

# ***Impact Factors for the Quality of Education***

## ***-Evidence from the Enrollment Ratio of First Tier Universities***

**Zhixin Fang<sup>1,a,†</sup>, and Siyi Wan<sup>2,b,\*,†</sup>**

<sup>1</sup>*School of Foreign Languages, Hunan Institute of Engineering, Xiangtan, Hunan, 411100, China*

<sup>2</sup>*School of Foreign Languages, North China Institute of Science and Technology, Langfang, Hebei, 065000, China*

*a. 2825048155@qq.com, b. xinyizhang6@ln.hk*

*\*corresponding author*

*†These authors contributed equally.*

**Abstract:** Huge differences in education levels can lead to a Matthew Effect on regional economic growth, so China has introduced many policies to promote the balanced development of education levels in various regions. A large number of researchers have investigated and researched the education level of each province from various aspects. However, there is still a research gap in the study of the enrollment ratio of first tier universities as an indicator of the education level. Therefore, this paper investigates the influencing factors on the rate of one college entrance examination in 2020 by collecting data on the enrollment ratio of first tier universities in each province, education expenditure, GDP per capital, disposable income per capital, public library collection per capital, student-teacher ratio of general high schools, and urban/rural population ratio, and carrying out correlation analyses on the data. It was found that all the research variables, except education expenditure, had a highly significant effect on the enrollment ratio of first tier universities when they were used as a single variable. And when multiple linear regressions were conducted, education expenditure had a significant negative effect on the enrollment ratio of first tier universities. It is recommended that while allocating regional education spending rationally, we should actively deploy economic and urban-rural development policies to boost people's disposable income, strengthen teachers in each region, and promote the balance of education resources in each region.

**Keywords:** education level, the enrollment ratio, college entrance exams, development of education, linear regression analysis

## **1. Introduction**

Education is the foundation of a century-long programme and an important component of society, and its development interacts and coordinates with that of society. The development of education is not only a guarantee of national quality, but also a matter of the country's future and destiny. China has achieved universal access to nine years of compulsory education, with almost all school-age children in the country receiving basic education, and the popularity of higher education is also increasing, with more and more students having access to university education. Although China has

made great progress in the popularization of education, there are still gaps in the quality of education and the level of education between regions.

The college entrance examination is a social phenomenon with a strong identity, and the enrollment ratio of first tier universities refers to the ratio of the number of college entrance examination candidates admitted to the undergraduate batch to the total number of college entrance examination candidates, and it is one of the most important indicators of the level of education in a province. It is also a kind of assessment of the quality of education, which can reflect to a certain extent the development level of higher education in a province.

This study will discuss how to improve the level of regional education in order to shorten the local education gap and promote the coordinated development of the region by analyzing the impact of various indicator factors on the enrollment ratio of first tier universities in each province.

## 2. Literature Review

Education is the core driver of a country's development and progress. In modern society, education determines to a large extent the future economic, social and cultural development of a country. In order to better meet the needs of the current society, the overall level of education must be raised so that the next generation can be well trained.

In the development of socialism, it is indispensable for education and economy to develop together, and education and economy promote each other but constrain each other in the process of joint development. The economy provides effective conditions and material supply for the development of education, and education cultivates high-quality talents for the development of the economy and improves the overall quality of the society, and transmits science and technology in the form of education and then gradually puts them into production. Therefore, in the construction of contemporary society, the economy and education are complementary to each other, and the two must be effectively coordinated in order for the economy and education to be effective. The combination can contribute to the overall development of society [1].

GDP per capital is a common indicator to measure the level of economic development of a country or region and the standard of living of its residents. Taking Henan Province as an example and comparing with the GDP per capital of four provinces, namely, Beijing, Shanghai, Jiangsu and Guangdong, the GDP per capital of Henan Province is the smallest, and the gap with the other four provinces is getting wider and wider. The study found that in recent years, these four provinces have attached great importance to talents, increased the introduction of a series of talents, to attract all kinds of talents to the region to cluster, thereby promoting economic development. Therefore, it is very important to actively attract overseas returnees and expatriates to teach and improve the internationalization of the teaching force [2].

