respectively.

Fig. 3.17 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.

Fig. 3.17: IP5 PATENT FAMILIES - ORIGIN



The total number of IP5 patent families in 2015 was 32,446, of which 41 percent were from the U.S., 22 percent were from Japan, 21 percent were from the EPC states, 8 percent were from R. Korea, 6 percent were from P.R. China, and 2 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 2018, most of the information that appears here includes data for 2019[34]. 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 3.14) which show the numbers of requests for patents as patent applications[35]. 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.

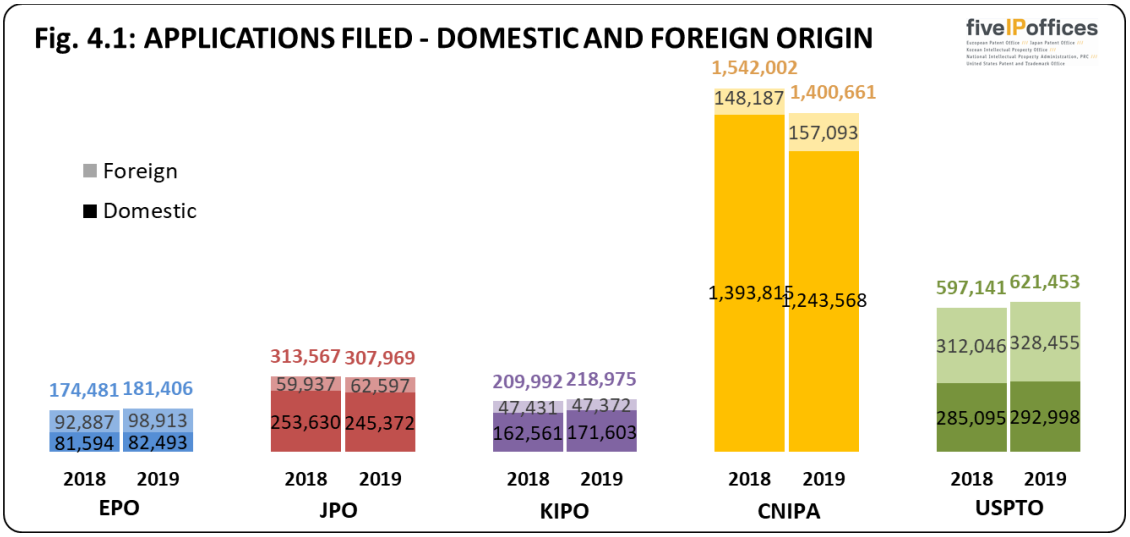
For information about specific terminology and associated definitions used in Chapter 4, please refer to Annex 2.

[34] 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
[35] 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.



In 2019, a total of 2,730,464 patent applications were filed at the IP5 Offices, a decrease of 4 percent from 2018 (2,837,019).

Patent applications decreased by 9 percent at the CNIPA, and by 2 percent at the JPO. Applications increased by 4 percent at the EPO and the USPTO each.

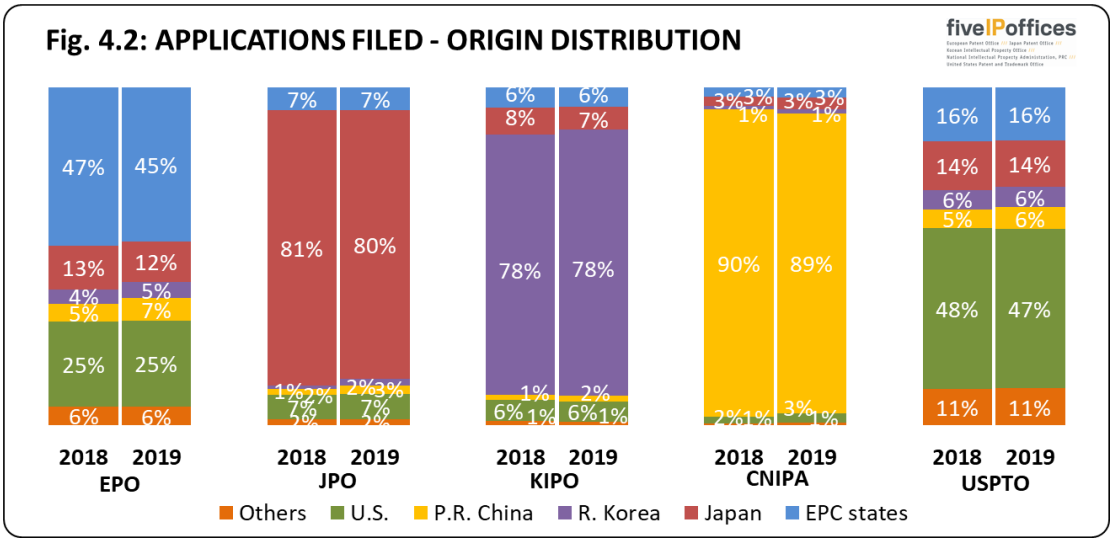
Domestic and foreign applications both increased at the EPO, the CNIPA and the USPTO. At the CNIPA, domestic applications decreased by 11 percent and foreign applications increased by 6 percent. At the KIPO, domestic applications increased by 6 percent and foreign applications marginally decreased.

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 2019.

Table 4.1: 2019 APPLICATIONS FILED – ORIGIN

Office / Origin	EPO	JPO	KIPO	CNIPA	USPTO	Total
EPC States	82,493	20,394	12,242	41,756	96,756	253,641
Japan	22,066	245,372	14,990	48,867	86,275	417,570
R. Korea	8,287	5,634	171,603	16,019	37,218	238,761
P.R. China	12,247	7,947	3,723	1,243,568	39,906	1,307,391
U.S.	46,201	22,867	13,111	39,450	292,998	414,627
Others	10,112	5,755	3,306	11,001	68,300	98,474
Total	**181,406**	**307,969**	**218,975**	**1,400,661**	**621,453**	**2,730,464**

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 2018 and 2019.



The shares of patent application filings by bloc of origin vary between Offices, but are generally consistent for 2018 and 2019 within each Office.

Caution should be used when comparing the numbers of applications between the IP5 Offices, due to the fact that the average number of claims contained in individual applications varies significantly. On average, in 2019, an application filed at the EPO contained 15.0 claims, (14.2 in 2018) while an application filed at the JPO contained an average of 11.0 claims (10.7 in 2018), and an application filed at the KIPO contained an average of 11.1 claims (11.1 in 2018). At the CNIPA, an application contained an average of 9.5 claims (8.7 in 2018), while one filed at the USPTO had 17.8 claims (17.8 in 2018) on average.

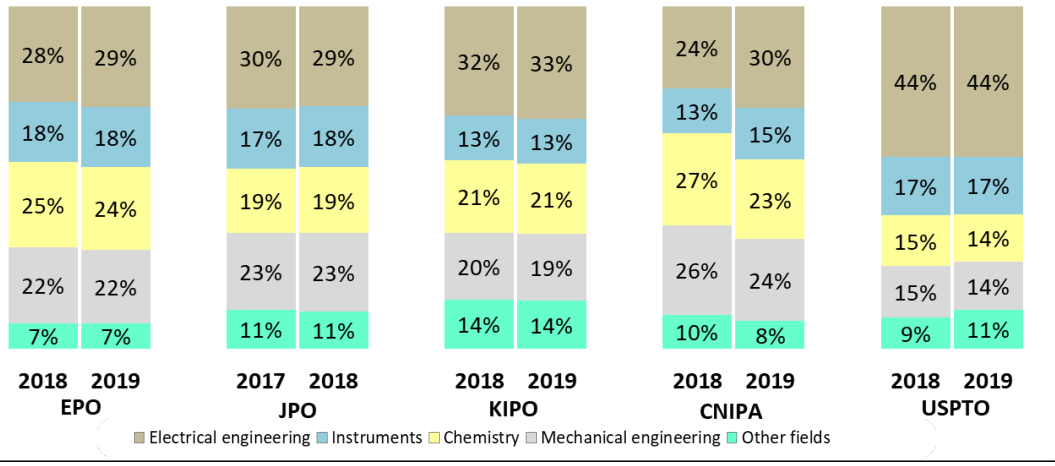
See the annexed statistical tables for longer trends.

