# Regional Difference in Distribution of China's Colleges and Universities and Its Impact on the Equality in Access to Higher Education

## DIFFERENCE REGIONALE DE LA DISTRIBUTION DES INSTITUTS ET UNIVERSITES DE CHINE ET SON IMPACT SUR L'EGALITE DE L'ACCES A L'EDUCATION SUPERIEURE

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**Abstract:** The inequality in higher education recruitment chances among various regions in China has been a much talked about subject and has triggered a number of discussions in recent years. Yet the systematic empirical study on this topic has not been carried out. This paper is an empirical effort to study the nature and reasons of inequality in access to higher education in China. The key questions asked in this study are, What is the impact of the imbalance in the regional distribution of higher education institutions on equal educational opportunities for students? And How has the regional distribution of higher education institutions formed and evolved in China? This paper traces back the historical process for the formation of regional distribution pattern of China's higher education institutions, and through statistical analysis, discusses the influence of the imbalance in regional distribution of higher education institutions on students' chances for higher education.

The authors' main findings are that, (1) The imbalanced regional distribution pattern of China's higher education institutions was mainly formed during the readjustment of departments and colleges in 1950s. Later, although the overall number of colleges and universities during the periods of Great Leap Forward (1958-1960) and the Cultural Revolution (1966-1976) fluctuated, the basic distribution pattern had not changed too much until 1990s. (2) There are two main reasons for the inequality in the chances for the students to be recruited by colleges and universities among different regions in China. One is the imbalance in regional distribution of colleges and universities, the other is the enrolment system with the planned number of students to be enrolled being based on provinces. The latter, in an institutionalized way, transforms the imbalance in regional distribution of colleges and universities into the difference in recruitment mark lines in different regions, and thus leads to the inequality in chances for being recruited by colleges and universities.

**Key words:** China's higher education, Inequality in access to higher education, imbalanced regional distribution.

**Résumé:** L'inégalité de chances dans le recrutement de l'éducation supérieure parmi les différentes régions en Chine a été un sujet beaucoup parlé et a provoqué de nombreuses discussions dans les dernières années. Mais une étude empirique et systématique sur ce problème n'a pas encore été entreprise. Cet article est un effort empirique pour étudier la nature et les raisons de l'inégalité de l'accès à l'éducation supérieure en Chine. Les questions cléfs posées dans cette étude sont comme suite : quel est l'impact du déséquilibre de la distribution régionale des institutions d'enseignement supérieur sur les opportunités éducatives des élèves? Comment la distribution régionale des institutions d'enseignement supérieur a formé et évolu en Chine? Cet article décrit le processus historique de la formation du modèle de la distribution régionale des institutions supérieures de Chine, et discute, par l'analyse statistique, les influences du déséquilibre dans la distribution régionale des institutions d'enseignement supérieur sur les chances des élèves pour l'éducation supérieure.

Les conclusions principales que l'auteur a tirées sont: (1) le modèle de la distribution régionale déséquilibrée des institutions d'enseignement supérieur a été formé pendant le rajustement de départements des instituts et universités dans les années 1950. Après, bien que le total des instituts

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et universités durant la période du Grand Bond en avant (1958-1960) et la Révolution culturelle (1966-1976) ait fluctué, le modèle de distribution fondamental n'a pas beaucoup changé avant les années 1990. (2) Il y a deux raisons pour expliquer l'inégalité des chances pour les élèves d'être admis par les instituts ou universités parmi les diverses régions chinoises. L'une est le déséquilibre de la distribution régionale des institutions ; l'autre est que le système de recrutement qui définit le nombre des étudiants recrutés selon les provinces. La deuxième, d'une manière institutionalisée, transforme le deséquilibre de la distribution des instituts et universités en différence du niveau de notes dans de différentes régions, et conduit à l'inégalité des chances d'être recruté par les instituts et universités.

**Mots-Clés:** éducation supérieure de Chine, inégalité de l'accès à l'éducation supérieure, distribution régioale déséquilibrée

## 1. INTRODUCTION

Some important changes have taken place in China's higher education since 1990s. First, some reforms have been carried out in the management system, the fee-collecting system and the graduate-assignment system of the higher education. Reforms in management system involve the transference of the majority of higher education institutions controlled by the ministries and committees of the Central Government to the Ministry of Education or the local governments by way of joint reconstruction. Reforms in the fee-collecting system and in the graduate-assignment system have been carried out simultaneously, ranging from total exemption of tuition fees and lodging fees to all-around collection of tuition fees and lodging fees, and from unified graduate-assignment to two-way selection in graduates' employment. Second, students enrollment for higher education has been enlarged. The number of enrolled students was increased from 1.084 million in 1998 to 2.6 million in 2001, up 2.4 times over three years; in 2002, the number of students aged 18-22 studying in higher education institutions accounted for 15%, which shows that higher education in China has reached the mass stage. These reforms have accelerated the development of higher education, yet have also increasingly aggravated the imbalance of development of higher education among different regions. Such imbalance mainly involves the following two aspects: First, across the country, higher education institutions are excessively centralized in several provinces. Taking 2004 as an example, of the 31 provinces, the provinces with the number of higher education institutions ranking the top 6 made up 32% of the country's total, while the number of higher education institutions ranking the last 6 provinces made up less than 6% of the country's total. Second, in terms of the provinces, higher education institutions are mainly centralized in provincial capital cities. Taking 1998, the number of provinces with more than 50% of the higher education institutions distributed in provincial capital cities reached 15, accounting for 56% of the total. Provinces with the number of higher education institutions in provincial capitals making up less than 30% of the provincial total were only Anhui and Hebei Provinces. Thus the question is, What is the impact of the imbalance in the regional distribution of higher education institutions on equal educational opportunities for students?

