



# Equity Issues in the Process of Massification of Higher Education in China: A Perspective on Public Funding Per Student

Yanhan Zhang<sup>(✉)</sup>

School of Education, University of Bristol, Bristol BS8 1QU, UK  
cqzhangyanhan@sina.com

**Abstract.** The massification of higher education in China has led to more students being given the opportunity to continue their development, but the equity issues involved have not been properly addressed. Rather than narrowing with its development, inter-provincial and inter-regional differences are becoming increasingly evident. This paper adopts a quantitative approach to analyse the differences between 31 provinces and cities and the eastern, western and southern regions of China over the decade 2011–2020, taking the perspective of equity in the education process and choosing the average public funding per student in higher education as an entry point to compare horizontally and vertically. It concludes that although financial support has increased with development and policy support over the decade, its correlation with the process of massification is not strong, suggesting that it is not yet fully prepared for the rapid expansion of higher education massification. Inter-provincial, inter-regional disparities are therefore still very evident, and improving equity in the education process also requires a focus on coordinated development across regions.

**Keywords:** education equity · higher education · massification · public funding per student

## 1 Introduction

The extremely rapid massification of higher education nowadays represents both the needs of individuals and the importance attached by the authority. Research has shown that not only does higher education benefit personal lifelong learning [1], but also creates a diverse range of talents for society and promotes social equity and efficiency at the same time [2]. Under the circumstances, countries are actively constructing and reforming their higher education systems. However, expansion in higher education does not always bring fortune. According to [3], massification of higher education cannot guarantee the advancement of educational justice as it conceals marginal disparities, which indicates that the imbalance between provinces and cities may be ignored by the overall progress of a country. Therefore, while more people are being given access to further education, issues of equity are becoming increasingly prominent, such as the

distribution of resources between different universities, and the extent of investment in higher education between different regions and provinces.

This essay will investigate whether the development of higher education massification promotes educational equity through an empirical analysis of data provided by the Ministry of Education on public funding per student of universities in each province from 2010 to 2020, conducting cross-sectional and longitudinal multi-perspective comparisons of the funding gap between provinces and areas. This will not only reveal, with more comprehensive and updated data, the equity issues that existed in Chinese higher education during the decade but also draw out measures for future development or reform on this basis.

## 2 Literature Review

In terms of public funding per student, it is an important component of educational resources. In particular, the average public expenditure per student is an indicator of the overall level of security for the maintenance and development of education. As explained by the Ministry of [4], it is the average expenditure of the total expenditure on education for the year, divided by the average number of students enrolled in the year, after deducting the expenditure on personnel costs. It contains actual expenditure on teaching operations and management, teacher training, experimental practice, cultural and sports activities, post and telecommunications, equipment and library materials, as well as the fees on education infrastructure. There are two reasons for choosing a specific focus on the public funding per student. Firstly, it proves the growth of investment in education. Secondly, it is of great significance to promote fairness and balanced development of education.

There are general debates on whether massification of higher education actually promotes education equity. [5] investigates the effect of university's increasing enrolment on higher education equity by examining the impact of university expansion policies on intergenerational transmission as a pathway, it is explored that their massification has a catalytic effect on overall equity, but further polarisation is exacerbated because of structural flaws in the relevant policies that lead to an expansion of benefits to different groups. Some other researchers adopt gaps in financial investment among provinces and regions to discuss education inequality. For instance, [6] conclude that the shift in the focus of higher education finance from total investment to per-capita standard is an inevitable requirement for improving the quality of higher education. This article sharply points out the need to shift the focus of discussion on equity in the education process from total inputs to per student standards and uses quantitative analysis to illustrate differences between regions and provinces. A similar viewpoint is made by [7] that the amount of higher education students have a negative impact on higher education public funding per student in China. The larger the scale of higher education in a region, the more resources the government of that region must allocate to higher education; however, due to the rigid constraints of fiscal revenue and fiscal expenditure, the only way to meet the high demand for resources in higher education at this time is to reduce public funding per student. Compared with that, [8] provide a more detailed analysis which found that regional inequalities in public funding per student are represented at greater levels in the

East than in the West, in the West than in the Center, and in the South than in the North. However, the major cause for the disparity in public funding per student is not across regions, but between provinces within the same area.

### 3 Methodology

First and foremost, a null hypothesis (H0) and an alternative hypothesis (H1) are primarily established:

H0: There is not a statistically significant difference between gross enrolment rate and public funding per students.

H1: There is a statistically significant difference between gross enrolment rate and public funding per students.

We will conduct the Pearson correlation analysis to test the degree of association between higher education gross enrolment rate from 2011 to 2020 and growth rate of public funding per student. Then, a descriptive analysis of per capita public expenditure in 31 provinces across the country will be conducted to measure the correlation analysis between university enrolment and public funding per student investment. Besides, bar charts and graphs are drawn to compare and summarise the cross-sectional and longitudinal trends. In addition, massification is represented by the gross enrolment rate.

By comparing the average public expenditure per student in 31 provinces and cities across the country (mainland), the Ministry of Education released the 2011–2020 National Statistical Table on the Implementation of Education Expenditure. The average public expenditure per student refers to the average expenditure obtained by dividing the portion of the total education expenditure after deducting the expenditure on personnel by the average number of students in school in that year. Expenditures on personnel costs and infrastructure investments are not included. (i.e. staff salaries are not included in public expenditure.) Given that staff salaries fluctuate according to the local economy, public expenditure is chosen to focus more on the investment in the learning experience of students.

## 4 Results

### 4.1 Overall

Primarily, according to statistical Bulletin of National Educational Development published by the Ministry of Education of the People's Republic of China (2011–2020), the gross enrollment rate of Higher education in China from 2011 to 2020 has increasing year by year.

