Special section
The top 100 global patent applicants

Global trend

The past three decades have seen dramatic growth in patent filings worldwide – filings almost tripled between 1985 and 2014. Furthermore, large multinational companies are increasingly seeking patent protection beyond their domestic borders, as reflected in an increase in cross-border and subsequent filings. This special section of *World Intellectual Property Indicators, 2015* aims to analyze the filing behavior of the top 100 patent applicants worldwide between 1980 and 2012.[1]

Inventors traditionally file first at their national office before filing abroad, in which case the same invention is recorded multiple times. To avoid counting the same invention multiple times, WIPO has developed a patent families database, from which the list of top 100 applicants has been extracted. Their selection is based on the cumulative total number of patent families for the 10-year period from 2003 to 2012. However, to observe long-term trends, data have been divided into three 10-year periods: 1983-92 (1980s), 1993-2002 (1990s) and 2003-12 (2000s).

Cleaning applicant names

Data reported in this section are based on the patent families database developed by WIPO. Since WIPO's patent families are constructed based on first filings, statistics on patent families may partially correct bias due to multiple counts of patent applications for the same invention and provide better measurement of original/first inventions. A patent family is defined as "a set of interrelated patent applications filed in one or more countries or jurisdictions to protect the same invention."

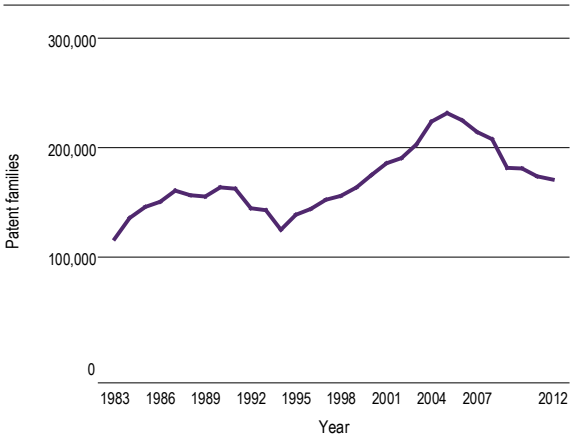
Different names may be recorded in the database for the same applicant. To provide accurate statistics on applicants, one must harmonize these names. WIPO carried out this name-cleaning process based on keyword searching and manual verification. The process was restricted to the top applicants only. The process takes historical changes of names into account, but not company structure; in other words, subsidiaries or applicants sharing a common parent company are not consolidated, and mergers and acquisitions are not taken into consideration.

Patent families are grouped by fields of technology based on WIPO's IPC-technology concordance table (available at *www.wipo.int/ipstats/en*). The total number of patent families by fields of technology for an applicant (table 3) may be different from the total number of patent families reported at aggregate level (table 1) due to missing IPC codes.

1. 2012 is the latest year for which complete patent family data are available.

Figure 1 shows the combined total number of patent families belonging to the top 100 applicants. Filings grew sharply between 1983 and 1987, increasing from around 116,000 to 160,000. Between 1991 and 1994 the number of patent families fell, coinciding with the economic downturn of the early 1990s. The fastest growth occurred between 1994 and 2005, when the combined total grew by 85%. Since peaking at 231,000 in 2005, the total has followed a downward trend. This has resulted in part from a sharp decline in filings by three companies, Samsung Electronics, LG Electronics and Panasonic. In addition, the top 100 applicants, share of all patent families worldwide decreased from 26% in 2005 to 14% in 2012.

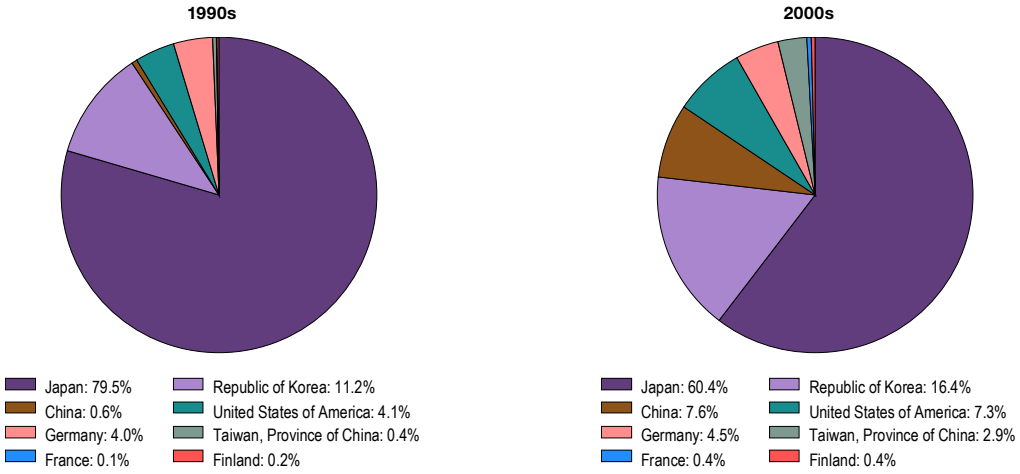
Figure 1. Trend in total patent families belonging to the top 100 applicants



Sources: WIPO Statistics Database and EPO PATSTAT database, October 2015.

Applicants from just eight origins make up the top 100 list: Japan with 55, the Republic of Korea (15), China (10), the US (9), Germany (5), Taiwan, Province of China (4) and one each from Finland and France. The list is dominated by multinational companies. However, four Chinese universities are among the top 100 applicants. Most of the listed applicants belong to the ICT, electrical machinery and transport sectors. The top applicant list does not include any biotechnology or pharmaceutical companies.

Figure 2. Distribution of patent families of the top 100 applicants by applicant origin (%)



Sources: WIPO Statistics Database and EPO PATSTAT database, October 2015.

Japanese applicants accounted for the largest share of all patent families worldwide, which is to be expected considering that Japan is home to 55 top applicants. However, their share declined from 80% in the 1990s to 60% in the 2000s (figure 2). Chinese applicants, on the other hand, saw their combined share grow from 0.6% to 7.6% over the same period. Korean and US applicants also saw notable growth in their shares of the total.

Who are the top applicants?

