

Efficiency Driven Effect of Education in China: The Perspective of Global Competitiveness and Graduate Education

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Abstract: Capital, natural resources, technology and education are often considered to be the most important factors in improving the level of economic development. China is in the "efficiency-driven" stage of economic development. There are objective laws in the development of education level and economic growth, but they interact with each other. Economic growth provides the foundation and necessary conditions for the development of education. At the same time, the role of education in promoting economic growth is also very obvious. Based on the perspective of postgraduate training, this paper studies the role of education in economic efficiency-driven, through the study of theory, data collection and empirical analysis, combined with the development characteristics of China's higher education, and compares China's and US higher education policies to guide China's higher education. The development of education, and then promote the transformation of China into the "innovation-driven" stage, has certain theoretical and practical significance.

Keywords: Educational economics, Efficiency-Driven, Human resources, Regional economy, Graduate training.

1. Introduction

With the arrival of the 21st century, science and technology have undergone tremendous changes, and the country's development capability and competitiveness are constantly being updated. Globalization and technological progress have created new opportunities and challenges for the development of national competitiveness. Knowledge and innovation have gradually replaced original capital as the most important resource. According to The Global Competitive Report_2016-2017, the 12 indicators that measure global competitiveness are divided into 5 stages to measure the country's economic development: Factor-driven phase, factor-driven to efficiency-driven transition stage, efficiency-driven stage and the innovation-driven stage. China now is being at the efficiency-driven stage.

In the latest ranking regarding the Global Competitiveness Report 2018, the United States won the overall best performance with a score of 85.6 (out of 100 points), and China has outstanding competitiveness, ranking 28th in the global competitiveness index (Score 72.6) and first in the "market size" indicator. In the efficiency-driven stage, the driving force for competitiveness and economic benefits comes from scientific and technological, product and process innovation, education and entrepreneurship. China needs to transform its economic growth model and rely more on efficiency improvements and innovation than on factor inputs. The main pillar elements of the efficiency-driven stage are higher education and talent training. It can be seen that education, especially higher education, is becoming increasingly important in economic development. The areas supported by education such as science and technology and research and development are the core of competitiveness.

Scientific research is one of the four important missions of colleges and universities. Today's globalized economy requires countries to cultivate well-educated human resources

and quickly adapt to changes in the environment and the needs of continuous economic development. In the process of improving the level of economic development, capital, natural resources, technology and education are generally considered to be the most important factors. With the development of knowledge and technology, the status of these factors in economic growth has gradually changed. First, the position of material capital in economic growth is gradually reduced, and economic development no longer depends on the input of original capital; second, the position of natural resources is gradually reduced; third, the position of technological progress is continuously strengthened; fourth, education and human resources The importance of capital is deepening and it has gradually become the most important pillar of economic development. In the entire education system, higher education continues to enter the core link, staying at the highest level, and becoming a source of technological progress.

Economic growth provides the foundation and necessary conditions for the development of education. At the same time, the role of education in promoting economic growth is also very obvious. From the perspective of social industry statistics, education as an important sector in national economic accounting, its development is essentially an important part of economic growth, and at the same time it has an irreplaceable effect on economic growth. The cyclical relationship between education and economic development is as Figure1 (Cyclic relationship between education development and economic growth).

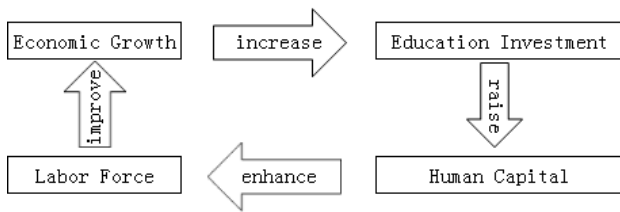


Figure 1. Cyclic relationship between education development and economic growth

In this circular relationship: First, economic growth has increased investment in education. The development of the economy provides a solid foundation for the source of education funding. At the same time, the transformation of the economy has promoted changes in the education system, thereby changing education investment. Secondly, the increase of educational resources has increased the motivation for the cultivation of human resources, the quality and level of education have been improved, and the increase and stock of human capital are changing. Third, the improvement of the quality of human capital promotes the improvement of national productivity. In the modern society of technological development, human capital controls the progress of science and technology, and the improvement of innovation greatly promotes the transformation of the structure of productivity. Finally, the development of productive forces has further promoted the improvement of the economic level.

