A Comparative Study on Chinese and Japanese Greenfield Investment and the Effects

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Abstract

Based on the micro-enterprises data of fDi-Markets database from 2010 to 2017, this paper comprehensively investigates the current situation and effectiveness of Chinese and Japanese greenfield investment. The results show that China's greenfield investment enjoys a fluctuating upward trend, while Japan's shows a fluctuating downward trend; from the perspective of investment location, Asia is the staple target market for Chinese and Japanese greenfield investment, but the investment scale of the two countries is significantly different; and there are distinctions in the industry distribution of their greenfield FDI, China's greenfield investment is mainly concentrated in the housing construction industry, while the industry distribution differences of Japan's greenfield investment shows more obvious, focusing on motor vehicles, trailers and semi-trailers. Moreover, the employment effect of greenfield investment in Japan performed stronger than that in China. The employment effect of the two countries remarkably differs in different industries and different host countries. In terms of the relationship between greenfield investment and innovation, China's greenfield investment is more related to innovation activities than that of Japan's based on innovation output and innovation input.

Keywords: greenfield investment; comparative analysis; China and Japan; employment effect; innovation

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1. Introduction

Since the implementation of the "Going Out" strategy, China has actively participated in the international division of labor and continued to open its domestic market. Enterprises FDI has also played an important role in China's opening up and participation in the international division of the labor system. In this process, scholars pay more attention to the performance of cross-border M&A,(Xian Guoming and Ming Xiunan, 2018; Chen Aizhen, 2019; Su Erdou and Xuejun, 2020), greenfield investment has received sparse attention in previous studies.

Considering the crucial role greenfield investment plays in improving the market competitiveness and technical level of enterprises. It is particularly important to explore the change trend and effect of China's greenfield investment. Compared with China, Japan's greenfield investment started earlier, and its mode is relatively mature. Nitsch and Makino (1996) based on the data of 173 multinational companies in Japan, found that the performance of greenfield investment subsidiary is better than that of cross-border mergers and acquisitions and joint ventures. To promote Chinese enterprises to carry out high-quality greenfield investment under the complex and changeable international investment environment, it is necessary to compare and analyze the distinctions of greenfield investment and its effects between China and Japan while exploring the development status and effects of China's greenfield investment.

The paper structure is as follows: the second part is the analysis of the current situation of China's greenfield investment; the third part is the comparative analysis of China and Japan's greenfield investment; the fourth part is the comparative analysis of the greenfield investment effect between China and Japan; the fifth part is the conclusion.

2. The current situation of China's greenfield investment

Based on the purpose of this study, we will analyze the current situation of China's greenfield investment from the perspective of the overall characteristics, regional distribution of domestic investors, sub-ownership and sub-industry. All the data are from the fDi-Markets database of Financial Times (FT) and the data of China's foreign direct investment bulletin published by the Ministry of Commerce and the National Bureau of statistics.

2.1 Basic analysis of China's greenfield investment

On the whole, although the proportion of greenfield investment in China's FDI is relatively small compared with cross-border M&A, the scale and number of greenfield investment projects increase year by year, as shown in Figure 1. The column chart in Figure 1 shows that the project's number of cross-border M&A and greenfield investments presents

different characteristics at different time stages. The frequency of Chinese enterprises participating in cross-border M&A exhibits a steady upward trend from 2010 to 2017. The statistics increased from 439 in 2010 to 1287 in 2017, and developed rapidly in 2015, breaking through the 1000 mark. It reached the highest number of 1332 in 2016. With the gradual optimization of China's foreign direct investment structure and the continuous improvement of investment quality, the growth rate of cross-border M&A in 2017 slightly declined, while the number of greenfield investments raised from 354 in 2010 to 576 in 2017. The highest number of greenfield investments reached 632 in 2016, and the growth rate slowed down slightly in 2017. The trend is consistent with cross-border M & A. The line chart in Figure 1 reflects the amount change trend of cross-border M & A and greenfield investment from 2010 to 2017. The statistics of Cross border M&A showed a fluctuating growth trend, rising from US $997 million in 2010 to US $4237 million in 2017, reaching a peak in 2014. In the same period, the statistics of greenfield investment jumped from US $198 million in 2010 to US $527 million in 2017. It reached a peak in 2016 and breaking through the 100 million marks, and the trend was consistent with the number of projects. Although the number of cross-border M&A and greenfield investments decreased slightly in 2017, they were higher than that of 2010. The horizontal comparison shows that although the growth rate of greenfield investment is less than that of cross-border M&A, its volatility is relatively gentle.

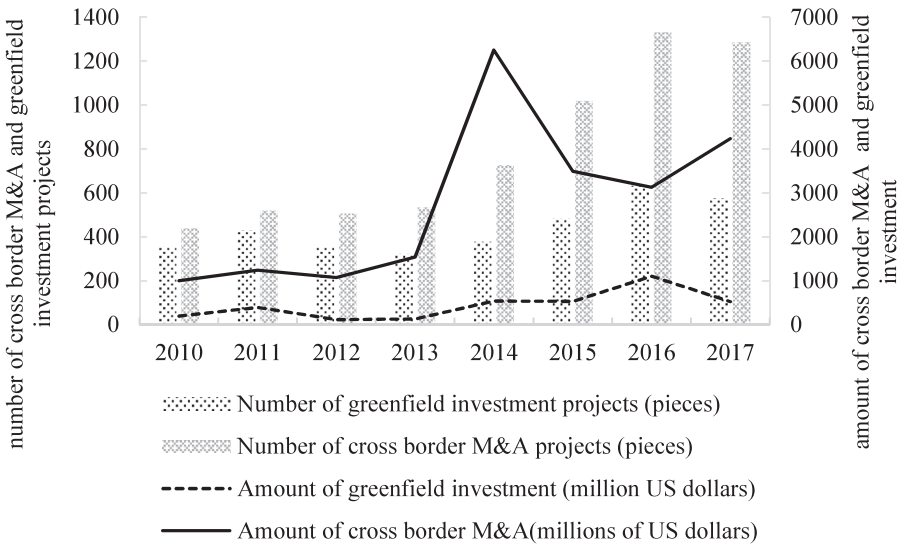

Figure 1 The situation of Greenfield Investment and Cross Border M&A of Chinese Enterprises
Data source: the fDi-Markets database and BvD-Zephyr database.

