Higher Education Expansion and Labor Market Outcomes: The Case of Vietnam

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Abstract

This study investigates how dramatic increase of university and college graduates affects labor market outcomes. Using a series of seven repeated cross sections of the Vietnam Household Living Standards Surveys, this paper analyzed the changes in the rate of returns to higher education attainment along with the increased supply of university and college graduates due to the higher education expansion throughout the 2002–2014 period. The study utilized a ratio of number of university and college students to the number of upper-secondary pupils within each province as an instrumental variable to calculate the effects of higher education expansion on the labor wage. The study found that, with the basic equations, the coefficients for higher education attainment are statistically significant and have positive values for the whole period. Our instrumental variables were found to be valid. For instrumental variable estimation, the return to higher education in IV earning equations was quite high. The findings of this study suggested that the expansion of the higher education system in Vietnam during 2002–2014 had positive effects on wages for those who increased their education attainment due to the reforms and there was a declining trend of the returns to higher education toward the end of the period.

Keywords: Labour Economics, Higher Education, Labour Market, Vietnam, Expansion

JEL Classification Code: A22, I20, I21

1. Introduction

The expansion of the higher education system in Vietnam provided more educational opportunities for the country's young population. Between 1998 and 2008, 54 colleges were upgraded to universities. Between 2006 and 2008, 78 mid-level vocational schools were upgraded to colleges and 28 colleges were upgraded to universities. In 1999, there were only 719,842 students participating in 69 universities.

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By 2011, the number of students sharply increased to 1,448,021 enrolling in 204 universities.

This study used the expansion as an identification strategy to investigate how returns to education changed over time. The nature of this increase in educational opportunities allowed estimating the differences in average wages and average education between individuals who could advance their education to the higher education level due to the expansion and those who did not.

The rates of return to education in Vietnam were investigated intensively in the past. However, most of previous research utilized cross-sectional data to calculate the returns at a specific point of time. There were few studies looking at the long-term relationship between the increased supply side of university/college graduates and the labor market outcomes over an extended time. Therefore, the first contribution of this study was to examine this trend over 12 years, from 2002 to 2014. The second contribution of this study was that it put more effort in calculating the effects of the higher education expansion on labor market outcomes, using the expansion as an identification strategy. The study also dealt with endogeneity issue of the education variable in calculating the rate of returns to higher education.

2. Literature Review

University education was considered an investment in human capital. Therefore, university graduates were expected to have better lifetime profiles (Mincer 1974, Becker 1993). However, economic returns of investing in higher education would be different between social groups (Trisnaningsih et al., 2020). Heckman et al. (2018) estimated returns to education using a dynamic model of educational choice and concluded that college attainment was not suitable for everyone because ability bias was a major component of observed educational differentials. In a study to investigate how China's higher education expansion in 1999 affected education opportunities of various population groups and the labor market, Li et al. (2014) showed that although higher education expansion increased the probability of individuals' going to college, it led to a decline of the returns. Carneiro et al. (2011) found that returns were higher for individuals with unobservable characteristics that make them more likely to attend college. Kyui (2016) analyzed the effects of Russian educational system expansion on labor market outcomes in 15 years and found decreasing marginal returns to higher education. Xing et al. (2018) found that higher education expansion policy increased the unemployment rate of new college graduates in the short run, the unemployment rate kept declining and the dis-employment effect mostly disappeared after five years.

For the last two decades, economists had a keen interest in estimating the rates of return to education in Vietnam (Do et al., 2020). Moock et al. (2003) found that the economic return to university education in Vietnam was 11 percent, higher than that of secondary school, which was only 5 percent (Moock et al., 2003). Although higher than secondary education, university education in Vietnam still had a low rate of return compared with other developing countries. Based on data of 324 wage-earning males tracked from two rounds of VHLSS in 1992–93 and 1997–98, Liu (2006) argued that the wage structure changed in such a way as to favor better-educated people during the transition period in Vietnam's economy. Returns to primary education decreased quickly overtime, while returns to higher education steadily increased. On the other hand, Doan (2011) found that the wage premium for university education in Vietnam was about 68% higher than a high school education. The yearly rate of return to university education in Vietnam was 17%, which was comparable with that of Asian countries.