Table 1 lists the top 100 applicants based on their total number of patent families between 2003 and 2012. Panasonic of Japan was the top applicant in the 2000s, with 111,653 patent families worldwide. It was followed by Samsung Electronics of the Republic of Korea (95,852), and by the Japanese companies Canon (74,193), Toyota (73,220) and Toshiba (65,151). LG Electronics of the Republic of Korea and International Business Machines (IBM) of the US are two other non-Japanese applicants that rank among the top 10. Together, the top 10 applicants accounted for a third of all families held by the top 100 in the 2000s, which is lower than the two-fifths they held in the 1990s.

With 32,227 patent families, Robert Bosch was the highest-ranking German applicant – 17th in the 2000s – while for China it was ZTE Corporation (31,673), in 18th place. The highest-ranking applicant from Taiwan, Province of China was Honghai Precision Industry (30,848). The sole applicants from France (Peugeot Citroen) and Finland (Nokia) ranked 75th and 86th respectively.

Panasonic was the top applicant in each decade (1980s, 1990s and 2000s). Four more Japanese applicants – Canon, Toshiba, Ricoh and Sony – featured among the top 10 in each of these three decades. Mitsubishi Electric, Hitachi, Fujitsu and NEC made it into the top 10 in the 1980s and 1990s, but dropped out in the 2000s.

Widening the focus to the top 30 applicants, ZTE, Honghai Precision Industry, Huawei Technologies and Fujifilm moved quickly up the rankings from the 1990s to the 2000s. Before the 1990s, these four applicants were not included in the top 100, but appeared in the top 30 in the 2000s.

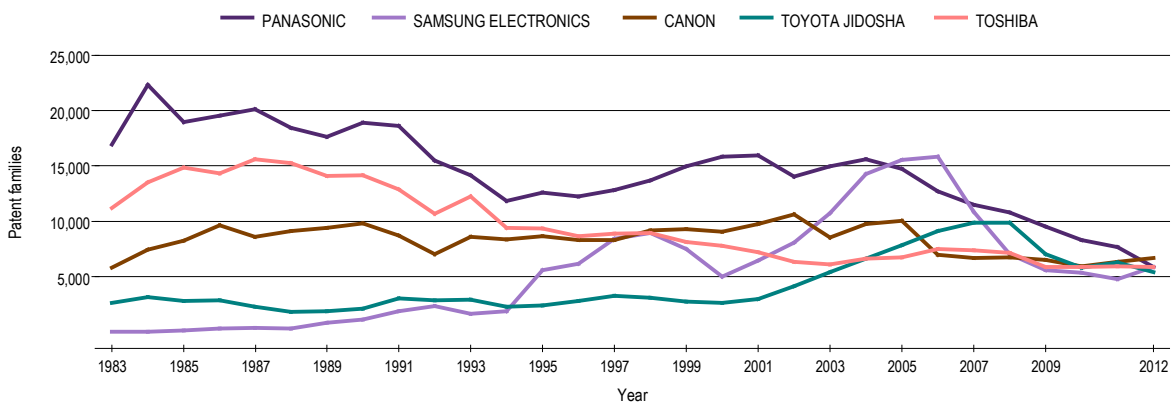
Table 1. Top 100 patent applicants worldwide, 2003-12

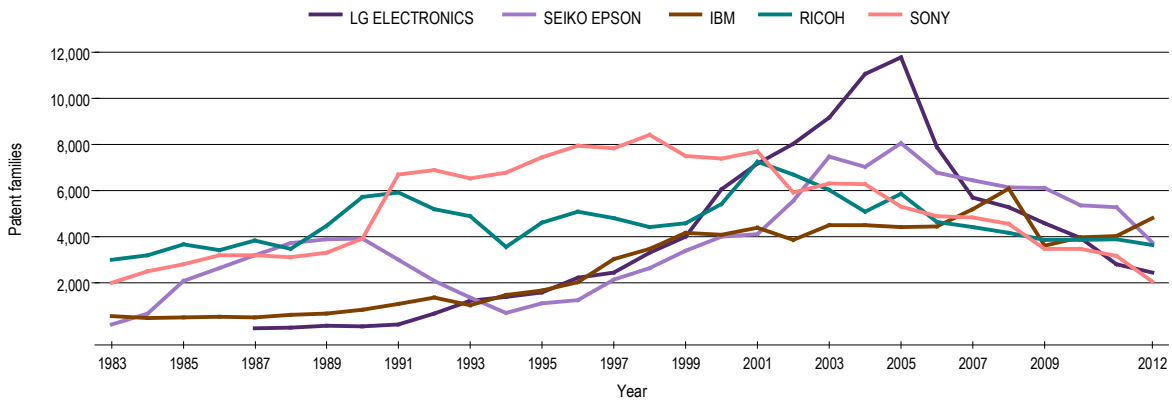
Applicant	Origin	Total number of patent families (2003-12)	Rank 1980s	1990s	2000s
PANASONIC CORPORATION	Japan	111,653	1	1	1
SAMSUNG ELECTRONICS	Republic of Korea	95,852	38	7	2
CANON	Japan	74,193	7	2	3
TOYOTA JIDOSHA	Japan	73,220	15	16	4
TOSHIBA	Japan	65,151	4	3	5
LG ELECTRONICS	Republic of Korea	64,593	80	12	6
SEIKO EPSON	Japan	62,305	16	18	7
INTERNATIONAL BUSINESS MACHINES (IBM)	United States of America	45,473	40	17	8
RICOH	Japan	45,306	8	9	9
SONY	Japan	44,261	9	5	10
SHARP	Japan	43,094	10	14	11
MITSUBISHI ELECTRIC	Japan	42,852	5	8	12
HITACHI LTD	Japan	35,369	3	4	13
DENSO	Japan	34,219	124	27	14
FUJITSU LTD	Japan	33,655	6	10	15
HONDA MOTOR	Japan	33,367	23	24	16
ROBERT BOSCH	Germany	32,227	41	33	17
ZTE CORPORATION	China	31,673	155	144	18
HONGHAI PRECISION INDUSTRY	Taiwan, Province of China	30,848	127	129	19
HYUNDAI MOTOR	Republic of Korea	30,735	90	20	20
HUAWEI TECHNOLOGIES	China	28,726	141	117	21
FUJI XEROX	Japan	27,457	25	28	22
SIEMENS	Germany	26,857	20	21	23
MICROSOFT	United States of America	23,925	104	81	24
FUJIFILM CORP	Japan	23,314	132	165	25
SANYO ELECTRIC	Japan	22,805	14	11	26
HYNIX SEMICONDUCTOR	Republic of Korea	22,797	130	30	27
NEC CORP	Japan	22,178	2	6	28
NISSAN MOTOR	Japan	21,648	18	23	29
NIPPON TELEGRAPH & TELEPHONE	Japan	19,673	13	19	30
DAINIPPON PRINTING	Japan	17,790	34	31	31
HONGFUJIN PRECISION INDUSTRY (SHENZHEN)	China	17,674	159	153	32
DAIMLER	Germany	17,270	58	45	33
KYOCERA CORP	Japan	16,985	54	35	34
GENERAL ELECTRIC	United States of America	16,802	59	84	35
BROTHER IND LTD	Japan	16,447	30	41	36
SAMSUNG SDI CO LTD	Republic of Korea	16,359	115	85	37
SUMITOMO ELECTRIC INDUSTRIES	Japan	15,730	22	36	38
OLYMPUS CORP	Japan	15,236	122	139	39
NIPPON KOGAKU	Japan	14,998	44	34	40
ZHEJIANG UNIVERSITY	China	14,707	96	142	41
KYOCERA MITA CORP	Japan	14,300	139	112	42
KONICA MINOLTA BUSINESS TECH	Japan	14,052	166	166	43
MITSUBISHI HEAVY IND LTD	Japan	14,018	12	15	44
CHINA PETROLEUM & CHEMICAL CORPORATION	China	13,658	103	111	45
QUALCOMM	United States of America	13,611	112	115	46
SAMSUNG ELECTRO MECH	Republic of Korea	13,375	94	99	47
TOPPAN PRINTING	Japan	13,313	46	39	48
BRIDGESTONE	Japan	13,068	47	47	49
KOREA ELECTRONICS TELECOMM	Republic of Korea	12,918	76	58	50

