Inter-Provincial Fiscal Allocation Disparities and Compulsory Education Quality: The Mediating Role of Resource Allocation

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Abstract. The issue of fiscal allocation for compulsory education in China has received widespread attention. However, insufficient research has been conducted on the mediating role of resource allocation in the link between fiscal disparities and educational quality, making it difficult to effectively support policy optimization for regional educational equity. Based on statistical data from eastern and western regions, as well as case studies of Zhejiang and Sichuan provinces, this paper systematically analyzes how differences in inter-provincial fiscal allocations impact the quality of compulsory education, with a particular focus on the mediating role of resource allocation. The findings reveal that eastern provinces typically enjoy higher fiscal investments and more balanced resource distribution, resulting in better educational outcomes. In contrast, the western regions face limited fiscal capacity, a shortage of schools and teachers, and restricted improvements in educational quality. Resource allocation plays a significant mediating role between fiscal investment and educational outcomes and is a key factor in explaining regional differences in educational quality. Based on these findings, this paper recommends two main policy directions: increasing fiscal support for less developed regions and planning educational development in a more scientifically sound manner.

Keywords: Compulsory education; fiscal allocation; educational quality; resource allocation; regional disparity.

1. Introduction

With the expansion of compulsory education in China, access to education has improved significantly. However, regional disparities in educational quality persist. In particular, in provinces with uneven economic development, differences in fiscal allocations directly influence the distribution of educational resources and, in turn, affect the quality of education. Variations in local government revenues result in inadequate investment in education in less developed areas, often leading to a shortage of teaching staff and facilities, which restricts efforts to improve educational outcomes in those regions.

Compulsory education plays a foundational and strategic role in the entire education system. Ensuring adequate and equitable public investment in compulsory education is fundamental to achieving educational equity. To address regional imbalances in fiscal capacity, the central government has implemented mechanisms such as joint fiscal responsibility between central and local governments and targeted funding policies. In this context, how fiscal disparities influence educational quality--especially under conditions of pronounced urban-rural and regional differences--has become a topic of increasing concern.

While existing studies have largely focused on the direct relationship between fiscal allocation and educational quality, relatively little attention has been paid to the mediating role of resource allocation. Therefore, this study aims to explore how inter-provincial differences in fiscal allocations affect compulsory education quality through the mediating mechanism of resource allocation. By filling this research gap, the study seeks to provide theoretical support for optimizing the distribution of educational resources and improving the overall quality of education.

2. An Overall Analysis of Fiscal Investment in Compulsory Education

2.1. Policy Analysis

In recent years, the Chinese government has prioritized education as a key strategic focus, emphasizing the fair development of the education sector. From advocating "priority and equitable development of education", to aiming for "high-quality and fair education", and more recently "promoting educational equity and improving quality", the policy narrative around educational development has continued to evolve and deepen. To achieve more equitable and higher-quality education, the state has advanced the balanced development of basic education by reforming development models and improving resource allocation. Targeted poverty alleviation through education has also been a vital measure to break the intergenerational transmission of poverty, helping fulfill the public's aspirations for better educational opportunities and increasing their sense of fulfillment and satisfaction [1].

The government has promoted educational equity and quality by increasing fiscal input, optimizing resource distribution, and strengthening funding management. The core of these policies includes: ensuring that the growth rate of educational funding outpaces that of regular fiscal revenues, raising the proportion of education expenditure in public finance, and expanding funding channels (such as standardizing education surcharges and allocating a portion of land transfer revenue to education). These policies particularly favor central and western regions. Since the implementation of these policies, fiscal expenditure on education as a percentage of GDP has remained above 4% nationwide since 2012, reaching 4.06% in 2023. Education spending has become the largest expenditure item for local governments. However, due to disparities in regional economic development, eastern and western provinces show significant differences in the pathways and outcomes of policy implementation.

2.2. Comparative Analysis of Eastern and Western Regions

2.2.1 Comparison of national fiscal expenditure on education between Eastern and Western Regions

From 2013 to 2022, total and average annual public education expenditures in both eastern and western China have shown an upward trend. Over the decade, fiscal investment in education increased steadily across both regions. However, eastern provinces consistently received significantly higher total investment compared to their western counterparts, and this gap has widened over time, reflecting a persistent imbalance in regional resource allocation.

While differences in average annual educational spending between the two regions are narrower than in total amounts, western regions have seen more significant growth in per capita funding. This suggests that policies promoting regional balance have had some effect in improving education spending per person in the West. Nonetheless, the eastern region still maintains a leading position, and structural disparities in educational investment remain.

2.2.2 T-Test analysis of educational quality indicators

There are significant imbalances in the provision of educational resources between eastern and western regions, particularly in the number of schools and qualified teaching staff. On average, eastern provinces have approximately 613 more junior high schools than their western counterparts--a difference that is statistically significant ($p < 0.001$) and has a large effect size (Cohen's $d = 0.84$). A greater number of schools implies more access to education, potentially better learning environments, lower student-teacher ratios, more comprehensive facilities, and diversified curricula.

