Household Income and Education: An Empirical Research Based on CFPS

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Abstract: In today's fast-paced economy, an increase in income frequently results in improved educational resources. This paper employs an OLS model to examine the relationship between household income and educational attainment. Experiments were conducted with control variables and other steps using data from the 2018 China Family Panel Survey (CFPS), and the results revealed a positive coefficient on the household income variable, providing preliminary evidence that household income has a positive effect on educational attainment, i.e., an increase in household income results in a significant increase in an individual's educational attainment. The purpose of this study is to analyse income and education levels based on individual and household data, to examine the educational base required for future social development, to lay the groundwork for future research, and to suggest that future policies should pay more attention to the distribution of educational resources, as improvements in household conditions can lead to some households falling short of predicted educational levels due to the unequal distribution of educational resources.

Keywords: household income, education, resource equality

1. Introduction

It is widely known that the popularization of compulsory education is getting higher and higher with the development of society, and people are attaching more and more importance to education [1]. Nowadays, With the rapid development of China's economy, the country has implemented targeted poverty alleviation, giving more opportunities to rural children, and people's income is getting higher and higher [2]. With more and more educational opportunities, the impact of household income is particularly important. Previous studies have focused on the relationship between household income and socioeconomic aspects, as well as topics related to national development.

Income is an important index to measure a household life level, the higher the income means the living conditions of the household, the better, in the local can get the more resources, and compared with some difficult to sale of fixed assets, the average household income can represent a household of more general level, because there is some deviation in fixed assets, such as the housing production value must but only one suite, So this property in a sense is not going to provide for the improvement of everyday life.

Therefore, in order to improve people's education level and explore the close relationship between income and education, this study uses the data of 2018 China household Panel Survey (CFPS) to enrich the research in this aspect. This paper will be organized in the following ways: the first part is

introduction, the second part is literature review, which summarizes some previous related articles, the third part is research method, including model construction, and the fourth part is results. The last part of this paper summarizes and criticizes the results of this study.

2. Literature Review

In this research, Wang jing and Luo Chuliang showed that from 2002 to 2013, the enrollment rate of senior high school increased significantly, and the influence of household background factors on attending senior high school increased, while the influence of household income on attending regular senior high school and key senior high school increased slightly. household income is the key factor that restricts children's access to education [3]. It mainly affects children's access to education through parents' ability of human capital investment and credit constraint of education investment. Parents with higher incomes have greater capacity to invest in human capital, including choosing a better compulsory education for their children in primary and junior middle schools by buying a house, allowing their children to participate in extracurricular tutoring and training, and sending their children to private schools with high fees and good quality. Parents with low income have lower economic risk tolerance, are faced with greater unemployment and income fluctuations, and the opportunity cost of sending their children to school is greater for families [4].

If turn to the female perspective, there is a significant positive correlation between female education level and household income. As women's education level increases, household income also increases. Revolution changed people's consumption structure of the knowledge economy, consumption has become a household education cultivate their necessary expenses, as the new rural construction, rural household income level speed increasingly, psychological expectations in the children's education is also more and more high, the change of household income level of rural household education increasingly prominent impact consumer spending. Wang Youwen and Zhang yan show that the improvement of rural household income level promotes the rural villagers' psychological expectation for children's education, and the farmers' psychological expectation for children's education promotes the level of household education consumption expenditure [5]. Village, the income level of resident has a decisive role for the rural residents' consumption [6], Helen li and min-xuan zhang's study shows that household education consumption and the household income is directly related to not only, and present a household education consumption along with the household per capita income level and it continues to grow, with the increase of household annual income level and stepwise upward trend [7].

Investment in education, while an essential means of increasing the personal and national income of the educated, does not necessarily guarantee that everyone's income will increase to the same degree unless everyone has access to the same level and quality of education. As long as there are such disparities in the extent to which individuals invest in education, it is inevitable that they will grow. As long as there is a disparity in the level of investment in education between individuals, there will inevitably be a disparity in personal income, leading to an increase in income inequality [8]. However, in actuality, education is unquestionably a significant factor in determining the degree of income inequality, along with the broader institutional environment and specific incentive arrangements. Education is unquestionably one of the most crucial factors, if not the most crucial, when labour market regulation is in effect. This is due to the fact that the impact of various incentive system arrangements on individual incomes tends to enhance rather than diminish the importance of education investment [9].