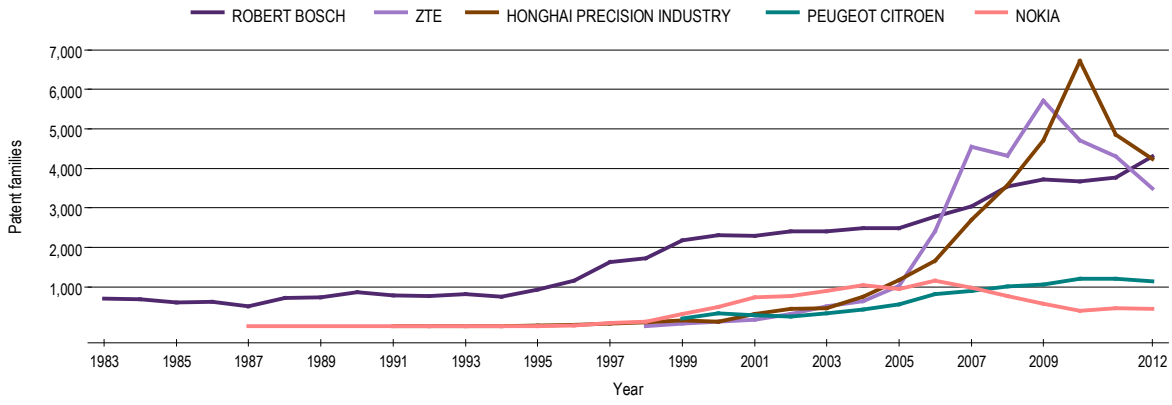
Applicant	Origin	Total number of patent families (2003-12)	Rank 1980s	1990s	2000s
GM GLOBAL TECH OPERATIONS	United States of America	12,585	106	143	51
FUJI PHOTO FILM CO LTD	Japan	11,718	11	13	52
TSINGHUA UNIVERSITY	China	11,633	93	122	53
LG DISPLAY CO LTD	Republic of Korea	11,556	165	164	54
POSCO	Republic of Korea	11,358	107	53	55
CASIO COMPUTER	Japan	11,050	36	38	56
LG INNOTEK	Republic of Korea	10,441	168	168	57
SHANGHAI JIAO TONG UNIVERSITY	China	10,299	109	141	58
JFE STEEL	Japan	10,071	145	126	59
NSK LTD	Japan	10,038	128	94	60
HEWLETT PACKARD DEVELOPMENT	United States of America	10,018	133	80	61
NTN TOYO BEARING	Japan	9,950	82	96	62
TDK CORP	Japan	9,848	55	68	63
INDUSTRY TECHNOLOGY RESEARCH INSTITUTE	Taiwan, Province of China	9,764	85	91	64
OCEAN,S KING LIGHTING SCIENCE & TECHNOLOGY	China	9,698	169	169	65
INTEL	United States of America	9,614	88	48	66
INVENTEC	Taiwan, Province of China	9,553	131	134	67
DAEWOO ELECTRONICS	Republic of Korea	9,376	157	150	68
FUNAI ELECTRIC CO	Japan	9,267	92	97	69
KAO CORP	Japan	9,208	45	43	70
AU OPTRONICS CORP	Taiwan, Province of China	9,154	156	147	71
YAZAKI CORP	Japan	8,985	67	40	72
ARUZE CORP	Japan	8,726	137	109	73
TOSHIBA TEC	Japan	8,684	134	82	74
PEUGEOT CITROEN	France	8,679	150	135	75
DAIKIN IND LTD	Japan	8,661	43	69	76
SUMITOMO WIRING SYSTEMS	Japan	8,180	91	42	77
OKI ELECTRIC IND CO LTD	Japan	8,173	21	32	78
HONEYWELL INTERNATIONAL	United States of America	8,088	75	107	79
SK TELECOM	Republic of Korea	8,052	143	124	80
LG PHILIPS LCD CO LTD	Republic of Korea	7,897	114	86	81
TORAY INDUSTRIES	Japan	7,840	29	37	82
NAT INST OF ADV IND & TECHNOL	Japan	7,765	136	103	83
LG ELECTRONICS (TIANJIN) ELECTRIC APPLIANCE	China	7,765	152	137	84
KIA MOTORS	Republic of Korea	7,681	105	73	85
NOKIA	Finland	7,675	125	106	86
XEROX	United States of America	7,658	65	70	87
JTEKT	Japan	7,640	170	170	88
HYUNDAI MOBIS	Republic of Korea	7,524	154	140	89
CHUGOKU ELECTRIC POWER	Japan	7,472	97	152	90
MAZDA MOTOR	Japan	7,464	19	61	91
SUMITOMO CHEMICAL	Japan	7,445	49	67	92
SANKYO CO	Japan	7,439	73	78	93
INFINEON TECHNOLOGIES	Germany	7,191	119	75	94
NIPPON STEEL	Japan	7,167	17	22	95
YAMAHA	Japan	7,095	60	74	96
VOLKSWAGEN	Germany	7,094	71	72	97
AISIN SEIKI	Japan	7,069	53	66	98
NTT DOCOMO INC	Japan	7,031	140	113	99
HARBIN INSTITUTE OF TECHNOLOGY	China	6,954	164	163	100

Sources: WIPO Statistics Database and EPO PATSTAT database, October 2015.

