

A Meta-analysis on the Heterogeneity of Human Capital Return Rates in China's Urban and Rural Areas

Shanshan Ma¹, Simiao Wu², Yazhou Zhang¹

¹Hefei University of Economics, Hefei, Anhui, 230001, China

²Anhui Agricultural University, Hefei, Anhui, 230001, China

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Abstract: By optimizing human capital in rural areas, a steady increase in the rates of return on human capital in rural areas will be achieved, and the fundamental problem of the difference in the rate of return on human capital between urban and rural areas will be solved. Based on the Chinese database "China Knowledge Network Database", "China Weipu Network Database", "China Wanfang Network Database", "Baidu Academic" and "Google Scholar Mirror", this article conducts a meta-analysis on the return to human capital in China. The forest map, Begger's test and meta-regression analysis are used as analysis methods to determine and test the heterogeneity. According to the forest map, the β_1 effect size is combined and calculated that [Overall (I-squared) = 99.3% > 50%, p=0.000]; (Heterogeneity between groups: P = 0.000 < 0.05). According to the forest map, the β_2 effect size is combined and calculated that [Overall (I-squared) = 99.6% > 50%, p=0.000]; (Heterogeneity between groups: P = 0.003 < 0.05). According to the forest map, the Adj-R² effect size is combined and calculated that [Overall (I-squared) = 99.8% > 50%, p=0.000]; (Heterogeneity between groups: P = 0.000 < 0.05). According to meta-regression analysis, the results of Adj-R² (Coef.) = 0.081 > β_1 (Coef.) = 0.046 > β_2 (Coef.) = 0.009 indicate that the explanation strength of urban and rural factors to the human capital return rate under comprehensive considerations, namely Adj-R² is 8.1%, the explanation strength of urban and rural factors to the education return rate, namely β_1 , is 4.6%, and the explanation strength of urban and rural factors to the work experience rate of return, namely β_2 , is 0.09%. There are obvious differences between the different studies on the rate of return on human capital in China and the urban and rural areas; there is no publication bias in all the research variables; the urban and rural factors have a certain impact on the rate of return on human capital, mainly through education and work experience, among which urban and rural factors have the greatest impact on education of human capital.

1. Introduction

For a long time, the dual economic structure has been a major development characteristic of China's economy. The urban-rural development gap has gradually narrowed but remained at a relatively high level. The difference in the rates of return of urban and rural human capital is one of the important reasons for the uncoordinated development of China's urban and rural areas. Since the

reform and opening-up, The direction of our continuous efforts are improving the conditions of human capital resources in rural areas, increasing the rates of return of human capital in rural areas, achieving coordinated and sustainable development of urban and rural areas, and solidly promoting the common prosperity of urban and rural areas. The basic equation of Mincer for estimating the rate of return on human capital is:

$$\ln Y_i = \beta_0 + \beta_1 * \text{edu}_i + \beta_2 * \text{exp}_i + d * \text{exp}_i^2 + \sum \lambda_i X_i + \varepsilon_i \quad (1)$$

In formula (1), $\ln Y_i$ represents the logarithm of subject i 's salary income. edu_i represents the subject i 's educational level, β_1 is the regression coefficient of education level, which reflects that each additional unit educational level will increase income percentage under the same other conditions; exp_i is the work experience of subject i , β_2 is the regression coefficient of work experience, which reflects each additional unit of work experience will increase income percentage under the same other conditions; exp_i^2 can represent the square of work experience, d is the regression coefficient of it, which reflects each additional unit of it will increase income percentage under the same other conditions; X is other control variables, including gender、region、health level and so on ; ε_i is a random error term; A is a constant term.

2. Meta-analysis Method

The meta-analysis statistical method is the re-statistics of many existing empirical documents that are in line with the research theme summarizing the consistency and heterogeneity of this type of research theme, and obtaining more extensive data to demonstrate the true relationship between variables. Under normal circumstances, there are two models of fixed-effects model and random-effects model, which mainly depend on the intensity of heterogeneity. If the heterogeneity is greater than 50%, it is suitable for the random-effects model to exploring heterogeneity and internal consistency, and vice versa. This article uses urban and rural areas as grouping variables to study the issue of urban-rural differences in the human capital return rates. Therefore, Forest plots, Begger's test and Meta-regression analysis are chosen as the analysis methods. The Forest map can realize the judgment of heterogeneity, and lay the foundation for exploring the source of heterogeneity in the future. [1]

3. Sample and data analysis

3.1 Collecting related articles and studies

Based on the attributes of the Humanities and Social Sciences and the characteristics of the human capital rates of return, this paper adopts single rate merger to carry out the judgment of heterogeneity and the test of the source of heterogeneity.

First, after clarifying the database to be searched, we get relevant documents through system search. This retrieval process mainly includes: identification, screening, eligibility and included. According to the requirements, a total of 1,627 documents were retrieved; after the duplicates being eliminated, the remaining are 1,049 documents; the initial screening by the title and subject, 103 documents meted the conditions; the secondary screening through the abstract and article structure, 63 documents meted the requirements. Finally, this paper selects 12 documents as the data source for Meta-analysis. The rest of the literature was excluded for the following reasons: participants do not meet the inclusion requirements; [2] the classification criteria of the research are different; the research results do not meet the inclusion indicators; the research index data is missing or incomplete.

3.2 Related variables in meta-regression analysis

This article studies the impact of urban and rural factors on the rate of return of human capital. The rate of return on education, the rate of return on work experience and the rate of return on human capital under comprehensive factors are used as important indicators to measure the rate of return on human capital. The explanatory variables are grouped based on urban and rural conditions. The explained variables are the educational rate of return, which is β_1 , the work experience rate of return, which is β_2 , and the human capital rate of return under comprehensive, which is Adj-R²?

