The Study of Returns to Private Investment in Higher Education from the Point of Employment

LES ETUDES SUR LES RENDEMENTS DE L'INVESTISSEMENT PRIVE DANS L'ENSEIGNEMENT SUPERIEUR DU POINT DE VUE DE L'EMPLOI

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Abstract: The quantitative methods are used to compare the difference of vocation and employment between the university graduates and high school graduates, which including the secondary school graduates. And the following four respects are involved to describe the impact of higher education to employment: the relative concentration degree, the difference of vocation, the weekly working time and the working industry. So we come to the conclution from the aspect of employment that private investment gets not only great market returns but also nonmarket returns.
Key words: higher education; private investment; non-market returns; employment

Résumé: Les méthodes quantitatives sont utilisées pour comparer les différences dans la vacation et dans le type de travail entre les diplômés des universités et les diplômés des collèges, y compris les écoles secondaires. Les quatre aspects suivants sont impliqués pour décrire l'impact d'une éducation supérieure sur l'emploi : le degré de concentration relatif, les différences de vocation, les heures de travail hebdomadaires, et le type de l'industrie dans lequelle ils travaillent. Du point de vue de l'emploi, nous arrivons à la conculsion que l'investissment privé peut obtenir non seulement des rendements du marché mais aussi des rendements qui ne proviennent pas du marché.
Mots-Clés: enseignement supérieur; investissement supérieur; rendements qui ne proviennent pas du marché; emploi

The problem of returns to education has been drawing the attention of educational economists. Economists has been estimating the returns to investment in higher education from the relationship between private income and education output since 1960s.And the research results almost have the same high rate of reurns, not considering the different economics development level of study object. Sstrictly speaking, the research of rate of returns to private investment in higher education only began a few years ago. Taking the citizens as its sample, paper [1] began to estamate the rate of returns to education earlier;

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In paper [2], the rate of returns to elementary and professional education are analysed with the enterprise of different owership as its study object; In paper [3], the author analysed the rate of returns to city workers' training education; And in paper [4], the rate of returns to private investment in higher education is studied; Paper [5] the rate of returns to human capital investment in transition of economy and paper[6-7] the same rate between countryside and city in China.

In short, most research define the returns to private investment in education only as the marketable income. However, nonmarketable returns become the new family investment hot point because of its more strong attractiveness.

1. THE CONNOTATION OF NONMARKETABLE RETURNS TO PRIVATE INVESTMENT IN HIGHER EDUCATION

The nonmarketable returns to private investment in higher education means the positive influence of body health, leisure quality, children health, education development and capacity of better consume choice. The common feature of nonmarletable returns is unobvious. In details, the returns mainly include the following six facts. Firstly, higher education can improve private employment quality; Secondly, higher education can help you to realise complete development; Thirdly, higher education may bring indirect benefit to investors' family; Fourthly, it can improve personal life quality; Fifthly, the higher level of education an investot gets, the higher society level he will get; And sixthly, education influence women vastly especially in improving inner-family productivity and promoting the efficiency of family affairs, which are difficult to compute by money. So in this paper, we study the problem of nonmarletable returns to higher education from improving personal employment quality.

2. THE INFLUENCE OF HIGHER EDUCATION TO WORKERS' VOCATION

2.1 The influence of higher education to workers' vocation relative concentration degree

The relative concentration degree is an index which reflects the concentration degree of employment among workers of different education level. It can describe the vocation distribution of some level of educational employee and it can also compare the difference of concentration degree among different levels of educational workers. The index of RCD is indicated by H ,and

$$H_j = \sum_{i=1}^{n} (X_{ij} / X_{\bullet j})^2 = \sum_{i=1}^{n} S_{ij}^2$$

i means vocation , j means educational level, X_{ij} means the number of j level educational workers deal with i kind of vocation, $X \cdot j$ means the number of j level educational workers, S_{ij} means the percentage of j level educational workers in all industries (Usually, the relationship of educational background with standard learning time is high school (including secondary technical school) 11 years, junior college14 years and university 15 years[3]).