Empirical literature on rates of return to education in Vietnam had several significant shortcomings. Most studies utilized cross-sectional data to examine the returns in each time with determinant factors originating from a particular labor market context in Vietnam. In addition, there were no studies quantifying the effects of the university expansion on the labor market outcomes.

3. Data and Methodology

Data for this research was mainly collected from the Vietnam Household Living Standards Survey (VHLSS) 2002, 2004, 2006, 2008, 2010, 2012 and 2014, which covered the period of higher education expansion. As we focused on the effect of the higher education expansion policy, we included only people aged 23 to 40, making the sample size containing 127,285 observations. We assumed that people took the entrance exam at age 18 after finishing upper secondary school. Data for the numbers of students enrolled in universities and colleges and upper-secondary school pupils were collected from the Annual abstracts of Statistics published by Vietnam General Statistics Office.

The methodology for this research was of two-folds. First, OLS regression was applied to examine the change in the returns to higher education during the period using the adjusted basic Mincer equation:

$$logY = logY_0 + rHE + \beta_1 A + \beta_1 A^2 + \gamma C + \varepsilon \qquad (1)$$

Where: Y: earnings of the person; HE: dummy variable indicating whether the person has a higher education degree or not; A: ages of the person; C: vector of controlled variables; ε : error term.

The parameters could be interpreted as the returns to schooling and experience, respectively. In the equation, control variables such as gender, marital status, economic sector, and region were included.

OLS estimates of returns to education may suffer from bias due to endogeneity of the educational variable because the variable represented for higher education attainment may be correlated with error terms due to omitted 'ability' variable. This problem could be addressed by adopting an instrumental variable approach. During the period under examined, the number of universities and colleges rapidly increased all over the country. In addition, the expansion policy affects individual schooling decisions, but it does not have direct effect on earnings. For the above reasons, the degree of the higher education expansion in the corresponding area can be utilized as an exogenous instrument for the variable of higher education attainment in the earnings equation. The study utilized the ratio of the number of university and college students to the number of upper-secondary pupils four years ago. The rate of return estimated with an instrumental variable (IV) was defined as the average return to higher education for individuals who are induced to hold a university/college degree because of the higher education reform.

Variations in higher education attainment were used as an instrument variable to examine the effect of the expansion on income of individuals who took advantage of this increasing

educational opportunity. The instrumental variable was the ratio of university and college students to upper-secondary pupils within each province four years ago. The ratio of four years ago was used since it took about 4 years to finish a higher education program in Vietnam (e.g., the ratio of 1998 will be used for the earnings equation in 2002). In other words, if a student passed the entrance exams and decided to enter a higher education institution, she/he could only join the labor market after four years.

4. Results and Discussions

Adjusted basic Mincer equation estimation (Table 1) showed that the coefficients for higher education attainment were all statistically significant at 1% confidence level and had positive values for the whole period. It indicated that if a person had a higher education degree, she/he would gain higher wages than those who did not. For example, in 2002, a higher education degree holder would have his wage 57.6% higher than a non-holder, which was equivalent to a return of 14.4% for an additional year of education (assuming it took her/him 4 years to get the higher education degree). It could be observed that returns to higher education increased steadily from 2002 to 2010 and decreased after that for both cohort age groups.

For the IV earnings equations, we used the ratio of higher education students to upper-secondary pupils in each province four years ago. This ratio reflects the degree of higher education expansion within the province and would increase if more students are accepted into a university or a college.

To use the higher education expansion policy as an instrumental variable, two requirements must be satisfied. Firstly, the expansion policy must be uncorrelated with unobserved ability. Because students always had to pass their high school graduation exams before submitting their applications for university/college admissions, we could assume that there were no significant changes in the ability of students before and after the expansion occurred. Secondly, an increase in the number of institutions should have led to an improvement in higher education achievement of the labor force. Therefore, individuals' educational attainment and the education reform must be correlated. This can be tested in the first stage estimates. It was expected that the instrumental variable would be strongly correlated with higher education attainment, but not correlated with students' ability because the expansion (reflected by the ratio of university and college students to upper-secondary pupils) made it easier to be accessed. However, it had no relation with students' ability.

