

The Effect of Tertiary Education Level on the Rate of Return to Education: An Empirical Study Based on CGSS2021

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ABSTRACT

This study empirically investigates the differences in the returns to education across different tiers of universities in higher education using data from the nationwide household survey CGSS2021, using the classic Mincer income function model in the field of economics. The empirical results show that the positive effect of higher education university rank on the personal rate of return to education is not obvious, compared with ordinary universities, but the top universities in the country have strong tier spanning, and there are differences in the impact of different grades of higher education schools on the rate of return to education.

KEYWORDS

Higher education; Education levels; Returns to education; Mincer income function; CGSS2021

1 Background

Based on the concept of human capital, the "returns to education" theory, which measures the outcomes of investments in the form of education, explains how and why investments in education affect economic outcomes and more accurately quantifies the "returns," has been a hot topic of quantitative research in the field of education and in the field of the labor force since its inception [1]. Since its inception, it has been a hot topic of quantitative research in the fields of education and labor. In previous studies, domestic scholars have mainly focused their research perspectives on the macro perspective based on the analysis of labor market changes and other epochal contexts, the meso perspective based on regional, urban-rural differences in educational inputs and differences in the structure of the labor market, as well as the micro perspective highlighting individual differences such as gender and family backgrounds [2]. As the only developing country in the world that has taken the expansion of higher education as a national-level development strategy, since the introduction of the Action Plan for the Revitalization of Education for the 21st Century in 1999, China's tertiary education penetration rate has increased significantly, and investment in education has continued to increase at an increasingly higher cost [3]. In response to this status quo, a large number of studies on the rate of return on education for higher education have emerged in China in the past 20 years. These studies have discussed the problems of educational equity, efficiency and educational return gap brought about by the expansion of higher education [4], and mostly stay in the following three aspects.

Comparison of the rate of return to education at different levels of education. Among them, the

comparison of educational returns between higher education and non-higher education has been a hot research topic, and the results of multiple linear regression derived from the use of data related to the China Comprehensive Social Survey 2021 show that for every additional year of work experience of higher education degree holders, their educational returns are more than five times of those of non-higher education holders [5]. As for the internal level of higher education, there are also more studies on the educational gains between the levels of higher education qualifications such as college, bachelor's degree, master's degree and doctorate. The study by Juan Yang et al. found that the educational return of master's degree level is the highest and relatively less risky in comparison [6].

The comparison of educational returns in different regions, such as the impact of urban-rural, eastern, central and western regional differences on educational returns. Wenwu Ma pointed out in comparing the return on investment in higher education in urban and rural areas that, taking 1999 as the boundary, the rate of return on higher education in urban and rural areas in China as a whole has significantly increased, but the gap between urban and rural areas has gradually widened [7]. And in the comparison of different work regions, the return on education in the east is the highest and most employed compared to the Center and West [8].

Studies on the return to education based on individual differences, such as the effects of gender and parents' education on the return to education. Mengtou Gao et al. showed that women with higher education have lower returns to higher education than men in terms of industry choice due to unfavourable gender bias in industry entry [9].

As mentioned above, most of the studies on the issue of equity in the distribution of higher education resources have focused on the comparison of returns to education at different levels of education, i.e., the impact of having a university degree and different levels of education on returns to education, with only a few studies focusing on the issue of returns to education at different levels of schooling within higher education.

2 Literature Review

Comparative studies in the West on the returns to higher education for different levels of educational quality started as early as the twentieth century. Psacharopoulos already in 1974 connected the screening hypothesis of higher education as a filter with different returns to education [10]. And this was followed by Brewer, Black and Smith et al. who went deeper in this direction. The study by Brewer et al. directly argues that students educated in an elite private system have a higher salary advantage, earning 26%-39% more, than students educated in bottom-ranked public education schools [11]. Black and Smith's findings support this by tracking their nation's youth and the use of matched estimation methodology to conclude that youth with higher quality private elite education credentials have post-graduation salary tended to be higher than those who graduated from lower quality universities [12-13]. In contrast, Yubilianto's study of returns to tertiary education in Indonesia shows that returns to education depend specifically on the choice of university. The typical return on higher education in Indonesia is 46.2%, but for those who do not qualify for the 10 best public or private universities, the return on investment will be lower than this value [14].

On the other hand, however, there are some studies that show that the effect of education level and quality on the return to education is not statistically significant, and may even be negatively correlated. Harmon et al. examined the relationship between school quality and the return to education using data from England and Wales, and the results showed that the effect of higher education quality on the return to education is not significant in comparison to its years of

schooling [15]. And Dale et al. even points out that this estimate of the impact on earnings due to the selectivity of universities may be biased because elite universities, which exist as the highest level of higher education, admit students partly on the basis of characteristics related to future earnings [16]. Gomez, on the other hand, bases his study on Colombian universities, and his results show that there is heterogeneity in the returns to education in higher education, rather than varying according to whether the university graduates attend is a top-ranked, top-tier university [17].

