Chapter 3

WORLDWIDE PATENTING ACTIVITY

Although the Trilateral Offices represent a significant proportion of total patents worldwide, the global picture is not complete without including the other offices from around the world. This chapter examines worldwide patent activities in terms of patent applications and grants. The statistics mostly cover a five-year period from 2001 to 2005. More current and detailed data from the Trilateral Offices are presented in Chapter 4. Comparable statistics on the usage of the PCT system appear in Chapter 5.

Applications reported hereafter are counted by the calendar year of filing and grants by the calendar year of granting.

Due to the complexity of the patent system several different representations of the patent filing process can be made. The following scheme can guide the reader to graphs that correspond to the different representations.

Figures 3.1, 3.4, 3.5, 3.7 show the **numbers of application forms filled out**. All of these are counted once only: (Direct national and direct regional filings, PCT international filings).

Figures 3.2, 3.11 show the numbers of **requests for patents** as they entered a grant procedure. Direct national and direct regional filings are counted once only. PCT national/regional phase filings are replicated over the numbers of procedures that are started.

Figures 3.3, 3.6, 3.8 show the equivalent numbers of **requests for national patent rights**. Direct national filings are counted once, PCT applications entering national procedures are replicated over the number of countries where they enter this phase. Direct regional filings and PCT regional phase filings are replicated over the number of countries designated in the application at the time it entered the regional procedure. This gives a representation in terms of national patent rights.

Figures 3.12, 3.13 show the **patent family** counts which are generated as the set of first filings, counted once each only, and documented in terms of the flows of priority rights from the first filings to subsequent filings in other countries.

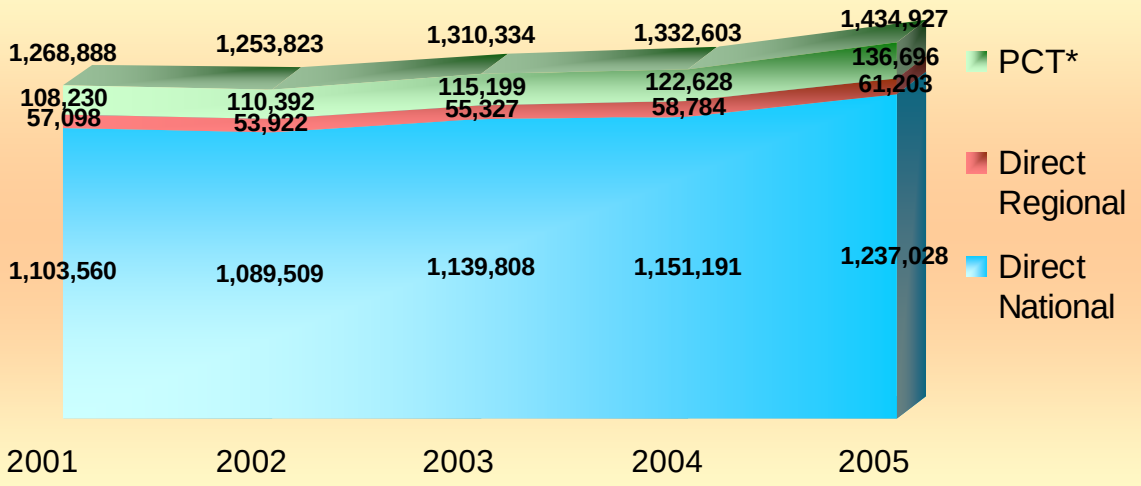
Regarding grants, Fig. 3.9 shows the numbers of **granted patents**. All grants are counted once only.

Fig. 3.10 shows the numbers of **validated national patent grant registrations**. Direct national grants are counted once only, but regional office grants are replicated over the numbers of countries for which the grant provides valid registrations. This gives a representation in terms of national patent rights.

PATENT APPLICATIONS FILED

The data in Fig. 3.1 below show the numbers of applications filed throughout the world. The PCT number in Fig. 3.1 is the number of international applications, rather than designations. Prior to 2004, applicants chose specific designations; starting in 2004 all contracting states were automatically designated, unless the applicant requests otherwise.

Fig. 3.1 WORLDWIDE PATENT APPLICATIONS BY FILING PROCEDURE



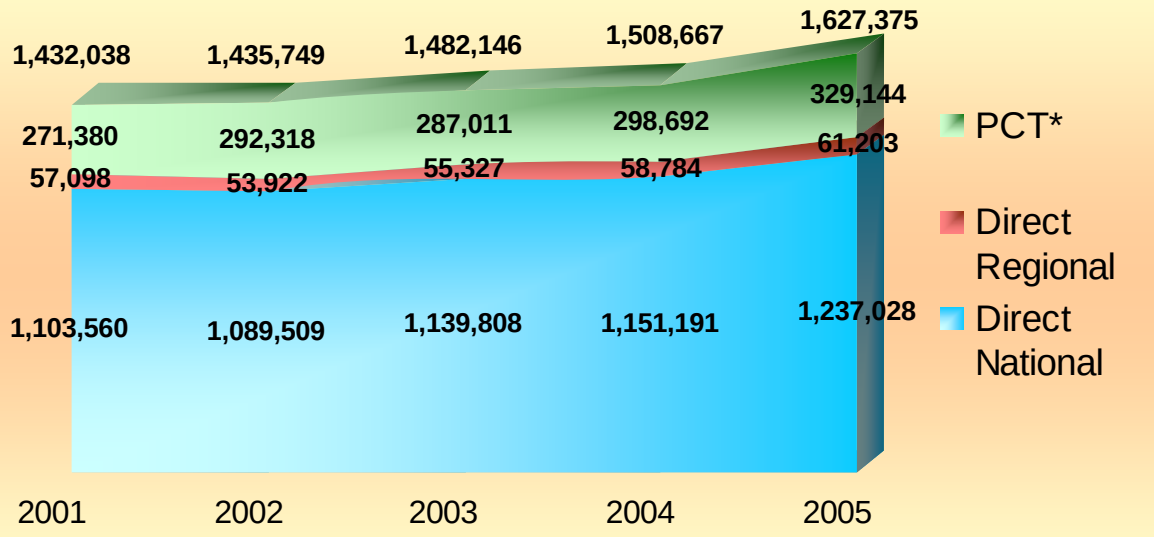
* This represents PCT international applications.