In today's knowledge, technology and economic system, considering overall strategy, education should be given priority, but the development of education must be coordinated with economic growth. In view of this, based on the perspective of graduate education, this paper explores the role of education in "efficiency-driven" economics. Through empirical analysis of higher education and regional economic based on relative theories, it compares higher education policies in China and America according to the development characteristics, in order to obtain policy guidance and promote China's transition to the "innovation-driven" stage.

2. Theoretical Background

Higher education has a positive role in promoting scientific and technological innovation. Scholars have studied the relationship between higher education and economic growth from both theoretical and empirical aspects. The theoretical background is mainly developed from four aspects regarding existing research.

2.1. Human Capital Theory

Human capital theory believes that the key factor for the sustainable development of an economy is the continuous improvement of human knowledge and skills. The state promotes the sustained growth of its economy by improving the quality and quantity of its human capital. In terms of quantity limited by the natural population growth rate, improving quality is the main way for the country's economic growth. T.W.Schultz, a well-known American economist who is respected as "the father of human capital theory", constructed the main framework of human capital theory. He conducted a quantitative study of the US economic and educational data from 1929 to 1957, and used the balance method to conclude that the average return on education investment at all levels was 17%; the return on investment

growth in education accounted for 70% of labor income %; the increase in education investment accounts for 33% of national income growth. During the same period, Dennison also calculated that the contribution of education to the national income level was 35%, which initiated research on the impact of education on economic growth.

According to existing research, the growth rate of education investment in the United States is much higher than the growth rate of other investments. Empirical analysis has confirmed that the investment income of human capital in economic growth is greater than the investment income of other capitals. Blankenau & Simpson (2004) analyzed that public education expenditure depends on the accumulation of human capital and affects the long-term development of economic growth. It can be seen that human capital investment has the highest rate of return.

2.2. New Economic Growth Theory

The endogenous growth model of modern scholar Solow (1960) regards education as an endogenous variable of economic growth for the first time, and indirectly analyzes the contribution of education to economic growth. In analyzing the input-output model of production, Solow (Solow 1960) attributed the higher contribution rate of capital and labor to the role of technological progress, indirectly confirmed the role of education and introduced it into the model, but economic growth is closely related to the accumulation of capital, and technological progress is still an exogenous variable. The Solow model leads the trend of analyzing human capital with economic models. Tian et al. (2012) used a fixed-effect model to analyze the impact of education development in eastern area of China on the regional economy based on the Cobb Douglas model. Studies have shown that education promotes industrial upgrading of the regional economy by enhancing regional human capital.

2.3. Regional Competitiveness Theory

In the context of economic globalization, the national competitiveness of a country or region's economy is called regional competitiveness. According to the World Economic Forum (WEF, also known as "Davos Forum") of the eight major elements of the international competitiveness evaluation system, the cores are scientific and technological innovation competitiveness and national quality competitiveness. Among them, a number of indicators are related to education, especially higher education. Paul and Euge (2014) measured the impact of education on economic growth in sub-Saharan African countries. It is concluded that the impact of education in this area is significantly lower than in other states, mainly due to the lack of quality education. Mao et al. (2010) combined Cobb Douglas production function and human capital theory, and used a random effects model to perform regression analysis on panel data in China. The research shows that the contribution rates of higher education gradually decreased from the eastern to western regions. Moreover, the competitiveness of each region is significantly different.

2.4. Late-Mover Advantage

The main idea of the late-mover advantage theory is "innovation" powered by higher education. In order to obtain greater economic benefits and higher economic growth rates in countries and regions, economically underdeveloped countries and regions should make effective use of resources,

innovation, opportunities, policies and other advantages to achieve leapfrog development, and innovation is the key to development, taking innovation as the key factor to development is the soul of late-mover advantage theory. Eric A. Hanushek (2013) analyzed that human capital is an important driving factor for economic growth in developing countries, and the development of higher education promotes human capital accumulation. Through the analysis of the development of education level, it is concluded that improving the quality of education can effectively increase human capital and promote economic development.

