The Role of Pharmaceutical Manufacturing Industry Cluster in Jilin Province

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Abstract: This paper compares the level of industrial clusters between the main clusters and compares the innovation capacity, profitability, industrial scale and comprehensive competitiveness. The analysis shows that the industrial agglomeration level of Jilin is high, and the pharmaceutical manufacturing industry is the pillar industry of Jilin, contributing more than 7% to the GDP of Jilin. However, the problem of the innovation ability is seriously backward and the low degree of product commercialization leads to the agglomeration of the pharmaceutical manufacturing industry that has not played a positive role in its economic growth.

1. Introduction

Chen Ning[1],Sun Qiu[3], Chu Shuzhen[2] believe that the government guidance and government strategy should be taken as the primary position in the development of big health industry clusters, focusing on the cultivation of leading enterprises and establishing a brand effect. Ren Hong[4] found that the key to the competitiveness of industrial clusters is the competitiveness of core enterprises. Xu Jing[5] believes that the industrial cluster cooperation in Jilin needs changes from both enterprises and the government. Wang Xingli[6], Shi dan[7] believes that the overall level of China's pharmaceutical manufacturing industry is far lower than the world level and has low international competitiveness. Zhang Huimin[8], Liu qiang[9] believes that China's pharmaceutical manufacturing industry in Shandong, Jiangsu and Zhejiang has formed an industrial agglomeration area. The pharmaceutical manufacturing industry in Jilin is the fourth largest industry in Jilin, but the industrial agglomeration has not brought too many advantages. Huang Dan[10] believes that Jilin has strong technology and market competitiveness, and its resource competitiveness is general. It should take technical competitiveness as an important development direction, so as to improve the comprehensive core competitiveness. Most of the above studies of scholars believe that it is necessary to find a growth center, that is, the core enterprise, from the industrial agglomeration, so as to promote the core competitiveness of the industrial agglomeration. However, the pharmaceutical manufacturing industry in Jilin has reached a certain level of industrial agglomeration, but it has not formed a strong core competitiveness of agglomeration.

2. Cluster Analysis of Pharmaceutical Manufacturing Industry in Jilin Province

2.1Analysis of Pharmaceutical Manufacturing Industry in Jilin Province

The pharmaceutical manufacturing industry has developed rapidly in recent years. In 2019, among the top 100 pharmaceutical enterprises, private enterprises accounted for 90%, Shandong had the largest number, and Jilin ranked fourth. There are eight of the top 100 enterprises in Jilin.

In addition, select the data of 2018, and compare the proportion of the provincial pharmaceutical manufacturing industry in the total industrial output value, to see the development of the industry in each province. In 16-14, although in Jilin Province in the total output industrial value in China increased steadily, the range and capacity were very small, only from 0.63%to 0.75%.

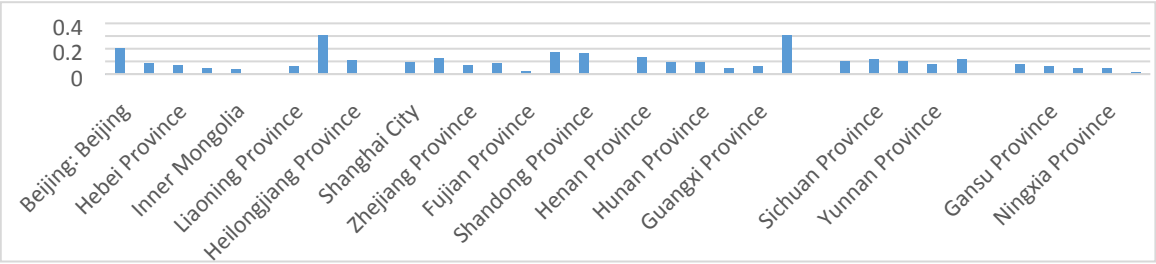

Figure 1. Part of the pharmaceutical manufacturing industry to the local total industrial output value in 2018

In 2016, the pharmaceutical manufacturing industry accounted for the proportion of the total industrial output value of the province, Jilin ranked in the first place, the industrial output value contributed more than 30%, but the contribution to the national industrial output value, far less than Shandong, Jiangsu, Henan, ranked fourth in the country, which shows that the competitiveness of Jilin is not strong. Although the contribution of the pharmaceutical manufacturing industry to the competitiveness of Jilin is increasing every year, the increase is not large. From the above data analysis, the development situation of the pharmaceutical manufacturing industry in Jilin still has room for progress in the whole country, and the output value of the pharmaceutical manufacturing has been increasing steadily. The reason is one of the four industries in Jilin, its industrial foundation is good, has a good resource endowment advantage, the government also will pharmaceutical manufacturing as a new pillar industry in Jilin, issued a series of policies to support it, by 2020, the total industrial output value of the pharmaceutical manufacturing industry can account for more than 7%of the province's GDP. However, from the national point of view, the competitiveness of the whole country does not match the competitiveness of the province. Therefore, we will then analyze the agglomeration and competitiveness of the pharmaceutical manufacturing industry in Jilin.