Figure 3. Trends in patent families for the top 10 applicants and the top applicant from each origin







Sources: WIPO Statistics Database and EPO PATSTAT database, October 2015.

Figure 3 presents the long-term trends in patent families for the top 10 applicants and for the top applicant from each origin. Samsung Electronics saw rapid growth in its patent families from 2000 to 2006. In 2005, it overtook Panasonic to become the top applicant. Similarly, LG Electronics saw fast growth until 2005, when it became the third-largest applicant, but has since seen its filings decrease rapidly. The trends for Toyota and Seiko Epson are similar to that for LG Electronics; however, the decline in filings by Toyota occurred during the 2008 financial crisis.

The number of patent families filed by IBM has remained stable at around 4,000 per year since 1999, except for a sharp increase in 2008. The top Chinese (ZTE) and Taiwanese (Honghai Precision Industry) applicants saw strong growth in their numbers of patent families from 2005 onward. However, since the financial crisis of 2009/10, both have experienced declines. The top German applicant (Robert Bosch) and the only French applicant listed (Peugeot Citroen) both saw continuous upward trends in their numbers of patent families from the early 2000s. Since reaching a peak of 154 patent families in 2006, Nokia of Finland has seen a decline.

Geographical coverage of patent families belonging to the top 100 applicants

As previously mentioned, applicants tend to file first at their national office before seeking protection in other jurisdictions. The decision to seek patent rights beyond domestic borders depends on various factors, such as the business strategy of the applicant and market size, to name a few. It is costly for an applicant to seek protection in a large number of jurisdictions. Therefore, the size of a patent family may provide some indication of its value.

Figure 4 shows the size of patent families belonging to the top 100 applicants. Most include only one office – most likely the applicant's domestic office. However, the share of single-office families has declined from 90% in 1983 to 71% in 2012. In contrast, the shares of other categories (two-office or three-office families and those with more than three offices) have increased. For example, the share of two-office patent families increased from 3% to 13% between 1983 and 2012. This indicates that the number of patent offices covered by inventions has increased over time. It also reflects the internationalization of multinational companies, patenting activities.

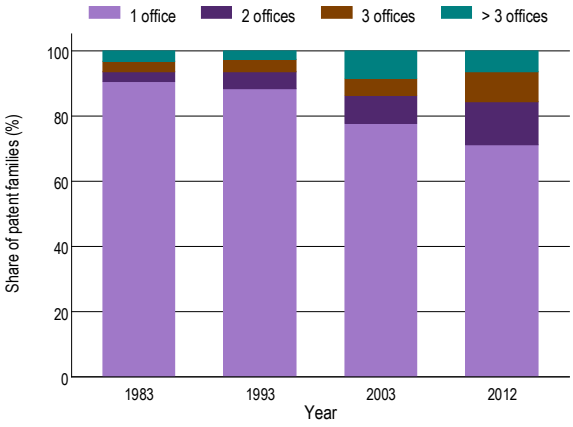
Figure 5 provides data on the size of patent families belonging to the top 100 applicants by applicant origin for the period 2003-12. Chinese applicants have the highest share of single-office families (85%) while German applicants have the lowest (55%). Applicants from Finland, Taiwan, Province of China, and the US have low shares of single-office families. This indicates that patent families from these origins tend to have wider geographical coverage. Finnish and US applicants have the largest shares of patent families with more than five offices, at around 7% each.

Table 2 provides the distribution of patent families by the number of offices for all 100 top applicants, sorted by share of single-office family. German applicant Infineon Technologies had the highest share of patent families with more than one office (69%), followed by General Electric of the US (63%), Honghai Precision Industry of Taiwan, Province of China (63%), and GM Global Tech Operations of the US (62%). One Chinese applicant, Ocean's King Lighting Science & Technology, only had single-office families; most likely all its patent families include its domestic office.

Microsoft, Qualcomm, Canon and Seiko Epson had the largest number of offices included in their patent families. Microsoft had at least one family with a total of 25 offices, followed by Qualcomm and Canon, each with at least one 22-office family, and Seiko Epson with at least one 21-office family.

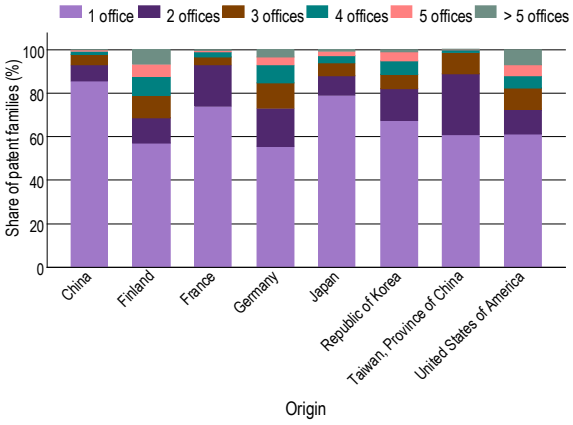
Among Chinese applicants, Petroleum & Chemical Corporation recorded the largest number of offices in a patent family (14). Finland's Nokia had at least one 19-office patent family. France's Peugeot Citroen included at least one 9-office family. Among German top applicants, Siemens had the largest number of offices for a patent family (17). One patent family belonging to LG Electronics and one from Posco of the Republic of Korea each covered 16 offices. Industry Technology Research Institute of Taiwan, Province of China had at least one family covering 9 offices.

Figure 4. Distribution of patent families belonging to the top 100 applicants by number of offices



Sources: WIPO Statistics Database and EPO PATSTAT database, October 2015.

Figure 5. Distribution of patent families belonging to the top 100 applicants by number of offices and applicant origin, 2003-12



Sources: WIPO Statistics Database and EPO PATSTAT database, October 2015.