2.2 Greenfield investment based on Ownership Classification

For sub-ownership, there are significant differences in greenfield investment among different ownership enterprises. In this paper, according to the name of the enterprise in the database, the equity structure of the enterprise and the detailed information of the actual controller, the ownership type of the enterprise is confirmed manually. Chinese enterprises are divided into four categories, namely state-owned enterprises, private enterprises, foreign-funded enterprises and Hong Kong, Macao and Taiwan enterprises. According to the statistics in Table 1, state-owned enterprises and private enterprises have become the fundamental body of China's greenfield investment, while the investment scale of foreign-funded enterprises and Hong Kong, Macao and Taiwan enterprises is relatively small. State-owned enterprises owned a significant place before 2012. Then the scale of greenfield investment of private enterprises exceeded that of state-owned enterprises for the first time In 2012. Taking 2010 as an example, the total amount of greenfield investment of all enterprises was 198 million US dollars, of which the investment scale of state-owned enterprises reached 121 million US dollars, accounting for 61.1%. In the same period, the investment scale of private enterprises was 67 million US dollars, accounting for 33.84%, while the total investment scale of foreign-funded enterprises and Hong Kong, Macao and Taiwan enterprises shared less than 10% of the total. When it comes to 2017, it showed change characteristics in different periods. In 2017, the scale of greenfield investment of all enterprises was US $527 million, of which the statistics of state-owned enterprises was US $256 million, and that of private enterprises was US $246 million, accounting for 48.58% and 46.68% of the total respectively. The investment scale of foreign-funded enterprises and Hong Kong, Macao and Taiwan enterprises in the same year is still less than 10% of the total investment.

According to the above analysis, the distribution and change characteristics of greenfield investment among different ownership enterprises in eight years from 2010 to 2017 are as follows: first, the greenfield investment scale of enterprises with different ownership shows a fluctuating upward trend, but the greenfield investment is mainly from state-owned enterprises and private enterprises. Especially for state-owned enterprises, the investment scale has been at a high level in most years. Second, some changes occurred in the greenfield investment scale of state-owned enterprises. The investment scale of state-owned enterprises decreased from 61.11% in 2010 to 48.58% in 2017, and that of private enterprises increased from 33.84% in 2010 to 46.68% in 2017, accounting for nearly half of the total. Although the absolute number of state-owned enterprises' investment scale is still higher than that of private enterprises, their relative scale has declined, which means that private enterprises play an increasingly important role in the process of the "Going Out" strategy.

Table 1 Greenfield investment classified by enterprise ownership

Unit: million US dollars, %

Enterprises	Total	2010	2011	2012	2013	2014	2015	2016	2017
state-owned	172853.5	12113.1	24249.0	4615.1	6573.0	30211.2	24635.5	44865.9	25590.8
proportion	49%	61%	62%	40%	50%	56%	46%	41%	49%
private	164964.4	6740.7	13066.3	6801.6	4369.0	23107.0	26802.8	59498.6	24578.4
proportion	47%	34%	34%	59%	33%	43%	50%	54%	47%
foreign capital	5625.8	104.1	703.9	72.6	1656.4	194.4	967.8	1548.0	378.5
proportion	2%	1%	2%	1%	13%	0.4%	2%	1%	0.7%
HK, Macao and Taiwan	9894.7	841.9	881.3	7.1	565.0	366.7	670.4	4433.5	2128.8
proportion	3%	4%	2%	0.0%	4%	0.7%	1%	4%	4%
total amount	353338.4	19799.8	38900.5	11496.4	13163.4	53879.3	53076.5	110346	52676.5

Data source: the fDi-Markets database

2.3 Greenfield Investment based on Industry Classification

This paper further analyzes the distribution characteristics of greenfield investment from the perspective of industry. First, this paper redivides the manufacturing industry according to ISIC rev.3, and the non-manufacturing industry is redivided according to GB/T 4574-2017 (Classification of National Economic Industries). Also, this paper divided the manufacturing industry into high technology, high and medium technology, low and medium technology and low technology according to OECD manufacturing technology division standard. Among them, there are 965 manufacturing enterprises, and the majority are medium and high technology enterprises. There are 2233 service enterprises in total, while the number of mining, construction and power, heat, gas and water production and supply enterprises is relatively small. From 2010 to 2017, the total greenfield investment of manufacturing enterprises was 140.554 billion US dollars, accounting for 39.78% of the total investment, and the greenfield investment of service enterprises was 52.303 billion dollars, accounting for 14.80% of the total investment. However, the greenfield investment amount of mining, construction and power, heat, gas and water production and supply industry was less than half of the total investment. Further subdivided manufacturing industry found that the greenfield investment of manufacturing enterprises mainly concentrated in low and medium and high and medium industries, while the proportion of high-tech enterprises was relatively weak.

Overall, although China's greenfield investment is mainly concentrated in manufactur-

ing sector, its service investment proportion is relatively high（Xuejun and Su erdou, 2020), which is one of the main characteristics of China's foreign direct investment. Further analysis of manufacturing sector found that greenfield investment mainly focused on low and medium and high and medium industries. The distribution of greenfield investment in different sectors and manufacturing industries have great differences. This distribution feature is closely related to the agglomeration of the industry or department of the enterprise and its position in China's industrial development.

Table 2 Analysis of greenfield investment by enterprises in different industries

Unit: million US dollars, %

Industry categories	Industry segmentation	companies	investment amount	proportion
manufacturing	low technology	153	24138.7	7%
	medium and low technology	217	55129.7	16%
	medium and high technology	479	52299.2	14%
	high technology	116	8986.9	3%
total		965	140554.5	4%
non-manufacturing	services	2233	52303.4	15%
	the mining industry	36	17262.1	5%
	the construction industry	133	85612.7	24%
	electricity, heat, gas and water production and supply industries	161	57605.8	16%
total		2563	212784	60%
sumtotal		3528	353338. 5	1

Data source: the fDi-Markets database

3 . A Comparative Analysis of China and Japan's Greenfield investment

On the basis of the current situation of Chinese enterprises' greenfield investment, this part will further make a comparative analysis of greenfield investment between China and Japan from the aspects of investment scale, investment location and investment industry distribution, And it can help to reveal the differences of greenfield investment between developed countries such as Japan and emerging economies such as China in different development stages This paper provides effective guidance for understanding the typical facts of China's greenfield investment.

3 . 1 **Comparative analysis of greenfield investment scale and investment trend**

In this part, this paper has been thoroughly analyzed the number of domestic investors in

China and Japan and the characteristic of the greenfield investment scale changes with time.