Table 1: Adjusted Basic Mincer Equation Estimation

Higher education degree attainment as main independent variable – Age 23–40							
Variables	y2002	y2004	y2006	y2008	y2010	y2012	y2014
HE attainment	0.576***	0.483***	0.604***	0.663***	0.704***	0.526***	0.508***
	(0.0300)	(0.0313)	(0.0301)	(0.0289)	(0.0248)	(0.0227)	(0.0187)
Age	0.00158	0.0576	0.107*	0.0360	−0.0421	0.154***	−0.00684
	(0.0449)	(0.0686)	(0.0637)	(0.0652)	(0.0631)	(0.0583)	(0.0544)
Age squared	−6.05e−05	−0.000586	−0.00136	−0.000348	0.000850	−0.00245***	0.000478
	(0.000705)	(0.00110)	(0.00102)	(0.00105)	(0.00102)	(0.000926)	(0.000863)
Observations	19,460	3,114	3,115	3,264	3,705	3,878	3,975
R-squared	0.157	0.211	0.241	0.299	0.284	0.226	0.273
Higher education degree attainment as main independent variable – Age 23–28							
HE attainment	0.441***	0.495***	0.591***	0.631***	0.624***	0.380***	0.392***
	(0.0467)	(0.0469)	(0.0433)	(0.0448)	(0.0397)	(0.0393)	(0.0286)
Age	0.0543	0.227	0.349	−0.0255	−0.201	0.192	−0.0256
	(0.210)	(0.293)	(0.273)	(0.295)	(0.267)	(0.270)	(0.229)
Age squared	−0.000701	−0.00408	−0.00610	0.000809	0.00432	−0.00294	0.00107
	(0.00411)	(0.00575)	(0.00537)	(0.00579)	(0.00522)	(0.00529)	(0.00449)
Observations	6,345	1,151	1,266	1,365	1,476	1,359	1,329
R-squared	0.164	0.219	0.254	0.265	0.220	0.157	0.229

Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 2: First Stage Regression – Ratio of University and College Students to Upper-Secondary Pupils as IV – Age 23–40

Variables	y2006	y2008	y2010	y2012	y2014
Ratio of students to pupils (4 years before)	0.0820***	0.0990***	0.0890***	0.0975***	0.0581***
	(0.0136)	(0.00990)	(0.00901)	(0.0101)	(0.00756)
Constant	−1.351***	−1.973***	−2.064***	−1.505***	0.455
	(0.350)	(0.358)	(0.352)	(0.337)	(0.344)
Observations	1,851	2,063	2,385	2,534	2,732
R-squared	0.179	0.210	0.202	0.184	0.203
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000

Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 3: Second Stage Instrumental Variable Estimation – age 23–40

Variables	y2006	y2008	y2010	y2012	y2014
HE attainment	1.773***	0.911***	1.623***	0.925***	1.349***
	(0.338)	(0.147)	(0.197)	(0.150)	(0.215)
Age	−0.115	0.0414	−0.144**	0.0515	0.0661
	(0.0825)	(0.0552)	(0.0672)	(0.0435)	(0.0402)
Age squared	0.00207	−0.000447	0.00247**	−0.000678	−0.000753
	(0.00130)	(0.000873)	(0.00105)	(0.000675)	(0.000640)
Observations	1,075	1,278	1,540	1,658	1,844
R-squared		0.262		0.108	

Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

To examine the validity of the instrumental variable, first stage regression was estimated. Dependent variable was higher education attainment (i.e., a dummy variable indicating whether the person has university/college degree or not). Independent variable was the ratio of university and college students to upper-secondary pupils within each province four years before. Control variables such as gender, marital status, economic sector, and region were also included in the regression.

Table 2 showed the correlation of the instruments on higher education degree attainment in the first stage for the cohorts aged 23–40. The sign on the treated group was positive and statistically significant in all years at the 1-percent level. It could be interpreted that the effect of the expansion was strong enough to be reflected in the estimates and the instrument was highly qualified for the first condition.

