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**ASIA PACIFIC INTELLECTUAL PROPERTY SCORECARD 2005:  
*BENCHMARKING IP PRODUCTION AND QUALITY IN THE ASIA  
PACIFIC ECONOMIES***

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**EXECUTIVE SUMMARY**

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## A. Introduction

From licensing intellectual properties created in the advanced western economies and Japan, the newly industrializing and other emerging economies in the Asia-Pacific region are shifting towards rapidly increasing their own IP creation.

Recognising this, the IP Academy has funded a research project carried out by the NUS Entrepreneurship Centre to develop a set of comprehensive indicators to benchmark and track annually the pattern of IP creation among 17 Asia-Pacific economies.

Using data on Asia Pacific-invented patents granted by the US Patents and Trademark Office (USPTO), we analyse and rank the Asia Pacific economies in terms of salient indicators of national performance in producing IP-protected assets and the quality of these IP assets.

## B. IP Output in Asia Pacific

The number of patents invented in the Asia Pacific economies has been rising over the years. In 1995, patents from this region accounted for 24.3% of total patents (and 25.4% of utility patents) granted by the USPTO; this has risen to 29.7% (30.2% for utility patents) in 2005. If Japan is excluded, the Asia Pacific region's share of world patenting has doubled from 4% (3.7% for utility patents) in 1995 to 9.2% (8.3% for utility patents) in 2005.

The growth rates in patenting output vary considerably among the different economies. Growth is relatively slow in Hong Kong and the developed economies of Japan, Australia and New Zealand; these countries recorded single-digit average growth rates in almost all time periods. The East Asian NIEs of Korea, Taiwan and Singapore exhibit very high growth rates, particularly in the 1990s, when annual growth often exceeded 20%. In recent years, India and China have emerged as the economies with the fastest patents growth. In the period 2000-2005, patents invented in these emerging economies grew at an average rate of between 15-18%.

By the mid-2000s, Korea and Singapore have achieved level of patenting propensities comparable to those of many OECD countries (more than 10 patents per 100,000 population). Taiwan had attained this in the mid 1990's, and in the post 2000 period, boasts patenting intensity of more than 25 patents per 100,000 population. This ranks Taiwan among the economies with the highest patenting propensities in the world, rivalling the US and Norway.

## C. Quality and Impact of Patents in Asia Pacific

The propensity of a patent to be cited by other patents as prior art is one possible indicator of the quality of the patent. The **Relative Citation Index** measures relative patent quality as the share of patents *citations* received by each economy relative to its share of total world patent output. Among the Asia Pacific economies, patent quality is highest in the Asian NIEs, followed by the Oceania economies and the ASEAN economies and lowest in the emerging economies of China and India.

A second measure of Patent Quality is the **Technology Impact Index**, measuring the proportion of patents that are influential and high-impact in that they are among the top 5% most highly cited patents in their respective technology classes. Technology Impact is generally found

to be highest in the East Asian NIEs, at levels comparable to many OECD economies. All the East Asian NIEs have recorded improvement in the Technology Impact Index. Significantly, Singapore's Index value since the mid 1990s has been higher than many of the OECD countries, including the USA and Israel.

#### **D. Composition of Asia Pacific Patents**

The technological composition of patents differs considerably across the Asia Pacific economies, with several countries having high degree of specialization with large proportions of their patents concentrated in one or two areas (eg. around 40% or more of patents from Singapore, Taiwan, Malaysia and Korea are concentrated in the Electronics field; patents from Japan and Hong Kong are mainly concentrated in the Construction and Mechanics field) while other countries have relatively more diversified technological portfolios.

Generally, patents invented in the East Asian NIEs have become more specialized over the years, although it is observed that patenting in Hong Kong has become less concentrated in the 2001-2005 period compared to earlier years. Singapore and Philippines have the highest level of technological specialization and also experienced the largest increase in the degree of specialization.

#### **E. Inventorship and Ownership of Asia Pacific Patents**

Large proportions of Asia Pacific patents are co-invented with inventors from other countries, primarily the USA. The exceptions are Japan, Korea and Taiwan, where more than 96% of patents are invented solely by domestic inventors.

Except for Japan and Taiwan, large proportions of patents invented in Asia Pacific economies are owned by foreign entities or individuals. The highest level of foreign ownership is observed in the 4 ASEAN economies. China, Singapore and India also exhibit high degree of foreign ownership, reflecting the significant presence of MNCs in the inventive activities of these economies. In Singapore, Taiwan and India, the extent of foreign ownership has fallen over the years, suggesting an increase in indigenous capabilities for producing IP.

Ownership of patents is highly concentrated in South Korea (79% of Korea-invented patents being owned by the top 20 assignees), Philippines (64%) and Singapore (57%). Concentration of ownership is lowest in the Oceania, Hong Kong and Taiwan.

#### **F. Top 20 Patent Assignees in Asia Pacific Economies**

The profile of the top 20 assignees differs substantially across the region (eg. dominance of several *chaebols* in South Korea vs the presence of many MNCs in Singapore) and is indicative of the development stage of the respective economies.

Apart from South Korea, Taiwan, Australia and New Zealand, the top 20 assignees in the Asia Pacific are mainly foreign-based organizations, reflecting the significant role of Direct Foreign Investment in these economies, and the shifting focus of MNCs from low-cost production to innovation activities in Asia.