A Quantitative Analysis of the Relationship between Education Level and Income

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Abstract. Since entering the 21st century, China has been paying more and more attention to academic qualifications. Some posts have set academic qualification thresholds, and people are often willing to improve their academic qualifications to obtain better remuneration. In this case, it is necessary to carry out corresponding research on the income relationship between academic qualifications and wages. This research and conclusion will help students to enhance their learning awareness and deeply understand the important impact of academic qualifications on wages and salaries so as to encourage students to continue their studies and lifelong learning so that they can have more choices in their future life. The topic of the study is whether there is a significant difference in the salary of students with different degrees. The research method is linear regression in quantitative analysis. The results are as follows: Students' different educational backgrounds have an impact on their wages and salaries, and the highest educational background has a positive correlation with their income.

Keywords: Quantitative analysis; education; income.

1. Introduction

In recent years, China has paid more and more attention to the cultivation of talent. According to relevant data, the admission rate of the national college entrance examination in 2022 is 92.89% [1], among which the admission rate of undergraduate students is 41.63%, and college students are not rare in today's society. According to the recruitment requirements of listed companies,65.4% to 75.3% of the positions are required for bachelor's degree [2]. Educational degree is one of the most important influencing factors recognized by society.

"The main research fields of the three winners of the 2021 Nobel Prize in Economics are empirical microeconomics, and the research topics are mostly related to education and labor. They took the birth season as the instrumental variable and found that for children born in the 1920s, people born in the first quarter had 0.126 years less schooling than those born in the other three quarters, and the rate of return on education was 0.7 percent points lower. For children born in the 1940s, the number of people born in the first quarter is 0.109 years less than those born in the other three quarters, and the rate of return on education is 1.02 percentage points lower. The study concluded that an extra year of schooling itself has a positive impact on a person's future income level. This impact is not caused by other factors but is purely the return of education [3]."

Li Mingna, Hui Ying, Gao Teng scholars reached the following conclusions in their research: education has an impact on wages: the higher the education level, the higher the salary [4,5]. However, the percentage of salary increase due to higher education level cannot be accurately calculated. This paper makes a practical discussion on this issue.

Through this research, people will have a more comprehensive and thorough understanding of the importance of academic qualifications, jump out of the trap of "learning is useless", so as to cultivate the ability of independent learning, realize lifelong learning, help individuals make more intelligent choices, and make China gradually realize the education model of quality education. At the same time, getting a higher education can make people contact with a wider range of contacts and resources and profoundly affect future development.

This paper studies the linear relationship between academic qualifications and wages by using the Mincerian equation so as to make college students realize the importance of academic qualifications and take improving academic qualifications as the primary goal [5,6].

The article mainly includes: using Stata software to process Chinese General Social Survey (CGSS) data, using the mincer equation to explore the relationship between education and wages, making descriptive statistics on the data obtained, and drawing a chart.

2. Method

This paper mainly studies the level of education and salary and regards both education and salary as continuous variables, so calculate the linear regression coefficient, that is, use the reg model in the quantitative analysis method.

Instead of using the years of education, the degree is expressed by dummy variables. The reasons are as follows: in the CGSS data, if the educational background is converted into the years of education, there will be a large error, which will affect the final result.

Because the research is about educational background, delete the options of "refuse to answer," "do not know" and "do not apply", and delete the option of "have not attended school". Because the research is about in-service personnel, that is, people who have completed their studies and are working, delete "retired", "unemployed", "do not know", "reading" and "refuse to answer".

The factors affecting wages include: the square of years of education, occupation and age. It is added to the formula as a control variable. There are hundreds of occupation statistics, so typical "government personnel" and "teachers" are integrated.

The data used in this paper is China's comprehensive social survey CGSS, which is better than China Family Panel Studies (CFPS), in that it has a clear working year

Refer to the Mingser equation, i.e., InY-a+bS+cEXP+dEXP2+u

Where Y represents the income of workers, InY represents the natural logarithm of income, S represents the years of education, EXP and EXP represent the square of work experience and work experience, respectively, and u is the random error term.

The hypothesis listed in this study is as follows: There is a positive correlation between education level and income. The higher the education level, the higher the income.

3. Results

Table 1. Descriptive statistics

Variable name	mean value	standard deviation	Max
Income	10.99522	0.504574	16.1181
Above graduate	0.29192	0.1683639	1
Above junior college	0.3556749	0.4787732	1
Above high school	0.591546	0.4916053	1
Above junior high school	0.872723	0.3333219	1
Above primary school	1	0	1
Age	40.76903	11.23956	84
Government agent	0.0214853	0.1450123	1
Teachers	0.0411023	0.19855	1

According to table 1, it shows that, the educational background above primary school covers all data, so it will not be discussed separately later.