In summary, the impact of higher education on economic growth depends on human capital, and "the father of human capital theory" Schultz initiated a study of the impact of education on economic growth. Other scholars have also studied the relationship between higher education and regional economic growth from the theoretical and empirical perspectives and at the same time analyzed the impact of education on economic growth through models.

In the past few decades, education in China has developed rapidly, and people have gradually realized the role of education in promoting economic development. The research of domestic scholars focuses more on the introduction of foreign theories and the use of models to estimate the impact of Chinese data. It has not yet formed a complete model of the impact of education on the economy to explain its internal mechanism, which is exactly the research question of this article.

3. Development of Higher Education in China

3.1. Overall Scale and Regional Development

According to the latest "2018 Statistical Bulletin on National Education Development" issued by the Ministry of Education of China, the total scale of various types of higher education in China reached 37.79 million, and the gross enrollment rate of higher education reached 45.7%. However, due to China's vast territory and different levels of regional economic development, there is also a large gap in the development of regional education. There are obvious differences in the distribution of higher education resources among different regions. The number of ordinary colleges and universities in East China accounted for the largest proportion in the total number of colleges and universities in China, reaching 30.07%. The number in Northwest China accounted for the smallest proportion in the total at 8.36%. The size of students in higher education in China is also inconsistent across provinces and cities.

In general, from the statistical analysis of the number of colleges and students, the eastern coastal areas have the richest educational resources, while the western regions lack educational resources, which is significantly lower than the national average. From east to west, the scale of higher education has gradually declined. The development of higher education in different regions is significantly different, and the allocation of higher education resources is not coordinated. The lack of development of different higher education has caused the imbalance in the supply of high-level talents in the regions has led to differences in regions.

3.2. Invest of Higher Education

The development of higher education mainly relies on state financial support, and increasing support for education means

more investment in education. The data shows that the national GDP in 2018 exceeded RMB 90 trillion Yuan, the national financial education expenditure accounted for about 4.11%, and the total investment in higher education nationwide was RMB 1.13 billion Yuan, an increase of 8.15% over the previous year.

The development level of higher education varies greatly among different economic regions. In coastal areas advantageous educational resources are concentrated, human resources and research environments are better as well. These regions can provide a good platform for higher education graduates to apply the knowledge to practice, and at the same time effectively expand the knowledge accumulation in work, forming a good cycle. The development of higher education promotes the healthy development of the region, which is conducive to the rapid development of regional core competitiveness and maintains regional development advantages.

4. "Efficiency Driven" Model of Higher Education

4.1. Theoretical Model

In order to estimate the extent to which higher education at various levels regional economic growth is driven by efficiency, the theoretical model chosen in this paper is an improvement on the Cobb-Douglas production function model. In the 1930s, the American mathematician Cobb and the economist Dauglas came to the production function when they studied the relationship between investment and output of American manufacturing from 1899 to 1922:

$Y_t = A_t K_t^\alpha L_t^\beta$, which is called Cobb-Douglas production function. Y_t is total product, K_t represents the units of capital, L_t stands for units of labor, A_t is the total factor productivity, α and β are the output elasticities of capital and labor respectively, $\alpha > 0$, $\beta > 0$, $\alpha + \beta = 1$.