Previous studies on the regional differences of higher education are mainly focused on the following two aspects. One is about the regional inequality in chances for going up to higher education institutions, which demonstrates the provincial inequality in chances for being recruited in higher education institutions from the perspective of provincial differences in recruitment marks, while differences in recruitment marks are caused by the number of students to be enrolled in various provinces ( Zhang Shangwu, Zhou Hongan, Feng Xiaohong (2003); Liu Jian (2001); Zheng Lin (2000); Yang Zhengxian(2001)). Another aspect is about the imbalance in regional development of the higher education, which mainly analyzes the relationships between the regional differences in higher education and the population, industrial structure, and elementary education development ( Du Yuhong (2000); Lin Yanping (2000); Dou Xinhao (2003)). Studies of the first aspect stand mostly at the level of discussions and the quantitative analysis is not enough. For studies of the second aspect, although a great deal of statistical analysis has been carried out, the analysis starts at the number of the undergraduates among each 10 thousand people, the number of the university graduates and the regional difference in higher education. These indicators reflect the inequality of regional higher education development, and to some extent also reflect the inequality in recruitment chances among different regions. However, not only do regional differences in higher education have much to do with the regional population, industrial structure and the development of elementary education, but, more important, the differences are intimately tied up with the development of the higher education institutions in various regions. My following analysis is an empirical effort to study the regional difference in distribution of China's colleges and universities and its influence on the equality in access to higher education. This study will focus on the analysis of relationship between higher education development and the economic development and government policies, and will further analyze the relationship between the regional development of

higher education institutions and the chances for higher education recruitment.

The research questions are as follows:

How significant is the gap in the regional distribution of higher education institutions in China?

How has the regional distribution of higher education institutions formed and evolved in China?

What is the impact of the imbalance in the regional distribution of higher education institutions on equal educational opportunities for students?

This paper will firstly conduct quantitative depiction of the imbalance in the regional distribution of the higher education institutions in China through statistical analysis, and then trace back the historical process for the formation of such regional distribution pattern. Lastly, we will analyze the influence of the imbalance in regional distribution of higher education institutions on chances for going up to colleges and universities in China.

## 2. DEGREE OF THE DIFFERENCES IN REGIONAL DISTRIBUTION OF CHINA'S HIGHER EDUCATION INSTITUTIONS

This section starts with the quantitative analysis of the regional distribution of higher education institutions after the founding of New China. Before the analysis, the following two points need to be explained.

First, the mentioned higher education institutions in the study refer to the ordinary higher education organs. Higher education in China is divided into ordinary higher education and adult higher education. Ordinary higher education institutions are full-time based and are entitled to issue diplomas, mainly including universities, independently-established colleges and professional schools of higher learning.

Second, the indicators for the analysis of difference include absolute indicators ( maximum value, minimum value, difference and times between the maximum value and the minimum value, etc. ) and relative indicators ( standard deviation(SD), coefficient of variation (CV)[2] and Gini-coefficient, etc. ). This study will mainly use maximum value and minimum value as the absolute indicators, and use coefficient of variation as relative indicator for the analysis.

We firstly analyze the change of higher education institutions and that of the provincial distribution. Table 1 has listed the total numbers, maximum values, minimum values, standard deviations, Gini-coefficients, coefficients of variation of higher education institutions in various provinces in some years and their coefficients of correlation with 1957. Table 1 shows that, the number of higher education institutions has increased from 205 in 1949 to 1552 in 2003, increasing by more than 6 times. In 2003, the province with the maximum number of higher education institutions had the institutions reaching the number of 94. While part of the provinces had their own higher education institutions from scratch. For example, in 1949, Inner Mongolia, Tibet and Qinghai had no higher education institutions, while in 1952, Inner Mongolia set up three higher education institutions, and in 1957, Qinghai set up one higher education institution. In 1971, Tibet has also set up one higher education institution. Thus by the early 1970s, all provinces had their own higher education institutions.

Then we analyze the change of distribution of higher education institutions among provinces. We can find from table 1 that Gini-coefficient and coefficient of variation have a similar trend of change, showing an overall downward trend. From 1949 to 1960, the two coefficients dropped sharply and rose slightly in 1965, and then showed a downward trend till 1985. After 1985, the two coefficients changed very little, and dropped slightly after 2000. It shows that through 50 years of development, the difference in the number of higher education institutions among provinces has shrunk to a large extent, yet there is still a big difference. The concrete analysis will be made below based on 2002.

In China, there is a difference in population among various provinces, and the scale of higher education institutions is also different. In order to analyze the regional differences in a more comprehensive way, we use the number of students studying at higher education institutions and the number of population in different provinces to conduct the further analysis.