Economic development and policy regulation all have an impact on the development of higher education, with GDP and per capital disposable income as indicators of economic development, local education expenditure as an indicator of investment in education, and student structure and faculty structure reflecting some of the scale of education. This study extends these effects to the level of regional education development, and continues to discuss in depth the influence of these indicators on the differences in local education levels [3].

The construction of public libraries is also closely related to the level of social education. The significance of its social education function is to enhance the cultural literacy of the general public, to complement social education and school education, and to create a favourable social and cultural atmosphere. It can not only make use of rich educational resources to meet the reading needs of young people, but also stimulate young people's interest in learning through vivid multimedia materials, thus expanding their knowledge and learning horizons [4].

According to the literature, investment in education for both urban and rural residents has steadily increased per capital income, and conversely, the more disposable income per capital is invested in education, the more it increases. And there are significant differences between urban and rural residents in the role of per capital investment in education on income growth, from the six central provinces as a whole, and the national level, urban residents per capital investment in education on income growth is significantly greater than the role of rural residents. Therefore, the study of the economic situation of urban and rural populations is also very important for social development and the development of education levels [5].

According to the literature, it was found that fiscal expenditure on education in Gansu Province has a negative impact on economic output, but this negative impact is gradually weakening. This is inconsistent with our common sense, so the present study chose the variable of education expenditure for the study [6].

As a result of the literature study, the slow economic growth and low level of urbanization in the central and western regions, coupled with the influence of multiple factors such as poor social and working environments, the problem of the outflow of professionals receiving higher education has been very prominent, with existing talents unable to stay and foreign talents unable to be attracted to the region, thus affecting the improvement of the quality of the population in the central and western regions, which indicates that the ratio of urban to rural populations is also an influential factor in the quality of education [7].

Shen Chen, Hu Binwu found that within a certain range to increase the number of enrollment in higher vocational colleges can have a highly significant impact on the downward adjustment of the graduate student-teacher ratio, which requires the education policy, vigorously guide the students to higher vocational colleges and universities diversion, in the higher vocational colleges and universities to inject a new vitality of the development of at the same time, but also let the graduate education institutions dependent on the graduate education in order to focus more on completing the elite education of postgraduate students. Therefore, it also shows that the student-teacher ratio has an impact on the development of the quality of education [8].

As a result of the literature study, it was found that equity in education can only be promoted by addressing the equity and efficiency of investment in education, otherwise those with lower economic levels will be at the bottom of the income distribution due to their lack of access to formal education. Therefore, the result suggest that investment in education has an impact on the quality of education [9]. Through the literature, it is found that with the increase of per capital GDP, education has become the focus of residents' consumption, and people's demand for high-quality and diversified education is increasing. Therefore, GDP per capital also has an impact on the quality of education [10].

Through reading the literature, this paper found that scholars lacked research on the rate of the first enrollment of the college entrance examination, and the present study hoped to use the rate as a kind of assessment of the level of quality of education, and to further analyse the influencing factors of the rate of the first enrollment of the provinces by studying the influencing factors of the quality of education, and to find ways to improve the level of education.

### 3. Research Hypothesis

Based on previous studies, the hypothesis of the present study is that:

1. There is a positive correlation between the enrollment ratio of first tier universities in the provincial college entrance examination and the expenditure on education, per capital GDP, per capital disposable income, per capital ownership of public library collections, and urban/rural population ratio.

2. There is a negative correlation between the rate of the first enrollment of the provincial college entrance examination and the student-teacher ratio of the general high school.

## 4. Method

### 4.1. Research Methodology

Linear regression was used throughout the data analysis process and this paper analyses and compares the data using one-way linear regression and multiple linear regression to observe the effects of correlation between groups of research subjects.