More than 1.4 million applications were filed in 2005. This represents the number of actions taken in 2005 to protect inventions around the world. This is an increase of 7.7 percent since 2004. Although many of these applications were filed according to national procedures (86.2 percent in 2005), the growth in filings is also contributed to by the ever-increasing use of supranational systems and in particular the PCT system.

Considering that not all the offices report filing statistics on a regular basis, one should be careful in interpreting these data. It can at least be concluded that there is a continuing tendency to use the patent systems in the world and that this does not seem to decline over time.

Fig. 3.2 shows the development of the number of requests for patents that entered a grant procedure. In this figure the PCT application numbers count the applications that entered a national/regional stage in the corresponding year. This leads to higher numbers 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 Germany PCT national phase entry, and an Italy PCT national phase entry, thus producing three PCT national/regional entry phase applications (shown in Fig. 3.2). As it is assumed in this report that PCT international phase applications are in general made as subsequent filings (at about 12 months after first filing), and that according to the regulations the national/regional phase begins 30 months after the first filing, this means that the entry into the national/regional phase generally takes place about 18 months after the PCT international filing.

Fig. 3.2 WORLDWIDE PATENT APPLICATIONS BY FILING PROCEDURE

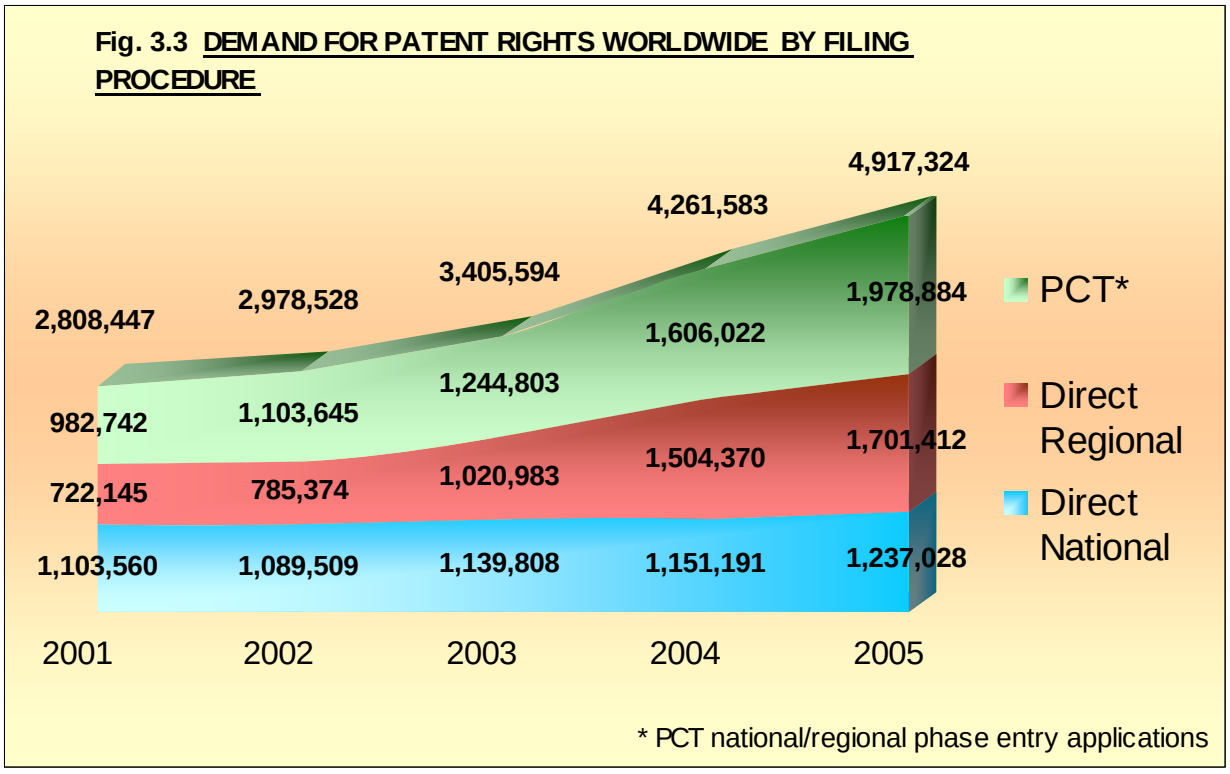


* This represents the number of PCT applications that entered to each national/regional stage.

There is a clear trend of annual increases. More than 1.6 million patent applications were filed in 2005. This represents an average compound rate of 3.2 percent per year since 2001.

Fig. 3.3 shows the evolution of the demand for patent rights resulting from the numbers of applications filed as shown in Fig 3.2. Filings counts are again based on PCT national/regional phase entry numbers for the world. But now, the applications for regional offices are expanded to cover the numbers of designations that can be counted under each regional patent system. This gives an estimate of the maximum number of patents that could be obtained later on from the filed applications in the corresponding years.

In this way the multiple country effects of the regional patent system are shown in terms of the underlying national patent rights. A single application may be counted multiple times, once per entry into the regional system or PCT national/regional phase. For example, one PCT application may lead to an EPO PCT regional phase filing that designates five EPC contracting states, a Japan PCT national phase entry, and an U.S. PCT national phase entry, thus producing a count of seven patent rights. A direct regional application may be to the EPO and designate three EPC contracting states, thus producing a count of three patent rights.



This representation shows the effect of the centralized procedures (regional and international) to help users of the system to expand their patent protection with a limited number of procedures.

