



The Character of R&D Investment of Multinational Corporation in Shaanxi Province

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Abstract

In the process of R&D globalization, due to market demand and preferential policies, many multinational companies choose to invest in R&D in China. With the increase of labor costs in coastal areas and the rapid economic development of the central and western regions, multinational companies have already shifted from coastal areas to central and western regions when choosing R&D regions in China, especially in Shaanxi Province. Therefore, studying the character of R&D investment and operating performance of Multinational Corporation in Shaanxi Province has important practical significance. This article uses the data of the R&D investment of multinational corporation in the joint annual inspection of Shaanxi Province in 2018 as the sample and uses EXCEL software to conduct data analysis to gain an in-depth understanding of the character of R&D and investment of multinational corporation in Shaanxi Province, business characteristics and business performance. And it is concluded that the R&D investment of multinational corporation in Shaanxi Province has a series of characteristics such as concentration of distribution, concentration of enterprise scale, and overall good performance of operating performance.

Keywords: Multinational corporation; R&D; Operating performance.

1. Introduction

In the context of increasingly fierce global competition, countries are paying more and more attention to R&D. Since 2005, global R&D funding has continued to grow, and the intercontinental category has shown a three-pronged pattern of "Asia, America, and Europe". With the continuous growth of R&D funding, the trend of R&D internationalization has become more and more obvious. According to the "World Investment Report 2019", in 2018, multinationals among the top 100 UNCTAD companies invested more than US\$350 billion in R&D, accounting for more than one-third of all R&D funded by enterprises. At the same time, Alexander Gerybadze, director of the International Management and Innovation Center of the University of Stuttgart, Hohenheim, Germany, was studying global R&D, especially corporate R&D trends, and found that while increasing R&D investment, multinational R&D is becoming more and more international. All this means that multinational corporations are big consumers of R&D expenditure and the main force to promote the development of R&D activities.

In the process of R&D globalization, due to market demand and preferential policies, more and more multinational companies choose to invest in R&D in china. The strategic motivation for implementing R&D in china is mainly to effectively use technological resources, or seek low-cost research and development, improve the efficiency of research and development, and the need to avoid risks. In the beginning, when multinational companies chose R&D locations in china, they mainly chose the Bohai Bay area with Beijing as the center, the Yangtze River Delta with Shanghai as the center, and the Pearl River Delta with Shenzhen as the center, mainly concentrated in Beijing, Shanghai, and Guangzhou, Shenzhen, Tianjin, Suzhou, Fujian and other large cities with relatively concentrated scientific research, strong economic strength and high degree of openness. The central and western regions, due to their poor economic foundation and late opening, attract fewer multinational companies. However, with the increase of labor costs in coastal areas and the rapid economic development of the central and western regions, multinational companies have already shifted to the central and western regions when choosing R&D areas in china. For example, [Lv Han \(2011\)](#), pointed out that Shaanxi has certain potential in attracting investment from multinational companies when studying the motives, influencing factors, and the corresponding industrial capacity of the host country for overseas R&D direct investment by multinational companies. The reason is that the basic factors affecting Shaanxi's attraction of foreign investment have not deteriorated, the competitive advantages of sub-locations have continued to increase, and the areas in which multinational companies are allowed to invest in Shaanxi and other western regions have gradually relaxed. [Liang Zheng \(2019\)](#), pointed out that when researching

the new trend of foreign-funded enterprises' R&D in China, they pointed out that due to the high labor costs in central cities such as Beijing and Shanghai, which have a large number of foreign-funded enterprise R&D institutions, and in addition to Beijing and Shanghai, Suzhou and other cities have labor cost advantages. It is also getting smaller and smaller, so many foreign-funded companies have moved their R&D or innovation centers to Chengdu, Xi'an and other places in order to reduce labor costs.

