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The analysis of influencing factors on ordinary primary education's funding shortage-An empirical research on hunan province

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ABSTRACT

Education expenditure is the material basis and prerequisite for education activities's survival and development. It's investment size affects the development level of education directly. But hunan's ordinary primary school funding in per student is below the national average from 2001 to 2010 by contrast. The empirical results founded that the unbalanced distribution of educational resources; the discount of ordinary primary school by government; the "size effect" of population which not full played and the unreasonable economic structure caused this problem. So implement a pertinent reform to improve the investment scale of hunan's ordinary primary education is wise and urgent.

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KEYWORDS

INTRODUCTION

Education is the foundation of country,and the cornerstone to national rejuvenation and social progress. With the eighteen national congress of the CPC convoked in November 8, 2012, "Education" became the focus of attention once again. The report pointed out clearly that make great efforts in education which people satisfied. And take education in the first place of the six task that improve the livelihood of the people and strength social's construction.

For the statistical data of hunan province,the ordinary primary school's educational funding in per student is lower than the national average over the years,and the gap has a continued expansion trend. What complexed influence factor implicated in this simple phenomenon?This paper treat it as the breakthrough point,and implement an empirical study by compared hunan province with the whole country. Then put forward some policy suggestions to optimize the investment scale to provide a useful reference for funding reform in future.

COMMENT THE LITERATURE

As the lifeblood of education's rise and fall,once "Education funds" put forward, it attracts researcher's eyes. For it's investment,the recent domestic research can be divided into two categories— standard research and empirical research which based on methods.

(1) Standard research

Yuan Liansheng analyzed our country's government education funding, and put forward some suggestion

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such as standard of financial revenue and expenditure, improve governance structure, and innovate government's education funding burden system[1]. Sun Zhijun, Du Yuhong analyzed China's compulsory education problem from the perspective of financial system reform,advanced a basis conclusion to determine the basic funds safeguard level of compulsory education and realize the equalization to improve the compulsory education finance system[2]. Lai Juan, Xie Yingliang use education fair as a starting point,summarized the historical evolution and present situation of education funds investment mechanism for compulsory education in China. Pointed out the existing problems,and make suggestions to improvement it[3].Wang Shanmai expounded the basic idea and countermeasure of China's fiscal investment in education which continuous protected from public finance, budget management system and educational finance system specification. Uwin Tena[4] studied the existence problems and solutions of education development in Poland's rural area,and provides the reference of the rural areas of China's education input[5].

(2)Empirical research

Li Yong Zhang Dan made a conclusion that the determinants of investment to the national finance earmarks based on the analysis of the universities which directly under the ministry from 2003 to 2007 financial data.Ji Junjie[6], Zhou Xiuyang's empirical study on the relationship between economic growth and education investment component from1992-2008,indicated that the different sources of education funds marginal contribution to economic growth rate are not the same. The recommendations is increase investment of financial education funds in the future,and reduce the proportion of personal education investment funds gradually[7]. Xie Siquan, Li Bo inspected the correlation between the ability of area innovation and basic education funding in secondary education. Concluded that the regional innovation ability played a significant role in promoting the investment in basic education,and expenditure structure of funding for basic education also has a significant impact on the regional innovation capability[8]. Feng Ying,Zhang Lujie described the regional distribution of 2001-2010 years on basic research funding for ten years on the total investment, investment growth rate, invest-

ment intensity and input which based on the latest data provided by "the China Statistical Yearbook on Science and Technology",then analysis on the level of economic development and public policy which impact investment in basic research funding in colleges and universities[9].

From the above research literature, we founded that the domestic study on educational investment has been very rich. But these studies are mostly theoretical analysis from the macroscopic angle. In addition, most research are concentrated in the higher education stage. The study in ordinary primary school are not common. So we taking it as the breakthrough point,and combined with the actual situation of hunan province to offer reference.

THE PRESENT SITUATION OF HUNAN'S ORDINARY PRIMARY EDUCATION FUNDING

Hunan has pay great attention to the cultivate of talents since ancient times. It has setted a goal to shift from a large education province to a strong one,and transform the big province in population into the one which possess powerful human resources since 2007. The World Bank's senior economist Psacharopoulos pointed in his research clearly that the investment yield in education declined with the improvement of education level,and elementary education has the largest contribution to the social and private. However hunan's elementary education funding is below the average level of the whole country,especially in ordinary primary school.