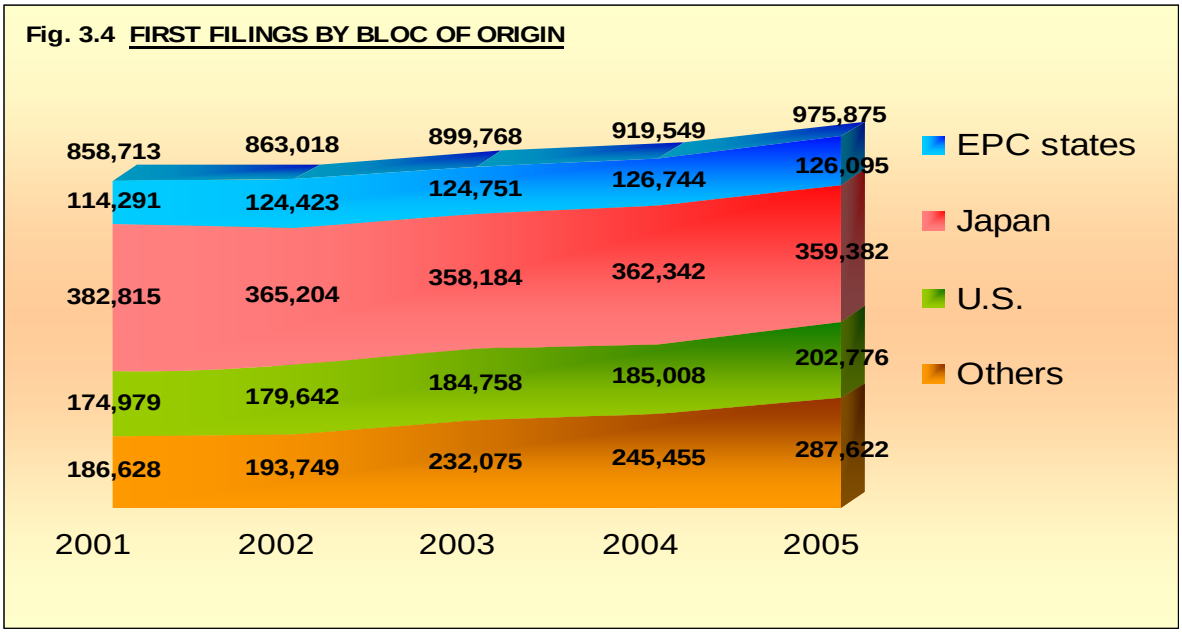
The demand for patent rights increased substantially over the period with a 15.0 percent average growth rate. Numbers of PCT application and regional application increased from 2001 to 2005. This shows that the patent right demand was expanded via the regional patent systems.

PATENT ACTIVITY BY BLOCS

FIRST FILINGS

The process of patent protection starts with the first filing, an initial patent application made to protect an invention or an innovation prior to any subsequent filing to extend the protection to other countries. The development of first filings in the major filing blocs is shown in Fig. 3.4.

Fig. 3.4 FIRST FILINGS BY BLOC OF ORIGIN



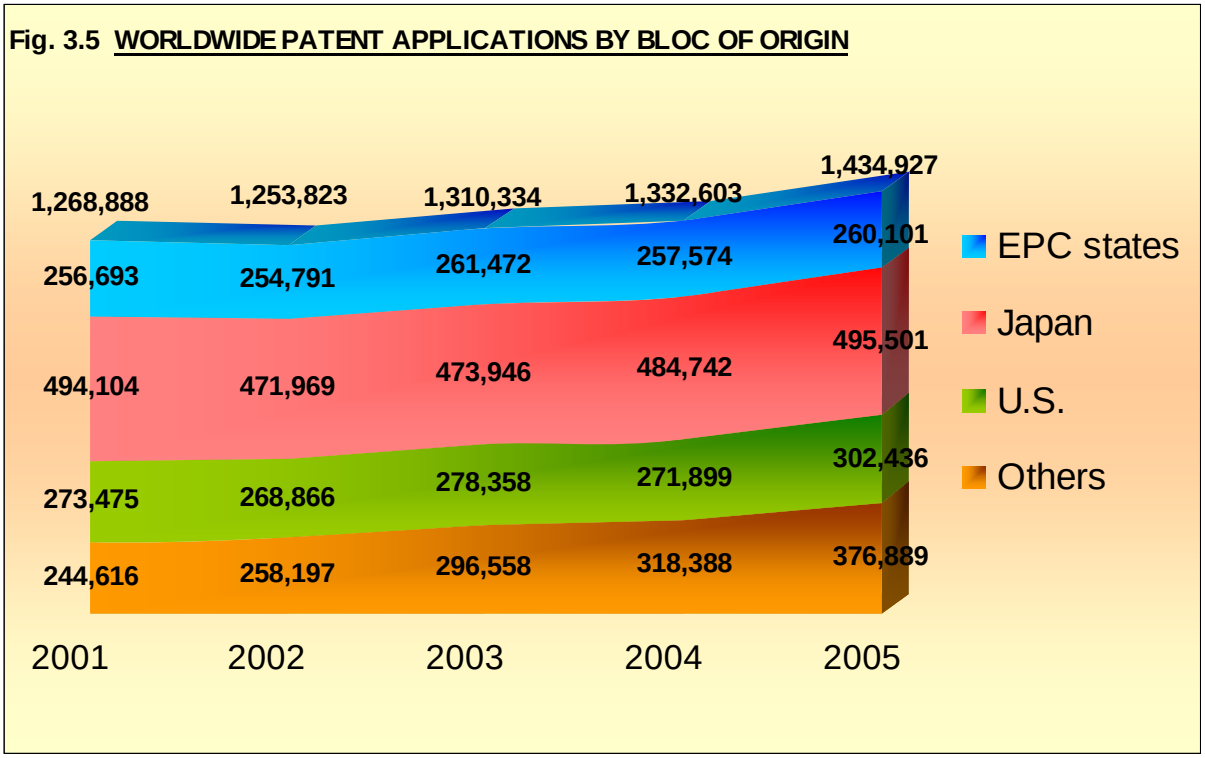
The total number of first filings increased by 6.1 percent from 2004 to more than 975,000 in 2005.

Japan recorded 359,382 first filings (about 37 percent of the whole), the highest number of first filings by bloc in 2005; although this was a decline from their 2004 total. The EPC contracting states had 126,095 first filings, slightly lower than their in 2004. The U.S. with 202,776 first filings showed a modest growth rate of more than 9 percent from 2004. The highest growth, more than 17 percent, was in the "Others" bloc. Both China and the Republic of Korea contributed a significant amount to "Others". China made up 46 percent of "Others" and about 10 percent of the total for 2005. The Republic of Korea made up 47 percent of "Others" and about 10 percent of the total for 2005.

The total number of first filings in 2004 was 919,549. From these first filings, one year later, in 2005, Fig. 3.1 shows that 459,052 subsequent filings were filed. Thus on average each first filing led to almost 0.50 subsequent applications in the following year (was almost 0.46 for first filings in 2003). But Fig. 3.2 shows that this corresponds to almost 0.71 subsequent applications entering a grant procedure (was 0.74), and Fig. 3.3 shows that it corresponds to 5.04 subsequent requests for patent rights throughout the world (was 4.63). This illustrates the fact that greater usage of the international and regional patent systems allows for the filing of fewer applications for a broader geographical coverage of the protected inventions.