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[36]. 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 2018 and 2019, while for the JPO the breakdown is given for the filing years 2017 and 2018[37].

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.

[36] 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

[37] JPO data for 2018 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). Percentages may not total 100 due to rounding.

Fig. 4.4 describes the distribution of the 2019[38] 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 2018 (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 - 2019

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

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, KIPO and USPTO, most of leading fields are related to the Electrical engineering sector (1 to 8) or to Instruments sector (9 to 13). At the CNIPA and the EPO, the leading fields are more spread between sectors, with EPO a little more concentrated in the Electrical engineering (1 to 8) and in the Mechanical engineering (25 to 32) sectors.

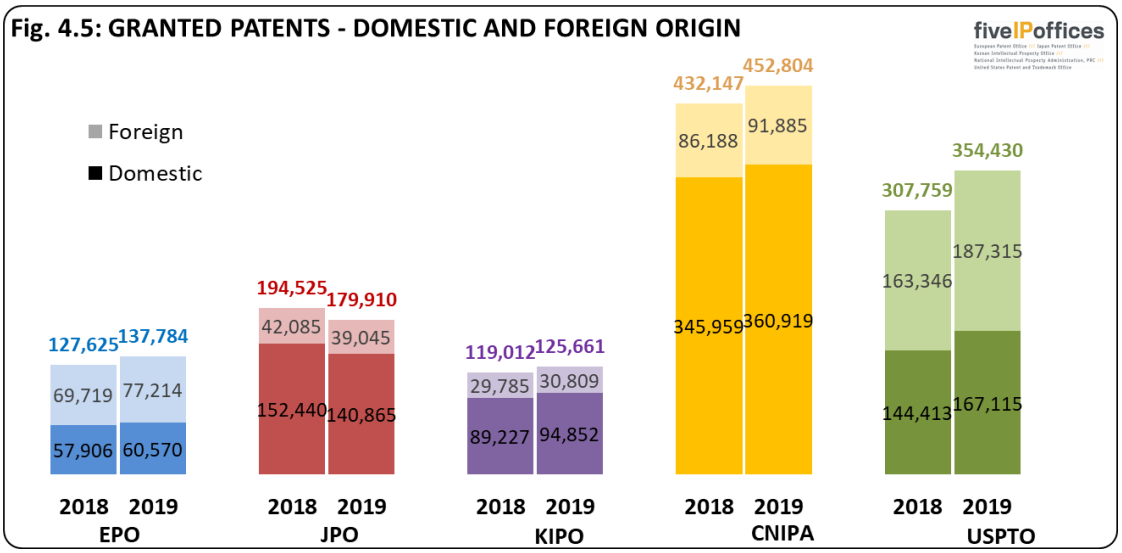
[38] In the case of JPO data for 2018 are reported and compared to data for 2017.

The highest share in a field can be found in *6.Computer technology* receiving 15 percent of all applications at the USPTO and 11 percent at the CNIPA.

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 1,250,589 patents in 2019. This was 69,521 more than in 2018 and represents an increase of 6 percent.

The numbers of granted patents increased in 2019 at the EPO, the KIPO, the CNIPA and the USPTO. At the USPTO, there was an increase of approximately 15 percent, by 8 percent at the EPO, by 5 percent at the CNIPA, by 6 percent at the KIPO. The number of granted patents decreased by 8 percent at the JPO.

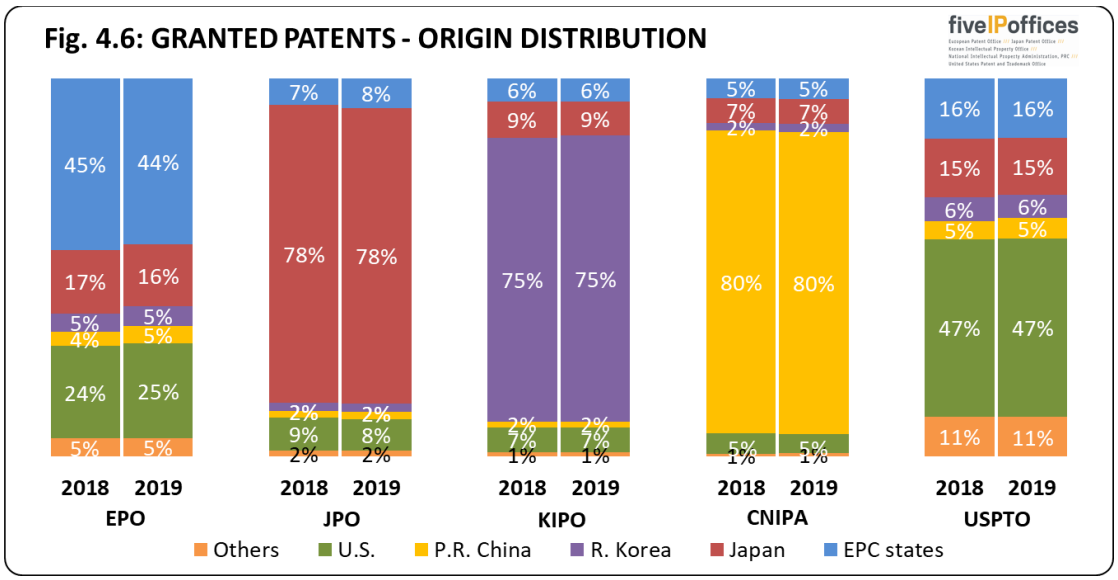
The differences between the IP5 Offices regarding the absolute numbers of granted patents can only be partly explained by differences in the numbers of corresponding applications. These numbers are also affected by differing grant rates and durations to process applications by the IP5 Offices (see the 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 2019.

Table 4.2: 2019 GRANTED PATENTS – ORIGIN

Office / Origin	EPO	JPO	KIPO	CNIPA	USPTO	Total
EPC States	60,570	13,485	7,706	24,717	55,638	162,116
Japan	22,423	140,865	11,351	30,401	53,542	258,582
R. Korea	7,247	3,938	94,852	9,437	21,684	137,158
P.R. China	6,229	3,738	2,032	360,919	19,209	392,127
U.S.	34,614	14,789	8,171	23,114	167,115	247,803
Others	6,701	3,095	1,549	4,216	37,242	52,803
Total	**137,784**	**179,910**	**125,661**	**452,804**	**354,430**	**1,250,589**

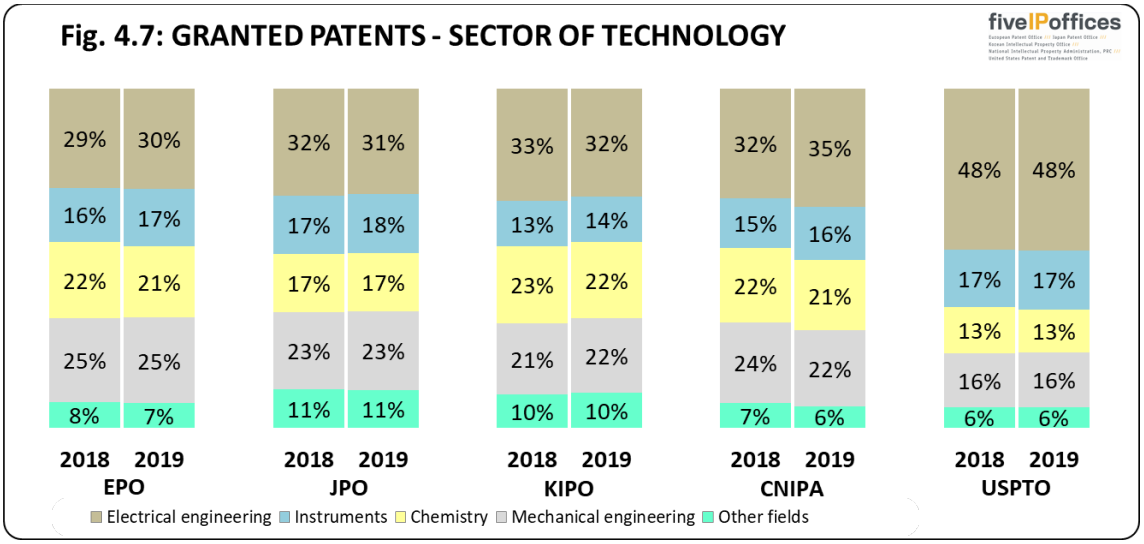
Fig. 4.6 shows the shares of granted patents by origin (residence of first-named owner or inventor) at each office for 2018 and 2019.