[3] LI Hongsong. (2004). The accumulated benefit analysis of human capital in our country. *Journal of*

The basic point of using this index is supposing $X_{1j}, X_{2j}\mathrm{K}\ X_{nj}$ is a data series of $X_{1j} + X_{2j} + \mathrm{K} + X_{nj} = A$(when n is fixed , A is fixed)，then the limit of sum of squares is A^2/n when $X_{1j} = X_{2j} = \mathrm{K} = X_{nj}$.

Table 1

unit：%

Vocation \ Educational years	11	14	15
Manager	18.5	22.4	23.9
Technical Staff	17.5	32.8	34.0
Clerk	18.7	28.7	28.0
Commercial service	16.1	6.0	3.3
Agriculture producer	3.0	0.2	0.0
Transport and equipment operator	11.8	3.0	1.4
Others	14.3	7.0	9.5
Total	100	100	100

Data from：computered by《China Labour Statistical Yearbook 2007》

Table 2

Educational years	11	14	15
H	0.161	0.249	0.261

Data from：computered by data from table 1

In table 1 we classify the workers industry into three categories according to whether they accept higher education or not, so $n = 3$ .And the sum of employment persentage of workers in each industry classfied by educational level is 1,so $A = 1$ .And the smaller H is, the more uniform the destribution in each vocation of this educational level workers will be. That is the difference among workers number of each vocation will be smaller. So if workers distribute uniformly in each industry, then H = 1/3≈0.333;When H is getting bigger, (H must be bigger than1/3)，the workers of this education level is getting more concentrated degree, which means there are more employees in some vocation than others.

We can get the relative concentration degree of different educational level in table 2 according to data in table 1.We can see clearly from table 2 that H is getting bigger as the educational years are getting more. And H =0.161 when workers accept high school education, which close to uniform distribution mostly.

But this degree can only reflect the vocation concentration on the whole, and can't describe the influence of higher education to workers vocation. So we introduced the following analysis in order to discuss the influence.

Labor Management Plan Cadres College in Beijing, (3).

2.2 The influence of higher education to workers' vocation difference

Firstly we introduce index P ,which means the ratio of persentage of different educational workers taking up different vocation devided by the whole persentage of different vocation.

So $P_{ij} = Q_{ij} / Q_{i0}$,and i means vocation , j means educational level, Q_{i0} means the whole persentage of different vocatio, which stands by the average level of the whole persentage of different vocation. If $P > 1$,then there are more workers and the rate of employment is more concentrated in this vocation; If $P < 1$, then there are fewer workers and the rate of employment is more scattered in this vocation. We get table 3 using data from table 1 according to the above formula.

Table 3

Educational years / Vocation	11	14	15
Manager	0.86	1.04	1.11
Technical Staff	0.62	1.17	1.21
Clerk	0.75	1.14	1.11
Commercial service	1.90	0.71	0.39
Agriculture producer	2.81	0.19	0.00
Transport and equipment operator	2.18	0.56	0.26
Others	1.39	0.68	0.92

Data from：computered by data from table 1

Table 4 . High school and college workers' average working time per week

unit：hour

Education / Working time	High school	College
1－8	0.2	0.28
9－19	0.6	0.24
20－39	5.8	4.16
40	40.3	69.20
41－48	17.6	12.03
Above 48	35.5	14.09
Total	100	100

Data from：《China Labour Statistical Yearbook 2007》

From table 3 we can see:

1st. As the improving of education level, people working as manager, technical staff and clerk become more and more concentrated, which need higher cultural quality and more professional training. On the other while, almost nobody is working as agriculture producer.

2nd. On the whole, people have freedom to choose every kind of job after high school education. And the ones who have higher education work as important manager parts other than producers.

3. THE INFLUENCE OF HIGHER EDUCATION TO WORKER'S EMPLOYMENT SITUATION

3.1 The influence of higher education to worker's average working time per week

We can get the influence of higher education to working time per week, taking High school and college workers' working time per week as our study object. And the result is listed as table 4 and figure 1.

We can see simply from table 4 and line figure 1 that:

1st. The working time of labours who accept higher education is relatively consentrated. In figure 1 the line of college workers is more towering compact ,while the line of high school workers is much flatter.