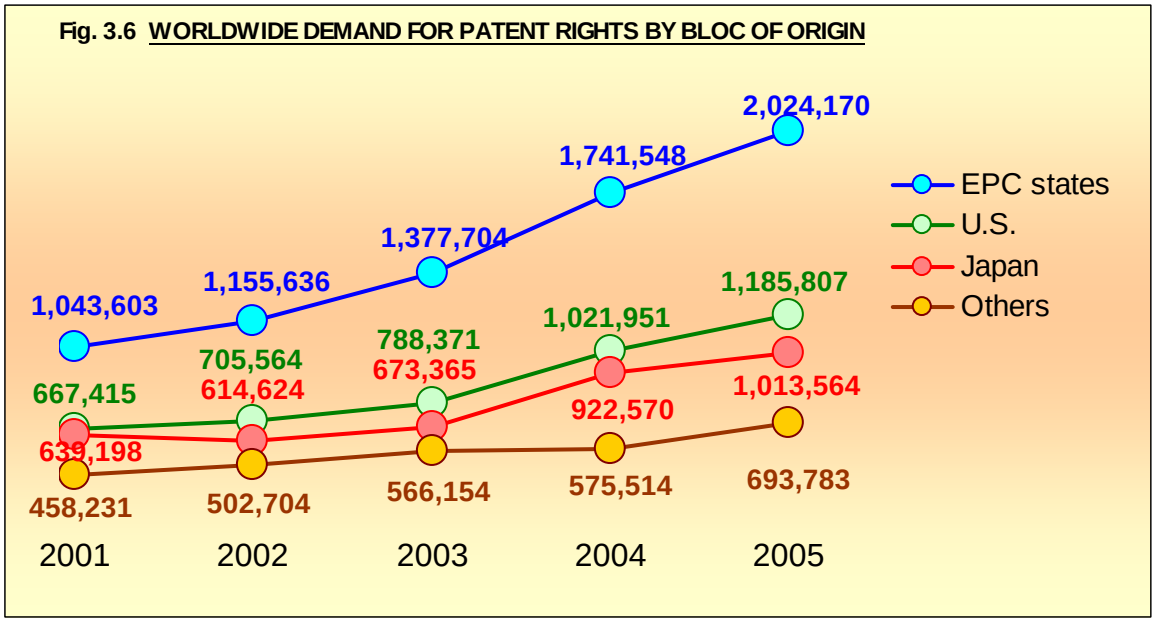
ORIGIN OF THE APPLICATIONS

Fig. 3.5 is tied to Fig. 3.1 but displays the worldwide patent applications according to area of origin.



Japan remains the bloc from which the largest share of applications was originating, even though the share from the "Others" bloc is increasing. The number of applications filed by residents of Europe has declined since 2003. Applicants from the U.S. show a modest growth.

Fig. 3.6 shows the trend for the demand of patent rights by blocs of origin of the applicants. This graph is related to Fig. 3.3, since it uses the same broader definition of regional and PCT applications that show the demand for patent rights.



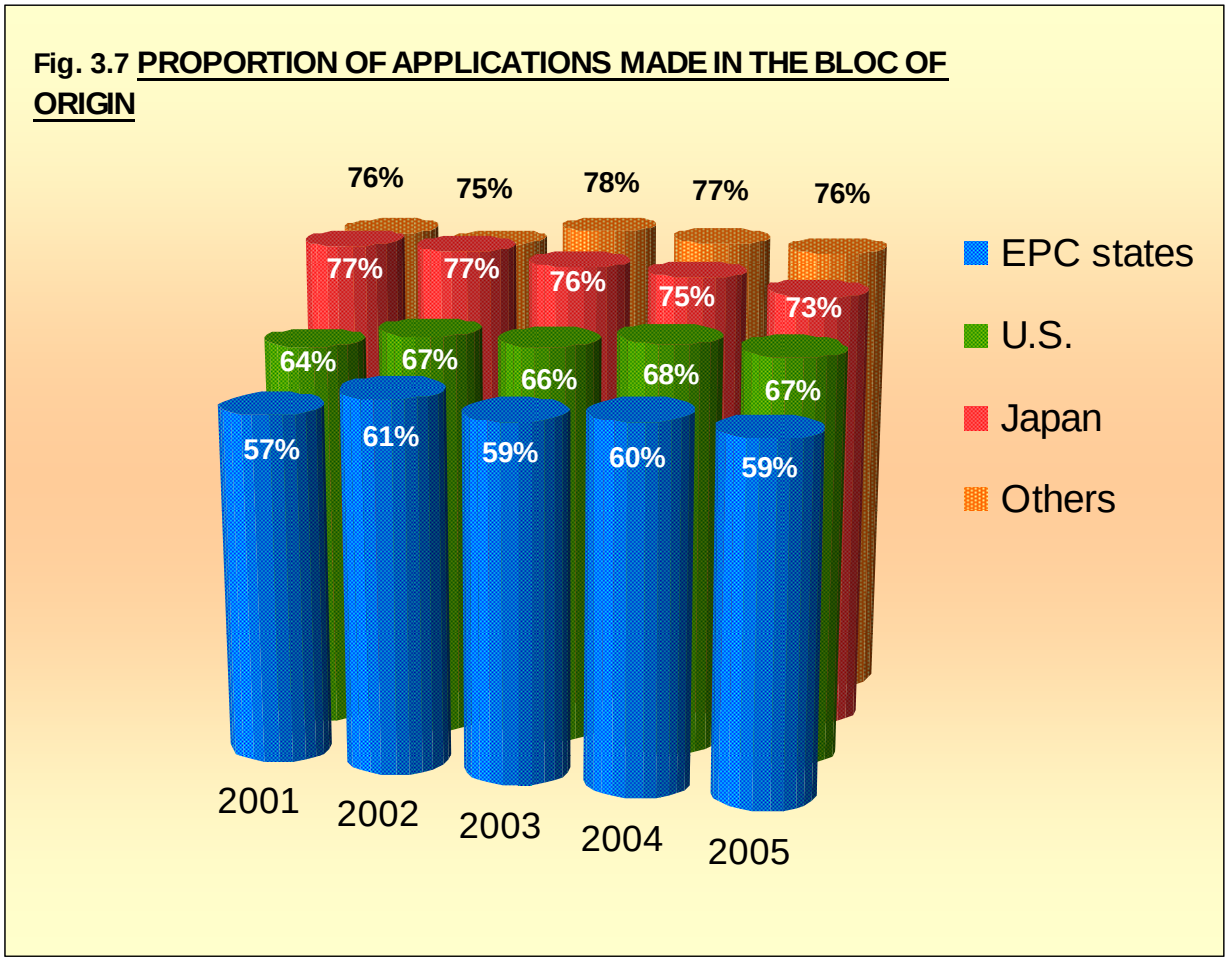
From 2004 to 2005 the EPC contracting states, U.S., and Japan showed an increase of 16, 16, and 10 percent, respectively. "Others" showed an increase of 21 percent.