At all offices except the USPTO, the share of domestic granted patents in 2019 is lower than the share of domestic applications that is shown in Fig. 4.2. For CNIPA, the difference is larger than for the other offices, which can be partially explained by the strong growth in domestic applications observed during the past few years. That 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 2018 and 2019 at each office according to the five main sectors of technology.

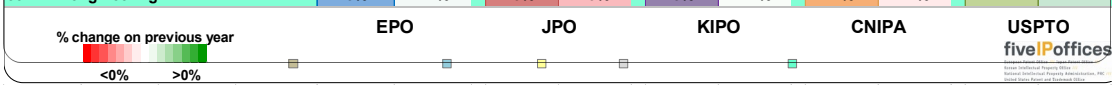


The distribution of granted patents by sectors is fairly consistent with that shown in Fig. 4.3 for applications. At the CNIPA, the share of Chemistry in granted patents is noticeably lower than the share in applications.

Fig. 4.8 describes the distribution of the 2019 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 2018 (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.

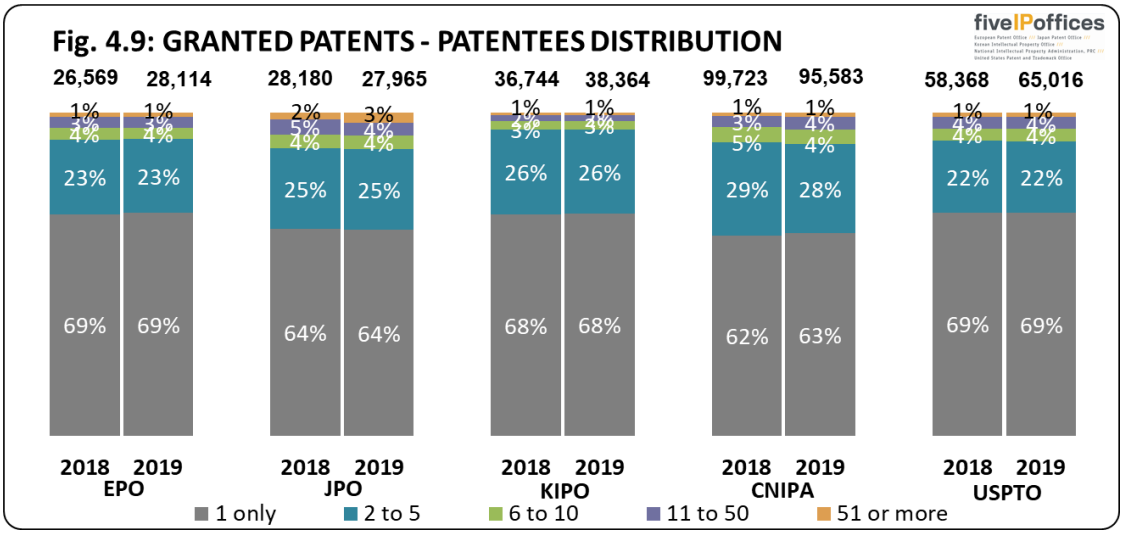
Fig. 4.8: DISTRIBUTION OF GRANTED PATENTS BY FIELD OF TECHNOLOGY - 2019

	EPO		JPO		KIPO		CNIPA		USPTO	
	Share	Change	Share	Change	Share	Change	Share	Change	Share	Change
1. Electrical machinery, apparatus, energy	7%	+2%	9%	-9%	9%	+5%	8%	+1%	7%	+12%
2. Audio-visual technology			4%	-6%	4%	+11%	3%		5%	+3%
3. Telecommunications	3%	+2%								-1%
4. Digital communication	9%	+10%			4%	+15%	8%	+32%	8%	+24%
5. Basic communication processes										
6. Computer technology	6%	+17%	6%	-10%	6%	+18%	10%	+14%	16%	+19%
7. IT methods for management										
8. Semiconductors			5%	-15%	6%	+11%			5%	+5%
9. Optics			5%	-8%					4%	+16%
10. Measurement	5%	+17%	5%	-7%	5%	+14%	8%	+16%	5%	+17%
11. Analysis of biological materials										
12. Control										
13. Medical technology	8%	+12%	5%	-6%	4%	+3%			6%	+29%
14. Organic fine chemistry										
15. Biotechnology										
16. Pharmaceuticals										
17. Macromolecular chemistry, polymers										
18. Food chemistry										
19. Basic materials chemistry										
20. Materials, metallurgy							3%	-6%		
21. Surface technology, coating										
22. Micro-structural and nano-technology										
23. Chemical engineering							3%	6%		
24. Environmental technology										
25. Handling										
26. Machine tools							4%	-7%		
27. Engines, pumps, turbines	4%	+14%							3%	
28. Textile and paper machines										
29. Other special machines	3%	-5%			4%	-2.1%				
30. Thermal processes and apparatus										
31. Mechanical elements										
32. Transport	7%	+13%	5%	-3%	5%	+2%	4%	+3%	4%	+19%
33. Furniture, games			6%	-7%						
34. Other consumer goods										
35. Civil engineering	3%	+2%	3%	-9%	5%	+1%	4%	-2%		



At the EPO *3. Telecommunications*， *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, *2.Audio-visual technology, 20. Material, metallurgy* are leading fields in granted patents but not in applications. At the USPTO *27. Engines, pumps, turbines* is leading field in granted patents but not in applications.

Fig. 4.9 shows the breakdown of patentees by their numbers of granted patents in 2018 and 2019.



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 2018 and 2019 for each office. See the annexed statistical tables for longer term trends. These data are 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 2019, the proportion was between 63 percent (CNIPA) and 69 percent (EPO, USPTO). The proportion of patentees that received less than six patents was between 89 percent for the JPO and 95 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 2019, the average number of granted patents received remained unchanged for most offices when comparing 2018 to 2019. The numbers were five for the EPO, six at the JPO, three at the KIPO, five at the CNIPA, and five at the USPTO. The greatest number of patents granted to a single applicant was 2,895 at the EPO, 4,264 at the JPO, 3,402 at the KIPO, 4,510 at the CNIPA, and 9,253 at the USPTO. This maximum number for 2019 was larger than for 2018 at the EPO, the KIPO, the CNIPA, 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 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.