Table 2. Linear regression results: income analysis of education background at all levels of education and above

	Income			
	Model 2	Model 3	Model4	Model5
Above junior high school	0.6187732**			
	(0.0720297)			
Above high school		0.7492584**		
		(0.0481753)		
Above junior college			0.9647073**	
			(0.0495634)	
Above graduate				1.386445****
				(0.1367069)
working years	0.0244527**	0.0263948**	0.0313826**	0.0327014**
	(0.004413)	(0.0042773)	(0.004204)	(0.0043427)
Square of length of service	-0.0001798**	-0.0002002**	-0.000245**	-0.00026**
	(0.0000445)	(0.0000431)	(0.0000424)	(0.0000438)
Age	-0.0302842**	-0.0267407**	-0.0260706**	-0.03723376**
	(0.0029414)	(0.0028499)	(0.002786)	(0.0028111)
Government agent	0.2590621	0.0320225	-0.1935353	0.2764332
	(0.1553224)	(0.1533007)	(0.1522099)	(0.1546345)
Teachers	-0.0939959	-0.3146151**	-0.5228838**	-0.1614522
	(0.114712)	(0.1137196)	(0.1134086)	0.114811
cons	11.34711**	11.2887**	11.3098**	12.03069**
	(0.1256096)	(0.1024256)	(0.0958908)	(0.0899028)
Adjusted R^2	0.0576	0.0959	0.1211	0.0654
Obs	4156	4156	4156	4156

According to table 2, the regression result shows that the income of people with education in junior high school or above is 0.61% higher than that of people without a junior high school. The income of people with a high school education or above is 0.74% higher than that of people without a high school education. The income of people with a college education or above is 0.96% higher than that of people without a college education. The income of those with graduate education or above is 1.38% higher than that of those without graduate education. Therefore, from the above research results, the author can see that the higher the education level, the greater the income gap compared with the neighboring education level.

Table 3. Linear regression results: income analysis of each level of education relative to the next level of education

	Income			
	Model 2	Model 3	Model4	Model5
Above junior high school	0.1882812**			
	(0.0789708)			
Above high school		0.3304681**		
		(0.1454398)		
Above junior college			0.423565**	
			(0.0973618)	
Above graduate				0.8623319**
				(0.1349613)
working years	0.0271256**	0.0226246**	0.022652**	0.0088878
	(0.0056972)	(0.0069771)	(0.0080145)	(0.0124704)
Square of length of service	-0.0002023**	-0.0001573*	-0.0001325	-0.0000312
	(0.0000577)	(0.0000739)	(0.0000816)	(0.0001164)
Age	-0.0283108**	-0.0211465**	-0.0208399**	0.000165
	(0.003829)	(0.0045655)	(0.0050732)	(0.0090154)
Government agent	-0.1503464	-0.0258633	-0.3293326	-0.3142005
	(0.7209268)	(0.8126391)	(0.2842479)	(0.1651824)
Teachers	-0.6279869	-0.8155101	-0.5168017*	-0.6321112**
	(0.511098)	(0.6309348)	(0.2256574)	(0.1248121)
cons	11.21662**	11.16013**	11.40447**	11.50778**
	(0.1742722)	(0.1670305)	(0.1513867)	(0.2124296)
Adjusted R^2	0.0417	0.0205	0.0325	0.0397
Obs	1690	1270	1215	1482

The regression result shows that the income of those who have attended junior high school is 0.18% higher than those who have only attended primary school. Moreover, the income of those who have attended high school is 0.33% higher than that of those who have only attended junior high school. The income of those who have attended college is 0.42% higher than that of those who have only attended college. The income of those who have gone to graduate school is 0.86% higher than those who have only gone to college.

To sum up, it can be concluded that education level has a very significant positive correlation with wages and salaries. The higher the education level, the higher the income.

