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ANALYSIS OF CHINA'S INNOVATION DEVELOPMENT INDICATORS

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In order to better analyze China's innovation and development indicators, this paper horizontally analyzes the indicators of innovation and development in typical countries such as China, the United States, Germany, Japan and South Korea. In general, China take a good place within these leading countries and has a big chance become a leader in innovation development in 3–5 years.

Keywords: innovation development; Innovative Human Resources; Innovation Input; Innovation Output; Transformation of Innovation Achievements and Economic Impact.

АНАЛИЗ ПОКАЗАТЕЛЕЙ ИННОВАЦИОННОГО РАЗВИТИЯ КИТАЯ

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Чтобы лучше проанализировать показатели инноваций и развития Китая, в данной статье сопоставляются показатели инноваций и развития в таких странах, как Китай, Соединенные Штаты, Германия, Япония и Южная Корея. В целом Китай занимает хорошее место среди этих ведущих стран и имеет большие шансы стать лидером в инновационном развитии через 3–5 лет.

Ключевые слова: инновационное развитие; инновационные человеческие ресурсы; инновационный вклад; инновационный результат; трансформация инновационных достижений и экономический эффект.

The United States leads the world in terms of comprehensive scientific and technological strength, and has always been in an absolute dominant position in terms of economic aggregate and scientific and technological output. Germany is the largest economy in Europe, and its manufacturing

value added and patents have always been at the forefront of the world. Japan is the third largest economy in the world. South Korea is a typical country where the government leads innovation-driven development, creating a period of rapid economic growth. The comparison results are shown in table.

The innovative country evaluation index system and the performance of the United States, Japan, Germany, South Korea, and China[1, 2] in 2015/2018/2019

Innovation Dimension	Specific Indicators	U. S.	Japan	Germany	South Korea	China
Innovative Human Resources	Total public expenditure on education/GDP ratio (%, 2018)	5.2	3.7	5.5	4.46	4.22
	Researchers per million population (people, 2018)	4414	5331	5212	7980	1307
Innovation Input	Total R&D investment/GDP (%, 2018)	2.84	3.26	3.09	4.81	2.19
	Enterprise R&D investment/total R&D investment (%, 2018)	62.37	79.06	66.01	76.64	76.63
	Net FDI inflows/GDP (%, 2019)	1.64	0.73	1.87	0.64	1.09
Innovation Output	Global proportion of international scientific papers published (%, 2019)	22.70	4.61	6.40	3.63	27.11
	High-tech exports/total manufacturing exports (%, 2019)	18.97	17.02	16.48	32.41	30.79
Transformation of Innovation Achievements and Economic Impact	The added value of medium and high-tech industries/the added value of all manufacturing industries (%, 2018)	47.44	56.57	61.70	63.83	41.45
	Energy consumption per kilogram of oil equivalent to GDP (US$, 2015)	7.8	11.0	11.5	6.3	5.7

Note 1 – The Chinese indicators in the table are all data from mainland China, excluding data from Hong Kong, Macao and Taiwan.

Note 2 – Main data sources: World Bank database, WIPO statistics database, OECD database.

China's innovation input and innovation output are generally close to or equivalent to innovative countries. Specifically, in terms of innovation investment, the R&D investment of Chinese enterprises accounted for 76.63 % of the total R&D investment, which was close to 76.64 % of South Korea; the net FDI inflow accounted for 1.09 % of GDP, lower than the

1.64 % of the United States, but far more than Japan and South Korea. In terms of innovation output, China's high-tech exports accounted for 30.79 % of all manufacturing exports, only lower than South Korea's 32.41 %.

There is a gap between China and innovative countries in some indicators of innovation human resources, innovation output, transformation of innovation achievements and economic impact. It is mainly manifested in: In terms of innovative human resources, China's total education public expenditure accounts for 4.22 % of GDP, only ahead of Japan's 3.24 %. The number of researchers per million population in South Korea is about 6 times that of China; in terms of the added value of medium and high-tech industries in the total manufacturing value added, China is only 41.5 %. Compared with 61.7 % in Germany and 63.83 % in South Korea, there is still a big gap.

In the past six years, the indicator of the proportion of the added value of medium and high-tech industries to the total added value of the manufacturing industry has been relatively stable in various countries. For example, from 2015 to 2020, Japan hovered at 57 %, China maintained at 41 %, and South Korea achieved it in 2018. This also shows that if the output value of the medium and high-tech industries is to be greatly increased, it is possible to achieve major breakthroughs in technology and talents.

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