

Research on the Differences in Basic Education Resources Allocation Between Urban and Rural Areas from the Perspective of Educational Investment and Outcomes

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Abstract—This paper uses macro-statistical data such as China Statistical Yearbook and China Education Statistical Yearbook to analyze basic education resources allocation from the perspective of educational investment and outcomes. The outcomes show that the narrowing of the gap between urban and rural students in per capita education investment is largely the result of rural students' self-selection through changing their household registration status, which cannot explain the promotion of fair allocation of educational resources between urban and rural areas. As can be seen from the indicators of educational outcomes, the competitiveness of rural students in obtaining higher-level educational opportunities is far lower than that of students in urban areas. The contradictions between urban and rural education resources allocation are concentrated in the secondary education period. Secondary education resources, especially the urban-rural disparity in the allocation of educational resources in senior high schools, have a significant impact on rural students' continuing education opportunities, and then affect the urban-rural disparity in higher education opportunities.

Keyword—*educational investment, educational outcomes, basic education resource allocation*

I. INTRODUCTION

With the advancement of urbanization, the educational opportunities of urban-rural social members are also changing fundamentally: both in scale and quantity, and the educational opportunities have been significantly improved. The report of the Nineteenth National Congress of the Communist Party of China pointed out that “to promote the integration of urban and rural compulsory education, to attach great importance to rural compulsory education, and to strive to make every child enjoy fair and quality education”. The urban-rural dual division system not only embodies in the economic field, but also leads to the unequal allocation of educational resources between urban and rural areas [1].

Under the education system of urban-rural separation, the “urban priority” policy causes serious differences in educational level [2]. On the one hand, the narrowing of the gap between urban and rural investment in education can hardly conceal the actual gap in the level and quality of basic education between urban and rural areas [3]. On the other hand, China's limited educational funds tend to be misappropriating, blind comparison and redundancy of investment [4-5]. Many studies have shown that education inequality is the main reason for the expansion of urban and rural incomes in China, and its contribution is still expanding. If this inequality and inefficiency of urban and rural education resources exist for a long time, it will solidify or even widen the existing social gap between classes. In 2017, the net enrollment rate of primary school-age children was 99.91%, the gross enrollment rate in junior high school was 103.5%, the gross enrollment rate in senior high school reached was 88.3%, and the gross enrollment rate in higher education was 45.7%. It can be seen that most of the workers have reached the level of high school education, but we have to admit that the allocation of educational resources in China shows a serious gap between urban and rural areas in equality of educational opportunities and outcomes. If educational equity is the starting point of social equity, then the equity of educational resources allocation is the starting point of educational equity. There are some characteristics in the development of education in China, such as low starting point, large number of educated groups and large social demand. As a scarce public resource, the difference of educational opportunities between urban and rural areas, regions and social strata fundamentally reflects the difference in the occupancy of educational resources among different groups. Among them, the gap of educational resources allocation between urban and rural areas is much larger than that of other levels. This paper focuses on the analysis of the differences in the allocation of educational resources between urban and rural areas from the perspectives of educational investment and outcomes.

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II. METHODOLOGY

A. Data resources

The data is from China Statistical Yearbook 2008-2015, China Educational Statistical Yearbook 2002-2013 and China Educational Economic Statistical Yearbook.

B. Research method

This paper mainly uses descriptive statistical method and comparative analysis method to describe the urban-rural differences of teachers in urban, county and rural areas in the past ten years from 2003 to 2013, including faculty scale (described by the ratio of students to teachers), teachers' academic qualifications, and the structure of professional titles. At the same time, the gap in educational resource allocation is discussed from the perspective of educational outcomes by comparing the students in different stages of basic education from 2003 to 2013.

III. DIFFERENCES BETWEEN EDUCATIONAL INVESTMENT AND BASIC EDUCATION RESOURCE ALLOCATION IN URBAN AND RURAL AREAS

A. Differences between Educational Funds and Basic Education Resources Allocation in Urban and Rural Areas

According to the previous analysis, the level of education of workers in our country has basically reached the high school level. Therefore, this paper combines the high school education with compulsory education stage to analyze the differences in the allocation of educational resources between urban and rural areas caused by the gap in educational investment.

In order to ensure the consistency of the statistical caliber of educational financial investment, this study uses the national financial education funds to analyze the differences between urban and rural educational investment. Since the national financial education funds for senior high schools in China were not divided into rural and urban categories before 2008, and considering the availability of data, this paper only compares the urban-rural differences of the national financial education funds for basic education between 2008 and 2015, as shown in Table 1. From Table 1, it can be seen that in 2008-2015, the scale of national financial investment in education has been gradually expanding, and the rural compulsory education stage has become the key stage of education in recent years because of its low starting point. In 2008, in rural primary school, national financial education funds accounted for 67.58%, and the budgetary education funds accounted for 68.91%.