Table 2. Distribution of patent families belonging to the top 100 applicants, 2003-12

Applicant	Origin	Number of offices						
		1	2	3	4	5	>5	Max.
INFINEON TECHNOLOGIES	Germany	30.8	42.3	20.6	4.0	1.7	0.6	9
GENERAL ELECTRIC	United States of America	36.9	9.0	16.3	18.6	12.5	6.8	18
HONGFUJIN PRECISION INDUSTRY (SHENZHEN)	China	37.2	44.3	15.9	2.1	0.5	0.0	6
GM GLOBAL TECH OPERATIONS	United States of America	38.3	10.9	42.0	6.9	1.4	0.4	10
QUALCOMM	United States of America	42.0	7.4	1.6	2.1	9.9	37.0	22
ROBERT BOSCH	Germany	44.9	17.9	13.6	12.7	6.3	4.5	12
SAMSUNG ELECTRONICS	Republic of Korea	45.8	27.2	10.7	9.7	4.8	1.9	15
SIEMENS	Germany	48.8	19.0	14.2	8.8	4.2	5.0	17
HONEYWELL INTERNATIONAL	United States of America	49.6	21.8	15.9	7.3	2.3	3.1	17
INDUSTRY TECHNOLOGY RESEARCH INSTITUTE	Taiwan, Province of China	50.0	34.3	12.5	2.2	0.6	0.4	9
KOREA ELECTRONICS TELECOMM	Republic of Korea	52.5	42.7	3.3	1.0	0.4	0.2	8
BROTHER IND LTD	Japan	52.8	31.0	8.2	7.3	0.4	0.3	14
HONGHAI PRECISION INDUSTRY	Taiwan, Province of China	54.6	32.2	11.8	1.2	0.2	0.0	6
SAMSUNG ELECTRO MECH	Republic of Korea	57.0	15.6	16.9	7.8	2.2	0.6	8
SAMSUNG SDI CO LTD	Republic of Korea	57.0	16.5	6.3	11.2	8.4	0.6	6
NOKIA	Finland	57.1	11.7	9.9	8.8	5.5	7.1	19
FUJITSU LTD	Japan	58.0	25.7	7.7	4.0	3.6	1.0	10
SONY	Japan	59.0	6.8	15.1	7.2	7.2	4.7	18
AU OPTRONICS CORP	Taiwan, Province of China	60.6	28.4	8.2	2.4	0.4	0.0	5
XEROX	United States of America	61.9	12.8	11.0	6.3	3.5	4.5	11
NTT DOCOMO INC	Japan	65.1	6.0	5.1	12.2	5.3	6.3	15
TOSHIBA	Japan	65.3	21.6	7.1	3.9	1.4	0.8	12
HONDA MOTOR	Japan	65.3	12.7	10.9	6.2	2.6	2.3	15
INTEL	United States of America	67.0	5.2	6.9	7.4	6.9	6.7	14
FUJIFILM CORP	Japan	68.0	17.4	8.4	4.3	1.4	0.6	11
HITACHI LTD	Japan	68.3	15.9	9.8	4.3	1.1	0.6	8
DENSO	Japan	69.4	14.1	9.5	5.4	1.3	0.2	10
HEWLETT PACKARD DEVELOPMENT	United States of America	69.9	13.4	8.4	4.0	2.3	2.0	18
CANON	Japan	70.1	18.6	6.0	3.0	1.8	0.5	22
MICROSOFT	United States of America	71.0	6.8	3.6	2.8	6.3	9.5	25
YAZAKI CORP	Japan	72.2	6.3	7.5	11.3	2.2	0.5	8
AISIN SEIKI	Japan	72.4	6.8	8.9	9.7	1.9	0.3	8
LG ELECTRONICS	Republic of Korea	72.5	9.5	4.9	6.6	3.8	2.7	16
TDK CORP	Japan	72.8	11.9	7.4	4.7	2.2	1.0	10
PEUGEOT CITROEN	France	73.7	19.1	3.9	1.9	0.7	0.7	9
OKI ELECTRIC IND CO LTD	Japan	73.8	16.9	4.8	3.9	0.5	0.0	6
TOSHIBA TEC	Japan	73.9	17.2	7.0	1.6	0.1	0.1	6
OLYMPUS CORP	Japan	74.2	13.1	7.5	4.0	0.9	0.3	9
LG PHILIPS LCD CO LTD	Republic of Korea	74.5	9.4	6.6	5.1	2.2	2.3	8
YAMAHA	Japan	74.8	7.3	7.1	7.6	2.0	1.3	10
FUJI PHOTO FILM CO LTD	Japan	75.1	16.6	5.3	1.6	1.0	0.4	6
SANYO ELECTRIC	Japan	75.5	7.2	7.5	4.9	3.6	1.3	10
INTERNATIONAL BUSINESS MACHINES (IBM)	United States of America	75.6	13.9	4.7	2.9	1.5	1.4	13
LG INNOTEK	Republic of Korea	75.6	5.6	4.5	6.3	5.6	2.4	7
FUNAI ELECTRIC CO	Japan	77.4	12.4	6.6	3.1	0.3	0.2	6
KONICA MINOLTA BUSINESS TECH	Japan	77.5	17.0	3.9	1.6	0.0	0.0	5
HYNIX SEMICONDUCTOR	Republic of Korea	77.6	13.2	4.0	3.0	1.7	0.5	8
NTN TOYO BEARING	Japan	78.3	4.0	6.2	8.6	2.5	0.4	9
SEIKO EPSON	Japan	78.6	9.8	6.4	2.7	1.9	0.6	21
SUMITOMO CHEMICAL	Japan	78.6	4.1	3.0	5.8	3.0	5.4	17

