Adult Education and Income Growth
The Case of Vietnam

TAM BANG VU* & ERIC IKSOON IM**

ABSTRACT

This paper investigates the effect of adult education on income growth in developing countries worldwide with an emphasis on the case of Vietnam. The Vector Autoregressive model for panel data (Panel VAR) is employed to examine any possible two-way causality between a pair of variables. The results show that adult education raises income growth in Vietnam more than in other developing countries. On the reverse causality, we find that the effect of income growth on adult education is lower in Vietnam than in other countries. We also find that the effect of income growth on male education is less than that of the female education in Vietnam.

Keywords: Adult education, income growth, developing countries, Vietnam.

1. INTRODUCTION

Adult education has made great contributions to economic development worldwide, especially in terms of increasing employment and productivity. In Vietnam, it was considered one of the most important aspects of Vietnam's education during the difficult years of wars. The government's encouragement and propaganda among people nationwide resulted in a very high literacy rate in Vietnam during these years. Since economic reform of 1986, adult education has received less attention due to people's focus on pursuing economic prosperity. Acutely aware of this problem, Vũ (2011) writes his article "Three Wishes for the New Year" (*Ba điều ước nguyện đầu Xuân*) several days before his last journey to the eternity, "do not forget that the duty to fight against illiteracy (*giặc dốt*) is still very important."

Literature on adult education worldwide is very scarce, and papers on adult education and income growth is even more difficult to find. Martin (2004) shows that urban adult education programs have proliferated in many urban centers, including new and previously unknown forms of learning

* Tam Bang Vu (Vũ Băng Tâm): Corresponding Author, Associate Professor, Doctor of Philosophy in Economics, University of Hawaii-Hilo, CoBE, 200 W Kawili Street, Hilo, Hawaii, 96720, USA, tamv@hawaii.edu.

** Eric Iksoon Im: Professor, Doctor of Philosophy in Economics, University of Hawaii-Hilo, eim@hawaii.edu.

Acknowledgement: The authors wish to thank Dr. Inessa Love of World Bank for providing the Panel VAR computer program.

opportunities. They comprise innovative partnership arrangements with previously unaffiliated organizations to the targeting of specialized groups of learners that can be found only in critical masses of the urban areas. Many methods of teaching are also introduced to meet the learning and educational needs of urban learners.

The remaining literature for the world as one group is on education in general and income growth. Using OLS on two single-equation estimations for cross sectional data of 81 to 93 countries, Bils and Klenow (2000) find that education only has a very weak effect on GDP per capita, but this GDP increase in turn has a positive effect on school enrollments. Vũ and Hammes (2007) use a larger panel dataset and an advanced econometric method of three stage least squares (3SLS). They find that the two-way causality is positive in both directions.

Concerning the Asia-Pacific region, Ahme (2009) shows that there is a positive association between adult education and higher levels of knowledge and skills, which helps reduce poverty in this region. However, he also points out that adult education suffers from negligence among developing countries, causing the enrollments to fluctuate wildly during the past two decades. Hughes and Tso (1964) report that adult education is very important for business, commerce, and industrial development in Southeast Asia.

Regarding the case of Vietnam, Vũ (1945) introduces and analyzes education methods around the world. He then recommends that adult education in the form of continuing education (*bổ túc văn hóa*) has to go hand in hand with formal education. Vũ (1946) explains why adult education in the form of common learning (*bình dân học vụ*) is crucial for a newly emerging economy like Vietnam. Nguyễn (2005) provides a quick account of the current state of continuing education in Vietnam and the importance of strengthening it without collaboration on the causes and consequences of this reinforcement.

Recently, more attention is given to the continuing education and elimination of illiteracy. Runckel (2011) provides a summary of education system in Vietnam but only barely touches the subject of adult education in saying that under Vietnamese government decree 322008-ND-CP, the Ministry of Education and Training (MOET) has responsibility for all education and training at the national level, including adult education, which might be understood as being conducted through continuing education programs. Phạm (2011) notes that this year is the first time Vietnam join the International Literacy Day on September 8, 2011, and emphasizes that literacy contributes strongly to economic growth. None of the papers on Vietnam provides a quantitative analysis about the effect of adult education on income growth.