### 4.2. Research Target

The dependent variable in this study is the rate of the enrollment ratio of first tier universities ( $M=0.2010034$   $SD=0.0778103$ ) in each province and city (except Xinjiang and Tibet) in 2020, and the independent variables are the expenditure on education ( $M=162000000$   $SD=108000000$ ), per capital GDP ( $M=71879.97$   $SD=32068.38$ ), per capital disposable income ( $M=32727.17$   $SD=12848.34$ ), per capital ownership of the public library collection ( $M=0.899655$   $SD=0.5563111$ ), the student-teacher ratio of the general secondary school ( $M=12.62$   $SD=2.001583$ ), and the urban/rural population ratio ( $M=2.286281$   $SD=1.735585$ ) in each province and city in 2020, and urban-rural population ratio. The sample size for all variables in this study is 29.

The enrollment ratio of first tier universities of the college entrance examination in each province and city is the ratio of the number of first-enrollment on-line students to the total number of college entrance examiners, both of which are obtained from the education examination bureaus of each province and city; the expenditure on education is from the China Education Expenditure Statistical Yearbook 2021; the data on per capital GDP, per capital disposable income, per capital ownership of public library collections, and urban/rural population ratios are obtained from the National Bureau of Statistics (NBS); and the data on the student-teacher ratio of general senior high schools are obtained from the Ministry of Education of the People's Republic of China 2020 statistics.

## 5. Result

The result of linear regression was shown in table 1-2.

Table 1: Linear regression results (enrollment ratio of first tier universities - GDP per capital/disposable income per capital/number of public library collections per capital/the student-teacher ratio of the general secondary school/urban/rural population ratio).

	Enrollment ratio of first tier universities				
	Model 1	Model 2	Model 3	Model 4	Model 5
GDP per capital	0.00000164**				
	(0.000000343)				
Per capital disposable income		0.00000392**			
		(0.000000889)			
Public library holdings per capital			0.077536**		

Table 1: (continued).

	Enrollment ratio of first tier universities				
			(0.0224031)		
Student-teacher ratio in general secondary schools				- 0.0254213**	
				(0.0056601)	
Urban/rural population ratio					0.0318975**
					(0.0060629)
cons	0.0828433**	0.0728503*	0.1312478**	0.52182**	0.1280767**
	(0.0269561)	(0.0311869)	(0.0235839)	(0.0722921)	(0.017293)
Adjusted R2	0.4390	0.3965	0.2816	0.4064	0.4879

Table 2: Linear regression results.

	Enrollment ratio of first tier universities		
	Model 1	Model 2	Model 3
Expenditure on education	-0.000000000181	-0.000000000312**	-0.000000000271*
	(0.000000000134)	(0.0000000000877)	(0.000000000109)
GDP per capital		0.00000189**	0.00000157
		(0.000000295)	(0.000000961)
Per capital disposable income			-0.000000626
			(0.00000341)
Public library holdings per capital			-0.0453081
			(0.035434)
Student-teacher ratio in general secondary schools			-0.0103659
			(0.005812)
Urban/rural population ratio			0.0157711
			(0.0169617)
cons	0.2303291**	0.1157063**	0.2876146**
	(0.0259594)	(0.024337)	(0.0944463)
Adjusted R2	0.0286	0.6084	0.6336

Note: \*p<0.05; \*\*p<0.01.

## 6. Discussion

From the analysis of the data it is possible to draw conclusions:

When the expenditure on education in each province and city is a single variable, the expenditure on education does not have a relevant effect on the enrollment ratio of first tier universities of the college entrance examination. When the education expenditure and GDP per capital of each province and city constitute variables at the same time, both of them have a highly significant effect on the enrollment ratio of first tier universities, in which the education expenditure has a highly significant negative effect on the enrollment ratio of first tier universities, and the GDP per capital has a highly significant positive effect on the enrollment ratio of first tier universities. And when all other variables are considered in the multiple linear regression, the expenditure on education also has a significant negative effect on the enrollment rate. This is inconsistent with the research hypothesis. (See table 2)

When GDP per capital is a single variable in each province and city, GDP per capital has a highly significant positive effect on the enrollment ratio of first tier universities. It is consistent with the research hypothesis. (as shown in table 1)

When disposable income per capital in each province and city is a single variable, disposable income per capital has a highly significant positive effect on the enrollment ratio of first tier universities. It is consistent with the research hypothesis. (See table 1)

