A Study on the Effect of Education Matching on the Wages of Low-Income Labor Force

Beibei Dong(✉)

School of Public Administration, Sichuan University, Chengdu 610000, China
1305865963@qq.com

Abstract. This paper found that there are under-education, educational adaptation and over-education in both the low-income labor force and the middle-and high-income labor force. The rate of return on education of low-income labor force is 17.1%, and that of middle-and high-income labor force is 42.2%. In the low-income labor force, the over-educated are subject to significant wage penalties, and their logarithmic wages fall by an average of 0.199 compared with the educational adaptors. Those with under-education received a significant wage premium, and their logarithmic wage income increased by an average of 0.125 compared with the educational adaptors.

Keywords: low income · under-education · educational adaptation · over-education

1 Introduction

Since the 1970s, education matching has attracted the attention of the international community [1]. In the field of employment, according to the matching degree between educational level and post requirements, scholars divide educational matching into three states: under-education, educational adaptation and over-education [2]. If the educational level of the worker happens to be in line with the educational level required by the job, he thinks that the education is appropriate; if it is less than the educational level required by the job, he thinks that the education is insufficient; if it is higher than the educational level required by the job, it is excessive education [3]. Under-education and over- education are called educational mismatch. The research on education matching mainly focuses on the impact of matching conditions on labor market results, such as the impact of education matching on wage income [4], job satisfaction [5] and so on. Scholars find that in the labor market of developed countries, workers with over-education are punished by certain wages, while workers with under-education enjoy a certain wage premium [6]. Peng Shuhong put forward that under the same post education requirements, the job satisfaction of the overeducated is the lowest, and that of the undereducated is the highest [7]. Compared with other groups, it is of great significance to analyze the impact of the low-income labor force education matching on the wage income.

D. Kumar et al. (Eds.): IEIT 2023, AHSSEH 10, pp. 975–979, 2023.
https://doi.org/10.2991/978-94-6463-230-9_117

2 Research Hypothesis and Variable

2.1 Research Hypothesis

Sen Amartya interprets poverty as a lack of substantive freedom, and poor groups are deprived of access to education, health care, pension and other resources [8]. There is a gap between the middle and high income groups in terms of educational opportunities and resources.

Hypothesis 1: Under-education mainly occurs in low-income workers, and over-education mainly occurs in middle-and high-income workers.

The theory of human capital holds that education can increase income by increasing productivity [9]. A large number of workers will voluntarily or unvoluntarily engage in posts higher than or lower than their own educational level, and under-education and over-education are common in the labor market [10].

Hypothesis 2: under-education will increase the wages of low-income workers relative to educational suitability, while over-education will lead to a decline in wages.

2.2 Variable Selection

Combined with Mincer equation model, D-H equation model and V-V equation model, taking China Family Panel Studies (CFPS2018) survey as data sample, the influence effect of education matching on wage income of low-income labor force is calculated.

Independent variables: Under-education, educational adaptation and over-education.

Dependent variable: The dependent variable of this study is the wage income of low-income labor force.

Control variable: The control variables can be divided into four parts: person, employment, family and regional characteristics.

3 Model Selection

In the study of the relationship between education and wage, scholars often use Mincer equation as the basic model [11]. In 1981, Duncan and Hoffman put forward the ORU equation, also known as the D-H model. In 1989, Verdugo and Verdugo put forward the V -V model to improve the ORU equation model.

$$AE = RE + OE - UE \tag{1}$$

AE is the actual number of years of education, RE is the required number of years of education, OE is the number of years of education, UE is the number of years of insufficient education.

The expression of ORU equation is as follows:

$$\ln(W) = \alpha_0 + \beta_{re}S_{re} + \beta_{oe}S_{oe} + \beta_{ue}S_{ue} + \gamma_1 X + \mu \tag{2}$$

β_{re}, β_{oe}, β_{ue} represents the marginal utility of years of education on income when education is appropriate, over educated, and under educated. And the relationship is as follow:

$$S_{oe} = S_{ae} - S_{re},\ S_{ae} > S_{re} \text{ and } S_{oe} = 0,\ S_{ae} \leq S_{re} \tag{3}$$

$$S_{ue} = S_{re} - S_{ae},\ S_{ae} < S_{re} \text{ and } S_{ue} = 0,\ S_{ae} \geq S_{re} \tag{4}$$

$S_{re}, S_{oe}, S_{ue}, S_{ae}$ In the V-V equation, the relation between, and is as follows:

$$\text{Soe} = 1, \text{Sae} > \text{Sre} \text{ and } \text{Soe} = 0, \text{ae} \leq \text{Sre} \tag{5}$$

$$\text{Sue} = 1,\ \text{Sae} < \text{Sre} \text{ and } \text{Sue} = 0,\ \text{Sae} \geq \text{Sre} \tag{6}$$

4 Feature Analysis

The research selects the standard 50% of the median per capita income of the national residents as the low income line. The subjects were divided into two groups: low income group and middle and high income group (see Table 1).

As can be seen from Table 1, Compared with the middle and high income labor force, under-education of the low income labor force accounts for a higher proportion, while the over-education accounts for a lower proportion.

We calculate that the return coefficient of education for the low-income labor force is 0.171, that is, for every unit of increase in the level of education, the income increases by 17.1%. For every unit of education of the middle and high income labor force, the income increases by 42.2%, which is much higher than the proportion of the income growth of the low income labor force. From the above analysis, it can be concluded that hypothesis 1 is not fully valid.