From the above research, it can be found that household income is closely related to children's education level, and parents' education level will also affect household income, and again affect children's education level. Therefore, this paper will use the data of 2018 China household Panel Survey (CFPS) to study the relationship between household income and education level.

3. Methodology

3.1. Data and Sample

The data for this article comes from China Family Panel Survey (CFPS), and author has taken the data of 2018 as research samples. The CFPS is a nationwide, comprehensive social tracking survey that aims to reflect social, economic, demographic, educational, and health changes in China by tracking and collecting data at the individual, household, and community levels and providing a database for academic and policy research. CFPS data are mainly collected through a large number of questionnaires, including personal questionnaires, household economic questionnaires, household relationship questionnaires and children's questionnaires. CFPS is a nationally representative survey, so this paper selects the data of personal questionnaire and household economic questionnaire for integrated processing. A total of 31,795 samples were obtained.

3.2. Variables

3.2.1. Dependent Variables

This paper takes the dependent variable "a recent survey of the highest educational attainment" as the evaluation index of educational level. In this index, author only selected a few of them as the data criteria for the test: 0="Never went to school", 6="Primary school", 9="Junior high school", 13="Senior high school/technical school/technical school/vocational high school", 15="Junior college", 16="University degree"[10].

3.2.2. Independent Variable

The explanatory variable about household income is represented by the total household income. From the CFPS, author choose the the total income as the most important independent variable, but to make the results easier to view, author used the logarithmic form of household income as the independent variable in the model(*lfincome1*).

3.2.3. Control Variables

There are many other factors will have influence of the educational level, including the personal learning, spending on education, inequality, healthy condition and household background. Therefore, this paper chose these four types of control variables, including: from the town or the country(*urban18*), total expenditure on education(*pd5total*), how hard individual study(*qs601n*), the inequality brought about by the gap between rich and poor(*qn6013*) and health(*qp201*). First, *urban18* indicates whether the household member is from a rural or urban area [11]; second, *pd5total* indicates how much the household spends on education. Larger cities have superior educational resources, which affects the level of education one ultimately receives [12]. Then, *qs601n* indicates how hard a person studies; the more serious a person studies, the more likely he or she is to learn more, get better grades, and therefore have higher qualifications [13]; *qn6013* indicates the inequality caused by the gap between the rich and the poor; the wealthier a place is, the more educational resources it has on average [14]; Lastly, *qp201* indicates a person's health, with robust individuals being more likely to concentrate on their studies [15]. These control variables were useful to solve the question about whether more factors affect the relationship between income and education. The data are all derived from the questionnaire, which sets many questions to express the degree and finally obtains our independent variables. Therefore, the selected control variables are all represented by a group of numbers to represent the degree, thus representing individual choice and state.

3.3. Model

This paper uses the OLS model to study the relationship between the household income and educational level. Because by analyzing available there are many factors that can affect the level of education degree, and which may affect the income change, thus affecting education degree, so it needs to take into account all of them, but there are too many factors, here will choose a few more important and representative, the general model is as follows:

$$edu\_last_{ijt} = \beta_0 + \beta_1 lfincome1_{ij} + \beta_2 urban18_{ij} + \beta_3 pd5total_{ijt} + \beta_4 qs601n_{ij} \qquad (1)$$
$$+ \beta_5 qn6013_{ij} + \beta_6 qp201_{ij} + u_{ij}$$

In this formula, i represents individuals, j represents provinces, and edu_last_{ij} represent a recent survey of the highest educational attainment, $lfincome1_{ij}$ represents different household income and u_{ij} represents the error terms.

4. Results

4.1. Summary Statistics

The descriptive statistics for the variables required for the article are shown below. Each row represents a different variable, while each column shows the number of variables, the mean, the standard deviation, the minimum value and the maximum value.

Table 1: Descriptive statistics of variables.

Variable	Obs	Mean	Std.Dev.	Min	Max
edu_last	33650	3.686	7.695	-8	16
lfincome1	35626	10.968	1.003	2.708	16.03
urban18	35678	-.056	2.269	-9	1
pd5total	31833	575.425	3777.539	-8	191000
qs601n	31833	-7.626	2.044	-8	5
qn6013	31833	5.757	4.85	-8	10
qp201	35678	2.879	1.629	-8	5

In the row (1), it shows that the average education level of household members is below the elementary school level, but the large standard deviation magnifies individual differences.