Additionally, the number of full-time primary and junior high school teachers is substantially higher in the east, with 74,643 and 43,791 more teachers, respectively, than in the west ($p < 0.001$). This demonstrates the East's advantage in both investment and staffing. A larger teacher workforce not only enhances educational quality but also allows for more individualized instruction, thereby improving overall learning outcomes.

Table 1. T-Test Results for Education Quality Indicators.

Variable	Region	N	Mean	t-value	p-value (two-tailed)	Statistical Significance	Cohen's d
Number of Junior High Schools	East	120	1599.69	2.05	0.042	Significant	0.278
	West	100	1309.78				
Number of Primary School Teachers	East	120	218659.99	4.186	<0.001	Significant	0.567
	West	100	144016.79				
Number of Junior High Teachers	East	120	130292.18	4.123	<0.001	Significant	0.558
	West	100	86501.22				

As shown in Table 1, these disparities are closely linked to stronger economic performance, greater fiscal input, and more refined education policies in the east. In contrast, fiscal constraints in Western regions make it difficult to provide sufficient schools and teachers, leading to shortages of educational resources. This imbalance affects students' access to education and may exacerbate regional inequalities in economic development and human capital cultivation. Therefore, increasing fiscal support for Western education, optimizing school distribution, and improving teacher compensation are essential steps toward achieving balanced resource allocation and regional educational equity.

3. Case Analysis

3.1. Differences in Overall Investment

In terms of fiscal allocations for compulsory education, Zhejiang Province demonstrates a significantly higher overall investment level than Sichuan. As early as 2016, Zhejiang issued the Notice on Further Improving the Funding Guarantee Mechanism for Urban and Rural Compulsory Education, which was further refined in 2024 for specific cities such as Zhoushan. The per-student public expenditure standards were raised to 1,500 yuan for primary schools and 1,700 yuan for junior high schools [2,3]. Additionally, educational funding is jointly supported by central and local governments, with supplementary allocations for special schools. From 2018 to 2022, the average public budget for educational programs in Zhejiang was approximately 219.96 billion yuan, with additional education-related funds totaling about 12.9 billion yuan.

In contrast, Sichuan issued a new policy in 2023 aimed at enhancing its guarantee mechanism, raising per-student public expenditure standards to 720 yuan for primary schools and 940 yuan for junior high schools, and increasing subsidies for boarding schools [4]. Between 2018 and 2022, Sichuan's average public education budget was 193.26 billion yuan, with other education-related funding around 4.98 billion yuan, considerably lower than that of Zhejiang. These figures reflect Zhejiang's more robust fiscal investment and comprehensive safeguard mechanisms.

3.2. Intra-Provincial Resource Allocation

Backed by a strong economic foundation, Zhejiang has seen rapid growth in educational funding. Its GDP rose from 5.62 trillion yuan in 2018 to 7.77 trillion yuan in 2022, while its education expenditure increased from 24 billion yuan to 34.4 billion yuan. Despite this, the number of schools slightly declined, indicating a strategic focus on improving educational quality rather than expanding

quantity. The number of urban students grew from 1.9 million to 2.38 million, while the rural student population dropped from 470,000 to 340,000, showing a clear fiscal preference toward urban education.

Similarly, Sichuan's GDP increased from 4.07 trillion yuan to 5.67 trillion yuan during the same period, and education spending rose from 20.7 billion yuan to 28.2 billion yuan. However, the number of schools decreased significantly, from 5,730 to 5,213, suggesting that the province is actively restructuring its education resource layout. The number of urban students increased from 1.6 million to 2.25 million, while the rural student population declined sharply from 1.35 million to 780,000. Although both provinces experienced a reduction in rural student numbers, Sichuan faces greater challenges in balancing urban-rural educational resources.

3.3. Funding Sources and Teaching Workforce

Regarding funding sources, fiscal revenues remain the primary source of education funding in Zhejiang, rising from 17.7 billion yuan in 2018 to 26 billion yuan in 2022. Contributions from the private sector remained relatively stable. In Sichuan, fiscal education funding also increased, from 16.8 billion yuan to 21.6 billion yuan over the same period, but at a slightly slower rate. Notably, Sichuan witnessed faster growth in non-fiscal education funding in 2022, indicating efforts to diversify its funding model and alleviate fiscal pressure.

In terms of teaching staff, Zhejiang's number of full-time teachers rose from 210,000 in 2018 to 230,000 in 2022, reflecting sustained investment in both quantity and quality of educators. Sichuan's teacher population grew from 330,000 to 350,000 during the same period. However, due to its vast geographic area and dispersed population, Sichuan faces greater challenges in teacher allocation, particularly in remote and underdeveloped areas where teacher shortages remain a persistent issue.