TABLE I. URBAN-RURAL DISPARITIES IN NATIONAL FINANCIAL FUNDING FOR BASIC EDUCATION (2008-2015)

Categories of Basic Education	Unit: hundred million yuan	2008 year			2015 year			Average growth rate	
		City	Rural areas	Rural Proportion (%)	City	Rural areas	Urban Proportion (%)	City (%)	Rural areas (%)
Primary school	State financial funds for education	866.89	1807.00	67.58	3144.67	6227.17	66.45	20.21	19.33
	Budgetary funding for education	782.64	1734.90	68.91	3135.55	6209.60	66.45	21.93	19.98
Junior middle school	State financial funds for education	706.73	1032.33	59.36	2142.62	3518.92	62.15	17.17	19.15
	Budgetary funding for education	629.04	972.61	60.73	2130.37	3506.44	62.21	19.04	20.11
Senior high school	State financial funds for education	694.99	99.83	12.56	1662.58	1260.08	43.11	13.27	43.65
	Budgetary funding for education	600.25	89.66	13.00	1654.79	1251.47	43.06	15.59%	45.73%

Although in 2015, the proportion of national financial education funds and the proportion of budgetary education funds in rural primary school budget decreased slightly (by 1.13 percentage points and 2.47 percentage points respectively), from the average growth rate, the growth rate of national investment in rural primary education is slightly higher than that of urban.

The investment of education funds in junior middle school is similar to that in primary school, which shows

that the growth rate of rural areas is slightly higher than that of urban areas. It can be seen that from the perspective of education fund investment, the gap between urban and rural compulsory education resources allocation is gradually narrowing.

Meanwhile, we find that in recent years, Chinese government has gradually increased the investment of rural education funds in the high school stage, from 12.56% in 2008 to 43.11% in 2015, with an average growth rate of

43.65%. Budgetary education funds have increased from 13% in 2008 to 43.06% in 2015, with an average growth rate of 45.73%.

It can be seen that our government has changed its focus from unfairness of the investment in compulsory education to the unfairness of the investment in urban and rural education at a higher level of education.

B. The Teacher Gap of Basic Education between Urban and Rural Areas

The gap between urban and rural teachers is called the software gap in the allocation of educational resources between urban and rural areas, which directly affects the quality of students' training and whether students can get higher educational opportunities.

This study measures the gap between urban and rural basic education teachers by measuring the scale of urban and rural teachers (student-teacher ratio), the structure of full-time teachers' academic qualifications and professional titles. In order to depict the changing trend of faculty in urban and rural basic education, this study describes the urban-rural differences in the scale of teachers (described by the ratio of students to teachers), the structure of teachers' academic qualifications and professional titles in urban, county and rural areas in the past ten years from 2003 to 2013.

1) Difference between Urban and Rural Teachers' Scale

In 2003, the ratio of pupils to teachers in urban primary school was 19.3, 19.56 in counties and towns, and 21.09 in rural areas. It can be seen that the gap of pupil-teacher ratio in urban and county and town areas is not very large, but the scale of teachers in rural areas is obviously weaker than that in urban areas. The ratio of students to teachers was 16.59 in urban areas, 19.30 in counties and towns, and 20.03 in rural areas. It can be seen that the scale of teachers in urban areas in junior middle school has great advantages, and there is a big gap between county and town areas and rural areas. As for the senior high school, the ratio of students to teachers in urban areas was 17.42, 19.03 in counties and towns, and 18.40 in rural areas. This shows that the ratio of students to teachers in urban areas is lower than that in the rural areas. What's more, it can be found that the ratio of students to teachers in rural areas in senior high school is lower than that in counties and towns. However, it is believed that this is not evidence of the faculty improvement, but because a considerable part of the students in rural areas abandoned their entrance examination for senior high school, leading to the loss of rural students in senior high school, which also reflects the unfair distribution of high-level educational opportunities between urban and rural areas. With the development of education and urbanization in China, it is found that the gap between urban and rural areas in compulsory education is gradually narrowing. In 2013, the pupil-teacher ratio was 18.91 in urban primary school, 17.65 in counties and towns, 15.11 in rural areas, while 13.67 in urban junior

middle school, 12.92 in counties and towns, and 11.83 in rural areas. On the one hand, it illustrates that in the process of urbanization, many rural families have changed their household registration status because of policy or personal property, which makes more students in compulsory education flow from rural areas to urban areas. On the other hand, our country is also increasing the teachers' training in rural areas and expanding the teachers' scale in counties and towns and rural areas. Under the combined effect of two factors, the gap of teachers' scale between urban and rural compulsory education has been significantly improved. In the senior high school, the ratio of students to teachers in different areas decreased, 14.4 in urban areas, 15.39 in counties and towns, and 15.04 in rural areas. The ratio of students to teachers in counties and towns decreased more obviously, indicating that the teachers' scale in senior high school has been improved to some extent in the past ten years.