In the row (2), The logarithm of the average household income is approximately 10, while the standard deviation is modest, indicating that the mean is a more reliable measure of central tendency.

In the row (3), The table indicates whether the household member is from a rural or urban area. Since the negative values for rural areas are relatively minor, the average place of origin is also negative.

Then it gets the subsequent list in the same way. As the data contains a significant number of missing values, the mean statistics for each variable are biased, as evidenced by the large standard deviations for some variables, resulting in a decrease in the mean's reliability and a large difference between the maximum and minimum values.

4.2. Estimated Results

The final result of regression is shown in the chart below, with rows representing the dependent variable results of different independent variables, columns representing all independent variables,

The values in parentheses represent the standard deviation of each variable and intermediate values representing the coefficients of each variable.

Table 2: Regression results.

	(1)	(2)	(3)	(4)	(5)
Lficome1	1.523***	1.520***	1.501***	1.359***	1.305***
	(37.01)	(35.69)	(35.75)	(35.01)	(33.57)
urban18	0.378***	0.385***	0.383***	0.322***	0.353***
	(9.53)	(9.57)	(9.66)	(8.79)	(9.64)
pd5total		0.0000792***	0.000138***	0.0000598***	0.0000474***
		(7.11)	(12.42)	(5.78)	(4.58)
qs601n			-0.626***	-0.172***	-0.164***
			(-30.37)	(-8.63)	(-8.22)
qn6013				0.617***	0.658***
				(74.27)	(75.24)
qp201					-0.357***
					(-14.50)
_cons	-13.18***	-12.95***	-17.55***	-16.01***	-14.57***
	(-29.19)	(-27.67)	(-36.14)	(-35.67)	(-31.80)
N	33607	31795	31795	31795	31795
R-sq	0.045	0.046	0.073	0.210	0.215

In the column (1), author control the individuals from the town or the country, found that the household income has a positive impact on the individual's educational income.

In the column (2), total expenditure on education is controlled on the basis of column (1), and it can be found that the household also has a positive impact on the individual's educational level, but it has lowered the coefficient of the household income by 5% on average.

In the column (3), author control the how hard individual study on the basis of column (2), found that the household also has a positive impact on the individual's educational level, but it has lowered the coefficient of the household income by 8% on average.

Then author get the subsequent list in the same way. It is not difficult to find that every time author control one more variable, the coefficient of the independent variable of household income will decrease to varying degrees. When all variables are covered in the end, the coefficient has decreased by 34%, but it is still positive.

It can be clearly seen that the t-statistic of the coefficients of household income far exceed the critical value at the 5% confidence level of freedom greater than 120, which means that all the coefficients are significant. Except for the dependent variable coefficient that author mainly focus on, which is statistically significant, other control variables are all within the confidence interval of 5%, which indicates that other variables do have a non-negligible impact on education level. In Table 2, the value of R-squared is added. It can be seen that with the increase of control variables, the goodness of fit is also increasing, which also shows the importance of other variables.

5. Conclusion

This study uses data of 2018 Chinese household Panel Survey (CFPS) to construct a model to analyze the relationship between household income and education level. Using OLS model structure, and found that the higher the household income, education level will increase accordingly, which means that if you want to make the country's per capita education levels rise, the economy is a ring, cannot

be ignored in the outbreak period of economic downturn, household income is in decline, so countries heavily subsidized, encourage consumption and management, It is also a matter of preventing educational problems caused by economic problems.

At the same time, it is easy to find the defects of this study. First, since the data only used two years of data in 2018, it means that the sample selection may not be the most consistent, because these two years were randomly selected and the time is relatively close. Second, the establishment of the model only uses simple analysis, without considering the correlation and nonlinear relationship of independent variables; Third, failed data in the sample are not removed, which may lead to errors in the results; Fourthly, there are many other factors in the database that may lead to the change of dependent variables. Due to the limitations of the study, author only selected a few as independent variables of different aspects for modeling, so the impact of other factors needs to be studied later.

In conclusion, this study also needs a lot of places to improve, but the purpose of this study is to research on bedding, urging people pay attention to the importance of household income for their children's education, education and affect income at the same time, the close relationship of the two needs all people take more attention to, in order to improve the country's average level of education in the future.

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