Despite the apparent decline in 2005 for the numbers of applications filed by residents of the EPC contracting states in Fig 3.5, the level of demand for patent rights there remains high and constantly increasing.

TARGETS OF THE APPLICATIONS

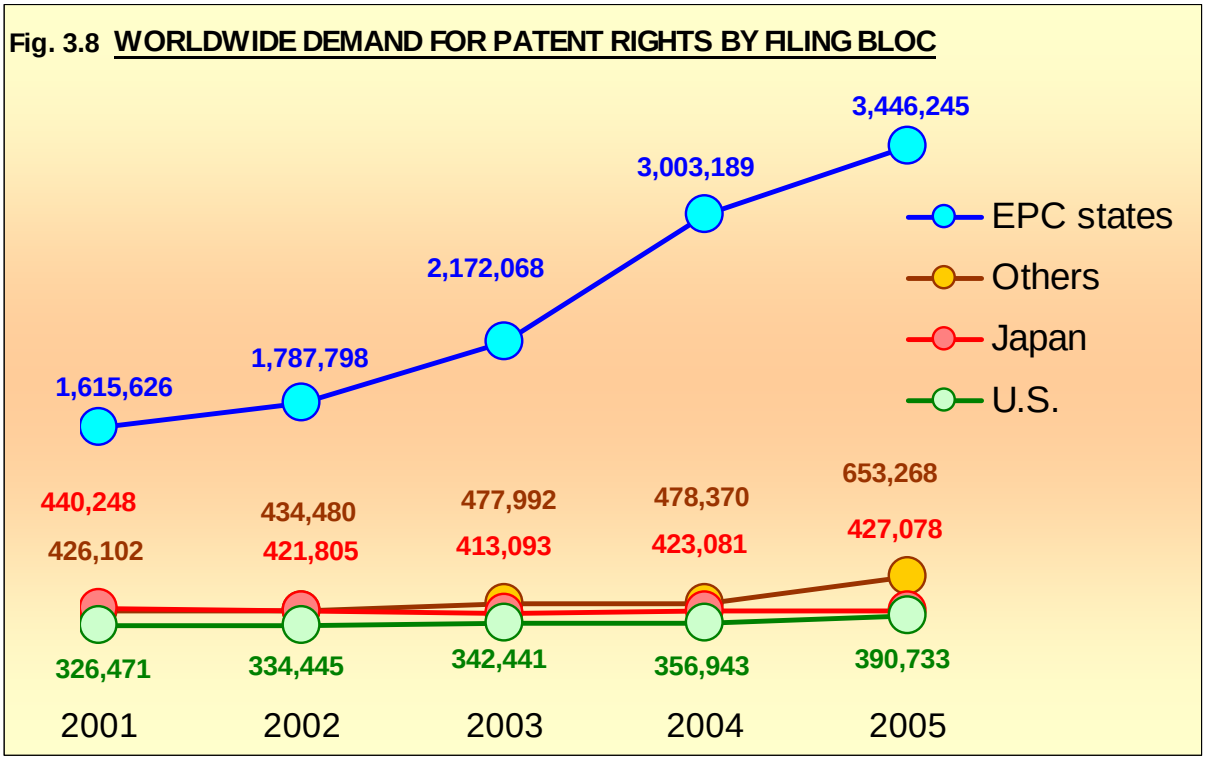
Fig. 3.7 shows the proportions of applications filed at home by the residents of each bloc. This graph is related to numbers of application forms filled out as described in Fig. 3.1.

Fig. 3.7 PROPORTION OF APPLICATIONS MADE IN THE BLOC OF ORIGIN



In most cases, the first filing is made in the country of residence and subsequent applications are made to protect the invention abroad. The proportions of applications made at home have decreased. This is yet another indication of the globalization of the demand for patent rights.

Fig. 3.8 shows the distribution of the demand for patent rights according to the targeted regions. This graph is related to Fig. 3.3.