2) Urban-Rural Differences in Teachers' Academic Qualification Structure

It can be found that, compared with 2003, the academic qualification structure of full-time teachers in urban and rural primary education has been improved. From the urban-rural differences in the proportion of different educational levels in 2013, it can be found that 58.06% of full-time teachers in urban areas has got bachelor or above, which has exceeded the professional level. However, most of full-time teachers in primary schools in counties, towns and rural areas are at professional level (52.71% and 54.96% respectively). It can be said that there are obvious differences in the educational structure of full-time teachers in urban and rural primary schools. It can also be found that teachers with bachelor degree or above have increased significantly, while teachers in senior high school and below have decreased significantly. Among them, the number of full-time teachers with bachelor degree or above increased by 48.64% in urban areas, 33.76% in counties and towns, and 25.36% in rural areas. Although there is still a big difference between urban and rural areas in terms of higher education level, it can still be seen that great efforts have been made to upgrade full-time teachers' educational level in counties and towns and rural areas. Meanwhile, the proportion of full-time teachers with high school and lower secondary education in rural areas has declined by 49.96 percentage points, while 40.7 percentage points in counties and towns.

It can be found that the proportion of full-time teachers with bachelor degree and above has increased in different regions, especially in rural areas, up 36.17 percentage points, followed by counties and towns, up 25.13 percentage points. By 2013, the gap became very small. Compared with other education stages, the proportion of full-time high school teachers with bachelor degree and above has improved most obviously.

3) An Analysis of Urban-Rural Differences in Teacher Title Structure

Among them, the proportion of full-time teachers with

senior professional titles (including middle school senior professional titles and primary school senior professional titles) has increased significantly, while the proportion of ungraded teachers has decreased. In terms of the increase, the proportion of full-time teachers' senior titles in rural areas increased the most, accounting for 18.83%, followed by counties and towns, accounting for 15.48%, and finally urban, accounting for 13.49%. However, according to the data of 2013, there is still a gap in the teachers' structure between urban and rural areas. Among them, the proportion of senior titles of full-time teachers in urban areas is 2.53 percentage points higher than that in counties and towns, and 6.28 percentage points higher than that in rural areas. However, the proportion of teachers who have never gotten their professional titles is much higher in urban areas (9.53%) than that in counties and towns and in rural areas (8.44% and 8.77). However, it can be concluded that the number of teachers in urban primary schools is much larger than that in rural areas, that is to say, there is a gap between urban and rural areas in the reserve of teachers.

It can be found that the proportion of full-time teachers in secondary schools between urban and rural areas is the largest, reaching more than 60% in 2013. What's more, the proportion of full-time teachers in senior professional titles has increased, especially in rural areas, up 10.66%, followed by counties and towns, up 9.06%, and in urban areas, up 5.51%. However, it can also be seen that there is still a big gap between urban and rural areas in the proportion of full-time teachers' senior titles. Among them, 10.16 percentage points are more in urban than in rural areas, and 7.19 percentage points are more than in counties and towns.

C. The Difference between Urban and Rural Basic Education Conditions

The difference of investment in urban and rural education funds determines the difference of school-running conditions. This part chooses the average size of students' school buildings, assets, as well as the allocation of library resources and other situations to analyze and explain.

1) Urban-Rural Difference in Building Area of School Buildings Urban per Student

In 2003, the average building area of urban students' school buildings was 5.13 square meters, 4.74 square meters in counties and towns, and 4.95 square meters in countryside. In 2013, the average building area of urban students' school buildings increased to 5.70 square meters, 5.93 square meters in counties and towns, and 6.34 square meters in rural areas, indicating that the growth of rural areas and counties and towns was faster than that of urban areas. In addition, it can be found that in 2013, the growth of the average school building area in rural areas and counties and towns was much larger than that in urban areas. In 2013, the average school building area in urban areas was 9.86 square meters, 11.25 square meters in counties and towns, and 13.09 square meters in rural areas. The reason may be that with the acceleration of