Therefore, a comprehensive grasp of the character of R&D and investment of foreign-funded enterprises in Shaanxi Province, the distribution characteristics of R&D foreign-funded enterprises by region, industry, and source of funds, and their operating performance are important for formulating corresponding policies for actively introducing foreign-funded enterprises to Shaanxi for R&D and investment, and reducing the development gap between the central and western regions. important meaning. And there is no relevant research in this area. Therefore, the main contribution of this article may be reflected in the detailed analysis of the R&D and investment status, operating characteristics and operating performance of foreign-funded enterprises in Shaanxi Province, which can lay the foundation for the adjustment of relevant foreign investment policies in Shaanxi Province and assist decision-makers to better formulate policy systems. Attract more foreign-funded enterprises to conduct R&D activities in Shaanxi and promote the economic development of Shaanxi Province.

According to the data from the "Joint Annual Inspection of Foreign-funded Enterprises" issued by the Shaanxi Department of Commerce in 2018, there are 1,318 foreign-funded enterprises in Shaanxi Province, of which 164 are engaged in R&D activities, accounting for 12.44%. These R&D-invested foreign-funded enterprises constitute the research sample of this article.

2. Current Character of R&D of Multinational Corporation in Shaanxi Province

This article analyzes the status quo of R&D investment of foreign-funded enterprises in Shaanxi from four aspects: country (region), region, industry, and use of foreign capital.

2.1. Analysis of the Country (Region) of Source of Funds for R&D Enterprises

There are 46 countries and regions (including Hong Kong, Macao and Taiwan) where the funds of foreign-funded enterprises in Shaanxi Province come from, but there are only 24 sources of funds for foreign-funded enterprises in R&D, among which the number of foreign-funded enterprises from Hong Kong is the largest. There are 45 companies, more than 10 countries (regions) of funding sources and 5, followed by the United States, secondary investment, Japan, Germany, and British Virgin Islands companies. The number of companies in these 6 countries or regions accounted for the total 69.51%, with a total R&D amount of 51.27%, which constitutes the main source of funds for R&D foreign-funded enterprises in Shaanxi Province. Among these six countries or regions, the total R&D scale of Hong Kong and Second Investment is larger, accounting for 14.49% and 21.98% respectively. Although the rest are large in number, the overall R&D scale is relatively small.

Except for the six main funding source countries (regions), South Korean companies performed exceptionally well. Although only 7 companies conduct R&D activities in Shaanxi, their overall R&D amount accounts for 42.59%, and the average R&D amount/personnel intensity investment is also relatively high. It is a "larger" in R&D investment by foreign-funded enterprises in Shaanxi, and has a very important position. , So we must attach great importance to it.

Generally speaking, the source countries (regions) of foreign capital for R&D in Shaanxi Province are too concentrated, and the scale is generally small, with a large gap in scale.

2.2. Analysis of Regional Distribution of R&D

Shaanxi R&D foreign-funded enterprises are located in 8 regions (Baoji City, Hanzhong City, directly under the provincial level, Weinan City, Xi'an City, Xianyang City, Yan'an City and Yangling Agricultural Demonstration Zone), of which 124 are located in Xi'an City. It accounts for 75.61% of the total, and its R&D funds account for 86.36%. Further analysis of Xi'an R&D foreign-funded enterprises shows that 86 of them are located in Xi'an High-tech Development Zone, accounting for 69.35%, and 16 are located in Xi'an Economic and Technological Development Zone. This shows that R&D foreign-funded enterprises have a very high regional distribution concentration, and they are mostly located in technology development zones.

2.3. Analysis of Industry's Distribution of R&D

More than 70% of foreign-funded enterprises engaged in R&D activities are R&D in the secondary industry, which may be related to the dominance and dominance of industry in Shaanxi Province. In terms of industry categories, there are 7 industries in Shaanxi where foreign-funded enterprises conduct R&D¹. The largest number of enterprises is the manufacturing industry, with 114 enterprises, accounting for 69.5%, and R&D funds accounting for 73.92%, which means that Shaanxi Province The industries in which foreign-funded enterprises conduct R&D are more concentrated in the manufacturing industry, and their capital source countries (regions) are the widest (22) and the most widely distributed (except Yan'an City, the remaining 7 regions are distributed). In the detailed analysis

¹ Electricity, gas and water production and supply industry Construction industry Scientific research, technical services and geological survey industry Agriculture, forestry, animal husbandry, fishery Wholesale and retail industry Information transmission, computer services and software industry Manufacturing industry

of the secondary industries in the manufacturing industry, it is also found that there is a higher concentration, especially in the scale of R&D, communication equipment, computer and other electronic equipment manufacturing, pharmaceutical manufacturing, and transportation equipment manufacturing. The total R&D funds of these three industries accounted for 82.33% of the total scale.