[2] Coefficient of variation is the ratio between standard deviation and the average, which is often used to compare the difference between variables with different units, and can also be used to compare the change of differences of a single variable with time.

**Table 1. The Number of Higher Education Institutions and the Results of Statistical Analysis**

| Year | 1949 | 1953 | 1957 | 1960 | 1965 | 1977 | 1985 | 1990 | 2000 | 2003 |
|---|---|---|---|---|---|---|---|---|---|---|
| Total | 205 | 181 | 229 | 1229 | 434 | 404 | 1016 | 1075 | 1041 | 1552 |
| Max | 37 | 26 | 31 | 149 | 53 | 28 | 70 | 67 | 69 | 94 |
| Min | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 3 | 4 | 4 |
| SD | 9.31 | 5.87 | 7.07 | 30.94 | 11.19 | 7.49 | 17.87 | 18.32 | 17.77 | 24.28 |
| Gini | 0.56 | 0.51 | 0.43 | 0.33 | 0.37 | 0.30 | 0.29 | 0.28 | 0.29 | 0.27 |
| CV | 1.23 | 0.91 | 0.86 | 0.62 | 0.72 | 0.54 | 0.51 | 0.53 | 0.53 | 0.48 |
| Coefficients of Correlation with 1957 | 0.72 | 0.96 | 1.00 | 0.53 | 0.94 | 0.84 | 0.80 | 0.81 | 0.63 | 0.61 |

**Table 2. Distribution of Higher Education Institutions among Provinces (2002)**

| Province | Number of institutions | Number of Students | Students per institution | Population (million) | Institutions per million persons | Students per 10000 persons |
|---|---|---|---|---|---|---|
| Beijing | 62 | 395713 | 6382 | 13.7 | 4.5 | 289 |
| Tianjin | 37 | 196892 | 5321 | 9.9 | 3.7 | 199 |
| Hebei | 75 | 472966 | 6306 | 66.5 | 1.1 | 71 |
| Shanxi | 39 | 208350 | 5342 | 32.5 | 1.2 | 64 |
| Neimenggu | 21 | 120782 | 5752 | 23.6 | 0.9 | 51 |
| Liaoning | 67 | 450536 | 6724 | 41.6 | 1.6 | 108 |
| Jilin | 40 | 264672 | 6617 | 26.7 | 1.5 | 99 |
| Heilongjian | 47 | 334627 | 7120 | 37.8 | 1.2 | 89 |
| Shanghai | 50 | 331649 | 6633 | 16 | 3.1 | 207 |
| Jiangsu | 93 | 700210 | 7529 | 73 | 1.3 | 96 |
| Zhejian | 61 | 393145 | 6445 | 45.8 | 1.3 | 86 |
| Anhui | 61 | 330112 | 5412 | 62.8 | 1 | 53 |
| Fujian | 33 | 197330 | 5980 | 34.1 | 1 | 58 |
| Jiangxi | 47 | 266251 | 5665 | 41.5 | 1.1 | 64 |
| Shandong | 75 | 583601 | 7781 | 90 | 0.8 | 65 |
| Henan | 65 | 467963 | 7199 | 94.8 | 0.7 | 49 |
| Hubei | 73 | 585023 | 8014 | 59.3 | 1.2 | 99 |
| Hunian | 63 | 419437 | 6658 | 65.4 | 1 | 64 |
| Guangdong | 71 | 467807 | 6589 | 77.2 | 0.9 | 61 |
| Guangxi | 39 | 186324 | 4778 | 47.5 | 0.8 | 39 |
| Hainan | 9 | 34711 | 3857 | 7.9 | 1.1 | 44 |
| Chongqing | 29 | 200111 | 6900 | 30.7 | 0.9 | 65 |
| Sichuan | 57 | 412357 | 7234 | 85.7 | 0.7 | 48 |
| Guizhou | 32 | 122742 | 3836 | 37.7 | 0.8 | 33 |
| Yunnan | 31 | 143009 | 4613 | 42.5 | 0.7 | 34 |
| Xizang | 3 | 8438 | 2813 | 2.6 | 1.2 | 32 |
| Shanxi | 52 | 411619 | 7916 | 36.3 | 1.4 | 113 |
| Gansu | 25 | 143009 | 5720 | 25.5 | 1 | 56 |
| Qinghai | 11 | 22198 | 2018 | 5.2 | 2.1 | 43 |
| Ningzxia | 12 | 29301 | 2442 | 5.6 | 2.1 | 52 |
| Xinjiang | 22 | 132336 | 6015 | 19.8 | 1.1 | 67 |
| CV | 0.503 | - | - | - | 0.635 | 0.699 |