First, this paper analyzes the changes in the domestic investors' numbers provided by the database. Figure 2 shows that the number of Chinese enterprises participating in greenfield investment has a rising trend from 2010 to 2011, a slight decline in 2012. And the statistics increased steadily yearly from 2013 to 2016, then fell modestly in 2017. At the same period, the number of Japanese enterprises that participated in greenfield investment has an opposite tendency. The number of enterprises has been decreasing year by year since 2012. Figure 3 shows the change in the scale of greenfield investment between China and Japan. It can be seen that China's greenfield investment scale was fluctuating upward from 2010 to 2016. Then experienced an explicit decline in 2017, which may be caused by the changes in the international investment environment. Meanwhile, the scale of Japanese greenfield investment declined from 2010 to 2017 with a small fluctuation range. Significantly, China's greenfield investment scale was smaller than that of Japan before 2014. In 2015, the investment scale of both countries was roughly the same, but after 2016, China's greenfield investment scale was significantly higher than that of Japan.

Therefore, as a developed country, Japan's greenfield investment has entered a steady development stage, while China's greenfield investment gradually catches up and exceeds the total investment amount of Japan in a fluctuating upward process.

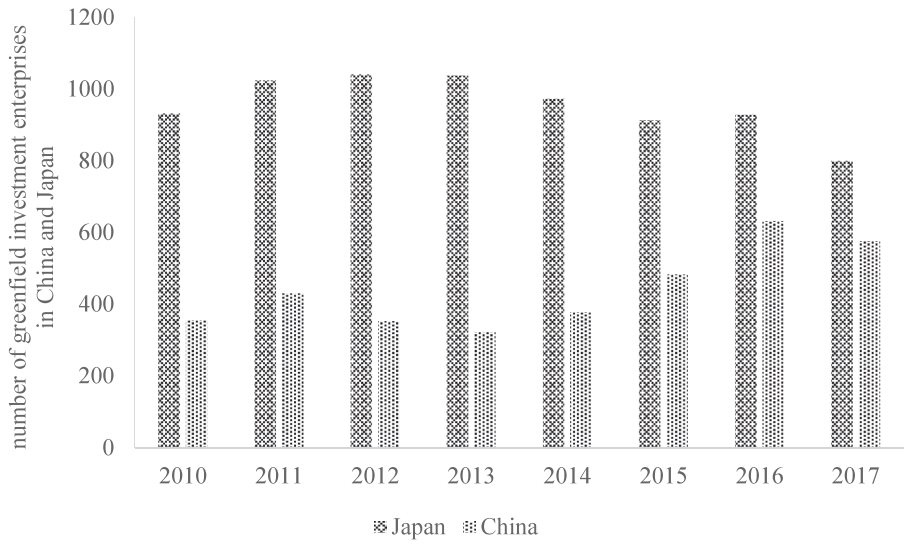

Figure 2 Number of Chinese and Japanese enterprises participating in greenfield investment
Data source: the fDi-Markets database

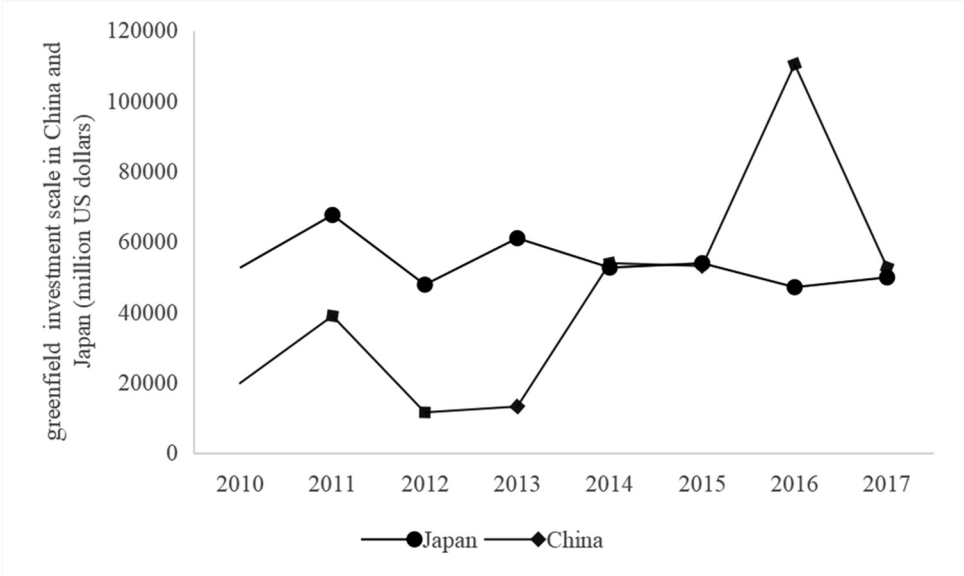

Figure 3 Comparison of the scale of greenfield investment between China and Japan
Data source: the fDi-Markets database

3.2 Comparative analysis of greenfield investment location

This part further analyzes the characteristics of the host countries' distribution of China and Japan's greenfield investment changed over time. Firstly, according to the fDi-Markets database, this paper obtains the distribution of China and Japan's greenfield investment in different continents from 2003 to 2019. It can be seen from table 3 that China and Japan's greenfield investment is distributed in six continents. As far as China is concerned, from 2010 to 2017, the significantly main target of China's greenfield investment is Asia. And the amount of greenfield investment in Asia increased from US $0.8995 billion in 2010 to US $ 2 .1965 billion in 2017, accounting for 45.31% and 41.70% of China's greenfield investment in 2010 and 2017 respectively. China's greenfield investment scale in Asia has steadily expanded with the continuous expansion of China's greenfield investment scale. It can be concluded that Asia is the dominant target of China's greenfield investment In addition to Asian countries, the European region constitutes the second largest market for China's greenfield investment. Take 2017 as an example, Europe has become the only investment market outside Asia with an investment amount of more than US $1 billion. In the same period, the greenfield investment scale in North America, Oceania, Africa and Latin America was relatively small. From the perspective of time trends, although the scale of China's greenfield investment in Asia is relatively large, the growth rate is not the fastest. The statistics rose from US $0.8995 billion in 2010 to US $2.1965 billion in 2017, an increase of about

1.44 times. Except for Asian countries, China's greenfield investment in Europe increased by about 1.10 times in 2010-2017. These growth rates are lower than the average growth rate of China's greenfield investment in the same period. The scale of greenfield investment in North America, Oceania, Africa and Latin America increased by about 5.126 times, 0.358 times, 9.11 times and 0.196 times respectively from 2010 to 2017. It can be seen that Asia, Europe, Africa and North America still have a wide range of investment potential and markets. This shows that China's foreign direct investment has a high degree of regional diversification.