According to relevant statistics,hunan's ordinary primary school funding in per student growth 371.8%,increased from 816 yuan to 3850 yuan from 2001 to 2010 in ten years. But the gap shot up at the same time,surged to 1067 yuan by 200 yuan in the same time. And grown 433.5% which1.2 times of the increase rate. So even the ordinary primary school's gross funding in hunan province increased year by year, their growth speed was significantly slower than the national level, thus the gap continues unabated. In addition,the proportion was decreased since 2007, and the average value of year-on-year growth is slightly lower than the national level too.

Inadequate investment in education will greatly re-

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strict the education progress,so it can't be ignored. TABLE 1 assumed that the national education funding in per student is hunan's desired goal. Compared it with the actual investment in hunan province can reflect the situation that hunan's ordinary primary school has funding shortage clearly and directly. We can found from TABLE 1,the gap between the actual total investment and the ideal total investment accounted for the actual is about 20% in average,and the difference is higher than 510million yuan in2010. The gap is thought-provoking.

TABLE 1 : Hunan's ideal investment measuring table on primary school funding

year	the number of students in ordinary primary school (person)	the actual standards in per student (yuan0	the ideal standards in per student (yuan)	gap (yuan)	the actual total education funds (ten thousand yuan)	the ideal total education funds (ten thousand yuan)	gaps (ten thousand yuan)	the proportion of gaps and actual education funds (%)
2001	6012579	816	1016	200	490590	610878	120288	24.5
2004	4325557	1374	1605	230	594487	694252	99765	16.8
2007	4448430	2471	2791	320	1099327	1241557	142230	12.9
2010	4791601	3850	4916	1067	1844605	2355551	510946	27.7

THE RESEARCH HYPOTHESIS AND RESEARCH DESIGN

Draw on the experience of the research results of the factors on the education funds from domestic and foreign scholars,and combined with the actual situation in ordinary primary school's education funding in hunan province. This paper supposed following research hypothesis:1. The difference of rural education funding in

TABLE 2 : Selected indicator variables to the original data

the variable name	the difference Of educational fund in per student (yuan)	the difference Of GDP In per (yuan)	the difference Of education budget in per student (yuan)	the non - financial education funding gap (yuan)	the difference Of rural education Funding in per student (yuan)	the difference Of urban and rural education funding ratio's (%)	the gap of population on one billion in the number of students (person)	the Engel coefficient's difference (%)	the difference Of second industry's contribution rate in GDP (%)
Year	Y	X1	X2	X3	X4	X5	X6	X7	X8
2001	200.00	2782.29	177.00	-345.04	54.00	-13.19	716.46	-1.03	5.28
2002	188.00	3104.67	111.00	-293.45	-32.00	-13.09	1483.84	-2.11	4.92
2003	212.00	3516.36	100.00	-179.38	-49.00	-15.39	2006.99	-2.50	6.38
2004	230.00	3875.77	71.00	94.08	-30.00	-10.96	2187.11	-2.60	0.59
2005	264.00	4471.62	69.00	155.60	-61.00	-13.31	1669.42	-2.82	9.29
2006	374.00	5096.11	180.00	-159.15	134.00	-10.63	1384.42	-2.35	-2.93
2007	320.00	6247.35	319.00	589.90	58.00	-6.52	992.86	-3.14	-0.09
2008	439.00	6767.20	448.00	747.63	115.00	-6.82	600.94	-4.75	2.99
2009	708.00	6618.82	604.00	763.90	451.00	-4.43	225.76	-5.00	-6.93
2010	1067.00	7321.27	1036.00	593.46	1009.00	-2.22	122.68	-4.05	-5.05

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per student has positive correlation significantly with the gap of educational funding.2. Education budget gap and the difference of educational funding in per student correlation positively.3. The gap of number in one billion population of students and the educational fund in per student gap has a negative correlation.4. The gap of second industry's contribution rate of GDP has a negative relationship with educational fund difference in per student.