Then, a comparison of the growth rates of the gross enrolment and the national average public funding per student over the years shows that from 2011 to 2020, the gross enrolment rate of higher education in China showed a year-on-year increase; however, the average public expenditure per student did not show a consistent trend, with the growth rate being negative in 2013, 2014, 2016 and 2020. It decreased significantly from 2011 to 2013 and also slowly declined from 2017 to 2019. There was an significant

decrease in 2020 due to an unexpected external reason - the pandemic. Considering that the adoption of online courses in universities does reduce the related hardware and software expenditure, such cases can be discussed separately.

By measuring the correlation between university gross enrolment rate and national public funding per student over the years, a Pearson index of .641 is drawn, which means there is only a moderate association between them. Therefore, the preliminary conclusion is that university expansion, while positively correlated with public funding per student, it can hardly be confirmed that higher education finances has adequately prepared for student size expansion.

## 4.2 Horizontal Perspective

Descriptive analysis of the average per capita public cost from 2011 to 2020. Firstly, the national average per capita public cost is generally on an upward trend, but the disparities across the country are obvious, with the largest absolute extreme difference reaching RMB 30,846.19 in 2014 and the smallest extreme difference exceeding RMB 20,000. Secondly, through the collation of tables, it is found that the inter-provincial funding situation is not optimistic compared to the overall national situation, where only four provinces which are Beijing, Tianjin, Shanghai and Ningxia are above the national level from 2011 to 2020, while nine provinces including Shanxi, Liaoning, Heilongjiang, Sichuan, Anhui, Shandong, Henan, Hubei and Hunan have never reached the national average. Guizhou, Yunnan and Shanxi have also reached the national level only once.

Beijing and Shanghai has an absolute advantage over other provinces and cities; secondly, some provinces and cities with similarly rich educational resources such as Zhejiang, Jiangsu and Guangzhou are not as good or even below the national average. At the same time, it is important to note that Tibet, Qinghai and Ningxia are above the national average in terms of average public funding per student, and even match the north in some years, but educational resources do not match those of developed cities, which is a result of the smaller size of the local student population, rather than a qualitative improvement in higher education resources in the true sense of the word.

To conclude, the economically developed provinces and cities, represented by the Beijing and Shanghai, have much higher average public funding per student than most of the central provinces and cities, and in general the eastern regions are higher than the central regions; the western regions have higher average public funding per student, but this is due to a smaller population rather than truly developed educational resources.

## 4.3 Longitudinal Perspective

Firstly, we classify funding variances of 5,000 or less with no clear directional characteristics as 'smooth change'. In the east, Hebei, Tianjin, Jiangsu and Liaoning; in the centre, Shanxi, Heilongjiang, Hubei, Jilin, Anhui and Henan; and in the west, Inner Mongolia, Sichuan, Shaanxi, Xinjiang, Chongqing and Guizhou. By way of summary, these provinces and cities are mostly located in the central and western parts of the country, as well as in the northeastern provinces and cities, and there are also individual provinces and cities such as Jiangsu, located on the eastern coast with developed economic and educational resources. In addition, Chongqing and Tianjin have a steady state where the

overall level is higher than the national level, considering the fact that they are municipalities directly under the central government and have certain policy support, compared to other provinces and cities where funding has long been at a backward level and such 'stability' falls into the category of smoothness without breakthroughs or upgrades.

Ultimately, comparing the situation of 12<sup>th</sup> and 13<sup>th</sup> Five-Year plan, the majority proportion of provinces and municipalities maintained a relatively flat trend. However, Beijing and Shanghai are exceptional, as both show a significant reduction in funding over the 13th Five-Year Plan period. In contrast, relatively less economically developed regions such as Gansu and Xinjiang saw a stronger development in the latter part of the period. The vast majority of provinces and municipalities reached their lowest values in 2011 and 2014. Besides, the overall funding investment in eastern region demonstrates a more positive situation than the central and western regions. Furthermore, looking at the overall level of the 12th and 13th Five-Year Plans, Qinghai, Tibet and Hainan are the only three provinces that shown significant increases in the whole period, while the other provinces and municipalities did not.

## 5 Discussion

To begin with, the study firstly demonstrates a correlation between the gross enrolment ratio in tertiary education and the growth rate of per capita public funding, which although in line with the hypothesis test, they are correlated with each other but not strongly. This is reflected in a decrease and negative growth in the overall investment in per capita public funding. This further indicates that higher education finances are not adequately prepared for student expansion. In addition, as the massification of higher education in China expands, inter-regional and inter-provincial disparities are still greatly evident in cross-sectional comparisons, manifesting themselves in the eastern regions being higher than the central and western regions; Beijing and Shanghai show great disparities with all other provinces and cities. In addition to the overall gap, the descriptive analysis reveals that even provinces and cities with well economic and educational resource base may have insufficient per pupil public funding. Furthermore, comparing the situation of 12<sup>th</sup> and 13<sup>th</sup> Five-Year plan, a more overall investment did shown in the 13th Five-Year Plan period, however, this was not the case for specific performance between provinces and municipalities.

## 6 Conclusion

In conclusion, this paper develops a study of the impact of China's rapid expansion of higher education on its educational equity in the context of its rapid expansion. Focusing on the expansion of mass higher education does contribute to the overall funding, but the correlation is not strong. This was followed by a cross-sectional and longitudinal descriptive analysis of changes in funding across the 31 provinces and municipalities, which revealed large regional and inter-provincial disparities. Compared with enhancing the national average development, more attention should be paid to narrow the relative gaps, preventing some regions and provinces from being 'averaged out', and to optimise the development of education in each province and municipality in a targeted manner, to achieve both strengthening the investment and decreasing wasting of resources.

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