Research on the correlation between the level of education of the residents and the level of regional economic development

Huanyu Yang*

School of English, Sichuan International Studies University, Chongqing, China

*Corresponding author: 20202102020336@stu.sisu.edu.cn

Abstract. The continuous development of the economy requires the participation of highly qualified people, and the development of highly qualified people requires financial investment and support. To study the correlation between the educational attainment of the population and regional economic development, this study used the gross regional product of China, the number of postgraduate graduates by province, the number of specialist and undergraduate graduates by province, and the population by province from 2016 to 2020 as the data for the study. This study used StataSE software for regression analysis and passed the F-test and Hausman test to finally select the fixed effects model from the mixed OLS model, fixed effects model, and random effects model for data analysis. The results indicate that the educational attainment of the population has a significant impact on regional economic development. China's economy has been growing in recent years, and investment in education has been increasing. Support for education needs to continue to be strengthened to provide stronger and better intellectual support for economic development.

Keywords: Educational attainment level; Level of economic development; fixed effects model.

1. Introduction

Since 2012, the average annual growth rate of China's GDP is 6.5%, the economy has changed from high-speed growth to medium-speed growth, and the economy is thinking of high-quality development. Meanwhile, China's education level has been improving, with a net enrolment rate of 99.96% for primary school-age children, a gross enrolment rate of 102.5% at the junior high school level in 2020, a gross enrolment rate of 91.4% at senior high school level in 2021, and The gross enrolment rate for higher education will reach 57.8% [1]. However, the development of education is the key to promoting social development, and at the same time, economic development cannot be achieved without the promotion of education, which also requires economic investment. In this regard, Zhang Xi explores the relationship between higher education and economic growth in China, arguing that in the long run, the expansion of higher education in China and the continuous investment in funding have a catalytic effect on economic growth [2]. Xu Yini explores the relationship between the level of the economy and the level of education, arguing that there is a two-way interaction between the economy and education, with education contributing to social development and economic growth, while economic growth in turn, constrains education [3]. Cui Wenjuan explores the relationship between the regional economy and the educational attainment of regional residents. By constructing a vector autoregressive model for empirical analysis, she concludes that the educational attainment of residents is significantly related to economic development in the long run [4]. Zhu Xiaolong also explores the role of education on economic growth and conducts a study based on an EBA model of inter-provincial panel data in China, ultimately concluding that education expenditure, higher education development and vocational education development are robust factors against disturbances in China's economic growth [5]. The above studies illustrate the relationship between education and the economy in different ways, while the vast majority shows that the development of education has a significant impact on the development of the economy. The research hypothesis put forward by the above studies is almost always that the level of education and economic development are correlated, which has a great degree of similarity with the hypothesis of this study. Also, most of the findings of the above studies indicate that there is a correlation between the level of education and economic development, and that educational development is conducive to economic

growth, which is also consistent with the findings of this study. In today's world, knowledge has become a crucial factor in improving comprehensive national power and international competitiveness, and the revitalization of education is the key to national revitalization and the improvement of national quality [6]. Since the 18th National Congress of the Communist Party of China, education has become increasingly strategic, and increased investment in education has become the most important manifestation of China's policy to prioritize the development of education during this period [1]. Therefore, promoting the priority development of education should, on the one hand, promote steady economic growth and, on the other hand, increase investment in education. It creates material conditions for the training of high-quality human resources and, at the same time, provides intellectual support for economic and social development, as well as promoting scientific and technological progress and improving production efficiency. Based on this, this study conducts empirical research on the correlation between residents' educational attainment and regional economic development levels in China from 2016-2020. It provides a factual basis and participation in decision-making for China's continued adherence to the education priority strategy. At the same time, this study examines the impact of educational attainment on the level of economic development, and as such, it can illustrate the role of education on economic development and can provide a factual basis for continued investment in education and improved rational allocation of educational resources in China in the future.

StataSE software was used for data analysis in this study. This paper used the 2016 to 2020 China's gross regional product, the number of postgraduate graduates by province, the number of specialist and undergraduate graduates by province and the population of each province as the data for the study. A fixed-effects model was also selected for data analysis from a mixed OSL model, a random-effects model and a fixed-effects model by conducting an F-test and a Hausman test in StataSE. Finally, the fixed effects model code was applied in StataSE for data analysis.