urbanization, rural students gradually gather in cities. That is to say, although the total area of school buildings in urban areas is larger than that in rural areas, due to the excessive number of students, the average construction area of school buildings per student is much smaller than that in rural areas. As for the high school period, the average school building area of urban students (19.54 square meters) is larger than that of rural students (18.3 square meters), and the average school building area of county students (16.8 square meters) is smaller than that of rural students. On the one hand, it can show the urban-rural difference in the average school building area of high school students. On the other hand, it can also be found that the source of candidates of high school diploma has been differentiated between urban and rural areas. The average building area of urban students is smaller than that of rural students, which shows that the number of urban students is larger than that of rural students in senior high school examinations. In addition, it can be found that the number of college entrance examination students in counties and towns is larger than that in urban areas and rural areas.

2) Urban and rural differences in the average teaching equipment assets

It can be found that compared with 2003, the educational equipment assets of all levels of education increased in 2013, and the gap between urban and rural areas decreased. In particular, the urban-rural ratio of urban and rural per capita teaching equipment assets from 4.34 declined to 1.32 between 2003 and 2013, and the ratio between cities and counties fell from 2.53 to 1.29 from 2003 to 2013. The urban-rural ratio of the average experimental equipment dropped from 1.08 in 2003 to 0.75 in 2013 and county township ratio dropped from 1.12 in 2003 to 1.01 in 2013. The same changes occurred in the junior high school education and high school education. These changes can explain the improvement of teaching equipment in rural areas and counties and in primary schools. However, from the data of 2013, in addition to the urban-rural ratio of experimental equipment in primary and junior high school, other data are showing obvious urban-rural gaps, indicating that there is still a significant gap in the value of each student's teaching equipment assets between urban and rural areas.

3) Urban-rural differences in the amount of teaching resources

It can be found that compared with 2003, the gap between urban and rural areas in number of computers for per 100 students and the amount of books per student has been narrowed in each education stage, and the number of computers for per 100 students has been improved in primary school rapidly. In 2003, the urban-rural ratio was 3.91, which fell to 1.60 in 2013. Similarly, the gap in the junior high school fell from 1.92 in 2003 to 1.14 in 2013. We believe that the improvement of this gap is due to the increase in government input and the flow of students from the urbanization to the city. Among these changes, we can find the town rural areas had more books than cities in the junior high school. Other data can still see a large gap

between urban and rural areas and between cities and counties in teaching resources in 2013. For example, in 2013, the number of computers was 21.96 for per 100 students in urban high school, the county and town only had 14.23, and the rural area only had 13.5, the urban area was 1.63 times that of rural areas, and the urban area was 1.54 times that of country side. Further, we find that the difference between cities and counties is greater than the difference between urban and rural areas to some extent. This can also explain that the urban-rural changes in the source structure of students are more apparent transform from the original urban-rural gaps to cities and countries gaps.

IV. EDUCATIONAL RESULTS AND DIFFERENCES IN URBAN AND RURAL EDUCATIONAL RESOURCE ALLOCATION

Looking at the urban-rural gap in the allocation of educational resources from the perspective of input not only illustrates the unfairness of education caused by the long-term urban-rural dual structure, but more importantly, this unfairness will have a profound impact on the educational investment decision-making of the family.

From the previous analysis, we can find that although the urbanization process is accelerating, China is gradually paying more attention to the input of rural educational

resources. However, the narrowing of the urban-rural gap in urban and rural per capita educational investment is largely due to the change in household registration status that a result of self-selection does not explain the promotion of fairness in the allocation of resources for urban and rural education. A large number of quality educational resources are occupied by urban residents, especially the difference between the level of teachers in urban and rural areas, which will make huge difference in academic performance, school enrollment rate and educational results. Educational investment decision-making is an important part of family investment, which affects the possibility of family members' future income increase directly. The educational investment decision-making also follows cost-benefit principle. Individuals or families may be able to obtain better educational resources by changing their household registration status, and then change individual educational choices, when they perceive the urban-rural gap in the allocation of educational resources. Wen Jun, Gu Chudan (2017) indicated that the gap between urban and rural education would cause a large loss of rural students through the individual from pre-school education, to the change of the educational path of rural residents in the “educational chain” nodes of higher education [6].