Table 2 gives the number of higher education institutions, number of students studying at colleges and

universities, population and thus calculated number of colleges and universities possessed by every million people, and the number of college students among each 10 thousand people. In view of the number of higher education institutions, those ranking up the top 5 provinces are Jiangsu, Hebei, Shangdong, Hubei and Guangdong, with the number of higher education institutions in each province all exceeding 70; those ranking the last are Tibet, Hainan, Qinghai and Ningxia, with the number of higher education institutions all being less than 20. But in view of the number of higher education institutions possessed by every million people, the top five provinces are Beijing, Tianjin, Shanghai, Qinghai and Ningxia, and those ranking the last are the 9 provinces of Yunnan, Sichuan, Henan, Guizhou, Guangxi, Shandong, Chongqing, Guangdong and Inner Mongolia, with each million people possessing less than one college or university. It thus can be seen that, although Guangdong and Shandong have a prodigious amount of higher education institutions, due to their large population, every million people possess fewer higher education institutions. Although the two provinces of Ningxia and Qinghai possess fewer higher education institutions, due to their smaller population, they rank front with every million people possessing more colleges or universities, ranking only next to the three metropolis of Beijing, Tianjin and Shanghai. As the scale of higher education institutions varies, and in view of the number of college students among each 10 thousand people, those ranking up front are the 5 provinces of Beijing, Shanghai, Tianjin, Shanxi and Liaoning, and those ranking last are Tibet, Guizhou, Yunnan, Guangxi and Qinghai.

Finally, we compare the regional differences regarding the number of higher education institutions, the number of higher education institutions per million persons and the number of college students per 10000 persons. We choose coefficient of variation as the indicator for calculation. The bigger coefficient of variation means the bigger regional differences. The calculated result shows that, regional difference in number of college students per 10000 persons reaches the maximum (0.699), the regional difference in number of higher education institutions per million persons ranks next (0.635), and the regional difference in number of higher education institutions turns out to be the smallest (0.503).

It can be concluded from the above analysis that great differences exist in the distribution of the higher education resources among provinces in China. Such differences have been gradually shrinking with the constant development of higher education. But so far the differences are still great. In the next section, we will make detailed analysis of the formation and development of the distribution pattern of higher education institutions.

## 3. FORMATION OF THE REGIONAL DISTRIBUTION OF CHINA'S HIGHER EDUCATION INSTITUTIONS

### 3.1 Historical Heritage: China's Higher Education Institutions in 1949

In 1949, there were 205 colleges and universities in all across China, with college students reaching 117193. In view of the regional distribution, provinces with higher education institutions surpassing 10 were the 6 provinces of Shanghai (numbering 37), Sichuan [3] (numbering 36), Jiangsu (numbering 15), Beijing (numbering 15 ), Guangdong (numbering 12 ) and Hebei (including Tianjin) (numbering 11 ), and there were no colleges or universities in the 5 provinces of Inner Mongolia, Heilongjiang, Tibet, Qinghai and Ningxia. Comparing the coastal areas and the inland areas, we find that there were 118 colleges and universities in coastal areas, making up 57.6% of the total; there were 87 colleges and universities in inland areas, making up 42.4% of the total. College students in coastal areas reached 71533, making up 61.4% of the total; while college students in inland areas reached 44971, making up 38.6% of the total.

In view of the disciplines distribution, in 1949 there were 49 comprehensive universities, 47 liberal arts colleges, 18 engineering colleges, 18 agricultural colleges, 22 medical colleges and 18 normal universities.

**Table 3. The Distribution of Higher Education Institutions**

| | 1949 | | 1953 | | 1957 | |
|---|---|---|---|---|---|---|
| | Total | Coastal areas | Total | Coastal areas | Total | Coastal areas |
| Institutions | 205 | 118 | 181 | 101 | 229 | 114 |
| Ratio (%) | 100 | 57.6 | 100 | 55.8 | 100 | 49.8 |
| Students (persons) | 117133 | 71533 | 212339 | 126554 | 441181 | 242679 |
| Ratio (%) | 100 | 61.4 | 100 | 59.6 | 100 | 55.0 |
| Average scale | 571 | 606 | 1180 | 1253 | 1927 | 2129 |

Source: Ministry of Education(1961), *Educational Achievements Over Ten Years*, Beijing: People's Education Press.

Note: the coastal areas involved 9 provinces, which were Beijing, Hebei (Tianjin), Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong and Guangdong.

It can be seen from the above analysis that in 1949 there existed the following two problems in China's higher education system. The first problem was an extreme imbalance in the distribution of colleges and universities among provinces. Most colleges and universities were centralized in the economically

[3] Chongqing was included in Sichuan at that time.

developed coastal provinces ----- the 9 coastal provinces made up nearly 60% of the higher education resources. The second problem was that the scale of colleges or universities were too small, with an average scale of the colleges or universities reaching only 600 students or so.

### 3.2 Readjustment of departments and colleges among Chinese universities in the 1950s

After the founding of new China, in order to nurture talented people in a planned way, the government made two important reforms in higher education. One was completely taking over the private colleges and universities in 1952. The other was learning from the Soviet Union Model by conducting a readjustment of departments and colleges among Chinese universities since 1951. The readjustment was divided into two periods. The first period was from 1951 to 1953, with the emphasis being placed on the disciplines readjustment; the second period was from 1955 to 1957, with the emphasis being placed on the redistribution of colleges and universities among regions.