2. Method

2.1. Data Source

This research utilized four data, all with the time dimension from 2016 to 2020. Furthermore, all data are selected from 31 provinces in China and the total sample size is 155.Data on the gross regional product were sourced from the China Statistical Yearbook; data on the number of postgraduate graduates and degrees conferred in each region of the country were sourced from the EPS database; data on the number of tertiary and undergraduate graduates and degrees conferred in each region of the country were sourced from the EFS database; and data on the number of populations in each province were sourced from the China Statistical Yearbook.

2.2. Variable Settings

The data on the gross regional product is in constant prices as inflation needs to be considered. Moreover, it is the dependent variable of this study and an indicator of the level of regional economic development. Data on the number of postgraduate graduates and degrees awarded in each region of the country and data on the number of tertiary and undergraduate graduates and degrees awarded in each region of the country are the independent variables and indicators of the educational level of the population for this study. Data on the number of people in each province are the control variables for this study. The number of people in each province is included as a control variable because there are other factors that affect the gross regional product than just the number of graduate students and the number of post-secondary and undergraduate students who graduate. The introduction of control variables reduces regression bias.

2.3. Research Method

This research has used a fixed effects model regression approach. The data analysis tool used in this research was StataSE. StataSE is a complete and integrated suite of statistical software that

provides its users with data analysis, data management, and professional charting. A mixed OLS model and a random effects model were also used in this research, but the fixed effects model was finally chosen. The F-test and Hausman test was carried out in this research. First off, the fixed-effects model was superior to the mixed OLS model, as shown by the P-value from the F-test, which was less than 0.05. The Hausman test's P-value was then less than 0.05, demonstrating that the fixed-effects model likewise performed better than the random-effects model. Therefore, the fixed-effects model was finally chosen for the regression analysis in this research. Once the data from this research were imported into StataSE, regression analysis was carried out using the relevant codes of the fixed effects model.

2.4. Research Hypothesis

The following hypotheses were made based on a regression analysis study that modelled fixed effects on the data:

H1: Residents' educational attainment has no effect on regional economic development.

H2: Residents' educational attainment influences regional economic development.

3. Results

From table 1, it can be concluded that the regression coefficient of the number of postgraduate graduates and degrees is greater than 0 (with p-value<0.01）, indicating that the number of postgraduate graduates has a highly significant positive impact on the gross regional product. The regression coefficient of the number of postgraduate and undergraduate graduates is greater than 0 (with p-value>0.05）, indicating that the number of postgraduate and undergraduate graduates has no significant effect on the gross regional product. The regression coefficient of 0.0027716 is greater than 0 and has a p-value less than 0.05, indicating that the number of populations has a significant positive effect on the gross regional product. Therefore, the population's level of education has a big impact on the growth of the local economy. Additionally, the influence on regional economic development increases with education level.

Table 1. Linear regression results

	gross regional product
	Model
The number of postgraduate graduates and degrees	4.528552**
	(0.8109075)
the number of tertiary and undergraduate graduates and degrees	0.363908
	(1.46194)
the number of populations in each province	0.0027716*
	(0.0013664)
cons	-50.36892**
	(16.29567)
Overall R2	0.4321
obs	155

Note：*p<0.05; **p<0.01.

4. Discussion

The result of this study is that the educational attainment of residents has a significant impact on regional economic development. And, to a certain extent, it can be shown that the higher the level of education has a more significant impact on the economic development of the region. This is consistent with the alternative hypothesis put forward in this study. It is thus clear that the strategy of giving priority to education must be adhered to.

The realisation of the Chinese dream and the great revitalization of the Chinese nation depend critically on education, which is a key means of enhancing people's overall quality and promoting all-around human development. Education is also a key pillar for social progress and national revitalization. Developing education is something that can directly or indirectly create new jobs. After graduating from university, some outstanding university students will choose to start their own businesses. At the same time, if funds continue to be invested in education and education continues to grow, schools will provide university students with more appropriate funding for entrepreneurship, which provides tremendous support for their start-ups. The priority given to education can be combined with the implementation of the strategy of developing the country through science and education to promote the innovative development of society through scientific and technological innovation, thus providing a reliable guarantee for the building of a strong socialist modern state [7]. The development of science and technology is inseparable from education, and economic development is also inseparable from science and technology and education development. In the future international competition, the competition for talent will become the focus of competition among countries. The level of education will be improved to promote scientific and technological progress and economic development.