Table 3 and Table 4 presented a series of IV estimates of the returns to education, using the higher education expansion variable (the ratio of university and college students to upper-secondary pupils within each province four years before) as an instrumental variable. For the instrument's validity, the IV model estimated returns from 2006 round onwards. Individuals' weight was utilized in each round of the data. All the coefficients for university education were statistically significant at 1% confidence level. For the age group of 23–40, Table 3 showed that the return to higher education in IV earning equations was at 177.3% in 2006 then it turned to lower, 91.1% in 2008. The return increased to 162.3% in 2010 before decreasing to 92.5% in 2012 and then rose again to 134.9% in 2014. This trend was slightly different to the results in the previous OLS models as the peak of return to education could not be clearly observed.

Table 4 showed the results for the cohort of 23–28. A similar pattern could be observed where the return to university education fluctuated during the period from 173.4% percentage point (in 2006) to 98.6 percentage point (in 2008), 163.7 percentage point (in 2010), 119.9 percentage point (in 2012) and finally 100.2 percentage point. For this cohort, the returns to higher education also hit a record high in 2010 and then declined after that, which was consistent to the OLS results.

Table 4: Second Stage Instrumental Variable – Age 23–28

Variables	y2006	y2008	y2010	y2012	y2014
HE attainment	1.734***	0.986***	1.637***	1.199*	1.002***
	(0.434)	(0.251)	(0.271)	(0.658)	(0.243)
Age	0.768	−0.236	−0.240	0.398	−0.409
	(0.680)	(0.485)	(0.574)	(0.500)	(0.502)
Age squared	−0.0157	0.00466	0.00437	−0.00721	0.00876
	(0.0134)	(0.00948)	(0.0112)	(0.00984)	(0.00983)
Observations	534	674	693	690	718

Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

The gaps between the IV and OLS estimates of the return to university education above could be explained by the fact that the return to education varies across individuals (Card, 1995). In this case, the IV estimate using the higher education expansion as an instrument was the ratio of the differences in average wages and average education between individuals who could advance their education to the university/college level due to the expansion. In other words, the higher education expansion policy affected the schooling decision of a subset of individuals, who would not continue their education otherwise. For example, due to the expansion, individuals who were from less advantaged family background could have access to higher education. Another possibility was that individuals were motivated to pursue higher education when newly established institutions offered new study majors that enable students to have a high rate of return when they enter the labor market.

If the existence of the newly established higher education institutions affects the education decisions of these individuals, then the IV estimation depends on the marginal return to education in this subset of the population. According to the results, individuals who could obtain university/college education due to the expansion owned a higher return than other university/college graduates. It was likely that the productivity of the treated group is higher than the average level, which means that the expansion enabled highly qualified students who for some reasons could not acquire university education before being able to access to university education. This is consistent with some previous research such as that of Le et al. (2020).

This research contained some limitations. Although the above utilized instrument variable method could deal with the endogeneity issue of the education variable in the Mincerian equation, it likely caused another issue of sample selection bias because we could not observe the whole population when estimating returns to education on only characteristics of individuals in waged employment. In Vietnam as well as in other developing countries, many workers were self-employed. This

selection bias could be corrected using the Heckman two-step procedure and incorporating lambda into earnings function estimates. Besides, the effect of higher education expansion would not be evenly distributed among various regions in Vietnam because universities and colleges tend to concentrate in the Red River Delta and Mekong Delta. Therefore, further research should be carried out to examine the effect of higher education expansion to individuals residing in different regions.

5. Conclusions

This research quantified the effects of higher education expansion on wages. The authors identified strong positive returns to education during the examined period. The results showed that the average return to a higher education degree increased in the first half of the period, but declined in the second half. The declining trend of the returns to higher education toward the end of the period had some implications. First, the supply of university and college graduate possibly increased faster than the growing demand for highly qualified workers in the labor market. Secondly, when the numbers of university and college holders increased quickly and were no longer scarce, the labor market would reward them with lower wages. Another possibility was a declining trend in the quality of higher education institutions and their academic programs during the higher education expansion period.