For regression analysis, log the C-D Cobb-Douglas production function on both sides to get a linear model as below:

$$\ln Y_t = \ln A_t + \alpha \ln K_t + \beta \ln L_t \quad (1)$$

This article mainly studies the driving effects of graduate education and general higher education on economic growth in various economic regions of the country. In order to reflect the role of graduate education and general higher education in empirical studies, the output elasticities of labor β is separated into graduate component β_g and the general higher education component β_r , following the method of separation of elastic coefficients by Professor Zuo. Then we get the model as below:

$$Y_t = A_t K_t^\alpha L_t^{(\beta_0 + \beta_g + \beta_r)} \quad (2)$$

The labor input of graduate education is represented as L_g , while the labor input of general graduate education is L_r . Therefore, in equation (2) we can obviously get:

$$\beta_g = \frac{\ln L_g}{\ln L_t} \beta'_g \quad (3)$$

$$\beta_r = \frac{\ln L_r}{\ln L_t} \beta'_r \quad (4)$$

Put equations (3) and (4) into equation (2), and then take the logarithm of the two sides of the equation and sort:

$$\ln Y_t = \ln A_t + \alpha \ln K_t + \beta_0 \ln L_g + \beta_r \ln L_r \quad (5)$$

Based on the formula (5), this paper will conduct an empirical analysis of the "efficiency driven" effect of higher education on regional economic growth at all levels.

4.2. Econometric Model

This article selects data from various provinces, divides the country into six economic regions, classifies higher education into graduate education, and general higher education according to the classification of China Education Statistical Yearbook, and builds a panel data model to study the problem based on the perspective of regional economic growth. According to formula (5), the construction model is as follows:

$$\ln Y_{it} = \ln A_{it} + \alpha \ln K_{it} + \beta_0 \ln L_{it} + \beta_g \ln L_{ig} + \beta_r \ln L_{ir} + \varepsilon_{it} \quad (6)$$

In which, total product Y_{it} is the GDP of the i -th province over the years; capital K_{it} is the capital investment amount of the i -th province; labor L_{it} is the population of employed people in the past years of the i -th Province; L_{ig} is the number of graduate students in the i -th province; L_{ir} is the number of undergraduate graduates in the i -th province.

Using the panel data of provinces and cities from 2004 to 2017, an empirical analysis is made of the effects of graduate education, general higher education, and adult higher education on the economic growth efficiency of the six economic regions of the country. When the coefficient β_g ,

β_r in the regression equation are significantly different from 0, the relationship between the development of graduate education, the development of general higher education, and the level of economic growth is considered significant.

5. Empirical Study

China has a vast territory, economic development speeds in different regions differ significantly, and uneven development trends. There are differences in education investment from eastern to western regions. Higher education in different regions has not same driving effects on the economy. This article divides the country into six economic regions according to the National Bureau of Statistics' national

division criteria. Using panel data models for analysis and regional comparison, this paper analyzes the empirical research on the "efficiency-driven" economic growth of higher education at all levels.

5.1. Procedure

This paper examines the efficiency driven effect of higher education development on the economic growth, due to the expansion of the enrollment scale in 2000, it takes about three years to graduate, so the data selected six regions in 2004-2017 annual data according to the regional economic division as the sample interval. The data comes from the National Statistical Yearbook of 2004-2017, the Educational Yearbooks of the Provinces, and relevant statistics information of the Bureau and Education website.

Y_{it} is the GDP of the i -th province; K_{it} is the fixed asset investment in the i -th province; L_{it} is the number of employed persons in the i -th province; L_{ig} , L_{ir} are the number of graduates of graduate education and general higher education, the data are mainly from the yearbooks of education statistics of provinces from 2004 to 2017.

In summary, the data collection was completed by consulting the "Education Statistical Yearbook", "Statistical Yearbook", etc., and some variable data were deflated. In this paper, the panel data is logarithmic transformed, and the co-integration relationship between variables is not affected.

Which is, Logarithmic to Y_{it} , K_{it} , L_{it} , L_{ig} , L_{ir} , then we get $\ln Y_{it}$, $\ln K_{it}$, $\ln L_{it}$, $\ln L_{ig}$, $\ln L_{ir}$, we use Eviews11.0 to perform regression estimation analysis according to equation (6).

5.2. Regression Model

5.2.1. Panel Data Test

Four panel data detection methods, LLC, IPS, ADF-Fisher, and PP-Fisher, can be used to perform panel unit root tests on the variables. After testing, each variable is a first-order simple integer. Under the condition of the same-order single integer, the co-integration analysis of each variable can be performed to determine the long-term stable relationship of the theoretical model.

