

The Changing Geography of the PCT System

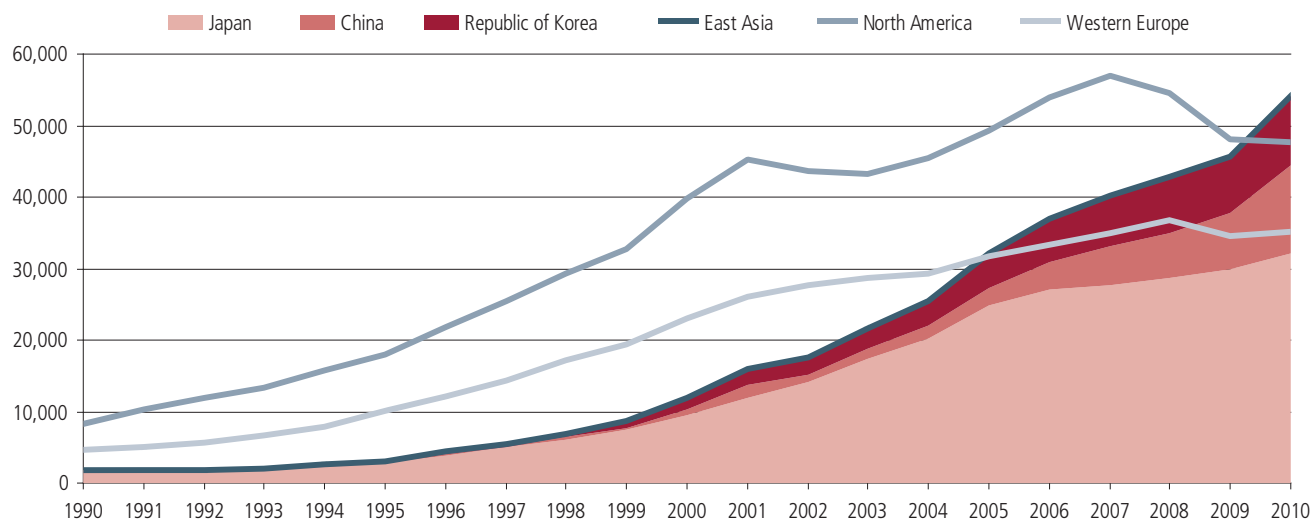
The face of the world economy has changed much over the past two decades. Led by China and other Asian economies, several middle income countries have grown at a persistently faster pace than have high income countries. Their share of the global output has correspondingly increased. The recent financial and economic crisis has only accelerated this trend; high income countries have experienced sharper declines and weaker recoveries than the group of fast-growing middle income countries.

This Note discusses how the shift in the world economy has shaped the geography of the PCT system. To a significant extent, this is a story about the rise of East Asia. However, economic forces can only partly explain the evolution of filings via the PCT system, and several considerations provide a more nuanced view of East Asia's ascendancy.

East Asia has become the main PCT filer

Until recently, the PCT system was mainly used by applicants from North America and Western Europe. In 2010, East Asia overtook them to become the subregion accounting for the most PCT filings (see figure 1). Indeed, since the economic recovery that followed the dot-com recession, the major East Asian filers – China, Japan and the Republic of Korea – experienced particularly rapid growth in applications. They continued to increase their filings even during and after the most recent economic downturn – unlike North America and Western Europe. From 2002 to 2010, the average annual growth rate of East Asia was 15.1%, compared to 1.1% for North America and 3.1% for Western Europe.

Figure 1: PCT filing trends



Source: WIPO Statistics Database

Rise of East Asia reflected in economic fundamentals, but not fully

Economic fundamentals can, to some degree, explain why East Asia has emerged as the main PCT filer. Table 1 presents selected countries' shares of total PCT filings, their shares of global gross domestic product (GDP) and of worldwide research and development expenditure (R&D) for 1998 and 2008.

