

The influence of family background and parents' education level on the income of their children

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Abstract: Based on the Probit model and Mincer equation, this paper uses CHIP (Chinese Household Income Project) to study China's economic income inequality from the perspective of family education background. The results show that individual income is significantly affected by education level; At the same time, personal education level is affected by the education level of parents. That is to say, the higher the educational level of parents, the greater the positive impact on their children's education, and the greater the positive impact on their children's income. Parents with higher education level are more likely to have their children receive high school and university education. The inequality of educational opportunity is higher in women than in men, and higher in cities than in rural areas.

Keywords: Educational achievements, Family influence, Probit model, Mincer equation

1. Introduction

In most countries, the rapid economic growth is usually accompanied by the aggravation of income and wealth inequality. There is a statistically significant correlation between the socio-economic status of parents and children (Li Chunling, 2003) [1]. Family is the birthplace of children's education. Family background plays an important role in the decision-making of children's education (Li Chonglu and Qiu Zeqi, 2016) [2]. The socio-economic status, educational achievements and educational resources of parents will affect the children's educational achievements. In addition, the urban-rural dual structure formed in China since the late 1950s has resulted in a large gap in urban-rural development level, residents' education level and ideology (Wang Haigang, Li Shi et al, 2007) [3], and the problem of "small town problem maker" has also been widely concerned. Therefore, this paper will also focus on the gap between urban and rural areas, and study the difference between parents' education level and children's income between urban and rural areas.

2. Model design and empirical analysis

2.1 Variable selection

This paper uses the 2013 CHIP (Chinese Household Income Project) database. In order to accurately investigate the income and education level of the offspring, the samples under 18 years old and over 65 years old are excluded. According to the highest level of education in 2013, the education level is divided into four categories: primary school, junior high school, senior high school (including ordinary high school, vocational high school and technical secondary school), and University (including junior college, undergraduate and graduate). At the same time, this paper also investigates the years of education of individuals, and the relevant statistical results are shown in Tables 1 and 2. It can be seen that the education level of parents is between primary school and high school. However, the education level of parents shows obvious gender differences, and the education of mothers is in a weak position. The average educational level of the offspring is much higher than that of the parents, and their educational level has increased by 1-2 levels. According to gender, urban and rural areas, we can find that the average educational level of the offspring is in line with the following rules: the educational level of men is higher than that of women, and the educational level of urban residents is higher than that of rural residents.

Table 1: Descriptive statistics of intergenerational education years (cities)

	father	mother	Offspring	male	female
<i>Average (Education)</i>	2.2517	1.7671	4.3876	4.5438	4.2332
<i>standard deviation</i>	1.5225	1.2299	2.2145	2.2245	2.1931
<i>Observation value (piece)</i>	17461	17461	17461	9713	7748

Table 2: Descriptive statistics of intergenerational education years (rural)

	father	mother	Offspring	male	female
<i>Average (Education)</i>	1.5509	1.2425	2.9099	3.0296	2.7802
<i>standard deviation</i>	0.8736	0.5998	1.4684	1.4239	1.5045
<i>Observation value (piece)</i>	33357	33357	33357	18075	15282

2.2 Model design

2.2.1 Model design for testing the correlation between personal income and education level

The extended Mincer equation is used to verify the relationship between individual income and education level. The specific equation is as follows:

$$\ln Y_i = \alpha_0 + \alpha_1 EDUC_i + \alpha_2 EXP_i + \alpha_3 EXP_i^2 + \delta X_i + e_i \quad (1)$$

Among them, the explained variable is the logarithm of hourly wage, which represents the rate of return on education. EXP_i refers to work experience, which adopts the international standard, that is, work experience (EXP_i) = age – years of Education – 6. X_i indicates whether the marital status and work unit are state-owned or not, as control variables.

2.2.2 Model design for testing intergenerational educational mobility

In order to verify the intergenerational mobility of education, Probit model is adopted. According to the standards of Li Lulu and Zhu bin (2015) [4], the occupations are divided into four categories: first, senior non manual labor occupations; Second, general non physical work occupation; The third is manual labor in industry / service industry; Fourth, agricultural manual labor.

In addition, Bourguignon et al. (2007) [5] pointed out that there is an interactive relationship between environment and effort in the process of determining an individual's educational level. The effort level of a certain offspring is calculated as follows (Checchi and Peragine, 2010) [6]:

$$\begin{aligned} \text{Effort} = & (\text{years of education of children} - \\ & \text{average years of education of children of the same age}) - \\ & (\text{years of education of parents} - \\ & \text{average years of education of parents of the same age}) \end{aligned} \quad (2)$$