2. METHODOLOGY AND DATA

a. Methodology:

We use the Vector Autoregressive model for panel data (Panel VAR) discussed in Love (2005). In quantitative analysis, there are two cases when a VAR approach is suitable. The first is for a time series dataset that is non-stationary and not co-integrated. The second is for a panel dataset when there might be feedback effects among all variables but no theoretical model is available to prove that all these feedback effects exist. Our paper falls into the second case. As emphasized by Love (2005), the Panel VAR method “combines the traditional VAR approach, which treats all the variables in the system as

endogenous, with the panel-data approach, which allows for unobserved individual heterogeneity." Hence, we specify the following model:

$$Y_{it} = \beta_0 + \beta_1 Y_{i,t-1} + \beta_2 X_{t-1} + a_i + b_t + e_{it} \qquad (1)$$

where $Y_{it} = k \times 1$ vector of dependent and endogenous variables, $Y_{i,t-1} = k \times 1$ vector of lagged dependent variable, $X_{i,t-1} = k \times m$ vector of lagged endogenous regressors other than the lag of the dependent variable. The three variables {PCY, EDU, CAP} are used alternately as the dependent variable in the model. PCY is the per capita income growth (henceforth called income growth), EDU is adult education growth, and CAP is capital stock growth. The subscript i is for each country and t is for each year, resulting in the country fixed effect, a_i, time fixed effect, b_t, and the idiosyncratic disturbance e_{it}, respectively.

The data is time-demeaned to remove time specific effects b_t by expressing all variables in the model as deviations from year specific means. In panel data technique, the fixed effects a_i is introduced to account for individual heterogeneity. Since the fixed effects are correlated with the explanatory variables due to lagged dependent variables, the traditional mean-differencing method to eliminate fixed effects would create biased coefficients. To overcome this problem for the cross-sectional effects, we use the Helmert procedure introduced in Love (2005). This procedure eliminates the forward orthogonal deviations, which are the means of all the future observations available for each country.

These two procedures preserve homoskedasticity, prevent serial correlation and also preserve the orthogonality between transformed variables and lagged regressors, thereby making it possible to use lags of the regressors as valid instruments since they are not correlated with the transformed error term. Another advantage of going through these procedures is that the model is more resilient to missing data. They are computable for all observations except the last for each cross-section, so they reduce data loss.

To examine Vietnam's education in the global context, we generate a dummy variable for Vietnam where VN = 1 and other countries = 0. The interactions of this dummy with other variables are then created to compare and contrast the feedback effects among variables in Vietnam with the other developing countries worldwide. Hence, the following simultaneous system is estimated:

$$\begin{aligned} PCY_{it} &= \alpha_1 PCY_{i,t-1} + \alpha_2 EDU_{i,t-1} + \alpha_3 EDU_{i,t-1} * VN + \alpha_4 CAP_{i,t-1} + \alpha_5 CAP_{i,t-1} * VN + v_{it} \\ EDU_{it} &= \beta_1 EDU_{i,t-1} + \beta_2 PCY_{i,t-1} + \beta_3 PCY_{i,t-1} * VN + \beta_4 CAP_{i,t-1} + \beta_5 CAP_{i,t-1} * VN + u_{it} \qquad (2) \\ CAP_{it} &= \gamma_1 CAP_{i,t-1} + \gamma_2 EDU_{i,t-1} + \gamma_3 EDU_{i,t-1} * VN + \gamma_4 PCY_{i,t-1} + \gamma_5 PCY_{i,t-1} * VN + w_{it} \end{aligned}$$

b. Data:

Data on real GDP, literacy rate, and investment for sixty-four developing countries worldwide are obtained from the United Nation World Development Indicators for the period from 1979 to 2009. To collate data on adult education, we first use data on literacy rate multiplied by population to obtain number of literate people for each country. We then subtract data on all other education levels—including numbers of enrollments in primary, secondary, and higher education—from this dataset to obtain data for adult education.