Under the condition that the panel data unit root test satisfies the same order single integer of all variables, further panel co-integration tests can be performed on the panel data. After running in Eviews 11.0, the test results are as follows: From the results, it can be seen that there is a co-integration relationship between the national panel data and the panel data of the six major economic regions. This shows that there is a long-term stable equilibrium relationship between the variables in the panel data model, which means that the impact of higher education development on regional economic growth is long-term. Panel data can be used for model regression analysis.

5.2.2. Panel Estimates for Various Economic Regions

Regressive estimation of the panel data of the country and the six major economic regions yields the following estimation results:

National Panel Data Estimate Results:

$$\ln Y_{it} = 6.00021 + 0.278300 \ln K_{it} + 0.130032 \ln L_{it} + 0.007789 \ln L_{ig} + 0.19862 \ln L_{ir} + \varepsilon_{it}$$

From the regression estimation results of the national panel data (as shown in Table 1. Estimated T and P values of national panel data), it can be seen that in the regression equation, the capital stock contributes the most to the national economic growth, indicating that China should increase its investment in capital and gradually convert fixed capital investment into human capital investment to promote the economic growth. At the same time, the higher contribution rate of general higher education and the lower contribution rate of postgraduate education indicate that China is currently in the early stage of the "efficiency driven" stage and has a greater demand for general higher education talents. With China's economic transformation, the demand for higher-level talents will increase, and the contribution of graduate education to China's economic growth will gradually increase.

Table 1. Estimated T and P values of national panel data

	K_{it}	L_{it}	L_{ig}
T	13.66782	2.78134	2.99072
P	0.0003	0.0002	0.0003

T value test results that the development of China's general higher education and graduate education has a significant coefficient, which indicates that general higher education and graduate education have a significant driving effect on national economic growth.

②Regional Panel Data Estimate Results:

According to the estimation results of the panel data model of each economic region mentioned above, it can be known that the driven effects of higher education development at different levels in each economic region of China on economic growth are different. A horizontal comparison is made between the regression estimation results of the panel data model of each economic region, and the results are shown in Table 2(Model estimation coefficient results for each region).

Table 2. Model estimation coefficient results for each region

Region	K	Lt	LnLg	LnLr
The whole nation	0.278300	0.139032	0.007789	0.199862
North China	0.176693	0.899021	0.009872	0.236678
Northeast	0.178893	0.977863	0.022141	0.139908
East China	0.110083	0.109863	0.139907	0.248731
South Central China	0.190661	0.345578	0.089932	0.189022
Southwest	0.077321	0.399063	0.048563	0.278893
Northwest	0.178893	0.349903	0.070998	0.290032

According to the table above, general higher education is the main factor promoting economic growth in national data, and graduate education also has a more obvious driven effect. With the development of China's overall economy, the

adjustment of the industrial structure and the transformation of the capital structure, with the popularization of higher education, the driving role of higher-level human capital on the economy will gradually expand.

As for general higher education, the contribution rate of general higher education in North China, East China, Southwest and Northwest China to the regional economy is higher than the national average, while the contribution of general higher education in Northeast and Central-South regions to the regional economy is lower than the national average. However, the contribution rate of general higher education to the economy in all regions is positive, and the effect coefficient is relatively large. This shows that in the process of achieving the "efficiency-driven" stage of transition, China must continue to increase investment in general higher education, and adjust regional development in accordance with the needs of industrial development in different regions, in order to promote the balanced development of human capital and industrial optimization and upgrading.

Regarding graduate education, the efficiency driven effect of graduate education development across the country and various economic regions on economic growth is inconsistent. The driving factors of graduate education in North China, East China, South Central, and Southwest China on regional economic growth are higher than the national average level, and all are positive contribution rates. This shows that the level of industrial structure optimization in these regions is relatively high, and the requirements for high-level talents' innovative ability, scientific research ability, and practical ability are higher, and graduate education promotes regional industrial upgrading. The contribution coefficient of graduate education to the northeast and north-western regions to regional economic growth is negative. Affected by the regional industrial environment and structure, the impact of graduate education and postgraduate human capital on the region has been hindered, and a balanced and healthy development has not been achieved.

