

Study on the Relationship between Compulsory Education Funding and Economic Development in Guangdong Province

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ABSTRACT

This paper employs panel data from 21 cities in Guangdong Province from 2017 to 2022 to examine the relationship between compulsory education investment and economic growth. The empirical results revealed a significant positive correlation between investment in compulsory education and the level of economic development. Additionally, there is a more apparent regional imbalance in compulsory education investment in Guangdong Province. In light of the empirical findings, this paper proposes that to more effectively promote the coordinated development of the regional economy and society, the Pearl River Delta region can serve as a source of radiation, facilitating industrial co-construction with other regions to stimulate economic growth. Furthermore, priority should be given to economically underdeveloped regions in terms of funding support for the compulsory education stage and the deployment of talent. Additionally, economic support and talent deployment will be provided to less developed regions.

KEYWORDS

Investment in education, Compulsory education, Economic development

1. INTRODUCTION

1.1. Research Background

Since the reform and opening-up of China, compulsory education in China has developed rapidly, achieving basic universalization in 2000 and full universalization in 2011. Since the 18th CPC National Congress, China has continued to promote the balanced development of compulsory education, and by the end of 2021, all counties and districts across the country will have passed the national supervisory assessment of the basic balanced development of compulsory education, and compulsory education in China will have achieved basic balance. To achieve the goal of strengthening education by 2035, the major practical challenge is the large resource allocation gap. Some studies have found that education funding has a significant pulling effect on economic growth, and the overall unbalanced nature of China's economic development and education funding is consistent, and it is the total amount of education funding that contributes the most to changes in GDP. [1] Under the new situation, exploring the coupled and coordinated relationship between economic development and compulsory education funding will help to build a good ecology of high-quality and coordinated development of compulsory education funding and the economy.

Therefore, this study will try to analyze and research the impact of compulsory education funding on economic development in Guangdong Province. This study will enrich the empirical research related to the funding of compulsory education resources to a certain extent, and at the same time, it can

provide several theoretical basis and empirical evidence for government departments and social and cultural organizations.

1.2. Research Relevance

This study aims to explore in depth the relationship between compulsory education funding and economic development in Guangdong Province, to make up for the shortcomings of the research in this field and other aspects, and to make a breakthrough relative to the previous ones, which can validate and enrich the existing theories on the relationship between education funding and economic development, and to provide new perspectives and data support for the subsequent academic researches. Studying the relationship between economic development and education funding, can reveal the differences in education investment between different regions and provide a basis for promoting education equity. At the same time, it provides a reference for long-term education and economic development planning in Guangdong Province and other regions, especially in terms of the potential role of education investment in promoting economic growth.

2. LITERATURE REVIEW

2.1. A Review of Economic Development and Education Funding

The existence of a close link between economic development and education funding input has been widely recognized in numerous studies. In particular, in Guangdong Province, one of China's fastest-growing economic provinces, the relationship between education funding inputs and economic development at the compulsory education level is of particular interest.

A review of established research findings reveals that research on education funding has focused on the following three areas.

First, the policy of education financing. Education funding is an important policy tool for promoting education development and improving the quality and equity of education. Research by Xiaoxia Wang et al. shows that education funding inputs are effective in improving education outcomes, which include promotion rates and student performance. [2] In Guangdong Province, the coordinated deployment of the financial sector for compulsory education has begun to show results, but it has yet to fully fulfill its responsibility of spinning off education expenditure. [3] Kaijun Wu et al. further explored the specific implementation effects of the provincial coordination reform and found that the provincial coordination reform not only enhanced the education spending of county governments but also significantly narrowed the inter-county funding gap. [4] The results of this study provide strong empirical support for the provincial coordination reform and suggest that the provincial coordination reform should be further improved to better play the role of regulating and guiding the provincial governments in education funding.