Currently, the vast majority of studies on quality, rank and returns to education in higher education focus on developed countries. China, as a developing country, has relatively few studies in this research area, and the existing past studies also suffer from the problem of subjectivity in the measurement indicators [18].

Therefore, this study will try to make up for the shortcomings of the existing empirical research perspectives, and empirically analyze the impact of different levels of higher education on the rate of return to education through more nationally representative, detailed and objective high-quality data.

3 Data Sources, Processing and Model Construction

3.1 Data sources and processing

The data for this study come from the research data of the China General Social Survey (CGSS) 2021 conducted by the Center for China Data and Surveys of Renmin University of China, which covers the survey respondents to 19 provinces in the country by means of stratified random sampling, and the sample coverage can be regarded as a representative sample of the whole country. The sample was cleaned and screened according to the needs of the study, and variables such as income, age, highest education level, and university level were selected for data analysis, and years of education were assigned to the samples with different levels of education using the assignment method, i.e., high school = 12, college = 15, bachelor's degree = 16, and postgraduate students = 19.

At the same time, since data on the number of years of work experience of individuals are not directly available, this study adopts a universal approach by subtracting an individual's age from his/her years of education and deducting the non-schooling period before the age of 6, i.e., "Age - Years of Education - 6". Samples under 16 years of age and over 60 years of age that did not fulfil the working age criteria were excluded. Finally, 1,689 valid samples were obtained. Using high school education as the reference, 1,125 samples with college degree or above (including specialties, bachelor's degree, postgraduate and above) and 564 samples with high school education were obtained.

3.2 Model construction

The study of returns to education in this research uses the classical Mincer income function model i.e. Mincer's rational choice model based on utility maximization - Mincer's equation: a linear relationship between the logarithm of wages and years of education. Its standard form is:

$$\ln Y = \alpha + \beta_1 \text{educ_y} + \beta_2 \text{exp} + \beta_3 \text{exp}^2 + \varepsilon$$

where $\ln Y$ denotes the logarithm of earnings, educ_y denotes years of education, β_1 is the coefficient of years of education denoting the rate of return to education, which represents the growth rate of the return to education for each additional year of schooling, exp is the number of years of work experience, exp^2 is the square of the number of years of experience in order to reflect the nonlinear relationship between earnings and work experience, and ε is the random error term

for the unmeasured factor. And the study based on different levels of universities uses group regression to calculate the magnitude of their returns to education separately. And the comparison of the difference in the rate of return to education between different levels of higher education is studied by group regression.

4 Empirical Analysis

4.1 Descriptive statistics of data

Table 1 Simple Statistical Description of Core Variables

Variable	Mean	Standard deviation
Income	109697	421262
Logarithm of income	10.92	1.125
Years of education	14.56	1.986
Work experience	16.96	12.74
Work experience squared	450.1	505.6
Central, state-affiliated colleges and universities	0.140	0.348
Provincial colleges and universities	0.305	0.461
Regional colleges and universities	0.192	0.394
Other full-time colleges and universities	0.179	0.383
Part-time colleges and universities	0.119	0.324
Others	0.0649	0.246

4.2 Baseline regression

From the results of the study derived so far, it can be seen that the rate of return on education of higher education institutions belonging to the central government or other state ministries and commissions reaches 0.22, which exceeds the rate of return on education of the entire sample of higher education universities of 0.17, while the rate of return of the remaining five classes of higher education institutions is lower than this value. And in the comparison of the educational yield of the remaining 5 classes of higher education universities, it can be found that, except for the educational yield of part-time higher education universities, which is the lowest value of 0.098, the gap between the educational yields of provincial higher education universities, regionally owned higher education universities, other full-time higher education universities and other higher education universities is not obvious, and all of them are maintained at the upper and lower ranges of 0.14 to 0.15. It can be seen that the positive effect from the higher education university level on the personal rate of return on education is not obvious after the expansion of colleges and universities, but the rate of return on education of the country's top colleges and universities has a strong tier spanning compared with ordinary colleges and universities.

5 Conclusion

Therefore, it can be concluded from the empirical study based on the data of CGSS2021 that there is a significant difference in the educational yield of different levels of domestic higher education at present. Among them, the educational yield of core colleges and universities belonging to the central government or other state ministries and commissions is the highest value, which highlights that the top colleges and universities in China still maintain a great advantage in talent cultivation and enterprise head-directed recruitment. The convergence of the educational yield of college students in the remaining colleges and universities also verifies the equalization of higher education talent capacity and the increasing saturation of the talent market in China since

the expansion policy of colleges and universities.

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