Data are divided by population to obtain data on per person for each variable, where data for adult education become data on the enrollment ratios of enrollment numbers to population. There are three datasets for adult education: enrollment ratio for all people over 15 years old, enrollments ratio for men over 15 years old, and that for women over 15 years old, henceforth called overall adult education, male adult education, and female adult education, respectively. Growth rate is then calculated for each variable.

3. RESULTS AND DISCUSSIONS

Table 1 reports the estimation results for System (2) for overall adult education. The results for Vietnam are calculated by summing the coefficients for all developing countries to the coefficients for the interaction terms with the dummies for Vietnam. For example, the coefficient for the adult education in Vietnam equals ($\alpha_2 + \alpha_3$) and so on for other variables. The F-tests are then performed on the significances of these sums. The results show that the two-way causality between the overall adult education and income growth is positive both ways. For the developing countries worldwide, these two-way effects are almost equal. The feedback effects of other variables in Table 1 are as expected.

However, the results for Vietnam reveal the effect of the adult education on income growth in Vietnam is much larger than the effect of income growth on adult education. Specifically, the effect of adult education on income growth in Vietnam is 10% higher than that of the developing countries worldwide but the reverse causality is 20% lower. This is not a good sign, as the increment of adult education is less than the increment of income growth. This implies that the richer Vietnamese people attain, the less interested in adult education they become, perhaps they are too busy pursuing economic prosperity and forget educational and cultural prosperity is equally important. If this tendency continues, the number of adult education enrollments will be gradually reduced in the future. Since education affects income growth positively, this phenomenon implies that there might be a reduction in income growth in the future.

Tables 2 and 3 report the estimation results for male adult education and female adult education, respectively. The effects of adult education on income growth are similar for men and women for all countries, including Vietnam. However, the effects of income growth on adult education for different genders are very different in Vietnam whereas it is similar for other countries. Especially, the effect of income growth on Vietnamese male adult is positive but 30% less than that of the other developing countries. On the contrary, the effect of income growth on Vietnamese female adult is only 10% less than that of the other developing countries. It implies that the higher income growth in Vietnam, the more likely that Vietnamese female citizens will be interested in adult education more than male citizens. Since literacy rate of women in Vietnam is still 6% lower than that of men, this is a good sign, as we can hope for a close of this gap in the future. The feedback effects of other variables in these tables are also as expected.

The results of the Variance Inflation Factor (VIF) tests for multicollinearity among the explanatory variables for the overall adult education are reported in Tables 4. They show that all VIF statistics for individual variables are far less than 10.00 and average VIF statistics for combined tests of all explanatory variables are also far below the acceptable level of 5.00. Hence, all t-tests, F-tests, and Chi-

squared statistics are valid. The results if the VIF tests for the estimations on male and female adult education are similar to the results in Table 4.

4. POLICY SUGGESTIONS

From the results, several policy suggestions are in order. First, adult education is very important as emphasized in Vũ (2011) "Three Wishes for the New Year." Hence, the central government needs to quicken its pace of encouraging Vietnamese adult attending continuing education programs in addition to its support to grade schools and universities. Second, since the effects of income growth on adult education is very weak, regional government should reinforce public propaganda on the great effects of adult education on income growth so that people realize going to school is the most important way to eliminate poverty in the long run.

Third, since the effect of income growth on female education is better than that of male education, the Vietnamese Women Association should be credited for their effort in liberating women and encouraging them obtaining education. The association should continue to help more women attend adult schools in order to close the gap between female and male literacy rate, which stands at 6% currently. Saying so does not mean that our ultimate goal is to close the gender gap in education, but equality in education is important in eliminating social dichotomy in income, as human resource is crucial in income growth. Continuing efforts should be made to catch up with other developing countries and eliminate overall illiteracy rate in Vietnam, which stands at 10% currently.