When the number of public library collections per capital in each province and city is a single variable, the number of public library collections per capital has a highly significant positive effect on the enrollment ratio of first tier universities. It is consistent with the research hypothesis. (See table 1)

When the GSS student-teacher ratio in each province and city is a single variable, the GSS student-teacher ratio has a highly significant negative effect on the enrollment ratio of first tier universities. It is consistent with the research hypothesis. (See table 1)

When the urban-rural population ratio of each province and city is a single variable, the urban-rural population ratio has a highly significant positive effect on the enrollment ratio of first tier universities. It is consistent with the research hypothesis. (See table 1)

## 7. Suggestions

Firstly, when GDP per capital and disposable income per capital in each province and city are the single variables, GDP per capital has a highly significant positive effect on the enrollment ratio of first tier universities. When GDP per capital is higher, families invest more in education, and children are more educated, so the rate of one school is higher. Therefore, the government should keep adjusting its policies, increase tax cuts and keep increasing people's disposable income to raise the per capital GDP of each province.

Secondly, when the number of public libraries per capital in each province and city is a single variable, the number of public libraries per capital has a highly significant positive effect on the enrollment ratio of first tier universities. Therefore, the government should encourage local communities to actively improve the construction of public libraries, expand book reading resources, and work together to create a learning society and do a good job of improving national education and national quality in the long term.

Thirdly, when the GSS student-teacher ratio in each province and city is a single variable, the GSS student-teacher ratio has a highly significant negative effect on the enrollment ratio of first tier universities. Obviously, through data analysis, it can be concluded that the teaching effect of small classroom is more significant than that of large classroom, and more effective in promoting the development of education quality. Therefore, there should be a flexible mix of modes of teaching,



with small classes being the mainstay and large classes being the mainstay, and the expansion of the number of teachers being encouraged.

Fourthly, when the urban/rural population ratio of each province or city is a single variable, it has a highly significant positive effect on the enrollment ratio of first tier universities. Therefore, on the one hand, people should continue to promote population mobility and increase the level of urbanization in each province, and on the other hand, related practitioners should improve the quality of rural teachers, fairly and reasonably distribute educational resources between urban and rural areas, strengthen the infrastructure of rural schools, and improve the conditions of rural schools.

Fifthly, expenditure on education itself does not correlate with the enrollment ratio of first tier universities; under the influence of other factors, there is a correlation between educational outcomes and economic development, but this does not mean that the higher the cost of education expenditure, the higher the enrollment ratio of first tier universities will be. Considering that a portion of education expenditure is used for education grants and scholarships, such education expenditure increases the regional educated population base, which increases the total number of people taking the college entrance examination, thus leading to greater competitiveness of the regional college entrance examination and a relatively lower the enrollment ratio of first tier universities. It is recommended that the number of enrolment plans for the first year of schooling be increased at the same time that education for the poor is expanded.

## 8. Conclusion

Except for the expenditure on education, each variable has a certain correlation with the school attendance rate when it is a single variable, which proves that all the factors considered in this study can influence and promote the school attendance rate at the theoretical level. However, when other factors are considered together, only the expenditure on education has a negative effect on the enrollment ratio of first tier universities, which means that under the condition of other factors, when the expenditure on education is less, the enrollment ratio of first tier universities is higher. When GDP per capital and expenditure on education are both factors, the higher the GDP per capital and the lower the expenditure on education, the higher the enrollment ratio of first tier universities. It can be seen that when researching and investigating a variety of factors, the factors and indicators will interact with each other and ultimately change the correlation of the dependent variable under study. Factors such as economic and political policies interact with each other and ultimately work together to affect the enrollment rate in the region. The issue of the enrollment ratio of first tier universities studied in this conclusion has been researched by very few scholars in the past, which makes up for the shortcomings of the previous studies and is conducive to providing some useful suggestions for the promotion of educational standards in the future. At the same time, the shortcoming of the current study is the realization that the enrollment ratio of first tier universities is also not the only accurate measure of the quality of education in the region, but rather a visual representation of the surface level of higher education outcomes. The related questions should be considered more comprehensively in future studies.

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