

Features of the development of innovation potential of Asian countries

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Annotation. For many countries that are at the stage of development, innovation and technology have become the basis of industrialization. Singapore, Hong Kong, South Korea, etc., showing high rates of development, in a short time made a significant competition for developed countries. While high-income countries accounted for 87% of global research and development (R&D) spending in 1996, in 2017 they accounted for only 64% of total R&D investment – the lowest figure recorded in 30 years. In contrast, the share of R&D investment in upper-middle-income countries, particularly China, has consistently increased from 10% of global R&D spending in 1996 to 31% in 2017.

Keywords: innovation, digital technologies, global innovation index, digital transformation, R&D investment, China, South Korea, Japan.

Asian R&D centers – China, Japan, the Republic of Korea, and India – increased their share of global R&D from 22% in 1996 to 40% in 2017, of which 24% of global R&D spending is accounted for by China, up from 2.6% in 1996 [6].

The Global Innovation Index (GII) is a ranking of 129 countries and economies in terms of innovation performance. Historically, only a few countries have managed to join the battle of the leading innovation powers-especially Japan and the Republic of Korea in the 1980s and 1990s. While the countries of North America and Europe continue to lead in the Global Innovation Ranking, Singapore leads in Asia. Recently, only China – an economy with an above-average income and an exception among other high-income economies-has entered the top 20 of the GII (Table 1).

Table 1

Ranking of selected countries in the Global Innovation Index (GII), 2019

Country	Index	Place in the overall ranking	Income level	Place in the region
Switzerland	67,24	1	high	1
Sweden	63,65	2	high	2
USA	61,73	3	high	1
Netherlands	61,44	4	high	3

Singapore	58,37	8	high	1
Germany	58,19	9	high	7
Israel	57,43	10	high	1
Republic of Korea	56,55	11	high	2
Ireland	56,10	12	high	8
Hong Kong	55,54	13	high	3
China	54,82	14	upper-middle	4
Japan	54,68	15	high	5

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South Korea, ranked 12th in 2018, moved up a line and took 11th place in 2019 with an index of 56.55, but in the Southeast Asian region, the country ranks 2nd after the innovation giant-Singapore. It is worth noting that China is ahead of Japan and ranks 14th in the Global Innovation Index (GII) in 2019. (Hong Kong, a special administrative region of the People's Republic of China, is one line higher) and has been increasing its position in this rating for several years. All of the first 15 GII countries (with the exception of China) have a high income per capita.

Decades of rapid economic growth have allowed China to invest in key areas that spur innovation, such as research and development, and the creation of new intellectual property. These investments improved China's GII ranking and allowed it to compete with advanced economies such as the United States and Sweden.

Research and development (R&D) is the foundation of innovation, supporting the development of new products and services that can drive growth and productivity. In recent decades, China has increasingly prioritized R&D, with spending as a percentage of GDP rising from 0.6% in 1996 to 2.19% in 2018. Although this is less than the OECD average (2.37%), the huge size of China's economy means that its R&D spending was 526.06 billion US dollars in 2018 and is currently second after the United States [3].

Achievements in R&D have helped improve China's position in the GII, where it ranks 9th in the world in terms of business development, just behind the USA and ahead of Ireland. Enterprises in developed countries tend to finance a significant portion of R&D initiatives. For example, enterprises in OECD countries on average finance about 60% of R&D in 2018, but in countries such as Japan and South Korea, this figure exceeds 75% [4]. This trend is also reflected

in China, where enterprises financed 76.5 percent (338.8 billion US dollars) of the country's gross R&D spending in 2017 [1].

Assessing the role of business in R&D financing in China is complicated by the importance of state-owned enterprises (SOEs). Many SOE leaders hold positions in the government and the Communist Party of China, which means that SOE-funded R&D initiatives often overlap with those funded by the government. State-owned enterprises also have preferential access to bank loans from state-owned banks, which reduces the cost of borrowing and provides state-owned enterprises with stronger financial support compared to private companies.

Most of the use of R&D in China is focused on commercial applications, which has led to higher education performing a smaller portion of R&D in China than anywhere else. Between 2008 and 2017, China's universities and academies performed an average of only 7.5% of R&D. This is well below the level of leading innovation leaders such as the Netherlands (33.9%), Sweden (26.2%) and the United Kingdom (26.0%), and significantly less than the OECD average (17.9%) [5].

Intellectual property (IP) protection, such as patents, is also crucial for innovation. They provide legal guarantees for innovators and serve as a useful indicator of a country's innovation potential. For decades, China has relied on foreign IP. In 2012, a World Bank study found that 18 percent of Chinese firms reported using foreign companies' technology, higher than the global average (14.8%) and almost twice as high as the OECD average (9.3%) [7].

Beijing has implemented a number of measures to improve China's patent system. In 2008, the Chinese Government launched a national IP strategy and amended existing patent laws. The National Patent Development Strategy was published in 2010. The plan provides incentives to increase the number of patents filed domestically, but it has resulted in patents being awarded for small design tweaks and incremental changes, rather than for entirely new inventions. New amendments to the patent law were proposed in January 2019. The Government's efforts have had their effect. China has quickly become a world leader in patent applications. According to the World Intellectual Property Organization, China filed about 161,000 patent applications in 2007, representing just 8.5% of the global total. Ten years later, China filed more than 1.3 million patent applications, accounting for 44% of all applications in 2017 [8]. This high volume of production has put China in the top five in terms of GII knowledge and technological results.

In other aspects of innovation, the country is also making progress, but China is still lagging behind the developed economies. Government initiatives, backed by significant funding, have enabled China to achieve near-universal primary and secondary education coverage and literacy levels. Inequality still exists in poor regions of China, but notable improvements in education have increased its ability to innovate. Improved primary and secondary education and increased funding for start-ups have helped drive Chinese innovation, but problems with higher education, the business environment, and the work culture persist. Startups are attracting more venture capital than ever before, but business regulatory issues are hampering innovation. Cities such as Beijing, Shanghai, and Hangzhou have begun to challenge Silicon Valley's dominance in startup development, accounting for more than 30 percent global growth in venture capital investment in 2010-2012 and 2015-2017. They are also home to 75% of China's "unicorns" (startups worth at least 1 billion US dollars) [1].

However, Chinese companies face significant obstacles that hinder their operations and innovation. Although government measures have helped to deal with red tape, reducing the average business start time from 22.9 days in 2017 to 8.6 days in 2019, China ranks 31st out of 190 economies in terms of ease of doing business due to existing legal obstacles and problems with the credit system [2].

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