

Literature review on education expansion and income gap in China

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Abstract

Since the reform and opening up, China's per capita years of education and college enrollment rate have been greatly improved. The impact of educational expansion on China's income gap has aroused widespread concern in the academic community. In this paper, the theoretical research and empirical analysis of education expansion and income gap are sorted out, and the related theoretical research at home and abroad are classified into three categories: education expansion has inhibition, promotion and comprehensive effects on income gap. In the empirical analysis, the paper summarizes the functional relationship between education expansion and income gap in China, and the heterogeneity analysis of income of different groups due to the expansion of different education levels.

Keywords: Educational Expansion; Education fair; Inverted "U" Curve; The income gap

1. Introduction

Since the beginning of the new century, China's economy has developed rapidly and its comprehensive national strength has been continuously strengthened. From 2000 to 2020, China's average Gini coefficient was 0.4723, which is still at a high level compared with that of developed countries. The current contradiction in China is the contradiction between the people's growing need for a better life and the unbalanced and insufficient development. The large gap between the rich and the poor will not only intensify social contradictions, thus threatening the long-term stability of the country, but also lead to problems such as insufficient economic development momentum. Therefore, the gap between the rich and the poor is an urgent problem to be solved in China.

The theory of human capital holds that investment in education is an important factor affecting residents' income. Since the reform and opening up, China has implemented the policy of educational expansion, especially the expansion of higher education since the end of last century, which has been a major change in China's educational system for more than 20 years. China implemented the policy of higher education expansion in 1999, with the enrollment rate of ordinary higher education institutions increasing by 42%, indicating the transformation of China's higher education from elite education to mass education. In 2019, the gross enrollment rate of China's higher education exceeded the 50% mark, realizing a significant leap from popularization to popularization of higher education. Specifically, China's Gini coefficient from 2000 to 2020 has roughly experienced two stages: first rising and then slightly falling. The effect of education expansion on the change of China's income gap has attracted wide attention in the academic circle.

This paper will sort out the relevant literature from the theoretical research and empirical analysis of education expansion and income gap. Exploring the impact of educational expansion on the income gap has important reference value for policy makers to ease the gap between the rich and the poor in China from the perspective of education.

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2. The theoretical research on education expansion and income gap

According to the theory of human capital, the transformation of human capital investment into personal income requires three stages: one is to transform various elements into human capital through investment, the other is to transform human capital into actual production capacity, and the third is to transform actual production capacity into income. Gary becker, an American economist, believes that education will have an impact on income. Investment in education will generate revenue in the future. Different investment in education or training will result in different individual productivity, which will lead to different wages and incomes. So, what is the theoretical support behind the effect of education expansion on income gap? This paper reviews the related theories at home and abroad and classifies them into three categories: inhibition, promotion and synthesis.

2.1. Education Expansion Reduces Income Gap

Rahter proposed the Maximization of Maintenance of Inequality (MMI) hypothesis that when education expands to a certain extent, the educational needs of the upper class are satisfied and saturated, i.e. when the educational enrollment rate approaches or reaches 100%, the educational opportunities of the lower class will be greatly improved, thus reducing the educational inequality and narrowing the income gap [1].

2.2. Education Expansion Enlarges Income Gap

Lucas combined with MMI hypothesis proposed to effectively maintain the inequality (EMI) hypothesis, that education inequality is reflected in the two dimensions of quantity and quality, although the expansion of education to a certain extent can alleviate the inequality in quantity, but due to the disadvantage of resources, the lower class is getting low-quality education, the upper class can still maintain the advantage of education quality, thus maintaining income inequality [2]. Both the MMI hypothesis and the EMI hypothesis show that the root of educational inequality is the inequality of social class resources. The EMI hypothesis is further expanded on the basis of the MMI hypothesis, which complements the inequality in the dimension of educational quality, and there are certain contradictions and opposites between the two in the conclusion. In fact, MMI theory focuses on the first aspect of inequality, that is, inequality in quantity. As far as our country is concerned, it can be regarded as an opportunity to go to college. The EMI theory focuses more on the second aspect of inequality, that is, the qualitative aspect of inequality. As far as our country is concerned, what kind of university opportunity can we consider?