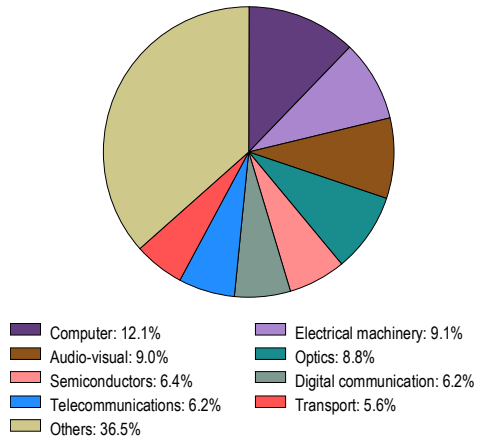
Applicant	Origin	Number of offices						
		1	2	3	4	5	>5	Max.
FUJI XEROX	Japan	78.8	10.4	7.6	2.4	0.6	0.2	14
KIA MOTORS	Republic of Korea	79.3	3.9	4.5	7.0	5.2	0.1	6
LG DISPLAY CO LTD	Republic of Korea	79.9	3.4	8.9	5.1	1.9	0.8	9
MITSUBISHI HEAVY IND LTD	Japan	80.0	3.6	5.1	4.1	4.3	2.9	11
SUMITOMO WIRING SYSTEMS	Japan	80.3	3.9	7.4	6.3	2.0	0.2	7
HUAWEI TECHNOLOGIES	China	80.3	6.4	8.8	2.5	1.1	0.8	11
VOLKSWAGEN	Germany	80.7	12.0	3.1	1.9	1.5	0.7	13
JTEKT	Japan	81.0	1.3	8.0	9.0	0.5	0.1	9
RICOH	Japan	81.2	11.3	4.2	2.1	0.7	0.5	12
CASIO COMPUTER	Japan	82.9	3.1	6.1	2.7	3.4	1.9	8
SHARP	Japan	83.3	3.9	8.4	2.3	1.4	0.6	11
SUMITOMO ELECTRIC INDUSTRIES	Japan	83.7	6.0	3.3	2.7	1.5	2.8	13
NEC CORP	Japan	84.1	6.7	3.1	3.6	1.4	1.1	12
MAZDA MOTOR	Japan	84.4	2.5	7.2	5.7	0.1	0.0	6
DAIKIN IND LTD	Japan	85.0	4.2	1.7	2.3	1.5	5.3	11
PANASONIC CORPORATION	Japan	86.0	5.1	4.0	2.8	1.4	0.7	15
HYUNDAI MOTOR	Republic of Korea	86.0	3.2	3.0	4.0	3.7	0.1	7
TOYOTA JIDOSHA	Japan	86.4	3.0	3.4	4.7	1.8	0.7	17
KYOCERA CORP	Japan	86.6	5.9	3.6	2.6	1.0	0.2	8
DAIMLER	Germany	86.7	4.7	4.2	2.4	1.6	0.4	12
TSINGHUA UNIVERSITY	China	87.7	4.5	5.0	1.4	0.8	0.5	13
NISSAN MOTOR	Japan	88.0	2.7	2.7	3.9	1.9	0.7	10
MITSUBISHI ELECTRIC	Japan	88.4	4.1	3.0	2.9	1.2	0.4	10
ZTE CORPORATION	China	88.5	2.8	5.5	1.8	0.8	0.6	12
KAO CORP	Japan	88.5	1.7	2.9	3.2	1.9	1.9	11
ARUZE CORP	Japan	88.6	2.5	1.8	2.8	1.5	2.8	12
KYOCERA MITA CORP	Japan	88.9	6.1	4.8	0.2	0.0	0.0	5
NIPPON KOGAKU	Japan	89.7	3.6	3.7	2.1	0.5	0.3	10
HYUNDAI MOBIS	Republic of Korea	89.9	7.5	1.7	0.7	0.3	0.0	5
NAT INST OF ADV IND & TECHNOL	Japan	90.1	4.6	2.9	1.1	0.6	0.8	10
BRIDGESTONE	Japan	90.4	0.9	2.2	4.5	1.4	0.6	9
INVENTEC	Taiwan, Province of China	91.8	8.0	0.1	0.0	0.0	0.1	6
NSK LTD	Japan	93.0	1.4	2.1	2.8	0.7	0.0	6
SK TELECOM	Republic of Korea	93.8	1.9	1.9	0.7	0.9	0.7	13
DAINIPPON PRINTING	Japan	95.2	1.8	1.2	1.0	0.7	0.2	8
POSCO	Republic of Korea	95.2	0.9	1.0	0.9	1.1	0.9	16
JFE STEEL	Japan	95.2	0.6	0.5	0.6	0.8	2.3	11
NIPPON STEEL	Japan	95.8	0.6	0.5	0.7	0.5	1.9	12
DAEWOO ELECTRONICS	Republic of Korea	96.7	0.5	0.4	0.2	1.2	0.9	9
CHINA PETROLEUM & CHEMICAL CORPORATION	China	97.0	0.4	0.4	0.9	0.4	0.9	14
TOPPAN PRINTING	Japan	97.4	1.1	0.2	0.5	0.4	0.5	16
TORAY INDUSTRIES	Japan	97.9	0.4	0.1	0.3	0.3	1.0	10
NIPPON TELEGRAPH & TELEPHONE	Japan	98.9	0.1	0.2	0.4	0.2	0.2	8
SHANGHAI JIAO TONG UNIVERSITY	China	99.2	0.4	0.2	0.1	0.0	0.0	8
ZHEJIANG UNIVERSITY	China	99.3	0.5	0.1	0.0	0.0	0.0	7
HARBIN INSTITUTE OF TECHNOLOGY	China	99.4	0.3	0.2	0.1	0.0	0.0	6
CHUGOKU ELECTRIC POWER	Japan	99.8	0.1	0.1	0.0	0.0	0.1	7
SANKYO CO	Japan	99.9	0.0	0.0	0.0	0.0	0.0	4
LG ELECTRONICS (TIANJIN) ELECTRIC APPLIANCE	China	100.0	0.0	0.0	0.0	0.0	0.0	3
OCEAN,S KING LIGHTING SCIENCE & TECHNOLOGY	China	100.0	0.0	0.0	0.0	0.0	0.0	1

Sources: WIPO Statistics Database and EPO PATSTAT database, October 2015.

Fields of technology for the top 100 applicants

Figure 6 shows the distribution by field of technology of patent families belonging to the top 100 applicants in the 2000s. The top eight fields accounted for 63% of all of these patent families combined. Computer technology accounted for the largest share (12%), followed by electrical machinery (9%), audio-visual (9%) and optics (8.8%). The distribution of patent families by field of technology has remained more or less stable between the 1990s and the 2000s. Among the top eight fields, digital communication saw its share of the total increase the most, while audio-visual recorded the sharpest decline.