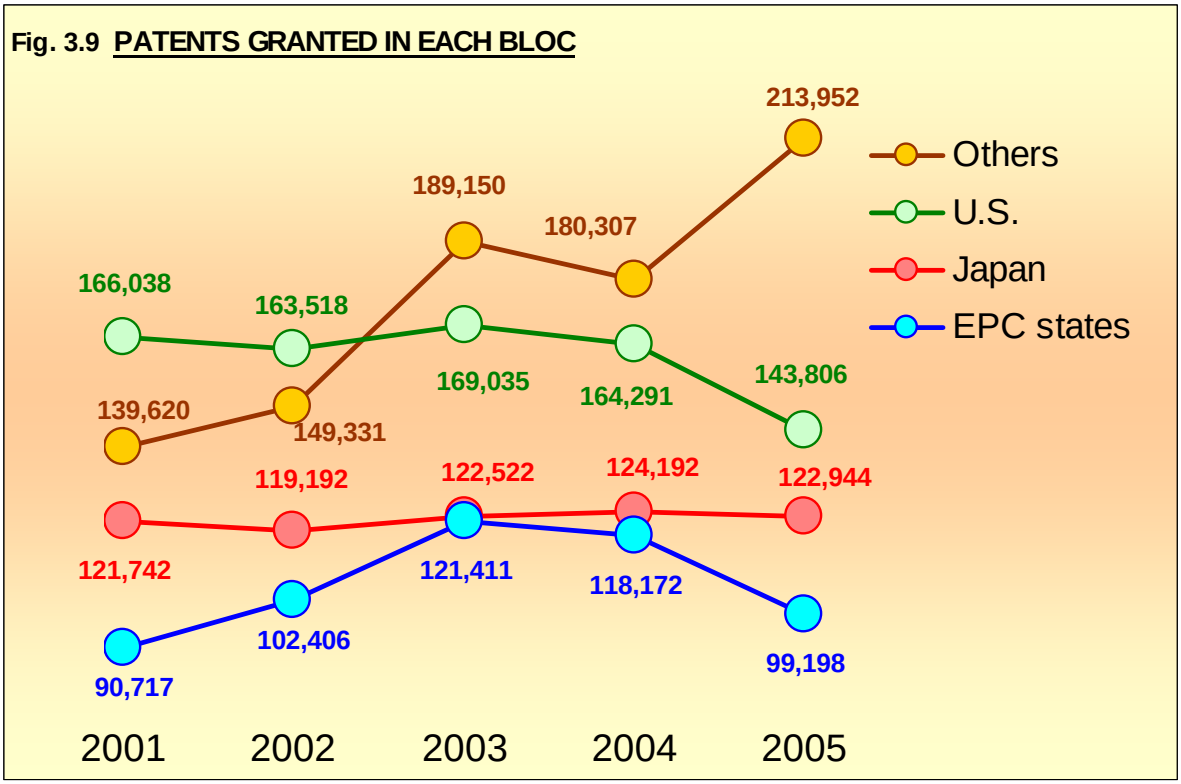


This shows that most of the patent rights are sought for in the EPC, because it is composed of 31 states. The influence of regional patent systems occurs especially in the EPC contracting states and to a much lesser extent in "Others".

Within the Trilateral blocs over the period 2001 to 2005, the relative change was highest in the EPC contracting states (115 percent increase overall, 20.9 percent compound increase per year). This reflects an increase in the use of both the regional and the PCT systems.

GRANTS

The development of the use of patent systems is shown next in terms of grants. Fig. 3.9 displays the cumulative numbers of patents granted by the various offices in each bloc. Granted patents are counted here.

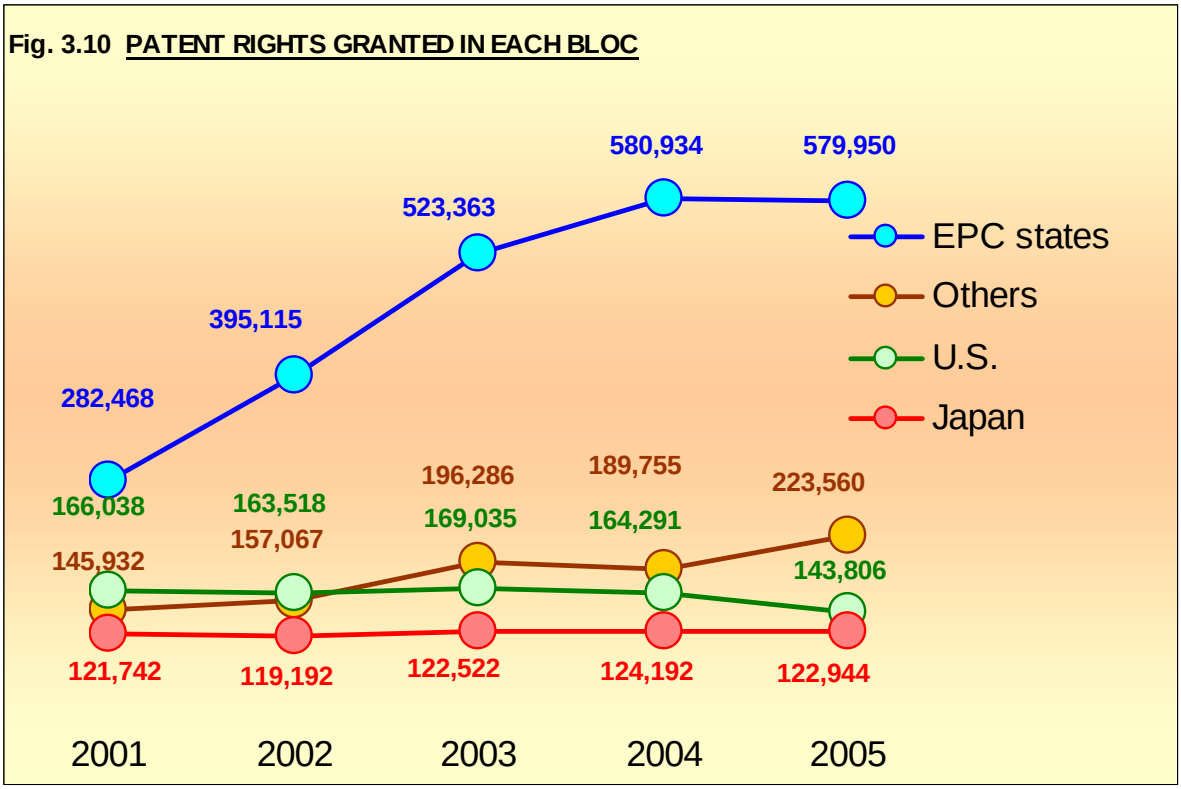


The worldwide number of grants decreased from the 2004 total of 586,962 to 579,900 in 2005. The number of patents granted in the EPC contracting states in 2005 decreased by 16 percent since 2004. The number of patents granted in Japan has remained fairly constant since 2001 though there was a slight decrease in 2005. The U.S. and EPC contracting states have granted 12 and 16 percent, respectively, fewer patents in 2005 than in 2004.

The numbers of patents granted in the "Others" bloc has increased significantly over the period. 2005 patents granted from China made up about 25 percent of "Others" and about 9 percent of the total. Also in 2005 patents granted from Republic of Korea made up about 34 percent of "Others" and about 13 percent of the total. The number of patents granted in the "Others" bloc rose 19 percent in 2005 over their 2004 total.

Regional granting procedures lead to multiple patent rights in the various designated states within the region concerned. Fig. 3.10 illustrates the development of the validated national grants resulting from the decisions reported in Fig. 3.9. This affects the EPC contracting states and "Others".

