

Research On Regional Coordination of Higher Education in China

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Abstract

Since the reform and opening up, China's market economy has developed rapidly, laying a solid foundation for the development of China's higher education. However, from the current point of view, the development of higher education in China is still limited to the promotion of quantity, and there are great differences in the development of different regions. Based on the introduction of the current situation of higher education in China and relevant theories, and the analysis of the differences in regional education scale, quality and scientific research level, this paper provides a choice of paths to solve the regional coordination problem of higher education.

Keywords

Higher education; Region; Coordinate.

1. RESEARCH BACKGROUND

As the second largest economy in the world, China has created a superior external environment and accumulated a solid material foundation for higher education. Until 2012, China's fiscal expenditure on education accounted for more than 4% of GDP. The China Higher Education Quality Report (2016) shows that by 2015, the number of college students in China had reached 37 million, ranking first in the world; There are 2852 colleges and universities, ranking second in the world. The gross enrollment rate of higher education increased from 10.5% in 1999 to 40% in 2015, nearly 30% higher, with an average annual growth rate of 8.7%, exceeding the world average. Therefore, from this indicator, China's higher education has achieved the historical leap from elite higher education to mass higher education.

Practice has proved that the expansion of higher education enrollment has enabled more students to enter colleges and universities, improved their education platform, alleviated the unfair phenomenon of education, and cultivated a large number of high-quality talents for the country; Moreover, through college study, the average length of education in China has been greatly improved, and the quality of the population has also been rapidly improved.

However, the increase in quantity has not brought about qualitative changes. Due to the differences in natural environment and social and economic development in various regions, the development of higher education is obviously unbalanced. With good regional and economic advantages, the eastern region has far exceeded the central and western regions in terms of both the scale and quality of higher education. Although the state has put forward some policies to change the imbalance, the problems in the process of higher education redevelopment have not been effectively controlled. The problems of unbalanced development of higher education and unfair distribution of educational resources have gradually become a hot topic of research.

In this case, it is of great significance to advocate the construction of a fair and reasonable spatial distribution pattern of higher education and reduce the spatial gap for promoting regional coordinated development.

2. BASIC THEORY

2.1. Human Capital Theory

The theory of human capital has gone through three stages of development until the 1980s, when the new economic growth theory rose and provided a basis for the development of the theory of human capital. This theory requires the introduction of human capital into the economic growth model. The main representatives are Romer and Lucas.

Romer's knowledge spillover model divides knowledge into general knowledge with "external effect" and professional knowledge that generates incremental income of factors. The combination of these two kinds of knowledge can increase the income of human capital and other factors. Lucas' human capital spillover model believes that the human capital generated through education has an "internal effect", that is, the labor force accumulates human capital through education, thus promoting economic growth to a certain extent.

The development of human capital theory is a long process of constant revision and improvement. Scholars in various periods have made outstanding contributions. The theory of human capital makes people clearly realize the role of education, especially higher education, in the accumulation of human capital, and the impact of education on economic growth.

2.2. Theory of regional unbalanced development

The theory of regional unbalanced development holds that in the process of spatial development of any region, with the flow of elements, it is impossible for the region to maintain a balanced state all the time, and there are differences in regional development.

First, Peru's growth pole theory. Among them, the growth pole influences the development of surrounding areas through polarization effect and diffusion effect. Polarization effect refers to that the growth pole attracts the elements in the surrounding areas and makes them flow to the growth pole, thus promoting the development of the growth pole. Diffusion effect refers to the weak development of the growth pole and the return of factor resources to the surrounding areas, thus promoting the development of the surrounding areas.

Second, Murdal's theory of circular cumulative causation holds that regional economic growth should first start from the place with superior resource endowments, and then continue to gain competitive advantage through the circular cumulative causation of economic development. The level of economic development is constantly increasing, and the imbalance of regional development is more obvious.

Third, Williamson's inverted "U" theory, which, through empirical analysis, believes that in the early stage of economic development, the economically developed regions, with the help of their inherent advantages, have developed rapidly, and the gap between regions has gradually widened, highlighting the imbalance; After a long period of development, this imbalance has gradually become stable; In the late development process, the gap between regions gradually narrowed, and the economic development gradually converged.