First of all, the scale of education should be expanded, and the construction of a lifelong education system should be carried out. Basic education should be firmly grasped, and we should actively develop upper secondary education and higher education in an appropriate and high-quality manner. Vocational education and adult education should be vigorously developed. In the process of economic development, it is also crucial to cultivate skilled personnel. Compared with developed countries, there is still a gap in the development of vocational education in China, so we have to make great efforts to cultivate skilled personnel and high-quality workers [8]. At the same time, migrant workers are increasingly moving to cities to work, and adult education and further education need to be developed further to improve the educational attainment of the migrant worker community [9].

Secondly, education reform should be pushed forward, the structure of education should be adjusted, teaching materials should be updated, professional settings should be improved, and quality education should be actively promoted. For the promotion of higher education reform, it is important to improve the quality of higher education, which should go in line with the technological revolution and the characteristics of the knowledge economy [10].

Thirdly, while the state is increasing its investment in education, the state can also make use of social resources and encourage social forces to participate reasonably and legally in investment in education as well as donations.

5. Conclusion

This research examines the correlation between the educational attainment of the population and the level of regional economic development. The research used the gross regional product, the number of graduate students graduating from each province, the number of specialist and undergraduate students graduating from each province, and the population size of each province as the database for the period 2016 to 2020. StataSE software was also used for data analysis in this research. In the process of selecting the regression model for data analysis, this research finally chose the fixed-effects model from the mixed OSL model, the fixed-effects model, and the random-effects model through the F-test and the Hausman test. From the results of the analysis, it is evident that the number of postgraduate graduates has a highly significant positive effect on the gross regional product, while the number of specialist and undergraduate graduates has no significant effect on the gross regional product. Therefore, it further indicates that the educational level of residents has a significant impact on regional economic development, and the higher the educational level, the greater the impact. Accordingly, although China has been increasing its investment in the education sector in recent years alongside its growing economy. However, there is still a need to adhere to the strategy of prioritizing the development of education. Nowadays, China is at a critical stage of upgrading its industrial

structure and an important stage of high-quality economic development, which makes it more necessary to provide strong intellectual support by importing high-quality talents into various fields through education. In addition, there are limitations due to this research. In terms of data selection, as the correlation between educational attainment and regional economic development levels needs to be explored, more data indicators on educational attainment could be added. The number of compulsory primary and lower secondary school graduates by province and the number of high school graduates by the province could be added to complete the picture of educational attainment. In the future, the researchers could actively work to overcome these limitations to make the research better.

References

[1] Min Weifang. Prioritizing the development of education to accelerate the construction of a strong socialist modernization. People's Education, 2022, (08): 6-10.

[2] Zhang Xi. Research on the relationship between higher education and economic growth in China. (Doctoral dissertation, Northeast University of Finance and Economics), 2017.

[3] Xu, Yini. The relationship between economic level and education level. Tomorrow's Style, 2017, (23): 1.

[4] Cui Wenjuan. Analysis of the relationship between regional economy and the educational level of regional residents. New Generation: Theory Edition, 2019, (13): 14-15.

[5] Zhu Xiaolong. The role of education on economic growth: An empirical study based on eba model with inter-provincial panel data in China. Journal of Taiyuan College (Social Science Edition), 2013, 14(004): 10-14.

[6] Luo Yaping. An introduction to the priority development strategy of education in China. Academic Theory, 2011, (29): 1.

[7] Han Zhen. Adhering to the priority development of education to lay a solid foundation for national rejuvenation. Chinese Higher Education, 2018, (19): 4-6.

[8] Huang Baoyu, Chen Xiuhua, Xie Yuanhui, & Huang Shanglin. Measures for the development of vocational education, 2020.

[9] He Feng. The impact of continuing education on the new generation of migrant workers and educational measures, 2021, (2011-3): 70-71.

[10] Liu Yandong. Deepening the reform of higher education to take the path of internal development with quality improvement as the core. Domestic Higher Education Teaching and Learning Research Update, 2012.