In addition, the study found that the expansion of the higher education system in Vietnam during 2002–2014 had positive effects on wages for those who increased their education attainment due to the reforms. Persons who benefited from the expansion in terms of education attainment gained higher wages than the average level. It was likely that the expansion has enabled highly qualified youths who for some reason could not pursue university and college education could be admitted under the new system. However, similar to the estimates for the average return, the marginal return to higher education also started to decline from 2012. It means that the rate of returns for individuals

who could obtain higher education due to the expansion started to be negatively affected by the rising supply of university and college trained workers. It was a proof that the rapid increase in the supply of higher education graduates in Vietnam could result in a negative influence on the labor market outcomes if not properly controlled.

References

Becker, G. S. (1993). *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education* (3rd ed.). Chicago, IL: The University of Chicago Press.

Card, D. (1995). *Using Geographic Variation in College Proximity to Estimate the Return to Schooling. In Aspects of Labour Market Behavior: Essays in Honor of John Vanderkamp*. Toronto, Canada: University of Toronto Press.

Carneiro, P., Heckman, J. J., & Vytlacil, E. J. (2011). Estimating Marginal Returns to Education. *American Economic Review, 101*(6), 2754–2781. https://doi.org/10.1257/aer.101.6.2754

Do, H. T. H., Mai, C. N., Mai, A. N., Nguyen, N. D., Pham, T. N., Le, H. T. T., … Vu, T. T. (2020). Impact of Vocational Training on Wages of Ethnic Minority Labors in Vietnam. *Journal of Asian Finance, Economics and Business, 7*(6), 551–560. https://doi.org/10.13106/JAFEB.2020.VOL7.NO6.551

Stevens, P., & Doan, T. (2011). Labor Market Returns to Higher Education in Vietnam. Economics - *The Open-Access, Open-Assessment E-Journal, 5*, 1–21. https://doi.org/10.5018/economics-ejournal.ja.2011-12

Heckman, J. J., Humphries, J. E., & Veramendi, G. (2018). Returns to Education: The Causal Effects of Education on Earnings, Health, and Smoking. *Journal of Political Economy, 126*(S1), S197–S246. https://doi.org/10.1086/698760

Kyui, N. (2016). Expansion of higher education, employment and wages: Evidence from the Russian Transition. *Labour Economics, 39*, 68–87. https://doi.org/10.1016/j.labeco.2016.01.001

Le, Q. T. T., Doan, T. H. D., Nguyen, Q. L. H. T. T., & Nguyen, D. T. P. (2020). Competency Gap in the Labor Market: Evidence from Vietnam. *Journal of Asian Finance, Economics and Business, 7*(9), 697–706. https://doi.org/10.13106/JAFEB.2020.VOL7.NO9.697

Li, S., Whalley, J., & Xing, C. (2014). China's higher education expansion and unemployment of college graduates. *China Economic Review, 30*(C), 567–582.

Liu, A. (2006). Changing wage structure and education in Vietnam, 1992–98—The roles of demand. *The Economics of Transition, 14*, 681–706. https://doi.org/10.1111/j.1468-0351.2006.00266.x

Mincer, J. (1974). *Schooling, Experience, and Earnings*. Cambridge, MA: National Bureau of Economic Research.

Moock, P., Patrinos, H., & Venkataraman. (2003). Education and Earnings in a Transition Economy: the Case of Vietnam. *Economics of Education Review, 22*, 503–510.

Trisnaningsih, S., Sutrisno, S., Permatasari, Y., Hendra, F. H., & Sulistyowati, E. (2020). Contingency Model to Increase the Uptake of Higher Education Graduates in the Job Market. *Journal of Asian Finance, Economics and Business, 7*(4), 197–203. https://doi.org/10.13106/JAFEB.2020.VOL7.NO4.197

Xing, C., Yang, P., & Li, Z. (2018). The medium-run effect of China's higher education expansion on the unemployment of college graduates. *China Economic Review, 51*, 181–193 https://doi.org/10.1016/j.chieco.2017.05.005