Educational fund in per student is the basic index to evaluate the education funds,it can accurately reflect the degree of education funding.[10]So we choose the average value in per student of all kinds of education funds investment scale to measure it. The data in this paper are came from "the China Statistical Yearbook","the Statistical Yearbook of Hunan

province"and"China Statistical Yearbook of education funding". In addition,this empirical research based on the panel data from 2001 to 2010 in ten years which compared hunan province with the national average level in per student.110 cases sample incorporated into the software analysis eventually, with no missing values. The specific circumstances in TABLE 2.

This article using SPSS19.0 software to analysis,inspection of each variable effects on the dependent variables,and regression model finally. Firstly,test the correlation variable and dependent variable, the probability of P variables two-tailed test values were less than 0.05 significant level which we can see from TABLE 3. So the eight variables selected were correlated with the dependent variable linearly.

TABLE 3 : Correlations

Correlations

		Zscore(Y)	Zscore(X1)	Zscore(X2)	Zscore(X3)	Zscore(X4)	Zscore(X5)	Zscore(X6)	Zscore(X7)	Zscore(X8)
Zscore(Y)	Pearson Correlation	1	.805**	.971**	.665*	.979**	.869**	-.753*	-.689*	-.746*
	Sig. (2-tailed)		.005	.000	.036	.000	.001	.012	.027	.013
	N	10	10	10	10	10	10	10	10	10

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Secondly,enter eight variables on the dependent variable regression. Both R^2 and adjusted R^2 are 1,means that the fitting degree of the model is very ideal. Furthermore the F statistic is 2838152.947, the probability of P value (0) is lower than the significance level (0.05) by the analysis of variance of the results. So reject the null

hypothesis,we got a significant regression equation.

TABLE 4 shows, the variables which this paper selected are passed T test. In order to reflect the explanatory variables on the dependent variable affecting the size better,we used standardized regression coefficient equation.

TABLE 4 : Coefficients (1)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	4.080E-17	.000		.000	1.000		
	Zscore(X1)	.154	.001	.154	205.803	.003	.078	12.788
	Zscore(X2)	-.456	.002	-.456	-219.065	.003	.010	98.386
	Zscore(X3)	.038	.001	.038	28.985	.022	.026	38.186
	Zscore(X4)	1.219	.002	1.219	801.974	.001	.019	52.427
	Zscore(X5)	-.071	.002	-.071	-42.242	.015	.015	64.655
	Zscore(X6)	-.047	.000	-.047	-98.870	.006	.197	5.088
	Zscore(X7)	-.223	.001	-.223	-279.381	.002	.069	14.410
	Zscore(X8)	.036	.001	.036	52.404	.012	.095	10.509

a. Dependent Variable: Zscore(Y)

$Y=0.154X1-0.456X2+0.038X3+1.219X4-0.071X5-0.047X6-0.223X7+0.036X8$ (1)

However,the collinearity diagnosis founds that each interpretation variable's tolerance were less than 0.1, and VIF values were more than 10 except X6. It indicates that the model (1) exist linear seriously. The principal component analysis can reduce the number of variables in the premise which keeping most of the sample information on the model to elimination of linear.

The K-M-O value of this model's data which standardization is 0.737> 0.7,means the correlation is strong. And the significant probability Bartlett spherical testing is 0 < 0.05. So the sample data of this model is related to a higher degree, meet the prerequisite of principal component analysis, so it can be performed.

TABLE 5 : Total variance explained

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.226	77.822	77.822	6.226	77.822	77.822	3.811	47.635	47.635
2	.891	11.135	88.957	.891	11.135	88.957	3.306	41.321	88.957
3	.451	5.644	94.600						
4	.246	3.072	97.672						
5	.115	1.432	99.104						
6	.055	.685	99.789						
7	.011	.138	99.927						
8	.006	.073	100.000						

Extraction Method: Principal Component Analysis.