5.2.3. Regional Intercept Analysis

The individual effects of the six major economic regions are averaged to obtain the deviation level of each economic region from the national average, as shown in the Table 3(Deviation results of regions and national average).

Table 3. Deviation results of regions and national average

Region	Result
North China	0.255670
Northeast	-0.06074
East China	0.318385
South Central China	-0.09847
Southwest	-0.30898
Northwest	-0.66544

According to the results in Table 3, it can be seen that in the regions with positive deviation, the deviation level between East China and North China is positive, and the degree of positive deviation in East China is larger, which is in line with the actual development level of each region. In the area of negative deviation, the distribution of deviation levels in the Northeast, Central South, Southwest, and Northwest regions,

the degree of deviation gradually increased. It shows that the current situation of China's economic development is still better in the east than in the middle, and worse in the west.

From the analysis of the conclusions, it can be seen that in terms of the whole country, China's general higher education and graduate education have an efficiency-driven role in economic growth. For each economic region, the degree of efficiency-driven effect of education on economic growth is not the same, and the results are not completely the same. The efficiency driven effect of higher education on economic growth at different levels are different, and regions should rationally make development plan according to own characteristics.

6. Conclusions and Discussions

According to the "Global Competitiveness Report" released by the World Economic Forum, China's economic development has entered the "efficiency driven" stage. At this stage, the industrial development speed and industrial structure upgrade of the major economic development in regions are inconsistent, and the state's investment in human capital is also different, which leads to the imbalance in the driving force of human capital to economic development in the major regions. This article will take the typical representative of developed countries, the United States, as an example to analyze their development efforts and policies for higher education in the "efficiency driven" stage, so as to guide the direction of China's higher education and then push towards "Innovation-driven" stage.

6.1. Conclusions

6.1.1. Higher Education Has A Significant Role in Driving Economic Growth

Through the data analysis, it is concluded that the level of higher education development in China has a significant driving effect on economic growth, and the contribution coefficient of general higher education development level to GDP output is 0.1999. Due to China's vast territory and uneven regional economic development, some regional economic development methods are still mainly based on material capital input and increased labor factor input, resulting that the driving effect of higher education on economic growth is not obvious. For different regions, the driving contribution coefficients of the Southwest and Northwest regions are relatively large, with the Northwest region having the largest contribution coefficient of 0.290. Since the contribution of human capital to economic growth shows a "decreasing marginal effect" phenomenon, in areas where economic development is slower, the driving effect of higher education on economic growth is obvious. The second is East area, as the most economically developed region in China, there is a high demand for high-level talents, and so human capital can be effectively used. In addition, the development of general higher education in North China, South Central and Northeast China has gradually reduced the driving effect on economic growth, but all have a positive effect. The industrial structure of these regions has relatively low demand for high-tech talents, which results in a relatively low economic driving effect of general higher education in these regions. In summary, the promotion of higher education is of great significance to regional economic growth and can improve and maintain stable economic growth.

6.1.2. The Driving Effects of Graduate Education Are Different

At present, China's higher education is dominated by general higher education. General higher education promotes economic growth the most, while graduate education promotes less. At the national level, the contribution rate of graduate education to economic growth is low, at 0.0078. In some regions the existing economic development mode and industrial structure still rely heavily on the manufacturing industry, and its adaptability to research and innovative talents is not strong, resulting in insufficient driving force for graduate education to the economy. For different regions, the contribution coefficient of graduate education in East China to economic growth is the largest, which is 0.1399.

The industrial structure in East China is dominated by high-tech industries and emerging tertiary industries. The knowledge system and structure are more advanced and high-level talents are in greater demand. The talent training mechanism is more complete. For graduate students and more high-level talents are more attractive and provide a good development environment. Therefore, the driving force of graduate education in East China for economic development is more balanced. As for the Northeast and Northwest China, the economic development is relatively backward. At this stage, the economy is still driven by basic industries. As a result, the absorptive capacity of graduate students in these two regions is weak, the imbalance in regional economic and educational development, and the current mode of graduate student training have caused an uncoordinated development of graduate education and economic development.