Readjustment in the early 1950s was focused on the readjustment of the disciplines. Such readjustment was mainly conducted in a planned way under the guidance of the former Soviet Union experts. On May 18, 1951, it was pointed out in *Guiding Principles and Tasks for Educational Work throughout China in 1951* that, “former schools and faculties in colleges and universities should be enriched and adjusted step by step ". In 1953, Ma Xulun, Minister of Education, pointed out in *Higher Education of New China over 4 Years* that, "with reference to the higher education system of the Soviet Union, we have annulled the school level from the past cumbersome old universities, and some disciplines like engineering, agriculture, medicine, teacher-training, politics and laws, finance and economics were removed from those old universities to the new-established colleges and universities. And, in line with the country's need for reconstruction talents, we have set up some new specialties." During this readjustment, a remarkable readjustment took place between China's two famous universities--Peking University and Tsinghua University. The school of engineering of Peking University was readjusted to Tsinghua University, and school of arts, school of science and law school of Tsinghua University were readjusted to Peking University. After the readjustment, Peking University became a comprehensive university that without engineering courses, and Tsinghua University became a multi-discipline engineering university. The number of colleges and universities based on disciplines in 1954 after the readjustment was indicated by Table 5, with the result being that the number of comprehensive universities, universities of finance and economics, and universities of politics and laws reduced, while the number of professional universities, especially engineering universities, teacher-training universities, agricultural and forestry universities and medical universities increased.

**Table 5. Number of Colleges and Universities Based on Disciplines Before and After Readjustment**

| Year / Category | 1949 | 1954 |
|---|---|---|
| Total | 205 | 188 |
| Comprehensive university | 49 | 14 |
| Natural Science and Technology | 28 | 40 |
| Agriculture | 18 | 26 |
| Forestry | 0 | 3 |
| Medicine and Pharmacy | 22 | 28 |
| Teacher Training | 12 | 39 |
| Language and Literature | 11 | 8 |
| Finance and Economics | 11 | 5 |
| Political Science and Laws | 7 | 4 |
| Physical Culture | 2 | 6 |
| Arts | 18 | 14 |
| Other | 27 | 1 |

Source of data:《Educational Yearbook of China 1949-1981》

Along with the readjustment of disciplines, as a result of the merger among the schools with similar majors, of their separation from the old comprehensive universities and the establishment of new colleges and

universities, regional distribution among universities changed. In coastal areas, there had been 101 colleges and universities by 1953, accounting for 55.8% of the total, with students amounting to 126554, making up 59.6% of the total, showing some drop as compared with 1949, but the number of colleges and universities was still more than that of the inland areas.

**Table 6 The Distribution of Colleges and Universities by GAD**

| Year | North China | Northeast | East China | Central South | Southwest | Northwest |
|---|---|---|---|---|---|---|
| 1949 | 27 | 20 | 74 | 34 | 42 | 8 |
| 1953 | 41 | 26 | 48 | 33 | 20 | 14 |
| 1957 | 49 | 28 | 57 | 45 | 28 | 22 |

Source: Educational Yearbook of China (1949-1981).

As the whole country was planned on the basis of the Grand Administrative District ( GAD )[4], at the early stage of new China, the readjustment of departments and colleges was conducted by GAD as well. According to the plans, each GAD should at least set up one comprehensive university, 1-3 agricultural universities and 1-3 normal universities, and should set up a great number of engineering universities. In view of the GAD ( see Table 6 ), in 1949, East China owned the largest number of universities, numbering 74, while there were only 8 in Northwest China. By the end of 1953, the number of universities had increased in North China, Northeast China and Northwest China, while the number of universities had reduced in East China and Southwest China. There was no great change in Central South of China. At that time the regional distribution turned out to be more balanced than that of 1949, but there were still more colleges and universities in East China, and less in Northwest China.

Since 1955, in consideration of the international situation (the coastal areas were in war preparations ) and the need for domestic support of the establishment of new industrial bases in the northwest and southwest, when modifying the First Five-year Plan, the central government pointed out that, excessive concentration should be avoided in the establishment and layout of higher education institutions, that the scale of colleges or universities should not be too large and that engineering universities should come in line with the industrial bases. Therefore, the central government decided that some colleges and universities or disciplines in coastal areas be moved to northwest and southwest areas. The most conspicuous example was "the west movement" of Shanghai Jiao Tong University. In June of 1955, the State Council held a meeting, discussing about the inland movement of Shanghai Jiao Tong University to Xi'an. In 1956, most of departments and teachers and students of the University moved to Xi'an, with the rest merging with the former Shanghai Ship Building College and Nanyang Engineering College into the branch of Shanghai Jiao Tong University. By August of 1959, the two universities separated and turned officially into Shanghai Jiao Tong University and Xi'an Jiao Tong University. In addition, in 1956, Nanjing Hua Dong Aeronautics and Astronautics University moved to Xi'an and merged with Xi'an Engineering Institute into Northwest Industrial University. The departments of Electronics of Shanghai Jiao Tong University, Nanjing Engineering Institute and South China Engineering Institute moved to Chengdu of Sichuan Province to set up Chengdu Telecommunication Engineering Institute. The departments of civil engineering and departments of architecture of Tsing Dao Engineering Institute and Northeast Engineering Institute moved to Xi'an to found Xi'an Architectural Engineering Institute.