The second half of Table 3 shows the location distribution of Japan's greenfield investment. In general, Japan's greenfield investment scale was significantly higher than that of China from 2010 to 2014. The scale of greenfield investment in China surpassed that in Ja-

Table 3 The regional distribution of greenfield investment between China and Japan from 2010 to 2017

Unit: million US dollars, %

		2010	2011	2012	2013	2014	2015	2016	2017
China	World	19851.44	38915.99	11496.35	13163.39	53824.14	53076.57	110345.99	52676.52
	Asia	8995.75	20824.18	4310.08	2472.10	19644.7	38448.91	47170.94	21965.37
	proportion	45%	54%	37%	19%	36%	72%	43%	42%
	Europe	5222.26	5249.69	758.93	3904.54	11782.93	3217.63	13755.07	10966.62
	proportion	26%	13%	7%	30%	22%	6%	12%	21%
	North America	1039.00	3290.88	2078.25	2068.6	8435.3	4266.27	8955.2	6365.26
	proportion	5 %	8 %	18%	16%	16%	8 %	8 %	12%
	Oceania	718.20	872.90	209.70	2508.87	1269.06	1133.16	1603.57	975.60
	proportion	4 %	2 %	2 %	19%	2 %	2 %	1 %	2 %
	Africa	871.80	1629.88	1202. 7	112.61	2779.18	2310.159	36143. 6	8808.68
	proportion	4 %	4 %	10%	1 %	5 %	4 %	33%	17%
	Latin America	3004.43	7048.46	2936.69	2096.67	9912.97	3700.44	2717.61	3594.99
	proportion	15%	18%	26%	16%	18%	7 %	2 %	7 %
Japan	World	52555.96	67554.18	47764	60965.45	52609.29	53855.48	47010.36	49824.94
	Asia	34335.49	41554.52	30535.62	38009.1	35822.35	29970.97	27590.98	22495.39
	proportion	65%	62%	64%	62%	68%	56%	59%	45%
	Europe	4119.52	7806.59	5782.11	4084.79	4269.79	7197.9	4411.27	6292.78
	proportion	8 %	12%	12%	7 %	8 %	13%	9 %	13%
	North America	7194.57	8634.69	5724.17	9535.89	7847.53	9737.59	5680.33	16399.32
	proportion	14%	13%	12%	16%	15%	18%	12%	33%
	Oceania	2061.76	329.2	416.99	827.97	742.08	1675.89	2129.06	355.51
	proportion	4 %	0.5%	0.9%	1 %	1 %	3 %	5 %	0.7%
	Africa	452.11	887.76	165.47	1341.4	558.57	362.79	2775.03	2214.49
	proportion	0.9%	1 %	0.3%	2 %	1 %	0.7%	6 %	4 %
	Latin America	4392.51	8341.42	5139.64	7166. 3	3368.97	4910.34	4423.69	2067.45
	proportion	8 %	12%	11%	12%	6 %	9 %	9 %	4 %

Data source: the fDi-Markets database

pan after 2016. Table 3 shows that Asia is also the main market for Japan's greenfield investment, and the scale of Japan's greenfield investment in Asia is significantly higher than that of other continents from 2010 to 2017. Apart from Asia, North America is the second major market for Japan's greenfield investment, and its greenfield investment in North America is mainly concentrated in the United States and Canada. In addition to Asia and North America, Europe is also a major market for Japan's greenfield investment. From the perspective of time trend, Japan's greenfield investment in Asia showed a decreasing trend from 2010 to 2017, while the greenfield investment in North America and Europe showed an increasing trend.

Based on the location distribution of greenfield investment between China and Japan, there are both similarities and differences. Asia is the main market of China and Japan's greenfield investment, while Europe is the second-largest greenfield investment market in China, while North America is the second-largest green space investment market in Japan. The difference in investment location is mainly caused by the development stage and investment motivation of the two countries.

This paper further analyzes the evolution of investment distribution of countries according to the investment proportion in the top ten countries of greenfield investment between China and Japan. Table 4 is calculated according to the amount of greenfield investment between China and Japan in different years and the investment scale of the top ten countries in that year. Overall, the top ten countries of China's greenfield investment in 2010 are both developed countries and developing countries, and the only developed country is the

Table 4 Top 10 countries of greenfield investment between China and Japan

Unit: %

	China				Japan			
排名	2010		2017		2010		2017	
1	Russia	13.85%	America	16.25%	China	25.01%	America	32.75%
2	Indonesia	12.19%	Kazakhstan	11.24%	America	12.82%	Vietnam	10.57%
3	India	11.35%	Russia	8.96%	India	9.27%	Singapore	5.53%
4	Cuba	6.55%	Indonesia	8.71%	Thailand	5.91%	India	5.36%
5	Brazil	6.01%	India	6.61%	Singapore	5.24%	China	4.25%
6	America	4.54%	Oman	6.36%	Vietnam	5.01%	Egypt	3.91%
7	Malaysia	3.91%	Nigeria	5.70%	Indonesia	4.42%	Thailand	3.83%
8	Australia	3.62%	Britain	5.25%	Mexico	4.19%	Malaysia	3.57%
9	Pakistan	2.69%	Kenya	5.19%	Australia	3.91%	UAE	2.35%
10	HK,China	2.60%	Pakistan	4.80%	Russia	2.43%	Saudi Arabia	2.13%

Data source: the fDi-Markets database

United States. China's greenfield investment is mostly concentrated in developing countries. Russia ranks the first, accounting for 13.85% of the total in that year. In 2017, the United Kingdom emerged as one of the top 10 countries in China's greenfield investment, while the United States became the first target country. The proportion of the investment scale of the top ten countries in the total investment scale of that year increased compared with 2010, indicating that the countries of China's greenfield investment began to stabilize. For Japan, there is a significant difference with the top 10 countries in China's greenfield investment. In 2010, China was the largest country for Japan's greenfield investment. Although the greenfield investment scale in China decreased in 2017, China is still the top 10 Japan's greenfield investment countries.