3. CURRENT SITUATION OF HIGHER EDUCATION DEVELOPMENT IN THREE MAJOR REGIONS OF CHINA

3.1. Current situation of the scale of higher education in the three regions

There is a gap in the development scale of regional higher education in China. The number of college students per 100000 population is an important indicator to measure the relative development scale of higher education [1].

Taking the data of 2015 as an example, it is found by comparison (Table 1): (1) The overall level of the number of students per 100000 population in the three regions decreases gradually

from east to middle and then to west. The gap between the highest and lowest number of students per 100000 population in the east (3077) and west (2353) is greater than that in the middle (1134). In particular, the number of students in school per 100000 population in Beijing is 5218 times the national level (2524), far higher than the highest level in the central and western regions. (2) The number of college students per 100000 population in the three regions is higher than the national level in provinces, showing a downward trend from east to middle and then to west. Among the eastern provinces, the number of college students per 100000 population is higher than the national level in 7 provinces, namely Beijing, Tianjin, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian and Shandong, accounting for about 64% of the eastern provinces; Among the central provinces, the number of college students per 100000 population is higher than the national level, including Jilin, Jiangxi and Hubei, accounting for about 33% of the central region; In the western region, the number of college students per 100000 population is higher than the national level in 2 provinces, accounting for only 18% of the western region. (3) The range of the number of students in school per 100000 population in the three regions is decreasing from east to west. The difference between the highest level and the lowest level of every 100000 students in the east is 3077, the difference between the highest level and the lowest level in the middle is 1134, and the difference between the highest level and the lowest level in the west is 2353.

3.2. Current situation of higher education quality in three regions

The quality of regional higher education can be judged from two aspects: first, the number of key (high-quality) universities in each region; The second is the level of teaching and scientific research ability.

3.2.1 Comparison of the number of key universities

There are 117 and 41 211 and 985 universities in China, respectively, totaling 158. The data in 2015 (Table 2) shows that: first, the number of key universities in the east is far higher than that in the west. There are 94 universities in 211 and 985 in the east, 30 more than the sum of the central and western regions. The number of key universities in the eastern region accounts for 9% of the number of universities in the eastern region, about twice that in the central and western regions. The number of key universities in the central and western regions is 4% and 5% respectively. Second, the difference between the highest level and the lowest level in the eastern region decreases from the middle to the west and then to the middle. The range in the eastern, central and western regions is 33%, 6% and 16% respectively. Among them, the key universities in the eastern region of Beijing account for 35% of the number of universities in the region, while the key universities in Zhejiang account for only 2%, with a range of 33%; The key universities in Jilin and Hubei in the central region account for 7%, while the key universities in Henan, Jiangxi and other provinces account for only 1% respectively; The proportion of key universities in Tibet, Shaanxi and other provinces in the western region is 17% and 12% respectively, while the proportion of key universities in Guangxi and Yunnan is only 1%. In addition, although the range in the central region is the smallest, the provinces with the highest proportion of key universities in the eastern and western regions (Jilin and Hubei) are 5 times and 2.4 times higher than those in the central region.

Table 1. Number of students in regional higher education in 2015

Region	Province	Number of students in school per 100000 population
Whole Country	Whole Country	2524
Eastern region	Beijing	5218
	Tianjin	4185
	Hebei	2141
	Liaoning	2876
	Shanghai	3330
	Jiangsu	2896
	Zhejiang	2414
	Fujian	2508
	Shandong	2516
	Guangdong	2434
	Hainan	2290
Central region	Shanxi	2504
	Inner Mongolia	2035
	Jilin	3469
	Heilongjiang	2518
	Anhui	2309
	Jiangxi	2654
	Henan	2293
	Hubei	3038
	Hunan	2215
Western region	Guangxi	2178
	Chongqing	3071
	Sichuan	2312
	Guizhou	1819
	Yunnan	1819
	Xizang	1766
	Shanxi	3628
	Gansu	2194
	Qinghai	1275
	Ningxia	2244
	Xinjiang	1759