Through such a readjustment, the number of colleges and universities increased notably in Northwest and Northeast China where there were fewer colleges and universities in the past, and the distribution among GADs turned out to be more balanced than that of 1949. Meanwhile, the distribution in coastal areas and inland areas changed in a radical way. By 1957, the number of colleges and universities in coastal areas (numbering 114) was almost the same compared with that of the inland areas ( numbering 115 ). As regards the number of students, there were slightly more students in coastal areas ( making up 55% ) than in inland areas.

### 3.3 Reflection on Readjustment of departments and colleges

The readjustment of departments and colleges during 1950s served as a link between the past and the future in the development of China's higher education. In the following part we will give an analysis of the roles and problems of the readjustment.

The readjustment carried out during 1950s brought about changes in the organizational system, training targets and management of China's higher education. At the same time, it gave rise to some equilibrium in regional distribution. The roles of the readjustment can be summarized as follows.

Strengthening the core features of specialism in colleges and universities and clarifying the training

[4] In the early stage of new China, administrative division was mainly based on grand administrative districts(GAD). The whole country was divided into 6 GADs, namely, North China ( including Beijing, Hebei, Tianjin, Shaanxi and Inner Mongolia ), Northeast China ( including Liaoning, Jilin and Heilongjiang ), East China ( including Shanghai, Jiangsu, Zhejiang, Anhui, Fujian, Jiangxi and Shandong ), Central South China ( including Henan, Hubei, Hunan, Guangdong and Guangxi ), Southwest China ( including Sichuan, Guizhou, Yunnan and Tibet ), and Northwest China ( including Shanxi, Gansu, Qinghai, Ningxia and Xinjiang ).

targets.

Through the readjustment, disciplines and training targets of colleges and universities were clarified. Comprehensive universities mainly offered courses in liberal arts and sciences to train researchers. Normal universities were supposed to train teachers for elementary education. All professional institutes had their professional targets to train professionals for the relevant trades and professions.

Reducing the regional imbalance.

The readjustment of departments and colleges, especially the regional readjustment, increased the number of colleges and universities considerably in the economically underdeveloped Northwest areas. It thus reduced the regional imbalance to a certain extent. In 1957, when the readjustment was drawn to an end, the coefficient of variation dropped from 1.27 in 1949 to 0.86, and the Gini-coefficient came down from 0.56 to 0.43. This shows that the inequality among provinces dropped significantly.

Increasing the number of students.

Through the readjustment and the merger of similar disciplines, the average scale of colleges and universities was enlarged and the teachers and instruments were fully utilized. In 1949, the average scale of colleges and universities reached 600 persons or so, while by 1957, when the readjustment was over, the afore-mentioned figure was increased by over two times (1927 persons ).

Readjustment of departments and colleges was conducted on the basis of the international and domestic situations. During 1950s, the West blockaded China and China had no alternative but to learn from the Soviet Union, setting up higher education system according to the Soviet system and by means of readjustment departments and colleges. Because of the influence of the Cold War, the coastal areas were in war preparations, while the economy and education in southwest and northwest China were relatively lagging behind. Thus a great number of talented people were needed urgently, support from the economically developed coastal areas was needed in order to construct the two rising industrial bases----northwest and southwest China industrial bases.

But two salient problems still existed in the readjustment.

There was still an imbalance in the provincial distribution of colleges and universities.

Readjustment of departments and colleges was conducted based on GADs, and colleges and universities were mainly set up in the central cities of the GADs, thus the province where the central city was situated had more colleges and universities, while other provinces had fewer. Therefore, the imbalance improved in the level of GADs, but in terms of provinces, there was still a great imbalance in the number of colleges and universities. In view of the coefficients of variation for the number of colleges and universities of provinces ( see Table 1 ), the coefficients of variation dropped a bit in 1957 as compared with 1953, but still above 0.8. Specifically, all the provinces where the GADs' central cities were situated had more colleges and universities. For instance, Beijing in the North China had 31, Liaoning Province in Northeast China had 14, Shanghai in the East China had 18, Hubei Province in the Central South China had 18, Sichuan Province in the Southwest China had 21, and Shanxi Province in the Northwest China had 12. In addition, Jiangsu Province where Nanjing, the capital of the Republic of China, was located still had 15 ones, ranking 5th in the country. The total number of colleges and universities in the above-mentioned 7 provinces accounted for 56% of the country's total. Such a pattern has remained unchanged till the present day. In 1998, for the number of colleges and universities of the above-mentioned 7 provinces, Beijing had 63, Liaoning Province had 61, Shanghai had 40, Hubei Province had 54, Sichuan Province (including Chongqing ) had 65, Shanxi Province had 42 and Jiangsu Province had 66, with colleges and universities in the 7 provinces accounting for 38% of the total.

Distribution of disciplines was uneven and the majors were too much segmented.

Readjustment of departments and colleges in 1950s greatly reduced comprehensive universities, universities of finance and economics and universities of politics and laws, and at the same time increased the universities of sciences and engineering and normal universities. The mono-discipline colleges increased, and even the comprehensive universities only offered courses of liberal arts and sciences. In time of the readjustment, the system of universities was transformed from " university-college-faculty " to " university-faculty-major ", with the college being annulled. Majors were set up under the faculty, and the teaching plans were worked out for various majors, the syllabuses and textbooks were also compiled on the basis of the majors. In 1953, 215 majors in all were set up, and by 1957, the majors were added up to 323. Such a detailed major segmentation gave rise to the isolation among various majors, which was unfavorable to personnel training as well as resulted in the low usage of the instruments and the relatively low ratio between teachers and students.