3.3 Comparison of greenfield investment industry distribution

This part analyzes the distribution characteristics of greenfield investment between China and Japan from the perspective of the industry. Above all, this paper divides the enterprise department into 42 categories based on the National Economic Industry Code Classification Standard[4]. According to the results of tables 4 and 5, there are significant differences in the industry distribution of China and Japan's greenfield investment. The housing construction industry is the largest China's greenfield investment industry, with an investment scale of US$6.7778 billion. The second is the power and heat production and supply in-

4 The abscissa "1-42" in Figures 4 and 5 represents the classification of the 42 major industries of the national economy, which are 1-transportation, storage and postal industry; 2-Accommodation and catering industry; 3-Information transmission, software and information technology service industry; 4-Other manufacturing and recycled products; 5-Other machinery and equipment; 6-Other electrical machinery and equipment; 7-Other railway equipment and transportation equipment; 8-Other nonmetallic mineral products; 9-Office, accounting and computer equipment; 10-Chemicals and chemical products (excluding pharmaceuticals); 11-Medical equipment, precision instruments and optical instruments, clocks and watches; 12-Medicine manufacturing; 13-Sanitation and social work; 14-Civil engineering construction industry; 15-Basic metals and metal products; 16-Resident service, repair and other service industry; 17-Radio, TV and communication equipment 18-Real estate industry; 19-Housing construction industry; 20-Wholesale and retail industry; 21-Education; 22-Culture, sports and entertainment industry; 23-Cultural, educational, industrial, sports and entertainment goods manufacturing industry; 24-Non-ferrous metal mining and dressing industry; 25-Wood, pulp, Paper, paper products, printing and publishing; 26-rubber and plastic products; 27-water conservancy, environment and public facilities management industry; 28-water production and supply industry; 29-automobiles, trailers and semi-trailers; 30-coke, refining Petroleum products and nuclear fuels; 31-gas production and supply industry; 32-electricity and heat production and supply industry; 33-oil and natural gas extraction industry; 34-science research and technical service industry; 35-rental and business service industry; 36-textile, Textiles, leather and footwear; 37-aerospace; 38-ship building and repair; 39-mining industry; 40-financial industry; 41-food, beverage and tobacco; 42-Ferrous metal mining industry respectively.

dustry, with an investment scale of about US $5.6822 billion. Japan's greenfield investment is mainly concentrated in the automobile, trailer and semi-trailer industries, with an investment scale of US $8.315 billion, followed by the housing construction industry and power, heat production and supply industry, with an investment scale of US $4.294 billion. Therefore, there are similarities and differences in the industry distribution of greenfield

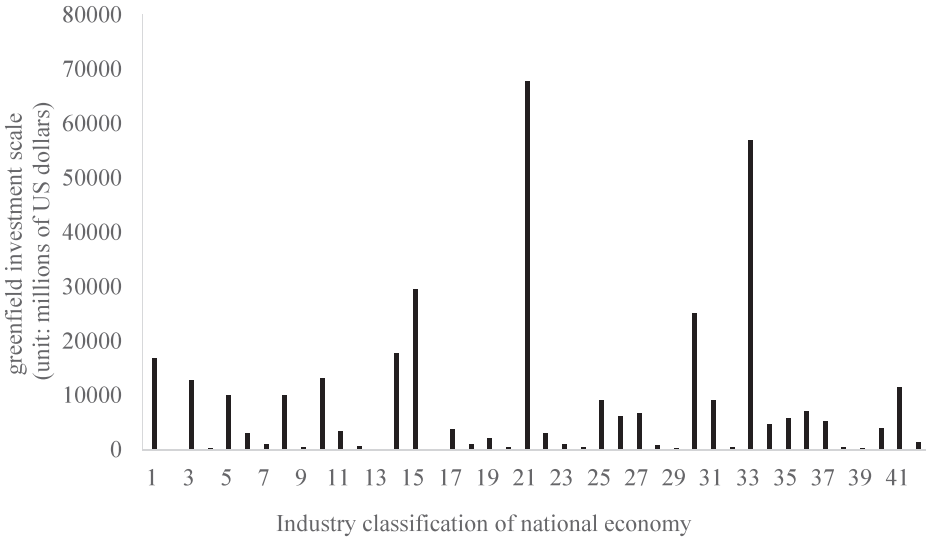

Figure 5 Industrial distribution of greenfield investment by Chinese companies

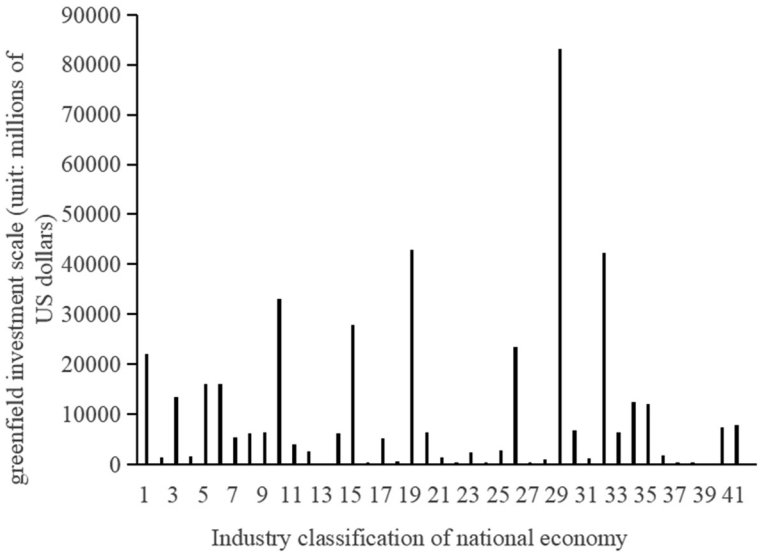

Figure 6 Industrial distribution of greenfield investment by Japanese companies

Data source: the fDi-Markets database

investment between China and Japan. The housing construction industry is the main industry of China and Japan's greenfield investment. The differences in greenfield investment in China is smaller than that in Japan.

4. Comparative analysis of greenfield investment effects between China and Japan

Based on the previous comparative analysis of the present situation of China and Japan's greenfield investment, the paper further explores the performance differences of the two countries' greenfield investment, which will help to provide advices for promoting Chinese enterprises to carry out high-quality greenfield investment.

4.1 Analysis of employment effects of greenfield investment in two countries

This paper analyzes the employment effect differences of China and Japan's greenfield investment from different years, different industries and different countries.

(1) A comparative analysis of the employment effects of China and Japan's greenfield investment in different years

Based on the number of jobs created by greenfield investment in the host country, this paper makes a comparative analysis on the employment effect differences of greenfield investment between China and Japan. In the sample period, the number of jobs created by