2nd. Labours who accept higher education are more reluctant to accept long time job. In figure 1 we can get that most college workers put about 40 hours a week in their job, while the high school workers put more than 48 hours. This is because there is great difference in working efficiency and ability between the two kinds of workers. The college workers have much higher working efficiency, so they refuse extending working time to gain income to raise themselves, which can be easily understood by the method of utility. Leisure is more important and can bring more utility than income by long-time working after certain income in certain time for college workers.[4]

3.2 The influence of higher education to worker's industry distribution

In this paper, primary industry means agriculture(including forestry, animal husbandry and fishery),and secondary industry means industry(including mining, Manufacturing, electricity, gas, steam and hot water) ,and tertiary industry means others.

The composition of different educational workers in three industries is showing in following table 5 and complicated bar chart 2.

Table 5. The composition of different educational workers in three industries

unit：%

Education / Industry	High school workers	Junior college workers	University workers
Primary Industry	47.3	7.2	0
Secondary Industry	32.8	38.9	27.2
Tertiary Industry	19.9	53.9	72.8
Total	100	100	100

Data from：computered by《China Labour Statistical Yearbook 2007》

[4] CHEN Xiaoyu and MIN Weifang. (1998). The research of rate of returns to private investment to higher education in our country. *Research of higher education*, (6), 33-37.

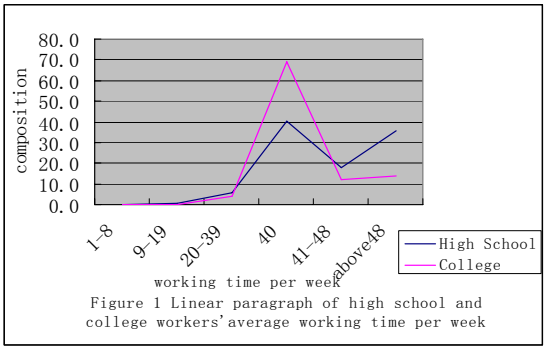

Figure 1 Linear paragraph of high school and college workers' average working time per week

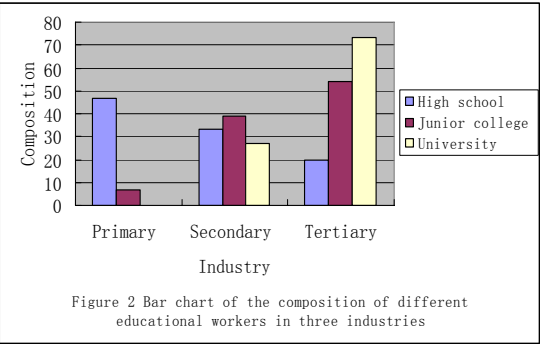

Figure 2 Bar chart of the composition of different educational workers in three industries

We can see the following from table 5 and figure 2 that:

1st. The composition of workers in the primary industry is showing downward trend as the raising of the levels of education. And there are some high school workers work in the primary industry other than college workers.

2nd. As the raising of the levels of education, the composition of workers in the tertiary industry is showing sharp upward trend. There are more than 70% of college workers in the tertiary industry, comparing with 20% of high school workers. Of course ,there is still great difference of employment among different educational workers even in the same industry.

3rd. As the raising of the levels of education, the composition of workers in the secondary industry is dropping. According to the Petty-Clark's Law, the flow of labours in three industries as the development of economics will cause the reduction of composition in the primary industry and increasing in the secondary and tertiary industry. But the ability of accommodating more workers for the secondary industry is limited comparing with the tertiary industry. So we come to the trend that as the raising of the levels of education, the composition of workers in the secondary industry dropping with the tertiary industry raising.

4. CONCLUSION

From the above Quantitative analysis of influence of different educational years to vocation and employment we can get that:

1st. Higher education can reduce the vocational difference of workers. The vocational distribution is more concentrated for college workers than high school workers, and the former mostly work as mental workers.

2nd. Higher education can improve the employment situation of workers. From the microscopic perspective, higher educational workers are doing jobs with more technology and profession, and they enjoy better employment environment and more leisure time. And from the macroscopic perspective, the raising of the levels of education of workers can not only promote the gross economics growth and speed

up economic restructuring but also improve the workers' employment situation[5].
Therefore, it's wise for a person to invest in educaion. Because it will bring not only higher start-income and better employment situation, but also incremental economics rewards and more employment opportunity. The situation is much clearer in districts with developed economics and market.

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