

An Empirical Study on the Relationship between Capital Input and Educational Information Asymmetry in China

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ABSTRACT

China's overall education level has been drastically improved since the reform and opening-up, benefiting from the continuous growth of fiscal education expenditure, but the development and the accessibility of education among different regions is unbalanced; there is an obvious information asymmetry, and the unfair opportunity of receiving education gradually becomes a hot topic. To explore the relationship between educational information asymmetry and the fiscal expenditure on education, this article used the number of academicians, the number of double-top universities as a measure of regional education information level, along with the fiscal expenditure on education and GDP in 2018 to establish linear regression model. The result shows that level of education information and education spending was positively correlated, but negatively correlated to education spending proportion of GDP. This paper gives concrete evidence for implementing policies to promote informationization in education. The confirmation of the cluster effect in developed regions proves the necessity of guaranteeing equal opportunity to higher education in remote minority areas.

Keywords: *Educational Information Asymmetry; Financial Education Expenditure; Informatisation Level; Fair Opportunity to Education*

1. INTRODUCTION

Information asymmetry theory is an economic theory, first proposed by Akerlof, which refers to the imbalanced possession of information about the trade between buyers and sellers. The party with more information is usually in an advantageous position, while the counterpart without information is at a disadvantage.

The same is true in education: In China, educational information asymmetry not only includes the knowledge being conveyed in universities that within the system, but also out of the education system, in the process of inputting information into the educational system and outputting information into the society, such as the recruitment information for students, the skills learned from school and the requirement in the job market, the information gaps among them inevitably exist [1].

This article uses the indicators published by the National Bureau of Statistics in 2018, including Double-Top universities, the regional academy membership to measure the degree of information asymmetry. In addition, with the financial input in education to conduct data visualization

and regression analysis to study the relationship between education financial input and the information asymmetry. Then, try to find the theoretical explanation, and in hope of providing insights for tackling the problem of education information asymmetry. The information asymmetry within the education system is mainly reflected in the imbalanced teaching level and efficiency gap caused by communication barriers among departments [2]. Under the educational management system and internal management framework, textbook compilation, teaching content arrangement and other decisions closely related to teaching level are often only the "internal" tasks of the top management office, and the interests of the majority of students and ordinary teachers are often ignored, so they are forced to complete the pre-determined learning and teaching tasks. The information asymmetry between management and ordinary teachers and students leads to the emergence of teaching problems: the outdated knowledge is still being taught in some universities, especially those who are located in undeveloped regions, the local management office takes slow steps to discover the real need of the student and the job market [3], which makes student more incompetent after graduation. The

information asymmetry outside the education system is mainly due to the lack of leading talents in some specific research area and the lack of timely grasp of the latest information of the economic and technological development, which leads to stereotyped talent training mode.[4] The reformation is hard to implement, with the existence of Information asymmetry in the education arena.

2. EDUCATION STATUS IN CHINA

2.1 Distribution of Universities

By 2018, the national total of 2663 higher education schools in colleges and universities (institutions). Jiangsu, Shandong, Henan, Guangdong has the largest number of colleges and universities.



Figure 1. Distribution of Universities

2.2 Distribution of Fiscal Expenditure on Education

Since the reform and opening up, the development of China's education has been accelerated, as early as 1993, in the Program for China's Education Reform and Development, the Central Committee of the Communist Party of China (CPC) put forward the goal of "the proportion of the state's fiscal expenditure on education in the GDP to reach 4%"[5]. China has accomplished this goal in most regions now and the overall educational financial input has maintained the trend of growth. According to the data from the National Bureau of Statistics (NBS), except for minority autonomous regions, all provinces and municipalities invest around 2.5-4.5% of their GDP in education in 2018, among which Jiangsu province will invest the least, accounting for only 2.2% of its GDP. The proportion of financial investment in education in ethnic minority autonomous regions to their gross regional product is far higher than that in other regions of the country, which seems not consistent with

their underdeveloped economic development level. This has a lot to do with China's national helping strategy of "Western Development". And the country's helping policy for ethnic minority areas has greatly increased financial support, leading to a high proportion of financial investment in education.



Figure 2. Distribution of Fiscal Expenditure on Education (100 million yuan)

However, the high level of financial investment in education does not mean that ethnic minority autonomous regions are in a favorable position compared with other provinces in the competition of educational information. In fact, the high proportion of financial investment in education is mainly due to the low GDP. Due to the restriction of development level and backward basic education facilities, minority areas have poor information acquisition ability and low efficiency of information flow [6]. Compared with other regions, the number of key universities, academicians and other leading academic research talents is less, and the information asymmetry in the education system is significant.

2.3 Distribution of Double-top Universities in China

The title of "Double-Top universities" is conferred by department of Education, which is always at the world's leading level in comprehensive capacity or in a certain field of research. "Double-top" is the highest accreditation standard for colleges and universities proposed by China recently. However, regions like Shandong, Henan that with the highest number of universities don't have the highest number of Double-Top universities. It reflects the quality of local education.[7] It can be seen that the two top universities are generally concentrated in Beijing, and the Yangtze River Delta region, with Shanghai in Jiangsu as the center. Thus, it can be inferred that the distribution of the double-top universities is related to the economic development degree of the region.