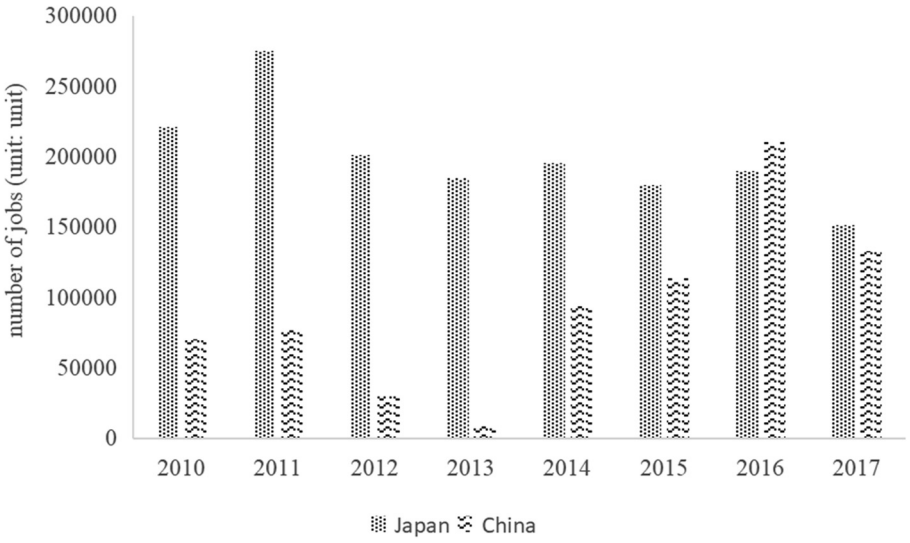

Figure 7 Analysis of the employment effect of China and Japan's greenfield investment in different years

Data source: the fDi-Markets database

China's greenfield investment increased from 70222 in 2010 to 132540 in 2017, reaching the peak in 2016, with about 210520 jobs, an increase of 1.99 times. From table 7, it is found that the employment of China's greenfield investment for host students showed a fluctuating growth in 2010-2017. In 2013, the statistics dropped to the lowest point in the sample period, generating 9726 jobs, and it showed a steady growth trend in 2014-2016, with a slight decline in 2017. For Japan, the number of jobs created by its greenfield investment in the host country from 2010 to 2017, was significantly more than that created by China in general, except in 2016. In addition, the fluctuation range of the number of jobs made by Japan's greenfield investment in different years was narrower than that of China's greenfield investment.

(2) The industry comparative analysis of the employment effects of China and Japan's greenfield investment

This paper studies the differences in employment effect caused by greenfield investment between China and Japan based on the industry. Table 8 and Table 9 respectively report the industry distribution of the jobs generated by China and Japan's greenfield investment in host countries. It is easy to find that the industries with the largest number of generated jobs in both countries are automobile, trailer and semi-trailer industries. However, there are some differences in the industry distribution of employment effects of the two countries. For example, the employment effect of greenfield investment in Japan has obvious differences among industries. The first industry is automobile, trailer and semi-trailer industry, with 385724 jobs. The second industry is housing construction, which created 144204 jobs.

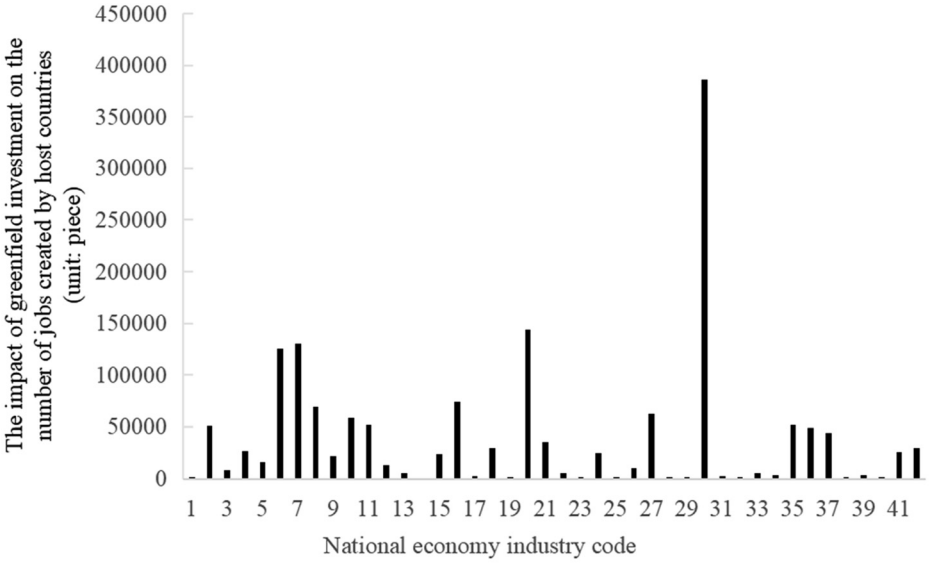

Figure 8 Industry distribution of jobs created by Japanese greenfield investment.

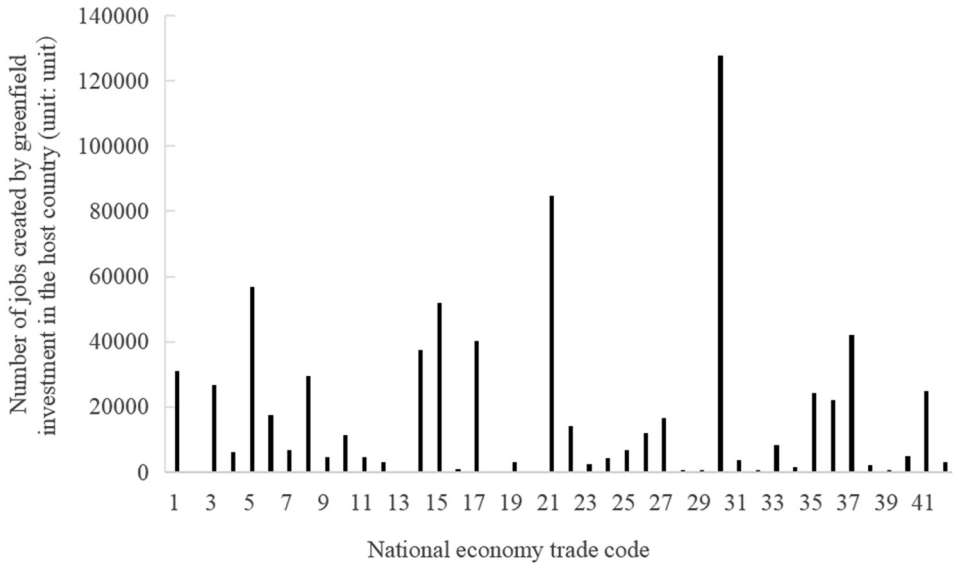

Figure 9 Industry distribution of jobs created by Chinese greenfield investment.
Data source: the fDi-Markets database

The difference in the number of jobs created between the two industries is more than half. On the other hand, the number of jobs generated by China's greenfield investment in automobile, trailer and semi-trailer industry is 127673, and housing construction generated 84692 jobs as the second-largest industry. The gap between the two industries is relatively small.