2.3. Education expansion has a comprehensive effect on income gap

Claudia Golding and Lawrence Katz of the United States, in their book *The Race between Education and Technology*, made a rigorous historical analysis of the co-evolution of American education level and wage structure in the 20th century, and concluded: "The sharp rise in inequality is mainly due to the slow-down in the pace of improvement in education level." According to their point of view, the income distribution gap depends on the speed of technological progress and the speed of improvement in education. If the speed of improvement in education is greater than the speed of technological progress, i.e. the supply of highly skilled workers is greater than the demand, the income gap will be suppressed, whereas the income inequality will be increased. Knight and Sabot proposed that the impact of educational expansion on the income gap mainly plays a role through two mechanisms: structural effect and compression effect [3]. Structural effect refers to the influence of education expansion on income gap under the condition of constant rate of return on education, and the compression effect refers to the influence of income return on income distribution of workers with different levels of education under the condition of constant structure of education distribution. Baicai Sun inherited the views of Nate and Sabot. Further research found that the impact of education distribution on income distribution equality is positive, while the impact of education yield on income distribution equality is negative [4].

3. Empirical Analysis of Education Expansion and Income Gap

3.1. The "U" relationship between education expansion and income gap

After examining the relationship between education and income distribution, western researchers believe that education expansion does not blindly expand the income gap, nor blindly narrow the income gap, but presents a phased characteristic, i.e. there is an inverted "U" relationship between education expansion and income gap.

The empirical research results of most scholars in China are similar. Bai Xuemei analyzed the relationship between education and income inequality in China by using the time series data of relevant indicators from 1982 to 2000 in

China, and found that there is an inverted "U" relationship between education expansion and income gap. China in 1982-2000 is in the previous stage of "U" relationship, and there is a significant linear positive correlation between average length of education and income inequality, i.e., the increase of average length of education will increase income inequality [5]. Yanzhen Wang and Xiumin Li use China's data from 1996 to 2012 to establish a simultaneous equations model incorporating distribution lags. Using the three-stage least square method to estimate the relationship among education expansion, education inequality and income distribution gap, the study found that the impact of education expansion on income distribution gap is inverted "U" shape, and China is on the right side of the inverted "U" shape. Income distribution gap will narrow with education expansion, the impact of education expansion on education inequality is negative, and the degree of education inequality will decrease with education expansion [6]. Ping Wei (2016) uses the panel data of 24 provinces in China from 1995 to 2011, Zhou Liang (2016) uses the relevant data of China from 2000 to 2012 to examine the impact of education on the income distribution gap, and all draw the conclusion of inverted "U" relationship [7] [8].

A small number of scholars have obtained diametrically opposite results, such as Yonghong Xu, Zhenli Xiao and Jianping Zhu using China's 1997-2016 provincial panel data, using fixed-effect panel model for analysis. The study found that the relationship between education expansion and income gap does not conform to the inverse "U" curve relationship, but is a positive "U" curve relationship, i.e. China is currently in the stage of increasing income gap with the improvement of education expansion level [9].