The second is the studies on the factors influencing the investment in education. The impact of education investment on economic development is also reflected in its role in economic resilience. Yinduo Wang's research shows that education investment can enhance the level of economic resilience through scientific and technological innovation and talent mobility effects, especially in the eastern region, the effect is significant. [5] This shows that education investment not only directly affects the quality of education, but also indirectly promotes the stability and sustainable development of the economy. Yuxiang Yang and Chaomei Tan's study points out that the contribution rate of education investment to Hunan's economic development is 20.08%, which is lower than that of capital and scientific and technological progress factors. [6] This finding suggests that despite the important contribution of educational inputs to economic development, there may be greater potential for improvement. Xinyue Zhang found that the relationship between education investment and economic [7] development is not a single linear relationship. At the same time, the crowding-in/crowding-out

effect of education investment on household education investment varies by education stage, suggesting that education funding policies need to take into account the characteristics and needs of different education stages. [8] The study of Fengliang Li, Manqing Liu, and Weifang Min found that there is a significant positive correlation between the scale of higher education Sino-foreign cooperative education, and the level of inter-provincial economic development. [9] This suggests that regions with higher levels of economic development are more capable of increasing investment in education, including compulsory education.

Third, there are studies on the impact of structure and region on it. The structure of educational funding inputs also has an impact on educational outcomes. Shanhuai Liu and Shuang Wang point out that the study on the optimization of the spatial layout of compulsory education resources in China shows that there is an imbalance in the allocation of education resources between regions.[10] In terms of regional differences, Wenyan Peng mentioned in her study that there are regional differences in the impact of education funding inputs on economic development, which may be related to the level of regional economic development, industrial structure, and education policies.[11] Ling Xu et al.'s study found that the internal regional disparities in secondary vocational education funding in Guangdong Province tended to widen and that the provincial regional disparities in Guangdong Province were more pronounced when compared with those in Jiangsu and Fujian Provinces. [12] This suggests that policymakers need to pay attention to the distribution of education funding between different regions within the province to promote balanced education development between regions.

To summarize, although the existing literature has been relatively rich in research on the factors affecting education funding inputs, few articles have explored empirical research on education funding inputs on economic development. The relationship between education funding inputs for compulsory education and economic development in Guangdong Province is multidimensional and complex. The increase and structural optimization of education funding plays an important role in enhancing education outcomes, promoting education equity, enhancing economic resilience, and promoting balanced regional economic development. Therefore, this study aims to explore the relationship between compulsory education funding and economic development in Guangdong Province.

2.2. Research Hypothesis

In today's era of the knowledge-based economy and continuous technological innovation, it is especially important to promote education solidly.[13] Since the beginning of the 21st century, the government has been committed to adjusting and restructuring the system of guaranteeing compulsory education funding, constantly seeking scientific and reasonable directions of governance, and formulating effective education financial policies to achieve stable and sufficient funding for compulsory education. In 2021, the total investment in education will be 5787.367 billion yuan, an increase of 9.13% over the previous year, and there will be growth in funding for different levels of education. [14] China's investment in education has been growing steadily during the 13th Five-Year Plan period at no less than 4% of GDP since it achieved the 4% fiscal target in 2012. The issue of China's economic development model and its transformation and upgrading has been a common concern in various fields, including academia, government agencies, and the public community. And there is a close relationship between compulsory education funding and economic development. By increasing the investment in education, not only the quality of education can be improved, but also economic development can be promoted. Based on the above analysis, this study proposes hypothesis H1:

H1: Controlling for other factors, there is a significant effect of education spending on economic development in Guangdong municipalities.

3. RESEARCH METHODOLOGY AND DATA

3.1. Model Analysis

In this paper, taking into account the collectability of data and the actual situation of education investment in Guangdong Province, we choose the per capita GDP of each city and the average per capita investment in compulsory education (yuan) as the main variables, and the level of urbanization, the level of industrial agglomeration, the level of employment, and the level of consumption as the control variables.

3.1.1. Explained Variables

GDP is the core indicator of national economic accounting and an important indicator of the financial situation and development level of a country or region. Therefore, in measuring the economic development level of Guangdong Province, this paper selects the per capita GDP of the cities in Guangdong Province as the explanatory variable, which is denoted by y .