2.2 Index Selection

Considering that the degree of industrial agglomeration is not only the industrial intensity in the region, but also the impression of the scale of enterprises and the level of regional development differences. In view of the data availability, this paper refers to Zhang Huimin's index selection principle, and mainly chooses location entropy (LQ)to measure the level of agglomeration.

2.3 Analysis of Industrial Agglomeration Agglomeration

As can be seen from the table below, the pharmaceutical manufacturing industry concentration level is high, ranked second in the country, far higher than the national level, and the pharmaceutical manufacturing industry agglomeration level in Shandong in 16, Henan ranked 12th,the three provinces above the national level, but the pharmaceutical manufacturing industry agglomeration is far higher than the level of the rest of the country.

Table 1. 2018 Location entropy ranking

Tibet	4.65	Heilongjiang	1.21	Chongqing	0.96	Inner Mongolia	0.68
Jilin	3.18	Qinghai	1.19	Guangxi	0.86	Gansu	0.66
Hainan	2.87	Yunnan	1.18	Shanghai	0.86	Guangdong	0.52
Beijing	1.66	Henan	1.17	Anhui	0.8	Shanxi	0.51
Jiangxi	1.63	Shaanxi	1.12	Tianjin	0.8	Ningxia	0.40
Guizhou	1.63	Hunan	1.08	Zhejiang	0.8	Fujian	0.30
Sichuan	1.42	Hubei	1.07	Liaoning	0.74	Xinjiang	0.15
Shandong	1.26	Jiangsu	1.02	Hebei	0.7		

3. Core Competitiveness of Pharmaceutical Manufacturing Industry in Jilin Province

3.1Current Situation of Regional Industrial Development

Shandong, Jiangsu, Henan and Jilin have a relatively large proportion of the total industrial output value, and the industrial concentration of these four provinces is higher than the national level. The main reason is that the pharmaceutical manufacturing industries in Jiangsu and Shandong have been at the forefront of the country. The annual profits of only these two s can exceed 50 billion yuan, the profits and taxes are nearly 70 billion yuan, and the industry has a strong ability to resist pressure. The proportion of pharmaceutical manufacturing industry in Jilin in the industrial manufacturing industry, has formed a development trend mainly pharmaceutical park and traditional Chinese medicine industrial base.

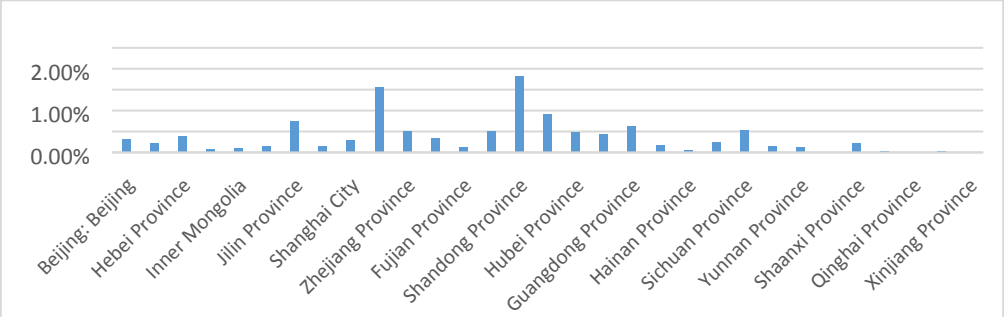

Figure 2. Part of the pharmaceutical manufacturing industry in the national industrial output value in 2016

3.2Industrial Competitiveness Indicators

Table 2. Industrial competitiveness indicators

Scale and strength	X1 Main business revenue	
	X2 Total assets	Fixed assets+Current assets
Innovation ability	X3 New Product R&D Strength	(New product research&D funds/sales revenue of current year)
	X4 R&D personnel investment intensity	Number of researchers/Total practitioners
	X5R&D fund investment intensity	R&D funding/corporate sales revenue
	X6 R&D Agency Investment Strength	Number of research personnel/Enterprise
	X7 New Product OutValue Rate	New product sales revenue/gross industrial output value
Profitability	X8 operating profit margin	Operating Profit/All Business Income
	X9 operating income profit and tax rate	(Profit+tax)/Operating income
	X10 cost and expense profit margin	Profit/(Cost of+expense)

4. Comparative Study on the Core Competitiveness of the Pharmaceutical Manufacturing Industry

4.1Empirical Analysis

This paper selected the data of various provinces in 2018, used spss software, and studied the industrial competitiveness of various Chinese provinces.