Table 2. Key universities in three regions (2015)

Region	Province	Number of key universities	Number of key universities/ Number of colleges and universities
Eastern region	Beijing	32	35%
	Tianjin	6	11%
	Hebei	1	1%
	Liaoning	6	5%
	Shanghai	14	21%
	Jiangsu	13	8%
	Zhejiang	2	2%
	Fujian	3	3%
	Shandong	9	6%
	Guangdong	7	5%
	Hainan	1	6%
Central region	Shanxi	1	1%
	Inner Mongolia	1	2%
	Jilin	4	7%
	Heilongjiang	5	6%
	Anhui	4	3%
	Jiangxi	1	1%
	Henan	1	1%
	Hubei	9	7%
	Hunan	7	6%
Western region	Guangxi	1	1%
	Chongqing	3	5%
	Sichuan	7	6%
	Guizhou	1	2%
	Yunnan	1	1%
	Xizang	1	17%
	Shanxi	11	12%
	Gansu	2	4%
	Qinghai	1	8%
	Ningxia	1	6%
	Xinjiang	2	5%

3.2.2 Comparison of teaching and scientific research

Take the 2014 National Teaching Achievement Award and 2016 Humanities and Social Sciences Research Base as the standard to judge the teaching and research level in different regions. There are 425 national teaching achievement awards (higher education) in 2014. The data in 2014 (Table 3) shows that the number of national teaching achievement award-winning projects (higher education) decreases from the east to the middle and then to the west. There were 260 awards in the eastern region, 111 awards in the central region and 81 awards in the western region, accounting for 57.52%, 26.12% and 19.06% of the total awards respectively. (2) The number of award-winning projects of national teaching achievements in the region is extremely poor. In the eastern region, Beijing won the most awards (71) and Hainan won the least (1), with a difference of 70; Central Hubei won the most awards (28), and Shanxi won the

least (2), with a difference of 26; Shaanxi in the western region won the most awards (33), while Guizhou, Tibet and other six provinces all won one, with a difference of 32.

Table 3. List of 2014 national teaching achievement awards (higher education)

Region	Province	Number of awards	Number of awards/ Total national awards
Whole Country	Whole Country	425	
Eastern region	Beijing	71	15.71%
	Tianjin	11	2.43%
	Hebei	7	1.55%
	Liaoning	19	4.20%
	Shanghai	34	7.52%
	Jiangsu	47	10.40%
	Zhejiang	27	5.97%
	Fujian	10	2.21%
	Shandong	15	3.32%
	Guangdong	18	3.98%
	Hainan	1	0.22
Central region	Shanxi	2	0.47
	Inner Mongolia	3	0.71
	Jilin	16	3.76
	Heilongjiang	17	4.00
	Anhui	18	4.24
	Jiangxi	8	1.88%
	Henan	11	2.59%
	Hubei	28	6.59%
Hunan	8	1.88%	
Western region	Guangxi	3	0.71%
	Chongqing	10	2.35%
	Sichuan	20	4.71%
	Guizhou	1	0.24%
	Yunnan	8	1.88%
	Xizang	1	0.24%
	Shanxi	32	7.53%
	Gansu	1	0.24%
	Qinghai	1	0.24%
	Ningxia	1	0.24%
	Xinjiang	3	0.71%

The Department of Social Sciences of the Ministry of Education officially announced the construction of key research bases for humanities and social sciences in colleges and universities in 2016. A total of 145 key research bases in 60 colleges and universities were funded. The data in 2016 shows (see Table 4): (1) In 2016, the number of universities and bases funded for the construction of key research bases of humanities and social sciences in universities decreased from the east to the middle and then to the west. In the eastern region, there are 35 universities and 102 bases that have received funding; In the central region, there are 13 universities and 27 bases that have been funded; In the western region, 12 universities