3.1.2. Explanatory Variables

Educational expenditure includes educational utility expenses (i.e., personnel and public funds of schools at all levels and in all categories) and educational capital investment (the cost of building school buildings and purchasing large-scale teaching equipment), etc. In general, educational expenditure is positively correlated with GDP. Normally, education expenditure is positively correlated with GDP, so in this paper, the average per capita expenditure on compulsory education in Guangdong Province (yuan) is chosen as the explanatory variable, denoted by x .

3.1.3. Control variables

Urbanization level. As the level and quality of urbanization increases, the total economic volume also increases rapidly, in this paper, the urbanization level is measured by the proportion (%) of the urban population in each city to the resident population, which is denoted by k_1 .

The level of industrial agglomeration. The higher its level, the more it will promote the interdependence and cooperation of industries in the region and thus promote economic development. In this paper, the level of industrial agglomeration is measured by the number of employed persons/area of administrative area, which is expressed by k_2 .

Employment level. The employment situation depends largely on the quality and speed of economic growth, so in this paper, the employment level is measured by the number of employed persons at the end of the year (10,000 people)/the number of resident population at the end of the year (10,000 people) in each city, which is denoted by k_3 .

Consumption level. Consumption level is closely related to economic development, and in macroeconomics, consumption plays a very obvious role in promoting economic development. In this paper, it is measured by the per capita consumption expenditure (yuan) of all residents in each city, which is expressed by k_4 .

3.2. Model Setting

A two-way fixed effects model was set up for the analysis:

$$y_{it} = \alpha + \beta_1 x_{it} + \beta_2 k_{1it} + \beta_3 k_{2it} + \beta_4 k_{3it} + \beta_5 k_{4it} + \mu_i + \nu_t + \varepsilon_{it} \quad (1)$$

Where i stands for city and t stands for year; α is a constant term; ε_{it} is an error term; y_{it} stands for GDP per capita of city i in year t (logarithmic); x_{it} stands for per capita per pupil investment in

compulsory education of city i in year t (logarithmic); k_1 - k_4 are the control variables; μ_i and ν_t are the city fixed effects and the year fixed effects, respectively.

3.3. Data Collection

In this paper, we use the panel data of 21 cities in Guangdong Province from 2017-2022, which are obtained from the Guangdong Statistical Yearbook (2018-2023), the implementation of education expenditure in Guangdong Province (2017-2022), and the relevant statistics on the official website of the Guangdong Provincial Department of Education. From the descriptive statistics analysis, it can be seen that this is a short panel data ($n=21$, $T=6$). Among them, the price-related data have been transformed from nominal to real prices (with 2017 as the base period), and GDP per capita, per capita expenditure on compulsory education, and consumption level have been logarithmically processed.

The descriptive statistical analysis of each variable not taking logarithmic yes is shown in Table 1.

Table 1. Descriptive Statistical Analysis

Variable		Mean	Std. dev	Min	Max	Observations
y	overall	72249.79	41194.1	27037.02	194787.9	N = 126
	between		40847.28	32038.43	167761.7	n = 21
	within		9756.728	44192.51	103397.9	T = 6
x	overall	34161.62	18161.35	16940.47	93559.08	N = 126
	between		17636.37	20295.72	82920.86	n = 21
	within		5588.804	2486.54	46390.87	T = 6
k ₁	overall	64.90151	18.7779	37.99	99.82	N = 126
	between		19.07262	42.18667	99.71333	n = 21
	within		1.842688	60.32151	68.55484	T = 6
k ₂	overall	0.0458553	0.1516394	0.0013936	0.9928798	N = 126
	between		0.1129254	0.0017892	0.5073892	n = 21
	within		0.1036939	-0.0417255	0.5313458	T = 6
k ₃	overall	0.5184476	0.0948918	0.3314282	0.7750422	N = 126
	between		0.0915394	0.3806219	0.7253012	n = 21
	within		0.0309866	0.4264843	0.626189	T = 6
k ₄	overall	10.0498	0.3728614	9.501769	10.82451	N = 126
	between		0.36004	9.686362	10.69584	n = 21
	within		0.1207557	9.829789	10.24889	T = 6

4. EMPIRICAL FINDINGS

In this paper, the data were analyzed through Stata software, and before the subsequent analysis, to obtain more objective results, the explanatory variables and the explained variables were winsorized, so that their values were restricted to between 5% and 95% percentiles and between their 10% and 90% percentiles, respectively.