Finally, since people in the far-away regions and small hamlets are very poor and have to work 11-12 hours a day before spending the whole evening with house chores, they do not have time to go to adult schools. Hence, the government should strengthen the "socialization of education" movement to include adult education, which calls for a mobility of all citizens involving in education similar to the "common learning movement" (*phong trào bình dân học vụ*) during the wars, when people of all ages were joining the war against illiteracy. It should include young people volunteering to help poor households doing house work in the evening so that the residents can go to night schools, the rich people donating money for school supplies, teachers volunteering to teach with symbolic fees provided by the government and non-profit organizations, and banks lending emergency money to poor households with low interest rates when they are in distresses to reduce the anxieties for poor people so that they can have a peace of mind for schooling. Since increasing in adult education raises personal income substantially in Vietnam, the investment in this mode of education will produce socioeconomic benefits for the country in the future.

5. CONCLUSION

This paper examines the feedback effects among several variables, including those between adult education and income growth. To see the case of Vietnam in a global context, we use data for sixty-four countries worldwide and add a dummy for Vietnam. The results show that adult education raises income growth in Vietnam more than in other developing countries. However, the effect of this income growth on adult education in Vietnam is lower than the rest of the developing world and especially so in the case of Vietnamese men. In the future, this exercise can be repeated when data for enrollments in adult education programs become available for each province so that the relation between adult education and regional economic development can be examined.

References

Ahme, M. (2009), "The State and Development of Adult Learning and Education in Asia and the Pacific," *Regional Synthesis Report*, UNESCO Institute for Lifelong Learning, Hamburg, Germany.

Bils, M. & P. J. Klenow (2000), "Does Schooling Cause Growth?" *American Economic Review*, 90: 1160-1183.

Hughes, I. & P. Tso (1964), "Universities and Adult Education in Southeast Asia," *Report on the Leverhulme Conference on Extramural Studies*, Hong Kong University, Hong Kong.

Love, I. & Z. Lea (2006), "Financial development and dynamic investment behavior: Evidence from panel VAR," *The Quarterly Review of Economics and Finance*, 46: 190–210

Martin, L. (2004), "Adult education in the urban context: serving low income urban communities," Midwest Research-to Practice Conference in Adult, Continuing, and Community Education, Indiana University, Indianapolis, IN.

Nguyễn Minh Hiển (2005), *Toàn văn báo cáo tình hình giáo dục Việt Nam*, Bộ Giáo dục-Đào Tạo, Hà Nội, Việt Nam.

Phạm Thị Ngọc Hải (2011), "Ngày quốc tế xóa mù chữ (8/9/2011)," Mạng Giáo dục, Bộ Giáo dục-Đào Tạo, http://www.moet.gov.vn/?page=1.9&view=3683

Runckel, C. (2011), "The Education System in Vietnam," *Business in Asia.com*, http://www.business-in-asia.com/vietnam/education_system_in_vietnam.html

Vũ Đình Hòe (1945), *Những phương pháp giáo dục ở các nước và vấn đề cải cách giáo dục*, Thanh nghị Tùng thư Publisher, Hà Nội, Việt Nam

Vũ Đình Hòe (1946), *Một nền giáo dục bình dân*, Đại La Publisher, Hà Nội, Việt Nam

Vũ Đình Hòe (2011), "Ba điều ước nguyện đầu Xuân," *Thế giới mới*, Jan. 26, 2011, Việt Nam.

Vũ, T.B. (Vũ Băng Tâm), & D. Hammes (2007), "Education and Productivity: A Three Stage Least Squares Estimation," at the 10th International Conference for Business and Development, Kyoto, Japan, conference proceedings, 1023-1048.

Table 1. Estimations Results for System (2): Model for Overall Adult Education

Alternative dependent variables in the systems:

PCY_t: growth rate of income per person

EDU_t: growth rate of overall adult education

CAP_t: growth rate of capital per person

Variable	PCY_{t-1}	EDU_{t-1}	CAP_{t-1}
PCY_t			
Aggregate Results	.1415**	.2056**	.3317**
	(.0465)	(.0376)	(.0098)
Results for Vietnam	.1432**	.2262**	.3302**
	(.0362)	(.0412)	(.0197)
EDU_t			
Aggregate Results	.2032**	.1932**	.1007*
	(.0357)	(.0286)	(.0968)

Results for Vietnam	.1615**	.1902**	.1013*
	(.0259)	(.0415)	(.0879)
CAP_t			
Aggregate Effect	.1052**	.1123**	.0913**
	(.0387)	(.0185)	(.0283)
Results for Vietnam	.1024*	.1032**	.0896*
	(.0967)	(.0446)	(.0745)

Root Mean Square Error 0.975

Adjusted R-squared .7857

p-value for the significance of the model: 0.001

Number of observations: 1586

Variance of the residuals: .0314; p-value for the White test: .4623

p-value for the AR(1): .6143 and p-value for the AR(2): .4978

Note: * and ** denotes 10% and 5% significant levels, respectively, and p-values are in the parentheses.

