

Benchmarking IP Creation in the Asia Pacific

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Patent Output in Asia Pacific

| | USPTO Patents 1980-2004 | EPO Patents 1980-2004 | USPTO Patents 2005 | USPTO Patents 2005 per million Population |
|-------------------------------|----------------------------|--------------------------|-----------------------|--|
| Japan | 561,410 | 129,683 | 32243 | 253.1 |
| South Korea | 36,482 | 2,050 | 4696 | 96.5 |
| Taiwan | 58,950 | 734 | 6172 | 269.6 |
| Hong Kong | 6,474 | 270 | 489 | 70.9 |
| Singapore | 3,433 | 417 | 466 | 105.3 |
| Malaysia | 773 | 79 | 129 | 5.4 |
| Thailand | 488 | 50 | 38 | 0.6 |
| Indonesia | 226 | 45 | 27 | 0.1 |
| Philippines | 366 | 6 | 26 | 0.3 |
| Vietnam | 23 | 5 | 6 | 0.1 |
| China | 4,125 | 417 | 963 | 0.7 |
| India | 2,510 | 423 | 519 | 0.5 |
| Pakistan | 48 | 0 | 6 | 0.0 |
| Bangladesh | 7 | 0 | 1 | 0.0 |
| Sri Lanka | 56 | 15 | 4 | 0.2 |
| Australia | 16,252 | 3,590 | 1160 | 57.7 |
| New Zealand | 2,480 | 465 | 162 | 40.1 |
| Asia Pacific | 692,598 | 138,042 | 47,107 | - |
| WORLD TOTAL | 2,908,728 | 684,174 | 157740 | - |
| Asia Pacific Share (%) | 23.8 | 20.2 | 29.9 | - |
| USA | 1,626,789 | | 85,129 | 287.9 |
| Germany | 214,211 | | 10,423 | 126.4 |
| Ireland | 2,338 | | 206 | 51.3 |

Growth in Asia Pacific Patent Output



| | 1985 | 1995 | 2005 | Growth 78-95 | Growth 96-05 |
|-------------------------------|---------------|----------------|----------------|--------------|--------------|
| Japan | 13,398 | 23,142 | 32,243 | 7.1 | 3.2 |
| South Korea | 50 | 1,265 | 4,696 | 42.7 | 12.7 |
| Taiwan | 202 | 2,143 | 6,172 | 33.9 | 10.7 |
| Hong Kong | 73 | 276 | 489 | 13.9 | 6.7 |
| Singapore | 14 | 81 | 466 | 16.5 | 15.9 |
| Malaysia | 4 | 11 | 129 | 15.2 | 18.0 |
| Thailand | 1 | 10 | 38 | 11.8 | 13.7 |
| Indonesia | 3 | 8 | 27 | 16.5 | 20.6 |
| Philippines | 6 | 5 | 26 | 3.1 | 11.2 |
| China | 2 | 91 | 963 | 25.2 | 32.2 |
| India | 14 | 64 | 519 | 7.8 | 26.6 |
| Australia | 430 | 584 | 1,160 | 3.5 | 7.4 |
| New Zealand | 51 | 62 | 162 | 1.6 | 7.4 |
| Asia Pacific | 13,463 | 25,740 | 47,107 | | |
| WORLD TOTAL | 77,273 | 113,955 | 157,740 | | |
| Asia Pacific Share (%) | 17.4 | 22.6 | 29.9 | | |
| USA | 43,669 | 65,285 | 85,129 | 2.2 | 2.1 |
| Germany | 6,969 | 7,206 | 10,423 | 6.6 | 3.7 |
| Ireland | 32 | 76 | 206 | 13.4 | 7.1 |

- Share of Asia Pacific in world's patents has increased over the years
- Growth rates in the developed economies of Japan, Australia and NZ are relatively low, similar to those in USA and Germany
- High growth in patenting output in the East Asian NIEs, particularly in the 1990s
- In more recent years, the fastest growth rates are observed in the emerging economies of China and India