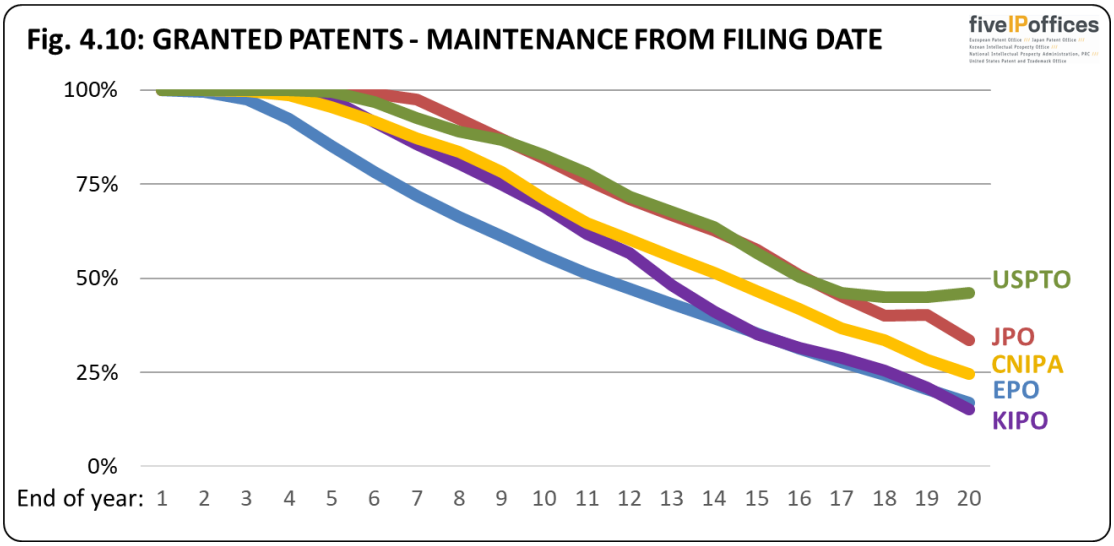
At the EPO, annual renewal fees are payable at the beginning of the year from the third year after filing in order to maintain the application. After the patent has been granted, renewal fees are then paid to the national office of each designated EPC contracting state in which the patent has been registered. 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[39].



At the USPTO, 46 percent of the granted patents are maintained for the 20 years from filing. This compared to, 34 percent at the JPO, 25 percent at the CNIPA, 17 percent at the EPO and 15 percent at the KIPO.

More than 50 percent of the JPO and the USPTO granted patents are maintained for at least 16 years, compared to 14 years at the CNIPA, 12 years at the KIPO and 11 years at the EPO.

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.

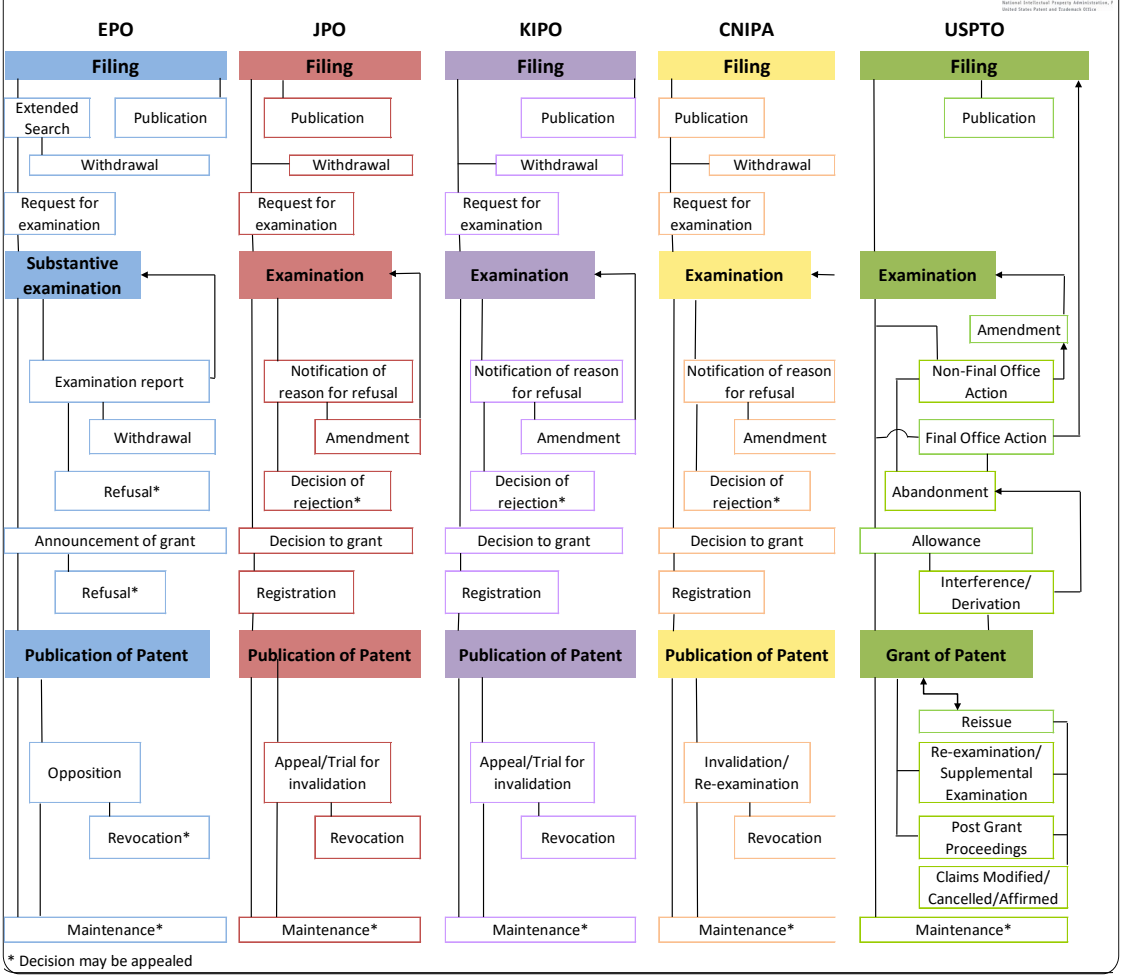
[39] Once granted by the EPO, European patents need to be validated to come into force in the various member states that are designated at the time of grant.

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[40].

[40] See www.fiveipoffices.org/statistics/statisticaldata_index.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 2018 and 2019. 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 measurement begins at the date of initial filing and ends upon completion of either the extended European search report that includes a written opinion on patentability or, in the case of a PCT without supplementary search, the international search report with a written opinion. The USPTO measures pendency starting from the date when the application is ready to be allocated to examining unit (status 20). The JPO, KIPO and CNIPA measure from the request for examination.

- 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 status 20 date (USPTO).

- For the JPO, the pendency time is the number of months in FY until 2017 and in CY from 2018 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.

Note: The length of time until request for examination can vary, this leads to significant differences between offices in the time periods that are reported.

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	2018	94.7	71.8	84.4	83.8	100.0
	2019	94.5	72.7	81.7	89.5	100.0
Grant	2018	62.2	75.3	65.2	53.5	74.5
	2019	63.9	74.9	68.8	44.3	77.3
Opposition	2018	3.2	0.6	-	-	-
	2019	2.7	0.6	-	-	-
Appeal on examination	2018	16.4	29.2	6.5	13.3	2.7
	2019	14.6	30.5	5.5	11.4	2.0

Pendency	Year	EPO	JPO	KIPO	CNIPA	USPTO
Awaiting request for examination	2018	95,643	633,244	235,969	294,079	-
	2019	98,161	619,007	244,276	266,567	-
Pending examinations	2018	371,884	168,679	166,878	1,968,203	546,792
	2019	335,293	173,494	174,064	2,218,145	578,138
Pendency first action (months)	2018	6.5	9.3	10.3	15.4	13.5

	2019	5.5	9.5	10.8	14.9	13.3
Pendency	**Year**	**EPO**	**JPO**	**KIPO**	**CNIPA**	**USPTO**
Pendency final action (months)	2018	31.8	14.1	15.8	22.5	21.7
	2019	28.1	14.3	15.6	22.2	21.8
Pendency invalidation (months)	2018	-	11.1	-	5.1	-
	2019	-	12.2	-	5.0	-

- = not applicable

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, the KIPO and the USPTO increased between 2018 and 2019. At the CNIPA and the JPO, the grant rate decreased between 2018 and 2019.