Table 1: PCT filings, GDP and R&D expenditure (%)

Countries	Income Group		PCT Filings		GDP		R&D expenditure	
	Type	Ranking	2008	1998	2008	1998	2008	1998
United States of America	High	1	31,63	41,68	20,30	23,12	33,47	38,63
Japan	High	2	17,62	9,10	6,16	7,99	12,61	15,46
Germany	High	3	11,55	14,03	4,27	5,39	6,79	7,86
Republic of Korea	High	4	4,84	0,76	1,91	1,68	3,82	2,53
France	High	5	4,33	4,79	3,02	3,63	3,80	5,01
China	Middle	1	3,75	0,52	11,66	6,53	10,20	2,74
India	Middle	2	0,66	0,02	4,91	3,65	2,23	1,67
Russian Federation	Middle	3	0,47	0,59	3,23	2,44	2,00	1,49
Brazil	Middle	4	0,29	0,17	2,83	2,98	1,80	1,66
Turkey	Middle	5	0,24	0,05	1,36	1,37	0,59	0,33
All others			24,62	28,29	40,34	41,21	22,68	22,61

Source: WIPO Statistics Database

Note: Data on GDP and on R&D expenditure are in purchasing power parity US dollars. The top five ranking of high income and middle income economies is based on 2008 PCT filings. Worldwide R&D expenditure is a WIPO estimate based on 76 countries.

In the case of China and the Republic of Korea, rising PCT share went hand in hand with growing GDP and R&D shares. However, there is no one-to-one correspondence. For example, the Republic of Korea saw a 4 percentage point increase in its PCT share, but only a modest increase in its R&D share. Vice versa, China saw a quadrupling of its R&D share, but a smaller increase in its PCT share – though China has, since 2008, overtaken the Republic

of Korea in PCT filings. Comparing the two countries suggests that once an economy reaches a particular threshold level of technological development, PCT use grows over-proportionately; the Republic of Korea appears to have reached that level earlier, but China is catching up quickly.*

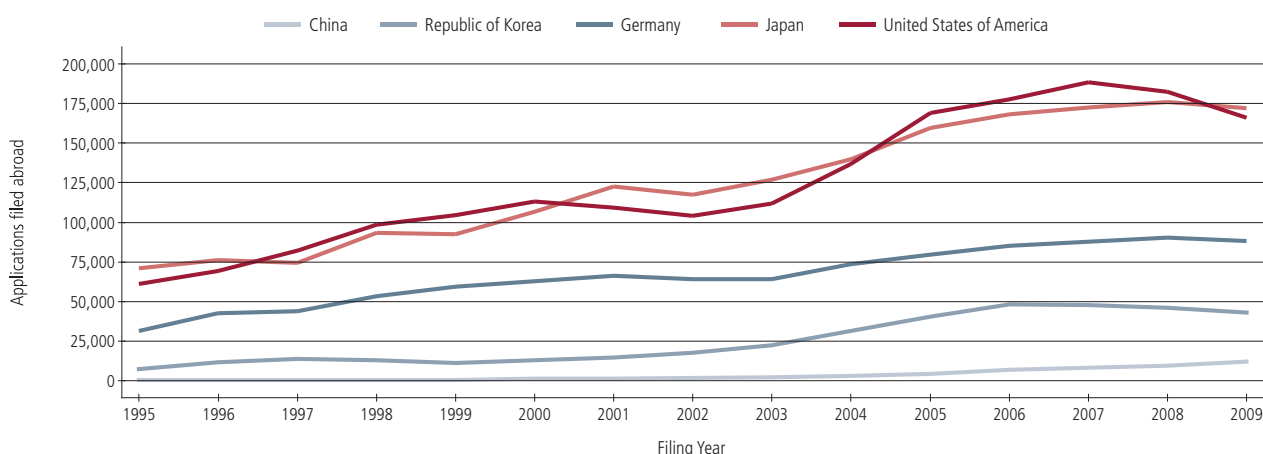
Japan stands out in that its share of global output and worldwide R&D expenditure fell, but its share of PCT filings almost doubled from 9.10% in 1998 to 17.6% in 2008. This is in contrast to the US, Germany and France which saw declining shares for all three performance measures. Japan's experience thus demonstrates that strategic decision-making can have a more pronounced impact on PCT use than that predicted by economic fundamentals.