Quality of Asia Pacific Patents: Relative Citation Index

| | Relative Citation Index | | |
|-------------|-------------------------|-----------|-----------|
| | 1978-1985 | 1986-1995 | 1996-2004 |
| Japan | 1.02 | 0.94 | 0.91 |
| South Korea | 0.83 | 0.77 | 0.74 |
| Taiwan | 0.76 | 0.76 | 0.79 |
| Hong Kong | 0.73 | 0.56 | 0.69 |
| Singapore | 0.67 | 1.08 | 0.94 |
| Malaysia | 0.72 | 0.88 | 0.71 |
| Thailand | 1.24 | 0.75 | 0.56 |
| China | 0.85 | 0.86 | 0.41 |
| India | 0.84 | 0.92 | 0.49 |
| Australia | 0.81 | 0.78 | 0.70 |
| New Zealand | 0.70 | 0.61 | 0.56 |
| USA | 1.08 | 1.15 | 1.21 |
| Germany | 0.79 | 0.69 | 0.62 |
| Ireland | 0.91 | 1.20 | 0.89 |
| Israel | 1.10 | 1.12 | 1.06 |

- The propensity of a patent to be cited by other patents as prior art is one possible indicator of the quality of the patent
- **Relative Citation Index** is measured as:

Share of Citations received by an economy's patents in Citations Received by World's Patents

 Share of an economy's patents in World's Total Patents

- Higher values of the **Relative Citation Index** indicate higher quality of an economy's patents
- Patent quality in Asia Pacific, as proxies by patents citations, have **generally decreased** over time, except in Singapore, Indonesia and Taiwan
- Patent quality is highest in the Asian NIEs and lowest in the emerging economies

Impact of Asia Pacific Patents: Highly Cited Patents



| | Share of each economy in World's top 5% highly cited patents | | | Technological Impact Index | | |
|-------------|--|-----------|-----------|----------------------------|-----------|-----------|
| | 1978-1985 | 1986-1995 | 1996-2004 | 1978-1985 | 1986-1995 | 1996-2004 |
| Japan | 11.233 | 15.141 | 16.487 | 0.870 | 0.704 | 0.787 |
| South Korea | 0.027 | 0.262 | 1.649 | 1.155 | 0.525 | 0.744 |
| Taiwan | 0.043 | 0.517 | 2.993 | 0.415 | 0.547 | 1.049 |
| Hong Kong | 0.055 | 0.045 | 0.162 | 1.409 | 0.664 | 1.128 |
| Singapore | 0.000 | 0.039 | 0.369 | 0.000 | 1.099 | 1.780 |
| Malaysia | 0.000 | 0.009 | 0.037 | 0.000 | 0.922 | 0.928 |
| Thailand | 0.003 | 0.002 | 0.012 | 1.751 | 0.400 | 0.581 |
| China | 0.000 | 0.049 | 0.146 | 0.000 | 0.807 | 0.816 |
| India | 0.030 | 0.036 | 0.087 | 1.196 | 0.989 | 0.583 |
| Australia | 0.302 | 0.333 | 0.394 | 0.671 | 0.671 | 0.709 |
| New Zealand | 0.037 | 0.024 | 0.048 | 0.569 | 0.418 | 0.540 |
| USA | 72.876 | 73.432 | 69.087 | 1.21 | 1.36 | 1.27 |
| Germany | 4.732 | 2.979 | 3.054 | 0.50 | 0.36 | 0.44 |
| Ireland | 0.034 | 0.094 | 0.103 | 1.09 | 1.49 | 1.00 |
| Israel | 0.244 | 0.449 | 0.787 | 1.18 | 1.23 | 1.24 |

- The top 5% most highly cited patents (the patents that are cited by the highest number of other patents as prior art) are identified within each technology category and year of grant
- **Technological Impact Index** for an economy is measured as:

Share in the World's top 5% most highly cited patents

Share in World's Total Patents

- **Technology Impact is generally highest in the Asian NIEs.**
- **Largest improvement in the Technological Impact Index in Taiwan and especially Singapore with an Index in 1996-2004 higher than USA, Ireland and Israel.**