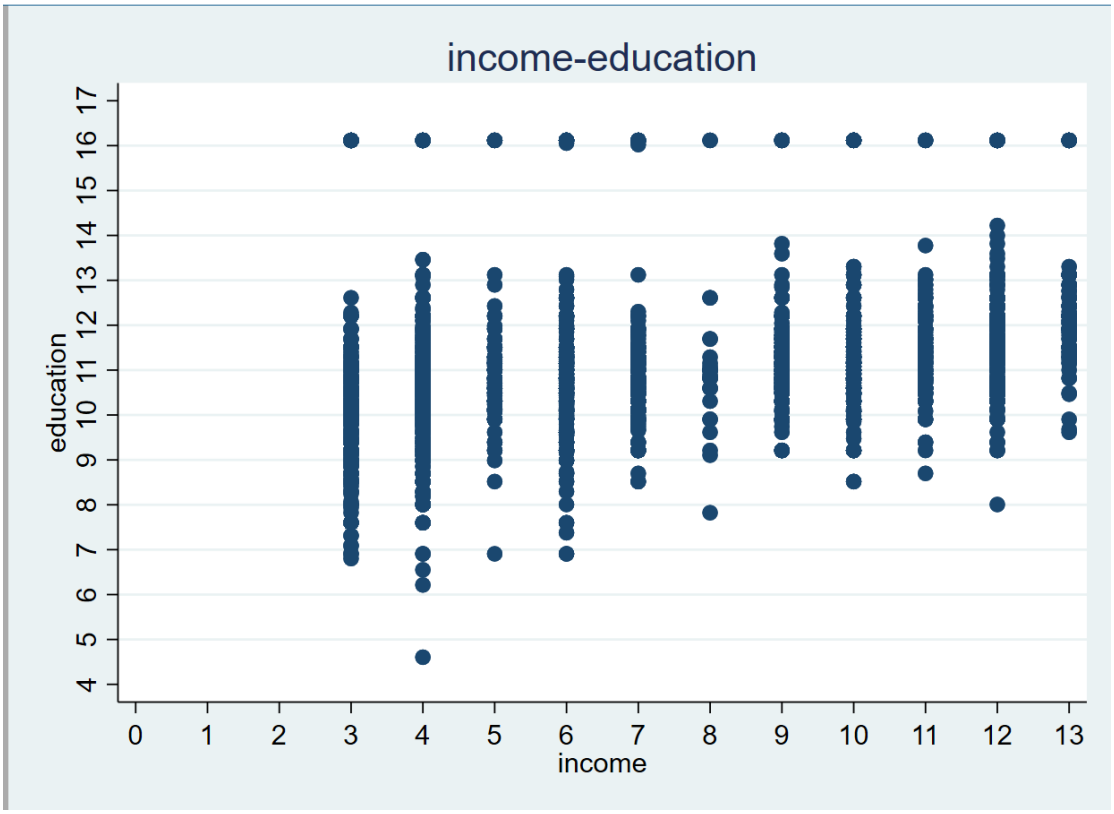

Fig 1. Relationship between education level and income

According to Figure 1, it can be concluded that education level has a very significant positive correlation with wages and salaries. The higher the education level, the higher the income.

4. Discussion

The conclusion of the study verifies the correctness of the hypothesis of this study. The research results are generally consistent with those of others but slightly different. For example:

Gao Teng mentioned in the research on the Influencing Factors of the Return on Education that the higher the education level, the higher the return on education, the higher the return on education [5]. Tang Erzi and Sun Zhen mentioned in "Employee Education, Enterprise Performance and Per Capita Wage" that employee education has a significant positive correlation with per capita wage and is strengthened through export, which once again proves the importance of education for job seekers and workers from the perspective of enterprises [6].

Wu Keming, Li Chao, and Wei Wenqi mentioned in the Empirical Study on the Employment Status of Higher Education that the higher the educational level of the higher educated, the better the type of school, the longer the service life, the better the employment status [7]. In view of this situation, the author believes that the state and enterprises should comprehensively improve the educational level and labor ability of workers through policies and positive guidance [7].

From the perspective of the state level, firstly, relevant national departments should provide employment guidance to college students to improve the educational level and working ability of future employees. For example, the cooperation between schools and enterprises, Sino-foreign cooperation in running schools, and other cooperation will enable students to have a clear goal for future career choices in the learning process. Secondly, formulate relevant policies to encourage in-service personnel to improve their academic qualifications [7]. Combine the training of labor skills with the improvement of academic qualifications and stimulate the learning interest of the employed in flexible ways. Thirdly, encourage entrepreneurship and innovation, and provide high-level returns for high-level talents. A good atmosphere of advocating academic qualifications and reading has been formed in society. Fourthly, reduce regional differences and increase support for relatively backward

regions. Local government functional departments should strengthen communication and exchange with local enterprises and take advantage of the company aggregation effect to widely attract talents to work in relatively backward regions actively [8-10]. Fifthly, improve the education mechanism so that people can receive a broader, higher level, and more professional education. The investment in education funds should be broadened in terms of sources and increased in intensity.

Besides, for enterprises, Firstly, enterprises can introduce relevant incentive policies and combine vocational training with academic upgrading to give workers working in enterprises more choices. Secondly, increase publicity efforts, use the corporate culture propaganda position to form a good atmosphere of attaching importance to education in enterprises, and encourage workers to continuously improve their academic qualifications through self-study examinations, adult college entrance examinations, and other examinations [5].

5. Conclusion

By analyzing the data of CGSS and using Stata software, this paper discusses the relationship between education level and salary and finally comes to the conclusion that education level has a very significant positive correlation with salary. The higher the education level, the higher the income.

This research is conducive to stimulating students' motivation to learn, constantly encouraging themselves to improve their academic qualifications, crossing the threshold of some positions, earning higher wages, continuing to study, continuing to lay the foundation for the future, and having a better future.

The most significant limitation of this article is that the CGSS data is the statistics made in 2018, which is slightly different from the current data. Unfortunately, this is an issue that cannot be revised due to objective sources of data collection.

Future research can pay more attention to the difference between the retained wage and the actual wage of students with different academic qualifications, and explore the reasons and determinants of the difference. Retained wages refer to "the minimum wage that individuals are willing to accept". To some extent, students' expectations of future wages can more effectively and reasonably explore the internal relationship between education and wages.

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