Table 2. Correlation test

	x	k ₁	k ₂	k ₃	k ₄
x	1.0000				
k ₁	0.8112	1.0000			
k ₂	0.4712	0.3583	1.0000		
k ₃	0.7633	0.7818	0.3542	1.0000	
k ₄	0.8897	0.9252	0.4437	0.7631	1.0000

The data were first tested for correlation and the results of the correlation test for each variable are given in Table 2.

From the Pearson correlation coefficients in Table 2, it can be seen that there is a relatively high correlation between individual independent variables, for example, the correlation between per capita expenditure on compulsory education and the level of consumption, and between the level of consumption and the level of urbanization is relatively high, which may indicate that these variables interact with each other in terms of economic development and investment in education.

Next, the Hausmann test is used to test whether the data analysis is using a fixed effects model, and the results are shown in Table 3.

Table 3. Hausmann test results

Variable	(1) FE	(2) RE
	y	
x	0.1005* (0.0522)	0.0978* (0.0511)
k ₁	0.0068* (0.0038)	0.0044** (0.0021)
k ₂	0.0534 (0.0365)	0.0537 (0.0367)
k ₃	0.1430 (0.1371)	0.1627 (0.1221)
k ₄	0.8281*** (0.0672)	0.8641*** (0.0585)
_cons	1.1775*** (0.4352)	0.9906** (0.4284)
N	126	126
adj. R2	0.8860	
Hausman tests	chi2(5) =24.66	
	Prob > chi2 = 0.0002	
Standard errors in parentheses		
* p < 0.1, ** p < 0.05, *** p < 0.01		

From the results it can be seen that the statistic of the Hausman test is $\chi^2(5) = 24.66$ with a p-value of 0.0002. as the original hypothesis of the Hausman test is that the more appropriate data model is the Random Effect Model (RE) and when the p-value is less than 0.05 it means the rejection of the original hypothesis, which means that Fixed Effect Model (FE) is more appropriate. The p-value in Table 3 is 0.0002, which is less than 0.05, and therefore the original hypothesis is rejected, implying that the Fixed Effect Model is more suitable for data analysis than the Random Effect Model in this paper.

Therefore, this paper will empirically analyze the relationship between education spending and economic development through the two-way fixed effect model, thus using the method of control variables for stepwise regression analysis, as shown in Table 4.

As can be seen from Table 4, with the introduction of control variables, the per capita expenditure on compulsory education has a positive effect on the real per capita GDP, and is significant in all models. After introducing all control variables into the model, the regression coefficient of per capita expenditure on compulsory education is 0.1883 which is still significant and has the highest degree of fit, indicating that the model constructed is overall better for the sample size and fit. From this conclusion, it can be seen that the per capita expenditure on compulsory education has a significant

positive effect on the real per capita GDP, when the per capita expenditure on compulsory education in each city increases by 1%, the real per capita GDP will increase by 0.1883%.

Table 4. Stepwise regression results

	(1)	(2)	(3)	(4)	(5)
	y	y	y	y	y
x	0.2139** (0.0823)	0.2657*** (0.0733)	0.2553*** (0.0709)	0.2511*** (0.0740)	0.1883*** (0.0599)
k ₁		0.0188*** (0.0050)	0.0187*** (0.0047)	0.0199*** (0.0055)	0.0096* (0.0054)
k ₂			0.1127*** (0.0314)	0.1064*** (0.0312)	0.0660* (0.0343)
k ₃				0.1618 (0.2230)	0.0567 (0.1987)
k ₄					1.0115*** (0.1852)
_cons	9.3634*** (0.8952)	7.2381*** (0.8950)	7.2997*** (0.8544)	7.1507*** (0.8719)	-1.8752 (1.9766)
N	126	126	126	126	126
adj. R2	0.9884	0.9901	0.9907	0.9907	0.9930
Standard errors in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01					

To further verify whether the conclusion is robust, after the regression analysis, there are further robustness tests, and the results are shown in Table 5.