### 3.4 Changes after Readjustment of Departments and Colleges

The regional distribution pattern of China's colleges and universities was mainly formed during the readjustment of departments and colleges in 1950s. Later, although the overall number of colleges and universities during the period of Great Leap Forward (1958-1960) and the Cultural Revolution (1966-1976) fluctuated, the basic

distribution pattern had not changed too much until 1990s, which can be illustrated by the following two facts.

First, the coefficients of correlation between the numbers of colleges and universities in various provinces in some years and that in 1957 (the year the readjustment completed). Table 1 gives these coefficients of correlation, from which we can find that, the coefficients of correlation remained above 0.8 in 1990, and it reduced gradually in 1990s, and after 2000 still no less than 0.6.

Second, changes of the number of colleges and universities in the top 6 provinces ( Beijing, Liaoning Province, Shanghai, Hubei Province, Sichuan Province and Shanxi Province ) in 1957 and their proportion in the country's total. The sum of colleges and universities in the above-mentioned 6 provinces accounted for 50% of the country's total in 1957. In 1998, this number in the above-mentioned 6 provinces still got the upper hand, accounting for 30% of the country's total. These two facts suggest that the regional distribution pattern of China's colleges and universities came into being during the readjustment period as a whole.

Influence of Regional Imbalance in the Distribution of Colleges and Universities on the Chance for Higher Education Recruitment

In recent years, the inequality in higher education recruitment chances among various regions in China has been a much talked about subject and has triggered a number of discussions.

As currently China's colleges and universities are adopting the method of laying down the enrolment plans, marking examination papers and carrying out recruitment based on provinces, thus causing different recruitment mark lines in various provinces. Although the unified examinations are carried out across the country, the different recruitment mark lines have resulted in the different chances for the students to receive higher education in various provinces. Generally speaking, the recruitment mark line has much to do with the education levels of various provinces and the competition rates (the ratio between the number of students signing up for the examinations and the planned recruitment number). As far as the education level is concerned, the higher the education level of the region is, the higher the recruitment mark line will be. As far as the competition rate is concerned, the higher the competition rate is, the higher the mark line will be. What this paper discusses about is the recruitment chance, therefore, the competition rate is chosen here to be the indicator for the recruitment chance. The higher competition rate shows the difficulty in being recruited and the less chances; the lower competition rate shows the easiness in being recruited and the more chances. In China, the planned recruitment number for various provinces is laid down by the Ministry of Education before the examinations, which is composed of two parts. One is the number of students to be enrolled by colleges and universities within each province, the other is the number of students to be enrolled by colleges and universities from other provinces[5]. As a result, the planned enrolment number in various provinces decides the chances for being recruited to a large extent.

### 3.3 Reflection on Readjustment of departments and colleges

The readjustment of departments and colleges during 1950s served as a link between the past and the future in the development of China's higher education. In the following part we will give an analysis of the roles and problems of the readjustment.

The readjustment carried out during 1950s brought about changes in the organizational system, training targets and management of China’s higher education. At the same time, it gave rise to some equilibrium in regional distribution. The roles of the readjustment can be summarized as follows.

Strengthening the core features of specialism in colleges and universities and clarifying the training targets.

Through the readjustment, disciplines and training targets of colleges and universities were clarified. Comprehensive universities mainly offered courses in liberal arts and sciences to train researchers. Normal universities were supposed to train teachers for elementary education. All professional institutes had their professional targets to train professionals for the relevant trades and professions.

Reducing the regional imbalance.

The readjustment of departments and colleges, especially the regional readjustment, increased the number of colleges and universities considerably in the economically underdeveloped Northwest areas. It thus reduced the regional imbalance to a certain extent. In 1957, when the readjustment was drawn to an end, the coefficient of variation dropped from 1.27 in 1949 to 0.86, and the Gini-coefficient came down from 0.56 to 0.43. This shows that the inequality among provinces dropped significantly.

Increasing the number of students.

Through the readjustment and the merger of similar disciplines, the average scale of colleges and universities was enlarged and the teachers and instruments were fully utilized. In 1949, the average scale of colleges and universities reached 600 persons or so, while by 1957, when the readjustment was over, the afore-mentioned figure was increased by over two times (1927 persons ).

[5] Colleges and universities in China are divided into two categories according to the area of their recruitment. One recruits students within the province, the other recruits students from various provinces across the country.

Readjustment of departments and colleges was conducted on the basis of the international and domestic situations. During 1950s, the West blockaded China and China had no alternative but to learn from the Soviet Union, setting up higher education system according to the Soviet system and by means of readjustment departments and colleges. Because of the influence of the Cold War, the coastal areas were in war preparations, while the economy and education in southwest and northwest China were relatively lagging behind. Thus a great number of talented people were needed urgently, support from the economically developed coastal areas was needed in order to construct the two rising industrial bases----northwest and southwest China industrial bases.

But two salient problems still existed in the readjustment.

There was still an imbalance in the provincial distribution of colleges and universities.