and 16 bases have received financial support. (2) There are differences in the number of funded universities and bases in the region. In the eastern region, 13 universities and 46 bases have been funded in Beijing, while Hainan has not; There are 3 universities and 11 bases in Hubei in the central region, and 1 university and 1 base in Shanxi, Inner Mongolia, Heilongjiang, Jiangxi, Henan, Hunan and other provinces; There are 3 colleges and universities in the western region of Sichuan, with 3 bases. Ningxia, Sichuan, Guizhou, Qinghai and other provinces have not been supported. In addition, there is a certain gap in the strength of universities in the region. For example, 13 universities in Beijing have been funded, with an average number of 46 bases, which is equivalent to three bases for each university, while one university in Shanxi has been funded, with only one base.

Table 4. Appropriation for humanities and social sciences research base of universities in 2016

Region	Province	Number of key research bases	Number of funded universities
Whole Country	Whole Country	145	60
Eastern region	Beijing	46	13
	Tianjin	7	2
	Hebei	1	1
	Liaoning	2	2
	Shanghai	17	5
	Jiangsu	6	3
	Zhejiang	4	2
	Fujian	5	1
	Shandong	4	1
	Guangdong	10	5
Central region	Hainan	0	0
	Shanxi	1	1
	Inner Mongolia	1	1
	Jilin	8	2
	Heilongjiang	1	1
	Anhui	2	2
	Jiangxi	1	1
	Henan	1	1
	Hubei	11	3
Western region	Hunan	1	1
	Guangxi	0	0
	Chongqing	2	2
	Sichuan	6	3
	Guizhou	0	0
	Yunnan	1	1
	Xizang	1	1
	Shanxi	2	2
	Gansu	3	2
	Qinghai	0	0
	Ningxia	0	0
Xinjiang	1	1	

4. THE PATH CHOICE OF REGIONAL COORDINATED DEVELOPMENT OF HIGHER EDUCATION

4.1. Equal Development Coordination Zone: Cultivate Growth Pole Model

The theory of unbalanced development points out that "balanced regional development is impossible and unnecessary, and regional imbalance is just the driving force for the common development of different regions" [2]. Therefore, for the coordinated development of higher education, when its higher education resource utilization efficiency is obviously superior, it will inevitably form a certain "return effect" and "diffusion effect" between adjacent regions. Furthermore, most of the regions with unbalanced development of higher education in China are also areas where higher education resources are scarce, and the polarization between them and the total amount of resources in areas rich in higher education resources is growing, and they are gradually falling into a vicious circle of "Matthew effect" to a certain extent. Therefore, it is also imperative to gather and continuously drive the overall growth of regional higher education resources with new system design and policy adjustment, so as to avoid the possible "return effect" of higher education resource rich areas on these regions. As a theoretical design, it is reasonable to cultivate regional growth poles of higher education in similar development coordination areas of higher education (coordinated development areas, unbalanced development areas), on the one hand, to avoid the reflow effect of coordinated development areas of higher education on the collection of resources in the unbalanced development areas of higher education, on the other hand, to create new growth points for the development of higher education in the unbalanced development areas and the collection of higher education resource elements. The specific path is as follows:

4.1.1 In the unbalanced area of higher education development

Beijing was chosen as the growth pole of regional development of higher education in China. From the perspective of the actual distribution of regional higher education resources, Beijing is in the first echelon of China's higher education resources, and is a highly enriched area of higher education resources; From the perspective of coordination, Beijing is an uncoordinated area of China's higher education development due to the huge difference between the actual and the expected level structure of its higher education resources. Therefore, within the framework of unbalanced and coordinated regional development of higher education in China, it is undoubtedly the only way to promote the coordinated regional development of higher education in China by selecting appropriate growth poles of higher education in different areas of coordinated development. In the long run, this measure is also an effective way to ensure that the "diffusion effect" of higher education development in different regions of China is greater than the "return effect". Therefore, on the basis of comprehensive consideration of the actual level of higher education resources and the coordination of development, Beijing can be selected as the growth pole of higher education in the imbalance area of higher education development in China.