Table 5. Robustness test results

	(1)	(2)
	Lag	Exclude two cities
L. x	0.1814*** (0.0482)	
x		0.1858*** (0.0639)
k ₁	0.0116* (0.0065)	0.0086 (0.0061)
k ₂	0.0611 (0.0464)	-0.0291 (0.2781)
k ₃	0.1363 (0.2247)	0.0195 (0.2184)
k ₄	1.0286*** (0.2350)	1.0508*** (0.1965)
_cons	-2.2074 (2.2586)	-1.9709 (2.1328)
N	105	114
adj. R2	0.9941	0.9907
Standard errors in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01		

First of all, considering that the impact of compulsory education per capita expenditure may have the effect of time lag, so the use of compulsory education per capita expenditure lagged one period for the robustness test, we can see that the corresponding regression coefficients in the results of (1) are still significant, and secondly, considering the higher level of economic development of the two cities of Guangzhou and Shenzhen in Guangdong Province, there are certain special characteristics, so we choose to exclude the two cities to carry out the regression analysis. It can be seen that the regression coefficient corresponding to the per capita expenditure on compulsory education is still significant.

Overall, after the robustness test of the two methods, the per capita expenditure on compulsory education always has a significant effect on per capita GDP, so the conclusion of this study is robust.

After verifying that the per capita expenditure on compulsory education has a positive promotion effect on per capita GDP, the 21 prefecture-level cities in Guangdong Province are considered to have different results due to the differences in regions, and thus are divided according to administrative regions: the Pearl River Delta (PRD) region, the eastern part of Guangdong Province, the northern part of Guangdong Province and the western part of Guangdong Province, as shown in Fig. 1. The regional heterogeneity analysis was conducted through the part-sample regression, and the results are shown in Table 6.