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 4.7 million applications were pending (i.e. awaiting request for examination or pending examination) in the IP5 Offices at the end of 2019. The total number of applications pending at the IP5 Offices increased by 5.0 percent between 2018 and 2019. Pending applications decreased at the EPO, increased at the JPO, the KIPO, the CNIPA and the USPTO.

The pendency to first action decreased at the EPO, the CNIPA and the USPTO, while it increased at the JPO and the KIPO. The pendency to final action decreased at the KIPO and the CNIPA. The EPO changed their measurement from median to arithmetic mean. The figures for 2018 have been re-compiled based on the new methodology.

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.

Unlike the other IP5 offices, the USPTO does not have a request for examination step. Therefore, for this report, the USPTO is measuring s pendency from the date when the application is ready to be allocated to the examining unit,. In the other IP5 offices, the request for examination can occur as early as 3 months from filing, or as late as 3 years from filing. This leads to significant differences between offices in the

time periods that are reported.

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.

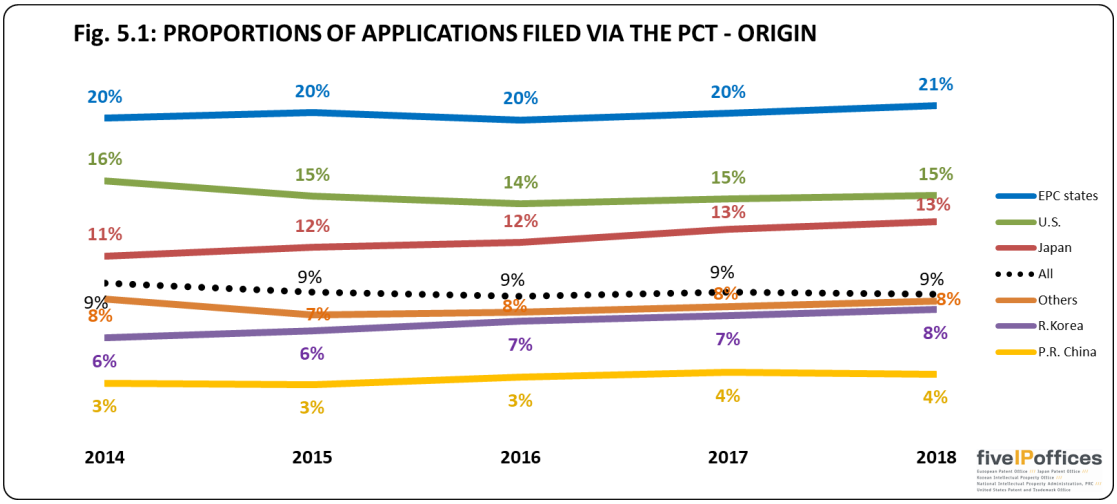
Statistics in this chapter have been derived from the WIPO Statistics Database[41] and the IP5 Offices. The graphs cover five-year periods that include the latest year for which reliable data are available[42]. Data for 2019 are presented in all figures except for Fig. 5.1 (proportions of applications filed by PCT) and Fig. 5.6 (IP5 patent families by origin).

[41] This edition refers to general patent data as of April 2020, and to PCT international application data as of July 2020, www.wipo.int/ipstats/en/index.html
[42] 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.



Nine percent of worldwide patent filings were made via the PCT route in 2018.

Comparing 2017 and 2018, the proportion of applications filed via the PCT remained stable for applications originating from Japan, U.S., and P.R. China. For EPC states and R. Korea, the proportion increased by 1 percent. The proportion for the EPC states origin applications continue to be higher than the proportions for applications from the remaining blocs.

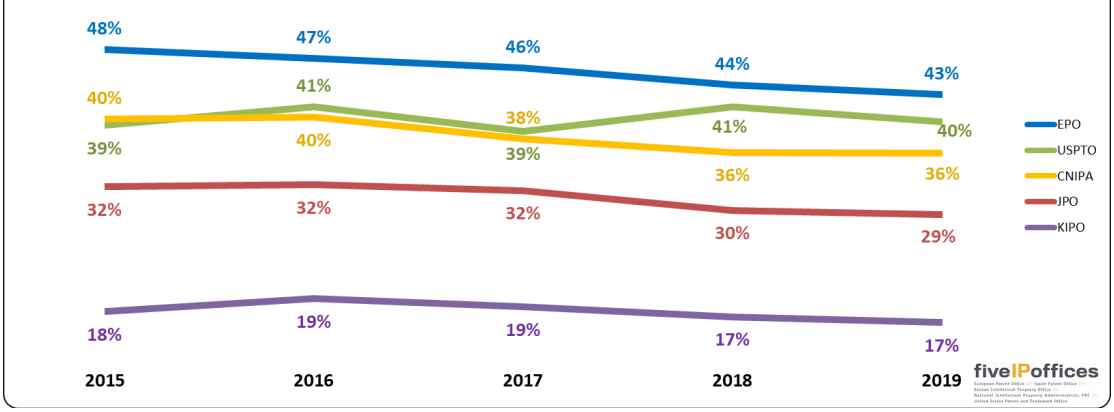
NATIONAL / REGIONAL PHASE ENTRY

After the international phase of the PCT procedure, applicants decide whether they wish to proceed further with their applications into the national or regional phase for each country or regional organization of interest. If the decision is made to proceed, 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[43].

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

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

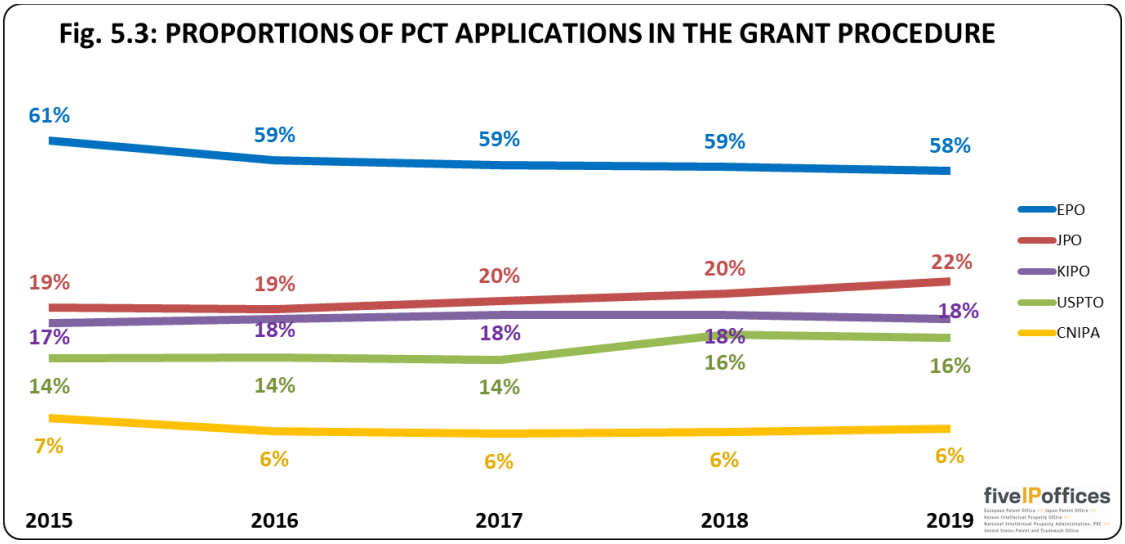


A higher proportion enters the regional phase at the EPO than enters the national phase at any of the other IP5 Offices. The proportion remains lowest at the KIPO.

Between 2015 and 2019, the proportion declined slightly at the EPO, the JPO, the KIPO and the CNIPA.

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).