4.1.2 In the coordination area of higher education development

Shanghai was chosen as the growth pole of regional development of higher education in China. The survey of the actual level of higher education resources shows that Shanghai is located in a highly enriched area of higher education resources in China because of its large scale of higher education, high quality of higher education and long-term leading efficiency of higher education resources. However, different from other areas rich in higher education resources, Shanghai has become a typical area for the coordinated development of higher education in China because of its close relationship between the actual and the expected level structure of higher education resources. Therefore, from the perspective of driving the overall development of regional higher education, Shanghai, with its high level of higher education resources and coordinated

development, is bound to be able to better promote and radiate the overall development of higher education in similar development coordination areas and adjacent regions to a considerable extent. Based on this consideration, within the framework of unbalanced and coordinated development of regional higher education, Shanghai can be selected as the growth pole of the coordinated development of higher education in China, and actively cultivated and supported.

4.2. Between provinces and regions in China: grid development model

The difference and differentiation of the actual higher education stock resources in 31 provinces and regions in China are, to a large extent, the result of the early resource allocation and institutional arrangement of the government. Therefore, it is necessary to synchronously adopt the grid development mode among the 31 provinces and regions in China, so that higher education in each province and region can obtain certain policy resource advantages, and then continuously improve the level and utilization efficiency of higher education resources in these regions, so as to realize the unbalanced and coordinated development of higher education in 31 provinces. The specific path is as follows:

4.2.1 Coordinate the joint development of similar universities

Establish a cross regional higher education development alliance in the same industry. Break the barriers to the convergence of higher education resources among regions, actively integrate the resource advantages of similar universities and disciplines in different regions, and form multi-dimensional and multi-channel interactive cooperation in talent training, scientific research, social services, international exchanges, and cultural heritage of higher education, such as joint training, exchange training, mutual recognition of credits, exchange and other ways to carry out talent training cooperation among similar universities; Jointly carry out scientific research work such as subject application, project research, experiment and training; Jointly carry out collaborative research and transformation of scientific and technological achievements for industrial enterprises and industrial departments. In fact, "the cooperation between higher education institutions and between universities and society is crucial to the balanced development of university social responsibility". On this issue, we can integrate the resource advantages of contract schools and form alliances (such as China Normal University Development Alliance, China Finance and Economics University Development Alliance, China Medical University Development Alliance, etc.) in the recruitment of international students, international personnel exchange, exchange and mutual visits, so as to form an overall joint effort to jointly carry out international exchanges and cooperation, and then through industry complementation and strong alliance, To realize the free flow and optimal allocation of higher education resource elements among regions as a whole. On the one hand, give play to the derivative advantages of higher education resources, on the other hand, effectively improve the resource efficiency of higher education, and promote the overall coordination and common development of regional higher education.

4.2.2 Guide the development of regional university clusters

Build a comprehensive and integrated development circle of regional higher education. In combination with the overall strategy of national economic and social development and the connecting point of regional economic and social development, we will actively create and form a higher education development circle that is suitable for different regional economic and social development levels and higher education resource levels. For example, build a higher education development circle in western provinces and regions around the national "Western Development" strategy and the national plan to improve the basic capacity of colleges and universities in the central and western regions; Combining the national strategic measures of "revitalizing the old industrial base in the northeast", build the development circle of higher education in the northeast; In combination with the national "the Belt and Road" development

strategy, build a higher education development circle of the Silk Road Economic Belt; Combining the national "Yangtze River Economic Belt" development strategy, build a higher education development circle of the Yangtze River Economic Belt; Build a higher education development circle of "Bangladesh China India Myanmar Economic Corridor" in combination with the national construction strategy of "Bangladesh China India Myanmar Economic Corridor"; In combination with the cooperation of the "Greater Mekong Subregion", build the "Yunnan Greater Mekong Subregion Education Cooperation Alliance" and so on [4]. Through the integrated development and cluster development of regional higher education at different levels, we will optimize the external environmental advantages of the collection of higher education resources in various provinces and regions and the "scale effect of regional higher education development", and ultimately promote the regional unbalanced and coordinated development of higher education in China as a whole.

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