From the table we can found that the critical number of principal components accumulated variance contribution rate which more than 80% is 2,recorded as F1 and F2. The cumulative variance contribution rate is 88.957%. So the principal component F1, F2 could explain 88.957% of the information. Less information loss, extraction effect well. According to the construction of the following expression scores coefficient:

$F1=-0.075X1+0.306X2-0.248X3+0.434X4+0.118X5-0.301X6+0.255X7-0.278X8$ (2)

$F2=0.307X1-0.112X2+0.480X3-0.273X4+0.104X5+0.134X6-0.482X7+0.117X8$ (3)

Then see F1, F2 as a new explanatory variables on the dependent variable regression. In order to ensure the accuracy of empirical,the heteroscedasticity and autocorrelation test. Because the residual graph trumpet-shaped,so that this model may exist heteroscedasticity. This research uses WLS method to dispose it. The probability of P absolute value rank treated all variables and residual values are greater than 0.05,refused the heteroscedastic assumptions,namely has eliminated heteroscedasticity.

TABLE 6 : Coefficients (2)

Coefficients[a,b]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.045	.110		.407	.696		
	REGR factor score 1 for analysis 1	.930	.087	.953	10.657	.000	.998	1.002
	REGR factor score 2 for analysis 1	.312	.119	.234	2.619	.034	.998	1.002

a. Dependent Variable: Zscore(Y)

b. Weighted Least Squares Regression - Weighted by n

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The explanatory variables were checked by T model,F1 and F2's tolerance corresponding are higher than 0.1; VIF values were less than 10,so that the variables of linear get rid well. Equation's D-W value is 1.81, close to 2, it can be considered that the variable does not exist autocorrelation. At this point, according to the regression coefficients can be obtained with new equation:

$$Y=0.953F1+0.234F2 \qquad (4)$$

Finally,bring (2), (3) to (4), we got a equation which get rid of the regression equation is linear, the autocorrelation and the heteroscedasticity:

$$Y=0.001X1+0.265X2-0.124X3+0.350X4+0.137X5-0.255X6+0.130X7-0.238X8 \qquad (5)$$

In the regression results of this model,adjusted R^2 is 0.928 which lower than model (1),but variables and dependent variables are highly correlated, it can estimates of the overall situation well. In addition, F statistics are adjusted to 59.096, the probability of P value equal to 0, which shows that the model (5) fitting ideal of education funding of ordinary primary school in hunan province into the factors influencing of the scale has good effect.

THE CONCLUSIONS OF STUDY AND POLICY RECOMMENDATIONS

According to the final equation model (5) of the regression coefficient,can sort the influencing factors on the degree of importance in ordinary primary school of hunan's education funding. The results are as follows:X4>x2>X6>X8>X5>X7>X3>X1. Therefore,according to the empirical results,the main influence factors of hunan's ordinary primary school education funding investment's scale are X4, X2, X6 and X8 according to the content. So we can get the following conclusions:

(1) The equilibrium of education. X4 (funding for rural education in per student), this index can reflect the fairness in education funding equilibrium. The regression coefficient equation shows that when increase each unit, hunan province and the national average pupils's education funding differences will expand 35%. It indicate that there is a strong positive correlation between them, hypothesis 1 has been well validated.

(2) The attention of the government. Budgetary education expenditure can reflect the degree of the government's emphasis on education in a certain extent. From the data point view, the ordinary primary school of hunan province's education budget is lower than the national level, means the concern of common primary school's education needs should be improved. In addition, X2 (education budget difference) has positive relationship significantly with the dependent variable, so hypothesis 2 passed.

(3) The scale of population. This paper selects X6 (the number of the ordinary primary school population of one billion students) to reflect it's scale. By the sample data, the difference in hunan province and the national per one billion population in ordinary primary school students are shrinking, and the difference between average educational fund is increasing year by year. Therefore, the hypothesis3 was founded, there was a negative correlation between them.

(4) Economic structure index. By the regression coefficient can be seen X8 (difference between the rate of GDP contribution to the second industry) and interpreted that there were negative correlation between variables. When each unit increase in X8,the difference of average educational fund will narrow about 0.238 units. Thus, hypothesis 4 passed in this test.