(3) The country comparative analysis of the employment effects of China and Japan's greenfield investment

Due to the different investment environments of the host country and the different enterprises' investment motivations, the employment effect of greenfield investment in different countries is also different. This part analyzes the differences of the employment effect of China and Japan's greenfield investment based on the host country. Figure 10 reflects the job numbers generated by China's greenfield investment in host countries from 2010 to 2017. Among them, China's greenfield investment created the most job numbers in India, with 99938 jobs, less than 100000, followed by the United States, which provided about 68182 jobs, about one-third less than India. Japan's greenfield investment provided the most jobs to China, up to 201510, followed by India, which provided 171120 jobs. Based on the comparison of the employment effect of greenfield investment between China and Japan in different countries, it is not hard to find that the employment effect of Japanese greenfield investment is significantly stronger than that of Chinese greenfield investment. Japan's

greenfield investment in each of the seven countries provided more than 100,000 jobs, while the largest job numbers created by China's greenfield investment did not reach 100,000. In addition, the employment effect of greenfield investment in Japan is remarkably weaker than that in China.

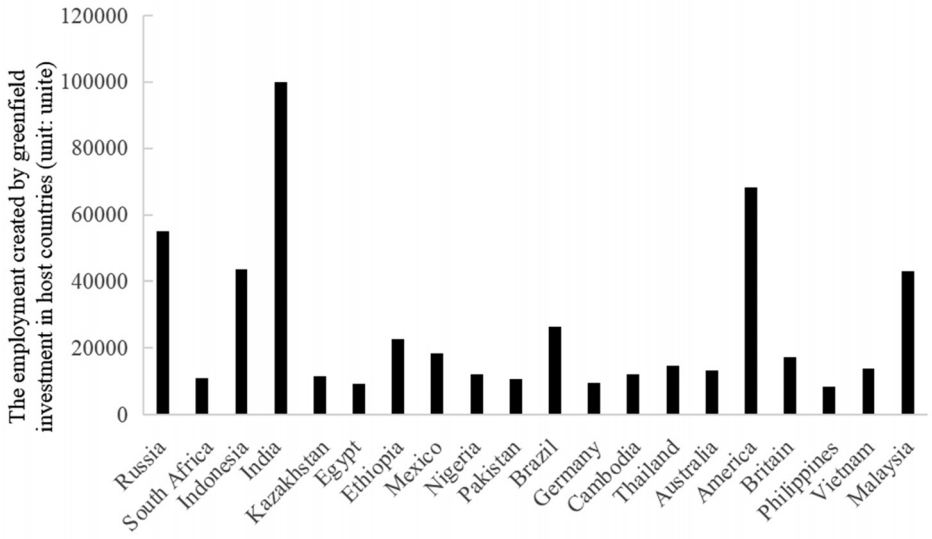

Figure 10 Country distribution of jobs created by greenfield investment in China.
Data source: the fDi-Markets database

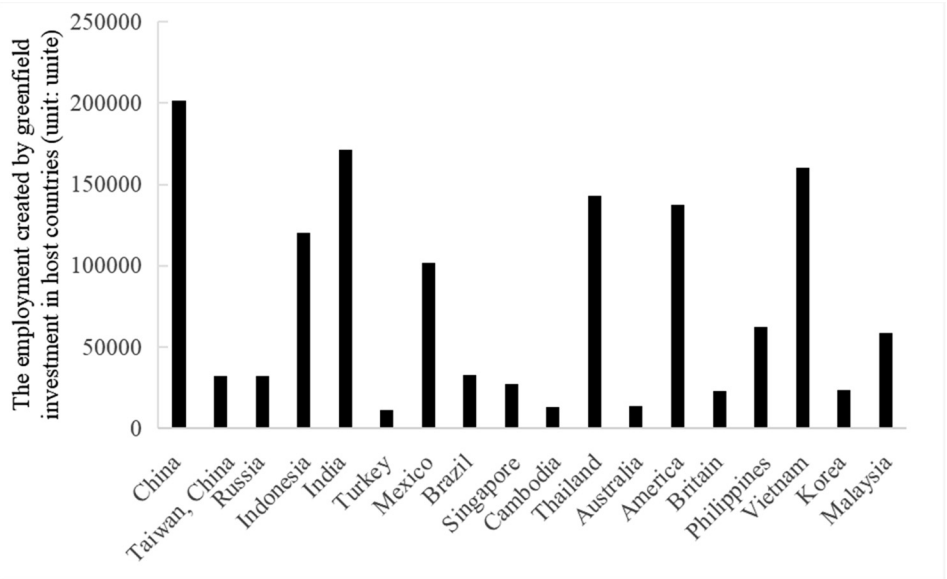

Figure 11 Country distribution of jobs created by greenfield investment in Japan.
Data source: the fDi-Markets database

4.2 The innovation effects comparison of China and Japan's greenfield investment

In order to thoroughly investigate the relationship between greenfield investment and innovation activities in China and Japan, this paper analyzes the relationship between them from the perspective of innovation output and innovation input. The innovation output is measured by the number of patent applications of the country, and the innovation input is measured by the R&D/GDP of the country. Figures 12 and 13 show the correlation between China's and Japan's greenfield investment and innovation output, respectively. Tables 14 and 15 report the correlation between China and Japan's greenfield investment and innovation input respectively. Concretely, the slope of the fitting line in Figure 12 is explicitly larger than that in Figure13. The further calculation reflects that the correlation coefficient between greenfield investment and innovation output in China is 0.57, while that in Japan is 0.40. The slope of the fitting curve in Figure14 is also larger than that in Figure15. And the correlation coefficient between China's greenfield investment and innovation investment is 0.54, while the correlation coefficient between greenfield investment and innovation investment in Japan is 0.33. This clarifies that, compared with Japan's greenfield investment, China's greenfield investment has a stronger correlation with innovation input and innovation output, and further speculates that the innovation driving effect of China's greenfield investment is correspondingly more obvious.

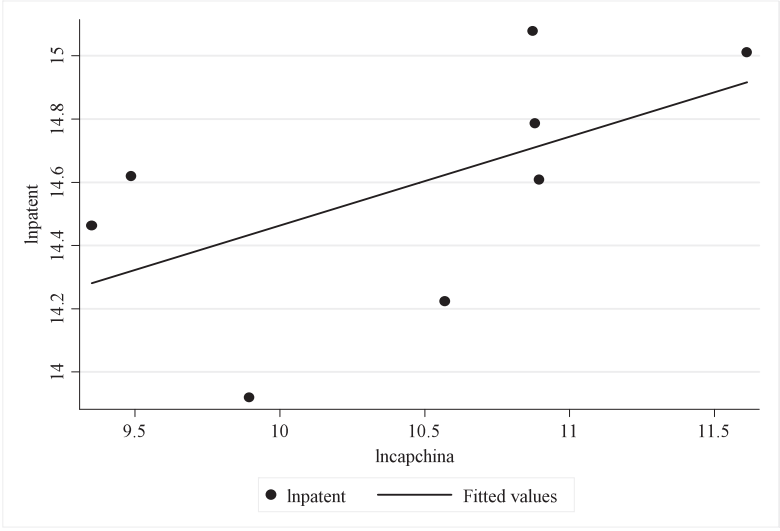

Figure 12 Correlation between China's greenfield investment and patent application

Data source: the fDi-Markets database, World bank data and annual reports of the State Intellectual Property Office over the years.