2.3 Regression results and empirical analysis

2.3.1 Regression analysis of personal income and education level

Table 3: Regression estimation of individual education level to income

	city		countryside	
	Regression 1	Regression 2	Regression 3	Regression 4
<i>Years of education</i>	0.0908*** (30.04)		0.0243*** (9.65)	
<i>Education level</i>		0.141*** (30.61)		0.0597*** (12.13)
<i>Hands-on background</i>	0.0225*** (9.31)	0.0251*** (10.32)	0.0182*** (10.37)	0.0207*** (11.62)
<i>.....</i>	<i>.....</i>	<i>.....</i>	<i>.....</i>	<i>.....</i>
<i>Female</i>	-0.245*** (-16.29)	-0.257*** (-17.09)	-0.327*** (-27.22)	-0.331*** (-27.61)
<i>_cons</i>	1.230*** (24.47)	1.587*** (39.33)	2.127*** (62.43)	2.118*** (71.35)
<i>Obs</i>	10008	10008	16231	16231
<i>Adj R-squared</i>	0.1685	0.1711	0.0683	0.0664

Table 3 shows the regression results of Mincer equation for urban and rural areas. It can be seen that

whether in rural or urban areas, the impact of education on personal income is higher than that of years of education, which is consistent with the prior hypothesis. At the same time, the regression results also show obvious differences between urban and rural areas: education level has a greater impact on income in cities. This phenomenon may be because most of the industries that urban residents are engaged in need higher human capital, so higher education level is closely related to higher income. The regression results also show the phenomenon of gender discrimination in wage income. The wage level of women is significantly lower than that of men with the same education level, especially in cities.

2.3.2 Regression analysis of intergenerational mobility of Education

Tables 4 and 5 report the estimated results of Probit model for urban and rural samples, respectively, reflecting the extent to which parents' education affects children's educational level.

Table 4: Regression results of probit estimation for urban samples

	Regression 4.1	Regression 4.2	Regression 4.3	Regression 4.4
<i>Father junior high school</i>	0.557*** (23.00)	0.536*** (21.85)	0.540*** (21.95)	0.219*** (9.36)
<i>Father high school</i>	1.110*** (34.89)	1.067*** (32.46)	1.071*** (32.54)	0.260*** (8.49)
<i>Father University</i>	2.189*** (41.31)	2.111*** (38.37)	2.118*** (38.44)	0.395*** (7.84)
<i>Mother junior high school</i>	0.0794***	0.0842***	0.0911***	0.162***
<i>Children have brothers</i>			-0.0383** (2.14)	-0.0797* (-1.81)
<i>Children have sisters</i>			-0.0192 (1.12)	-0.0677*** (-4.31)
N	17461	17461	17461	19303
Pseudo R2	0.094	0.102	0.103	0.087

Table 5: Regression results of probit estimation for rural samples

	Regression 5.1	Regression 5.2	Regression 5.3	Regression 5.4
<i>Father junior high school</i>	1.535*** (29.38)	1.496*** (28.14)	1.499*** (28.20)	0.361*** (4.78)
<i>Father high school</i>	2.837*** (30.87)	2.766*** (29.30)	2.770*** (29.35)	0.276** (2.06)
<i>Father University</i>	5.916*** (22.66)	5.810*** (22.06)	5.832*** (22.15)	0.769** (2.05)
<i>Mother junior high school</i>	0.00868	0.0278	0.0307	0.703***
<i>Children have brothers</i>			-0.168*** (5.12)	-0.0737* (1.65)
<i>Children have sisters</i>			-0.0439* (1.77)	-0.00663 (-0.16)
N	33357	33357	33357	33357
Pseudo R2	0.084	0.082	0.105	0.097

From regression 4.1 and 5.1, we can see that both in urban and rural areas, parents' education at all levels has a positive and significant impact. It can be seen from regression 4.2 and 5.2 that the influence of family income and social status is positive. The higher the father's occupation is, the greater the influence on the education level of the offspring is. From regression 4.3 and 5.3, it can be seen that siblings have a negative impact on the educational achievement of their children. Due to the limited resources, whether the children are male or female, they can enjoy less resources when they have siblings, so the educational achievement is poor. It can be seen from regression 4.4 and 5.4 that with the addition of effort factor, the influence of gender on offspring becomes insignificant. After the addition of effort factor, the influence of father's educational level on offspring's educational achievement increases significantly, but the influence of mother's degree decreases relatively. Comparing the urban and rural regression, we can find that compared with the urban, the education level of rural fathers will have a greater impact on the educational outcomes of their children. At the same time, the effect of brothers and sisters is more obvious in rural residents. This result is in line with the policy recommendations of

comprehensively implementing compulsory education in rural areas, improving the education level of rural residents and promoting the concept change and gender equity in rural areas.

3. Conclusion

Based on the results of regression analysis, this paper believes that family background, especially parents' education level, has an important impact on children's educational achievement. The difference of family background will be transformed into the inequality of human capital stock of the offspring, and further transformed into the inequality of income of the offspring through the signal effect of labor market and education income, which aggravates the solidification of intergenerational inequality. Relevant public policies should focus on reducing the negative impact of relatively disadvantaged environment on individual education decision-making, so that all groups of society can get fair education opportunities.

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