Figure 6. Distribution of patent families belonging to the top 100 applicants by field of technology, 2003-12



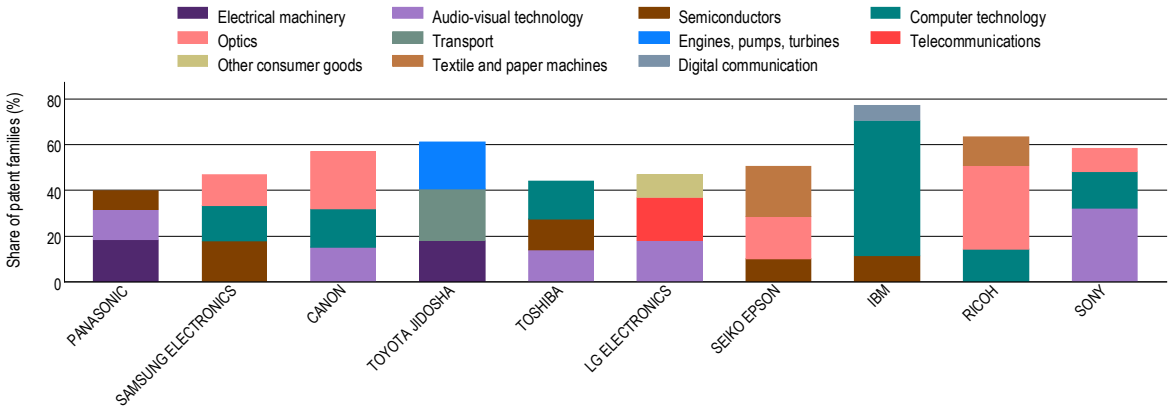
Sources: WIPO Statistics Database and EPO PATSTAT database, October 2015.

Figure 7 presents the top three technology fields for each top 10 applicant. The combined share of the top three fields ranged from 77% of all IBM,s patent families to 40% of Panasonic's. Computer technology accounted for two-thirds of IBM,s patent families. Optics accounted for the largest share of Ricoh's patent families. Transport accounted for a large share of all Toyota's patent families, while Sony's largest was in audio-visual technology. Computer technology appears as one of the three top fields of technology for six of the top ten applicants. Audio-visual, optics and semiconductors each feature among the top three fields for five of them.

Table 3 shows the main fields of technology for the top 100 applicants over the period 2003-12 sorted by share of main fields of technology. Optics was the main field for 15 of these applicants, followed by computer technology (13 applicants), transport (13) and electrical machinery (11). For Microsoft, computer technology was the main field of technology, while Chinese telecom giants Huawei Technologies and ZTE tended to focus on digital communication. Transport was the most important field of technology for Hyundai Mobis, while semiconductors accounted for the largest share of all of Hynix Semiconductor's patent families.

Almost all patent families belonging to Sankyo and Aruze were associated with furniture and games. In contrast, measurement accounted for around a tenth of all patent families created by three Chinese universities – Zhejiang University, Tsinghua University and Shanghai Jiao Tong University. The main field of technology accounted for more than half of the patent families of 19 of the top 100 applicants.

Figure 7. Top three technology fields for each top 10 applicant, 2003-12



Sources: WIPO Statistics Database and EPO PATSTAT database, October 2015.

Table 3. The main field of technology for each of the top 100 applicants, 2003-12

Applicant	Origin	Main field of technology	Total patent families (2003-12)	Main field share of total (%)
SANKYO CO	Japan	Furniture, games	7,454	95.5
ARUZE CORP	Japan	Furniture, games	8,741	89.3
LG PHILIPS LCD CO LTD	Republic of Korea	Optics	7,898	70.9
HYNIX SEMICONDUCTOR	Republic of Korea	Semiconductors	22,804	69.5
MICROSOFT	United States of America	Computer technology	24,006	69.1
HYUNDAI MOBIS	Republic of Korea	Transport	7,547	64.4
SUMITOMO WIRING SYSTEMS	Japan	Electrical machinery, apparatus, energy	8,200	63.9
SAMSUNG SDI CO LTD	Republic of Korea	Electrical machinery, apparatus, energy	16,367	63.8
HUAWEI TECHNOLOGIES	China	Digital communication	32,199	63.2
ZTE CORPORATION	China	Digital communication	32,329	62.6
NTN TOYO BEARING	Japan	Mechanical elements	9,965	61.8
INTERNATIONAL BUSINESS MACHINES (IBM)	United States of America	Computer technology	45,566	59.3
FUNAI ELECTRIC CO	Japan	Audio-visual technology	9,289	56.1
NSK LTD	Japan	Mechanical elements	10,054	55.2
INVENTEC	Taiwan, Province of China	Computer technology	9,565	53.8
OCEAN,S KING LIGHTING SCIENCE & TECHNOLOGY	China	Electrical machinery, apparatus, energy	9,924	53.1
KIA MOTORS	Republic of Korea	Transport	7,704	52.4
YAZAKI CORP	Japan	Electrical machinery, apparatus, energy	9,012	52.2
KONICA MINOLTA BUSINESS TECH	Japan	Optics	14,064	50.3
PEUGEOT CITROEN	France	Transport	8,688	49.5
LG DISPLAY CO LTD	Republic of Korea	Optics	11,554	47.5
KYOCERA MITA CORP	Japan	Optics	14,304	47.2
DAIKIN IND LTD	Japan	Thermal processes and apparatus	8,796	47.2
HYUNDAI MOTOR	Republic of Korea	Transport	30,746	46.8
MAZDA MOTOR	Japan	Transport	7,469	45.5
JTEKT	Japan	Mechanical elements	7,654	44.8
VOLKSWAGEN	Germany	Transport	7,148	43.9
SK TELECOM	Republic of Korea	Digital communication	8,083	43.9
QUALCOMM	United States of America	Digital communication	14,628	41.7
DAIMLER	Germany	Transport	17,388	41.4
INTEL	United States of America	Computer technology	11,674	40.1
HEWLETT PACKARD DEVELOPMENT	United States of America	Computer technology	13,345	39.6
NTT DOCOMO INC	Japan	Digital communication	7,073	38.9
DAEWOO ELECTRONICS	Republic of Korea	Audio-visual technology	9,391	38.7
LG ELECTRONICS (TIANJIN) ELECTRIC APPLIANCE	China	Thermal processes and apparatus	7,790	38.5
FUJI XEROX	Japan	Optics	27,455	37.4
NIPPON KOGAKU	Japan	Optics	15,122	37.4
POSCO	Republic of Korea	Materials, metallurgy	11,421	36.8
RICOH	Japan	Optics	45,301	36.4
INFINEON TECHNOLOGIES	Germany	Semiconductors	7,326	36.1
AU OPTRONICS CORP	Taiwan, Province of China	Optics	9,161	35.7
BRIDGESTONE	Japan	Transport	13,169	35.1
JFE STEEL	Japan	Materials, metallurgy	10,165	34.7
TDK CORP	Japan	Electrical machinery, apparatus, energy	9,864	34.2
NOKIA	Finland	Digital communication	10,900	33.4
GM GLOBAL TECH OPERATIONS	United States of America	Transport	12,741	33.4
YAMAHA	Japan	Other consumer goods	7,113	33.4
SONY	Japan	Audio-visual technology	44,341	32.0
CHUGOKU ELECTRIC POWER	Japan	Electrical machinery, apparatus, energy	7,521	30.4
NEC CORP	Japan	Computer technology	22,319	30.4