4. Meta-analysis results

4.1 Forest map

4.1.1. Interpretation of β_1 forest map

In meta-analysis, Forest map is a map drawn by the results of calculations of effect sizes. In the research process of this article, 1=rural sample, 2=urban sample. In order to better explore the heterogeneity of urban and rural human capital return rate and its reasons, this paper conducts research from the perspective of education return rate β_1 , work experience return rate β_2 and human capital return rate under comprehensive considerations Adj-R²?

β_1 is the regression coefficient of educational level, which reflects under the same other conditions, each additional unit educational level will increase income percentage. As shown in [$\beta_1=0.06$, 95 % CI (0.05, 0.07), P <0.001]. It shows that every additional unit of education will increase income by 6%. This study is statistically significant. According to the forest map, the β_1 effect size is combined and calculated that [Overall (I-squared) = 99.3% >50%, p=0.000], which shows that there are obvious differences in the educational return rate between different studies; (Heterogeneity between groups: P =0.000 <0.05) shows that there is a significant difference in the rate of return of education between urban and rural areas. [3]

4.1.2 Interpretation of β_2 forest map

β_2 is the regression coefficients affected by work experience, reflecting that under the same other conditions, each additional unit of work experience will increase income percentage. [$\beta_2=0.01$, 95 % CI (0.01,0.01), P <0.001] shows that every additional unit of work experience will increase income by 1%. This study is statistically significant. the β_2 effect size is combined and calculated that [Overall (I-squared)=99.6% >50%, p=0.000], which shows that there are obvious differences in the work experience return rate between different studies; (Heterogeneity between groups: P =0.003 <0.05) shows that there is a significant difference in the rate of return of work experience between urban and rural areas. [4]

4.1.3 Interpretation of Adj- R² forest map

For the purposes of this article, Adj-R² is a comprehensive index that takes into account education level, working years and work experience, in addition to gender, work area and other influencing factors, which shows that the independent variables can explain the overall level of changes of the dependent variables. [Adj-R²=0.08, 95 % CI (0.08, 0.08), P <0.001] shows that every additional unit will increase income by 8%. This study is statistically significant. According to the forest map, the Adj-R² effect size is combined and calculated that [Overall (I-squared) =99.8% >50%, p=0.000], which shows that there are obvious differences in the human capital under consideration of comprehensive factors between different studies; (Heterogeneity between groups:

$P = 0.000 < 0.05$ shows that various factors have different degrees of influence on the rate of return on urban and rural human capital.

4.2 Examining publication bias

In meta-analysis, publication bias test is often used to determine whether there is a publication bias in a published paper. Examining publication bias is mainly done through Funnel chart, Begger's test and Egger's test. In this paper, Begger's test is selected for examining publication bias. The P value is the test value of the degree of publication bias. If $P < 0.05$, it means that the literature included in the study has publication bias; otherwise, it does not exist. The P values of β_1 , β_2 , and Adj-R² are all greater than 0.05, indicating that there is no publication bias in the literature included in this study. [5]

4.3 Meta-regression analysis

This article divides the urban and rural areas into two groups to study the different effectiveness of the human capital rates of return in the urban and rural areas. As shown in β_2 ($p > |Z|$) = 0.032 = Adj-R² ($p > |Z|$) = 0.032 = β_1 ($p > |Z|$) = 0.026 < 0.05. It is indicated that the human capital rates of return in urban and rural areas is statistically significant; Adj-R² (Coef.) = 0.081 > β_1 (Coef.) = 0.042 > β_2 (Coef.) = 0.009, indicates that the explanation strength of urban and rural factors to the human capital return rate under comprehensive considerations, namely Adj-R² is 8.1%, the explanation strength of urban and rural factors to the education return rate, namely β_1 , is 4.6%, and the explanation of urban and rural factors to the work experience return rate, namely β_2 , is 0.09%, indicating that the urban and rural factors have a certain impact on the rate of return on human capital, mainly through education and work experience, among which urban and rural factors have the greatest impact on education of human capital. [6]

5. Research conclusions and advice

5.1 Conclusions

The research on the heterogeneity of the rates of return on human capital in urban and rural areas is conducive to the improvement of education levels, promotes the sustainable development of relatively poor rural areas in China, and gives full play to the role of human capital in realizing rural revitalization and common prosperity. [7] Firstly, there are obvious differences between different studies on the human capital return rates; secondly, there is no publication bias in all research variables. Third, the urban and rural factors have a certain impact on the rate of return on human capital, mainly through education and work experience, among which urban and rural factors have the greatest impact on education of human capital.

5.2 Advice

Pay attention to the income of educational resources, continue to improve rural education conditions, which will create sufficient resources to reduce the gap in the rates of return of urban and rural education.

With the help of science and technology to innovate education, realize the sharing of high-quality educational resources between urban and rural areas, which will provide necessary technical conditions to reduce the gap in the rates of return of urban.

We should focus on the advantages of rural areas, integrate various resources, and awaken the

endogenous development momentum in rural areas, which will narrow the gap between urban and rural education yields. [8]

The effect of educational scale means that when the scale reaches a certain level, the organic combination of production factors produces an effect of $1+1>2$, which maximizes the value of resources. Further give play to the important role of education in consolidating the results of poverty alleviation. In the process of continuously increasing the rates of return of education in rural areas and improving the overall style of rural areas, we should adhere to local conditions, maximize the effectiveness of rural areas' educational resources, and form rural areas' development characteristics and advantages, in order to promote the intensive and large-scale development of educational resources in rural areas

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