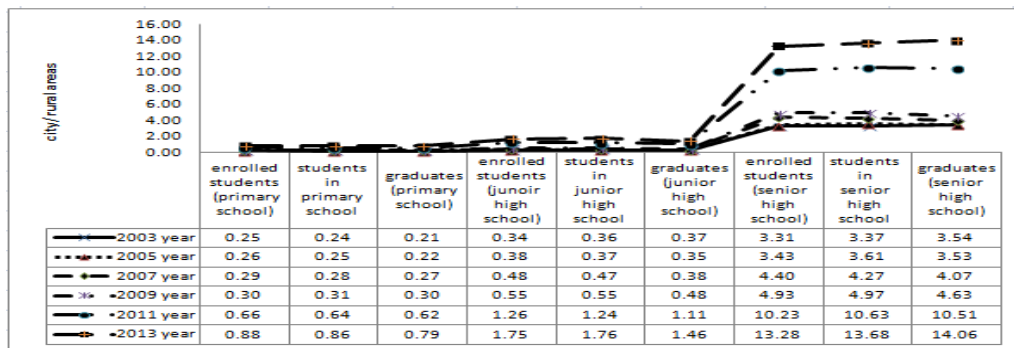


Fig. 1. Student size ratio at different stages of urban and rural basic education (urban/rural)

Fig.1 shows the urban-rural comparison of students at all stages of basic education from 2003 to 2013. It can be found that from 2003 to 2013, the number of enrolled students, the number of students enrolled, and the number of graduates in rural areas were larger than those in urban areas. From the trend of change, the ratio of urban to rural areas is gradually increasing, indicating that rural primary school students are more than urban primary school students, but with the advancement of urbanization, the scale of urban primary schools is gradually increasing. Secondly, we found that the number of junior high school enrollment, the number of students enrolled, and the size of graduates in rural areas were larger than those in urban areas from 2003 to 2009, but in the stage of junior high school to high school, the number of students in urban areas exceeded that of rural areas to a large extent. This shows that, more rural students will choose to transfer to the city through pass an entrance examination of key high

schools or other ways to obtain the educational resources of the city from 2003 to 2009. However, we have found that the urban and rural population has a diversion of education in the junior high school stage since 2011. The number of urban junior high school enrollment, the number of students enrolled, and the number of graduates are larger than those in rural areas in 2011 and 2013. From the educational results, the number of urban junior high school graduates was 1.11 times and 1.46 times that of rural areas in 2011 and 2013 respectively, while the number of urban high school graduates was 10.51 times and 14.06 times that of rural areas respectively.

The reason behind the data is, on the one hand, the result of China's gradual advancement of urbanization. In 2013, China's urbanization rate reached 53.7%, indicating that more rural populations have gathered in cities and towns through the conversion of household registration status, and obtained urban educational resources; on the

other hand, it also shows that some rural residents are beginning to realize the high-quality resources congest to urban areas bring about educational difference in urban-rural areas. Therefore, many rural residents choose to live cities to receive quality education through other means, such as the purchase of urban house, in the stage of junior high school to high school. Therefore, although macro statistics show that the gap between urban and rural educational resource allocation is gradually narrowing, it does not mean that rural residents have access to more equitable educational opportunities. Whether it is the advancement of urbanization or the process of self-selection of rural residents through the change of household registration, it is not inclined to be beneficial to rural areas actively from the perspective of starting point fairness and opportunity fairness. At the same time, it can be inferred that the seemingly fair educational opportunities for rural students need to make more efforts to obtain under the premise of the existing educational resources. Therefore, it can be clearly seen from the indicators of educational outcomes that the competitiveness of rural students in obtaining high-level educational opportunities is much lower than that of students in urban areas. In addition, from the perspective of changing trends, the differences in urban and rural educational resource allocation have evolved from the original high school stage to the junior high school stage. In other words, the contradiction between urban and rural educational resource allocation is concentrated in the secondary education stage. The secondary education resources, especially the urban-rural gap in the allocation of educational resources in high school, have a major impact on rural students in their continuing educational opportunities, which in turn will affect the urban-rural gap in higher educational opportunities.

V. CONCLUSION

First of all, from the perspective of fairness in educational investment, with the country's emphasis on education and the improvement of policies formulated by local government, the investment in education within the budget has grown rapidly, and the gap between urban and

rural areas has gradually narrowed, but differences in teacher's level and school conditions remain the biggest obstacle to the development of rural education. The narrowing of the urban-rural gap in urban and rural per capita education investment is largely a result of a self-selection of rural students by changing their household registration status, and does not explain the promotion of urban and rural educational resource allocation.

In addition, from the perspective of changing trends, the differences in urban and rural educational resource allocation have evolved from the original high school stage to the junior high school stage. In other words, the contradiction between urban and rural educational resource allocation focus on the secondary education stage. The secondary education resources, especially the urban-rural gap in the allocation of educational resources in high school, have a major impact on rural students in their continuing educational opportunities, which in turn will affect the urban-rural gap in higher educational opportunities.

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