3.4. Policy Differences

Zhejiang's policy design emphasizes equal access to public services and supports school enrollment for children of migrant workers. In 2023, the province introduced the Transfer Payment Policy for "Zheli Excellent Education" in Compulsory Education, which allocates funds based on the number of students, allowing resources to follow students across regions [5]. This "funds-follow-students" mechanism ensures that educational resources are equitably distributed as student populations shift.

Conversely, Sichuan's policies focus on clarifying fiscal responsibilities and enhancing teacher welfare. The Fiscal Responsibility Reform Plan for Education Between Provincial and Local Governments outlines specific fiscal arrangements and provides financial support for rural teacher subsidies and salaries for specially appointed teachers [6]. This policy design reflects Sichuan's focus on addressing fundamental weaknesses and improving educational equity by strengthening institutional support.

3.5. Differences in Educational Quality

When it comes to educational quality, Zhejiang and Sichuan have adopted different development paths. Although Sichuan has approximately 255,000 junior high school teachers--almost twice the number in Zhejiang--its vast geographic area and uneven economic development result in acute teacher shortages in remote areas. While Zhejiang also faces teacher shortages in certain mountainous areas, its overall teacher supply is more sufficient.

In terms of student population, Sichuan has more students enrolled in both primary and junior high schools--5.5 million and 3.2 million respectively--compared to 3.85 million and 1.67 million in Zhejiang. This places greater pressure on Sichuan's compulsory education system. Additionally, the total number of schools in Sichuan is significantly higher than in Zhejiang, but the main challenge lies in improving educational quality across this large scale.

4. Policy Implications

4.1. Optimizing Fiscal Investment Strategies

There are significant disparities in fiscal investment in compulsory education across different regions. In light of this reality, economically developed and underdeveloped regions must adopt differentiated strategies to promote educational equity and balance.

For economically developed regions, the priority should be to optimize the internal allocation of educational resources while maintaining high levels of investment. Additional fiscal support should be directed toward relatively weak areas within the region, such as mountainous and rural areas. Improvements in school infrastructure--including upgrading teaching equipment, enhancing sports facilities, and renovating school buildings--are necessary to improve education quality from a physical standpoint [7]. These efforts can contribute to more balanced educational development within the region.

In contrast, economically underdeveloped regions must focus on increasing the total investment in compulsory education [8]. Fiscal allocations should be based on local economic development levels, population distribution, and actual educational needs to ensure scientific and rational budgeting [9,10]. Special attention should be given to supporting remote and impoverished areas where educational resources are scarce. This includes ensuring sufficient funding to attract and retain qualified teachers, promote specialized teaching programs, and improve teacher compensation [7]. Gradually narrowing the educational gap between urban and rural areas--and among different regions--will help promote broader educational equity.

4.2. Scientifically Planning Educational Development Layouts

Educational development plans at the local level must be aligned with changes in population structure, economic growth trends, and actual educational demands. Such planning should be both scientifically informed and forward-looking.

In rapidly urbanizing areas with high population mobility, it is crucial to align educational resources with urban development needs [11]. School site selection and capacity planning should be based on population size and distribution in newly developed urban areas and densely populated neighborhoods to ensure sufficient school placements for incoming students. At the same time, the sustainable development of rural education must not be overlooked. This can be achieved by establishing partnership mechanisms between urban and rural schools, optimizing rural teacher incentive schemes, and preventing the decline of rural schools due to resource shortages and student attrition.

For regions with large land areas and significant intra-regional disparities, tailored approaches must be adopted. In populous cities and economically dynamic areas, greater investment in education is required, including recruiting high-quality teachers, updating teaching equipment, and comprehensively improving education quality to meet the public's demand for better education [12]. Conversely, in remote rural areas, the focus should be on building and maintaining basic educational infrastructure. Efforts should be made to improve school conditions and ensure a stable supply of essential educational services, allowing children in rural areas to access equitable and quality education [13].

Additionally, all regions should strive to align education with local economic and social development. By adjusting the educational structure in line with industrial transformation and societal needs, local governments can better cultivate talent suited to regional development. Education should serve as a key driving force for local economic construction and social progress.

5. Conclusion

This research explored the connection between inter-provincial fiscal allocation differences, resource allocation, and compulsory education quality in China. By analyzing data from eastern and

western regions and case studies of Zhejiang and Sichuan, this paper found distinct regional disparities. The eastern region has higher fiscal investment and better-allocated resources, leading to superior education quality, while the western region lags due to financial constraints. Resource allocation significantly mediates the relationship between fiscal input and education quality.

The case studies highlighted differences in investment, resource distribution, funding sources, policies, and education quality. In response, this paper proposed tailored fiscal investment strategies for developed and underdeveloped regions and emphasized the need for scientific educational development planning.

For future research, it would be valuable to develop more accurate quantitative models to measure the impact of fiscal allocation on education quality via resource allocation. Additionally, investigating the long-term effects of policy interventions and drawing lessons from international experiences could further enrich the understanding and contribute to better educational policies.

Authors Contribution

All the authors contributed equally, and their names were listed in alphabetical order.

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