Applicant	Origin	Main field of technology	Total patent families (2003-12)	Main field share of total (%)
BROTHER IND LTD	Japan	Textile and paper machines	16,456	30.1
HONDA MOTOR	Japan	Transport	33,660	29.9
LG INNOTEK	Republic of Korea	Semiconductors	10,459	29.4
NIPPON STEEL	Japan	Materials, metallurgy	7,232	29.1
FUJITSU LTD	Japan	Computer technology	39,969	28.0
XEROX	United States of America	Optics	7,674	26.7
SUMITOMO ELECTRIC INDUSTRIES	Japan	Electrical machinery, apparatus, energy	15,797	26.5
NISSAN MOTOR	Japan	Transport	21,665	26.4
FUJI PHOTO FILM CO LTD	Japan	Optics	11,721	26.3
SAMSUNG ELECTRO MECH	Republic of Korea	Audio-visual technology	13,378	26.3
KOREA ELECTRONICS TELECOMM	Republic of Korea	Digital communication	12,962	25.9
CANON	Japan	Optics	74,359	25.3
NIPPON TELEGRAPH & TELEPHONE	Japan	Computer technology	19,691	25.1
CHINA PETROLEUM & CHEMICAL CORPORATION	China	Basic materials chemistry	13,679	25.1
OLYMPUS CORP	Japan	Optics	15,379	24.2
AISIN SEIKI	Japan	Transport	7,113	24.0
MITSUBISHI HEAVY IND LTD	Japan	Engines, pumps, turbines	14,426	23.9
TOYOTA JIDOSHA	Japan	Transport	77,598	22.8
HITACHI LTD	Japan	Computer technology	37,550	22.5
CASIO COMPUTER	Japan	Audio-visual technology	11,064	22.1
SEIKO EPSON	Japan	Textile and paper machines	62,326	21.9
GENERAL ELECTRIC	United States of America	Engines, pumps, turbines	17,189	21.9
HONGFUJIN PRECISION INDUSTRY (SHENZHEN)	China	Computer technology	17,676	21.1
KYOCERA CORP	Japan	Telecommunications	17,050	20.4
HONGHAI PRECISION INDUSTRY	Taiwan, Province of China	Computer technology	30,852	20.0
ROBERT BOSCH	Germany	Engines, pumps, turbines	32,589	20.0
TORAY INDUSTRIES	Japan	Textile and paper machines	7,878	19.7
SANYO ELECTRIC	Japan	Electrical machinery, apparatus, energy	22,973	19.6
FUJIFILM CORP	Japan	Optics	23,377	19.5
TOSHIBA TEC	Japan	Computer technology	8,692	18.7
KAO CORP	Japan	Organic fine chemistry	9,240	18.7
LG ELECTRONICS	Republic of Korea	Telecommunications	67,390	18.7
TOPPAN PRINTING	Japan	Optics	13,318	18.6
PANASONIC CORPORATION	Japan	Electrical machinery, apparatus, energy	113,060	18.1
DENSO	Japan	Engines, pumps, turbines	34,230	18.1
SAMSUNG ELECTRONICS	Republic of Korea	Semiconductors	96,159	17.5
OKI ELECTRIC IND CO LTD	Japan	Control	8,178	17.1
SHARP	Japan	Audio-visual technology	43,148	16.9
SIEMENS	Germany	Electrical machinery, apparatus, energy	29,300	16.7
TOSHIBA	Japan	Computer technology	65,742	16.6
HONEYWELL INTERNATIONAL	United States of America	Measurement	8,544	16.6
SUMITOMO CHEMICAL	Japan	Macromolecular chemistry, polymers	7,505	16.4
MITSUBISHI ELECTRIC	Japan	Electrical machinery, apparatus, energy	47,329	15.7
HARBIN INSTITUTE OF TECHNOLOGY	China	Measurement	6,983	14.1
DAINIPPON PRINTING	Japan	Optics	17,814	13.3
INDUSTRY TECHNOLOGY RESEARCH INSTITUTE	Taiwan, Province of China	Semiconductors	9,796	12.7
NAT INST OF ADV IND & TECHNOL	Japan	Measurement	7,800	12.4
ZHEJIANG UNIVERSITY	China	Measurement	14,722	11.6
TSINGHUA UNIVERSITY	China	Measurement	11,679	11.0
SHANGHAI JIAO TONG UNIVERSITY	China	Measurement	10,308	9.8

Sources: WIPO Statistics Database and EPO PATSTAT database, October 2015.

Conclusion

The number of patent families belonging to the top 100 applicants grew sharply between 1994 and 2005. Since peaking at 231,000 in 2005, the total has followed a downward trend. This resulted in part from a sharp decline in filings by Samsung Electronics, LG Electronics and Panasonic.

Most of the top 100 applicants are Japanese. However, their combined share has declined over the decades, while those held by applicants from China, the Republic of Korea and the US have increased.

The top 100 applicants are mainly multinational companies. However, the list includes four Chinese universities. Most of the listed applicants are active in the ICT, electrical machinery and transport sectors. The top applicant list does not include any biotechnology or pharmaceutical companies.

The average number of offices included in patent families has increased over time, reflecting an internationalization of patenting activity.

Patent families of the top 100 applicants are concentrated in a small number of technological fields. The top eight fields accounted for 63% of all of their patent families combined. Computer technology (12%) recorded the largest share, followed by electrical machinery (9%), audio-visual (9%) and optics (8.8%).

Optics was the main field of technology for 15 of the top 100 applicants, followed by computer technology (13), transport (13) and electrical machinery (11).