Table 3. KMO and Bartlett Inspection

KMO	.665

Bartlett spherical degree test	Approximate chi square	45
	P value	.000

Main component analysis of the provincial index data, the first main component contains new product R&D strength, R&D personnel investment intensity, R&D investment intensity, R&D institutions investment intensity, new product output rate, mainly reflects the scientific and technological innovation ability of pharmaceutical manufacturing industry, pharmaceutical manufacturing as a high-tech industry, innovation ability is the core of the core. The second main component includes operating profit margin, operating income profit and tax, cost and expense profit margin, which reflects the profitability of the industry and the commercialization ability of the products. The third main component includes the main business income and total assets, which mainly reflects the scale of the industry.

Table 4. Composition Matrix

	Composition		
DDDDDF	1	2	3
X5	.871	.204	-.380
X3	.863	.225	-.263
X4	.843	.076	-.339
X6	.720	-.275	-.085
X7	.711	-.317	.136
X9	.150	.891	.354
X10	.111	.881	.358
X8	.204	.832	.237
X1	.381	-.501	.746
X2	.561	-.400	.682

Comprehensive scoring type: F=0.45F1+0.35F2+0.2F3

As shown in the following table, after excluding some provinces that are difficult to form industrial agglomeration, the ranking of all provinces is shown in the following table below, and the industrial innovation ability F1 of Jilin is ranked 23, second to bottom. Profitability F2 was ranked 22.Enterprise F3 ranks ahead, third in the country and 23 in overall scoring F. Comprehensive score in the front of Beijing, Zhejiang, Shanghai, Jiangsu, Shandong, Shandong in the previous analysis of industrial concentration level far less than Jilin, the industrial scale is far less than in Jilin province, pharmaceutical manufacturing industry scale is not the main factor to determine the core competitiveness of an industry, is the profitability and innovation determines the comprehensive competitiveness of high-tech industry.

Table 5. Table of comprehensive competitiveness of high-tech industry

Region	F1	Region	F2	Region	F3	Region	F
Zhejiang	1	Beijing	1	Shandong	1	Beijing	1
Jiangsu	2	Shanghai	2	Jiangsu	2	Zhejiang	2
Beijing	3	Fujian	3	Jilin	3	Shanghai	3
Shanghai	4	Yunnan	4	Henan	4	Jiangsu	4
Jiangxi	22	Jilin	22	Hebei	22	Henan	22
Jilin	23	Shaanxi	23	Shanxi	23	Jilin	23

4.2Relationship between Pharmaceutical Industry Cluster and Comprehensive competitiveness in Jilin Province

From the above competitiveness analysis research, the competitiveness of Jilin is backward industry scale is too large, small and medium-sized enterprises, enterprises will not closely related, strong control, large enterprises, small, but industry irregularities, enterprise capital is not strong, there is no way to maintain enterprise innovation ability, enterprise transformation ability is too

weak, no commercialization of technology output, cannot profit, low added value, in addition to correction pharmaceutical and aodong pharmaceutical can be competitive in the market, many small and medium-sized enterprises do not have their own core products.

SPSS software used linear regression analysis on the location entropy and industrial added value of Jilin, which found no relationship. However, the location entropy value of Jilin has always been ranked among the top few in China, which can only show that the pharmaceutical manufacturing industry is the leading industry and the pillar industry of Jilin.

5. Problem and Countermeasure Analysis

5.1Increase the Investment in Scientific Research

Enterprises above the designated scale, especially the leading enterprises, should increase their investment in R&D within the enterprises, set up R&D institutions, carry out R&D activities, and conduct moderate industry cooperation for small and medium-sized enterprises.

5.2Expand the Market and Create A Brand Industry

The comprehensive competitiveness of the industry is to see the profitability of the industry and the ability to transform scientific and technological achievements. Only one enterprise in Jilin has entered the top 100 enterprises, the brand effect is weak, the commercialization degree is low, and the market rate is not high. And the pharmaceutical industry of the product repetition rate is high, the new product development has stagnated.

5.3Cultivating the Leading Enterprises

Industrial agglomeration did not bring a positive external effect to Jilin, but suppressed his development. The excessive concentration of technical resources was concentrated in the leading industries, and the policy was also biased. The government should timely turn its attention to small and medium-sized enterprises, promote joint production among enterprises, and promote the circulation of technology, resources and talents.

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