Table 1. Matching of low-and middle-high-income education

	Under-education (%)	Education adaptation (%)	Over- education (%)
Low income	50.32	26.27	23.41
City	52.11	21.64	26.25
Rural areas	44.21	29.70	26.09
Middle and high income	48.85	24.46	26.69
City	41.55	26.73	31.73
Rural areas	48.22	25.23	27.00

Table 2. Estimation results of virtual variable model.

	(1)	(2)	(3)	(4)	(5)
Excessive education	−0.206*** (− 4.65)	−0.196*** (− 4.39)	−0.216*** (− 4.45)	−0.205*** (− 4.43)	−0.199*** (−4.20)
Insufficient education	0.085*** (2.41)	0.113*** (1.09)	0.103*** (1.32)	0.076*** (2.36)	0.125*** (1.62)
Population characteristics		Control	Control	Control	Control
Employment characteristics			Control	Control	Control
Family characteristics				Control	Control
Regional characteristics					Control
Cons	8.832*** (265.47)	9.695*** (105.95)	10.000*** (77.30)	9.534*** (71.28)	9.578*** (69.93)
R^2	0.01	0.09	0.11	0.16	0.16

T statistics in parentheses* * P < 0.05** P < 0.01*** P < 0.001.

5 The Effect of Education Matching on the Wages of Low-Income Labor Force

In order to ensure the accuracy of the calculation results, personal characteristics, family characteristics, employment characteristics and regional characteristics control variables are added to the equation in turn. Form (1)-(5) five equations, the results are shown in Table 2.

Based on the calculation results of adding all the control variables, it is concluded that under the same other conditions, for every unit of over-education, the logarithmic wage income decreases by an average of 0.199. For every additional unit of under-education, logarithmic wage income increases by an average of 0.125. Hypothesis 2 of the study is verified.

By using a variety of matching methods, we found that the Average Treatment Effect on the Treated (ATT) value of insufficient education is about 0.15. The ATT value of overeducation is about-0.19. it is similar to the 0.125 and 0.199 calculated by the equation model, which shows that the empirical analysis results of this study are robust.

6 Conclusion

There are under-education, educational adaptation and over-education in the low-income labor force and the middle-and high-income labor force. The rate of return on education of low-income labor force is 17.1%, which is much lower than that of 42.2% of middle-and high-income labor force. In the low-income labor force, those who are over-educated are subject to significant wage penalties. Under the same other conditions, for every additional unit of education, logarithmic wage income falls by an average of 0.199. The over-education receive a significant wage premium. For every unit of insufficient education, the logarithmic wage income increases by an average of 0.125.

References

1. Richard B. Freeman.(1976). The Overeducated American. New York: Academic Press. pp:35–40. https://doi.org/10.1080/00091383.1976.10568981.
2. Duncan, G. J. Hoffman, S. D. (1981). The Incidence and Wage Effects of Overeducation. Economics of Education Review, 1(1): 75–86. https://doi.org/10.1016/0272-7757(81)90028-5.
3. Wu Xiaogang, Li Xiaoguang (2021). Changing Trends in Education Matching in the Chinese Urban Labor Market: A Dynamic Analysis of the Age-Period-Generation Effect Social Sciences in China. (02):102–122+206–207. https://kns.cnki.net/kcms2/article/abstract.
4. Ragoobur, Verena Tandrayen1. (2022) Education Mismatch and Wages in Mauritius: Premium or Penalty. Review of Economics/Jahrbuch für Wirtschaftswissenschaften. 73(02): 103–129. https://doi.org/10.1515/roe-2021-0036
5. Sam, Vichet. lmpacts of Educatiroral Mismatches on Job Satisfaction: The Case of University Graduates in Cambodia. International Journal of Manpower. (01): 84–99. https://doi.org/10.1108/IJM-07-2018-0229.
6. Yan Min, Wang Weiguo (2018) The Penalty Effect of Educational Mismatch on Wages: An Empirical Study Based on Micro Panel Data of China. Journal of Finance and Economics.44(03):84–96. https://doi.org/10.16538/j.cnki.jfe.2018.03.007.
7. Zhou Mi, Luo Tingting, Zhao Xiaolin, Tan Xiaoting. (2018) The Effect of City Scale on the Migrant Workers' Wage Premium from the Perspective of Education and Job Matching. Journal of Agrotechnical Economics. 280(08):35-43. https://doi.org/10.13246/j.cnki.jae.20180518.001.
8. Mummendey, A. Kessler, T. Klink, A, Mielke, R.(1999). Strategies to Cope with Negative Social Identity: Predictions by Social Identity Theory and Relative Deprivation Theory. J Pers Soc Psychol, 76(2):229–245. https://doi.org/10.1037/0022-3514.76.2.229.
9. Marioni, Larissa da Silva (2021). Overeducation in the labour market: evidence from Brazil. Education Economics. (01):53–72. https://doi.org/10.1080/09645292.2020.1832201.
10. Fu Qiong. (2023) Research on Educational Mismatch and Pay Effect. Zhejiang Social Sciences. (04):81–89+159. https://doi.org/10.14167/j.zjss.2023.04.005.
11. Rubb, Stephen (2003). Overeducation in the labor market: a comment and re-analysis of a meta-analysis. Economics of Education Review,22(6),621–629. https://doi.org/10.1016/S0272-7757(02)00077-8.