Readjustment of departments and colleges was conducted based on GADs, and colleges and universities were mainly set up in the central cities of the GADs, thus the province where the central city was situated had more colleges and universities, while other provinces had fewer. Therefore, the imbalance improved in the level of GADs, but in terms of provinces, there was still a great imbalance in the number of colleges and universities. In view of the coefficients of variation for the number of colleges and universities of provinces ( see Table 1 ), the coefficients of variation dropped a bit in 1957 as compared with 1953, but still above 0.8. Specifically, all the provinces where the GADs' central cities were situated had more colleges and universities. For instance, Beijing in the North China had 31, Liaoning Province in Northeast China had 14, Shanghai in the East China had 18, Hubei Province in the Central South China had 18, Sichuan Province in the Southwest China had 21, and Shanxi Province in the Northwest China had 12. In addition, Jiangsu Province where Nanjing, the capital of the Republic of China, was located still had 15 ones, ranking 5th in the country. The total number of colleges and universities in the above-mentioned 7 provinces accounted for 56% of the country's total. Such a pattern has remained unchanged till the present day. In 1998, for the number of colleges and universities of the above-mentioned 7 provinces, Beijing had 63, Liaoning Province had 61, Shanghai had 40, Hubei Province had 54, Sichuan Province (including Chongqing ) had 65, Shanxi Province had 42 and Jiangsu Province had 66, with colleges and universities in the 7 provinces accounting for 38% of the total.

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As currently China's colleges and universities are adopting the method of laying down the enrolment plans, marking examination papers and carrying out recruitment based on provinces, thus causing different recruitment mark lines in various provinces. Although the unified examinations are carried out across the country, the different recruitment mark lines have resulted in the different chances for the students to receive higher education in various provinces. Generally speaking, the recruitment mark line has much to do with the education levels of various provinces and the competition rates (the ratio between the number of students signing up for the examinations and the planned recruitment number). As far as the education level is concerned, the higher the education level of the region is, the higher the recruitment mark line will be. As far as the competition rate is concerned, the higher the competition rate is, the higher the mark line will be. What this paper discusses about is the recruitment chance, therefore, the competition rate is chosen here to be the indicator for the recruitment chance. The higher competition rate shows the difficulty in being recruited and the less chances; the lower competition rate shows the easiness in being recruited and the more chances. In China, the planned recruitment number for various provinces is laid down by the Ministry of Education before the examinations, which is composed of two parts. One is the number of students to be enrolled by colleges and universities within each province, the other is the number of students to be enrolled by colleges and universities from other provinces[6]. As a result, the planned enrolment number in various provinces decides the chances for being recruited to a large extent.

The following quantitative analysis is about the influence exerted by the number of colleges and universities in various provinces on the number of students to be enrolled in various provinces. We take the number of students to be enrolled in 31 provinces as the dependent variable and the number of colleges and universities in various provinces as the independent variable to conduct the regression analysis based on the 5 years' data (1989, 1993, 1997, 2000 and 2002 ). The result is indicated in Table 7.

**Table 7 Result of the Regression Analysis**

| Year | 1989 | 1993 | 1997 | 2000 | 2002 |
|---|---|---|---|---|---|
| β(Beta) | 0.841*** | 0.742*** | 0.835*** | 0.843*** | 0.897*** |
| Adjusted $R^2$ | 0.696 | 0.534 | 0.686 | 0.699 | 0.797 |
| F | 67.4*** | 33.13*** | 64.48*** | 66.14*** | 114.97*** |

Notes: ***P<0.001. The independent variable is the number of colleges and universities in various provinces. β : Standardized coefficients

[6] Colleges and universities in China are divided into two categories according to the area of their recruitment. One recruits students within the province, the other recruits students from various provinces across the country.

It can be seen from the results of the regression analysis that, the 5 years' regression coefficients and F are significant at the level of 0.001, with the Adjusted $R^2$ reaching above 0.5. It suggests that the number of colleges and universities in a province decides the planned recruitment number of students in the province to a large extent, and through which, decides the chances for the students to be recruited. That is to say, the inequality in number of colleges and universities in various provinces is one of the major causes for the inequality in the chances for the students to be recruited.

## 5. CONCLUSIONS

We can draw the following two conclusions through the above analysis.

Firstly, the regional distribution of China's colleges and universities is not very balanced. Such an imbalanced distribution pattern is mainly due to the consideration of international relations and the state economic development strategies during the readjustment of departments and colleges in 1950s. Later, although the overall number of colleges and universities fluctuated in some periods, the basic pattern of regional distributions remained unchanged till 1990s.

Secondly, There are two main reasons for the inequality in the chances for the students to be recruited by colleges and universities in different regions. One is the imbalance in regional distribution of colleges and universities, the other is the enrolment system with the planned number of students to be enrolled being based on provinces. The latter, in an institutionalized way, transforms the imbalance in regional distribution of colleges and universities into the difference in recruitment mark lines in different regions, and thus leads to the inequality in chances for being recruited by colleges and universities.

The policy implication of the above findings is that, if the policy maker attempts to improve the inequality in chances for being recruited by colleges and universities in different regions, in the long term, some measures can be taken to shrink the differences in regional distribution of colleges and universities when formulate the policies for the development of higher education.

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