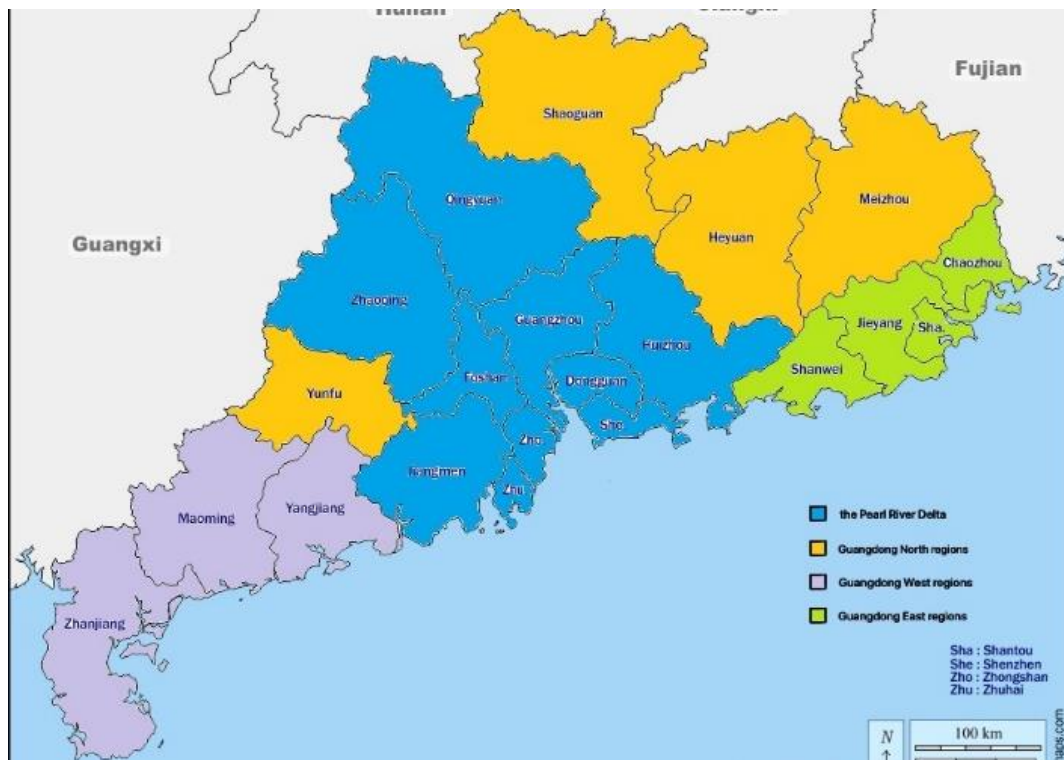


Figure 1. Administrative division of Guangdong Province

Table 6 shows that there are differences in the impact of per capita expenditure on compulsory education on GDP in different regions, with regression coefficients of 0.1514, 0.4760, 0.3935, and significant positive impacts in the Pearl River Delta, Guangdong East and Guangdong West regions, indicating that the increase in per capita expenditure on compulsory education in these three regions can effectively improve regional per capita GDP, while the regression coefficient of 0.1248 in Guangdong North region does not pass the test. The regression coefficient is 0.1248. It does not pass the test, so there is no significant effect of per capita expenditure on compulsory education in northern Guangdong on regional GDP per capita.

Table 6. Heterogeneity test results

	(1)	(2)	(3)	(4)
	the Pearl River Delta	Guangdong East regions	Guangdong North regions	Guangdong West regions
x	0.1514** (0.0737)	0.4760** (0.1586)	0.1248 (0.2218)	0.3935*** (0.1000)
k ₁	0.0228*** (0.0068)	-0.0454 (0.0274)	0.0117 (0.0133)	-0.0226** (0.0089)
k ₂	0.1076*** (0.0380)	-1.5555 (1.8740)	-2.7754 (9.3651)	-21.2095 (22.0893)
k ₃	0.4627** (0.1939)	0.9993 (0.6598)	-1.3965** (0.5190)	0.2900 (0.2203)
k ₄	0.2811 (0.4160)	0.2757 (0.3501)	2.6596*** (0.2861)	1.1968*** (0.2319)
_cons	4.8247 (4.1348)	5.5126*** (1.7169)	-16.6757*** (4.8188)	-3.8725* (1.7883)
N	54	24	24	24
adj. R2	0.9899	0.9741	0.9852	0.9930
Standard errors in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01				

5. CONCLUSION

The development of education is closely related to China's economic development, but also the basic requirements of the modernization of education, education, and the economy to promote each other, the relationship between coordination, and common development, stepped on a "new stage", to achieve a "double transcendence". [15] This paper focuses on the relationship between compulsory education investment and economic development in Guangdong Province and takes the per capita GDP and compulsory education per capita investment as the main objects of analysis adopts the panel data of 21 cities in Guangdong Province from 2017 to 2022, and draws the following conclusions through the descriptive statistics, Hausmann test, regression analysis, correlation, robustness, and heterogeneity analysis.

First, overall, there is a significant positive correlation between the investment in compulsory education and the level of economic development. This suggests that increased investment in compulsory education can promote local economic development.

Secondly, taking into account the situation of economic development with a certain lag and the case of individual special cities, there is still a significant positive correlation between the investment in compulsory education and the level of economic development, so the result is robust.

Third, there are obvious regional imbalances in the investment in education in Guangdong Province, and there are obvious regional differences in its contribution to economic growth. Specifically, there is a significant positive correlation between the investment in compulsory education and the economic development of the Pearl River Delta (PRD) region, the eastern part of Guangdong Province and the western part of Guangdong Province, while there is no significant impact on the economic growth of the northern part of Guangdong Province, which is due to several reasons. First of all, the current source of education funding still mainly relies on financial allocations from the national and regional governments, while the northern part of Guangdong Province, as a relatively economically backward region among the four regions in Guangdong Province, accounts for a lower proportion of the government's investment in education funding, and therefore has a smaller impact on economic development. Secondly, the industrial structure of northern Guangdong is relatively backward and

unbalanced, which creates a limited number of jobs and requires a lower quality of labor, thus making it difficult to attract talented people and making it difficult for investment in education to play a role. In terms of the degree of urban agglomeration, the northern part of Guangdong is more unbalanced than other regions, so the excellent educational resources tend to flow to more developed regions, thus weakening the impact on economic development. Therefore, the per capita expenditure on compulsory education has no obvious impact on the economic development of northern Guangdong.