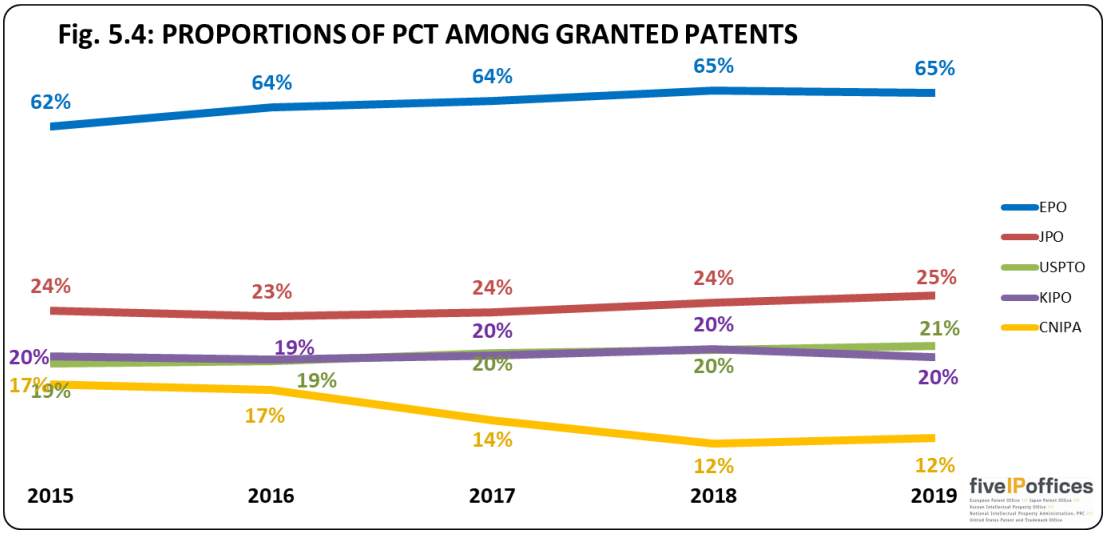


The proportions of PCT national/regional phase applications among all applications remained stable from 2018 to 2019 for the KIPO and the CNIPA. At the EPO and the USPTO the proportion decreased by 1 percent and 3 percent respectively, while it increased by 2 percent at the JPO.

EPO continues to have much higher proportion of PCT applications, compared to the other IP5 Offices. This can be explained by the fact that, contrary to other IP5 Offices, most of the first filings filed in the EPC states are filed at national offices, resulting in a higher share of PCT at the EPO.

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.

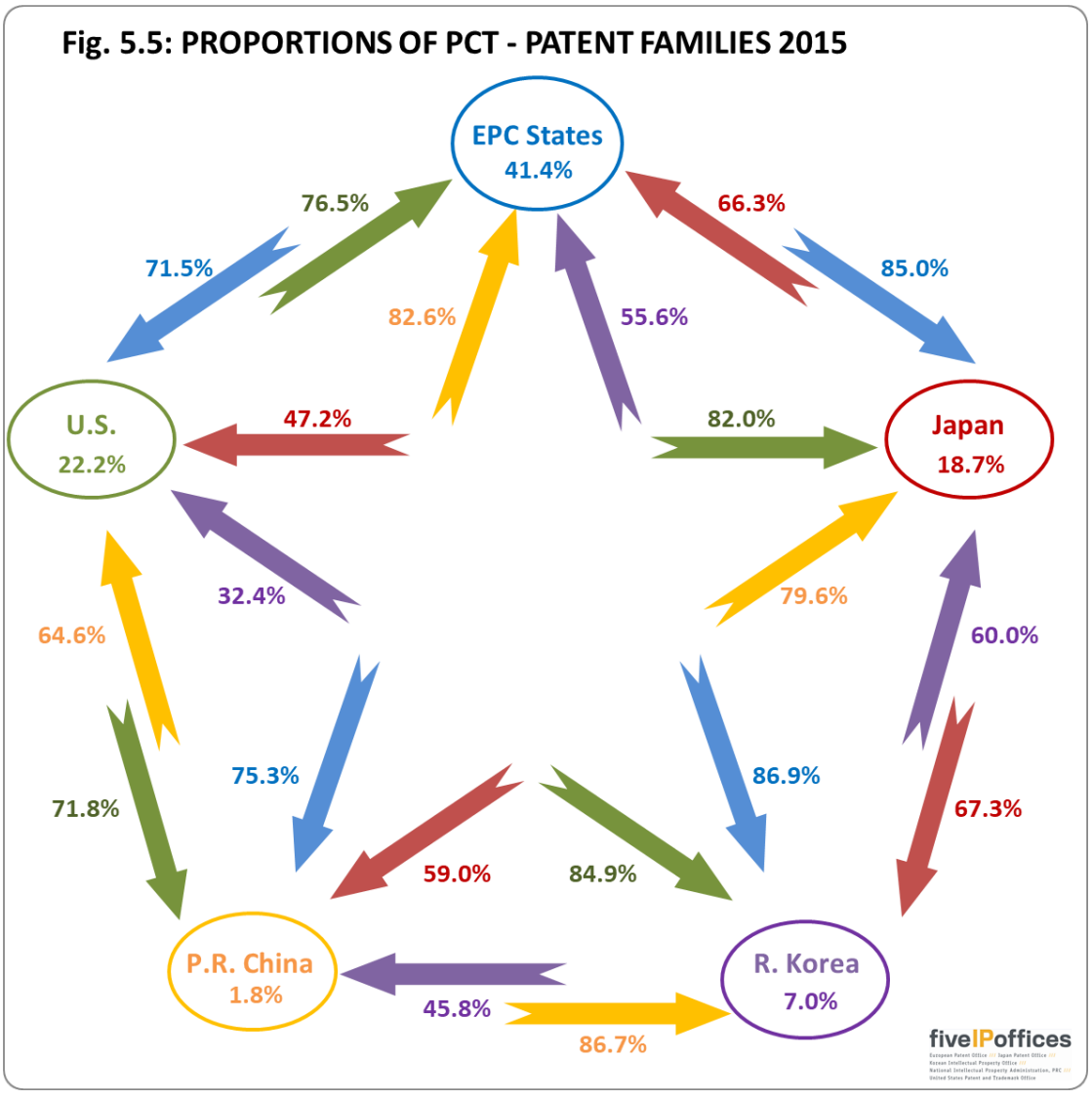
Over the 5-year period, there was an increase in the proportion of PCT in patent grants at the EPO, the JPO, and the USPTO, of 3 percent, 1 percent and 2 percent respectively. At the CNIPA, the percentage decreased by 5 percent. The percentages of PCTs in patent grants in Fig. 5.4 are always higher than the percentages of PCTs in applications in Fig. 5.3, for all IP5 Offices.

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 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 for the priority year 2015. 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 2015, and can be compared with Fig. 3.14.

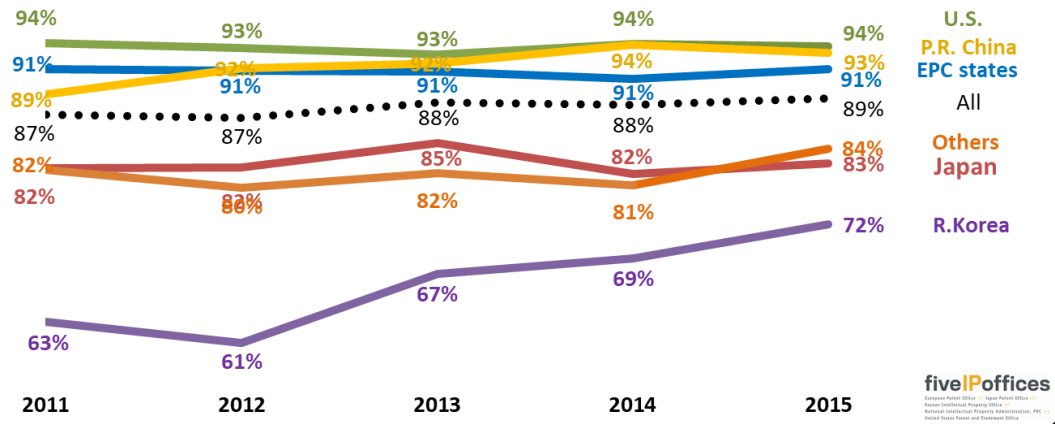


In general, the usage of the PCT route is far higher when making applications abroad rather than at home. Applicants from the U.S., P.R. China and the EPC states use the

PCT system for their foreign filings to a greater extent than applicants from Japan and R. Korea do.