Table 2. Estimations Results for System (2): Model for Male Adult Education

Dependent variables in the systems:

PCY_t: growth rate of income per person

EDU_t: growth rate of male adult education

CAP_t: growth rate of capital per person

Variable	**PCY_{t-1}**	**EDU_{t-1}**	**CAP_{t-1}**
PCY_t			
Aggregate Results	.1425**	.1013**	.3302**
	(.0402)	(.0324)	(.0187)
Results for Vietnam	.1418**	.1118**	.3298**
	(.0276)	(.0315)	(.0256)
EDU_t			
Aggregate Results	.1006**	.1932**	.1007*
	(.0243)	(.0286)	(.0968)
Results for Vietnam	.0712**	.1912**	.0986*
	(.0352)	(.0254)	(.0694)
CAP_t			
Aggregate Effect	.1102**	.1068**	.1078**
	(.0276)	(.0278)	(.0384)

Results for Vietnam	.1097*	.1072**	.0968*
	(.0698)	(.0367)	(.0859)

Root Mean Square Error 1.068

Adjusted R-squared .8278

p-value for the significance of the model: 0.000

Number of observations: 792

Variance of the residuals: .0416; p-value for the White test: .5723

p-value for the AR(1): .5978 and p-value for the AR(2): .6723

Note: * and ** denotes 10% and 5% significant levels, respectively, and p-values are in the parentheses.

Table 3. Estimations Results for System (2): Model for Female Adult Education

Dependent variables in the systems:

PCY_t: growth rate of income per person

EDU_t: growth rate of adult education

CAP_t: growth rate of capital per person

Variable	**PCY_{t-1}**	**EDU_{t-1}**	**CAP_{t-1}**
PCY_t			
Aggregate Results	.1498**	.1039**	.3325**
	(.0189)	(.0267)	(.0198)
Results for Vietnam	.1454**	.1187**	.3308**
	(.0423)	(.0265)	(.0267)
EDU_t			
Aggregate Results	.1046**	.2056**	.1014*
	(.0264)	(.0342)	(.0968)
Results for Vietnam	.0918**	.2014**	.1043*
	(.0325)	(.0423)	(.0687)
CAP_t			
Aggregate Effect	.1132**	.1096*	.0919**
	(.0285)	(.0278)	(.0325)
Results for Vietnam	.1094*	.1105**	.0908*
	(.0864)	(.0377) (.0825)	

Root Mean Square Error 0.896

Adjusted R-squared .7934

p-value for the significance of the model: 0.003

Number of observations: 802

Variance of the residuals: .0534; p-value for the White test: .6235

p-value for the AR(1): .5867 and p-value for the AR(2): .6143

Note: * and ** denotes 10% and 5% significant levels, respectively, and p-values are in the parentheses.

Table 4. VIF Tests for Multicollinearity

4a. Dependent Variables: Growth rate of income per person

Variable	VIF	1/VIF
Lag of PCY	5.32	0.188
Lag of adult education	4.35	0.229
Lag of capita per person	3.54	0.282
Mean VIF	2.78	

4b. Dependent Variable: Growth rate of adult education

Variable	VIF	1/VIF
Lag of PCY	4.98	0.201
Lag of adult education	3.32	0.298
Lag of capita per person	2.68	0.373
Mean VIF	2.56	

4c. Dependent Variable: Growth rate of capital per person

Variable	VIF	1/VIF
Lag of PCY	5.04	0.198
Lag of adult education	4.12	0.243
Lag of capita per person	3.01	0.332
Mean VIF	2.64	

Note: the results of the VIF tests for models involving male adult education and female adult education are similar to the results in Table 4.