Figure 3. Distribution of Double-top Universities in China

2.4 Regional distribution of Academician

Academician is the highest academic title in science and technology established in China. It usually refers to the academician of the Chinese Academy of Sciences or the Chinese Academy of Engineering. It is an important index to measure the level of higher education in a region, it presents an uneven distribution.

Similarly, the distribution of academicians is concentrated in the eastern coastal areas, where the economies are more developed with flexible policies. Educational information asymmetry is mainly reflected in the above aspects. Now, we will explore the relationship between educational input and educational information asymmetry.



Figure 4. Regional distribution of Academician

3. THE REGRESSION MODEL

In this paper, the number of the double-top universities (S) and the number of academicians (Y) in each province and city are taken as the data to measure the degree of information asymmetry. By the end of 2018, 2,639 academicians involve in teaching in China, and 82 percent

were from double-top universities. In this paper, the informatization level (Q) is calculated by the following formula:

$$Q = \alpha_1 S + 0.82 Y + \epsilon_j \text{ (Error Term)} \quad (1)$$

Meanwhile, obtain the 2018 provincial and municipal fiscal education expenditure and regional GDP published by the National Bureau of Statistics, and calculate the proportion of fiscal education expenditure in the regional GDP.

This experiment Selected the information level of Q as the dependent variable, provincial education budget (F), regional GDP (G), the percentage of education spending to GDP (R) as the independent variable to establish regression model, aims to research from the aspects of the relationship between the number of double-top universities, academicians of fiscal expenditure on education and the educational information asymmetry.

The regression model is established as follows:

$$Q = \beta_0 + \beta_1 F + \beta_2 G + \beta_3 R + \epsilon_i \quad (2)$$

4. RESULTS AND ANALYSIS

4.1. Regression Results

Table 1. Results of the Regression Model

Model	Unstandardized Coefficients		Standardized Coefficients		T	Sig
		Standard Error				
Local government expenditure on education (100 million yuan)	3.531E-7	.000	.281		9.214	.268
Gross Regional Product (\$100 million)	4.212E-7	.000	.318		12.412	.312
The proportion of education input	-.001	.000	-.124		-3.154	.004

4.2. Regression Analysis

Local education financial expenditure, gross regional product and information level are positively correlated, and the information level of Jiangsu, Guangzhou and other provinces and cities with high education expenditure and high gross regional product also increases accordingly. Education information level and scale of public education facilities, closely related to the level of economic development, the capital strength of the region has a large number of first-class universities and academicians, in a leading level in the education information acquisition, and less fiscal education expenditure such as Yunnan, Jilin province is difficult to maintain a high level of competition ability in the aspect of education information, compared with the big province of education spending at a competitive disadvantage.

In addition, through regression analysis, it is found that the level of educational information, educational financial expenditure and the proportion of educational input are negatively correlated. This is similar to Alesina and Wacziarg's view of the scale of public goods. [8] At the end of the 20th century, Alesina and Wacziarg argued that there were economies of scale in public goods, and that the larger a country was, the smaller its fiscal expenditure as a percentage of GDP. This paper finds that this theory is also applicable in the field of education. As mentioned above, educational information level is positively correlated with educational financial expenditure, while with the continuous expansion of regional educational scale, the proportion of educational financial expenditure shows a downward trend. This is because the increase in scale will improve the utilization of funds, promote educational equity and improve the level of information.

5. CONCLUSION & PROSPECT

5.1. Conclusions

① At the end of 2018, China's national financial education expenditure accounted for 4.11% of GDP, a robust increase of 0.23% compared with 2010. The growth rate of education financial expenditure generally exceeded the growth rate of GDP. However, this proportion is still lower than the world average of 4.9%, and there is still a large space for growth.

② There is obvious information inequality among different provinces (cities). There is no obvious relationship between the ability to obtain educational information and the proportion of financial education expenditure in GDP, but there is a positive correlation between the ability to obtain educational information and the total expenditure. This is related to the comprehensive cost of information acquisition. Whether the number of double-top universities or the number of academicians, Beijing, Shanghai, Jiangsu, Hubei and other provinces with large financial expenditure on education and high education level lead other regions in obtaining educational information, while areas with low financial education expenditure such as Guizhou and Jilin are facing significant inequality of educational information.

③ There is a negative correlation between the proportion of financial investment in education and GDP and the amount of financial investment in education of provinces and cities, which confirms the scale effect of public goods theory proposed by Wacziarg and Alesina in the early stage: when the economic scale reaches a certain level, the average cost of a single product presents a downward trend. With the increase of the scale of financial investment in education, the number of universities, educational institutions and other infrastructure has increased, the situation of information inequality has been alleviated, and the utilization rate of education funds has been improved.

Therefore, the proportion of financial education investment in regional production has gradually decreased.

5.2. Prospect

The result also verified the educational proximity effect proposed by U.S. scholars in 2018: "The concept of geographic limits to the diffusion of knowledge can help explain different levels of growth and development between regions". [9] The cluster effect is obvious, that the Yangtze River Delta region not only has a rapid rise in economic indicators, but also gradually strengthens in the degree of informatization. Their flexible policy making and effective capital input are worth studying. Schools in promising areas like Beijing, Jiangsu, and Zhejiang can be leading figures in the educational reformation in the coming years.

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