East Asia's rise in global patenting emerged earlier

Looking beyond the PCT system, East Asia already overtook Western Europe in 1977 as the subregion in which patent offices received the most applications. At that time, Japan accounted for the bulk of them; a decade later, filings in the Republic of Korea picked up and, some time in the 1990s, applications in China started to grow rapidly. In 2009, the number of patents filed in East Asia (834,703) exceeded the number at all offices in North America (496,285) and Western Europe (224,017) combined.

In 1995, East Asia also emerged as the region of origin of most patents filed in foreign countries. However, East Asia's dominance is less pronounced for these so-called filings abroad when taken in the context of total patents filed by the region. In particular, filings abroad by Japanese and US residents are similar in magnitude; filings abroad by Chinese residents are still few in number – though growing rapidly – especially compared to China's share of global GDP (see figure 2).

Figure 2: Trends in patent applications filed abroad



Source: WIPO Statistics Database

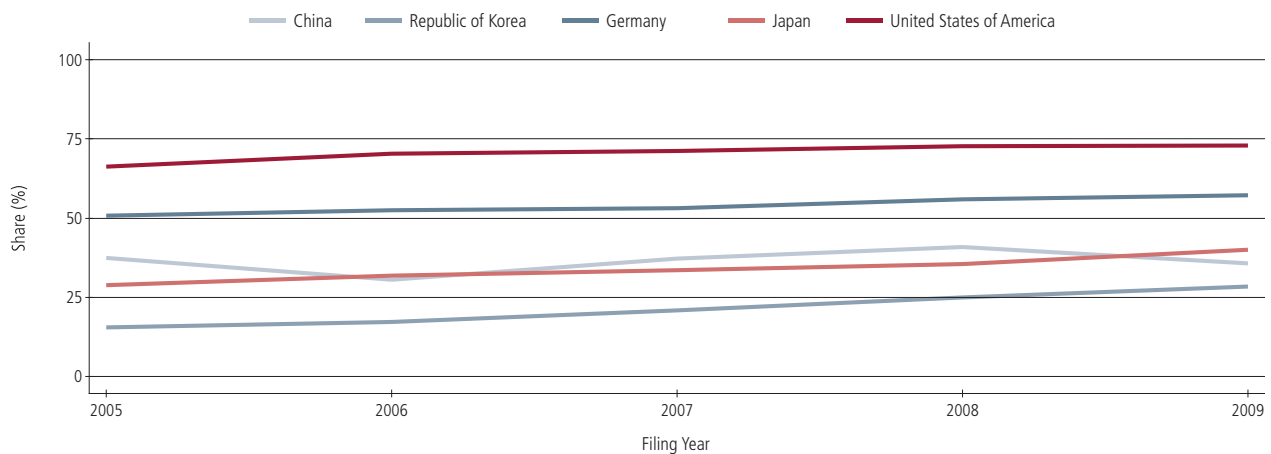
Note: Data are missing for some origins. The year 2009 is based on estimates.

Countries' use of the PCT system differs

As shown above, East Asia emerged as the subregion accounting for the most PCT filings in 2010, but had already become the region of origin of most patents filed in foreign countries in 1995. This suggests that East Asian applicants have relied less on the PCT system for their filings abroad than have applicants from other regions, and more on the so-called Paris route. This is, indeed, borne out by the data. Figure 3 shows the share of PCT national phase entries out of countries' total filings abroad from 2005 to 2009. For the Republic of Korea, China and Japan, this share remained below 50 percent, whereas it remained above that level for the US (73%) and Germany (57%). However, use of the PCT system has increased markedly for the Republic of Korea and Japan in recent years.