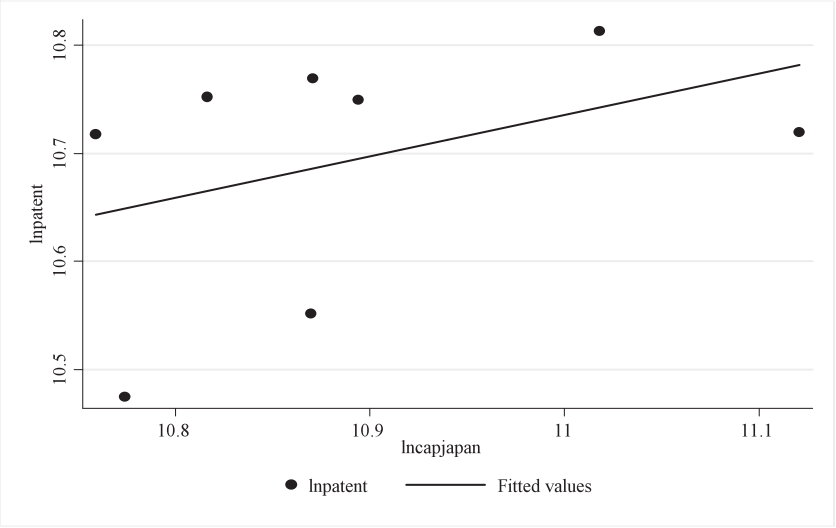

Figure 13 **Correlation between Japan's greenfield investment and patent application**

Data source: the fDi-Markets database, World bank data and annual reports of the State Intellectual Property Office over the years.

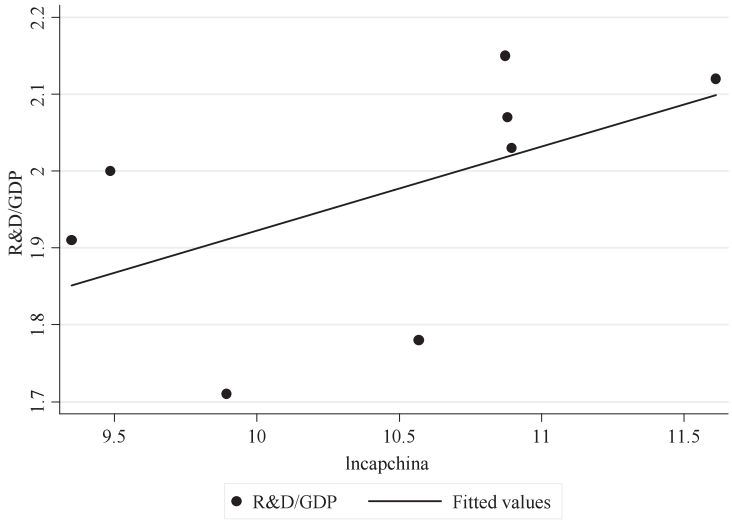

Figure 14 **Correlation between China's greenfield investment and R&D/GDP**

Data source: the fDi-Markets database, World bank data and annual reports of the State Intellectual Property Office over the years.

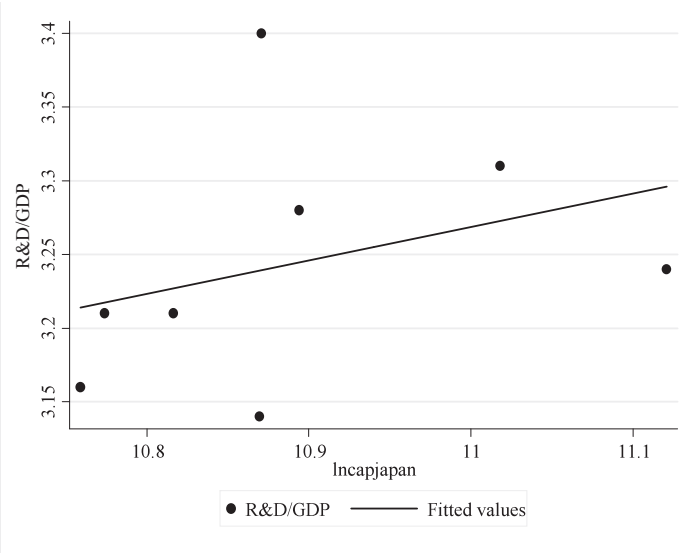

Figure 15 Correlation between Japan's greenfield investment and R&D/GDP

Data source: fDi markets database, World bank data and annual reports of the State Intellectual Property Office over the years.

5 . Main conclusions

Under the background of China's accelerating implementation of high-level opening-up and the "dual circulation" development pattern, this paper comprehensively analyzes the development status of China's greenfield investment based on the data of the fDi-Markets database and makes a comparative analysis with Japan, which is more mature in the development of the foreign direct investment. The main conclusions are as follows:

First, for the total investment scale, China's greenfield investment showed a fluctuating upward trend from 2010 to 2016, and a moderate decline in 2017, which may be caused by changes in the international investment environment. The scale of Japan's greenfield investment experienced a fluctuating downward trend from 2010 to 2017, but the fluctuation was narrow in different years.

Second, in terms of investment location, Asia is the main market for China and Japan's greenfield investment, but the two countries' scales are significantly different. At the same time, Europe has become the second largest investment market for China, while North America for Japan.

Thirdly, there are some differences in the industry distribution of greenfield investment between China and Japan. China's greenfield investment is mainly concentrated in the housing construction industry, while Japan's greenfield investment is mainly concentrated

in cars, trailers and semi-trailers, and the industrial distribution difference in Japan is more obvious.

Fourthly, for the employment effect of greenfield investment, the employment effect of greenfield investment in Japan is stronger than that in China. In different industries and different host countries, there are significant differences in the employment effect of greenfield investment between the two countries.

Fifthly, in terms of the relationship between greenfield investment and innovation activities, it is found that compared with Japan's greenfield investment, China's greenfield investment has a stronger correlation with innovation activities based on innovation output and innovation input.

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