Fig. 3.10 PATENT RIGHTS GRANTED IN EACH BLOC

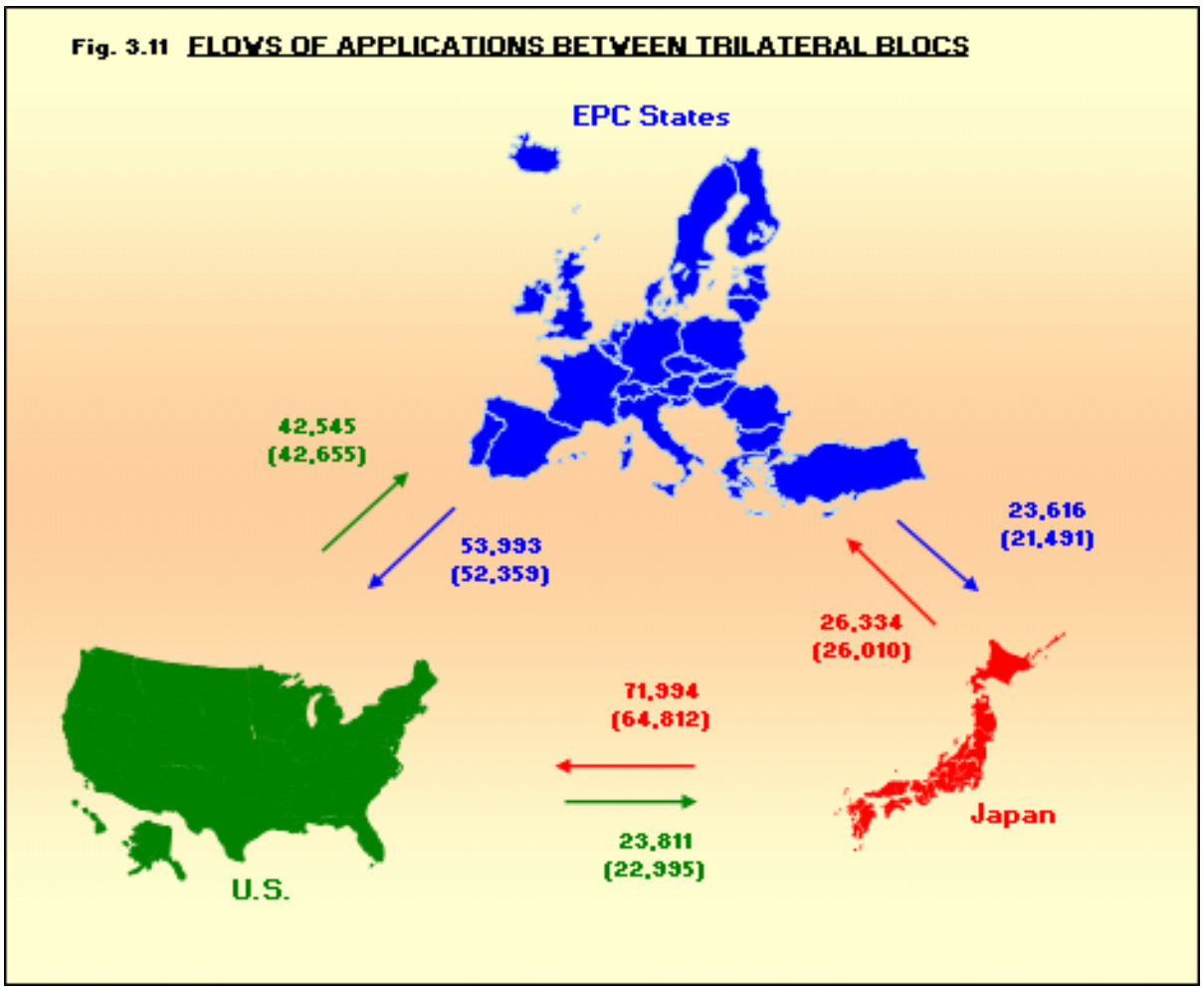


There has been a steady growth of the number of patents granted in the EPC contracting states. A growing number of patents were granted via the regional procedure, after entry to the EPO either directly or via the PCT system.

INTERBLOC ACTIVITY

FLOWS OF APPLICATIONS

The flows of patent applications between the three major filing blocs are described next. Fig. 3.11 is based on the distinct applications entering a grant procedure (as in Fig. 3.2) and shows details of the specific flows of applications between the trilateral blocs in 2005. The 2004 figures are given in parentheses.



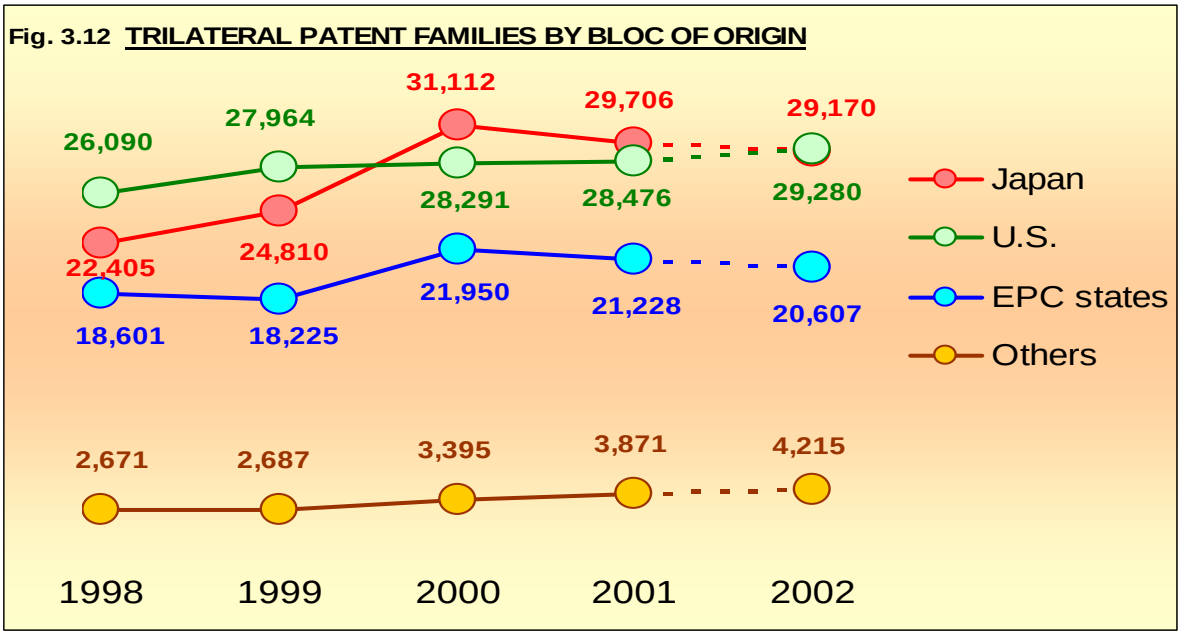
The filing behavior in 2005 is quite similar to what it was in 2004. Japanese applicants filed many more applications in the U.S. than in the EPC bloc. As before, U.S. applicants applied more in the EPC bloc than in Japan. Residents of the EPC contracting states filed many more applications in the U.S. than they did in Japan.