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.

Fig. 5.6: PROPORTIONS OF PCT IN IP5 PATENT FAMILIES - ORIGIN



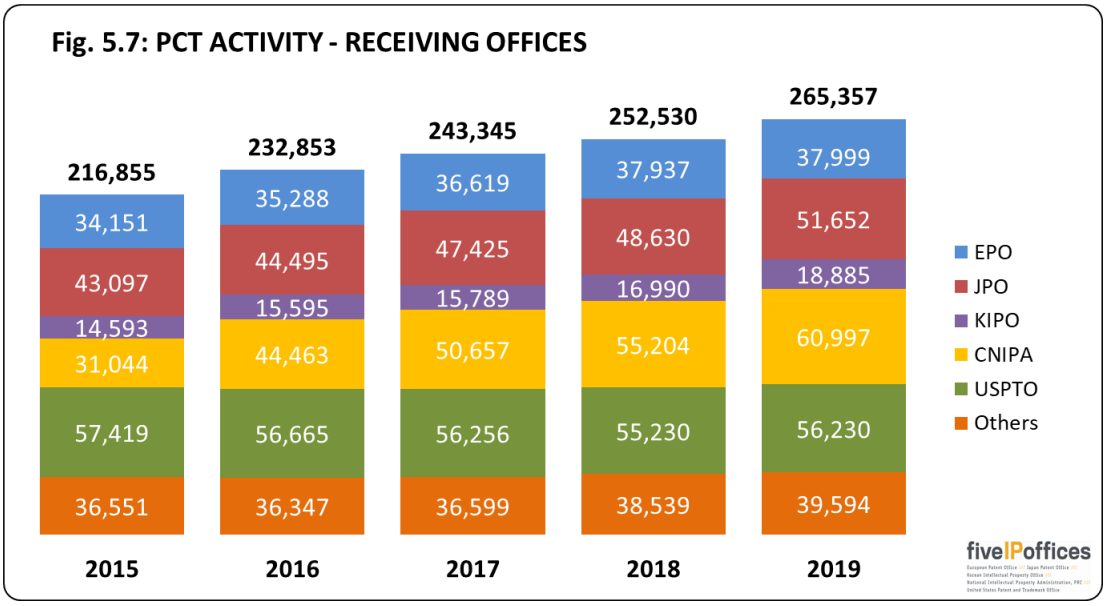
Since IP5 patent families represent highly internationalised applications, the rate of PCT usage is high compared to the overall usage of PCTs among applications in general, as was shown in Fig. 5.1.

Except for R. Korea, since 2015 there are only marginal variations in the usage of the PCT system. In 2019, usage in the R. Korea increased by 3 percent, where it still remains lower than in 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 2015 to 2019.

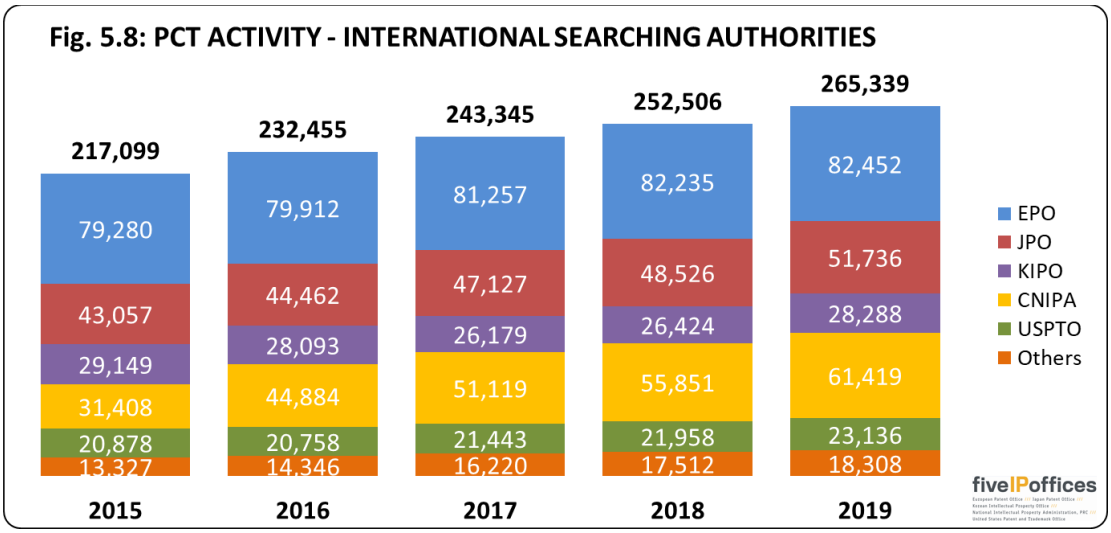
Fig. 5.7 shows the breakdown of PCT international filings by ROs over time.



The total number of PCT international phase filings grew at a high pace in 2016, 2017, 2018 and 2019. The compound annual growth rate from 2015 to 2019 was 5 percent.

In 2019, the IP5 Offices had an overall increase of PCT international filings of 5 percent compared with 2018. The KIPO had the largest percentage increase of 11 percent. Together the IP5 Offices were RO for 85 percent of the PCT international filings in 2019 (83 percent in 2015).

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.

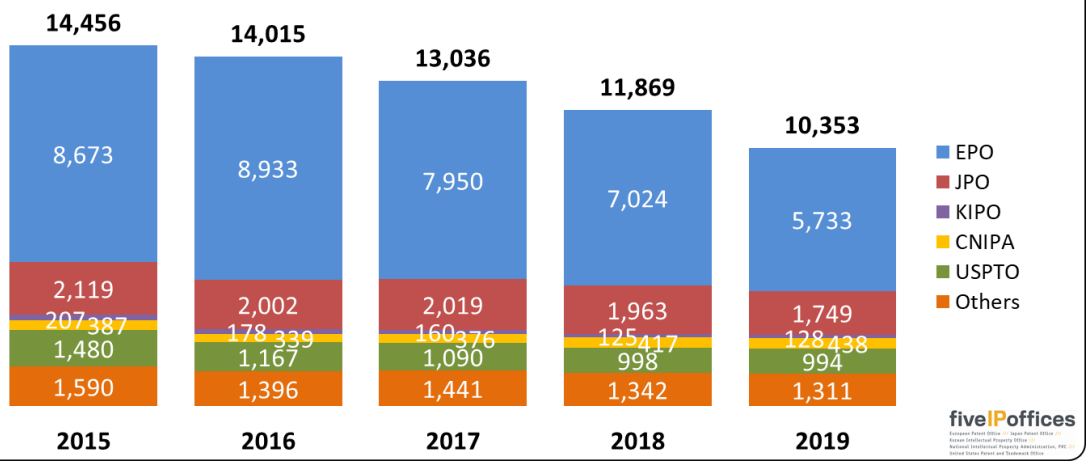


There is a steady increase in total activity over the period described. In 2019, the IP5 Offices received 93 percent of all PCT international search requests, consistent with the percentage of requests received by the IP5 Offices during the previous years. The EPO continues to receive the largest number of requests, receiving 31 percent of all requests in 2019.