2.4. Analysis of R&D Enterprises' Utilization of Foreign Capital

Shaanxi R&D foreign-funded enterprises use foreign capital in four ways, namely Sino-foreign joint ventures, Sino-foreign cooperation, wholly foreign-owned, and joint-stock systems. The main ways to use foreign capital are only Sino-foreign joint ventures and wholly foreign-owned enterprises. The number of foreign-funded enterprises accounted for 56.7% of the total. With 37.2%, R&D investment accounted for 32.5% and 66.2% respectively. Compared with Sino-foreign joint ventures, the number of sole proprietorships is smaller, but the scale of R&D investment is large. This is caused by the purpose of foreign-funded enterprises to protect their core technologies. Among the 6 main sources of funding, foreign-funded companies in Hong Kong (sole proprietorship 12, joint venture 27), Japan (sole proprietorship 4, joint venture 10), and Germany (sole proprietorship 4, joint venture 9) tend to choose Sino-foreign joint ventures. investment. Among the top two companies in the manufacturing and information transmission, computer services, and software industries, manufacturing companies (28 sole proprietorships, 78 joint ventures) are more inclined to choose Sino-foreign joint ventures. Information transmission, computer services and software industries (sole proprietorship 28. Joint venture 10) It is more inclined to choose sole proprietorship.

3. Analysis of Operating Characteristics of Foreign-Funded R&D Enterprises in Shaanxi

This article will analyze the operating characteristics of R&D foreign-funded enterprises in Shaanxi from six aspects: enterprise scale, human capital, operating time, equity structure, capital structure and R&D results.

3.1. Enterprise Scale Analysis

The scale of an enterprise can be understood from two different perspectives: input and output. This article sets "total investment, total registered capital, total assets, and number of employees" from the perspective of input, and "operating income, total profit, net profit, total taxation" from the perspective of output as the main indicators to measure the scale of the enterprise.

The overall scale of R&D investment foreign-invested enterprises in Shaanxi Province is: the average total investment is US\$90.05 million, the average registered capital is US\$35.99 million, the average asset value is 771 million yuan, the average number of employees is 386, the average operating income is 470 million yuan, and the profit is The average total value is 57.1 million yuan, the average net profit is 55.01 million yuan, and the average total tax is 25.72 million yuan. According to the median and standard deviation of the eight indicators, there is a large gap in the scale of R&D investment in foreign-funded enterprises in Shaanxi Province, which is also the main reason for the large gap in the R&D scale of foreign-funded enterprises in Shaanxi Province.

3.2. Human Capital Analysis

From the perspective of the nationality of employees, foreign employees in foreign-funded enterprises in Shaanxi Province account for a relatively small proportion, accounting for only 0.74% on average, so they are basically domestic employees. This can ease the employment pressure of graduates and increase the employment rate in Shaanxi; In terms of the educational level of personnel, the average proportion of employees with a college degree or above is 41.68%, of which the proportion of R&D companies is lower than that of non-R&D companies, which is 35.28%, but the proportion of R&D personnel (14.63%) is far Higher than that of non-R&D companies (2.11%).

3.3. Analysis of Operating Hours

Based on the original data, the average operating time of R&D investment foreign-invested enterprises is 11.53 years. From the frequency distribution chart 3.47, it can be seen that the operating time is mostly 10-15 years, followed by 5-10 years. The number of enterprises operating for 30-35 years is the least, with 2 companies.

3.4. Analysis of Ownership Structure

The equity structure of non-R&D companies is more concentrated. Among R&D companies, the number of companies with a foreign shareholding ratio of (0.8-1] accounted for 43%, accounting for the largest proportion. This is because foreign companies tend to choose a highly concentrated way of equity in order to prevent technology spillovers. investment.