6.1.3. Intercept Deviation---Current Distribution of Economic and Educational Resources

From the perspective of intercept term deviation, in several regions with positive deviation, the deviation level in East China and North China is positive, and the degree of positive deviation from East China is relatively large, which is in line with the development level of each region. In the area of negative deviation, the distribution of deviation levels in the Northeast, Central South, Southwest, and Northwest regions gradually increased, and the degree of deviation gradually increased. It shows that the current situation of China's economic development is still better in the east than in the middle, and worse in the west.

6.2. Comparison of Economic Development in China and US

The United States was in the "efficiency driven" stage from 1962 to 1984. During this stage, the development of higher education showed an upward trend and it grew in concert with GDP. For the contribution of GDP growth rate, during 1962-1973, the contribution of higher education to GDP growth rate was 26.3%, and from 1973 to 1984, the contribution of higher education to GDP growth rate in the United States rose to 44.61%. It can be seen that in the "efficiency driven" stage, the development of higher education has played a significant role in driving and supporting US employment and related industries, directly stimulating and stimulating US economic growth. Compared with the "efficiency-driven" stage of the United States during 1962-1984, Chinese current higher education development has a certain gap in the driving role of the economy. The main reasons are as follows:

The US multi-level higher education system has a clear positioning. Since the completion of the first private two-year college in 1892, the United States has resumed a multi-

layered educational structure and educational system consisting of research universities, general liberal arts colleges, two-year colleges, and community universities. Higher education at all levels has a clear status and trains unique talents. This enables higher education in the United States to continuously adjust the proportion of various education and personnel training according to the changes in the economic structure and the development of industrial structure for the demand for talents, so that higher education and economic development are coordinated and balanced.

General education is coordinated development with elite education. Higher education in the United States has entered a mass education stage with a gross enrolment rate of more than 15% since the 1930s. While expanding the number of educated population, the United States is also protecting elite education. American higher education institutions have very strict admission standards for students and employment standards for teachers. While ensuring the popularization of education, the quality of higher education is guaranteed, so that higher education at all levels can truly cultivate talents for economic development.

US have a market-oriented educational resource allocation mechanism. Both American education and economy are based on a free market which encourages free competition. Therefore, the survival and development of American higher education are in a competitive environment, providing impetus for the innovation and development of higher education institutions.

6.3. Suggestions for Educational Development

Through theoretical research, data collection and empirical analysis, combined with the characteristics of the development of higher education in China, and comparing the higher education policies of China and the United States, it can obviously draw the following policy recommendations for the future development of education.

6.3.1. Balance Regional Differences and Form Industrialized Development

Through regional economic development, to narrow the gap in higher education among different regions, we must pay more attention to the issue of educational equity, strengthen the development of regional higher education, and maximize the role of higher education. Investment in higher education will be tilted more towards the western regions, balancing the number of key colleges and universities in various regions, reducing the development gap of higher education in various regions, and coordinating the relationship between higher education and regional economic growth.

In addition, in the current stage of development, China implements highly planned and unified management with a single source of funds, neglects its industrial characteristics, and does not take advantage of market regulation. Therefore, China should improve the development of the education industry and promote the industrialization of education. Through the reform of the education system, education is adapted to the market economy, the role of market regulation is fully brought into play, and education's ability to innovate and compete is strengthened, thereby improving the quality of teaching and the driving force for innovation.

6.3.2. Improve the Quality of Higher Education

Compared with the United States, the scale of higher education expanded in the 1960s, and the proportion of students enrolled reached the highest. The popularity of higher education promoted the development of universities.

Subsequent federal government funding for higher education focused on strengthening research capabilities and developing graduate education.