PATENT FAMILIES

The information in this section was obtained from the DOCDB database of worldwide patent publications. The statistics are based on references to priorities given in published applications and differ to some extent from the statistics earlier in this chapter, which were based on counts of patent applications provided by individual patent offices. Detailed tables that show the flows of patent families between blocs can be seen in the web based annex[15] to this report.

The development over time of trilateral patent families is shown in Fig. 3.12. Due to the delay in publication (from the moment of filing), the figures can only be reported with any degree of accuracy after several years of delay. The references to priorities and flows between trilateral blocs are fairly accurate up to the year 2002, but the numbers for trilateral patent families may not be accurate after the year 2001 because more time is needed to gather the evidence of activity in all three blocs.

Fig. 3.12 **TRILATERAL PATENT FAMILIES BY BLOC OF ORIGIN**



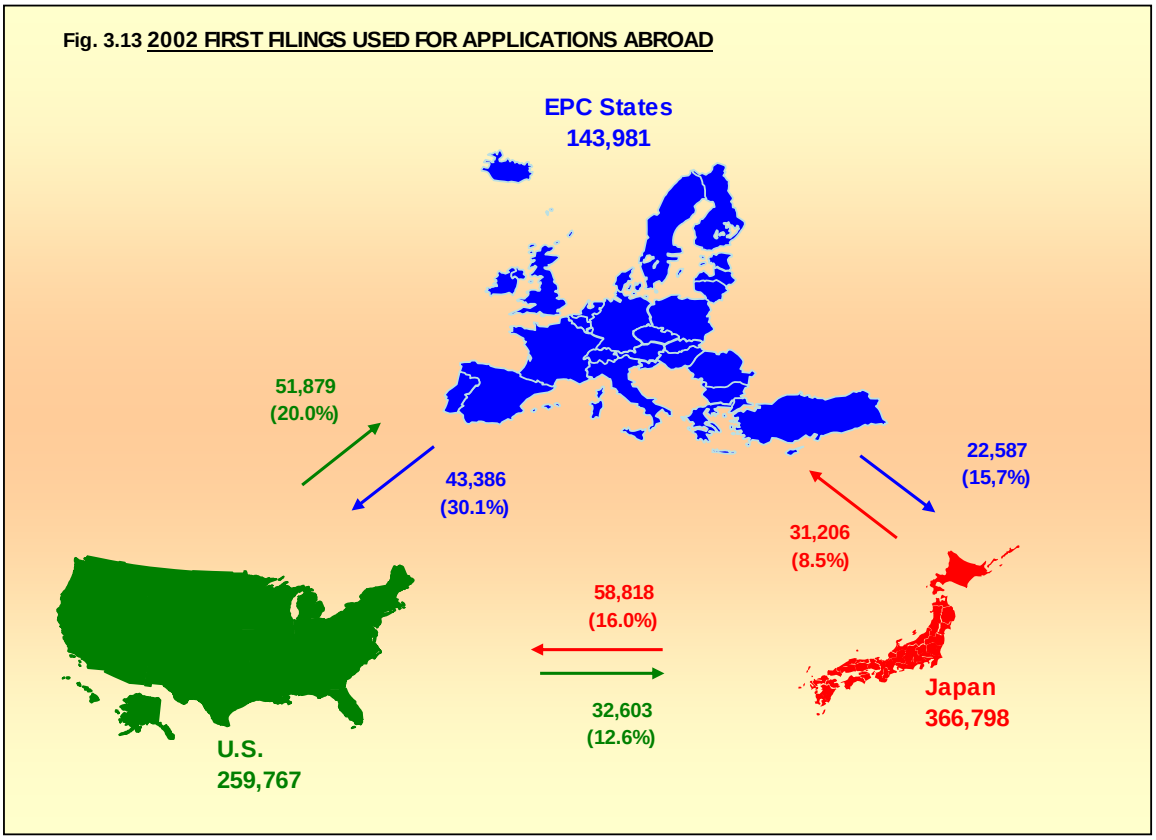
The trilateral patent families' data turned down for Japan and the EPC contracting states from 2000 to 2001, while the data for the U.S. and "Others" showed a small increase. The total number of trilateral patent families in 2001 was 83,281, of which 25.5 percent originated from the EPC contracting states, 35.7 percent from Japan, 34.2 percent from the U.S. and 4.6 percent from "Others".

Out of all priority forming filings in the trilateral area in 2001, 10.1 percent formed trilateral patent families. The proportions differed considerably according to the bloc of origin of the priority forming filings. For the EPC contracting states, 14.2 percent of priority forming filings formed trilateral patent families; for the U.S. 11.2 percent; for Japan 7.7 percent, and for "Others" 1.6 percent.

[15] This can be found at www.trilateral.net/tsr/tsr_2006/ web_annex/ web_annex.xls.

The flows of patent families from first filings to subsequent filings between trilateral blocs are shown in Fig. 3.13. The number given for each bloc is the total number of distinct references to priority filings in 2002. This can be taken as an indicator of the number of first filings in the bloc. The flow figures between blocs of origin and target blocs indicate the numbers of secondary filings in the target bloc that referenced priority filings from the bloc of origin in 2002.

Fig. 3.13 2002 FIRST FILINGS USED FOR APPLICATIONS ABROAD



From information that is tabulated in the file of statistical data that is connected to the web based version of this report, out of all first filings in the trilateral area in 2002, only 20.9 percent formed patent families which included at least one other trilateral bloc. When considered by bloc of the priority applications, Japan has the smallest proportion. Although there was an increase for each, the proportions are similar to the 2001 levels. The EPC contracting states had 31.5 percent in 2002 up from 31.0 percent; Japan had 16.6 percent (was 15.5 percent); the U.S. had 21.3 percent (was 21.0 percent). Also as in 2001, for secondary filings Japan had the largest number of priorities claimed. Japan had 60,854; the EPC contracting states had 45,366; the U.S. had 55,202.

When the trilateral blocs which received subsequent applications from the trilateral area are considered, a larger proportion of filings were received by the U.S. than by the other blocs (13.3 percent by the EPC contracting states, 13.7 percent by Japan, and 20.0 percent by the U.S.). From all the priority forming first filings throughout the world in 2002, 17.9 percent formed patent families including at least one trilateral bloc.