3.5. Capital Structure Analysis

The capital structure of foreign-funded enterprises in Shaanxi Province has not performed well, but relatively speaking, the ratio of asset-liability and equity ratio of foreign-invested R&D enterprises is slightly better than that of non-R&D-invested foreign-funded enterprises. The ratio is around 0.55.

3.6. Analysis of R&D Results

Of the 164 foreign-invested R&D-invested enterprises, 75 have obtained domestic authorizations, with a total of 710 valid patents, and 5 foreign-funded enterprises have obtained overseas authorizations, with a total of 9 valid patents. Among the 1,154 non-R&D investment foreign companies, only 42 companies have obtained domestic authorization. The number of valid patents is 166, and the number of overseas authorizations is 0, which is far below the level of R&D achievements of foreign-invested R&D enterprises.

4. Analysis of Operating Performance of Foreign-Funded R&D Enterprises in Shaanxi

The overall performance of R&D investment foreign-funded enterprises has performed well, which is better than that of non-R&D enterprises.

On the whole, the operating performance of Baoji and Hanzhong of the eight regions is better, and the Yangling Agricultural Demonstration Zone performs the worst; among the 24 funding source countries (regions), the operating performance of Finnish and Italian R&D foreign-funded enterprises The performance is better; among the seven industry categories, the information transmission, computer services and software industries, and the production and supply of electricity, gas and water have performed better, and the construction industry has performed poorly. Among them, the secondary industry in the manufacturing industry, Central Africa The operating performance of the metal and mineral products industry is relatively good, and the wood processing and wood, bamboo, rattan, palm, and grass products industries perform the worst (see Attached Table d); among the different ways of using foreign capital, the ROE level of wholly-owned enterprises is the lowest, but Its total ROA, ROT, PRATE and TAT are all the highest. Chinese-foreign cooperative enterprises have the highest ROE and ROS levels, while joint-stock companies except ROE have the lowest performance levels, so joint-stock companies have poor corporate performance.

5. Research Conclusion

By studying the financial data of the joint annual inspection of foreign-funded enterprises in 2018 provided by the Department of Commerce of Shaanxi Province, this article understands the distribution status of R&D investment, the operating characteristics of R&D investment enterprises and the operating performance of R&D investment enterprises in Shaanxi Province. Finally, the following conclusions were reached:

- (1) The distribution of R&D investment by foreign-funded enterprises in Shaanxi Province is relatively concentrated: (1) Among the 24 R&D companies' funding source countries (regions), R&D companies mainly come from Hong Kong, the United States, secondary investment, Japan, Germany and the British Virgin Islands. Countries and regions accounted for 69.51% of the total. The R&D amount mainly comes from South Korea, secondary investment and Hong Kong, accounting for 70.06% of the total. (2) In terms of regional distribution, 75.61% of R&D investment foreign-funded enterprises are located in Xi'an, and R&D funds account for 86.36%. (3) In the industry distribution, 69.5% of R&D enterprises belong to the manufacturing industry, and the proportion of R&D funds is as high as 73.92%. (4) The use of foreign capital by R&D investment companies is concentrated in sole proprietorship and joint ventures, of which the R&D amount of sole proprietorship accounts for 66% of the total.
- (2) Observing the operating characteristics of R&D investment foreign-funded enterprises in Shaanxi Province, we can see that the scale of R&D foreign-funded enterprises in Shaanxi Province is characterized by a concentration of scale and a large gap. The operating time is mostly 10-15 years, and the proportion of R&D personnel is much higher than that of non- Research and development companies. In terms of the proportion of foreign ownership that can reflect the degree of equity concentration, the proportion of R&D foreign companies in (0.8-1] accounted for the largest proportion. In terms of capital structure, the capital structure of foreign companies in Shaanxi Province did not perform well, but in relative terms , R&D investment foreign-invested enterprises have slightly better asset-liability ratio and equity ratio than non-R&D-invested foreign-invested enterprises.
- (3) The overall performance of R&D investment foreign-invested enterprises is good, which is better than that of non-R&D enterprises. Among them, foreign-funded enterprises in the information transmission, computer services, and software industries, as well as in the production and supply of electricity, gas and water, performed better; wholly foreign-owned enterprises performed better.

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