Drawing on the development experience of the United States, we should continue to improve funding support for higher education, increase the enrolment rate of higher education, make the popularization of higher education, and ameliorate the curriculum, teacher training, and administrative management of universities. At a time when the enrolment rate is constantly increasing, we should pay more attention to the quality of higher education, improve the quality of higher education, and make a qualitative leap in higher education. At the same time, speed up regional industrial upgrading, thereby increasing the demand for higher education graduates, allowing them to play a role in contributing to social and economic development, and form a good cycle.

6.3.3. Gradually Increase Investment in Graduate Education

The innovation relies more on higher education, especially graduate education and scientific research projects. Postgraduate training should pay more attention to scientific research and innovation ability, increase investment in majors in line with the development of the region, so that graduates can meet the needs of regional industrial innovation. While improving the quality of graduate education, we must pay attention to the coordinated development of graduate education and graduate talent training and regional economy. In the process of optimizing the industrial structure, the development of graduate talents is adapted to the industrial structure, improving the adaptability of graduate talents, and thereby promoting economic growth.

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References

- [1] World Economic Forum. The global competitiveness report 2016-2017[J]. 2012.
- [2] Baltagi B. Econometric analysis of panel data[M]. John Wiley & Sons, 2008.
- [3] Barro R J. Human capital and growth[J]. American Economic Review, 2001: 12-17.
- [4] Blankenau W F, Simpson N B. Public education expenditures and growth[J]. Journal of Development Economics, 2004, 73(2): 583-605.
- [5] Brosig J, Heinrich T, Riechmann T, et al. Laying Off or Not? The Influence of Framing and Economics Education[J]. International Review of Economic Education, 2010, 9(1):44-55.
- [6] Cohn, Elchanan, Geske, et al. The Economics of Education[J]. Comparative Education Review, 1990, 26(3):1-8.
- [7] Chinn C A, Barzilai S, Duncan R G. Education for a "Post-Truth" World: New Directions for Research and Practice[J]. Educational Researcher, 2020:0013189X2094068.
- [8] Curaj A, Matei L, Pricopie R, et al. The European Higher Education Area[J]. 2015, 10.1007/978-3-319-20877-0.
- [9] Directory U G S. Economics of Education Review[J]. Nordic Economic Policy Review, 2017, 30(21):26.

- [10] Etzkowitz H. The triple helix: university-industry-government innovation in action [M]. Routledge, 2010.
- [11] Etzkowitz H. Innovation in innovation: the triple helix of university-industry-government relations [J]. *Social science information*, 2003, 42(3): 293-337.
- [12] Gibbons M . Higher education relevance in the 21st century[J]. 2010.
- [13] Grantham-McGregor S, Cheung Y B, Cueto S, et al. Developmental potential in the first 5 years for children in developing countries[J]. *The Lancet*, 2007, 369(9555): 60-70.
- [14] Hanushek E A, Kimko D D. Schooling, labor-force quality, and the growth of nations[J]. *American economic review*, 2000: 1184-1208.
- [15] Jorge-Moreno J D , Castillo L L , Triguero, María Sanz. The effect of business and economics education programs on students' entrepreneurial intention[J]. *European Journal of Training & Development*, 2012, 36(4):409-425.
- [16] Kim J , Kwon Y , Cho D . Investigating factors that influence social presence and learning outcomes in distance higher education[J]. *Computers & Education*, 2011, 57(2):1512-1520.
- [17] Psacharopoulos G , Patrinos H A . Taylor & Francis Online :: Returns to investment in education: a further update - Education Economics - Volume 12, Issue 2[J]. *Education Economics*.
- [18] Rhodes F H T . Universities in the Marketplace: The Commercialization of Higher Education[J]. *Perspectives in Biology & Medicine*, 2004, 47(3):294-296.
- [19] Shephard K . Higher education for sustainability: Seeking affective learning outcomes[J]. *International Journal of Sustainability in Higher Education*, 2008, 9(1).
- [20] Teichler U . Higher education and graduate employment in Europe[M]. Springer Netherlands, 2006.
- [21] Wang L , Malhotra D , Murnighan J K . Economics Education and Greed[J]. *Academy of Management Learning & Education*, 2011, 10(4):643-660.