3.2. The overall impact of higher education expansion on the income gap

China has implemented nine-year compulsory education nationwide. Therefore, the inequality in education is mainly reflected in the inequality in senior high school and higher education. The inequality in higher education opportunities has attracted the attention of social science research due to its deeper and wider social and economic impact. As a result, many academic disputes have arisen. Many scholars have further focused on the impact of higher education expansion on the income gap. Most studies believe that the current expansion of higher education in China has a positive impact on the income gap, but in the long run, it will help narrow the gap between the rich and the poor. Jianyu Han and Weijian Lu based on 1998-2013 China's provincial panel data research results show that: the expansion of higher education has a significant expansion effect on residents' income gap, but with the gradual expansion of the proportion of groups receiving higher education, the equality effect of higher education expansion slowly begins to manifest, and the effect of higher education expansion on residents' income gap is relatively reduced [10]. Jian Liu based on Mincer's wage equation, using instrumental variable method to analyze the impact of higher education on the change of income gap. He thinks that from the overall perspective of the whole society, the average number of years of education in the whole society has increased significantly after the expansion of enrollment, and the rate of return on education has changed in the same direction with the income sub-points. The existence of "Matthew Effect" in education development has further exacerbated the income gap in our country [11]. Guochang Zhao and Zhou Zhu studied the impact of China's education expansion on the income gap from 2005 to 2015, and found that the constituent effect of education expansion enlarged the income inequality-although education expansion reduced the inequality of high school education, it increased the inequality of higher education [12].

3.3. Heterogeneous influence of higher education expansion on different groups

On the impact of the expansion of higher education on the income gap of different regions, Wenyan Sun, Qin Yang and Peng Xu found that from the results of different regions, the urbanization level in the eastern region is generally high, and the impact on the regional income gap is not significant, while the expansion of higher education has a significant negative effect on the regional income gap. The results in the central region are basically the same as those in the eastern region. Compared with the eastern and central regions, the western region has a lower level of urbanization, and the improvement of its level is not conducive to narrowing the income gap between regions, while the impact of the expansion of higher education is not significant [13]. Wenbo Cai and Jinsheng Huang analyzed the relationship between China's regional higher education investment and the urban-rural income gap from 2006 to 2016, and concluded that from the national level, higher education investment has a significant role in promoting the expansion of the urban-rural income gap. From the regional perspective, the eastern and western higher education investment has a significant role in promoting the expansion of the urban-rural income gap, while the central region has no significant relationship between the two [14].

On the impact of higher education expansion on the income difference of different income groups, Sheng Ying studied the intra-group differences and found that the structural effect of education expansion is negative for high-income groups, narrowing the income gap of high-income groups, but positive for low-income groups, widening the income gap of low-income groups [15]. Li Wang and Fenglan Lee based on the micro-data of China's household tracking survey, conducted a study on the differences between groups and found that, compared with the middle-income and high-

income groups, higher education plays a greater role in increasing the income of the low-income groups, especially the very low-income groups, while the effect on increasing the income of the very high-income groups is the smallest. Higher education reduces the income gap between the low-income groups and the middle-high income groups [16]. Further, Yingying Huang and Hailin Ma found that the income gap between men and women in the higher income group is smaller than that in the lower income group. This means that the income gap between men and women can be narrowed if more women are admitted into the middle- and high-income groups [17].

4. Conclusion and recommendations

On the whole, most scholars agree that education expansion has an inverted u-shaped relationship with income gap, and in the long run, education expansion has a negative effect on income gap. From the perspective of region, scholars have not reached a consensus on the impact of higher education expansion on regional income gap, but from the perspective of different income groups, higher education plays a greater role in increasing the income of low-income groups, and education expansion is conducive to alleviating the income gap between low-income groups and high-income groups. Therefore, the government should continue to adhere to the policy of education expansion, increase the proportion of education expenditure in GDP, and attach equal importance to increasing education expenditure and improving the efficiency of fund use. For the backward areas in western China, we should perfect the directional enrollment expansion mechanism and promote the development of education credit. For rural areas, on the one hand, we can strengthen the tilt of rural education resources, on the other hand, optimize the urban-rural allocation of higher education resources, encourage college students to participate in rural construction, and improve the rural labor supply structure. For the Chinese government, targeted expansion of education is one of the effective measures to narrow the gap between the rich and the poor and achieve social equity.

Compliance with ethical standards

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All authors declare that No conflict of interest in this work.

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