According to the above analysis,the unbalanced distribution of educational resources; the discount of ordinary primary school by government; the "size effect" of population which not full played and the unreasonable economic structure caused this problem. Therefore, in order to improve the investment scale of hunan's ordinary primary school,we put forward the following suggestions:

1. Promote education fair, uniform standards of rural student funding. Because of the economic conditions,the poor and rural's education has the congenital deficiency, which restricts the equalization level. The regional funding differences are more serious. As hunan for example, the rural education's funding of ordinary primary school has lagged behind the national average level since 2006. And the gap is widening year by year,even reached 1009

yuan in 2010. This phenomenon is contrary to the goal—the balanced development of compulsory education which proposed in the eighteen conference. The reason is that our education funds lack of a reasonable standard all the year round. The existed double or multiple standards will add differences only,lead education more unfair. So with the reality of our country I think,we should develop a unified0 reasonable0dynamic average educational fund input standard brook as soon as possible. In addition, according to the principle of compensation, we should implement an appropriate policy to rural and backward education areas, and give necessary support and help, such as the establishment of a special fund, carry out love donations, to accelerate the pace of education in rural areas and narrow the urban-rural and regional inequality of education, then promote social harmony and stable.

2. Strengthen government's attention, and promote the healthy development of education. Compulsory education is shouldering an important mission of improving nation's quality, it has been the focus of attention of the society long long ago. However, as an important part of the compulsory education, the ordinary primary school has not been given due attention in hunan province, and this phenomenon is not rare in the national scope. The main reason is that the efficiency of education play lag seriously. As the stage of ordinary primary school for example, educated people need ten years at least to create material wealth for the society. Such a slow return to the government in the allocation of funding,so the achievement effect which more put in infrastructure entity business nature seems reasonable. However, from a long-term point of view, the ordinary primary education played an important role in indelible formation of adolescent's world outlook, values,and has a lifelong immeasurable impact on human capital formation and culture. Therefore, all the departments of the government should change the old concept—heavy industrial, light education. Measures that can be taken are as follows: (1)Strengthen legislation,regulate education funding system and standards fundamentally. (2)Innovation positively, make multiple financing channels to develop and improve the education funding.

(3)Deepening the budget, arrangements for each of the funds reasonable. (4)Strengthen the supervision, monitoring and evaluation of allocation of educational funds.

Develop the effect of scale, improve utilization efficiency of educational resources. On education funding,expansion is important. But Improve the utilization efficiency is more practical for our country which under the condition of limited resources. Has a low growth rate, the sharing of resources is not high, the layout of the school lacks integrity and unreasonable waste of personnel redundancy will greatly reduce the utilization efficiency of educational resources and effect of teaching equipment. So we should plan in advance,macroeconomic regulation in medium-term and optimization summary later to strengthen the education resources. First of all, the relevant departments should fully considering the site selection and students number to comprehensive layout combined with the actual size and growth rate with an overall vision. Secondly,we can carry out the share cooperation plan within the region, strengthen exchanges and cooperation in education resources between schools. Such as regional alliance among famous schools and ordinary schools,to promote the usage efficiency of the whole regional education resources. Furthermore the administrative and logistics management department should be streamlining and downsizing,to improve the efficiency of resource usage. Finally, we should establish a two-way feedback mechanism for the use of education funding by the public, and explore the work of education funds management with courage to make positive improvement.

4. Optimization the industrial structure, and change the mode of economic growth gradually. The 18th national congress of the Communist Party of China reaffirmed their commitment to promoting the strategic adjustment of economic structure, which actually reflects the essence of requirements in modern economic growth. The Chinese government has long been award that the traditional mode is consumption resources to exchange for GDP. However, from the relevant data of hunan province, the construction of industry production's value is higher

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than the whole country, and the effect of tertiary industry in economy is still not ideal. It reveals hunan's defects and shortcomings of the current industrial structure. The unreasonable industrial structure will restrict economic's development,and will bring negative effects to the development of education too. The atrophy of education will hinder economic's development and industrial structure's adjustment in turn. They are closely related complementary. Therefore, in order to achieve a strong education goals and achieve a new leap in economic situation, hunan province should develop green economy relied on the power of science and technology and advantages of human resources. Creating brand effect, improve the service quality, and better the overall quality of the industry, can enhance their competitive strength ultimately.

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