The CNIPA once again demonstrated strong growth with a 10 percent increase. The JPO and the KIPO experienced both an increase of 7 percent. The USPTO increased by 5 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 2019 to 2018, the total number of requests for international preliminary examinations decreased 13 percent. 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 website. Since the changes in the PCT regulations for the international preliminary examination (IPE), the number of requests for such examination declined markedly. After a limited increase during the period 2014 to 2016, the declining trend was restored in 2017.

Together, the IP5 Offices were in charge of 87 percent of the IPEA work in 2018. In 2019, the EPO performed 55 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, KIPO, CNIPA), designs (JPO, KIPO, CNIPA, 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[44], 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). A 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 2018 and 2019 in Table 6.

Table 6: STATISTICS ON OTHER WORK

In 2019, the number of utility model applications increased 9 percent at the CNIPA and decreased by 13 percent and 3 percent, at the KIPO and JPO. The number of trademark applications increased by 11 percent at the KIPO and 5 percent at the USPTO. For design applications, there were increases at the KIPO and USPTO by 2 percent, and 4 percent, respectively.

Activity	Year	EPO	JPO	KIPO	CNIPA	USPTO
Search for national offices	2018	26,499	-	-	-	-
	2019	25,380	-	-	-	-
Design applications	2018	-	31,406	63,680	708,799	45,083
	2019	-	31,489	65,039	711,617	46,847
Utility model applications	2018	-	5,388	6,232	2,072,311	-
	2019	-	5,241	5,447	2,268,190	-
Plant patent applications	2018	-	-	-	-	1,079
	2019	-	-	-	-	1,134
Re-issue applications	2018	-	-	-	-	1,013
	2019	-	-	-	-	1,110
Trademark applications	2018	-	184,483	200,341	7,370,709	638,618
	2019	-	190,773	221,507	7,837,441	673,569
Provisional applications	2018				-	169,340
	2019				-	170,089

[44] 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 EXPENDITURES (Fig. 2.4)

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. 2.5)

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
- Patented micro-organisms deposition organization
-

B. Examination and appeals/trials, etc.

- Infrastructure improvement for examination and appeals/trials
- Disposition of examination and appeals/trials
- Execution of PCT

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[45]

H. Others

All other expenses not covered by the above.

[45] 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. 2.6)

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. 2.7)

A. Administrative Operation

B. Examination

- Patent examination
- Trademark 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. 2.8)

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[46]. 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 2019;
- 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:

[46] 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[47]. 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[48] 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[49] and that PCT filings are subsequent filings. Currently, USPTO first filing data, unless otherwise noted, also include a substantial proportion of applications that are continuations of applications previously filed at the USPTO. See also *APPLICATIONS, COUNTING OF*.

[47] 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.
[48] See the Article 4A to 4D of the Paris Convention at the WIPO web site; www.wipo.int/treaties/en/ip/paris/
[49] 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.

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[50]. 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[51]. 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.

CROSS FILINGS

IP5 cross filings are patent applications filed at the IP5 Offices during the same time period (i.e. calendar year in this report) and claiming the same priority. Such applications can be filed as direct national, direct regional or PCT that entered the national or regional stage during the reporting period. The priority application may have been filed in any patent office in the world. Cross filings are filed in at least two and up to all five IP5 Offices. Counts of cross filings are based on the number of underlying priorities claimed in subsequent patent applications filed in the reporting period.

The counts of cross filings are considered an indicator for shared workload among the IP5 Offices. Cross filings are therefore reported according to the year of the subsequent applications.

Contrary to patent families involving activity in the individual EPC Contracting States, cross filings in Europe are limited to subsequent filings at the EPO. Cross filings are reported according to the year of the subsequent applications while patent families are reported according to the year of the priority applications.

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[52], IP5

[50] 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.
[51] www.wipo.int/ipstats/en/statistics/pct/index.html
[52] The additional statistical tables that are 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.

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 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[53].

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[54] 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.

[53] 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.
[54] 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, the KIPO and the CNIPA.

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, the KIPO and the CNIPA), 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 (the EPO, the JPO, the KIPO, the CNIPA, and the 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 2018 relates to applications mainly filed in the years 2014 to 2018.

For the JPO, the period to file a request for examination is three years from filing date. The rate for 2018 relates mainly to applications filed in the year 2015.

For the KIPO, the period to file a request for examination has been changed from 5 years to 3 years from filing date in 2018.

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. 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, the 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, the KIPO and the CNIPA) 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 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 average time period, in months, measured from the date of filing the application to the date of issue of the European 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 average 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 a calendar year, 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 (19) [KIPO]
AI	Artificial Intelligence (ii) [USPTO]
ARIPO	African Regional Intellectual Property Office (12)
CCD	Common Citation Document (10) [EPO]
CPG	Cooperation for facilitating Patent Grant (14) [JPO]
CNIPA	China National Intellectual Property Administration (i)
CPC	Cooperative Patent Classification (13) [EPO]
CSP	Cooperative Search Pilot (26) [CNIPA]
CPES	Cloud Patent Examination System (26) [CNIPA]
CS&E	Collaborative Search and Examination (26) [CNIPA]
DOCDB	DOCumentDataBase (12) [EPO]
DPIIT	Department for Promotion of Industry and Internal Trade (14) [JPO]
EAPO	Eurasian Patent Organization (35)
EPC	European Patent Convention (2) [EPO]
EPO	European Patent Office (i)
EUIPO	European Union Intellectual Property Office (11) [EPO]
FA	First Action (i) [JPO]
FAOM	First Office Action on Merits (93) [USPTO]
FY	Fiscal Year (ii) [USPTO]
GCC	Gulf Cooperation Council Patent Office (36) [CNIPA]
GIPA	Global Intellectual Property Academy (30) [USPTO]
GPPH	Global Patent Prosecution Highway (14) [JPO]
IB	International Bureau of WIPO (iii)
IFRS	International Financial Reporting Standards (15) [EPO]

IMF	International Monetary Fund (iii)
INDECOPI	National Institute for the Defence of Free Competition and the Protection of Intellectual Property
INPADOC	International Patent Documentation Center (12) [EPO]
INPI	National Institute of Industrial Property (14) [JPO]
IP	Intellectual Property (i)
IP5	Five IP Offices: EPO, JPO, KIPO, CNIPA, USPTO (i)
IP5 SR	IP5 Statistics Report (i)
IPC	International Patent Classification (3)
IPEA	International Preliminary Examining Authority (3)
IPRs	Intellectual Property Rights (ii) [KIPO]
ISA	International Searching Authority (3)
JPO	Japan Patent Office (i)
KDB	Korea Development Bank(20) [KIPO]
KIPO	Korean Intellectual Property Office (i)
OAPI	Organisation African Intellectual Property (35)
OEE	Office of Earlier Examination(14) [JPO]
OFF	Office of First Filing (14) [JPO]
OSF	Office of Second Filing (14) [JPO]
PACE	Program for Accelerated Prosecution of European Patent Applications (9) [EPO]
PATSTAT	Worldwide Patent Statistical Database (12) [EPO]
PCT	Patent Cooperation Treaty (1)
PPH	Patent Prosecution Highway (iv)
P.R. China	People's Republic of China (2)
R&D	Research and Development (20) [KIPO]
RCE	Request for Continued Examination (31) [USPTO]
R. Korea	Republic of Korea (2)

RO	Receiving Office (3)
SAIP	Saudi Authority for Intellectual Property (14) [JPO]
SMEs	Medium-sized Enterprises (11)
SUCCESS	Study of Underrepresented Classes Chasing Engineering and Sciences Success (29) [USPTO]
U.S.	United States of America (2)
USG	U.S. Government (29) [USPTO]
USPTO	United States Patent and Trademark Office (i)
WIPO	World Intellectual Property Organization (iii)

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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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