Based on the above conclusions, this paper puts forward the following suggestions.

First, in order to better promote the coordinated development of the regional economy and society, the radiation-driven role of the PRD region can be brought into full play, and industrial co-construction with other regions can be carried out to stimulate economic development. In future policy formulation, regional differences should be taken into account. The economic structure and development stages of different regions may affect the relationship between education investment and economic growth, to target increased education investment to promote economic growth.

Secondly, in terms of funding for compulsory education, the Government can take into account the number of compulsory education schools, the number of teaching staff, and the corresponding infrastructure construction in each municipality, and thus give appropriate policy and funding support according to its actual situation, and give priority to economically less developed regions in terms of funding support for compulsory education and the deployment of human resources.

REFERENCES

- [1] Zhang X.Y (2023). Research on the Role of Education Investment in High Quality Economic Development-Based on Linear and Nonlinear Perspectives. *Journal of Tianjin Academy of Education* (05), 36-49.
- [2] Wang X.X & Wu B.Z (2022). The impact of total and structural investment in education on educational outcomes. *Economic Science* (04), 154-168.
- [3] Hu Y.G & Wu K.J (2023). Analysis of the Effectiveness of Provincial Coordination of Compulsory Education Funding: Based on Empirical Evidence from Guangdong Province. *Modern Education Series* (06), 24-39.
- [4] Wu K.J, Hu K.J & Zhou L.P et al. (2023) Analysis of the Implementation Effect of Provincial Coordination Reform on Compulsory Education Funding--An Empirical Study Based on County-Level Panel Data in Guangdong Province. *Education Development Research* (04), 1-8. doi:10.14121/j.cnki.1008-3855.2023.04.008.
- [5] Wang Y.D (2023). Research on the impact of education spending on economic resilience. *Science Decision Making* (10), 145-160.
- [6] Yang YX & Tan C.M (2012). Empirical analysis of the contribution rate of education investment to regional economic development. *Seeking* (07), 254-255+144. doi:10.16059/j.cnki.cn43-1008/c.2012.07.083.
- [7] Zhang X.Y (2023). Research on the Role of Education Investment in High Quality Economic Development-Based on Linear and Nonlinear Perspectives. *Journal of Tianjin Academy of Education* (05), 36-49.
- [8] Wang X.X & Wu B.Z (2022). The impact of total and structural investment in education on educational outcomes. *Economic Science* (04), 154-168.
- [9] Li F.L, Liu M.Q & Min W.F et al. (2023). An empirical study on the impact of Chinese-foreign cooperative education in higher education on China's economic growth. *Peking University Education Review* (02), 101-119+191.
- [10] Liu S.K & Wang S (2019). Research on the optimization of spatial distribution of compulsory education resources in China. *Educational Research* (12), 79-87.
- [11] Peng W.Y (2022). A study of regional differences in the impact of education investment on economic development. *China Collective Economy* (08), 19-20.
- [12] Xu L & Wu X.F (2021). Empirical analysis of secondary vocational education funding and its regional disparities in Guangdong Province. *Vocational and Technical Education* (09), 67-73.
- [13] Zhao Z.Q & Yu X. (2023). The impact of economic development level and population growth on the allocation of educational resources--an empirical study based on the western region. *Exploration of Education Science* (04), 65-73.
- [14] Ministry of Education, National Bureau of Statistics, Ministry of Finance (2022) Ministry of Education, National Bureau of Statistics, Ministry of Finance Statistical Bulletin on the Implementation of National Education Expenditure in 2021, https://www.gov.cn/zhengce/zhengceku/2022-12/31/content_5734387.htm

- [15] Yue C.J (2022) [New Theory of Practice-Extraordinary Decade] Education and Economy Promote Each Other and Develop Together https://theory.gmw.cn/2022-07/15/content_35885250.htm