* The fact that the PCT shares of high income countries exceed their GDP shares supports the view that a threshold level for intensive use of the PCT system exists.

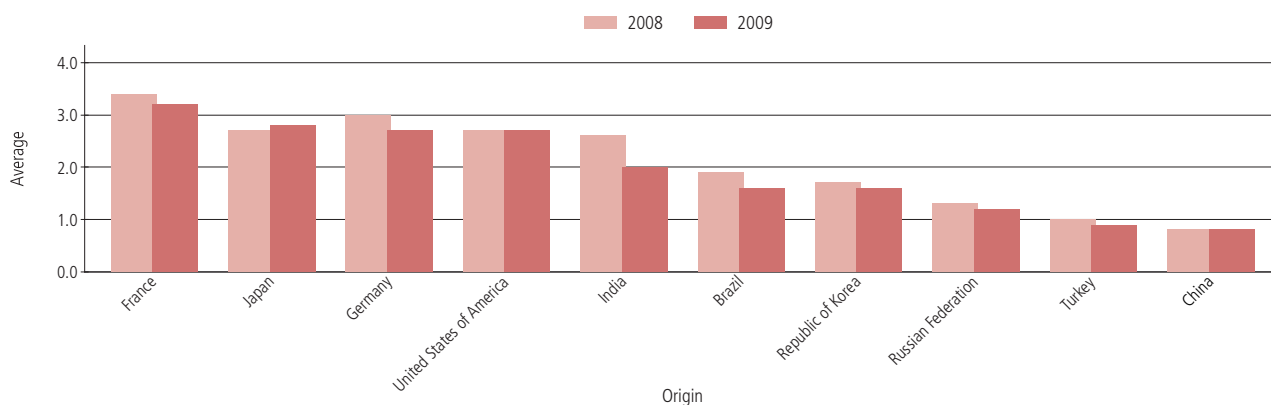
Figure 3: Share of PCT national phase entries out of total filings abroad



Source: WIPO Statistics Database

There are also important differences in the extent to which PCT filings later become national phase entries. Figure 4 shows that there are more than 2.5 national phase entries per PCT filing for Japan, Germany and the US; for the Republic of Korea, this number stands at around 1.5; and for China it falls to below 1 – smaller than several other middle income countries. To put these numbers into perspective, US applicants in 2009 accounted for 6 times as many PCT filings but 27 times as many PCT national phase entries as did Chinese applicants. The following factors might explain why middle income countries, and especially China, showed far fewer national phase entries per PCT filing: applicants may have commercial interests in fewer countries; they may be deterred by the costs of proceeding with national phase entry; or they may have less experience in drafting applications leading therefore to more dropouts.

Figure 4: Number of PCT national phase entries per PCT application



Source: WIPO Statistics Database

Note: PCT national phase entries are compared with PCT applications filed 12 months earlier. PCT national phase entry at a regional patent office may result in several national patents. Thus, the number of national jurisdictions in which applicants seek protection is invariably higher than the number of national phase entries.

What might happen in the coming years?

Fundamental economic forces will continue to shape the geography of the PCT system. Reflecting current economic forecasts, this heralds growing dominance by Asia. Even though East Asia alone already accounts for more filings than any other subregion, there remains additional growth potential. East Asian countries still rely less on the PCT system for their filings abroad than do the US and Germany. China's participation in the PCT system is still relatively young. As China's economy further develops and applicants gain experience with the international patent system, its PCT filings may well generate more national phase entries.

Beyond the three dominant East Asian countries, other Asian economies might reach the threshold level of technological development at which more intensive patenting sets in. The 36.6 percent growth in India's PCT filings in 2010 points in that direction, though it remains to be seen whether such fast growth will persist.